STATE OF DELAWARE
DIVISION OF FISH AND WILDLIFE
CONTRACT # NAT202301-LeipsicResearchDock

PROJECT MANUAL

FOR

LEIPSIC RESEARCH DOCK FACILITY

AT

LEIPSIC, DELAWARE 19901

PREPARED
BY

CENTURY ENGINEERING, LLC
550 BAY ROAD
DOVER, DE 19901

JUNE 1, 2026

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SECTION 00 01 07 – SEALS PAGE

1) DESIGN PROFESSIONALS OF RECORD;

a) CIVIL ENGINEER: .....SEAL

(1) NAME:..... ARTHUR LANCE WILGUS, P.E.
(2) DELAWARE PE LICENSE: 6538
(3) TITLE: ..... CIVIL ENGINEER
(4) FIRM NAME:.....CENTURY ENGINEERING, LLC
(5) FIRM ADDRESS:..... 550 BAY ROAD, DOVER, DE 19901
(6) FIRM TELEPHONE:..... 302-734-9188
(7) EMAIL ADDRESS:..... LWILGUS@KLEINFELDER.COM
(8) RESPONSIBLE FOR: .....DIV 00, 01, 02, 22, 32 & 33

11-07-2025

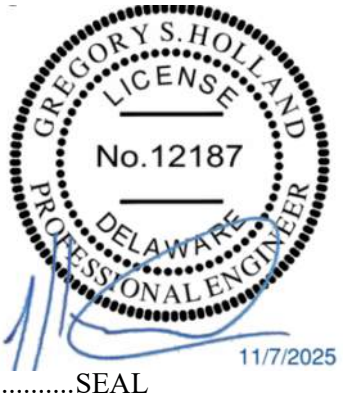
b) ARCHITECT: .....SEAL

(1) NAME:..... PAUL B. GUGGENBERGER, AIA
(2) DELAWARE LICENSE: 6548
(3) TITLE: ..... PRINCIPAL
(4) FIRM NAME:.....STUDIO JAED
(5) FIRM ADDRESS:..... 2500 WRANGLE HILL RD, SUITE 110
.....BEAR, DE 19701
(6) FIRM TELEPHONE:..... 302-832-1652
(7) EMAIL ADDRESS:..... GUGGENBERGERP@STUDIOJAED.COM
(8) RESPONSIBLE FOR: .....DIV 05, 06, 07, 08, 09, 10, 11, 12, 13, & 14

11-07-2025

c) STRUCTURAL ENGINEER:.....SEAL

(1) NAME:.....GREGORY S. HOLLAND, P.E.
(2) DELAWARE PE LICENSE: 12187
(3) TITLE: .....PRINCIPAL IN CHARGE, STRUCTURAL
(4) FIRM NAME:.....CENTURY ENGINEERING, LLC
(5) FIRM ADDRESS:.....10710 GILROY ROAD
.....HUNT VALLEY, MD 21031
(6) FIRM TELEPHONE:..... 443-589-2400
(7) EMAIL ADDRESS:..... GHOLLAND@KLEINFELDER.COM
(8) RESPONSIBLE FOR: .....DIV 03



d) MECHANICAL ENGINEER:.....SEAL

(1) NAME:.....EDWARD DEAN ASBURY, P.E.
(2) DELAWARE PE LICENSE: 29209
(3) TITLE: .....MEP ENGINEERING MANAGER
(4) FIRM NAME:.....CENTURY ENGINEERING, LLC
(5) FIRM ADDRESS:..... 550 BAY ROAD, DOVER, DE 19901
(6) FIRM TELEPHONE:..... 717-210-3306
(7) EMAIL ADDRESS:.....EASBURY@KLEINFELDER.COM
(8) RESPONSIBLE FOR: .....DIV 20, 22, & 23

11-07-2025

e) ELECTRICAL ENGINEER: .....SEAL

(1) NAME: .....EDWARD DEAN ASBURY, P.E.
(2) DELAWARE PE LICENSE: 29209
(3) TITLE: .....MEP ENGINEERING MANAGER
(4) FIRM NAME: .....CENTURY ENGINEERING, LLC
(5) FIRM ADDRESS: ..... 550 BAY ROAD, DOVER, DE 19901
(6) FIRM TELEPHONE: 717-210-3306
(7) EMAIL ADDRESS: .....EASBURY@KLEINFELDER.COM
(8) RESPONSIBLE FOR: .....DIV 26, 27 & 28

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Specifications for this project are arranged in accordance with the Construction Specification Institute numbering system and format. Section numbering is discontinuous and all numbers not appearing in the Table of Contents are not used for this Project.

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NOTE: Provisions within the referenced specification sections regarding material and execution requirements are applicable. The provisions regarding DelDOT provided survey, testing, inspection, measurement, payment or other services are not applicable.

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11. TOWN OF LEIPSIC PERMIT PERMISSION LETTER
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SECTION 00 11 16 – INVITATION TO BID

The Department of Natural Resources and Environmental Control, Division of Fish & Wildlife will receive sealed bids for **Leipsic Research Dock Facility, Contract No.: NAT202301-LeipsicResearchDock**, in the Auditorium, DNREC Building, 89 Kings Highway, Dover Delaware 19901, until 2:00 p.m-sharp local time on September 4, 2026, at which time they will be publicly opened and read aloud in the Auditorium. Bidder bears the risk of late delivery. Any bid received after the stated time will be returned unopened.

Project is in the Town of Leipsic and will construct a new pre-engineered metal building including interior office and storage spaces and supporting electrical and mechanical systems, a new pre-fabricated aluminum fixed dock and connecting ramp supported by circular steel piles on the south bank of the Leipsic River, an above ground diesel fuel storage tank with dockside fuel dispensing station, site improvements including pavements, water supply well, area lighting, and security gate.

A **MANDATORY** Pre-Bid Meeting will be held at 10:00AM-sharp on August 7, ,2026 at the Leipsic Research Dock Facility project site for the purpose of establishing the listing of subcontractors and to answer questions. Contractors arriving after 10:00AM-sharp will not be considered eligible for bidding. Representatives of each party to any Joint Venture must attend this meeting. **ATTENDANCE OF THIS MEETING IS A PREREQUISITE FOR BIDDING ON THIS CONTRACT.**

Sealed bids shall be addressed to the following address. The outer envelope should clearly indicate

"DELAWARE DIVISION OF FISH AND WILDLIFE
CONTRACT No: NAT202301-LeipsicResearchDock – DO NOT OPEN".

Dept. of Natural Resources & Environmental Control
Delaware Division of Fish & Wildlife
89 Kings Highway, Dover DE 19901
Attn: Jeremey Ashe. Phone Number 302-735-3601.

Contract documents may be obtained and printed from www.bids.delaware.gov.

Bidders will not be subject to discrimination on the basis of race, creed, color, sex, sexual orientation, gender identity or national origin in consideration of this award, and Minority Business Enterprises, Disadvantaged Business Enterprises, Women-Owned Business Enterprises and Veteran-Owned Business Enterprises will be afforded full opportunity to submit bids on this contract. Each bid must be accompanied by a bid security equivalent to ten percent of the bid amount and all additive alternates. 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.

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SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

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7. PERFORMANCE BOND AND PAYMENT BOND

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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: Contracting State Agency as noted on cover sheet.

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 (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

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 Owner and the 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 Owner and 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 Owner/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 Agency 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.

1.23 CUSTOM FABRICATION: As defined in 29 Del. C. § 6902, the term “custom fabrication” means the offsite fabrication, assembly, or other production of non-standard goods or materials, including components, fixtures or parts thereof, specifically for a public works project. Such goods and materials shall include those used in the following trades or systems: (1) Plumbing or pipe fitting systems, including heating, ventilating, air-conditioning, refrigeration systems, sheet metal or other duct systems; (2) Electrical systems; (3) Mechanical insulation work; (4) Ornamental iron work; and (5) Commercial signage that does not attempt or appear to direct the movement of traffic on highways or roadways or interfere with, imitate, or resemble any official traffic sign, signal or device.

ARTICLE 2: BIDDER'S REPRESENTATION

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 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 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.

2.2.4 Bidder has accounted for the possibility of price increases due to the direct and indirect effect of tariffs, other international events, inflation, and supply chain interruptions. Change Orders will be denied if they are based upon any of these events. Bidder is expected to account for these possibilities and include them in the bid.

2.3 JOINT VENTURE REQUIREMENTS

2.3.1 For Public Works Contracts, 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.

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 State.

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 issuing Agency 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 Agency 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 2 calendar 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.

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 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.

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

4.1.7 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.

4.1.8 Bidder shall complete the Non-Collusion Statement form included with the Bid Forms and include it with their Bid.

4.1.9 In the construction of all Public Works projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.

4.1.10 Each bidder shall include a signed Affidavit for the Bidder certifying compliance with OMB Regulation 4104 - “Regulations for the Drug Testing of Contractor and Subcontractor

Employees Working on "Large Public Works Projects." "Large Public Works" is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

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 State. 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 standard OMB form (attached). The bid bond may be an electronic bond and need not be transmitted as a paper document.

4.2.2 The Agency 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 SUBCONTRACTOR LIST

4.3.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, each Bidder shall submit with their Bid a completed List of Sub-Contractors included with the Bid Form. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the Bidder will be using to perform the work and provide material for that subcontractor category. Should the Bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the Bidder shall list that third-tier contractor's full name and address (City & State). **If the Bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the Bidder intends to perform the work themselves, the Bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

4.3.2 It is the responsibility of the Contractor to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Contractor elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Bid Form and be able to document their capability to act as Subcontractor in that category in accordance with this law.

4.4 AFFIDAVIT OF CONTRACTOR QUALIFICATIONS

4.4.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, each Bidder shall submit with their Bid the Affidavit of Contractor Qualifications certifying that the Bidder will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term. After a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

4.5 AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

4.5.1 In accordance with Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code, contractors and subcontractors must provide craft training for journeyman and apprentice levels if **all** of the following apply:

A. A project meets the prevailing wage requirement under Title 29, Chapter 69, Section 6960 of the Delaware Code.
B. The contractor employs 10 or more total employees.
C. The project is not a federal highway project

Failure to provide required craft training on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code.

Bidders shall submit the Affidavit of Craft Training Compliance prior to contract execution.

4.6 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

4.6.1 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, sex, color, sexual orientation, gender identity 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, sex, color, sexual orientation, gender identity 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, sex, color, sexual orientation, gender identity or national origin."

4.7 PREVAILING WAGE REQUIREMENT

4.7.1 Wage Provisions: For renovation and new construction projects whose costs exceed the thresholds contained in Delaware Code, Title 29, Section 6960, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.

4.7.2 The employer shall pay all mechanics and labors employed directly upon the site of work, or engaged in custom fabrication work, as that term is defined in Article 1.23 herein and as also

as defined in 29 Del. C § 6902 and described in 29 Del. C. § 6960(b), regardless of where the work is performed, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.

4.7.3 As per 29 Del. C. § 6960(b), the scale of the wages to be paid must be posted by the employer in a prominent and easily accessible place at the site of the work. There may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay laborers and mechanics employed by the employer the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims.

4.7.4 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

4.8 SUBMISSION OF BIDS

4.8.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid.

4.8.2 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.

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

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

4.8.5 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.

4.8.6 Compliance with Federal Bureau of Investigation rules mandates training for Contractors, Subcontractors, their employees, and custodial workers with access to locations that have access to Criminal Justice Information Services (CJIS). The contract awardee must have fingerprinting and background checks done for all Subcontractors and employees.

4.9 MODIFICATION OR WITHDRAW OF BIDS

4.9.1 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.

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

4.9.3 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 Unless otherwise stated, Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids will be made available to Bidders.

5.1.2 The Agency 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 days 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 Agency shall have the right to accept Alternates in any order or combination.

5.2.2 The Agency 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).

5.2.6 Bidder must account for the possibility of price increases due to the direct and indirect effect of tariffs or other international events, inflation, and supply chain interruptions. Change Orders will be denied if they are based upon any of these events. Bidder is expected to account for these possibilities and include them in the bid.

5.3 DISQUALIFICATION OF BIDDERS

5.3.1 An agency shall determine that each Bidder on any Public Works Contract 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.

G. Any Bidder who is debarred in another State and/or by the United States Government is also debarred in Delaware.

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 Per Section 6962(d)(13)a., Title 29, Delaware Code, “The contracting agency shall award any public works contract within thirty (30) days of the bid opening to the lowest responsive and responsible Bidder, unless the Agency elects to award on the basis of best value, in which case the election to award on the basis of best value shall be stated in the Invitation To Bid. Any public school district and its board shall award public works contracts in accordance with this section’s requirements except it shall award the contract within 60 days of the bid opening.”

5.4.3 Each Bid on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive Bid shall conform in all material respects to the requirements and criteria set forth in the Contract Documents and specifications.

5.4.4 The Agency 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.

5.4.5 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. The successful Bidder shall provide, at least two business days prior to contract execution, copies of the Employee Drug Testing Program for the Bidder and all listed Subcontractors. 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 two (2) years after the date of the Certificate of Final Payment.

5.4.6 If the successful Bidder fails to execute the required Contract, Bond and all required information, 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.

5.4.7 Each bidder shall supply with its bid its taxpayer identification number (i.e., federal employer identification number or social security number) and should the vendor be awarded a contract, such vendor shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.4.8 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 an award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

6.2 Bidders to whom an award of a Contract has been made must produce their Delaware Business License before the Contract can be executed.

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 Agency 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 OMB 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.

7.2.3 The Performance Bond and/or the Payment Bond may be electronic bonds and need not be transmitted as paper documents.

ARTICLE 8: FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum.

END OF SECTION

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SECTION 00 31 46 - PERMITS

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 permits that have been issued for this Project as well as permits-in-progress initiated by the Owner and those required Contractor application.

1.3 DEFINITIONS

A. Permits: A document issued by the Authorities having jurisdiction approving specific construction. Permits may approve the documents as submitted or contain caveats that are to be followed.

1. Preconstruction Permits: Permits issued prior to the bidding and award, and which are required prior to proceeding to this stage.

2. Post Bid Permits: Permits required to be applied for by the successful contractor. These include demolition permits, building permits and sub-permits such as mechanical, electrical, fire suppression and plumbing.

3. Post Construction Permits: Permits to be obtained by the successful contractor and issued by the authorities having jurisdiction stating that a structure or portion of the structure has been approved as complying with applicable laws, regulations and codes and may be occupied and put to its intended use.

1.4 RESPONSIBILITIES

A. The Contractor shall abide by the approved permits which are to include the notations provided by the entity/person approving the permit.

B. The Contractor is responsible for obtaining and paying for all Post Bid and Post Construction permits unless stated otherwise in the construction documents.

1. The Contractor shall conform to all the regulations and requirements, and shall be responsible for costs associated therewith, of all permits required of the Work.

2. The Contractor shall be responsible for scheduling all inspections as required by the permits.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF PRECONSTRUCTION PERMITS

A. State of Delaware Architectural Accessibility Board

B. Delaware State Historic Preservation Office

C. US Fish & Wildlife – Endangered Species Act (ESP) Section 7 Consultation

D. Department of Natural Resources and Environmental Control (DNREC)
   1. Fish & Wildlife Species Conservation Research Program (SCRP)
   2. Sediment and Stormwater Management Standard Plan Approval
   3. Wetlands & Subaqueous Lands Permit
   4. Delaware Coastal Management Program (DCMP)

E. US ACOE Nationwide Permit 3

F. US ACOE Individual Permit

G. FEMA Conditional Letter of Map Revision (CLOMR)

H. Town of Leipsic Permit Permission Letter

I. Kent County Inspections and Enforcement Required Documents

J. Delaware Office of the State Fire Marshal Plan Review – Site

K. Delaware Office of the State Fire Marshal Plan Review – New Dock

L. Delaware Office of the State Fire Marshal Plan Review – New Building

3.2 SCHEDULE OF POST BID PERMITS

A. State of Delaware Well Permit

B. Delaware Office of State Fire Marshal – Flammable/Combustible Liquids/Gases and/or Dispensing Systems Permit Plan Submittal (see requirements in SFMO Site permit above)

C. Kent County Inspections and Enforcement – Building Permit

D. Kent County Department of Public Works Sewer Permit. This permit will be obtained by the contractor as part of the Building Permit; however, the cost of the sewer impact fees will be invoiced by Kent County to, and paid separately by, DNREC.

3.3 SCHEDULE OF POST CONSTRUCTION PERMITS

A. Kent County Inspections and Enforcement – Certificate of Occupancy

B. All other Miscellaneous Permits as required by Authorities Having Jurisdiction

END OF SECTION

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LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

BID FORM

For Bids Due: September 4, 2026

To: Dept. of Natural Resources and Environmental Control
Division of Fish & Wildlife
89 Kings Highway
Dover, DE 19901

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:

$_____
($)

UNIT PRICES

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

	ADD	DEDUCT
UNIT PRICE No. 1: Adjustment of Excavation, Removal, and Backfill of Structures (CY)	$_____	$_____
UNIT PRICE No. 2: Undercut Excavation (CY)	$_____	$ N/A

LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

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 547 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

Sub-Contractor List
Non-Collusion Statement
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
Bid Security
(Others as Required by Project Manuals)

LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

Subcontractor Category		Subcontractor	Address (City & State)	Subcontractors tax-payer ID # or Delaware Business license #
1. Surveying	A			
	B			
2. Erosion Control	A			
	B			
3. Earthwork	A			
	B			
4. Pavements	A			
	B			
5. Pile Driving	A			
	B			
6. Concrete/Masonry	A			
	B			

LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

BID FORM

7.	Carpentry	A			
		B			
8.	Mechanical	A			
		B			
9.	Electrical	A			
		B			
7.	Fuel System	A			
		B			
8.	Water Well	A			
		B			
9.	Metal Building	A			
		B			
10.	Aluminum Dock Installer Only	A			
		B			

LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

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 Office of Management and Budget, Division of Facilities Management)*.

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.

LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

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

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

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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

My Commission expires _____. NOTARY PUBLIC _____.

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

LEIPSIC RESEARCH DOCK FACILITY
KENT COUNTY, DELAWARE
PROJECT NO.: NAT202301-LeipsicResearchDock

AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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

My Commission expires _____. NOTARY PUBLIC _____.

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

END OF SECTION

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STATE OF DELAWARE
DEPARMTENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

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

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

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

SEALED, AND DELIVERED IN THE
Presence of

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

_____
Name of Surety

Witness:_____

By: _____

_____
Title

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SECTION 00 52 13

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR A101-2017

The contract to be utilized on this project shall be the “Standard Form of Agreement Between Owner and Contractor” AIA Document A101-2017, including AIA Document A101 – 2017 Exhibit A, as well as Supplements to A101-2017 and Exhibit A and the State of Delaware’s General Requirements.

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AIA® Document A101™ – 2017

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

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

BETWEEN the Owner:
(Name, 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)

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

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

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement.

AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Sample

The Owner and Contractor agree as follows.

Init.
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TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

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5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

☐ The date of this Agreement.

☐ A date set forth in a notice to proceed issued by the Owner.

☐ Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

☐ Not later than ( ) calendar days from the date of commencement of the Work.

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☐ By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

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

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

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ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

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

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

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 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; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

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§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

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

§ 5.2 Final Payment

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

§ 5.3 Interest

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.)

_____ % _____

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the 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.)

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§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2017

☐ Litigation in a court of competent jurisdiction

☐ Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, 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.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

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

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

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§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
.3 AIA Document A201™–2017, General Conditions of the Contract for Construction
.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

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

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

☐ AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

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☐ The Sustainability Plan:

Title	Date	Pages

☐ Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

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

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

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AIA® Document A101™ – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the _____ day of _____ in the year _____
(In words, indicate day, month and year.)

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

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 Document A201™–2017, General Conditions of the Contract for Construction. Article 11 of A201™–2017 contains additional insurance provisions.

THE OWNER:
(Name, legal status and address)

THE CONTRACTOR:
(Name, legal status and address)

Sample

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

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

§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's

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property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Cause of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures
If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

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☐ **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance,** to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

☐ **§ A.2.4.2 Ordinance or Law Insurance,** for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

☐ **§ A.2.4.3 Expediting Cost Insurance,** for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

☐ **§ A.2.4.4 Extra Expense Insurance,** to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

☐ **§ A.2.4.5 Civil Authority Insurance,** for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

☐ **§ A.2.4.6 Ingress/Egress Insurance,** for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

☐ **§ A.2.4.7 Soft Costs Insurance,** to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

☐ **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

Sample

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☐ **§ A.2.5.2 Other Insurance**

(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) 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 for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than _____ ($__) each occurrence, _____ ($__) general aggregate, and _____ ($__) aggregate for products-completed operations hazard, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
.2 personal injury and advertising injury;
.3 damages because of physical damage to, or destruction of, tangible property, including the loss of use of such property;
.4 bodily injury or property damage arising out of completed operations; and
.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

Sample

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§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- **.1** Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- **.2** Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- **.3** Claims for bodily injury other than to employees of the insured.
- **.4** Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured
- **.5** Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- **.6** Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- **.7** Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- **.8** Claims related to roofing, if the Work involves roofing.
- **.9** Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- **.10** Claims related to earth subsidence or movement, where the work involves such hazards.
- **.11** Claims related to explosion, collapse, and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than _____ ($__) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than _____ ($__) each accident, _____ ($__) each employee, and _____ ($__) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than_____ ($__) per claim and_____ ($__) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than_____ ($__) per claim and_____ ($__) in the aggregate.

Sample

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§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.
(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

☐ **§ A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below.

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

☐ **§ A.3.3.2.2 Railroad Protective Liability Insurance,** with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate, for Work within fifty (50) feet of railroad property.

☐ **§ A.3.3.2.3 Asbestos Abatement Liability Insurance,** with policy limits of not less than _____ ($__) per claim and _____ ($__) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

☐ **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

☐ **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

☐ **§ A.3.3.2.6 Other Insurance**
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits

Sample

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§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	
Performance Bond	

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

Sample

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SECTION 00 54 13

SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR A101-2017

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor," AIA Document A101-2017. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

ARTICLE 3: DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

3.1 Delete paragraph 3.1 in its entirety and replace with the following:

"The date of Commencement of the Work shall be a date set forth in a notice to proceed issued by the Owner."

ARTICLE 5: PAYMENTS

5.1 PROGRESS PAYMENTS

5.1.3 Delete paragraph 5.1.3 in its entirety and replace with the following:

"Provided that a valid Application for Payment is received by the Architect that meets all requirements of the Contract, payment shall be made by the Owner not later than 30 days after the Owner receives the valid Application for Payment."

5.3 Insert the interest rate of "1% per month not to exceed 12% per annum."

ARTICLE 6: DISPUTE RESOLUTION

6.2 BINDING DISPUTE RESOLUTION

Check the box "Other" – and add the following sentence:

"Any remedies available in law or in equity."

ARTICLE 7: TERMINATION or SUSPENSION

7.1.1.1 Delete paragraph 7.1.1.1 in its entirety.

ARTICLE 8: MISCELLANEOUS PROVISIONS

8.4 Delete paragraph 8.4 in its entirety and replace with the following:

"The Contractor's representative shall not be changed without ten days written notice to the Owner."

END OF SECTION

SECTION 00 54 14

SUPPLEMENT TO A101-2017 – EXHIBIT A - INSURANCE & BONDS

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor," AIA Document A101-2017 Exhibit A Insurance and Bonds. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

ARTICLE A.2 OWNER'S INSURANCE

A.2.1 General

Delete paragraph A.2.1 in its entirety.

A.2.2 Liability Insurance

Delete paragraph A.2.2 in its entirety, except in the case of school projects this paragraph shall remain.

A.2.3 Required Property Insurance

Delete paragraph A.2.3 in its entirety.

A.2.4 Optional Extended Property Insurance

Delete paragraph A.2.4 in its entirety.

A.2.5 Other Optional Insurance

Delete paragraph A.2.5 in its entirety.

ARTICLE A.3 CONTRACTORS INSURANCE AND BONDS

A.3.1.1 Strike the last sentence of the paragraph.

A.3.1.3 Additional Insured Obligations

In the first sentence after "coverage to include (1)" delete "(1) the Owner,".

Strike the remainder of the first sentence beginning at the semicolon "; and (2) the Owner" through the end of the sentence.

Delete the second sentence in its entirety.

A.3.2.2.1 Insert "$1,000,000.00" in the blank for each occurrence.
Insert "$3,000,000.00" in the blank for general aggregate.
Insert "$3,000,000.00" in the blank for aggregate for products-completed operations hazard.

A.3.2.3 Insert "$1,000,000.00" in the blank for per accident.

A.3.2.6 Insert "$500,000.00" in the blank for each accident.
Insert "$500,000.00" in the blank for each employee.
Insert "$500,000.00" in the blank for policy limit.

A.3.2.8 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.9 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.10 Insert “$2,000,000.00” in the blank for per claim.
Insert “$4,000,000.00” in the blank for in the aggregate.

A.3.2.11 Strike in its entirety.

A.3.2.12 Strike in its entirety.

A.3.3.2.1 Delete paragraph 3.3.2.1 in its entirety

A.3.3.2.2 Strike in its entirety.

A.3.3.2.3 Insert “$1,000,000.00” in the blanks for per claim.
Insert “$3,000,000.00” in the blanks for in the aggregate.

A.3.4 Insert the actual contract price in both the Payment Bond and the Performance Bond Penal Sum blanks. It must be 100% of the contract price.

Strike the last sentence in this section and replace with “Payment and Performance Bonds shall be in the standard form issued by the Delaware Office of Management and Budget.”

END OF SECTION

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the Delaware Department of Natural Resources and Environmental Control Division of Fish & Wildlife ("**Owner**"), in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole, firmly by these presents.

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

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

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

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

transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

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

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

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

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____ (SEAL)
Name: Name:
Title:

(Corporate Seal)

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PAYMENT BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the Delaware Department of Natural Resources and Environmental Control Division of Fish & Wildlife ("**Owner**"), in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

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

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

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

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

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

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

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SECTION 00 62 76 – APPLICATION AND CERTIFICATE FOR PAYMENT FORMS AIA G702 AND G703

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AIA® Document G702® – 1992

Application and Certificate for Payment

TO OWNER:

PROJECT: 123

APPLICATION NO: 001
PERIOD TO:
CONTRACT FOR: General Construction
CONTRACT DATE:
PROJECT NOS: / /

Distribution to:
OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
FIELD: ☐
OTHER: ☐

FROM CONTRACTOR:

VIA ARCHITECT:

Sample

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	$0.00
2. NET CHANGE BY CHANGE ORDERS	$0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)	$0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	$0.00
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 of G703)	$0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	$0.00
8. CURRENT PAYMENT DUE	$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	$0.00

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$0.00	$0.00
Total approved this Month	$0.00	$0.00
TOTALS	$0.00	$0.00
NET CHANGES by Change Order		$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:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's 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 $0.00

(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.)

ARCHITECT:

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.

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User Notes: (3B9ADA56)

Delaware Division of Fish & Wildlife
Leipsic Research Dock Facility
DFW Contract No. NA12023011 Leipsic Research Dock
June 3, 2026

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AIA® Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certification for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:	001
APPLICATION DATE:	
PERIOD TO:	
ARCHITECT'S PROJECT NO:	

A	B		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)
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
	GRAND TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00%**	**$0.00**	**$0.00**

Sample

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Delaware Division of Fish & Wildlife
Leipsic Research Dock Facility
DFW Contract No. TBD
LeipsicResearchDock
June 1, 2026

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SECTION 00 72 13

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION A201 - 2017

The General Conditions of this Contract are as stated in the American Institute of Architects Document AIA A201 (2017 Edition) entitled General Conditions of the Contract for Construction as revised by the Supplementary General Conditions and is part of this project manual as if herein written in full.

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AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Sample

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14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal 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 a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's 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 the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 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. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

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

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining

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provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 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 retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and 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 the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, 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 suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building

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information model, and each of their agents and employees.

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 Section 4.2.1, the Architect does 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 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 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.

§ 2.3.2 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.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the

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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.

§ 2.3.5 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.

§ 2.3.6 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.

§ 2.4 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.

§ 2.5 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 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 default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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 Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's 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 2.3.4, 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 Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's

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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 Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the 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 submit 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, subject to Section 15.1.7, 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. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be 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 notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative 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 or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

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

§ 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 approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect 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

§ 3.5.1 The Contractor warrants to the Owner 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 to 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

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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 Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work 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 Contractor shall secure and pay for the building permit as well as 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 and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect 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 that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim 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 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

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.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 notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice 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 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 and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved 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 perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect 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.

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§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how 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 is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is 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 Architect without action.

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

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner 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 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 the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect 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 Architect on previous submittals. In the absence of such 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.

§ 3.12.10.1 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 be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately 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 and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and 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.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the

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time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 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, or patching shall be restored to the condition existing prior to the cutting, fitting, or 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 or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its 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 and 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 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 and Architect with 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 and Architect harmless from loss on account thereof, but shall not be responsible for 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 or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, 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 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

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ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

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

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The 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. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 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 promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 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. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under

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Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or 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.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 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 Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 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 rendered in good faith.

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

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests 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 a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice 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 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 or Architect has reasonable objection to a person or entity proposed by the Contractor, the

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Contractor shall propose another to whom the Owner 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 for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner 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; 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 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 SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate

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Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor 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 a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and 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, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner 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. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

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

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

§ 7.3.2 A Construction Change Directive shall 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 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine 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 Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.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, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the 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.

§ 7.3.7 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.

§ 7.3.8 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 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

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Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's 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 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 Architect will 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 may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

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, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 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 (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended 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

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable

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by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect 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. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and 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 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 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, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The

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foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and 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 Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from 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 suppliers 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 either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier 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 Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a 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 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 Architect 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 Architect and Owner 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 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 and suppliers

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to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to 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 or provided by 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, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after 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 Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner 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 shutdown, 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 that 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 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 Contractor's list, the Architect 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 Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the 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 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 shall 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.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, 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 receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no 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, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and 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, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance 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 the lien, claim, security interest, or encumbrance, 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 Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, 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 the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not

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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;
.3 terms of special warranties required by the Contract Documents; or
.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a 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.

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

§ 10.2.2 The Contractor shall 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 implement, 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 the owners and users of adjacent sites and utilities of the safeguards.

§ 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 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either 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 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.

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§ 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, notice of the 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 and Substances
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. 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 notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the 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 and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, 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 in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous 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 hazardous 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 reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances 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 reimburse 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 Insurance and Bonds
§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the

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endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 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.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 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; (2) the Architect and Architect's consultants; and (3) Separate Contractors, 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 those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The

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Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at 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, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement 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 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

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 Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the 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, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before 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 Architect's services and expenses made necessary thereby, shall be at the

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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 any 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 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 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual 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 of the Owner or Separate Contractors, whether completed or partially completed, 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, excluding that jurisdiction's choice of law rules. 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 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 the assignment.

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§ 13.3 Rights and Remedies

§ 13.3.1 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.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 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 Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties 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.

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, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, 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 Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, 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 reasonable evidence as required by Section 2.2.

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§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, 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' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work 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' notice to the Owner and the 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 or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or Suppliers;
- **.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 reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' 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 Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under 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 the Contract.

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§ 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 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 Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

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, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the 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 Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall 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.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 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.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section

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15.1.3 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.

§ 15.1.6.2 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.

§ 15.1.7 Waiver of 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 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, 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. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a 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 the 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, if the Architect 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.

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§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, 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 15.1.7, 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 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 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. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. 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

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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 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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 those of the Owner and Contractor under this Agreement.

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SECTION 00 73 13

SUPPLEMENTARY GENERAL CONDITIONS A201-2017

The following supplements modify the "General Conditions of the Contract for Construction," AIA Document A201-2017. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

TABLE OF ARTICLES

1. GENERAL PROVISIONS
2. OWNER
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ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Strike the last sentence of Section 1.1.1 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."

Add the following Section:

"1.1.1.1 In the event of conflict or discrepancies among the Contract Documents, the Documents prepared by the State of Delaware, Division of Facilities Management shall take precedence over all other documents."

1.1.8 INITIAL DECISION MAKER

Strike the last sentence of Section 1.1.8 in its entirety and add the following to the end of the remaining sentence:

" and certify termination of the Agreement under Section14.2.2."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1.1 Insert "if possible" at the end of the second sentence.

Add the following Sections:

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

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

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

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

Strike Section 1.5.1 in its entirety and replace with the following:

"All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain, the property of the Owner whether the Project for which they are made is executed or not. Such documents may be used by the Owner to construct one or more like Projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors, and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other

documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect's consultants.

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

Strike Section 1.5.2 in its entirety.

1.7 DIGITAL DATA USE AND TRANSMISSION

Strike Section 1.7 in its entirety and replace with the following:

"The parties shall agree upon protocols governing transmission and use of Instruments of Service or any other information or documentation in digital form."

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Strike Section 1.8 in its entirety.

ARTICLE 2: OWNER

2.2 EVIDENCE OF THE OWNERS FINANCIAL ARRANGEMENTS

Strike Section 2.2 in its entirety.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.3 Strike 2.3.3 in its entirety.

2.3.4 Add the following sentence at the end of the paragraph:

"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."

Strike Section 2.3.6 in its entirety and replace with the following:

"2.3.6 The Contractor shall be furnished free of charge (1) electronic set of the Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage and handling."

2.5 OWNER'S RIGHT TO CARRY OUT THE WORK

Add ", except as outlined in Section 3.15" after the reference to "Article 15" at the end of the last sentence of the Section.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.2 Add “and Owner” after “report to the Architect” in the second sentence.

3.2.4 Strike “subject to Section 15.1.7” in the second sentence.

3.2.4 Strike the third sentence.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Sections:

“3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be so disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or 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, or as otherwise identified by the specifications. Consult the Owner and the Architect before storing any materials.”

“3.3.5 When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use.”

3.4 LABOR AND MATERIALS

Add the Following Sections:

“3.4.4 Before starting the Work, each Contractor shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the Architect & Owner of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects will not be recognized.”

“3.4.5 Under no circumstances shall the Contractor’s Work proceed prior to preparatory Work 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 Sections:

“3.5.3 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 two years after Acceptance by the Owner, and will maintain all items in perfect condition during the period of warranty."

"3.5.4 Defects appearing during the period of warranty 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 warranty will have elapsed."

"3.5.5 Upon notification by the Owner of a defect covered by the Contractor's warranty, the Contractor shall respond within 4 hours of the notification."

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

"3.5.7 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."

3.8 ALLOWANCES

Add the following Section:

"3.8.1.1 For costs to be covered under a project allowance, (included in the schedule of values) the Contractor shall submit a summary of those costs anticipated and an Allowance Access Authorization Form to the Architect and Owner, reflecting the projected costs. The Allowance Access Authorization Form must be signed by the Owner prior to initiating any work associated with the allowance."

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add "estimated" after "and the" and before "date of" in the second sentence.

3.10.2 Strike "and thereafter as necessary to maintain a current submittal schedule" in the first sentence.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following Sections:

"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 the conformed contract 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 Upon completion of the work noted in 3.11.2 the contractor shall schedule a meeting with the Architect/Engineer and Owner to review the final record drawings and closeout documents prior to submission. After this meeting the Contractor shall make adjustments per the review, and submit one (1) original markup and (2) copies of the red line drawings (as-built conditions, to the Owner and one (1) print to the Architect. In

addition, attach one complete set of the as-built documents to each of the Operating and Maintenance Instructions/Manuals. The Contractor will include (2) USB drives, each containing all "red line drawings (as-built) and Closeout Documents properly tabbed in accordance with closeout requirements as defined elsewhere in the contract documents."

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.10.2 Strike "If the Contract Documents require" from the beginning of the sentence.

3.12.10.2 Strike "to" between "professional" and certify" and replace with "shall".

3.17 Insert "indemnify and" between "shall" and "hold" in the second sentence.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.7 Strike the first sentence and replace with the following:

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

4.2.7 Strike the second sentence and replace with the following:

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

Add the following Section:

"4.2.10.1 There will be no full-time Project Representative provided by the Owner or Architect on this project."

"4.2.13 Add "and in compliance with all local requirements." to the end of the sentence."

ARTICLE 5: SUBCONTRACTORS

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

5.2.3 Strike Section 5.2.3 in its entirety and replace with the following:

"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 and 4."

5.2.4 Strike Section 5.2.4 in its entirety and replace with the following:

"The Contractor may not substitute any Subcontractor listed in its Bid unless the Contractor complies with the requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.

Failure to comply with this requirement shall subject the Contractor to a penalty as outlined in Section 5.2 of the Owner's General Requirements."

Add the following Section:

"5.2.5 The Contractor shall comply and shall ensure all Subcontractors comply with all requirements for drug testing as set forth in TITLE 19 LABOR DELAWARE ADMINISTRATIVE CODE 4000 Office of Management and Budget 4100 Division of Facilities Management **4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects."**

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

6.1.1 Strike "and waiver of subrogation" from the end of the second sentence.

6.1.4 Strike Section 6.1.4 in its entirety.

6.2 MUTUAL RESPONSIBILITY

6.2.3 Strike "shall" and replace with "may" in the second sentence.

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK IN THE STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT GENERAL REQUIREMENTS)

7.2 CHANGE ORDERS

Add the following Sections:

"7.2.2 In addition to the above:

7.2.2.1 The General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor's own forces.

7.2.2.2 For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven- and one-half percent (7.5%) on the subcontractor's work.

7.2.2.3 Where the Third Tier Contractor is going to be completing the additional work, the Third-Tier contractor will be allowed a markup of fifteen percent (15%) overhead and profit on changes order work above and beyond the direct costs stated previously. To this amount, the Subcontractor will be allowed a markup not to exceed seven and one-half percent (7.5%) on the Third-Tier Contractor's work and the General Contractor will be allowed a markup not to exceed seven and one-half percent (7.5%) of the amount of the Subcontractor's markup.

7.2.2.4 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.

7.2.2.5 These markups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc."

7.3.4.1 Strike "and other employee costs approved by the Architect" after "worker's compensation insurance,"

7.3.4.4 Add "work attributable to the" before "change" at the end of the sentence.

7.4 MINOR CHANGES IN THE WORK
Add "unless such changes are approved" at the end of the third sentence.

ARTICLE 8: TIME

8.2 PROGRESS AND COMPLETION

8.2.1 Add the following Section:

"8.2.1.1 Refer to Project Specifications Section SUMMARY OF WORK for Contract time requirements."

8.2.2 After "by the Contractor" strike "and" and insert "to".

8.2.4 Add the following Section:

"8.2.4 If the Work falls behind the Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner."

8.3 DELAYS AND EXTENSION OF TIME

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

Add the following Section:

"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."

Strike Section 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 Section 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 Section:

"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 Sections:

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

"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 1.5% of the initial contract amount."

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Strike Section 9.3.1 in its entirety and replace with the following:

"At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values for completed portions of the Work. The application shall be notarized, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage."

Add the following Sections:

"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."

"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 Subsections 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

9.6.1 Strike Section 9.6.1 in its entirety and replace with the following:

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

9.6.8 Strike "Provided the Owner has fulfilled its payment obligations under the Contract Documents," in the first sentence.

9.7 FAILURE OF PAYMENT

Strike Section 9.7 in its entirety and replace with the following:

"If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within fourteen days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within thirty days after the date established in the Contract Documents, the amount certified by the Architect, then the Contractor may, upon thirty additional days' notice to the Owner 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 shutdown, delay and start-up, plus interest as provided for in the Contract Documents."

9.8 SUBSTANTIAL COMPLETION

9.8.3 At the end of Section 9.8.3, add the following sentence:

"If the Architect is required to make more than 2 inspections of the same portion of work, the Contractor shall be responsible for all costs associated with subsequent inspections including but not limited to any Architect's fees."

9.8.5 Strike "shall" and insert "may" in the second sentence.

9.8.5 Insert "1/2 of the" after "make payment of" in the second sentence.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 Strike the the first sentence and replace with the following (the remainder of the Section remains as written):
"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 authorized by public authorities having jurisdiction over the Project."

9.10.2 Strike "to remain in force after final payment is currently in effect" after "required by the Contract Documents" and replace with "shall remain in force until final payment is completed" in the first sentence.

9.10.4.4 Strike "if permitted by the Contract Documents,"

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Sections:

10.1.1 Each Contractor shall develop a safety program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor's Work.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full time basis. If deemed necessary by the Owner or Architect, Contractor Safety meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following Section:

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.

10.2.5 Strike the second sentence in its entirety.

10.3 HAZARDOUS MATERIALS AND SUBSTANCES

10.3.3 Strike Section 10.3.3 in its entirety.

10.3.4 Insert "hazardous" in the last sentence after "handling of such" .

10.3.6 Strike Section 10.3.6 in its entirety.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE AND BONDS

11.1.1 Strike "Owner" from the third sentence.

11.2 OWNER'S LIABILITY INSURANCE

Strike 11.2 in its entirety, except that in the case of school projects in which case Section 11.2 shall remain.

11.3 WAIVERS OF SUBROGATION

Delete Section 11.3 in its entirety

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION INSURANCE

Delete Section 11.4 in its entirety

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

Add the following Section:

"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 non-conforming work and that required under contract including any damage to the structure."

12.2.2.1 Strike all references to "one year" or "one-year" and replace with "two years".

12.2.2.2 Strike "one-year" and replace with "two years".

12.2.2.3 Strike "one-year" and replace with "two years".

12.2.5 Strike "one-year" and replaced with "two years".

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Strike the last sentence.

13.4 TESTS AND INSPECTIONS

13.4.1 Strike the last sentence and replace with the following:

"The Owner shall pay for tests, inspections, or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor."

13.5 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" and replace with "30 days of presentment of the authorized Certificate of Payment at the annual rate of 12% or 1% per month."

Insert the following Section:

"13.6 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

13.6.1 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

14.1 TERMINATION BY THE CONTRACTOR

14.1.1.4 Insert ", upon the Contractors' request," after "furnish to the Contractor".

14.1.3 Strike "and profit on Work not executed, and" after "as well as reasonable overhead" and replace with ", profit, and reasonable"

14.3 SUSPENSION BY OWNER FOR CONVENIENCE

14.3.2 Strike "Adjustment of the Contract Sum shall include profit".

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.3 Strike Section 14.4.3 in its entirety and replace with the following:

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

ARTICLE 15: CLAIMS AND DISPUTES

15.1 CLAIMS

15.1.2 TIME LIMITS ON CLAIMS

Strike the last sentence.

15.1.3 NOTICE OF CLAIM

Strike all references to "21" and replace with "45".

15.1.5 CLAIMS FOR ADDITIONAL COSTS

Strike the first sentence and replace with the following:

"Contractor shall not proceed to execute any portion of the Work that is subject to the Claim without prior approval of the costs or method of payment for the costs associated with the Claim as determined by the Architect and approved by the Owner."

15.1.7 WAIVER OF CLAIMS FOR CONSEQUENTIAL DAMAGES

Strike Section 15.1.7 in its entirety.

15.2 INITIAL DECISION

15.2.1 Strike "and binding dispute resolution" in the fourth sentence and replace with "or any and all remedies at law or in equity".

15.2.5 Strike Section 15.2.5 in its entirety and replace with the following:

"The Architect will approve or reject Claims by written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and any or all remedies at law or in equity."

15.2.6 Strike Section 15.2.6 and its sub-Sections in their entirety.

15.3 MEDIATION

15.3.1 Strike “binding dispute resolution” and replace with “any or all remedies at law or in equity”.

15.3.2 Strike “, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,” in the first sentence.

15.3.2 Strike all references to “binding dispute resolution” and replace with “any or all remedies at law and in equity”.

15.3.3 Strike Section 15.3.3 in its entirety.

15.4 ARBITRATION

Strike Section 15.4 and its Subsections in their entirety.

END OF SECTION

STATE OF DELAWARE

DIVISION OF FISH AND WILDLIFE

DELAWARE DEPARTMENT OF LABOR PREVAILING WAGE RATES

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DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF CONSTRUCTION ENFORCEMENT
252 Chapman Rd, STE 210
Newark, DE 19702

Via Electronic and Regular Mail

March 25, 2026

Mr. Lance Wilgus
Century Engineering Inc
550 Bay Road
Dover, DE 19901

Re: NAT202301-LEIPSICRE Leipsic Research Dock Facility, Kent County, DE

Dear Mr. Wilgus:

I am responding to your request for a category determination for contract: NAT202301LEIPSICRE-Leipsic Research Dock Facility which is a state funded construction project located in Kent County, Delaware. The scope of the work consists of a new prefabricated aluminum fixed dock supported by circular steel piles, including a diesel fuel tank and dispensing system, lighting, electric and water utilities, construct a new pre-engineered metal storage building, including interior office spaces and supporting electrical and mechanical systems, a new water supply well, and new asphalt pavements. You estimate the total cost of construction for this project to be [redacted]

Based on the information you provided, the Department of Labor has determined that this project is a Multiple Category project consisting of a Building Construction portion and a Heavy Construction portion, each of which is substantial i.e., more than twenty percent (20%) of the overall cost of the project. The Building Construction consists of a new pre-engineered metal storage building including interior office spaces and supporting electrical and mechanical systems, as well as the construction of new asphalt pavement, and associated activities and materials. The estimated cost for the construction of the storage/admin building (including supporting utilities) is approximately [redacted] which equates to [redacted]% of the total estimated construction cost.

The Heavy Construction portion consists of the construction of a new prefabricated aluminum dock which is supported by circular steel piles, including a diesel fuel tank and dispensing system, including lighting, electric, and water systems. Also, the

installation of a new water supply well. This is approximately [redacted] which equates to [redacted]% of the total estimated construction cost.

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

Delaware's Prevailing Wage Regulations provide that the rates applicable to a project are the rates in effect on the date of publication of the specifications for that project. I have enclosed a certified copy of March 13, 2026, prevailing wage rates for Heavy Construction and Building Construction to be included in your bid specification. However, please be advised that, in the event that a contract for a project is not executed within one hundred and twenty (120) days from the earliest date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project.

This determination is directed solely at the parties identified herein. It is based on unique facts relevant to this matter. It does not constitute precedence and should not be cited as such by future parties.

Pursuant to 19 Del. Chapter 36, all contractors must obtain their Contractor Registration Certificate prior to performing construction services or maintenance work throughout Delaware. Contractors can apply by visiting the Delaware One Stop https://onestop.delaware.gov/Operate_Contractors

Additionally, effective January 1, 2025, SSI for SB307 amends Delaware's Prevailing Law 29 Del.C.6960(b) now requires these applicable prevailing wage rates to be paid to all workers who perform custom fabrication work regardless of where the work is performed. For further information regarding custom fabrication see 29 Del.C.6902(8).

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

If you have any questions or I can provide any additional assistance, please do not hesitate to contact me on 302-451-3415.

Sincerely,

James Keeley

James Keeley
Labor Law Enforcement Officer
James.keeley@delaware.gov

Enclosures

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 318-2769

Mailing Address:
252 Chapman Road
Suite 210
Newark, DE 19702

Located at:
252 Chapman Road
Suite 210
Newark, DE 19702

PREVAILING WAGES FOR **HEAVY CONSTRUCTION** EFFECTIVE MARCH 13, 2026

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	29.67	26.10	56.73
BOILERMAKERS	94.57	43.10	79.08
BRICKLAYERS	92.55	79.48	33.43
CARPENTERS	64.06	64.06	52.30
CEMENT FINISHERS	58.52	32.68	24.35
DIVER	105.43	Contact DOL	Contact DOL
DIVER TENDER	119.76	Contact DOL	Contact DOL
ELECTRICAL LINE WORKERS	99.31	99.31	99.31
ELECTRICIANS	86.87	86.87	86.87
GLAZIERS	27.39	23.80	16.12
INSULATORS	71.54	71.54	71.54
IRON WORKERS	79.33	81.82	80.70
LABORERS	59.65	59.65	59.65
MILLWRIGHTS	91.00	91.00	73.10
PAINTERS	97.61	97.61	97.61
PILEDRIVERS	93.37	52.83	41.11
PLASTERERS	25.80	22.44	15.15
PLUMBERS/PIPEFITTERS/STEAMFITTERS	101.88	104.47	26.16
POWER EQUIPMENT OPERATORS	85.29	92.36	85.29
SHEET METAL WORKERS	41.24	25.59	24.04
SPRINKLER FITTERS	44.46	16.83	15.00
TRUCK DRIVERS	50.14	27.61	29.89

CERTIFIED: 3-25-2026 BY: Sabrina Crossland /fu
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 318-2769.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: NAT202301-Kent County Heavy Construction portion consists of the construction of a new prefabricated aluminum dock which is supported by circular steel piles, including a diesel fuel tank and dispensing system, including lighting, electric, and water systems.

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 318-2769

Mailing Address:
252 Chapman Road
Suite 210
Newark, DE 19702

Located at:
252 Chapman Road
Suite 210
Newark, DE 19702

PREVAILING WAGES FOR **BUILDING CONSTRUCTION** EFFECTIVE MARCH 13, 2026

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	30.70	37.78	55.01
BOILERMAKERS	91.87	46.61	68.52
BRICKLAYERS	68.29	68.29	68.29
CARPENTERS	64.06	64.06	52.30
CEMENT FINISHERS	96.91	68.92	53.44
ELECTRICAL LINE WORKERS	61.02	52.34	39.90
ELECTRICIANS	86.87	86.87	86.87
ELEVATOR CONSTRUCTORS	121.73	86.57	109.37
GLAZIERS	88.42	88.42	76.04
INSULATORS	71.54	71.54	71.54
IRON WORKERS	79.33	79.33	79.33
LABORERS	59.65	59.65	59.65
MILLWRIGHTS	91.00	91.00	73.10
PAINTERS	61.53	61.53	61.53
PILEDRIVERS	93.37	52.83	42.72
PLASTERERS	40.06	40.06	29.69
PLUMBERS/PIPEFITTERS/STEAMFITTERS	82.05	85.29	78.26
POWER EQUIPMENT OPERATORS	85.29	85.29	85.29
ROOFERS-COMPOSITION	36.41	31.28	33.64
ROOFERS-SHINGLE/SLATE/TILE	24.68	29.36	23.08
SHEET METAL WORKERS	87.84	87.84	87.84
SOFT FLOOR LAYERS	63.69	63.69	50.43
SPRINKLER FITTERS	77.63	77.63	77.63
TERRAZZO/MARBLE/TILE FNRS	73.75	73.75	84.10
TERRAZZO/MARBLE/TILE STRS	81.93	81.93	93.27
TRUCK DRIVERS	58.41	36.83	28.66

CERTIFIED: 3-25-2026 BY: Salina Crossland/Re
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 318-2769.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: NAT202301-Kent County The Building Construction consists of a new pre-engineered metal storage building including interior office spaces and supporting electrical and mechanical systems, as well as the construction of new asphalt pavement, and associated activities and materials.

PREVAILING WAGE DEBARMENT LIST

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

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

Contractor	Address	Date of Debarment
Mullen Brothers, Inc. and Daniel Mullen, individually	3375 Garnett Road, Boothwyn, PA 19060	Indefinite/ Civil Contempt
State Contractors Corporation, and Jose Oscar Rivera, individually	13004 Hathaway Drive Silver Spring, MD 20906	Indefinite/ 19 Del.C. 2374(f)
Green Granite and Jason Green, individually	604 Heatherbrooke Court Avondale, PA 19311	Indefinite/ Civil Contempt
Pro Image Landscaping, Inc. and Owner(s) individually	23 Commerce Street Wilmington, DE 19801 and/or 2 Cameo Road Claymont, DE 19703	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
Liberty Mechanical, LLC and Owner(s), individually	2032 Duncan Road Wilmington, DE 19801	Indefinite/ 19 Del.C. 2374(f)
Integrated Mechanical and Fire Systems Inc. and Allison Sheldon, individually	4601 Governor Printz Boulevard Wilmington, DE 19809	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
ACH 1, INC.	873 Salem Church Road Newark, DE 19702	Indefinite/19 Del.C.6960

Updated: July 6, 2022

SECTION 00 81 13

GENERAL REQUIREMENTS

TABLE OF ARTICLES

1. GENERAL
2. OWNER
3. CONTRACTOR
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5. SUBCONTRACTORS
6. CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS
7. CHANGES IN THE WORK
8. TIME
9. PAYMENTS AND COMPLETION
10. PROTECTION OF PERSONS AND PROPERTY
11. INSURANCE AND BONDS
12. UNCOVERING AND CORRECTION OF WORK
13. MISCELLANEOUS PROVISIONS
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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.

1.1.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor's own risk and cost.

1.2 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.2.1 For Public Works Projects financed in whole or in part by state appropriation the Contractor agrees that during the performance of this contract:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity 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, sex, color, sexual orientation, gender identity 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, sex, color, sexual orientation, gender identity or national origin."

ARTICLE 2: OWNER

(NO ADDITIONAL GENERAL REQUIREMENTS – SEE SUPPLEMENTARY GENERAL CONDITIONS)

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 Owner 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 General Contractor is to consult with the Owner 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 Owner 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 Owner, 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 Owner if the Drawings and Specifications are observed to be at variance therewith.

3.9 The Contractor shall be responsible to the Owner 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 Delaware Department of Finance within ten (10) days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of total value of such contract or contracts together with the names and addresses of the contracting parties."

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

3.13 During the contract Work, the Contractor and each Subcontractor, shall implement an Employee Drug Testing Program in accordance with OMB Regulation 4104 - "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working

on “Large Public Works Projects”. “Large Public Works” is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

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 in the form approved by the Office of Management and Budget. 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 State and the agency 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 agency may, when it considers that the interest of the State so requires, 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 two (2) years 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 Owner 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 State, or Agency that neglects or refuses to perform or fails to comply with the terms thereof, the Agency 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 State, any Agency, officer and/or employee of the State, 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 State, 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 State 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 Owner 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 seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) 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.

5.1.5 Should a Bidder be awarded a contract, such successful Bidder shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.1.6 The Contractor may employ additional Subcontractors on the jobsite only after submitting a copy of the Subcontractor's Employee Drug Testing Program to the Owner for approval. A Contractor or Subcontractor shall not commence work until the Owner has concluded its review and determined that the submitted Employee Drug Testing Program complies with OMB Regulation 4104.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All

penalty amounts assessed and not refunded or remitted to the contractor shall be reverted to the State.

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

5.3 ASBESTOS ABATEMENT

5.3.1 The selection of any Contractor to perform asbestos abatement for State-funded projects shall be approved by the Office of Management and Budget, Division of Facilities Management pursuant to Chapter 78 of Title 16.

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 Public Works 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 Owner, 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 Owner.

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, 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 prevailing wage rates plus a maximum multiplier of 1.35 times DPE. For example, if the prevailing wage rate is $50/hour, the DPE would be $67.50/hour (50 x 1.35).

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:

7.3.3.1 The General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor's own forces.

7.3.3.2 For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven- and one-half percent (7.5%) on the subcontractor's work.

7.3.3.3 Where the Third Tier Contractor is going to be completing the additional work, the Third-Tier contractor will be allowed a markup of fifteen percent (15%) overhead and profit on changes order work above and beyond the direct costs stated previously. To this amount, the Subcontractor will be allowed a markup not to exceed seven and one-half percent (7.5%) on the Third-Tier Contractor's work and the General Contractor will be allowed a markup not to exceed seven and one-half percent (7.5%) of the amount of the Subcontractor's markup.

7.3.3.4 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.

7.3.3.5 These markups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc.

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, 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 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

8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, "Any Contractor who fails to perform a public works contract or complete a public works project within the time schedule

established by the Agency in the Invitation To Bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project."

8.4.2 "Upon such failure for any of the above stated reasons, the Agency that contracted for the public works project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the public works project within the time schedule established by the Agency and failed to do so for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record."

8.5 RETAINAGE

8.5.1 Per Section 6962(d)(5) a.3, Title 29, Delaware Code: The Agency may at the beginning of each public works 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 Agency may forfeit, 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, 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 five percent (5%) retainage on all Contractor's monthly invoices until completion of the project. This retainage may 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 Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is 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 public works Contract executed by any Agency may provide for partial payments at the option of the Owner 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 agency, 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 Agency, 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.

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 Owner 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.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of substantial completion.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the five percent (5%) retainage if determined appropriate, 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 Owner 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 Owner 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 Owner in the event any previously unknown hazardous material such as PCBs, asbestos, etc. is encountered on the project. 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 Contractor 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 to the closeout documents to be submitted at the end of the project.

10.2.1 Any activities with the potential to disturb lead-based materials should be performed by the Contractor in accordance with OSHA regulations pertaining to Lead in Construction, 29 CFR 1926.62, Lead.

10.2.1.1 The Contractor shall notify the Owner in the event they encounter previously unknown material that they suspect may contain “lead”. The Owner will arrange with a qualified specialist for identification and testing and advise the Contractor of the results. In the case that testing identifies potential lead based materials, the contractor shall continue performance of the work that has the potential to disturb associated in accordance with OSHA regulations pertaining to Lead in Construction, 29 CFR 1926.62, Lead.

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 Owner, 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 Owner.

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, may 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 (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	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury	$1,000,000	for each occurrence

	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	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.

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 Owner 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 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 two years 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 Owner, 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 Owner 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 Owner and reports of such tests shall be submitted to the Owner. 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 Owner.

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 State Historic Preservation Office 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 by the Division of Historical and Cultural Affairs.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The General Contractor shall replace without expense to the Owner all glass broken during the construction of the project. If job conditions warrant, at completion of the job the General Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of two (2) years 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 two (2) years, 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 OR SUSPENSION OF THE 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 Owner, 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 Owner's option, and the Owner 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 Owner 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 Owner.

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 Owner may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Owner will cease upon the date of termination. Notwithstanding the foregoing, the Owner 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 OF SECTION

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EMPLOYEE DRUG TESTING REPORT FORM
Period Ending:_____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds maintain testing data that includes but is not limited to the data elements below.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____
_____
_____

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

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

Number of Negative Results _____ Number of Positive Results _____

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

Date: _____

This form is not required to be submitted to the Owner. Included as a reference to show information required to be maintained by the Contractor. The Owner shall have the right to periodically audit all Contractor and Subcontractor test results at the Contractor's or Subcontractor's offices (or by other means to make the data available for inspection by the Owner).

EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS

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

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____
_____
_____

Name of employee with positive test result: _____

Last 4 digits of employee SSN: _____

Date test results received: _____

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

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

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

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

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

AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training must be provided by a contractor and/or subcontractor for each craft on a project for which there are Delaware Department of Labor approved and registered training programs or, if the contractor and/or subcontractor meets the requirements under Title 29, Chapter 69, Section 6960A.(b)(1)c.1.-3., payment may be made in accordance with Title 29, Chapter 69, Section 6960A.(b)(1)d. A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at: https://laborfiles.delaware.gov/main/det/apprenticeship/DE%20Craft%20Training%20Occupation%20List%20Effective%20March%201%202022.pdf. If you have questions regarding craft training programs, please submit all questions in writing to the Delaware Department of Labor at: apprenticeship@delaware.gov. ***This Affidavit of Craft Training Compliance must be submitted prior to contract execution***.

In accordance with Title 29, Chapter 69, Section 6960A.(a)(1), a contract relating to a public works project under § 6962 of Title 29 must include a craft training program for each craft in the project if at the time the contractor executes a public works contract, all of the following apply:

a. A project meets the prevailing wage requirement under Section 6960 of Title 29.
b. The contractor employs 10 or more total employees.
c. The project is not a federal highway project, except for the project under Section 6962(c)(11) of Title 29.
d. There is an apprenticeship program for a craft in the project on the list of crafts under Section 204(b)(2) of Title 19.

Pursuant to Title 29, Chapter 69, Section 6960A.(a)(2), ***a contractor must commit that all subcontractors provide craft training*** if paragraph (a)(1) of this section applies to the subcontractor. Failure to provide required craft training or payment on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6960A.(d)(1)-(3).

Craft(s): _____

Contractor Name: _____

Contractor Address: _____

_____

_____

Contractor Program Registration Number(s) _____
On this line also indicate whether DE, Other State (identify) or US Registration Number

Or

☐ **A payment has been made in the amount established under Section 204(b)(2)b.2. of Title 19, for the craft into the Delaware Department of Labor's Apprenticeship and Training Fund.**

Or

☐ **Craft Training requirements are not applicable because:**

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

State of Delaware)
) ss:
County of _____)

Before me, a notary public, in and for said county and state, personally appeared, _____, who acknowledged to me that she/he did execute the foregoing instrument on behalf of _____.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ____ day of _____ 20___.

_____
Notary Public
Commission Expires _____

THIS PAGE MUST BE SIGNED AND NOTARIZED TO BE CONSIDERED.

SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY OF WORK

Project includes construction of a new pre-engineered metal building including interior office and storage spaces and supporting electrical and mechanical systems, a new pre-fabricated aluminum fixed dock and connecting ramp supported by circular steel piles on the south bank of the Leipsic River, an above ground diesel fuel storage tank with dockside fuel dispensing station, site improvements including pavements, water supply well, area lighting, and security gate.

1.2 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work to the site and/or existing building to normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated.

   1. Weekend Hours: Weekend work shall not be allowed unless preapproved by the Owner.
   2. Early Morning Hours: Early morning hours are not allowed unless required for utility shutdowns.
   3. Holidays: No work shall occur on State or Federally recognized holidays.
   4. In Water Work: **No In-Water Work** shall be allowed during the period from March 1 through July 31.

C. Noise, Vibration, and Odors: Coordinate operations that may result in any level of noise and vibration, odors, or other disruption to the occupancy or use of adjacent occupied areas, the buildings and adjacent properties with the Owner.

   1. Notify Architect and Owner not less than seven (7) days in advance of proposed disruptive operations.
   2. Obtain Architect's and/or Owner's written permission before proceeding with disruptive operations.

D. Nonsmoking Campus and Building: Smoking is prohibited within the boundaries of all state workplaces including all buildings, facilities, indoor and outdoor spaces and all the surrounding grounds owned by the State. This policy also includes but is not limited to parking lots, walkways, State vehicles and private vehicles parked or operated on State workplace property.

1.3 FIELD ENGINEERING

A. Provide field engineering services; establish grades, lines, and levels, by use of recognized engineering survey practices.

B. Control datum for survey is that shown on drawings. Locate and protect control and reference points.

1.4 SCHEDULE

A. The following is the required schedule for this work:
   1. Bids Due: 2:00 p.m-sharp local time on September 4, 2026 at 89 Kings Highway, Dover, DE 19901.
   2. Notice of Building Contract Award: Within thirty (30) days of receipt and acceptance of qualified low bid.
   3. Purchase Order Issuance: The issuance of a State of Delaware purchase order is contingent upon the successful Contractor submitting bonds on State-approved forms, signed contracts and insurance certificates to the State of Delaware within twenty (20) days of Notice of Award. A purchase order will be issued in approximately thirty (30) days after these items have been submitted to the State of Delaware.
   4. On-Site Mobilization: Upon receipt of State of Delaware purchase order and issuance of the Notice to Proceed.
      a. Mobilization payment shall not exceed 10% of the total contract value. 60% of the mobilization payments shall be payable for initial mobilization, and the remaining 40% shall be payable upon final demobilization.
   5. Substantial Completion: The work shall be completed by 547 Calendar Days from Notice to Proceed.
   6. Completion of Punch List: No later than 14 calendar days from date of substantial completion.

1.5 CONSTRUCTION PROGRESS DOCUMENTATION

A. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
   1. Bar-Chart Schedule: Submit horizontal bar-chart-type construction schedule within five days of date established for commencement of the Work.
   2. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities.
   3. Time Frame: Extend schedule from date established for commencement of the Work to date of substantial completion.
      a. Contract completion date shall not be changed unless specifically authorized by Change Order.
   4. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at each regularly scheduled progress meeting.
      a. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made.

B. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 14 00 – 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. Limits: Confine construction operations to the limits indicated on the drawings.
2. Parking: Parking shall be restricted to inside the limits of construction as shown on the drawings. Parking outside of the limits of construction shall not be permitted at any time.
3. Dumpster: Dumpster shall be located in the area identified on the drawings. The dumpster shall be covered to avoid windblown debris. Debris shall be removed on a regular basis in order to avoid an overflowing dumpster. Restoration of grounds disturbed by the dumpster will be required upon completion of the Project. “No Trespassing” signs shall be placed on the dumpster.
4. Access: Access to the construction site shall be from Lombard Street adjacent to the project.
5. Storage: Material storage and stockpiles shall be within the stockpile area and coordinated with the Owner.
6. Public Roadways, Driveways, Entrances and Public Sidewalks: Keep public roadways, driveways, entrances and public sidewalks outside of the limits of construction clear and available to the Public, 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 roadways, driveways, sidewalks and entrances.
    b. The Owner will not sign for any deliveries at any time.
    c. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

7. Access to potable water will not be provided.
8. Access to restrooms facilities will not be provided.

B. Use of Existing Building: No buildings located on site.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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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 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Referenced Specifications, Delaware Department of Transportation Standard Specifications for Road and Bridge Construction (January 2026, or most current at the date of advertisement).

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.

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 list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price No. 1 – Adjustment of Excavation, Removal, and Backfill of Structures

1. Description: This item shall be for the adjustment of furnishing excavation, removal and backfill of below grade residential building and in-ground pool structures where the necessary removal depth is different due to actual conditions than as shown and required on the plans. The price shall include the cost of all associated work including excavation, removal, transportation and proper disposal of below-grade construction materials and backfill soils as determined and accepted by the Owner.

2. Unit of Measurement: Cubic Yard (CY). Measurement will be made based upon the measured actual depth of excavation and the resulting adjusted volume of removed materials in a method as determined and accepted by the Owner.

B. Unit Price No. 2 – Undercut Excavation

1. Description: This item shall include the furnishing of all undercut excavation of unsuitable soils, furnishing, placing and compaction of Borrow Type B backfill in the excavated area, transportation, disposal and all associated costs, to remove unsuitable existing soils, and as defined by the Referenced Specifications “Delaware Department of Transportation Standard Specifications for Road and Bridge Construction (January 2026, or most current at the date of advertisement)”, in Section 202 “Excavation and Embankment” and paragraph “Undercut Excavation”, unless otherwise specified herein, in the amounts and locations as determined and accepted by the Owner. No separate measurement or payment will be made for furnishing the Borrow Type B backfill, it shall be considered included with, and incidental to, this item.

2. Unit of Measurement: Cubic Yard (CY). Measurement will be made based upon the measured volume of undercut excavation in a method as determined and accepted by the Owner.

END OF SECTION 012200

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Document 00 26 00 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
2. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed unless otherwise indicated.

C. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 26 00 – 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 “Submittal Procedures for” administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect 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.

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

SECTION 01 29 00 – 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 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 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.

2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven 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. Change Orders (numbers) that affect value.
    d. 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.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

    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 Owner 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 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. Architect 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 3 signed and notarized original copies of each Application for Payment to Architect 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. 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. List of Contractor's staff assignments (Project Superintendent specifically).
5. Copies of building permits.
6. Certificates of insurance and insurance policies.
7. Performance and payment bonds.

G. 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.

H. 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. Updated final statement, accounting for final changes to the Contract Sum.
2. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
3. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
4. AIA Document G707, "Consent of Surety to Final Payment."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

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 provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General project coordination procedures.
   2. Administrative and supervisory personnel.
   3. Project meetings.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
   2. Division 1 Section "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components with subcontractors to ensure maximum accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.

1.4 SUBMITTALS

A. Staff Names: Within 15 days of notice to proceed, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.5 PROJECT MEETINGS

A. General: The Architect will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
   2. Minutes: The Architect will record significant discussions and agreements achieved. The minutes will be distributed to everyone concerned, including Owner, within 7 days of the meeting.

B. Preconstruction Conference: A preconstruction conference will be scheduled before the start of construction, at a time convenient to the Owner and Contractor, but no later than 15 days after execution of the Agreement. The conference will be held at the Project. The meeting will be conducted to review responsibilities and personnel assignments.
   1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Items of significance that could affect progress will be discussed, including the following:
      a. Tentative construction schedule.
      b. Designation of responsible personnel.
      c. Procedures for processing field decisions and Change Orders.
      d. Procedures for processing Applications for Payment.
      e. Submittal procedures.
      f. Preparation of Record Documents.
      g. Use of the premises.
      h. Responsibility for temporary facilities and controls.
      i. Parking availability.
      j. Storage areas.
      k. Equipment deliveries and priorities.
      l. Progress cleaning.
      m. Working hours.

C. Progress Meetings: Progress meetings will be conducted monthly. Coordinate dates of meetings with preparation of payment requests.
   1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Review present and future needs of each entity present, including the following:
    1) Deliveries.
    2) Off-site fabrication.
    3) Access.
    4) Site utilization.
    5) Temporary facilities and controls.
    6) Work hours.
    7) Progress cleaning.
    8) Quality and work standards.

3. Reporting: The Architect will distribute minutes of the meeting to each party present and to parties who should have been present. A brief summary, in narrative form, of progress since the previous meeting and report will be included.
    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. The revised schedule will be issued concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 31 50 – FIELD ENGINEERING

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 provisions and procedural requirements for Field Engineering services, including, but not necessarily limited to the following:

1. Land Survey Work.
2. Engineering services.

1.3 SUBMITTALS

A. Certificates: Submit a certificate signed by the Land Surveyor certifying that the location and elevation of improvements comply with the Contract Documents.

B. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections "Submittals" and "Project Closeout".

1.4 QUALITY ASSURANCE

A. Surveyor: Engage a Professional Land Surveyor, licensed in the State of Delaware, to perform required surveying services to ensure that grades, lines, levels, and locations of the Work are in compliance with the Contract Documents.

B. Engineer: Engage a Professional Engineer of the discipline required, registered in the State of Delaware, to perform required engineering services.

1.5 EXAMINATION

A. The Owner will identify existing control points and property line corner stakes.

B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.
2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.

C. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

D. Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.

1.6 PERFORMANCE

A. Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

1. Advise entities engaged in construction activities, of marked lines and levels provided for their use.
2. As construction proceeds, check every major element for line, level and plumb.

B. Surveyor's Log: Maintain a surveyor's log of control and other survey Work. Make this log available for reference.

1. Record deviations from required lines and levels, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
2. On completion of foundation walls, major site improvements, and other Work requiring field engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and sitework.

C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

D. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00 – 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. Contractor's Construction Schedule.
2. Field condition reports.
3. Special reports.

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.

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.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

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.

1.4 SUBMITTALS

A. Preliminary Construction Schedule: Submit two opaque copies.

B. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

C. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

D. Special Reports: Submit two copies at time of unusual event.

1.5 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.

PART 2 - PRODUCTS

2.1 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 commencement of the Work to date of Substantial 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 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 20 days, unless specifically allowed by Architect.
2. 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.
3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect'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. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.
b. Use of premises restrictions.
c. Provisions for future construction.
d. Seasonal variations.
e. Environmental control.

2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

a. Mockups.
b. Fabrication.
c. Deliveries.
d. Installation.

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. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.2 CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit horizontal bar-chart-type construction schedule within five days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities.

2.3 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. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.

11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives received and implemented.
15. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 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, 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 bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at 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. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, and other parties identified by Contractor with a need-to-know schedule responsibility.

END OF SECTION

SECTION 01 33 00 – 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 submittals.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and 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 Requirements" for submitting test and inspection reports and for mockup requirements.
5. Division 1 Section "Closeout Procedures" for submitting warranties.
6. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
7. Division 1 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.

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 responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals. The Contractor will be responsible for field verifying existing conditions.

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.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 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 number or other unique identifier, including revision identifier.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Location(s) where product is to be installed, as appropriate.
    l. Other necessary identification.

E. Deviations: Highlight or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. 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. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Drawing number and detail references, as appropriate.
j. Submittal and transmittal distribution record.
k. Remarks.
l. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "Furnish as Submitted”.

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 "Approved as Submitted", or “Approved as Noted” taken by Architect.

1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:

1. CADD files are limited to those that have been generated for this Project.
2. Contractor will be asked to sign Architects waiver of release form before files will be delivered to the contractor.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

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 operation and maintenance manuals.
k. Compliance with specified referenced standards.
l. Testing by recognized testing agency.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit six (6) copies of Product Data, unless otherwise indicated. Architect will return three copies. Mark up and retain one returned copy as a Project Record Document.

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: Fully illustrate requirements in the Contract Documents. 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.
m. Relationship to adjoining construction clearly indicated.
n. Seal and signature of professional engineer if specified.
o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. 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 40 inches (750 by 1000 mm).
3. Number of Copies: Submit PDF or six (6) opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit five copies where copies are required for operation and maintenance manuals. Architect will retain three copies; remainder will be returned.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Number and title of appropriate Specification Section.

3. 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.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or 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.

a. Number of Samples: Submit four sets of Samples. Architect will retain three Sample sets; remainder will be returned.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least four sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, 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. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect will return two copies.

a. Mark up and retain one returned copy as a Project Record Document.

F. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation" for Construction Manager's action.

G. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

H. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."

I. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."

J. 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. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return two copies.

    a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit three 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 specified in Division 1 Section "Quality Requirements."

B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

D. 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.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. 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 in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. 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 in the Contract Documents.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. 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.

L. 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.

M. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Requirements."

N. 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 in the Contract Documents.

O. 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.

P. 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 in the Contract Documents.

Q. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

R. 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.

S. 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.

T. 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.

U. 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.

V. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.

1. Architect will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. 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, as follows:

1. Approved as Submitted.
2. Approved as Noted.
3. Revise & Resubmit
4. Rejected.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 35 43 – ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.1 ENVIRONMENTAL PROCEDURES

A. Environmental procedure considerations consist of, but are not limited to, the following factors:

1. Natural resources including air, water, and land.
2. Solid waste disposal.
3. Noise.
4. Control of toxic substances and hazardous materials.
5. The presence of chemical, physical, and biological elements and agents that adversely effect and alter ecological balances.

1.2 GENERAL REQUIREMENTS

A. Provide and maintain environmental protection defined herein, other Sections and as indicated in the Drawings.

B. Comply with all Federal, State, and local laws, ordinances and regulations pertaining to environmental protection.

C. Compliance by subcontractors with the provisions of this and various other sections of these specifications is the responsibility of the Contractor.

D. Use of equipment from which factory-installed, anti-pollution and noise control devices are removed or rendered ineffective, either intentionally or through lack of proper maintenance is prohibited.

E. Furnish a certificate that all materials and operating equipment installed as a part of this project, the installation thereof and all equipment used in the construction, are in compliance with all applicable local laws, ordinances, regulations and permits concerning environmental pollution control and abatement.

1.3 PROTECTION OF NATURAL RESOURCES

A. General: It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed be preserved in their existing condition, be restored to an equivalent of the existing condition or improved as indicated, as approved by the Architect/Engineer, upon completion of the work. Confine on-site construction activities to areas defined by the drawings and specifications.

1.4 TOXIC SUBSTANCES

B. Asbestos and Hazardous Materials Procedure: In the event the Contractor, during the course of the work on the project, encounters the presence of asbestos or any materials containing asbestos, or polychlorinated biphenyl (PCB's) or any other hazardous materials as recognized by local Authorities having jurisdiction, promptly notify the Owner through the Architect/Engineer. Do not perform any work pertinent to the asbestos or hazardous material prior to receipt of special instructions from the Owner through the Architect/Engineer. Any delay in the progress of the work as a result of encountering either asbestos or hazardous materials on the project will be mitigated by the Architect/Engineer. Within 24 hours of this notification to the Owner through the Architect/Engineer of the encountering of the presence of asbestos or hazardous materials, the Contractor will meet with the Architect/Engineer to replan and work around the affected area. The Architect/Engineer will provide the special instructions without delay and upon confirmation by the local Authorities of the actions taken and authorize work to progress.

C. Comply with all applicable provisions of the National Emission Standards for Asbestos (40 CFR 61 Subpart B).

D. Comply with the local regulations of polychlorinated biphenyl (PCB). Since these chemicals are used in some existing insulation, existing fixed and vehicular transformers, assure proper marking, handling, and disposal of any PCB's in accordance with the regulations of 40 CFR 761.

1. Do not use PCB chemical substance, mixture, equipment, container, sealant, coating, or dust-control agent except in accordance with regulations of 40 CFR 761.
2. Immediately report any PCB chemical substance, mixture, equipment, container, sealant, coating or dust control agent found stored within the project area to the Architect in writing and stop work in the area.

E. Lead paint is not known to be present.

F. Asbestos is not known to be present.

1.5 CONTROL AND DISPOSAL OF EXCESS MATERIAL, TRASH AND DEBRIS

A. Dispose of excess excavated material that is approved by the Architect/Engineer as clean fill onsite if an onsite soil disposal area is approved by the Architect/Engineer. If no such site is approved, dispose of the material in accordance with the provision of paragraph 1.5 (C).

B. Pick-up trash and place in containers. Empty containers on a regular schedule. Conduct handling and disposal to prevent contamination of the site and other areas. Do not dispose of in areas of natural vegetation. On completion, leave the area clean and natural looking.

C. Dispose of rubbish and debris as follows:

1. Transport all waste off the site and dispose of it in a manner that complies with State, and local requirements. Secure a permit or license prior to transporting any material off the site. Do not burn or bury waste materials on the site.

1.6 CONTROL AND DISPOSAL OF CHEMICAL AND SANITARY WASTES

A. Store chemical waste in corrosion-resistant containers, remove from the project site, and dispose of as necessary, but not less frequently than monthly. Provide for disposal of chemical waste in accordance with standard established practices as approved by the Architect. Dispose of lubricants to be discarded in accordance with approved procedures meeting state, and local regulations.

1.7 DUST CONTROL

A. Keep dust down at all times including nonworking hours, weekends, and holidays.

B. Secure and cover transport equipment and loose materials in transit to ensure that materials do not become airborne during transit.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 40 00 – QUALITY 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 for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -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 tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include but are not limited to the following:

1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing,

or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. Installer/Applicator/Erector: 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.

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. Experienced: When used with an entity, "experienced" 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.

1.4 CONFLICTING REQUIREMENTS

A. General: 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.

B. 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.

1.5 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

F. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

G. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

    a. Allow seven days for initial review and each re-review of each mockup.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor and the Contract Sum will be adjusted by Change Order.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.

1. Distribution: Distribute schedule to Owner, Architect testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

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SECTION 01 42 00 – 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. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the 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. Location is not limited.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.

D. "Approved": The term "approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

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 the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at the Project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, 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 the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

2. Trades: 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 tradespersons of the corresponding generic name.
3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

    a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

J. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the CSI/CSC's "MasterFormat" numbering system.

B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Section Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 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 the date of the Contract Documents.

C. Conflicting Requirements: Where 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 the 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 the requirements. Refer uncertainties to the Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the 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, the Contractor shall obtain copies directly from the publication source and make them available on request.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

1.5 SUBMITTALS

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PRODUCTS (Not Applicable)

PART 2 - EXECUTION (Not Applicable)

END OF SECTION

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SECTION 01 50 00 – TEMPORARY 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to testing agencies and authorities having jurisdiction.

B. Water Service: Water is not available at the site.

C. Electric Power Service: Electric power is not available at the site.

D. Telephone Service: Telephone service is not available at the site. Provide temporary phone service to the site as required to contact Contractor site representatives.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
   1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
   2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
   3. Indicate sequencing of work that requires water, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Comply with Federal, State and local codes and regulations as well as utility company requirements.

C. Coordinate work with Owner's requirements.

D. Materials: Materials must be new and adequate in capacity for the required usage. Materials must not create unsafe conditions nor violate requirements of applicable codes and standards.

E. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Maintain excavations free of water. Provide and operate pumping equipment. Grade site to drain water away from buildings and excavations.

C. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.

D. Prohibit traffic and storage on waterproofed and roofed surfaces, on lawns and landscaped areas.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.

B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Not Required.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. Heating Equipment: Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. 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: Install temporary service or connect to existing service.
1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

C. Construction Aids: The General Contractor and each Subcontractor shall provide construction aids and equipment required by their personnel and to facilitate execution of their Work. Examples are scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment. Mutual use may be arranged by the Contractor where applicable.

D. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.
1. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. Security: Security of persons and property in the areas under control of the Contractor shall be the Contractor's exclusive responsibility.
   1. The Contractor, at his own expense, shall initiate whatever programs that are necessary to execute his responsibility.
   2. Control of access to the area under the Contractor's control shall be maintained. Visitors shall be required to report immediately to the Contractor's Superintendent and to produce full identification which will be recorded in the Contractor's Daily Log along with the purpose of the visit.

B. Traffic Regulation: Obtain all necessary permits for access to and use of public roads and streets for construction and hauling purposes. Comply with traffic control regulations applying to permit issuance.
   1. Provide markers, signs, lights and barriers on and near the site to safely control construction traffic and public access.

C. Parking: Use designated areas for construction personnel's private vehicles and of Contractor's light-weight vehicles.

D. Project Signs: As required per the drawings and other sections of these specifications.

E. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

F. Cleaning During Construction: Control accumulation of waste materials and rubbish. Periodically dispose of legally off site.

G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Trucks, cranes, and other devices for lifting material and personnel are considered tools and equipment and not temporary facilities.

H. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

I. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
   1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
   2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
   3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
   4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

J. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

3.4 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with 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 Contractor. Owner reserves right to take possession of Project identification signs.
   2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
   3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

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SECTION 01 60 00 – 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 for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. Related Sections include but are not limited to the following:

1. Division 1 Section "References" for applicable industry standards for products specified.
2. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
3. Other included Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service

performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

    a. Specification Section number and title.
    b. Generic name used in the 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.
    h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.

    a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.

4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
5. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A at the end of this section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.

b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's/Engineer’s Action: If necessary, Architect/Engineer will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect/Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.
b. Use product specified if Architect/Engineer cannot make a decision on use of a proposed substitution within time allocated.

C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Architect's Action: If necessary, Architect/Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect/Engineer will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."

b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.

D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect/Engineer will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's/Engineer’s sample. Architect's decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Reference Instructions for Bidders paragraph 3.3.2.

B. Conditions: Architect/Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

2.3 COMPARABLE PRODUCTS

A. Conditions: Architect/Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

EXECUTION (Not Used)

Knowledge for Creating and Sustaining the Built Environment

SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Phone: _____

Address: _____

Trade Name: _____ Model No.: _____

Installer: _____ Phone: _____

Address: _____

History: ☐ New product ☐ 1-4 years old ☐ 5-10 years 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 ☐ _____

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SUBSTITUTION REQUEST
(After the Bidding/Negotiating Phase — Continued)

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 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ Other:

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END OF SECTION

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SECTION 01 73 00 - EXECUTION

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 general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. General installation of products.
3. Coordination of Owner-installed products.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. Related Sections include the following:

1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate

and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

C. Building Lines and Levels: Locate and lay out control lines and levels for foundations including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations from two or more locations.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 8 feet (2.4 m) in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect/engineer.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction forces.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in DelDOT Standard Specifications, Latest Edition.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes: Administrative and procedural requirements for construction waste management activities.

1.2 DEFINITIONS

A. Construction, Demolition, and Land clearing (CDL) Waste: Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage.

B. Salvage: Recovery of materials for on-site reuse, sale or donation to a third party.

C. Reuse: Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Crushing or grinding of concrete for use as sub-base material. Chipping of land clearing debris for use as mulch.

D. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.

E. Source-Separated CDL Recycling: The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.

F. Co-mingled CDL Recycling: The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.

G. Approved Recycling Facility: Any of the following:

1. A facility that can legally accept CDL waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.

2. Material Recovery Facility: A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures, are used to recover recyclable materials.

H. Universal waste components (UWC) are as follows: electric motors, PCB ballasts, non PCB ballasts, capacitors, contactors, circuit breakers, elemental and liquid mercury containing articles, transformers, lead acid batteries, fluorescent light bulbs, and all HID light bulbs.

1.3 SUBMITTALS

A. Contractor shall develop a Waste Management Plan: Submit 3 copies of plan within 14 days of date established for the **Notice to Proceed**.

B. Contractor shall provide Waste Management Report: Concurrent with each Application for Payment, submit **3** copies of report.

1.4 PERFORMANCE REQUIREMENTS

A. General: Divert a minimum of **75%** CDL waste, by weight, from the landfill by one, or a combination of the following activities:

1. Salvage
2. Reuse
3. Source-Separated CDL Recycling
4. Co-mingled CDL Recycling

B. CDL waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:

1. Acoustical ceiling tiles
2. Asphalt
3. Asphalt shingles
4. Cardboard packaging
5. Carpet and carpet pad
6. Concrete
7. Drywall
8. Fluorescent lights and ballasts
9. Land clearing debris (vegetation, stumpage, dirt)
10. Metals
11. Paint (through hazardous waste outlets)
12. Wood
13. Plastic film (sheeting, shrink wrap, packaging)
14. Window glass
15. Wood
16. Field office waste, including office paper, aluminum cans, glass, plastic, and office cardboard.

1.5 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED Accredited Professional, certified by the USGBC as waste management coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Conduct construction waste management activities in accordance with hauling and disposal regulations of all authorities having jurisdiction and all other applicable laws and ordinances.

D. Preconstruction Conference: Schedule and conduct meeting at Project site prior to construction activities.

1. Attendees: Inform the following individuals, whose presence is required, of date and time of meeting.

a. Owner
b. Architect

c. Contractor's superintendent
d. Major subcontractors
e. Waste Management Coordinator
f. Other concerned parties.

2. Agenda Items: Review methods and procedures related to waste management including, but not limited to, the following:

a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
b. Review requirements for documenting quantities of each type of waste and its disposition.
c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
e. Review waste management requirements for each trade.

3. Minutes: Record discussion. Distribute meeting minutes to all participants.
Note: If there is a Project Architect, they will perform this role.

1.6 WASTE MANAGEMENT PLAN – Contactor shall develop and document the following:

A. Develop a plan to meet the requirements listed in this section at a minimum. Plan shall consist of waste identification, waste reduction plan and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight throughout the plan.

B. Indicate anticipated types and quantities of demolition, site-cleaning and construction waste generated by the project. List all assumptions made for the quantities estimates.

C. List each type of waste and whether it will be salvaged, recycled, or disposed of in an landfill. The plan should included the following information:

1. Types and estimated quantities, by weight, of CDL waste expected to be generated during demolition and construction.

2. Proposed methods for CDL waste salvage, reuse, recycling and disposal during demolition including, but not limited to, one or more of the following:

a. Contracting with a deconstruction specialist to salvage materials generated,
b. Selective salvage as part of demolition contractor’s work,
c. Reuse of materials on-site or sale or donation to a third party.

3. Proposed methods for salvage, reuse, recycling and disposal during construction including, but not limited to, one or more of the following:

a. Requiring subcontractors to take their CDL waste to a recycling facility;
b. Contracting with a recycling hauler to haul recyclable CDL waste to an approved recycling or material recovery facility;
c. Processing and reusing materials on-site;
d. Self-hauling to a recycling or material recovery facility.

4. Name of recycling or material recovery facility receiving the CDL wastes.

5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:

1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in hauling and tipping fees by donating materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Including cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT, GENERAL

A. Provide containers for CDL waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

B. The collection containers for recyclable CDL waste must contain no more than 10% non-recyclable material, by volume.

C. Provide containers for CDL waste that is disposed in a landfill clearly labeled as such.

D. Use detailed material estimates to reduce risk of unplanned and potentially wasteful cuts.

E. To the greatest extent possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.

F. Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.

3.2 SOURCE SEPARATION

A. General: Contractor shall separate recyclable materials from CDL waste to the maximum extent possible.

Separate recyclable materials by type.

1. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water and to minimize pest attraction. Cover to prevent windblown dust.
3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from weather.

3.3 CO-MINGLED RECYCLING

A. General: Do not put CDL waste that will be disposed in a landfill into a co-mingled CDL waste recycling container.

3.4 REMOVAL OF CONSTRUCTION WASTE MATERIALS

A. Remove CDL waste materials from project site on a regular basis. Do not allow CDL waste to accumulate on-site.

B. Transport CDL waste materials off Owner's property and legally dispose of them.

C. Burning of CDL waste is not permitted.

3.5 UNIVERSAL WASTE DIVERSION

A. Remove all universal waste from fixtures, panels, and related devices for proper diversion and reclamation.

B. Store all universal waste in containers provided by contact person within facilities operations.

C. Store all universal waste in a secured location and request periodic removal from assigned contact person.

D. Exemption: electric motors, circuit breakers, transformers and lighting contactors are exempt from this provision provided the contractor chooses to salvage or reuse the components.

E. No identified universal waste will be discarded into the waste stream.

END OF SECTION

WASTE MANAGEMENT PROGRESS REPORT				
	DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL	**DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE**		
MATERIAL CATEGORY		Recycled	Salvaged	Reused
1. Acoustical Ceiling Tiles				
2. Asphalt				
3. Asphalt Shingles				
4. Cardboard Packaging				
5. Carpet and Carpet Pad				
6. Concrete				
7. Drywall				
8. Fluorescent Lights and Ballasts				
9. Land Clearing Debris (vegetation, stumpage, dirt)				
10. Metals				
11. Paint (through hazardous waste outlets)				
12. Wood				
13. Plastic Film (sheeting, shrink wrap, packaging)				
14. Window Glass				
15. Field Office Waste (office paper, aluminum cans, glass, plastic, and coffee cardboard)				
16. Other (insert description)				
17. Other (insert description)				
Total (In Weight)		(TOTAL OF ALL ABOVE VALUES – IN WEIGHT)		
		Percentage of Waste Diverted	(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)	

SECTION 01 77 00 – 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 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
3. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in 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. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. 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/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect/Engineer, 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/Engineer’s Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect/Engineer. 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. Submit demonstration and training videotapes.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

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.

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's reference during normal working hours.

B. Record Drawings: Maintain and submit one original set of blue- or black-line white prints with two copies 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 three copies of each Product Data submittal. Mark one 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 three complete sets 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. 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. 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 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.

C. Provide additional copies of each warranty to include in each operation and maintenance manual.

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 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. Provide a magnetic sweep of all areas around the building to retrieve stray nails, screws and other fasteners or metal shards.
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. 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.
f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
g. Sweep concrete floors broom clean in unoccupied spaces.
h. Clean transparent materials, including glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
i. Remove labels that are not permanent.
j. 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.

k. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

C. 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

SECTION 01 78 23 – OPERATIONS AND MAINTENANCE DATA

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 preparing maintenance manuals, including the following:

1. Maintenance documentation directory.
2. Maintenance manuals for the care and maintenance of products, and materials.

B. Related Sections include but are not limited to the following:

1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for maintenance manuals.
2. Division 1 Section "Closeout Procedures" for submitting maintenance manuals.
3. Division 1 Section "Project Record Documents" for preparing Record Drawings for maintenance manuals.
4. Divisions 02 through 33 Sections for specific maintenance manual requirements for the Work in those Sections.

1.3 SUBMITTALS

A. Final Submittal: Submit 1 copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's/Engineer’s comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's/Engineer’s comments.

1.4 COORDINATION

A. Where maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. Table of contents.

B. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect/Engineer.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-

reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

b. Identify each binder on front and spine, with printed title "MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch, 20-lb/sq. ft. white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.

b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to operation and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

F. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting maintenance documentation.

END OF SECTION

SECTION 01 78 39 – PROJECT RECORD DOCUMENTS

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 Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include but are not limited to the following:

1. Division 1 Section "Closeout Procedures" for general closeout procedures and maintenance manual requirements.
2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Final Submittal: Submit three sets of marked-up Record Prints and one set of record transparencies. Print each Drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit three copies of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit three copies of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: 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 would be difficult to identify or measure and record 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.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below boat ramps, building pads
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Changes made by Change Order or Construction Change Directive.
    i. Changes made following Architect's written orders.
    j. Details not on the original Contract Drawings.
    k. Field records for variable and concealed conditions.
    l. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. 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.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.

1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Architect for resolution.
3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.

C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect/Engineer.
    e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications 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. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

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 Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. 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.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's/Engineer’s reference during normal working hours.

END OF SECTION

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected site elements.
2. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner as determined by the Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of selective demolition activities with starting and ending dates for each activity.

1.5 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.6 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

F. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Inventory and record the condition of items to be removed and salvaged.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Arrange to shut off utilities with utility companies.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
   4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   5. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 CLEANING

A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Silica fume.
5. Aggregates.
6. Admixtures:
    a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
7. Vapor retarders.
8. Liquid floor treatments.
9. Curing materials.
    a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
10. Joint fillers.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.

6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
10. Intended placement method.
11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
   a. Location of construction joints is subject to approval of the Architect.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Bonding agents.
5. Adhesives.
6. Vapor retarders.
7. Semirigid joint filler.
8. Joint-filler strips.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Silica fume.
5. Aggregates.
6. Admixtures:
   a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.7 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I/II , .
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Silica Fume: ASTM C1240 amorphous silica.

B. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:
   a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
   b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
   c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
2. Maximum Coarse-Aggregate Size: 1 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260/C260M.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

E. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.3 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A ; not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.4 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

2.5 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:
   a. Ambient Temperature Below 50 deg F: Black.
   b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
   c. Ambient Temperature Above 85 deg F: White.

D. Water: Potable or complying with ASTM C1602/C1602M.

E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

F. Resin Curing Compound: Solvent-based liquid, white pigmented, membrane-forming.

1. For use on exterior slabs. When slab will be painted, sealed, topped, or receive other applied finish, completely remove curing compound after curing is complete and before finish coatings are applied.
2. Comply with ASTM C309, Type 2, Classes A and B, Liquid Membrane Forming, White Pigmented.
3. VOC Content: Less than 350 g/L.
4. Solids Content: 20 percent, minimum.

2.6 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Silica Fume: 10 percent by mass.
4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, .

2.7 CONCRETE MIXTURES

A. Normal-weight concrete used for footings and piers: See drawings for Concrete Properties.

B. Normal-weight concrete used for interior and exterior slabs-on-grade: See drawings for Concrete Properties.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.4 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.
    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.5 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.
    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.
3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as indicated on Drawings . Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.

3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.7 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish .

C. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.

5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system .
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
    a. Slabs on Ground:
        1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch .

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Architect before application.
2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

3.8 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.9 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
    a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
    b. Continuous Sprinkling: Maintain concrete surface continuously wet.

c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
    1) Recoat areas subject to heavy rainfall within three hours after initial application.
    2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:
    a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
        1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
            a) Lap edges and ends of absorptive cover not less than 12 inches.
            b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
        2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
            a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
            b) Cure for not less than seven days.
        3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
            a) Water.
            b) Continuous water-fog spray.
    b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
        1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
            a) Lap edges and ends of absorptive cover not less than 12 inches.
            b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
        2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
            a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
            b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
   a) Water.
   b) Continuous water-fog spray.

c. Floors to Receive Polished Finish: Contractor has option of the following:
   1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
      a) Lap edges and ends of absorptive cover not less than 12 inches.
      b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
   2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
      a) Water.
      b) Continuous water-fog spray.

d. Floors to Receive Chemical Stain:
   1) As soon as concrete has sufficient set to permit application without marring concrete surface, install curing paper over entire area of floor.
   2) Install curing paper square to building lines, without wrinkles, and in a single length without end joints.
   3) Butt sides of curing paper tight; do not overlap sides of curing paper.
   4) Leave curing paper in place for duration of curing period, but not less than 28 days.

e. Floors to Receive Urethane Flooring:
   1) As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
   2) Rewet absorptive cover, and cover immediately with polyethylene moisture-retaining cover with edges lapped 6 inches and sealed in place.
   3) Secure polyethylene moisture-retaining cover in place to prohibit air from circulating under polyethylene moisture-retaining cover.
   4) Leave absorptive cover and polyethylene moisture-retaining cover in place for duration of curing period, but not less than 28 days.

f. Floors to Receive Curing Compound:
   1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
   2) Recoat areas subjected to heavy rainfall within three hours after initial application.
   3) Maintain continuity of coating, and repair damage during curing period.
   4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

g. Floors to Receive Curing and Sealing Compound:
   1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
   2) Recoat areas subjected to heavy rainfall within three hours after initial application.
   3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3. Exterior Concrete Floors, Slabs and Miscellaneous Concrete Items (e.g., all exposed exterior building foundation piers, sidewalks, slabs on grade, pier abutment, lighting pole foundations, etc.):
   a. Exterior Floors and Miscellaneous Concrete Items to Receive Curing Compound:
   b. Resin Curing Compound Only: Solvent-based liquid, white pigmented, membrane-forming. See Paragraph 2.5.f.
      1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
      2) Recoat areas subjected to heavy rainfall within three hours after initial application.
      3) Maintain continuity of coating, and repair damage during curing period.

3.10 TOLERANCES

A. Conform to ACI 117.

3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than three seven 14 28 days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
4. Rinse with water; remove excess material until surface is dry.
5. Apply a second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s).
2. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
    a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
        1) Project name.
        2) Name of testing agency.
        3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
        4) Name of concrete manufacturer.
        5) Date and time of inspection, sampling, and field testing.
        6) Date and time of concrete placement.
        7) Location in Work of concrete represented by samples.
        8) Date and time sample was obtained.
        9) Truck and batch ticket numbers.
        10) Design compressive strength at 28 days.
        11) Concrete mixture designation, proportions, and materials.
        12) Field test results.
        13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
        14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
    a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M:
    a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    b. Perform additional tests when concrete consistency appears to change.
3. Slump Flow: ASTM C1611/C1611M:
    a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    b. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; .
    a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C1064/C1064M:
    a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
    a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C31/C31M:
    a. Cast and laboratory cure two sets of three 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C39/C39M.
    a. Test one set of three laboratory-cured specimens at seven days and one set of two specimens at 28 days.
    b. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests:
    a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
   1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.

13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.14 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

SECTION 05 51 00
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stairs with concrete treads.

B. Structural steel stair framing and supports.

C. Handrails and guards.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.

B. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal anchors in concrete.

C. Section 09 90 00 - Painting and Coating.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2022.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

H. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

I. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.

J. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.

K. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.

L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

M. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

P. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

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

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
1. Include applicable code, design loads, and assumptions.
2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
3. Include the design engineer's seal and signature on each sheet of shop drawings.

C. Design Data: As required by authorities having jurisdiction.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Fabricator Qualifications:
1. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.01 METAL STAIRS - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.

1. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
3. Structural Design: Provide complete stair and railing assemblies that comply with the applicable local code.
4. Dimensions: As indicated on drawings.
5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
7. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
1. Service: Exposed joints tight with face surfaces aligned; underside of stair not covered by soffit is not considered exposed to view.
a. Welded Joints: Welded on back side wherever possible.
b. Welds Exposed to View: Ground smooth; not required to be flush.
c. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts or screw threads.
d. Metal Surfaces to be Painted: Sanded smooth, suitable for satin or matte finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

A. Jointing and Finish Quality Level: Service, as defined above.

B. Risers: Closed.

C. Treads: Metal pan with field-installed concrete fill.
1. Concrete Depth: 1-1/2 inches, minimum.
2. Tread Pan Material: Steel sheet.
3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch minimum.
4. Concrete Reinforcement: Welded wire mesh.
5. Concrete Finish: Steel troweled.

D. Risers: Same material and thickness as tread pans.
1. Riser/Nosing Profile: Sloped riser with rounded nosing of minimum radius.
2. Nosing Depth: Not more than 1 inch overhang.
3. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.

E. Stringers: Rolled steel channels.
1. Stringer Depth: 12 inches.
2. End Closure: Sheet steel of same thickness as risers welded across ends.

F. Landings: Similar construction, using corrugated steel decking, supported and reinforced as required to achieve design load capacity.

G. Railings: Steel pipe railings.

H. Finish: Shop- or factory-prime painted.

I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.03 HANDRAILS AND GUARDS

A. Guards:
1. Top Rails: Round pipe or tube rails unless otherwise indicated.
   a. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
2. Infill at Pipe Railings: Same material as top rails.
   a. Vertical Spacing: Three-pipe, equally spaced, OSHA compliant.
   b. Jointing: Welded and ground smooth and flush.
3. End and Intermediate Posts: Same material and size as top rails.
   a. Horizontal Spacing: As determined by delegated design.
   b. Mounting: Welded to top surface of stringer.
4. Handrails: Round pipe or tube rails unless otherwise indicated.
   a. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
   b. Mounting: Mount to guardrail and project into stair width.
   c. Extension: 12-inch minimum, from stair nosing to handrail bend or fitting.

2.04 MATERIALS

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.

C. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.

D. Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.

E. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).

F. Concrete Fill: See Section 03 30 00.

G. Concrete Reinforcement: Mesh type, galvanized.

2.05 ACCESSORIES

A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

C. Shop and Touch-Up Primer: SSPC-Paint 15, and comply with VOC limitations of authorities having jurisdiction.

2.06 SHOP FINISHING

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime Painting: Use specified shop- and touch-up primer.
1. Preparation of Steel: In accordance with SSPC-SP 2 Hand Tool Cleaning.
2. Number of Coats: One.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. When field welding is required, clean and strip primed steel items to bare metal.

B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.

C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Provide welded field joints where specifically indicated on shop drawings. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.

F. Obtain approval prior to site cutting or creating adjustments not scheduled.

G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stair railings and guardrails.

B. Safety Railing Systems.

1.02 RELATED REQUIREMENTS

A. Section 09 90 00 - Painting and Coating.

1.03 REFERENCE STANDARDS

A. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

B. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

E. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).

F. Occupational Safety and Health Administration (OSHA) 9 CFR 1926 - Safety and Health Regulations for Construction, Subpart M-Fall Protection.

G. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.29 - Subpart D, Walking-Working Surfaces; Fall Protection Systems and Falling Object Protection.

H. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

1.04 SUBMITTALS

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

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Certification: Provide manufacturer's certifications that railing system design meets or exceeds imposed load requirements of the International Building Code.

D. Shop Drawings: Indicate rail system layout, profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
   1. Include the design engineer's seal and signature on each sheet of shop drawings.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Fabricator Qualifications:
   1. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Safety Railing Systems:
   1. Basis-of-Design: Garlock Safety Systems, RailGuard 200 Permanent Mount Guardrail Safety Railing.
   2. Available Manufacturers: Subject to compliance with requirements of drawings and specifications, products from the following manufacturer's may be provided:
      a. Frontline Fall Protection; GUS-FXD Guardrail System for Concrete or Steel Substrates; www.frontlinefall.com/#sle.
      b. Garlock Safety Systems; RailGuard 200 Permanent Mount Guardrail Safety Railing: www.garlocksafety.com/#sle.
      c. Safety RailCo.; SRC Permanent Mount Rail: www.safetyrailcompany.com/#sle.
      d. Vestil Manufacturing Company; VDKR Pipe Safety Railing: www.vestildocs.com/#sle.

2.02 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
   1. International Building Code, 2021.
   2. OSHA: 29 CFR 1926.502.
   3. OSHA: 29 CFR 1910.29.
   4. ASTM Standard E985 Maximum Allowable Deflection under test conditions specified in section 7.1 and 7.2.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 50 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.
   1. Top Rails and Wall Rails: 1.62 inches diameter, round.
   2. Intermediate Rails: 1.62 inches diameter, round.
   3. Posts: 1.62 inches diameter, round.

F. Provide railing manufacturer's anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated.

G. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

H. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
   1. Ease exposed edges to a small uniform radius.
   2. Welded Joints:
      a. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
      b. Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.

I. Finsh: Powder-coated, safety yellow.

2.03 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.

B. Exposed Fasteners: No exposed bolts or screws.

C. Straight Splice Connectors: Steel concealed spigots.

D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Weld connections that cannot be shop welded due to size limitations.
   1. Weld in accordance with AWS D1.1/D1.1M.
   2. Match shop welding and bolting.
   3. Clean welds, bolted connections, and abraded areas.
   4. Touch up shop primer and factory-applied finishes.
   5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

2.05 ACCESSORIES

A. Accessories are to be provided by rail system manufacturer.

B. Rail Base:
1. Basis-of-Design: Garlock Safety Systems, Single Post Floor Moung and Double Post Floor Mount.
2. Finish: Power-coated, safety yellow.
3. Mounting: Through-bolt.

C. Gate:
1. Basis-of-Design: Garlock Safety Systems, EasyFit XL, self-closing, hinged gate.
2. Finish: Power-coated, safety yellow.
3. Closing Mechanism: Torsion spring.
4. Mounting: Post-mounted with clamps.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with OSHA Regulations.

D. Anchor railings securely to structure.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rough opening framing for doors, windows, and roof openings.

B. Preservative treated wood materials.

C. Fire retardant treated wood materials.

D. Concealed wood blocking, nailers, and supports.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

B. AWPA U1 - Use Category System: User Specification for Treated Wood; 2023.

C. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2021, with Editorial Revision (2022).

D. PS 1 - Structural Plywood; 2019.

E. PS 20 - American Softwood Lumber Standard; 2021.

F. WWPA G-5 - Western Lumber Grading Rules; 2021.

1.03 SUBMITTALS

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

B. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Western Wood Products Association; WWPA G-5.

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER

A. Grading Agency: Western Wood Products Association; WWPA G-5.

B. Sizes: Nominal sizes as indicated on drawings.

C. Surfacing: S4S.

D. Moisture Content: S-dry or MC19.

2.04 CONSTRUCTION PANELS

A. Subfloor/Underlayment Combination: PS 1 type, rated Single Floor.
   1. Panel Type: Plywood.
   2. Bond Classification: Exterior.
   3. Span Rating: 24.
   4. Performance Category: 3/4 PERF CAT.
   5. Edges: Tongue and groove.
   6. Veneer Grade: A-C.
   7. Surface Finish: Fully sanded face.

B. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.05 ACCESSORIES

A. Fasteners and Anchors:

B. Fasteners and Anchors: Stainless steel.

C. Termite-Resistant Sill Plate Barrier: Self-adhesive, film-backed barrier with release sheet; adheres to concrete substrates and blocks termite access.
1. Thickness: 68 mil, 0.068 inch.
2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.

D. General Purpose Construction Adhesives: Suitable for securing plywood to cold rolled steel framing.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
1. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat rough carpentry items as indicated .
c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber exposed to weather.
c. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Provide the following specific nonstructural framing and blocking:
1. Cabinets and shelf supports.
2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Wall-mounted equipment and accessories.

3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Subflooring/Underlayment Combination: Glue and Screw to framing.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.

3. Install adjacent boards without gaps.

3.05 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood casings and moldings.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 08 52 00 - Wood Windows.

C. Section 09 90 00 - Painting and Coating: Painting of finish carpentry items.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

1.04 SUBMITTALS

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

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum ten years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

B. Protect from moisture damage.

C. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.
   2. Window Sills: Clear pine; prepare for paint finish.

2.02 FASTENINGS

A. Adhesive: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Fasteners: Of size and type to suit application.

2.03 ACCESSORIES

A. Wood Filler: Solvent base, tinted to match surface finish color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 90 00 - Painting and Coating

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 07 11 13
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bituminous dampproofing.

B. Protection boards.

1.02 REFERENCE STANDARDS

A. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2018).

B. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.03 SUBMITTALS

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

B. Product Data: Provide properties of primer, bitumen, and mastics.

C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in production of materials of this section with at least ten years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with at least five years of documented experience.

1.05 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design: W.R. Meadows, Inc: Sealmastic Spray-Mastic: www.wrmeadows.com/#sle.

B. Bituminous Dampproofing Manufacturers: Submect to compliance with requirements of drawings and specifications, products from the following manufacturers may be provided.

1. Henry, a Carlisle Company: www.henry.com/#sle.
2. Karnak Corporation: www.karnakcorp.com/#sle.
3. Mar-flex Waterproofing & Building Products: www.mar-flex.com/#sle.
4. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 BITUMINOUS DAMPPROOFING

A. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition: ASTM D4479/D4479M Type I, asbestos free.
   2. VOC Content: Not more than permitted by local, State, and federal regulations.
   3. Applied Thickness: 1/16 inch, minimum, wet film.

B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.03 ACCESSORIES

A. Protection Board: 1/8-inch thick biodegradable hardboard.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.

B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

C. Do not apply dampproofing to surfaces unacceptable to manufacturer.

D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.03 APPLICATION

A. Foundation Walls: Apply two coats of asphalt dampproofing.

B. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

C. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

D. Apply bitumen by spray application.

E. Apply from 2 inches below finish grade elevation down to top of footings.

F. Seal items watertight with mastic, that project through dampproofing surface.

G. Place protection board directly over dampproofing, butt joints, and adhere to tacky dampproofing.

H. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at perimeter foundation wall and underside of floor slabs.

B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

C. Batt insulation in interior partition and floor construction.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Sound Attenuation Batts.

B. Section 13 34 19 - Metal Building Systems: Insulation for Pre-Engineered Metal Buildings.

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

D. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C; 2022.

1.04 SUBMITTALS

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

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

B. Insulation in Matal Framed Interior Partitions and Floors: Batt insulation.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
   5. Products:
      a. DuPont de Nemours, Inc; Styrofoam Brand Square Edge: building.dupont.com/#sle.
      b. Kingspan Insulation LLC; GreenGuard GG25-LG XPS Insulation Board: www.kingspan.com/#sle.
      c. Owens Corning Corporation; FOAMULAR NGX Type 250 Next Generation Extruded: www.ocbuildingspec.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 MINERAL FIBER BLANKET INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   4. Facing: Unfaced.
   5. Products:
      a. CertainTeed Corporation: www.certainteed.com/#sle.
      b. Johns Manville: www.jm.com/#sle.
      c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.

3. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Extend boards over expansion joints, unbonded to foundation on one side of joint.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BATT INSTALLATION

A. Refer to Section 13 34 19 - Metal Building Systems for building envelope insulation.

B. Install insulation in accordance with manufacturer's instructions.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Snow guards.

1.02 RELATED REQUIREMENTS

A. Section 13 34 19 - Metal Building Systems.

1.03 REFERENCE STANDARDS

A. Aluminum Association (AA) - Aluminum Standards and Data, 2003 Edition

B. ASTM B85-03 - Standard Specification for Aluminum-Alloy Die Castings.

C. ASTM B221-04a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.04 SUBMITTALS

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

B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
   1. Snow Guards: Submit design calculations for loadings and spacings based on manufacturer testing.
   2. Submit shop drawings sealed and signed by a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

D. Snow Guard Delegated Design Informational Submittals:
   1. Include calculation of number and location of snow guards based on designed roof snow load, roof slope, roof type, components, spacings and finish.
   2. Test results: Results of product tensile load testing, issued by a recognized independent testing laboratory, showing ultimate load-to-failure value of attachment.

E. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer to specialize in production of material of the type specified with a minimum of 20 years documented experience.

B. Installer Qualifications: Installer to specialize in metal roof installation and installation of Snow Guard Products with a minimum of 5 years documented experience.

C. Snow Guard Mockup:
1. Size: Minimum [8] feet long.
2. Show: Snow guard attachment, cross members, and accessories.
3. Locate where directed.
4. Approved mockup may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 SNOW GUARDS

A. Fence Type Snow Guard: Continuous snow guard; manufacturer's standard pipe, bar, channel, or solid rod, set in brackets or posts, with optional plates and metal trim to match roof.
1. Basis-of-Design: Metal Roof Innovations, LTD, S-5, Colorgard 2.0 with SnoClips.
2. Manufacturers:
a. Metal Roof Innovations, Ltd. S-5! Attachment Solutions: www.s-5.com/#sle.
b. PMC Industries, Inc: www.aceclamp.com/#sle.
c. Rocky Mountain Snow Guards, Inc: www.rockymountainsnowguards.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.
3. Compatability:
a. Snow guard system components shall be compatable with metal panel roof system specified under Section 13 34 19.
4. Clamps:
a. Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.
1) Clamp model: No. S-5-E for trapezoidal rib.
2) Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch diameter, with round nose point.

5. Ice and Snow Clips:
   a. Aluminum, with rubber foot, minimum 3 inches wide.
      1) Model: SnoClip II for standing seam heights 1” to 1.75”
      2) Model: SnoClip III for standing seam heights 1.75” to 3”

B. Delegated Design:
   1. Configuration:
      a. Fence type snow quard system with all accessories required for complete installation.
      b. Minimum installation as follows:
         1) Snow guard system at all roof eavesf.
         2) Provide clip(s) at each seam.
         3) Provide one row at all eaves.
         4) Provide snow clips at one row at each eave. Provde two snow clips at each roof panel.
   2. Final system configuration may exceed the minimum requirements noted above, if additional components are required to meet snow load requirements as indicated in delegated design submission.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 SNOW GUARD INSTALLATION

A. SnoRail and SnoFence Snow Retention Systems
   1. Place clamps at maximum 32 inches on center or as required by in-service loads.
   2. Place clamps in straight, aligned rows.
   3. Place both set screws on same side of clamp.
   4. Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.

5. Use End-Condition clamps in lieu of standard clamp at each end of each assembly, and at a frequency and spacing of one for each 50 feet of assembly.
6. Install SnoPosts vertically in each clamp.
    a. Install cross members through holes in clamps and posts.
7. Install coupler at cross member end joints.
8. Tighten set screws against cross members at all End Condition clamp and post locations.
9. Do not cantilever cross members more than 4 inches beyond last clamp at ends.
    a. Install two SnoClips per panel between panel seams.

3.05 CLEANING

A. Clean installed work to like-new condition.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).

B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2022.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

E. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.

1.03 SUBMITTALS

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

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Backing material recommended by sealant manufacturer.
   4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   5. Substrates the product should not be used on.
   6. Substrates for which use of primer is required.
   7. Substrates for which laboratory adhesion and/or compatibility testing is required.
   8. Installation instructions, including precautions, limitations, and recommended backing materials and tools.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Initial Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Executed warranty.

1.04 **MOCK-UP**

A. Prepare on-site mock-ups for confirmation of initial color selections. Mock-ups shall include up to four colors for each sealant type and substrate type.

B. Approved mock-up may remain as part of the part of the work.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least five years of documented experience.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nonsag Sealants:
1. Bostik Inc: www.bostik-us.com/#sle.
2. Dow: www.dow.com/#sle.
3. Henry Company: www.henry.com/#sle.
4. Hilti, Inc: www.hilti.com/#sle.
5. Pecora Corporation: www.pecora.com/#sle.
6. Sika Corporation: www.usa.sika.com/#sle.
7. Specified Technologies Inc: www.stifirestop.com/#sle.
8. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
9. W.R. Meadows, Inc: www.wrmeadows.com/#sle.
10. Substitutions: See Section 01 60 00 - Product Requirements.

B. Self-Leveling Sealants:
1. Bostik Inc: www.bostik-us.com/#sle.
2. Dow: www.dow.com/#sle.
3. Pecora Corporation: www.pecora.com/#sle.
4. Sika Corporation: www.usa.sika.com/#sle.
5. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.

6. W.R. Meadows, Inc: www.wrmeadows.com/#sle.
7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints:
      a. Seal the following joints:
         1) Wall expansion and control joints.
         2) Joints between doors, windows, and other frames or adjacent construction.
         3) Joints between different exposed materials.
         4) Joints between paving and building foundation or slab.
         5) Control joints and expansion joints in concrete paving and curbs.
   2. Interior Joints:
      a. Seal the following joints:
         1) Joints between door frames and window frames and adjacent construction.
         2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
         3) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.

B. Exterior Sealant Types:
   1. Type EX-1 - Exterior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
   2. Type EX-2 - Lap Joints between Manufactured Metal Panels: Butyl rubber, noncuring.
   3. Type EX-3 - Control Joints and Expansion Joints in Concrete Paving: Self-leveling polyurethane traffic-grade sealant.

C. Interior Sealant Types:
   1. Type INT-1 - Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
   2. Type INT-2 - Control Joints and Expansion Joints in Concrete Floor Slab: Self-leveling polyurethane traffic-grade sealant suitable for continuous liquid immersion.
   3. Type INT-3A - Joints between Porcelain Fixtures and Floors and Walls: Mildew-resistant silicone sealant; white.
   4. Type INT-3B - Joints between Casework and wall and Between Backspash and Countertop: Mildew-resistant silicone sealant; clear.

2.03 JOINT SEALANTS - GENERAL

2.04 NONSAG JOINT SEALANTS

A. Type INT-3A - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   1. Color: White.
   2. Basis-of-Design: Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.

3. Available Products: Subject to requirements of drawings and specifications, products from manufacturers listed in paragraph 2.01 may be provided.

B. Type INT-3B - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: Clear.
2. Basis-of-Design: Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
3. Available Products: Subject to requirements of drawings and specifications, products from manufacturers listed in paragraph 2.01 may be provided.

C. Type EXT-1 and Type INT-1 -Polyurethane Sealant: ASTM C920, Grade NS, Uses M, A, G and O; multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum, when tested in accordance with ASTM C719.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's full range and confirmed by mock-up.
4. Basis-of-Design: Pecora Corporation; DynaTrol II: www.pecora.com/#sle.
5. Available Products: Subject to requirements of drawings and specifications, products from manufacturers listed in paragraph 2.01 may be provided.

D. Type EX-2 - Noncuring Butyl Sealant: Solvent-based, single component, nonsag, nonskinning, nonhardening, nonbleeding; nonvapor permeable; intended for fully concealed applications.
1. Basis-of-Design: Pecora BA-98 Non-Skinning Bytyl Sealant.
2. Available Products: Subject to requirements of drawings and specifications, products from manufacturers listed in paragraph 2.01 may be provided.

2.05 SELF-LEVELING JOINT SEALANTS

A. Type EX-3 and Type INT-2 -Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M, A and G; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's full range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Basis-of-Design: Sikaflex-1c SL: www.usa.sika.com/#sle.
6. Available Products: Subject to requirements of drawings and specifications, products from manufacturers listed in paragraph 2.01 may be provided.

2.06 ACCESSORIES

A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.

B. Sealant Backing Rod, Closed-Cell Type:
1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.

2. Size: 25 to 50 percent larger in diameter than joint width.

C. Preformed Joint Filler: Closed-cell polyethylene foam espandion and isolaton joint filler for use in concrete construction with integrated tear-off strip at top edge to create void for installation of cold-applied sealant. ASTM D7174, Type-1. ASTM D5249, Type-2.
1. Density: <2.0 lb.cu.ft., when tested in accordance with ASTM D545.
2. Comprision Recovery from 50% Compressoin: > 95% when tested in accordance with ASTM D7174 and ASTM D545.
3. Water Absorption: <0.5% when tested in accordance with ASTM D545.
4. Basis-of-Design: Momaco, Fastflex: www.nomaco.com/#sle.

D. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

E. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

F. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

G. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.

H. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

J. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

K. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

L. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.

1.04 SUBMITTALS

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

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than twenty years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

C. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
3. Mesker, dormakaba Group: www.meskeropeningsgroup.com/#sle.
4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
5. Steelcraft, an Allegion brand: www.allegion.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.

4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Interior and Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 3 - Extra Heavy-duty.
    b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 1 - Full Flush.
    d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
3. Door Thermal Resistance: R-Value of 8.7, minimum, for installed thickness of polyurethane, test method ASTM C518.
4. Door Thickness: 1-3/4 inches, nominal.
5. Weatherstripping: Refer to Section 08 71 00.
6. Door Finish: Factory primed and field finished.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
2. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
3. Frame Finish: Factory primed and field finished.
4. Weatherstripping: Separate, see Section 08 71 00.

C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
   2. Frame Finish: Factory primed and field finished.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Install door hardware as specified in Section 08 71 00.

D. Touch up damaged factory finishes.

3.03 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.04 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 Section Includes

A. Exterior coiling doors.

B. Electric operators and control stations.

C. Wiring from electric circuit disconnect to operators and control stations.

1.02 Related Requirements

A. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

B. Section 26 05 83 - Wiring Connections: Power to disconnect.

1.03 Reference Standards

A. ASHRAE - Standard 90.1; 2017.

B. IECC - International Energy Conservation Code; 2018.

C. ITS (DIR) - Directory of Listed Products; Current Edition.

D. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).

F. UL (DIR) - Online Certifications Directory; Current Edition.

G. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 Submittals

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

B. Product Data: Provide electrical equipment, component connections and details, and product data sheet, specification and details.

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

D. Color samples.

E. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.

F. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

G. Specimen warranty.

1.05 Delegated Design Requirements

A. Wind Loading: Meet or exceed requirements of IBC-2018 and requirements indicated on the drawings.

B. Cycle Life: Doors to withstand up to 20 cycles per day, and an overall maximum of 50,000 operating cycles for the life of the door.

C. Insulated Door Slat Material requirements:
1. Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84
2. Sound Transmission Class (STC) rating up to 30 for the entire assembly. If an STC of 32 is desired, additional options are required. All configurations are evaluated per ASTM E90 and based on testing a complete, operable assembly
3. Minimum R-value of 8.0 (U-value of 0.125) as calculated using the ASHRAE Handbook of Fundamentals
4. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero

D. Custom Layout: Product to be configured for custom layout as indicated on drawings.

1.06 Project Constraints

A. Structural components of the pre-engineered metal building limit the width and height available for mounting coiling door, hood, motor, and other system components. The basis-of -design product is configured with the motor mounted to the back of the hood, thereby reducing the overall width of the overhead door assembly relative to assemblies with the motor mounted to the side of the hood.

B. The Contractor is responsible for providing a product that works within project constraints.

1.07 Quality Assurance

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least five years documented experience.

C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified and indicated.

1.08 Warranty

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for defects in material and workmanship, and for roller shaft counterbalance assembly. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

A. Basis-of-Design: Cookson Thermiser Max, ESD30.

B. Overhead Coiling Metal Doors - Available Manufacturers: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
1. Cornell Iron Works, Inc: www.cornelliron.com/#sle.
2. Overhead Door Company: www.overheaddoor.com/#sle.
3. The Cookson Company: www.cooksondoor.com/#sle.
4. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

C. Products provided by "Available Manufacturers" and/or substitutions are required to work within Project Constraints indicated in paragraph 1.06. The Contractor is responsible for providing a product that works within project constraints.

2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.
1. Capable of withstanding positive and negative wind loads of 20 psf without undue deflection or damage to components.
2. Sandwich Slats: Manufacturer's standard, with core of foamed-in-place polyurethane insulation; minimum R-value of 8.
a. Slat Material: No. 6F.
1) Galvanized Steel/Galvanized Steel: Manufacturer recommended gauge based on performance requirements. Minimum 24/24 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating.
b. Nominal Slat Size: 2 inches wide by required length.
c. Insulation: 7/8" foamed-in-place, closed cell polyurethane.
d. Total Slat Thickness: 15/16 inch.
e. Flame Spread Index: 0.
f. Smoke Developed Index: 10.
g. Insulation Value: R-8.0 (U-Value of 0.125).
h. STC Rating: Sound Transmission Class (STC) rating up to 30 for the entire assembly.
3. Exterior Slat Finish: Powder Coat applied over galvanized finish.
a. Base Finish: Galvanized. ASTM A 653 galvanized base coating treated with dual process rising agents in preparation for chemical bonding baked-on base coat and aked-on polyester enamel finish coat.
b. Painted Finish: SpectraShield Powder Coat. Color to be selected from manufacturer's full range of more than 180 colors.
c. Top Coat: Polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per

ASTM B117Painted Finish: SpectraShield Powder Coat. Color to be selected from manufacturer's full range of more than 180 colors.

4. Interior Slat Finish: Powder Coat applied over galvanized finsh.
   a. Base Finish: Galvanized. ASTM A 653 galvanized base coating treated with dual process rising agents in preparation for chemical bonding baked-on base coat and aked-on polyester enamel finish coat.
   b. Painted Finish: SpectraShield Powder Coat. Color to be selected from manufacturer's full range of more than 180 colors.
   c. Top Coat: Polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per ASTM B117Painted Finish: SpectraShield Powder Coat. Color to be selected from manufacturer's full range of more than 180 colors.
5. Endlocks: Fabricate interlocking sections with high strength endlocks on alternate slats each secured with two 1/4 inch rivets. Provide windlocks as required to meet specified wind load.
   a. Nylon: Required up to 21’-5” width.
6. Bottom Bar:
   a. Configuration:
   b. Insulated Bottom Bar: Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4” tall x 1-1/16” thickness.
   c. Air Infiltration Certification Label: Must be affixed to bottom bar.
7. Guide: Hot-dip Galvanized, ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication.
8. Counterbalance Shaft Assembly:
   a. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width
   b. 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.
9. Brackets:
   a. Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
   b. Hot-dip Galvanized, ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication.
10. Hood Enclosure: ; .
    a. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
11. Weatherstripping:
    a. Bottom Bar, Motor Operated Door: Sensing/weather edge with neoprene astragal extending full width of door bottom bar.
    b. Guides: Replaceable vinyl strip on guides sealing against both sides of curtain.
    c. Lintel Seal: Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.
    d. Hood: Neoprene/rayon baffle to impede air flow above coil.
12. Electric operation.

2.03 Electric Operation

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.

B. Electric Operators:
   1. Mounting: Front of coil.
   2. Motor Enclosure:
   3. Motor Rating: 1/3 HP; continuous duty.
   4. Motor Voltage: 120 volts, single phase, 60 Hz.
   5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
   6. Controller Enclosure: NEMA EN 10250, Type 4.
   7. Opening Speed: 12 inches per second.
   8. Brake: Manufacturer's standard type, activated by motor controller.
   9. Manual override in case of power failure.
   10. See Section 26 05 83 for electrical connections.

C. Control Station: Provide standard three button, 'Open-Close-Stop' momentary-contact control device for each operator complying with UL 325.
   1. 24 volt circuit.
   2. Surface mounted, at interior door jamb.
   3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
      a. Primary Device: Provide NEMA 4X photo eye sensors as required with momentary-contact control device.
      b. Secondary Device: Provide electric sensing edge with wireless edge kit as an option along with continuous-constant control device.

PART 3 EXECUTION

3.01 Examination

A. Verify that adjacent construction is suitable for door installation.

B. Verify that electrical services have been installed and are accessible.

C. Verify that door opening is plumb, header is level, and dimensions are correct.

D. Notify Architect of any unacceptable conditions or varying dimensions.

E. Commencement of installation indicates acceptance of substrate and door opening conditions.

3.02 Installation

A. Install units in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Coordinate installation of electrical service with Section 26 05 83.

F. Complete wiring from disconnect to unit components.

3.03 Tolerances

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet straight edge.

3.04 Adjusting

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 Cleaning

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 08 52 00
WOOD WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory fabricated, aluminum-clad, wood windows.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Rough opening framing.

B. Section 06 20 00 - Finish Carpentry: Interior wood trims.

C. Section 09 90 00 - Painting and Coating. Interior painting.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2017.

B. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

1.04 SUBMITTALS

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

B. Product Data: Show component dimensions, anchorage and fasteners, glass, and internal drainage details.

C. Shop Drawings:
1. Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
2. Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.

D. Manufacturer's Certificate: Certify that products furnished meet or exceed specified requirements.

E. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than twenty years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect factory finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and after installation of sealants.

1.08 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period.

B. Failures include, but are not limited to, the following:
1. Failure to meet performance requirements.
2. Structural failures including excessive deflection, water leakage, and air infiltration.
3. Faulty operation of movable sash and hardware.
4. Deterioration of materials and finishes beyond normal weathering.
5. Failure of insulating glass.

C. Warranty Period:
1. Window: 10 years from date of Substantial Completion.
2. Glazing Units, Non-laminated: 20 years from date of Substantial Completion.
3. Glazing Units, Laminated: 10 years from date of Substantial Completion.
4. Aluminum-Cladding Finish: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum Clad Wood Windows:
1. Basis-of-Design: Andersen Windows, Inc., 400 Series Woodwright, aluminum-clad wood, single-hung window.

2. Available manufacturer's: Subject to the requirements of the specification, products from the following manufacturers may be provided.
   a. Andersen Windows, Inc: www.andersenwindows.com/#sle.
   b. Marvin: www.marvin.com/#sle.
   c. Pella Corporation: www.pellacommercial.com/#sle.
   d. Weather Shield Manufacturing, Inc: www.weathershield.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 WOOD WINDOWS

A. Frames and Sashes: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to a moisture content of not more than 12 percent at time of fabrication; free of visible finger joints on linear members, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch (0.8 mm) deep by 2 inches (51 mm) wide; water-repellent preservative treated.
   1. Exterior Finish: Manufacturer's standard fluoropolymer two-coat system with fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight and complying with AAMA 2605.
   2. Exterior Color: Dark Bronze.
   3. Interior Finish: Manufacturer's standard factory-prime coat.

B. Insulating-Glass Units - ASTM E2190: Manufacturer's standard factory-glazing system that produces weathertight seal.
   1. Glass: Annealed glass, ASTM C1036, Type 1, Class 1, q3.
   2. Tint: Clear.
   3. Fill: Fill space between glass lites with Argon.
   4. Coating: Low-E coating on second surface.

C. Hardware: Manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
   1. Counterbalancing Mechanism: Complying with AAMA 902, concealed, of size and capacity to hold sash stationary at any open position.
   2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
   3. Tilt Hardware: Releasing tilt latch allows sash to pivot about horizontal axis to facilitate cleaning exterior surfaces from the interior.

D. Muntins: None.

E. Insect Screens: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
   1. Type and Location: Full, outside screen.
   2. Aluminum Frames:
      a. Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
      b. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
      c. Finish: Baked-on organic coating in matching color and finish of cladding.

3. Glass-Fiber Mesh Fabric:
   a. PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D3656/D3656M and SMA 1201.
   b. Color: Manufacturer's standard.

2.03 PERFORMANCE REQUIREMENTS

A. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 requirements for the specific window type in accordance with the following:
   1. Performance Class (PC): LC.
   2. Performance Grade (PG): 25, with minimum design pressure (DP) of 25.06 psf.

B. Overall Thermal Transmittance (U-value): 0.35, maximum, including glazing, measured on window sizes required for this project.

2.04 FABRICATION

A. Fabricate wood windows in sizes indicated. Include a complete system for installing and anchoring windows.

B. Glaze wood windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

E. Clear maple head and seat boards.
   1. Top and bottom plywood platforms.
   2. Exterior head and sill casings and trim.
   3. Support brackets.

F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install sills, stools, aprons, and trim.

E. Set sill members and sill flashing in continuous bead of sealant.

F. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

G. Seal perimeter of window unit with backer rod and sealant at interior and exterior.

3.03 TOLERANCES

A. Maximum Variation from Level or Plumb: 1/16 inch per 3 ft non-cumulative or 1/8 inch per 10 ft, whichever is less.

3.04 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

3.05 CLEANING

A. Refer to Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Remove protective material from factory finished surfaces.

C. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

D. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Commercial door hardware for the following:
      a. Swinging doors.

B. Related Sections include the following:
   1. Division 8 Section "Steel Doors and Frames"

1.02 SUBMITTALS

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

B. Qualifications: Submit manufacturer’s qualifications.

C. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

D. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
   2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
      a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
   3. Content: Include the following information:
      a. Type, style, function, size, label, hand, and finish of each door hardware item.
      b. Manufacturer of each item.
      c. Fastenings and other pertinent information.
      d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
      e. Explanation of abbreviations, symbols, and codes contained in schedule.
      f. Mounting locations for door hardware.
      g. Door and frame sizes and materials.
      h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
         1) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
5. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.

E. Keying Schedule: Prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

F. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.

G. Warranties: Special warranties specified in this Section.

1.03 QUALITY ASSURANCE

A. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
1. Electrified Door Hardware Qualifications: Experienced in providing consulting services for electrified door hardware installations.

B. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that are listed to perform electrical modifications, by a testing and inspecting agency acceptable to authorities having jurisdiction, are acceptable.

C. Regulatory Requirements: Comply with provisions of the following:
1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, FED-STD-795, "Uniform Federal Accessibility Standards," as follows:
a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
b. Door Closers: Comply with the following maximum opening-force requirements indicated:
1) Interior Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
2) Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
3) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

4) Thresholds: Not more than 1/2 inch (13 mm) high, Not more than 3/4 inch (19 mm) high for exterior sliding doors. Bevel raised thresholds with a slope of not more than 1:2.

2. NFPA 101: Comply with the following for means of egress doors:
   a. Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
   b. Delayed-Egress Locks: Lock releases within 15 seconds after applying a force not more than 15 lbf (67 N) for not more than 3 seconds.
   c. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
   d. Thresholds: Not more than 1/2 inch (13 mm) high.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Review methods and procedures related to electrified door hardware including, but not limited to, the following:
   1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
   2. Review sequence of operation for each type of electrified door hardware.
   3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review required testing, inspecting, and certifying procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item with Door Number related to the final Approved Door Hardware Schedule, and include basic installation instructions with each item or package.

C. **Delivery of Cores and Keys:**
   1. **Deliver cores and keys by registered mail to Century Engineering.**
   2. **Cores and keys are to be identified with the project name and door opening number.**

1.05 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.06 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
   1. Structural failures including excessive deflection, cracking, or breakage.
   2. Faulty operation of operators and door hardware.
   3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period for Locksets: Three, (3) years from date of Substantial Completion, unless otherwise indicated.

D. Warranty Period for Manual Closers: Ten, (10) years from date of Substantial Completion, unless otherwise indicated.

E. Warranty Period for Exit Devices: Three, (3) years from date of Substantial Completion, unless otherwise indicated.

1.07 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.

C. Engage a factory authorized service representative to train Owner’s maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

PART 2 PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section, door hardware sets indicated in door and frame schedule, and the Door Hardware Schedule at the end of Part 3.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products. Retain subparagraph below for electrified door hardware.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
   2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.02 HINGES

A. Basis-of-Design: Stanley Commercial Hardware.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
   1. Butt Hinges:
      a. Bommer Industries, Inc.
      b. Hager Companies.
      c. IVES Hardware; an Ingersoll-Rand company.
      d. McKinney Products Company; an ASSA ABLOY Group company.
      e. Stanley Commercial Hardware; Div. of The Stanley Works.
      f. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standards: Comply with the following:
   1. Hinges ANSI/BHMA Standard A156.1 Grade 1

D. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

E. Concealed bearings are made from engineered polymer material with PTFE and Aramid fiber; bearing is maintenance free, no oil, no grease.

F. Butt hinges equipped with easily seated, non-rising pin. Hole in bottom of pin enables quick pin removal for ease of installation.

G. Hinge Weight: Unless otherwise indicated, provide the following:
   1. Supports weights up to 600lbs.

H. Hinge Base Metal: Unless otherwise indicated, provide the following:
   1. Exterior Butt Hinges: Stainless Steel or Brass or Bronze
   2. Interior Butt Hinges: Steel or Brass or Bronze

I. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
   1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
      a. Outswinging exterior doors.
      b. Outswinging corridor doors with locks.

J. Fasteners: Comply with the following:
   1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
   2. Wood Screws: For wood doors and frames.
   3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
   4. Screws: Phillips flat-head screws; machine screws drilled and tapped holes for metal doors, wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.03 LOCKS AND LATCHES

A. Basis-of-Design: SARGENT Manufacturing Company; an ASSA ABLOY Group company.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
   1. Best Access Systems; Div. of Stanley Security Solutions, Inc.
   2. Corbin Russwin Architectural Hardware; n ASSA ABLOY Group Company.
   3. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
   4. Schlage Commercial Lock Division; an Ingersoll-Rand company.
   5. Yale Security Inc.; an ASSA ABLOY Group company.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standards: Comply with the following:
   1. Bored Locks and Latches: BHMA A156.2.

D. Bored Locks: ANSI A156.2, BHMA Series 4000, Grade 1, and is UL Listed.

E. Certified Products: Provide door hardware listed in the following BHMA directories:
   1. Mechanical Locks and Latches: BHMA's "Directory of Certified Locks & Latches."

F. Lock Trim: Comply with the following:
   1. Lever: Cylindrical Locks & Latches, Zinc material with a minimum wall thickness of .060
   2. Dummy Trim: Match lever lock trim and escutcheons.

G. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
   1. Bored Locks: BHMA A156.2.

H. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
   1. Bored Locks: Minimum 9/16-inch latch bolt throw.
   2. Deadbolts: Minimum 1-inch bolt throw.

I. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

J. Cylindrical Locks & Latches to have solid shank with no opening for access to keyed lever keeper.

2.04 CYLINDERS AND KEYING

A. Basis-of-Design: SARGENT Manufacturing Company; an ASSA ABLOY Group company.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
   1. Best Access Systems; Div. of Stanley Security Solutions, Inc.
   2. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
   3. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
   4. Schlage Commercial Lock Division; an Ingersoll-Rand company.
   5. Yale Security Inc.; an ASSA ABLOY Group company.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standards: Comply with the following:
   1. Cylinders: BHMA A156.5.

D. Cylinder Grade: BHMA Grade 1, Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
   1. Number of Pins: Seven.
   2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
   3. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
   4. Bored-Lock Type: Cylinders with tailpieces to suit locks.

E. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
   1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's locksets.

F. **Construction Keying: Comply with the following:**
   1. **Construction Cores: Provide Brass construction cores in all locksets and cylinders that are replaceable by permanent cores.**
      a. Replace Brass construction cores with permanent cores, as indicated in keying schedule

G. Keying System: Unless otherwise indicated, provide a factory-registered keying system complying with the following requirements:
   1. Master Key System: Cylinders are operated by a change key and a master key.

H.

Keys: Provide nickel-silver keys complying with the following:
   1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
      a. Notation: "DO NOT DUPLICATE."
   2. Quantity: In addition to one extra blank key for each lock, provide the following:
      a. Cylinder Change Keys: Three.
      b. Master Keys: Five.

2.05 STRIKES

A. Standards: Comply with the following:
   1. Strikes for Bored Locks and Latches: BHMA A156.2.
   2. Strikes for Auxiliary Deadlocks: BHMA A156.5.

B. Strikes: Provide manufacturer's standard strike **with strike box** for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
   1. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by manufacturer.

2.06 SURFACE CLOSERS

A. Basis-of-Design: SARGENT Manufacturing Company; an ASSA ABLOY Group company.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. DORMA Architectural Hardware; Member of The DORMA Group North America.
   2. Dor-O-Matic; an Ingersoll-Rand company.
   3. LCN Closers; an Ingersoll-Rand company.
   4. Norton Door Controls; an ASSA ABLOY Group company.
   5. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
   6. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
   7. Yale Security Inc.; an ASSA ABLOY Group company.
   8. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standards: Comply with the following:
   1. Closers: BHMA A156.4.

D. Surface Closers: BHMA Grade 1

E. Certified Products: Provide door closers listed in BHMA's "Directory of Certified Door Closers."

F. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.07 PROTECTIVE TRIM UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Metal Protective Trim Units:
      a. Burns Manufacturing Company, Inc.
      b. Triangle Brass Manufacturing Company, Inc.

B. Standard: Comply with BHMA A156.6.

C. Materials: Fabricate protection plates from the following:
   1. Stainless Steel: 0.050 inch (1.3 mm) thick; beveled 4 sides.

D. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine or self-tapping screws.

E. Furnish protection plates sized 2” less than door width on push side and 1” less than door width on pull side, by height specified in Door Hardware Schedule.

2.08 STOPS AND HOLDERS

A. Basis-of-Design: IVES Hardware; an Ingersoll-Rand company.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
   1. Burns Manufacturing Incorporated.
   2. Hager Companies.
   3. IVES Hardware; an Ingersoll-Rand company.

4. Rockwood Manufacturing Company.
5. Stanley Commercial Hardware; Div. of The Stanley Works.
6. Trimco.
7. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standards: Comply with the following:
1. Stops and Bumpers: BHMA A156.16.
2. Mechanical Door Holders: BHMA A156.16.
3. Combination Overhead Holders and Stops: BHMA A156.8.
4. Door Silencers: BHMA A156.16.

D. Stops and Bumpers: BHMA Grade 1

E. Mechanical Door Holders: BHMA Grade 1

F. Combination Overhead Stops and Holders: BHMA Grade 1

G. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

2.09 DOOR GASKETING

A. Basis-of-Design: Reese Enterprises, Inc.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
1. Hager Companies.
2. National Guard Products.
3. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
4. Reese Enterprises, Inc.
5. Zero International.
6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standard: Comply with BHMA A156.22.

D. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

E. Air Leakage: Not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.

F. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784.
1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.

G. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL 10B or NFPA 252.

H. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.

I. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

J. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.

2.10

THRESHOLDS

A. Basis-of-Design: Reese Enterprises, Inc.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
1. Hager Companies.
2. National Guard Products.
3. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
4. Reese Enterprises, Inc.
5. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
6. Zero International.
7. Substitutions: See Section 01 60 00 - Product Requirements.

C. Standard: Comply with BHMA A156.21.

2.11 METAL PROTECTIVE TRIM UNITS

A. Basis-of-Design: Rockwood Manufacturing Company.

B. Manufacturers: Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
1. IVES Hardware; an Ingersoll-Rand company.
2. Pawling Corporation.
3. Rockwood Manufacturing Company.
4. Trimco.
5. Substitutions: See Section 01 60 00 - Product Requirements.

C. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- (1.3-mm-) thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

2.12 FABRICATION

A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.
1. Manufacturer's identification will be permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Steel Machine or Wood Screws: For the following fire-rated applications:
   a. Mortise hinges to doors.
   b. Strike plates to frames.
   c. Closers to doors and frames.
3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:
   a. Surface hinges to doors.
   b. Closers to doors and frames.
   c. Surface-mounted exit devices.
4. Spacers or Sex Bolts: For through bolting of hollow metal doors.
5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.13

FINISHES

A. Standard: Comply with BHMA A156.18.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
1. BHMA 600: Primed for painting, over steel base metal.
2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
3. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
4. BHMA 630: Satin stainless steel, over stainless steel base metal.
5. BHMA 652: Satin chromium plated over nickel, over steel base metal.
6. BHMA 689: Aluminum painted, over any base metal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 series.
   1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.

B. Wood Doors: Comply with DHI A115-W series.

3.03 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
   1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
   2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
   3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
   1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
   2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Key Control System: Place keys on markers and hooks in key control system cabinet, as determined by final keying schedule. Supply key cabinet with 25% expansion. Factory install keys in cabinet or in field with owner’s representative. Key cabinet to be supplied with a “Complete System” equal to the Telkee System.

D. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings, in equipment room. Verify location with Architect.
   1. Configuration: Provide one power supply for each door opening.
   2. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.04 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner or Architect will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
   1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.05 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
   2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
   3. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
   1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
   2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
   3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.06 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.07 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.08 DOOR HARDWARE SCHEDULE

A. Hardware Set 01 – Single Door. HM Door and HM Frame. Exterior.
Doors: 001A, 001B
Operation: Passage from inside at all times.
Passage from outside by key or when unlocked by key.

Qty	Description	Finish	Mfg
1	CONTINUOUS HINGE 780-224HD x UL x FULL HT	628	HAGAR
1	ENTRANCE LOCKSET 28-WBS-63-64-10G05 x LL	626	SARGENT
1	DOOR CLOSER 281 P10 EN COVER	626	SARGENT
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
1	RAIN DRIP R201C x FULL WIDTH + 4"	628	REESE
1	THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
1	DOOR SWEEP 323A x FULL WIDTH	628	REESE

B. Hardware Set 02 – Single Door. HM Door and HM Frame. Interior.
Doors: 002, 003, 007, 008
Operation: Passage from inside at all times.
Passage from outside by key or when unlocked by key.
Push button inside locks outside trim.

Qty	Description	Finish	Mfg
3	BUTT HINGE CB168 4-1/2" X 4-1/2"	628	STANLEY
1	ENTRANCE LOCKSET 28-WBS-63-64-10G37 x LL	626	SARGENT
1	WALL STOP WS406/407CCV	626	IVES
1	SWEEP 959 x FULL WIDTH	628	REESE
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE

C. Hardware Set 03 – Single Door. HM Door and HM Frame. Interior.

Door: 004
Operation: Passage from inside at all times.
Passage from outside unless outside lever is locked by push buttn inside..
Emergency release of push button with screwdriver from outside.

Qty	Description	Finish	Mfg
3	BUTT HINGE CB168 4-1/2" X 4-1/2"	628	STANLEY
1	PRIVACY LOCKSET 28-WBS-63-64-10U65 x LL SARGENT	626	
1	WALL STOP WS406/407CCV	626	IVES
1	SWEEP 959 x FULL WIDTH	628	REESE
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE

D. Hardware Set 04 – Single Door. HM Door and HM Frame. Interior.

Doors: 005
Operation: Passage from inside at all times.
Passage from outside by key or when unlocked by key.
Key retracts latch and locks/unlocks outside lever.

Qty	Description	Finish	Mfg
3	BUTT HINGE CB168 4-1/2" X 4-1/2"	628	STANLEY
1	CLASSROOM LOCKSET 28-WBS-63-64-10U65 x LL SARGENT	626	
1	OVERHEAD STOP 590	626	SARGENT
1	SWEEP 959 x FULL WIDTH	628	REESE
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE

E. Hardware Set 05 – Double Door, RHR Active. HM Door and HM Frame. Interior.

Doors: 006
Operation: Passage from inside at all times.
Passage from outside by key or when unlocked by key.
Key retracts latch and locks/unlocks outside lever.

Qty	Description	Finish	Mfg
6	BUTT HINGE CB168 4-1/2" X 4-1/2"	628	STANLEY
1	CLASSROOM LOCKSET 28-WBS-63-64-10U65 x LL SARGENT	626	
2	TOP/BOTTOM SURFACE BOLTS SB453x12"	62	IVES
2	OVERHEAD STOP 590	626	SARGENT
2	SWEEP 959 x FULL WIDTH	626	REESE
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE

END OF SECTION 08 70 00

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile.
   2. High Performance Floor Coatings.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.

E. Preparation of new wood-based floors for installation of new floor coverings.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete, curing, sealing, and admixture specifications.

B. Section 09 65 00 - Resilient Flooring: Floor covering specifications.

C. Section 09 96 00 - High-Performance Coatings: Floor coating specifications.

1.03 PRICE AND PAYMENT PROCEDURES

A. Concrete testing and remediation shall be included by the contractor in the base bid.

1.04 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements and Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Certificate: Manufacturer's certification of compatibility with types of flooring applied over remedial product.
   2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
   3. Manufacturer's installation instructions.
   4. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

D. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Product data for recommended remedial coating.
   7. Submit report to Architect.
   8. Submit report not more than two business days after conclusion of testing.

1.07 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

C. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.

5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

C. Keep materials from freezing.

1.09 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Use product recommended by testing agency and flooring system manufacturer.
   3. Products: Subject to compliance with flooring manufacturer's requirements, the following products may be provided.
      a. Allied Construction Technologies, Inc; AC Tech 2170: www.actechperforms.com/#sle.
      b. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
      c. Crown Polymers, a division of American Polymers Corporation; CrownShield 8303 MVB: www.crownpolymers.com/#sle.

d. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.
e. H.B. Fuller Construction Products, Inc; TEC LiquiDam with TEC Level Set 200 SLU: www.tecspecialty.com/#sle.
f. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: www.laticrete.com/#sle.
g. Maxxon Corporation; Aquafin SG2: www.maxxon.com/#sle.
h. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: www.sikafloorusa.com/#sle.
i. Tnemec Company, Inc; Series 208 Epoxoprime MVT: www.tnemec.com/#sle.
j. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
1. Preliminary cleaning.
2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
5. Specified remediation, if required.
6. Patching, smoothing, and leveling, as required.
7. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
8. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
9. Other preparation specified.
10. Adhesive bond and compatibility test.
11. Protection.

B. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.04 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.05 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.

B. Metal channel ceiling framing.

C. Acoustic insulation.

D. Gypsum wallboard.

E. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

F. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

G. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).

H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.

I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.

K. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.

L. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

M. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

N. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

O. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.

P. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

Q. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

R. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

1.04 SUBMITTALS

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

B. Product Data:
   1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com/#sle.

B. Manufacturer Qualifications: Company specializing in performing work of the type specified and with at least twenty years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 Delivery, Storage, and Handling

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

C. Store metal products to prevent corrosion.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216 and as indicated on the drawings.

2.02 METAL FRAMING MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
   1. Structural Grade: As required to meet design criteria.

B. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. MarinoWARE: www.marinoware.com/#sle.
   3. SCAFCO Corporation: www.scafco.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Structural Steel Framing for Application of Gypsum Board: See Section 05 40 00.

D. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/360 at 5 psf (240 Pa).
   1. Studs: C-shaped with flat faces.

E. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/360 at 5 psf.
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.

F. Non-structural Framing Accessories:
   1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
   2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
      a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
   3. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
   4. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
   5. USG Corporation: www.usg.com/#sle.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces, unless otherwise indicated.
   2. Thickness:
      a. Vertical Surfaces: 1/2 inch.

C. Impact Resistant Wallboard:
   1. Application: Partion facing open boat storage area.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.
   4. Thickness: 5/8 inch.
   5. Edges: Tapered.

D. Backing Board For Wet Areas:
   1. Application: Surfaces behind tile in wet areas including restrooms.
   2. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
      a. Regular Type: Thickness 1/2 inch.

2.04 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness 3 inches.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.

D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Joint Compound: Setting type, field-mixed.

E. Finishing Compound: Surface coat and primer, takes the place of skim coating.

F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

H. Nails for Attachment to Wood Members: ASTM C514.

I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C1007AISI S220 and manufacturer's instructions.

B. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure in all locations.
   2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

D. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall-mounted cabinets.
   3. Plumbing fixtures.
   4. Toilet partitions.
   5. Toilet accessories.
   6. Wall-mounted door hardware.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.
   2. Seal between base of gypsum board and floor.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use fiberglass joint tape, embed with drying type joint compound and finish with drying type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.08 Protection

A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

1.02 RELATED REQUIREMENTS

A. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

B. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

A. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.

B. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2021).

C. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.

D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2019.

E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2021.

F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 1999 (Reaffirmed 2019).

G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2019).

H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2019).

I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).

J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.

K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2019).

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).

M. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017 (Reaffirmed 2022).

B. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.

C. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2019.

D. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.

E. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).

F. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.

G. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).

H. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.

I. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2023.

1.04 SUBMITTALS

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

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Tile: 10 square feet of each size, color, and surface finish combination.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 MOCK-UPs

A. See Section 01 40 00 - Quality Requirements for general requirements for mock-up.

B. Construct tile mock-up where indicated on drawings, incorporating all components specified for the location.
   1. Prepare 12" x 12" mock-up for selection of grout color. Provide mock-up for up to four colors.
   2. Approved mock-up may remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. All products by the same manufacturer.

B. Basis-of-Design: Dal-Tile Corporation.

C. Manufacturers: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided..
   1. American Olean Corporation; _____: www.americanolean.com/#sle.
   2. Dal-Tile Corporation; _____: www.daltile.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

D. Ceramic Mosaic Tile: ANSI A137.1 standard grade.
   1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
   2. Size: 2 by 2 inch, nominal, mounted in manufacturer's standardsize sheet.
   3. Shape: Square.
   4. Edges: Square.
   5. Surface Finish: Unglazed.
   6. Color(s): As indicated on drawings.
   7. Pattern: Three-color mix.

8. Basis-of-Design Product:
   a. Dal-Tile Corporation; Keystones: www.daltile.com/#sle.

E. Glazed Wall Tile: ANSI A137.1 standard grade.
1. Moisture Absorption: 7.0 to 20.0 percent as tested in accordance with ASTM C373.
2. Size: 4-1/4 by 4-1/4 inch, nominal.
3. Edges: Cushioned.
4. Surface Finish: High gloss.
5. Color(s): As indicated on drawings.
6. Pattern: Field tile with 6" decorative boarder of 2" x 2" tile in three additional colors..
7. Basis-of-Design Product:
   a. Dal-Tile Corporation; Color Wheel Classics: www.daltile.com/#sle.

2.02 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Bostik Inc: www.bostik-us.com/#sle.
3. Custom Building Products: www.custombuildingproducts.com/#sle.
4. H.B. Fuller Construction Products, Inc: www.tecspecialty.com/#sle.
5. LATICRETE International, Inc: www.laticrete.com/#sle.
6. Sika Corp: www.sika.com/#sle.
7. Substitutions: See Section 01 60 00 - Product Requirements.

C. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4 or better.
1. Applications: Use this type of bond coat at interior floors and walls.
2. Basis-of-Design Product:
   a. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.

D. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
1. Applications: Use this type of bond coat at thick-set floor applications.
2. Basis-of-Design Product:
   a. Custom Building Products; MegaLite Ultimate Crack Prevention Large Format Tile Mortar: www.custombuildingproducts.com/#sle..

2.03 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Bostik Inc: www.bostik-us.com/#sle.
3. Custom Building Products: www.custombuildingproducts.com/#sle.
4. H.B. Fuller Construction Products, Inc: www.tecspecialty.com/#sle.
5. LATICRETE International, Inc: www.laticrete.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

C. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Basis-of-Design Product:
a. Custom Building Products; Prism Color Consistent Grout: www.custombuildingproducts.com/#sle.

2.04 Maintenance Materials

A. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.

2.05 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
1. Crack Resistance: No failure at 1/8 inch gap, minimum.
2. Fluid or Trowel Applied Type:
a. Thickness: 20 mils, maximum.
b. Basis-of-Design Product:
1) H.B. Fuller Construction Products, Inc; TEC HydraFlex Waterproofing Crack Isolation Membrane: www.tecspecialty.com/#sle.

B. Backer Board: Coated glass mat type complying with ASTM C1178/C1178M; inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
1. Standard Type: Thickness 1/2 inch.

C. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
1. Test in accordance with Section 09 05 61.
2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Sound tile after setting. Replace hollow sounding units.

G. Keep control and expansion joints free of mortar, grout, and adhesive.

H. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

I. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

J. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - MORTAR BED METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F112, bonded, unless otherwise indicated.

B. Mortar Bed Thickness: 2-inch maximum, slope to drain.

3.05 INSTALLATION - WALL TILE

A. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation, or in accordance with manufacturer recommendations.

END OF SECTION

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

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

B. Product Data: Provide data on suspension system components and acoustical units.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.05 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

C. Acoustical Ceiling System Installer Qualifications: Company specializing in installation of the products specified in this section with minimum five years documented experience.

1.06 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design: Armstrong World Industries, Inc,: www.armstrongceilings.com/#sle.

B. Acoustic Tiles/Panels: Subject to requirements for drawings and specifications, products from the following manufacturers may be provided.
1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
3. USG Corporation: www.usg.com/ceilings/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Suspension Systems:
1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.

B. Acoustical Panels, Type 1: Painted mineral fiber, with the following characteristics:
1. Size: 24 by 24 inches.
2. Thickness: 5/8 inch.
3. Light Reflectance: 0.82 percent, determined in accordance with ASTM E1264.
4. NRC: 0.55, determined in accordance with ASTM E1264.
5. Ceiling Attenuation Class (CAC): 33, determined in accordance with ASTM E1264.
6. Panel Edge: Square.
7. Color: White.
8. Basis-of-Design Product:
a. Armstrong World Industries, Inc; Fine Fissured, 1728: www.armstrongceilings.com/#sle.

2.03 Suspension Systems

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold-down clips, stabilizer bars, clips, and splices as required.
1. Materials:
a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.

B. Exposed Suspension System, Type 1: Hot-dipped galvanized steel grid with steel cap.
1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
2. Profile: Tee; 15/16 inch face width.
3. Finish: Baked enamel.

4. Color: White.
5. Basis-of-Design Product:
   a. Armstrong World Industries, Inc; Prelude XL: www.armstrongceilings.com/#sle.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 Preparation

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions, as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
1. Make field cut edges of same profile as factory edges.

F. Lay acoustical insulation over full area of acoustical ceiling system.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.06 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean surfaces.

C. Replace damaged or abraded components.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2019a, with Editorial Revision (2020).

B. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2018).

C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.

D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

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

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.

E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Flooring Material: 20 square feet of each type and color.
3. Extra Wall Base: 20 linear feet of each type and color.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum ten years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years five experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Do not double stack pallets.

1.07 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile - Type 1: Homogeneous, with color extending throughout thickness.
1. Basis-of-Design: Armstrong, Standard Excelon.
2. Manufacturers: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
a. Armstrong Flooring: www.armstrongflooring.com/#sle.
b. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
c. Tarkett USA, Inc.: www.tarkett.com/#lsle..
d. Substitutions: See Section 01 60 00 - Product Requirements.
3. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
4. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
5. Size: 12 by 12 inch.
6. Thickness: 0.125 inch.
7. Color: To be selected by Architect from manufacturer's full range.

2.02 RESILIENT BASE

A. Resilient Base - Type 1: ASTM F1861, Type TS, rubber, vulcanized thermoset; style as scheduled.
   1. Basis-of-Design: Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
   2. Manufacturers: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
      a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
      b. Mannington Commercial: www.manningtoncommercial.com#sle.
      c. Roppe Corporation: www.roppe.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   3. Height: 4 inches.
   4. Thickness: 0.125 inch.
   5. Finish: Satin.
   6. Length: Roll.
   7. Color: To be selected by Architect from manufacturer's full range.
   8. Accessories: Premolded external corners and internal corners.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

C. Adhesive for Vinyl Flooring: As recommended by flooring manufacturer.

D. Moldings, Transition and Edge Strips: PVC.
   1. Basis-of-Design: Johnsonite, SSR-XX-B.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.

C. Prohibit traffic until filler is fully cured.

D. Clean substrate.

3.03 Installation - General

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:
1. Spread only enough adhesive to permit installation of materials before initial set.
2. Fit joints and butt seams tightly.
3. Set flooring in place, press with heavy roller to attain full adhesion.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
1. Resilient Strips: Attach to substrate using adhesive.

F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 Installation - Tile Flooring

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

3.05 Installation - Resilient Base

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.07 **FINISHING**

A. Finish with three coats of wax.
1. Wax material as recommended by flooring manufacturer.

3.08 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

D. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Exterior:
         1) Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
      b. Interior:
         1) Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
         2) Wood: Walls, ceilings, doors, and trim.
         3) Drywall: Walls, ceilings, gypsum board, and similar items.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

1.03 REFERENCE STANDARDS

A. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

B. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

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

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.
   6. Clean-up information.

C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

D. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements for additional provisions.
2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
3. Label each container with color in addition to manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in production of products specified in this section with 20 years experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum 10 years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.

B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated; www.sherwin-williams.com/#sle.

B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 60 00 - Product Requirements, and the following:

1. Products that meet or exceed performance and physical characteristics of basis of design products.
2. Subject to compliance with drawings and specifications, products from the following manufacturers may be provided:
    a. Behr Process Corporation: www.behr.com/#sle.
    b. Benjamin Moore & Co: www.benjaminmoore.com/#sle.
    c. PPG Paints: www.ppgpaints.com/#sle.
    d. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.
3. Primer and Sealers: Same manufacturer as top coats.

2.02 PAINTINGS AND COATINGS

A. General:
1. Provide factory-mixed coatings unless otherwise indicated.
2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 Paint Systems - Exterior

A. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal, hollow metal doors and frames.
1. Latex Systems:
    a. Gloss Finish:
        1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            a) 5 to 10 mils wet, 1.8 to 3.6 mils dry per coat.
        2) 2nd and 3rd Coats: Sherwin-Williams Pro Industrial Sher-Cryl HPA, B66-1200 Series: www.sherwin-williams.com/#sle.
            a) 2 to 4 mils dry per coat.

2.04 Paint Systems - INTERIOR

A. Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, ferrous metal, hollow metal doors and frames.
1. Latex Systems:
    a. Gloss Finish High Performance:
        1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            a) 5 mils wet, 2 mils dry per coat.
        2) 2nd and 3rd Coats: Sherwin-Williams Pro Industrial Sher-Cryl HPA, B66-1200 Series: www.sherwin-williams.com/#sle.
            a) 2 to 4 mils dry per coat.

B. Wood:
1. Latex Systems:

a. Eg-Shel/Satin Finish:
1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.
a) 4 mils wet, 1.2 mils dry per coat.

C. Drywall: Walls, ceilings, gypsum board, and similar items.
1. Latex Systems:
a. Eg-Shel Finish High Performance (HP):
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Eg-Shel, B20-1950 Series: www.sherwin-williams.com/#sle.
a) 4 mils wet, 1.7 mils dry per coat.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Gypsum Board: Remove dust, grit, and foreign matter. Fill minor defects with filler compound; sand smooth and remove dust prior to painting.

D. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

E. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until coated.

F. Wood: Remove dust, grit, and foreign matter. Scrape, sand, and spot prime knots and pitch streaks. Fill nail holes and imperfections with wood filler and sand smooth.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 Priming

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

3.05 Cleaning

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 96 00
HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. High performance coatings.

B. Surface preparation.

1.02 REFERENCE STANDARDS

A. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

C. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.03 SUBMITTALS

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

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified coating system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.

C. Samples: Submit two samples 8 by 8 inch in size illustrating colors available for selection.

D. Maintenance Data: Include cleaning procedures and repair and patching techniques.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Coating Materials: 1 gallon of each type and color.
   2. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Coating Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.

B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.

C. Restrict traffic from area where coating is being applied or is curing.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for bond to substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide high performance coating products from the same manufacturer to the greatest extent possible.

B. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated; www.sherwin-williams.com/#sle.

C. High-Performance Coatings:
1. Dow: www.dow.com/#sle.
2. PPG Paints: www.ppgpaints.com/#sle.
3. Sika Corporation: www.sikafloorusa.com/#sle.
4. Sherwin-Williams Company: www.protective.sherwin-williams.com/industries/#sle.
5. Substitutions: Section 01 60 00 - Product Requirements.

2.02 TOP COAT MATERIALS

A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.

B. Epoxy Floor Coating for _____:

1. Number of Coats: One.
2. Top Coat(s): Polyamide Epoxy Deck Coating, Slip Resistant, Two-Component.
   a. Basis-of-Design: Sheerwin-Williams; armorseal 8100: www.protective.sherwin-williams.com/#sle.
   b. Sheen: Satin.
   c. Color: Haze Gray.
3. Primer: As recommended by coating manufacturer for specific substrate.

2.03 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Do not begin application of coatings until substrates have been properly prepared.

C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Cementitious Substrates: Do not begin application until substrate has cured 28 days minimum and measured moisture content is not greater than 12 percent.

F. Proceed with coating application only after unacceptable conditions have been corrected.
   1. Commencing coating application constitutes Contractor's acceptance of substrates and conditions.

3.02 PREPARATION

A. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

B. Clean surfaces of loose foreign matter.

C. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.

D. Remove finish hardware, fixture covers, and accessories and store.

E. Concrete:

1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
2. Clean surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi at 6 to 12 inches. Allow to dry.
3. Clean concrete according to ASTM D4258. Allow to dry.
4. Prepare surface as recommended by coating manufacturer and according to SSPC-SP 13.

3.03 PRIMING

A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Concrete: Prior to priming, patch with masonry filler to produce smooth surface.

3.04 COATING APPLICATION

A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in MPI - Architectural Painting and Specification Manual.

B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for general requirements for field inspection.

B. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
1. Touch up and restore coated surfaces damaged by testing.
2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, and specified thickness, Contractor shall pay for retesting and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations, and specified thickness.

3.06 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

D. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

3.07 PROTECTION

A. Protect finished work from damage.

END OF SECTION

SECTION 10 14 23
PANEL SIGNAGE

PART 1 GENERAL

1.01 Section Includes

A. Panel signage.

1.02 Reference Standards

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 Submittals

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

B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.

C. Shop Drawings:
   1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
   2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
      a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
      b. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
      c. Submit for approval by Owner through Architect prior to fabrication.

D. Selection Samples: Where colors, materials, and finishes are not specified, submit two sets of color selection charts or chips.

E. Verification Samples: Submit samples showing colors, materials, and finishes specified.

F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

G. Manufacturer's qualification statement.

1.04 Quality Assurance

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.

1.05 Delivery, Storage, and Handling

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store under cover and elevated above grade.

D. Store tape adhesive at normal room temperature.

1.06 Field Conditions

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 Manufacturers

A. Basis-of-Design: Intelligent Signage, Inc.: www.intelligentsignage.net/#sle.

B. Panel Signage: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
1. Best Sign Systems, Inc: www.bestsigns.com/#sle.
2. Inpro Corporation: www.inprocorp.com/#sle.
3. Intelligent Signage, Inc.: www.intelligentsignage.net/#sle.
4. Vista System LLC; ____: www.vistasystem.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 Regulatory Requirements

A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.03 Panel Signage

A. Panel Signage:
1. Application: Room and door signs. Provide a sign for every doorway, whether it has a door or not, not including corridors,lobbies, similar open areas and exits.
2. Description: Flat signs with engraved panel media, tactile characters.
3. Sign Size: 4 inches by 6 inches.
4. Total Thickness: 1/8 inch.
5. Sign Edges: Squared.
6. Letter Edges: Squared.
7. Corners: Radiused.
8. Color and Font, unless otherwise indicated:
a. Character Font: Helvetica, Arial, or other sans serif font.

b. Character Case: Upper and lower case (title case).
c. Background Color: As scheduled.
d. Character Color: Contrasting color.

9. Material: Acrylic plastic base with applied plastic letters and braille.
10. Tactile Letters: Raised 1/32 inch minimum.
11. Braille: Grade II, ADA-compliant.
12. One-Sided Wall Mounting: Tape adhesive.

2.04 SIGNAGE APPLICATIONS

A. Room and Door Signs:
1. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section for replaceable occupant name. Include braille text of room number.
2. Service Rooms: Identify with room names and numbers indicated on drawings. Include braille text of room number and name.
3. Unisex Rest Rooms: Identify with pictograms and the word "RESTROOM." Pictograms to included woman, man, and accessiblity symbol. Include braille text indicating "UNISEX RESTROOM."

2.05 Accessories

A. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 Examination

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 Installation

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

B. Urinal screens.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

B. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

C. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

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

B. Product Data: Provide data on panel construction, hardware, and accessories.

C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

D. Samples: Submit two samples of partition panels, 2 by 2 inch in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design: Scranton Products; Hiny Hiders: www.scrantonproducts.com/#sle.

B. Solid Plastic Toilet Compartments:
   1. ASI Accurate Partitions: www.asi-accuratepartitions.com/#sle.
   2. ASI Global Partitions: www.asi-globalpartitions.com/#sle.
   3. Inpro: www.inprocorp.com/#sle.
   4. Metpar Corp: www.metpar.com/#sle.
   5. Scranton Products: www.scrantonproducts.com/#sle.
   6. Substitutions: Section 01 60 00 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor-mounted unbraced.
   1. Color: As selected from manufacturer's full range.
   2. Screens without Doors:
      a. Thickness: 1 inch.
      b. Height: 55 inch.
      c. Depth: 24 inch.
      d. Mount to wall with continuous brackets at each side. Mount to floor with shoe.

2.03 ACCESSORIES

A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.

B. Wall and Pilaster Brackets: Stainless steel; continuous type.

C. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach shoes to floors using anchor devices.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

END OF SECTION

SECTION 10 28 00
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Under-lavatory pipe supply covers.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking in walls.

B. Section 10 21 13.19 - Plastic Toilet Compartments.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

D. ASTM C1036 - Standard Specification for Flat Glass; 2021.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

F. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2021.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023c.

H. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

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

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design: Bobrick, Contura Series: www.bobrick.com/#sle.

B. Commercial Toilet, Shower, and Bath Accessories: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
1. AJW Architectural Products: www.ajw.com/#sle.
2. American Specialties, Inc: www.americanspecialties.com/#sle.
3. Bobrick Washroom Equipment, Inc.: www.bobrick.com/#sle.
4. Bradley Corporation: www.bradleycorp.com/#sle.

C. Under-Lavatory Pipe Supply Covers:
1. Plumberex Specialty Products, Inc; Trap Gear: www.plumberex.com/#sle.
2. IPS Corporation; Lav Guard 2: www.spsplumbingproducts.com
3. A/E approved equivalent..
4. Substitutions: Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

D. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.

E. Adhesive: Two component epoxy type, waterproof.

F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 Commercial Toilet Accessories

A. Toilet Paper Dispenser: Double roll, semi-recessed, stainless steel unit with pivot hinge.

1. Basis-of-Design Product: Bobrick, B-4388

B. Paper Towel Dispenser: Folded paper type, stainless steel, surface-mounted, with viewing slots on sides as refill indicator and tumbler lock.
   1. Capacity: 400 C-fold towels minimum.
   2. Basis-of-Design Product: Bobrick, B-4262.

C. Waste Receptacle: Stainless steel, freestanding style.
   1. Removable, cold rolled steel top with power coated finish with 6" diameter opening.
   2. Liner: Removable, heavy-duty vinyl liner, attached at a minimum of four points with stainless steel grommets and hooks.
   3. Minimum capacity: 18 gallons.
   4. Basis-of-Design Product: Bobrick B-2300.

D. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, with ABS cover and transluscent ABS tank; push type soap valve.
   1. Basis-of-Design: Bobrick B-40

E. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass; ASTM C1048.
   1. Size: 18 x 24 inch.
   2. Frame: 1/2 inch channel shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
   3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
   4. Basis-of-Design Product: Bobrick B-1659

F. Grab Bars: Stainless steel, smooth surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/2 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
      c. Finish: Satin.
      d. Length and Configuration:
         1) 36" horizontal.
         2) 42" horizontal.
         3) 18" vertical.
      e. Basis-of-Design Product: Bobrick, B-6806.

G. Coat Hook: Machined stainless steel, single-prong, circular shaped hook with bumper and backplate for concealed attachment, satin finish.
   1. Basis-of-Design Product: Bobrick, B9541

2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
   1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
   2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
   3. Construction: 1/8 inch flexible PVC.

a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
b. Comply with ASTM C1822, type indicated.
c. Comply with ICC A117.1.
d. Microbial and Fungal Resistance: Comply with ASTM G21.

4. Color: White.
5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.
6. Basis-of-Design Product: Plumberex, Trap Gear.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

D. See Section 06 10 00 for installation of blocking, reinforcing plates, and concealed anchors in walls.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; Current Edition.

B. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

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

B. Product Data: Provide extinguisher operational features.

C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
   1. Activar Construction Products Group, Inc. - JL Industries; Cosmic Extinguisher - Multipurpose Chemical: www.activarcpg.com/#sle.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.

3. Larsen's Manufacturing Co.: www.larsensmfg.com/#sle.
4. Nystrom, Inc: www.nystrom.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:
1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
3. Larsen's Manufacturing Co: www.larsensmfg.com/#sle.
4. Nystrom, Inc: www.nystrom.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
1. Basis-of-Design: Activar, JL Industries, Cosmic 10E.
2. Class: A:B:C type.
3. Size: 10 pound, nominal capacity.
4. Finish: Baked polyester powder coat, red color.
5. Temperature range: Minus 40 degrees F to ___ degrees F.

2.03 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.
1. Manufacturers standard bracker for fire extinguisher model provided.
2. Provide bracket for each fire extinguisher in the project.

B. Wall Sign:
1. Basis-of-Design: Brady, High Visibility Signs, V1FE15A; www.bradyid.com.
2. Double-sided, V-shaped sign, wall mounted.
3. Provide sign for each fire extinguisher in the project.

C. Floor Marking Kits:
1. Floor Marking Tape for Extinguisher Access Identification: Self-adhesive vinyl or polyester tape with overlaminate, 2 inches wide, with "DO NOT BLOCK" on the 36 inch (914 mm) side strips and "FIRE EXTINGUISHER" and fire extinguisher icon on the 24 inch (610 mm) middle strip.
2. Floor Sign: 17-1/2 inch diameter vinyl sign with "FIRE EXTINGUISHER", directional arrow, and fire extinguisher icon.
3. Basis-of-Design: Insite Solutions, LLC; Fire Extinguisher Floor Marking Kit: www.stop-painting.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure rigidly in place.

C. Place extinguishers in cabinets and on wall brackets.

3.03 **SIGN INSTALLATION**

A. Mount wall sign above each fire extinguisher at ± 7'-6" A.F.F.

B. Apply floor marking kit below each fire extinguisher. Prepare floor and apply kin in accordance with manufacturers instructions.

END OF SECTION

SECTION 11 91 00
HOISTS

PART 1 GENERAL

1.01 Section Includes

A. Manual Hoists and Trolleys.

1.02 Administrative Requirements

A. Coordination: Coordinate trolley configuration with hoist beam provided by pre-engineered metal building manufacturer.

1.03 Submittals

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

B. Product Data: Manufactures product literature for hoist and trolley.

C. Shop Drawings: Indicate dimensions and mounting details.

D. Certificate: Certify that products of this section meet or exceed specified requirements.

E. Operation and Maintenance Data.

F. Executed warranty.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 01 60 00 - Product Requirements for additional provisions.
   2. Tools: One each of special tools required for maintenance of hoist and trolley.

1.04 Quality Assurance

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.05 Delivery, Storage, and Handling

A. Deliver hoist and trolley to project site in in manufacturer's original, unopened packaging..

B. Store products under cover and elevated above grade.

1.06 Warranty

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for hoist and trolley. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

A. Basis-of-Design: Harrington, A Kito Group Company.

B. A/E approved equivalent.

C. Substitutions: See Section 01 60 00 - Product Requirements.

D. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.02 **HOIST**

A. Basis-of Design: Harrington, CF010.
1. Capacity: 1 ton.
2. Operation: Manual.
3. Chain Material: Corrosion resistant, nickel-plated.
4. Chain Length: 15 feet.
5. Accessories:
   a. Chain Container.

2.03 TROLLEY

A. Basis-of-Design: Harrington, PTF2010, Push Trolley.
1. Capacity: 1 ton.
2. Operation: Push-type.
3. Configuration: Coordinate wheel configuration and spacing with final hoist beam design.

2.04 Accessories

A. Furnish all materials and accessories required for complete, functioning installation.

PART 3 EXECUTION

3.01 Examination

A. Verification of Conditions: Verify that field conditions and hoist beam are satisfactory for installation of equipment.

3.02 Preparation

A. Clean hoist beam as required for installation of trolley.

3.03 Installation

A. Install in accordance with manufacturer's written instructions.

3.04 Adjusting

A. Adjust and lubricate hoist and trolley for smooth operation.

3.05 Cleaning

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean hoist and trolley.

3.06 Closeout Activities

A. Demonstrate proper operation of equipment to Owner's designated representative.

B. Training: Train Owner's personnel on operation and maintenance of system.
   1. Training Reference: Operation and maintenance manual and additional training materials as required.
   2. Provide minimum of two hours of training.

3.07 Protection

A. Protect installed hoist and trolley from subsequent construction operations.

END OF SECTION

SECTION 12 24 00
WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 REFERENCE STANDARDS

A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.

B. Sequencing:
   1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
   2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

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

B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

D. Selection Samples: Include fabric samples in full range of available colors and patterns.

E. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

F. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

G. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

H. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this type with minimum five years of documented experience with shading systems of similar size and type.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
1. Shade Hardware: 25 years.
2. Fabric: 25 years.
3. Aluminum and Steel Coatings: One year.
4. Shade Installation: 2 years

PART 2 PRODUCTS

2.01 Manufacturers

A. Basis-of-Design: MechoShade Systems LLC; Mecho/5 System: www.mechoshade.com/#sle.

B. Available Manufacturers: Subject to requirements of the drawings and specifications, products from the following manufacturers may be provided.
1. Draper, Inc: www.draperinc.com/#sle.
2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
3. MechoShade Systems LLC: www.mechoshade.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.02 Roller Shades

A. General:
1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Roller Shades:
1. Description - Interior Roller Shades: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
a. Drop Position: Regular roll.
b. Mounting: Surface mounted at window head, between jambs..
c. Size: As indicated on drawings.
2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
3. Roller Tubes: As required for type of shade operation.
4. Hembars: Designed to maintain bottom of shade straight and flat.
a. Style: Exposed aluminum bottom bar, flat profile with closed ends; clear anodized finish.
5. Manual Operation for Interior Shades:
a. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
b. Drive Chain: Continuous loop beaded ball chain, 95 pounds minimum breaking strength. Provide upper and lower limit stops.

2.03 Shade FABRIC

A. Fabric: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
1. Manufacturers:
a. MechoShade Systems LLC; ThermoVeil Basket Weave - 1500 Series (3% open): www.mechoshade.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Material: Vinyl coated polyester.
3. Performance Requirements:
a. Flammability: Pass NFPA 701 large and small tests.
b. Fungal Resistance: No growth when tested according to ASTM G21.
4. Openness Factor: 3%.
5. Roll Width: 72 inches.
6. Color: Beige.

2.04 Roller Shade FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
   1. Vertical Dimensions: Fill openings from head to sill with 1/4 inch space between bottom bar and window stool.
   2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. Start of installation shall be considered acceptance of substrates.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.

C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.03 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.04 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

3.05 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufacturer-engineered, shop-fabricated structural steel building frame.

B. Metal wall and roof panels including soffits, gutters and downspouts, and roof mounted equipment curbs.

C. Thermal Insulation.

D. Door canopies for personnel doors.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 72 00 - Roof Accessories: For snow rails and colored inserts for snow rails.

B. Section 07 92 00 - Joint Sealants: Sealing joints between accessory components and wall system.

C. Section 08 11 13 - Hollow Metal Doors and Frames.

D. Section 08 33 23 - Overhead Coiling Doors.

E. Section 08 52 00 - Wood Windows.

1.03 REFERENCE STANDARDS

A. American Institute of Steel Construction (AISC):
   1. AISC 360 - Specification for Structural Steel Buildings.
   2. AISC 341 – Seismic Provisions for Structural Steel Buildings (when appropriate).
   3. AISC Design Guide 3 – Serviceability for Steel Buildings

B. American Iron and Steel Institute (AISI):
   1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.

C. American Welding Society (AWS):
   1. AWS D1.1 / D1.1M – Structural Welding Code – Steel.
   2. AWS D1.3 / D1.3M – Structural Welding Code – Sheet Steel.

D. Association for Iron & Steel Technology (AISE):
   1. AISE 13 – Specifications for Design and Construction of Mill Buildings.

E. ASTM International (ASTM):

1. ASTM A 325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
2. ASTM A 653 / A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A 792 / A 792M – Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
4. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
5. ASTM C 518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
6. ASTM C 1363 – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
7. ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
8. ASTM D 523 – Standard Test Method for Specular Gloss.
9. ASTM D 968 – Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
10. ASTM D 1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
11. ASTM D 2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
12. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
13. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
14. ASTM D 3361 – Standard Practice for Unfiltered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
15. ASTM D 4214 – Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
16. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
17. ASTM E 96 / E 96M – Standard Test Methods for Water Vapor Transmission of Materials.
18. ASTM E 1592 – Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
19. ASTM G 87 – Standard Practice for Conducting Moist SO2 Tests.

F. FM Global:
1. FMRC Standard 4471 – Approval Standard for Class 1 Roofs for Hail Damage Resistance, Combustibility, and Wind Uplift Resistance.

G. Metal Building Manufacturers Association (MBMA):
1. MBMA Metal Building Systems Manual.
2. Seismic Design Guide for Metal Building Systems.

H. North American Insulation Manufacturers Association (NAIMA):
1. NAIMA 202 – Standard For Flexible Fiber Glass Insulation to be Laminated for Use in Metal Buildings.

I. The Society for Protective Coatings (SSPC):

1. SSPC-Paint 15 - Primer for Use Over Hand Cleaned Steel performs to SSPC-Paint 15 standards.
2. SSPC-SP2 – Hand Tool Cleaning.

J. Underwriters Laboratories (UL):
1. UL 580 – Standard for Tests for Uplift Resistance of Roof Assemblies.
2. UL 723 – Standard for Test for Surface Burning Characteristics of Building Materials.

K. US Army Corps of Engineers (COE):
1. COE Unified Facilities Guide Specification Section 07 61 13.

1.04 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene at the project site, two weeks before starting work of this section.
1. Review methods and procedures related to metal building systems including, but not limited to, the following:
a. Condition of foundations and other preparatory work performed by other trades.
b. Structural load limitations.
c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
d. Required tests, inspections, and certifications.
e. Unfavorable weather and forecasted weather conditions.
2. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:
a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
b. Structural limitations of purlins and rafters during and after roofing.
c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
d. Temporary protection requirements for metal roof panel assembly during and after installation.
e. Roof observation and repair after metal roof panel installation.
3. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:
a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
b. Structural limitations of girts and columns during and after wall panel installation.
c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
d. Temporary protection requirements for metal wall panel assembly during and after installation.
e. Wall observation and repair after metal wall panel installation.

1.06 SUBMITTALS

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

B. Product Data: Provide data on profiles, component dimensions, fasteners.

C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections; wall and roof system dimensions, panel layout, general construction details, anchors and methods of anchorage, and installation; framing anchor bolt settings, sizes, locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.

D. Structural calculations identifying applicable codes and standards, loading, reaction loads at base plates.

E. Samples: Submit two samples of precoated metal panels for each color selected, 6 x 6 inch in size illustrating color and texture of finish.

F. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.

G. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.

H. Designer's Qualification Statement.

I. Manufacturer's Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.
   1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.

J. Metal Building System Certificates: For each type of metal building system, from manufacturer.
   1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
      a. Name and location of Project.
      b. Order number.
      c. Name of manufacturer.
      d. Name of Contractor.
      e. Building dimensions including width, length, height, and roof slope.
      f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
      g. Governing building code and year of edition.
      h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
      i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
      j. Building-Use Category: Indicate category of building use and its effect on load importance factors.

K. Certification that roof system meets or exceeds IECC-2024 thermal resistance requirements.

L. Certification that wall system meets or exceeds IECC-2024 thermal resistance requirements.

M. Material Test Reports: For each of the following products:
1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

N. Erector's Qualification Statement.

O. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

P. Project Record Documents: Record actual locations of concealed components and utilities.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this type of work.
1. Design Engineer Qualifications: Licensed in the State in which the Project is located.
2. Comply with applicable code for submission of design calculations as required for acquiring permits.
3. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide data as requested.

B. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
1. Member of MBNA.
2. Not less than ten years of documented experience.

C. Erector Qualifications: Company specializing in performing the work of this section with minimum ten years experience.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect foam-plastic insulation as follows:

1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
3. Complete installation and concealment of foam-plastic materials as rapidly as possible in each area of construction.

E. Store batt insulation in original packaging, in dry location, protected from wind and weather.

1.09 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements:
1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal panels without field measurements, or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.10 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Section 03 30 00 - Cast-in-Place Concrete.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations, which are specified in Section 07 72 00 - Roof Accessories."

C. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Metal building system manufacturer shall provide a written weathertightness warranty for a maximum of 25 years against leaks in standing seam roof panels, arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions.
1. Warranty shall be signed by both the metal roof system manufacturer and the metal roof system installer.
2. Maximum liability of warranty shall be no less than $0.70 per square foot of roof area.

B. Metal building system manufacturer shall provide a written warranty for 25 years against perforation of metal roof panels due to corrosion under normal weather and atmospheric conditions.

1. Warranty shall be signed by metal roof system manufacturer.

C. Metal building system manufacturer shall provide a paint film written warranty for 25 years against cracking, peeling, chalking, and fading of exterior coating on painted roof and wall panels.
   1. Warranty shall be signed by metal building system or roof system manufacturer and state that the coating contains 70 percent “Kynar 500” or “Hylar 5000” resin.
   2. Metal building system manufacturer shall warrant that the coating shall not peel, crack, or chip for 25 years.
   3. For a period of 25 years, chalking shall not exceed ASTM D 4214, #8 rating and shall not fade more than 5 color difference units in accordance with ASTM D 2244.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design: Butler Manufacturing Company:www.butlermfg.com/#sle.

B. Metal Buildings Systems: Subject to requirements of drawings and specifications, products from the following manufacturers may be provided.
   1. Butler Manufacturing Company: www.butlermfg.com/#sle.
   2. Ceco Building Systems: www.cecobuildings.com/#sle.
   3. Nucor Building Systems: www.nucorbuildingsystems.com/#sle.
   4. VP Buildings: www.vp.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ASSEMBLIES

A. Description: Provide a complete, integrated set of metal building system manufacturer's standard, mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
   1. Provide metal building system of size and with bay spacings, roof slopes, and spans indicated on drawings.

B. Primary-Frame Type
   1. Rigid Clear-Span: Solid-member, structural-framing system without interior columns.
   2. Lean to: Solid-member, structural-framing system without interior columns, designed to be partially supported by included rigid clear-span structure.

C. Primary Framing: Rigid frame of rafter beams and columns, canopy beams and end wall columns, and wind bracing.

D. Secondary Framing: Purlins, and other items detailed.

E. Wall System: Preformed, tapered-rib, exposed-fastener, metal panels of vertical profile, with sub-girt framing/anchorage assembly, insulation, and liner sheets, and accessory components.

F. Roof System: Preformed, trapezoidal-rib,metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, insulation, and liner panels, and accessory components.

2.03 PERFORMANCE REQUIREMENTS

A. A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Installed Assembly U-factor of Wall System: U-052, maximim.

C. Installed Assembly U-factor of Roof System: U-0.035, maximum.

D. Design structural members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with applicable code (2018 International Building Code)

E. Design structural members to withstand positive and negative wind loads in accordance with applicable code (2018 International Building Code).

F. Design structural members to withstand superimposed loads of personnel doors, coiling doors, wall and roof mounted equipment, wall mounted canopies, hoist beams, and and other wall and roof mounted elements that may be indicated in the construction documents.

G. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of L/360 of span.

H. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.

I. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 180 degrees F.

J. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.

2.04 MATERIALS - FRAMING

A. Structural Steel Members: ASTM A36/A36M.

B. Structural Tubing: ASTM A500/A500M Grade B cold-formed.

C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.

D. Anchor Bolts: ASTM F1554, Grade 36, Class 1A, with hot dip type for protective coating.

E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.

F. Welding Materials: Perform in accordance with AWS D1.1/D1.1M.

G. Primer: SSPC-Paint 20 zinc rich.

H. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

2.05 MATERIALS - WALLS AND ROOF

A. Metal Roof Panels: Trapezoidal-Rib, Standing-Seam Metal Roof Panels: Formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.
   1. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.
   2. Exterior Finish: PVFD finish with 70 percent Kynar 5000.
   3. Panel Coverage: 24 inch.
   4. Panel Height: 3 inch.
   5. Color: Cool Harvest. Submit samples set for color confirmation by Owner.
   6. Clips: Thermalift clip system and insulation package to meet or exceed U-0.032.

B. Metal Wall Panels: Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
   1. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.
   2. Exterior Finish: PVFD finish with 70 percent Kynar 5000.
   3. Panel Coverage: 36 inch.
   4. Major Rib Spaceing: 12 inch.
   5. Panel Height: 1.5 inch.
   6. Panel: Butlerib II wall panel.
   7. Color: Cool Desert Beige. Submit samples set for color confirmation by Owner.
   8. Thermal Block: eShadowall Thermal Spacer Block and insulation package to meet or exceed U-0.050.

C. Metal Liner Panels: Flush-Profile, solid panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels; designed for interior side of metal wall panel assemblies and installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.
   1. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.
   2. Exterior Finish: PVFD finish with 70 percent Kynar 5000.
   3. Panel Coverage: 36 inch.
   4. Major Rib Spaceing: 12 inch.
   5. Panel Height: 1.5 inch.
   6. Panel: Butlerib II wall panel.
   7. Color: Cool Desert Beige. Submit samples set for color confirmation by Owner.

D. Insulation: Mineral-Fiber-Blanket Insulation: ASTM C 665, type indicated below; consisting of fibers manufactured from glass, slag wool, or rock wool.
   1. Nonreflective Faced: Type II (blankets with nonreflective membrane covering), Category 1 (membrane is a vapor retarder), Class A (membrane-faced surface with a flame-spread index of 25 or less).

2. Reflective Faced: Type III (blankets with reflective membrane covering), Category 1 (membrane is a vapor retarder), Class A (membrane-faced surface with a flame-spread index of 25 or less).
3. Unfaced: Type I (blankets without membrane covering), passing ASTM E 136 for combustion characteristics.
4. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm (1.15 ng/Pa x s x sq. m) when tested according to ASTM E 96/E 96M, Desiccant Method.
   a. Composition: White metallized-polypropylene film facing, fiberglass scrim reinforcement, and kraft-paper backing.
5. Retainer Strips: 0.025-inch (0.64-mm) nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.
6. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
7. Thermal Blocks: Manufacturer's standard thermal blocks.

2.06 COMPONENTS

A. Doors and Frames: See Section 08 11 13.

B. Overhead Coiling Doors: See Section 08 33 23.

2.07 **ACCESSORIES**

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
   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.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
   2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
   3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
   4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
   5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
   6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch (25-mm) standoff; fabricated from extruded polystyrene.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
   2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
   3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

D. Flashing and Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
   1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
   2. Opening Trim: Formed from 0.034-inch (0.86-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.
   3. Color: Cool Desert Beige. Submit samples set for color confirmation by Owner.

E. Gutters and Gable Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
   1. Gutter Supports: Fabricated from same material and finish as gutters.
   2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
   3. Color: Cool Harvest. Submit samples set for color confirmation by Owner.

F. Downspouts: Formed from 0.022-inch (0.56-mm) nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.
   1. Mounting Straps: Fabricated from same material and finish as gutters.
   2. Color: Cool Desert Beige. Submit samples set for color confirmation by Owner.

G. Snow Guards: See section 07 72 00 - Roof Acccessories.
   1. Pre-Engineered metal building manufacturer shall supply coil stock colored inserts to be installed in snow guard systems as specified in section 07 72 00.

H. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

I. Materials:
   1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.

a. Fasteners for Metal Roof Panels: Self-drilling, Type 410 stainless-steel or self-tapping, Type 304 stainless-steel or zinc-alloy-steel hex washer head, with EPDM washer under heads of fasteners bearing on weather side of metal panels.
b. Fasteners for Metal Wall Panels: Self-drilling, Type 410 stainless-steel or self-tapping, Type 304 stainless-steel or zinc-alloy-steel hex washer head, with EPDM sealing washers bearing on weather side of metal panels.
c. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
d. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

J. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

K. Metal Panel Sealants:
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
2. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.08 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.
1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing.
5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
   1. Make shop connections by welding or by using non-high-strength bolts.
   2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
   1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
   1. Engage land surveyor to perform surveying.

C. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

D. Proceed with erection only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.03 ERECTION - FRAMING

A. Erect framing in accordance with AISC 360.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.

C. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

D. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

E. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

F. Base and Bearing 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. 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.
   3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

G. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. 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 will be completed and in service.

H. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.
      a. Joint Type: Snug tightened or pretensioned.

I. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors and windows.
   3. Locate canopy framing as indicated.
   4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

J. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, 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. Bolt joists to supporting steel framework using carbon-steel bolts unless otherwise indicated.
5. Bolt joists to supporting steel framework using high-strength structural bolts unless otherwise indicated. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
6. 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.

K. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

L. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

M. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

N. After erection, prime welds, abrasions, and surfaces not shop primed.

3.04 METAL PANEL INSTALLATION GENERAL

A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

C. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated

items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
   1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
   2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.05 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
   1. Install ridge caps as metal roof panel work proceeds.
   2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
   1. Install Thermalift clip system to supports with self-drilling or self-tapping fasteners.
   2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
   3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
   4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
   5. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
   6. Provide metal closures at peaks, rake edges, rake walls and each side of ridge caps.

C. Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with exposed fasteners at each lapped joint, at location and spacing recommended by manufacturer.
   1. Provide metal-backed sealing washers under heads of exposed fasteners bearing on weather side of metal roof panels.
   2. Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.
   3. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps and on side laps of nesting-type metal panels, on side laps of ribbed or fluted metal panels, and elsewhere as needed to make metal panels weatherproof to driving rains.
   4. At metal panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

D. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

E. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.06 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
   2. Shim or otherwise plumb substrates receiving metal wall panels.
   3. When two rows of metal panels are required, lap panels 4 inches (102 mm) minimum.
   4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
   5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
   6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
   7. Install screw fasteners in predrilled holes.
   8. Install flashing and trim as metal wall panel work proceeds.
   9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
   10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
   11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), nonaccumulative, on level, plumb, and on location lines as indicated, and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.07 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels with supplemental support framing system for full width of exterior ceiling areas. Install panels in orientation indicated on drawings.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.08 THERMAL INSULATION INSTALLATION

A. Comply with IECC 2018 requirements for thermal resistance.

B. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
   1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
   2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
   3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
   4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

C. Blanket Roof Insulation: Comply with the following installation method:
   1. Over-Purlin with ThemaLift Clip: Extend first layer of insulation and vapor retarder over and perpendicular to fop flange of purlins, overlapping adjoining facing on next insulation course and maintaining continuity of vapor retarder. Hold in place with ThermaLift Clip system. Extend second layer of insulation over top of first layer, in between ThermaLift Clips.

D. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by thermal blocks fastened to secondary framing.
   1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.09 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
   1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
   2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.
   1. Provide elbows at base of downspouts to direct water away from building.
   2. Tie downspouts to underground drainage system indicated.

E. Louvers: Locate and place louver units level, plumb, and at indicated alignment with adjacent work.
   1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
   2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
   3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of corrosion-resistant paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
   4. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

F. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

G. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.10 TOLERANCES

A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.

B. Siding and Roofing: 1/8 inch from true position.

3.11 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Special inspections required under the building code.

B. Tests and Inspections:

C. High-Strength, Field-Bolted Connections: Connections shall be[tested and] inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector'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 will not be accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

E. Product will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

3.12 CLEANING AND 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 erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing[, bearing plates,] and accessories.
1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 14 46 00
MATERIAL LIFTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vertical reciprocating conveyors (VRC) lifts.

1.02 REFERENCE STANDARDS

A. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.

B. A. ANSI – American National Standards Institute (ANSI B20.1).

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2019, with Errata (2021).

E. ASME B20.1 - Safety Standard for Conveyors and Related Equipment; 2021.

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

H. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2021, with Editorial Revision.

I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

J. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates; 2015 (Reapproved 2021).

K. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.

L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

M. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

N. ITS (DIR) - Directory of Listed Products; Current Edition.

O. NEMA MG 00001 - Motors and Generators; 2024.

P. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of material lift system with adjacent construction using necessary attachments; provide anchoring devices in accordance with manufacturer's installation instructions; coordinate installation of cast-in-place components.
   1. Electrical System: Coordinate utility and electrical system connections to ensure they are made in an orderly and expeditious manner.

B. Preinstallation Meeting: Conduct preinstallation meeting one week before start of this work on project site; require attendance by affected installers.

1.04 SUBMITTALS

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

B. Product Data: Provide data on material descriptions, construction details, component dimensions and profiles, and finishes; include data on rated capacities, electrical and operating characteristics, and necessary accessories.

C. Shop Drawings: Provide plans, elevations, sections, and attachment details; include equipment assembly details with dimensions, weights, loads, required clearances, components, size and location of anchors, required field connections, and methods for field assembly; provide diagrams indicating signal, power, and control wiring.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

F. Maintenance contracts.

G. Executed warranty.

H. Project Record Documents: Accurately record actual locations of concealed items, conduits, and components.

I. Maintenance Materials: Provide the following for Owner's use in maintenance of material lifts and equipment.
   1. See Section 01 60 00 - Product Requirements for additional provisions.
   2. Provide technical information for servicing operating equipment.
   3. Spare Parts: Provide parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   4. Provide legible schematic wiring diagrams of installed electrical equipment and changes made to this part of work; list symbols corresponding to identity or markings on material lift structural and electrical components.
   5. Provide copy of lubrication chart covered with plastic or glass and framed; mount on wall at location as indicated by Architect.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design of material lifts under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty to repair or replace material lift system components as necessary, commencing on Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Provide 2-year installer warranty to repair or replace material lift system components that fail due to improper installation commencing on Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.

D. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide factory-fabricated structures capable of withstanding the following loads and stresses without damage or failure.
   1. Loading: Comply with applicable requirements of ASCE 7.
   2. Platform and Framing Deflection: Limited to 1/360 of span length, without permanent deformation.
   3. Thermal Movement: Provide material lift assemblies to accommodate thermal movement caused by ambient temperature change of 120 degrees F and surface temperature change of 180 degrees F without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects on components.
   4. Fabricate frame and platform using structural or formed-steel shapes welded to supports; assembly to withstand deformation during operating and stored periods.

B. Provide material lift system as indicated with necessary capacity, size, operation, function, and construction; with safety devices, controls, and accessories complying with applicable standards of 29 CFR 1910, ASME A17.1, and ASME B20.1.

2.02 VERTICAL RECIPROCATING CONVEYORS (VRC) LIFTS

A. Basis-of-Design: Wildeck, Mechanical Straddle Lift.

B. Manufacturers:

1. Advance Lifts, Inc: www.advancelifts.com/#sle.
2. Autoquip Corporation: www.autoquip.com/xsle.
3. Cisco-Eagle: www.cisco-eagle.com/#sle.
4. TKF Conveyors: www.tkf.com/#sle.
5. Wildeck, Inc.: www.wildeck.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Vertical Reciprocating Conveyor (VRC) Lifts: Platform with mechanical powered drive unit with VRC and used to move materials between multiple floor levels; no riders allowed.
1. Configuration: Straddle design, carrier moves vertically between two metal guide columns.
2. Traffic Pattern: Z Pattern - In on one side and straight through to opposite side.
3. Lifting Capacity: 2,000 lb.
4. Platform Travel Distance: 10.5 feet, with 2 operating levels.
5. Lowered Platform Height: 0 inches. Platform recessed into floor slab.
6. Platform Overall Dimensions:
   a. Width: 48 inches, nominal.
   b. Length: 48 inches, nominal.
7. Speed: 28 fpm, nominal.
8. Horsepower: Sized for the rated live load and specified speed.
9. Carriage Height: 84 inches.
10. Guarding: Guarding on all sides of the VRC, which do not coincide with solid walls, shall be by safety enclosures a minimum of 8' high, consisting of material which will reject a ball 3/4" in diameter. Access for loading and unloading shall be by gates which are electrically and mechanically interlocked with carriage movement. The interlock shall positively prevent a gate from being opened unless the carriage is at the level and shall also prevent carriage movement if any gate is not fully closed and locked.
11. Riding: Riding the conveyor is not permitted. Signs shall be furnished with the unit so stating. These signs shall be posted at each point of access and each point of operation.
12. Finish: Finish on the lift, gates and enclosures shall be coated manufacturer's standard paint system.
   a. Color: Manufacturer's standard color.

2.03 OPERATION

A. Raising and lowering of the carriage shall be provided by lift chains and sprockets on a common shaft powered by a helical gear reducer assembly.

B. Upward and downward travel of the carriage will begin by depressing a control button, which activates the motor reducer in the proper direction and releases the brake. As the shaft and sprockets rotate, the lift chains travel up or down moving the carriage until it trips the limit switch at the desired floor level. At this point the motor shuts-off and the brake engages.

C. Uncontrolled descent will be prevented by dual carriage safety cams attached to the lift chains. In the event a chain breaks or goes slack, the safety cams will lock the carriage in place.

D. Electricall control push-buttons and emergency stop switches will be provided at each operating level. These controls, as well as all limit switches on the lift and gates operate on 110/24 volts to increase user safety. The step-down transformer, reversing motor started and field wiring terminal block is included in the main control panel. The control system will provide; NEC/UL

Motor Overload Protection, Adjustable Maximum Capacity Sensing, Inrush Bypass Timing, and Maintenance Control. The control system will include a graphic operator interface and will provide continuous system diagnostics with an event history.

1. The control panel must be manufactured to and labeled UL-508a.

E. Overload/jam protection will be of a force-limiting style so as to provide maximum safety to operators, maximum cargo protection, and minimize wear-and-tear of the equipment. Protection to be provided by a solid-state device that will detect the power level required to lift the empty, partial or fully loaded carriage, and limit the lifting mechanisms power output to that level. Sensors that only detect when full cargo capacity has been exceeded are not adequate or acceptable for this application.

F. Chain sensing switches monitor the tension of the chain and will shut down the unit in the event of a chain failure.

G. Fail-safe braking is provided by the spring set disc brake which releases only when the motor is powered-up. In the event of a power failure, the brake will automatically engage.

2.04 COMPONENTS

A. Geared Motor: Comply with NEMA MG 1; designed for continuous duty at ambient temperatures from 32 to 102 degrees F.

B. Electrical Characteristics:

C. Motor Control: Inverter control, and other components as required by manufacturer for system indicated.

D. Disconnect Switch: Factory mount disconnect switch in control panel.

E. Electrical Components, Boxes, Conduit, Wiring, and Devices: Comply with NFPA 70, and UL (DIR) or ITS (DIR) listed and labeled, and marked as applicable for proposed locations.

F. Lubrication: Provide grease fittings for lubricating bearings requiring periodic lubrication, automatic feed type grease cups, and visible and easily accessible lubrication points.

G. Guide Rails, Ropes, Counterweights, Sheaves, Attachment Brackets, and Anchors: Sized in accordance with local building code, and including safety factors.

H. Maintenance Devices: Provide as necessary within material lift system, supported on structural members within accessible locations.

I. Safety Barrier Gate: Provide for automatic return of gate from either raised or lowered position; position level with platform; acts as a deterrent to access of operating area.

J. Signal-Light System: Illuminated red and green signal-lights, with lens at least 4 inches in diameter, and used to indicate parking status; provide interior steel control panel that indicates status of exterior signal-lights at each designated location; provide steel or plastic housing with sunshade for exterior signal-lights.

K. Alarm: Provide audible and visual alarm system that indicates lift system is engaged, with manual reset.

2.05 MATERIALS

A. Rolled Steel Sections, Shapes, and Rods: Comply with ASTM A36/A36M.

B. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.

C. Rolled Steel Floor Plates: Comply with ASTM A572/A572M, 1/8 inch thick, with manufacturers standard surface pattern; rolled from steel plate complying with ASTM A786/A786M, Grade 55 (380).

D. Steel Tubing: Comply with ASTM A500/A500M, cold formed.

E. Anchor Bolts and Rods: Comply with ASTM F1554, Grade 55.

F. Welding: Comply with applicable requirements of AWS D1.1/D1.1M and AWS D1.3/D1.3M.

2.06 FINISHES

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site dimensions of project construction adjacent to material lift location, including platform heights comply with project requirements; verify on-site measurements before fabrication.

B. Verify that locations for electrical rough-in connections to system equipment are in acceptable locations before installing equipment.

C. Verify that electrical power is available and of correct characteristics.

D. Verify that walls and floors of pits for recessed maintenance lift areas are plumb and square, and properly sloped for drainage.

E. Do not proceed with installation until unacceptable conditions have been corrected.

3.02 PREPARATION

A. Locate edge of recessed material lifts with tops flush with access substrate, and align exposed connecting edges to form hairline joints.

B. Clean recessed pits and other locations of debris.

3.03 INSTALLATION

A. Install material lift system and components in accordance with manufacturer's written installation instructions.

B. Install material lift system securely to supporting structure, square to recessed pit, and flush with adjacent surfaces.

C. Install structural components using methods that comply with requirements indicated relative to layout and structural position.

3.04 ADJUSTING

A. Adjust material lift equipment to operate smoothly and safely.

B. Verify vertical travel of material lift system, and adjust as necessary to maintain operating range indicated.

C. After installation, inspect exposed factory finished material lift equipment, and repair damaged finishes.

3.05 CLEANING

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components.

3.06 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of material lift system to Owner's personnel.
1. Use operation and maintenance data as references during demonstration.
2. Briefly describe function, operation, and maintenance of each component.

B. Training: Train Owner's personnel on operation and maintenance of system.
1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
2. Provide minimum of two hours of training.
3. Instructor: Manufacturer's training personnel.
4. Location: At project site.

3.07 MAINTENANCE

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Provide a separate maintenance contract for service and maintenance of material lift system and components for two years after Date of Substantial Completion.

C. Perform maintenance work using competent personnel, under supervision and in direct employment of material lift installer.

D. Examine monthly; clean, adjust, and lubricate equipment.

E. Repair or replace parts whenever required, with parts produced by manufacturer of original equipment.

F. Provide emergency call back service 24 hours per day during maintenance period.

END OF SECTION

SECTION 200000 - GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for work under Division 20.

B. Coordinate the work of this Section with the requirements of the Project.

1.2 DEFINITIONS

A. Following are definitions of terms and expressions used in the Mechanical Sections in addition to definitions found in the Contract Conditions:

1. "Piping" includes pipe, fittings, valves, hangers, and other accessories that comprise a system.
2. "Ductwork" includes ducts, fittings, housings, dampers, hangers, and other accessories, which comprise a system.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements

1. Work shall conform to the requirements of the codes, laws and ordinances of the local authority having jurisdiction. National Fire Protection Association, American Society of Mechanical Engineers and other authorities having jurisdiction.
2. Comply with applicable codes, laws, standard practices.
3. Comply with the standards of good practice as outlined in the ASHRAE Guide, the Sheet Metal and Air Conditioning Contractor's Association's "Duct Manual", and the Apprentice Training Manual of the Steam Fitters Union.
4. The requirements of the authorities having jurisdiction shall take precedence over the Drawings and Specifications and changes required by the authorities shall be made after review by the Architect.

1.4 SUBMITTALS

A. Shop drawings are required for the following:

1. Plumbing
   a. Drains
   b. Water Heaters
   c. Well Tank
   d. Plumbing Fixtures
2. Heating and Air Conditioning
   a. Air Devices
   b. Insulation
   c. Exhaust Fans
   d. Heating and Air Conditioning Equipment
   e. Mechanical/Electrical Coordination
   f. Temperature Controls

g. Testing, Adjustment and Balancing Reports and Qualifications

3. Field Instructor's Name and Credentials.

B. Review of shop drawings does not relieve the Contractor of responsibility for complying with the contract documents.

1.5 PROTECTION

A. Protect material and equipment from damage.

B. Post notices prohibiting the use of water closets.

C. Provide plastic protection inserts, specifically manufactured for the bathtubs and shower stalls.

D. Cap or plug openings in equipment, piping and ductwork with proper caps and plugs.

E. Building materials should be stored in a weather-tight, clean area prior to unpacking for installation.

F. Accumulation of water during construction should be avoided and any porous construction materials such as insulation should be protected from moisture.

1.6 VARIANCES

A. Where conflicts exist within the contract documents, request clarification prior to the submission of a bid. If clarification is not requested, provide the work representing the higher cost and quality.

1.7 WARRANTY

A. During the warranty period, make the proper adjustments of systems, equipment and devices installed and perform work necessary to ensure the efficient and proper operation of the systems, equipment and devices.

B. Certain items of equipment shall be warranted for a longer time than the general warranty period. Provide for service or replacement required in connection with the warranty of these items.

C. The warranty period shall not begin until the project has reached substantial completion. Any warranty limits from the manufacturer related to delivery of equipment or unit startup shall be between the contractor and the manufacturer only and shall not impact the warranty between the owner and the contractor.

PART 2 - PRODUCTS

2.1 PRODUCTS TO BE USED

A. Items are specified by designations such as trade name, manufacturer's name, catalog number and indicate the capacity and quality of the products or materials to be used on this project.

B. Only products indicated on Contract Documents by name and model number have been coordinated with other trades. Coordinate items of other manufacturer with other trades.

C. Product indicated on the Contract Documents by name and model number are the basis of design. Additional manufacturers named in the specifications are approved equals. Any substitution beyond the named equal manufacturers is required to follow the substitution process outlined in Division 1 of the specifications.

2.2 MATERIALS AND WORKMANSHIP

A. Items shown and not specifically called for, or items specified and not specifically indicated or detailed on the Drawings, or items neither specified nor shown, but which are reasonably incidental to and commonly required to make a complete job, shall be provided.

2.3 FOUNDATIONS AND EQUIPMENT SUPPORTS

A. Provide foundations, supports, curbs and bases for equipment, as indicated or necessary for satisfactory installation and operation of equipment. Furnish and set anchor bolts.

B. Concrete pads shall be 4 inches thick minimum, thicker if necessary to accommodate a particular piece of equipment. Edges shall be beveled with outer edge extending 3 inches beyond equipment. Provide concrete pads for floor-mounted equipment. Exterior pads shall be reinforced and shall have edges turned down to below the frost line. Exterior pads shall extend eight inches beyond edges of equipment and shall be sloped for drainage.

C. Floor mounted stands, supports, rods or legs, where required, shall be constructed of structural steel shapes (angles, channels) of Kindorf or Unistrut or steel pipe and fittings securely braced and fastened to flanges bolted to the floor. Minimum rod size shall be 3/8-inch diameter. Paint steel with rust inhibiting paint.

2.4 ROOF SUPPORTS AND CURBS

A. Provide wood blocking or adjust the height of the custom curb to raise the level of the bottom of the curb to be level with the top of the finished roof assembly.

B. Pipe curb assemblies, except for plumbing vent pipes shall be constructed of 18 gauge galvanized steel with base plate, raised cant, wood nailer strip and galvanized steel counter flashing. Top shall be provided with acrylic clad ABS plastic cover and graduated neoprene boots secured to cover and pipes by stainless steel band clamps. Pipe curbs shall be Pate Company PCA-5 or equivalent of Thy Curb.

C. Equipment supports shall be constructed of 18 gauge galvanized steel with base plate, raised cant, insulation, wood nailer strip and galvanized steel counter flashing. Equipment supports shall be Pate Company ES-5b or equivalent of Thy Curb.

2.5 HANGERS AND PIPE SUPPORTS

A. Provide pipe hangers and supports to maintain required slope and alignment for equipment and piping. Pipe hangers shall be as manufactured by Carpenter & Patterson, Fee & Mason, Modern Hanger or Grinnell.

B. Pipes may not be supported from other pipes. Trapeze hangers may be used for parallel runs of pipe with same slope.

C. Provide sway bracing at sufficient intervals to prevent lateral motion of horizontal or vertical piping and ductwork as required by the jurisdiction to meet the appropriate regional requirements.

D. For pipe and tubing, both horizontal and vertical, and regardless of the spacing of other supports, provide supports at or near changes in direction. Hangers shall be spaced at not over 6 feet apart for ½ inch pipe, not over 8 feet apart for 3/4 and 1-inch pipe and not over 10 feet for larger sizes.

E. For wood joist construction, hanger rods shall be supported from wood joists with hangers bolted through or attached with lag screws to the joists.

F. For steel bar joist construction, hanger rods shall be supported from the top chord of the joists or from panel points of the lower chord of the joists. Where piping runs parallel to joists or where hangers are required at other than joist locations, provide steel angles welded to joists to support hangers so that weight is supported from the top chord of the joists.

G. Hangers for pipe shall be similar to Carpenter & Paterson "Clevis" figure 100. Hangers for insulated lines with vapor barrier and carrying fluids with temperatures below 70 degrees shall be large enough to permit continuous insulation. Hangers on vapor barrier insulated piping shall be provided with rigid protector saddles with rigid core of insulation to thickness of adjacent insulation. Saddles shall be 16 gauge galvanized steel and shall cover one half of the circumference of the pipe covering. Saddle shall be secured to insulation with adhesive.

H. Pipes upon or within close distance of walls shall be carried by wall brackets, Carpenter & Paterson, Fig. 221, 139, or 227 as approved.

I. Support vertical lines at floor level with extension pipe clamps. Support lowest level of riser with pipe hanger as specified above on horizontal pipe as close to riser as possible.

J. Special supports required shall be provided to suit the conditions.

K. Expansion bolts or wood plugs will not be permitted in slag block walls. Equipment hung on such walls shall be supported by through bolts or approved anchor bolts set into masonry as the wall is laid up.

2.6 OPENINGS, CHASES, LINTELS AND SLEEVES

A. Determine the location and size of chases, lintels and openings necessary for the proper installation of the work and provide them during the erection of the work in which such chases and openings occur.

B. Provide sleeves through walls and floors for pipes. Sleeves through walls shall be of sufficient size to permit the insulation, where specified, to continue through the sleeve. Sleeves through walls shall be flush with the walls.

C. In case cutting of building construction is necessary, including cutting of structural members, such cutting shall be done and repaired to match original condition of the work.

D. Where non-combustible pipes pass through sleeves or around ductwork through openings in fire rated wall, floor-ceiling and ceiling-roof assemblies, seal openings with a Underwriters Laboratories classified firestop method. Firestop method shall be a one part, intumescent (expands with heat), latex elastomer capable of expanding a minimum of three times. Firestop materials shall be UL listed when tested in accordance with ASTM E814 for a two hour fire (F) and temperature (T) rating.

E. If combustible piping materials are used, a UL listed firestop method shall be provided where the combustible materials penetrate fire rated wall, floor-ceiling and ceiling-roof assemblies. Firestop method shall be classified by UL as a through-penetration firestop device when tested in accordance with ASTM E814 for a two hour fire (F) and temperature (T) rating. Plastic piping materials, including, but not limited to PVC, CPVC and ABS, are combustible. Firestop method shall be similar to Nelson Firestop Products.

F. Escutcheon plates shall be used to conceal sleeve opening on exposed uninsulated piping. Floor plates shall be split chrome plated cast brass similar to Ritter No. 36A.

2.7 VIBRATION ISOLATION

A. Provide vibration isolators manufactured by a firm specializing in this type of work for equipment and piping that is capable of transmitting noise and vibration to the building structures.

B. Isolators shall be designed to suit vibration frequency to be absorbed. Provide isolator units of area distribution to obtain proper resiliency under machinery load and impact. Where unequal distribution of weight occurs, design isolators for uniform deflection under imposed load.

C. Examine the contract drawings for sizes, horsepower, rotational speeds, equipment location, length of span between columns and beams and construction type to determine the isolator selection type and deflection required for each piece of mechanical equipment. Conform to the requirements of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Handbook, “HVAC Applications”, Chapter 48, “Sound and Vibration Control”

D. Isolators of the same type shall be the product of the same manufacturer, Mason, Vibration Eliminator or Korfund.

E. Mountings shall be of the types indicated below:

1. Type A: Double deflection neoprene mountings shall have a minimum static deflection of 0.50”. Metal surfaces shall be neoprene covered to avoid corrosion and have friction pads both top and bottom so they need not be bolted to the floor. Bolt holes shall be provided for those areas where bolting is required. On

equipment such as small vent sets and close coupled pumps, steel rails shall be used above the mountings to compensate for the overhang. Mountings shall be type ND or rails type DNR as manufactured by Mason Industries, Inc. Color code to indicate durometer.

2. Type D: Neoprene crossribbed or waffle pattern, 5/16 inches thick. Provide ¼ inch hot dipped galvanized steel bearing plates. Permanently identify durometer. Mason Industries, Inc. Type W.

F. Hangers shall be of the types indicated below:

1. Type E: Vibration hangers shall contain a steel spring and 0.3" deflection neoprene element in series. The neoprene element shall be molded with a rod isolation bushing that passes through the hanger box. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing thru a 30-degree arc before contacting the hole and short- circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include a scale drawing of the hanger showing the 30-degree capability. Hanger shall be type 30N as manufactured by Mason Industries, Inc.

G. Horizontal thrust restraints shall be of the types indicated below:

1. Type X: Air handling equipment shall be protected against excessive displacement, which might result from high air thrusts in relation to the equipment weight. The horizontal thrust restraint shall consist of a spring element in series with a neoprene pad as specified for the mountings or hangers. The spring element shall be contained within a steel frame and designed so it can be present for thrust at the factory and adjusted in the field to allow for maximum of ¼" movement at start and stop. The assembly shall be furnished with one rod and angle brackets for attachment to both the equipment and ductwork or the equipment and structure. Horizontal restraints shall be attached at the centerline of thrust and symmetrically on either side of the unit. Horizontal thrust restraints shall be WB as manufactured by Mason Industries, Inc.

H. Pipe anchors shall be of types indicated below:

1. Type N: Provide an all directional acoustical pipe anchor, consisting of a telescopic arrangement of two sizes of steel tubing separated by a minimum 1 inch thickness of heavy duty neoprene and duct or neoprene isolation materials. Vertical restraints shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material and shall not exceed 500 psi and the design shall be balanced for equal resistance in any direction. Deflection shall be a minimum of 1". All directional anchors shall be type ADA as manufactured by Mason Industries, Inc.

I. Pipe connectors shall be of types indicated below:

1. Type K: Flexible wire reinforced butyl or neoprene hose with integral elastomer and duct flanges and iron back-up rings, control cables with isolating bushings and washers and flange brackets to limit expansion. Length: 6 times diameter up to 36" maximum 150 psi working pressure at 250 degrees F, suction service working pressure 200 psi at 100 degrees F. Mason Industries, Inc. Type MTBF.
2. Type L: Flexible bellows type bronze hose with bronze braid, sweat connections. Length: 8 times diameter, 10" minimum. Suitable for freon refrigerant service.

Compressor discharge servicing working pressure 200 psi at 100 degrees F. Mason Industries, Inc. Type BSS.

J. The first three pipe hangers in the main lines near isolated mechanical equipment shall be supported with hangers as described in Type F. Horizontal runs in other locations in mechanical rooms and equipment rooms shall be isolated by hangers as described in Type E. Floor supported piping shall rest on isolators as describes in Type C. Heat exchangers shall be considered part of the piping run. Type F hangers or the first three type C mounts as noted above will have the same static deflection as specified for the mounting under the connected equipment. If piping is connected to equipment located in basements and hangs from ceiling under occupied spaces, the first three hangers shall have 1" deflection for pipe sizes up to and including 3", 2" deflection for pipe sizes up to and including 6", and 3" deflection thereafter. Other hangers are mounts shall have a minimum steel spring deflection of 1". Hangers shall be located as close to the overhead supports as practical.

K. Piping risers shall be suspended from or supported by Type F Hangers or Type C mountings and the piping anchored or guided with Type N anchors. Steel spring deflections shall be minimum of 1" except in those expansion locations where additional deflection is required to limit deflection or load changes to plus minus 25% of the initial stress.

L. Duct discharge runs for a distance of 50' from the connected equipment shall be isolated from the building structure by means of Type G hangers or Type C floor supports. Spring deflections shall be a minimum of 1".

M. Provide vibration isolation as required above and as indicted in the following schedule:

EQUIPMENT	LOCATION	ISOLATIION TYPE	DEFL. (IN)
Split System Heat Pump Units		A	0.5"
Inline Centrifugal Fans		E, X	1.0"
Wall Mounted Propeller Fans		D	0.25"

2.8 ACCESS PANELS

A. In general, valves, dampers, traps and equipment shall be accessible through the removable panels in the ceiling. Where ceilings are not removable and in walls where access is required for service, access panels shall be provided. Access panels shall be appropriate for the finish in which they are installed, with a fire rating to match the wall or ceiling in which they are installed. Access panels furnished under division 20 shall meet the requirements of specification section.

B. Group valves, dampers and equipment together to keep the required number of access panels to a minimum.

2.9 ELECTRICAL WORK

A. Motors and heating elements for equipment specified under the mechanical Sections of the Specifications shall be provided with the equipment.

B. Starters, disconnect switches, and work pertaining to equipment power connections are specified under Division 26 unless specified with the equipment of this Division of the Specifications. Electrical devices provided under this Division shall meet requirements for similar equipment specified under Division 26.

C. Interlock wiring, and the provision of pilot devices such as push buttons, thermostats, flow switches and similar items and their related wiring associated with the Automatic Control System, shall be provided in accordance with the applicable requirements of Division 26. For ease of servicing, permanently identify both ends of conductors with W. H. Brady Co. self-sticking Perma-Code wire markers. Mark control diagrams accordingly.

D. Coordinate control device voltages.

E. Unless specifically noted otherwise, motors ½ HP and over shall be wound for 240 volts, 1 phase, 60 hertz current, and those under ½ HP for 120 volts, single phase, 60 hertz current. Motors shall be equipped with grease packed ball bearings. Motors shall be rated for continuous duty at 100 percent of rated capacity with an ambient temperature of 40 degrees C.

F. Design motors in accordance with NEMA standards and affix to each a nameplate accurately listing pertinent data. Motors shall have sufficient capacity to start and operate the machine they drive without exceeding the motor nameplate rating at the speed specified or at speeds or loads, which may be obtained, by the drive actually furnished. The motor HP or KW ratings are those estimated to be required by the driven equipment when operating at specified duties and efficiencies and are used to determine electrical feeder sizes. If the actual horsepower or KW required for the equipment to be furnished is greater than the indicated horsepower or KW, it shall be provided. Changes required in starter, feeder, branch circuit or other electrical items shall be made. Provide a shop drawing showing the mechanical/electrical coordination between trades. The shop drawing shall list all mechanical equipment with power demand, associated branch circuit feeder designation, conduit and wire size, breaker size and fused safety switch.

G. Unless otherwise indicated, polyphase motors shall be Class B, general purpose, squirrel cage, single speed, open induction type, stamped with NEMA Class B letter designation.

H. Single phase motors except as noted shall be open, capacitor start type. Motors 1/6 horsepower and under shall be permanent split capacitor type with built-in reset thermal overload protection, unless specifically noted otherwise. Motors 1/12 horsepower and smaller that start with no load may be shaded pole with built-in reset thermal overload protection.

I. Two speed motors shall be two winding, variable torque type with 100 percent and 50 percent speeds.

J. Mechanical equipment with a factory wired control panel shall be wired in accordance with the National Electrical Code. Additionally, components within the panel shall bear the UL label.

K. Motors 5 horsepower and over shall be provided with power factor correction devices to provide a power factor of 0.90 at design load.

L. Equipment shall be UL listed as a system or be tested by an independent electrical testing agency acceptable to the Architect to comply with requirements of the Authority having jurisdiction.

M. Do not install equipment, ductwork or piping in the dedicated spaces above switchgear, panels and transformers as identified in the National Electrical Code.

2.10 FLASHING

A. Sanitary vent pipes passing through the roof shall be provided with conical neoprene boots for any pitch roof with base extending minimum of eight inches from vertical portion of boot. Provide clamp for securing boot to pipe.

B. Flashing assemblies specified above shall be set in place as part of the work under this Division of this Specification, but will be finally installed as specified in another Division of this Specification.

C. Base flashing of roof drains, ducts, fans and other equipment, if required, is specified in Division 7 of this Specification. Cap flashings shall be provided to make a water tight seal.

2.11 IDENTIFICATION

A. Equipment shall be identified with engraved plastic laminate or anodized aluminum nameplates with pressure sensitive backing. Plates shall also be provided with drilled holes and fastened to equipment with moly-rivets. Letters shall be at least 3/8 inch high and larger in proportion to the size of the piece of equipment. Identification shall be the same as noted on schedules on the Drawings. Labels shall be provided for the following equipment.

1. Air Handling Units
2. Exhaust Fan
3. Heaters

B. Labels shall identify the piping system. Labels shall be located where pipes enters and leaves a space and at 30 foot centers on normal runs. Duct systems shall be similarly identified by noting the system and direction of flow.

C. On valves, except immediately adjacent to equipment, provide 1 inch diameter brass tag with embossed and painted black numbers to identify the valve. Tag numbers shall be coordinated between trades. Tags shall be attached to valve wheels with a brass link. Tags shall be manufactured by Brady, Seton Nameplate, or Wilmington Plastics.

2.12 COMMISSIONING

A. Commissioning is a comprehensive and systematic process to verify that the building systems perform as designed to meet the Owner's requirements. Commissioning during the construction and warranty phases is intended to achieve the following objectives:

1. Verify and document that equipment is installed and started per the manufacturer's recommendations and the technical specification requirements.
2. Verify and document that equipment and systems receive complete operational checkout by installing Contractors.
3. Verify and document equipment and system performance.

B. The commissioning process does not relieve the Contractor's responsibility to provide fully finished and functioning systems.

C. The commissioning shall meet the requirements specified in the technical sections of this specification and as outlined in the project commissioning plan.

D. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:

1. Cooperate with the Owner and Commissioning Agent (CxA) in the scheduling of activities to be included in the commissioning plan.
2. Evaluate the performance deficiencies identified in test reports and, in collaboration with the entity responsible for system and equipment installation, recommend corrective action.
3. Cooperate with the Owner and CxA for resolution of issues recorded in the Commissioning Open Issues Log.
4. Attend commissioning team meetings as requested by the CxA.
5. Integrate and coordinate commissioning process activities with the construction schedule.
6. Review and use the Pre-Functional Checklists as specified in the commissioning plan. In consideration to any approved "Substitution Requests" in accordance with the General Conditions and Submittal Procedures, the Contractor shall be responsible for revising and completing the Pre-Functional Checklists and submit to the CxA for approval during the "Request for Substitution" process.
7. Complete the Pre-Functional Checklists as work is completed and provide to the CxA.
8. Review and use the commissioning process and comply with the Pre-Functional Tests and Functional Test procedures and requirements specified within the commissioning plan. In consideration to any approved "Substitution Requests" in accordance with the General Conditions and Submittal Procedures, the Contractor shall be responsible for revising and completing the Functional Performance Test procedures and requirements and submit to the CxA for approval during the "Request for Substitution" process.
9. Complete the commissioning process as indicated in the commissioning plan and Functional Performance test procedures and requirements.

E. In conjunction with the Pre-Functional Checklists, adjustments and test shall be made by Contractor as specified in the commissioning plan, and as required by governing codes, regulations, manufacturer's recommendations and good construction practices. Contractor shall adjust, calibrate, and test equipment and devices installed under these

Specifications. Except as otherwise specified, Contractor shall furnish labor, materials, tools, and instruments to perform work.

F. In accordance with the Contract Documents, the Contractor shall render all services and do all work required to install each item of equipment, including auxiliaries, and wiring in operating condition to the Owner/Architect/CxA satisfaction. Individual systems and items of equipment shall be completed in a sequence that will permit systematic checkout and trial operation of each such component before it is incorporated into the initial operation. Contractor shall provide supervision and other workers required to make adjustments and correct deficiencies during initial equipment checking.

G. Certain calibration and test procedures may involve personnel or work being furnished by other contractors. Contractor shall arrange working crews and schedule so that calibration will be performed in one operation.

H. Work shall be performed as necessary to meet the Contract Document requirements and the approved contraction schedule.

I. Personnel performing adjustments and test shall be qualified and experienced. Adjustments and test shall be performed as many times as is necessary to assure proper operation of equipment and systems and quality of materials and workmanship.

J. If tests reveal unsatisfactory materials or workmanship, such materials or installation shall be repaired or replaced by Contractor to satisfaction of the Architect/CxA and shall meet Contract Document requirements.

K. Equipment and instrumentation furnished by Contractor (including gauges, switches, thermometers, and other devices which are part of major equipment assemblies furnished by Contractor) shall be assembled, tested, adjusted and calibrated as required for correct and reliable operation.

L. Contractor shall confirm the inspection and test procedures, indentified in the Pre-Functional Checklists, for systems in which the equipment is installed and submit to the CxA for approval Inspection and Test procedures information shall include but not be limited to the following:

1. Identification of material or article to be inspected or tested.
2. List of test equipment.
3. Detailed sequential instructions and test objective.
4. Measurement characteristics and required measuring equipment.
5. Acceptance and rejection criteria.
6. Allowable adjustment, repair or rework.
7. Requirements for data recording and reporting.

M. Pre-Functional tests and inspections shall be performed for all equipment, materials, and systems installed by Contractor, as specified in the commissioning plan and in accordance with equipment manufacturer’s recommendations.

N. Pre-Functional tests shall be tests and checks required by the commissioning plan to verify correct assembly and installation of equipment and systems.

O. In conjunction with the Functional Test procedures and requirements, the Contractor shall provide labor, equipment, and services to place systems and equipment into service.

P. The CxA will furnish personnel to observe the Contractor's work during the commissioning functional performance testing (FPT). Contractor shall provide a minimum of five working days notice that the systems are ready for the commissioning testing to begin. Contractor shall provide workers required to make adjustments and correct deficiencies during equipment commissioning and initial operation. It is anticipated that commissioning will be in progress over extended periods of time. Workers required of Contractor shall be on site as required by the CxA. The FPT will be performed by the Contractor and will be witnessed by CEI. The CxA is under contract to observe the initial FPT and (1) additional FPT for each of the systems required by the CxA. If any of the initial FPT for major mechanical equipment requires corrective action, corrective action shall be made and the FPT shall be re-performed. Subsequent field verification efforts shall be invoiced on an hourly basis by the CxA and the cost of these efforts shall be the responsibility of the Contractor.

Q. Contractor shall furnish and apply oils, greases, refrigerants, fuels and other lubricants and materials required to place equipment in condition ready for operation. Contractor shall provide temporary gauging devices required during checkout and operation of equipment and systems. Contractor shall remedy any deficiencies and provide labor, material, etc. to complete the commissioning process in accordance with the Contract Documents, approved construction schedule and commissioning plan.

R. After systems have been commissioned to satisfaction of the Owner, Architect/Engineer, CxA, Contractor, and equipment manufacturers, the systems will be considered commissioned and ready for operation.

PART 3 - EXECUTION

3.1 MANNER OF INSTALLATION

A. Piping and ductwork shall be installed to preserve access to valves, dampers and equipment. Valves, dampers and equipment which require frequent service, adjustment or control and which cannot be located in a readily accessible and safe place, shall be provided with extension devices and remote operators, as necessary and as accepted for use by the Architect.

B. Piping and ductwork shall be run to follow the lines of the building and to allow the maximum headroom consistent with proper pitch. Piping subject to thermal expansion shall be arranged to permit movement without damage to the piping, ductwork and equipment.

C. The Drawings are generally indicative of the work to be installed, but they do not show all offsets, fittings and similar details required, which shall be provided to meet the job conditions. In areas where work is installed in close proximity to work of other trades or within trades covered by this Division of the Specifications, prepare larger scale drawings consisting of plans and sections to show how work is to be installed in relation to work of other trades.

D. Equipment and systems shall be installed in accordance with the requirements and recommendations of the associated manufacturer.

3.2 EXCAVATION AND BACKFILL

A. Provide excavation and backfill necessary to install underground piping and other work included in this Division of the Specifications. Establish lines and grades required for the proper location of the work.

B. After the piping has been placed, the trenches shall be backfilled to the lines of present grades or finished grade as required. No backfill shall be placed, however, until water has been removed from the trenches and joints have been set and also after the tests have been made on piping as required.

3.3 RECORD DRAWINGS

A. Keep at the site two (2) sets of black and white prints for the express purpose of showing changes from the contract Drawings made during construction. Mark up the prints with red pencil during construction and deliver the prints, before final inspection, to the Architect as a final set of “Record Drawings”. Refer to Division 1 for additional requirements.

3.4 TESTING

A. Before concealing piping and before insulating piping, test piping per the requirements listed below or as required by the authority having jurisdiction, whichever is more stringent, and prove tight.

B. Replace and retest to Architect's satisfaction pipe or fittings broken or damaged under test.

C. Before testing piping systems, remove or otherwise protect from damage, control devices, air vents, plumbing fixtures and other parts which are not designed to stand pressures used in testing piping.

D. New sanitary and storm drain piping shall be tested by a standing water test so that the highest point of the system has no less than a 10 foot head of water. Fixtures shall be removed from system and piping capped or plugged. No drop in water level shall be allowed. Test systems for a period of four (4) hours.

E. New domestic water system shall be tested hydrostatically, pumping the system to 150 psi test pressure and holding the system at the test pressure for two hours without additional pumping. The fire protection system shall be similarly tested at 175 psi test pressure. While under pressure, visually inspect joints, welds or other connections to determine leakage. If leaks are detected, repair leak and retest.

3.5 CLEANING OF SYSTEMS

A. Clean strainers and dirt pockets as often as required to guarantee no system stoppage by end of warranty period.

B. Dust shall be removed from ductwork before Substantial Completion. Filter media shall be new at Substantial Completion.

C. If systems become stopped with refuse, remove the obstruction and replace and repair work disturbed.

D. Clean plumbing fixtures using non-scratching cleaners. Polish chromium plated work. Stilson type wrenches shall not be used on chrome plated work.

E. Dust in the construction area shall be suppressed with wetting agents or sweeping compounds. Dust shall be cleaned regularly.

F. Remove rust and clean surfaces to be insulated or painted.

G. Leave systems in clean condition and running order.

3.6 STERILIZATION

A. The domestic water piping systems shall be sterilized with a chlorine water solution so that the piping system contains water with a chlorine concentration of 100 ppm at the end of a three hour retention period. Systems shall be flushed before sterilization. After the chlorine water solution has remained in the piping system for the specified period and at the specified concentration, the system shall be drained, flushed with clear water until the chlorine concentration is less than 1.0 ppm. Obtain representative samples of the systems water for analysis by a recognized bacteriological laboratory. If samples are not acceptable, the process shall be repeated until the samples are acceptable.

B. The domestic water piping system may be sterilized by other methods approved by local plumbing codes or the Health Department.

C. As a condition of acceptance of the system, furnish a certificate under seal to certify that the system has been sterilized to meet the requirements of the Health Department and that the system is satisfactory for human consumption.

D. Chemicals and materials used for sterilization of the systems shall meet the requirements of the

3.7 PAINTING

A. Remove rust, scale, grease, and dirt from equipment and material and leave ready for finish painting. Equipment specified with factory baked enamel finish shall be touched up as required to provide a surface visually free of scratches, nicks and blemishes.

B. Paint uninsulated ferrous piping, hangers and miscellaneous iron work in concealed spaces with one coat of Rust-O-Leum dampproof red primer.

C. Paint gas piping systems with associated markings per ANSI/ASME standards or as required by the Authority Having Jurisdiction.

D. Where metal duct is visible through a register or grille, paint the interior of the duct with flat black paint.

3.8 OPERATING AND MAINTENANCE MANUAL

A. Submit operating and maintenance instructions. The manual shall include the following:

1. A brief description of systems and their various components.
2. Full, definite and explicit instructions for starting, stopping, controlling and changing over systems from one season to another.
3. List of manufacturer's representatives with address and telephone numbers.
4. Manufacturer's printed operating and maintenance instructions, parts lists, illustrations and diagrams for pieces of equipment.
5. A complete schedule of periodic servicing and lubrication requirements for equipment.
6. One copy of each shop drawing and Contractor's drawings.
7. One copy of other items of equipment where not required as a shop drawing submittal.
8. One copy of each wiring diagram.
9. Motor manufacturer's certificate for motors exposed to the weather.
10. The field test data specified in Section 230000 under Balancing and Adjusting.
11. Sterilization certificate for domestic water systems.

3.9 FIELD INSTRUCTION

A. Upon completion of work, furnish services of a competent representative to instruct Owner's representative in the proper operation and maintenance of elements of the mechanical systems. Submit instructor's name and credentials to the Architect for approval.

B. Spend not less than [8] hours in such formal instruction to prepare Owner to operate and maintain the systems.

3.10 PERFORMANCE TEST

A. Should the performance or capacity of the systems, equipment or devices furnished be questioned by written notice from the Architect after installation, provide necessary test equipment and complete a satisfactory test of the items in question. The test shall be run when and as directed by the Architect and in the presence of his representative. Should the items furnished not pass such a test, they shall be removed and replaced by systems, equipment or devices satisfactory to the Architect.

END OF SECTION

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SECTION 22 00 00 - GENERAL PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 NOTE

A. The requirements of Section 200000 apply to work performed under this Section.

1.2 SCOPE

A. The work under this Section of the Specification shall include the furnishing of labor, materials and equipment for the installation of complete plumbing systems, including interior sanitary soil, waste and vent piping; storm, interior domestic hot and cold water piping, plumbing fixtures and appliances to provide continuous and satisfactory service.

1.3 CONNECTIONS TO EQUIPMENT

A. Provide labor and materials to connect equipment furnished under this Section of the Specification.

B. Provide labor and materials to connect equipment furnished under other Sections of the Specification and requiring plumbing connections as if the equipment was furnished under this Section of the Specification. Provide traps, water stop valves, etc., for equipment requiring such connections to provide functioning systems.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Cleanouts shall be provided at ends of runs, at changes of direction and near the base of each vertical soil, waste, or drain pipe. Cleanouts shall be placed on horizontal lines every 50 feet unless the conditions require them at closer intervals. Cleanouts at the base of vertical pipes shall be placed in a fitting just above the floor. Cleanouts shall consist of Y branches or 1/4 bends the full size of the line for piping 4 inches and smaller, and 4 inches for larger pipes. Cleanouts in horizontal lines shall be extended to floor level or grade as necessary. Cleanouts shall be series as listed below:

1. Below concrete floors with no finish or ceramic tile finish.
   a. Zurn - ZN-1400-3
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab
2. Below carpeted floors (flush with concrete with identification screw through carpet).
   a. Zurn - ZN-1400-15
   b. J. R. Smith
   c. Watts
   d. Josam

e. Mifab

3. Below resilient tile floors.
   a. Zurn - ZN-1400-7
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab
4. Exposed horizontal piping.
   a. Zurn - Z-1440A
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab
5. Concealed in finished wall-prime coat.
   a. Zurn - Z-1440-1
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab
6. Base of exposed vertical pipes.
   a. Zurn - Z-1445
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab
7. Base of concealed vertical pipes.
   a. Zurn - Z-1445-1
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab

B. Cleanouts shall consist of cast iron ferrules and shall seat against a lead seal. Access covers shall be polished nickel bronze in finished areas, brass below carpeting. Access covers will be secured by non-ferrous tamperproof screws.

2.2 DRAINS

A. Provide roof, floor and area drains shown on Drawings and/or described below. Drains shall be Zurn, J. R. Smith, Josam or Mifab.

B. Floor drains shall have deep seal "P" traps. Provide flapper type backwater valves on drains connected directly to the storm sewer where the line serving the floor drains does not have a backwater valve. For floor drains adjacent to air handling units, provide oval funnel converting assemblies of same material as drain top.

1. Zurn - Z-329
2. J. R. Smith
3. Watts
4. Josam
5. Mifab

C. Floor drains shall be served by trap primers. Trap primers shall be bronze bodied "Flow – Through" type. Trap primers shall come with built-in air gap, trap primers shall meet the requirements of ASSE Standard 1018. Trap primers shall be set above the floor level of the drains they serve. Trap primer valves located behind walls shall be provided with access doors. Access doors to be coordinated with the Architect. Extend water line from trap primer to floor drain trap. Constrict valve in bypass line to provide flow to the trap primer.

1. J. R. Smith – 2699
2. Watts
3. Zurn
4. Josam
5. Mifab

D. Roof drains shall have a cast iron body with polypropylene dome secured to be vandal resistant, sump receiver, underdeck clamp, and adjustable extension collar.

1. Zurn - Z-100ERC
2. J. R. Smith
3. Watts
4. Josam
5. Mifab

E. Downspout Nozzles shall be nickel bronze construction with, stainless steel screen, decorative wall flange and goose-bill spout. Provide factory optional finish as selected by the Architect. Downspout nozzles shall be of the size and quantity indicated on the drawings.

1. Zurn - Z199
2. J. R. Smith
3. Watts
4. Josam

F. Backwater valve shall be flapper type valve. Extend 4 inch access pipe from valve to floor level and provide an access cover. If line is greater than 18 inches below floor provide watertight pit as access.

1. Zurn - Z-1095
2. J. R. Smith
3. Watts
4. Josam
5. Mifab

G. Floor drains shall be of the following type:

1. FD-1 - cast iron adjustable nickel bronze 8 x 8 inch strainer.
   a. Zurn - Z-415S
   b. J. R. Smith
   c. Watts
   d. Josam
   e. Mifab
2. FD-1 -cast iron adjustable nickel bronze 8 inch round strainer.
   a. Zurn - Z-415B
   b. J. R. Smith
   c. Watts

d. Josam
e. Mifab

2.3 PLUMBING FIXTURES

A. Provide plumbing fixtures as shown on the Drawings or as described herein. Exposed metal parts of fixtures, including faucets, waste fittings, waste plugs, strainers, flush valves, traps, supply and waste pipes and escutcheons shall be brass, chromium plated.

B. Mounting Heights of Fixtures

1. To provide for the physically disabled, plumbing fixtures shall be provided for their use at a mounting height suitable for the disabled as set forth by the Federal Government. Fixtures for special uses need not meet this requirement. Fixture mounting heights are generally indicated on the drawings.
2. Hot water and drain piping accessible to a wheelchair patient shall be suitably protected against high temperature by molded vinyl piping covers with access to shut-off valves, trap cleanout, etc. Insulation shall have out of sight fastening system, tie bands are not approved. Covers shall be Truebro Lav Guard 2 E-Z.

C. Hot and cold water connections to fixtures shall be provided with a stop valve. Stop valves, risers, etc. shall be (residential/light commercial grade as manufactured by Brass Craft, Central Brass or Engineered Brass Co.) (commercial/institutional grade as manufactured by Brass Craft, Chicago, Engineered Systems or McGuire).

D. Flush valves shall be of the non-hold open type and shall operate with 5 psi or less hand pressure.

E. Provide metal supports necessary to adequately and substantially hang and set fixtures. Supports shall be Zurn, Josam or J. R. Smith and suitable for the wall thickness and piping arrangements shown.

F. Plumbing fixtures shall be caulked at wall and floor with silicone caulking material of same color as the fixture.

G. Locate countertop sinks furnished under this Division. Furnish templates to the countertop fabricator for cutting of required holes.

H. For sinks and fixtures specified under other Divisions or other contracts and not provided with faucets, tailpieces, traps, and stop valves; provide necessary fittings and completely connect the sinks and fixtures.

I. Where sensor operated flush valves and faucets are specified hereinafter, furnish one transformer to serve a maximum of three lavatories, furnish one transformer to serve a maximum of ten urinals and furnish one transformer to serve a maximum of ten water closet. Each transformer shall be for a 120V primary voltage. Wiring will be installed under Division 26.

J. Fixtures shall be as follows:

1. P-1 Water Closet - elongated syphon jet action bowl with close coupled gravity flow tank, white vitreous china bowl with 17" rim and floor outlet for 12" rough-

in to operate on 1.28 gallon flush fitted with bolt caps, wheel handle stop valve, supply pipe and flexible riser.

a. Model
   i. American Standard – Cadet Flowise – 2989.101
   ii. Eljer
   iii. Kohler
   iv. Crane

b. Seat - white solid plastic closed front seat with cover.

   i. Church - 380TL
   ii. Olsonite
   iii. Beneke

2. P-2 Lavatory - 20" x 18" white vitreous china 4" center faucet spacing splash back lavatory with 27" clearance below waste outlet and to accommodate wall hanger or concealed arm supports. Fixture shall comply with ADA requirements. Provide with (residential) (commercial) weight (wheel handle) (screw driver) (loose key) stop valves, flexible risers, and adjustable 1-1/4" x 1-1/2" (cast brass) (17 gauge tubing) P trap with cleanout, trap nipple, and escutcheon. Provide (with concealed arm wall hanger system) (with concealed arm wall hanger system and pipe support legs).

   a. Model
      i. American Standard - Lucerne - 0355.012
      ii. Crane
      iii. Eljer
      iv. Kohler

   b. Faucet - 4" Centerset lavatory faucet shall be cast brass construction with all brass shank nuts and coupling nuts. Shall feature water-conserving 1.5 gpm. pressure compensating aerator. Vandal-Resistant handles. Shall also feature 1/4 turn washerless ceramic disc valve cartridges.
      i. American Standard 5502.170
      ii. Speakman

   c. Supply pipes and drain shall be protected by 3/16" thick white molded all vinyl internally ribbed insulation with access for stop valves, trap, etc.
      1) Truebro Lav Guard 2 E-Z.

3. P-3 Urinal - white vitreous china syphon jet action, wall hung urinal with 14" lip, 1-1/4" top spud to operate on 1.0 gallons per flush. Provide (with wall hanger) (with wall hanger and pipe support legs) (with the appropriate carrier system to accommodate the piping arrangement and wall cavity restrictions).

   a. Model
      i. American Standard - Allbrook - 6541.132
      ii. Crane
      iii. Eljer
      iv. Kohler

   b. Flush Valve - non-hold open diaphragm type with screw driver stop, vacuum breaker (front operated 3" pushbutton) (with wall mounted, hard wired sensor operator) to operate on 1 gallon per flush.
      i. Sloan - 186-1

4. P-4 Ice Maker Wall Box - wall box suitable for flush mounting. Box shall be constructed of plastic. Provide lead free quarter turn valve with a single lever.

a. Model
   i. Water Tite – AB97 Series
   ii. Symmons
   iii. Oatey

5. P-5 Utility Sink - Stainless Steel 27" x 27-1/2" x 14" Floor Mount Single Compartment Scullery Sink. Sink is manufactured from 14 gauge 304 Stainless Steel with a Buffed Satin finish, Center drain placement. Sinks supported by (4) 16 gauge stainless steel, 1-5/8" O.D. tubular legs with bullet shaped feet adjustable up to 1".
   a. Model
      i. Elkay – SS81242
      ii. Trinity
      iii. Steelton
   b. Faucet 8" Centerset Wall Mount Faucet with 3" Bucket Hook Spout 2" Lever Handles 1/2" Offset Inlets Polished Chrome. Faucet has a flow rate of 4.0 GPM, and is made of Chrome-plated Brass material, with a Quarter Turn Ceramic Disc valve. Faucet requires 2 faucet holes.
      i. Elkay – LK940BP03L2H
      ii. American Standard
      iii. Chicago

2.4 WATER HEATER - ELECTRIC STORAGE - COMMERCIAL

A. Provide a commercial storage type electric water heater(s) of the capacity shown on the Drawings and as specified herein. Heater shall be complete with insulated tank, heating elements, operating and safety controls and internal wiring to a junction and control box.

B. Tank shall be low soluble cement lined designed and stamped for ASME code design at 125 psi. Tank shall be provided with magnesium anode rods, insulated with glass fiber and enclosed in enamelled metal jacket. Insulation shall meet ASHRAE 90 Standards. Tank shall meet 2015 NAECA Energy Factor Regulations. Cold water shall enter tank at bottom through a distribution tube or baffle arrangement.

C. Heating elements shall be medium watt density inconel sheathed type, pre-wired and flanged for easy service and replacement. Heating elements shall be equally sized with a maximum of 15 KW per element. Heating elements shall be controlled by an immersion thermostat controlling the elements through UL rated magnetic contactors. Elements shall be protected by cartridge type fuses with a 100,000 amp interrupting capacity. Also provide 120 volt control power transformer and 120 volt controls.

D. Water heater shall be provided with electric low water cutoff, manual reset high limit control, ASME rated pressure temperature relief valve, 3-1/2 inch dial thermometer and operating pilot light.

E. Storage tank shall be fully guaranteed for three years. Other parts and controls shall be guaranteed for one year.

F. Storage water heaters shall be A.O. Smith, Rheem or State.

2.5 SHOCK ABSORBERS

A. Provide shock absorbers in the water piping in horizontal runs where shown on drawing and elsewhere as required to prevent noise or injury to the piping system resulting from water hammer.

B. Shock absorbers shall be J. R. Smith Hydrotrol or Zurn Z-1700 Shocktrol. Unit shall consist of stainless steel casing and air charged bellows. Shock absorbers shall be sized as recommended in the Plumbing Drainage Institute Standard WH-201.

2.6 WALL HYDRANTS AND HOSE BIBBS

A. Provide wall hydrants and hose bibbs as herein specified and indicated on the Drawings. Coordinate the mounting height with the architect prior to installation.

B. The exterior wall hydrants shall be frostproof hydrants Zurn 1310 with integral backflow preventor, J. R. Smith or Josam. The hydrant face shall be polished nickel bronze. The unit shall have bronze working parts and neoprene washers. Provide a loose key which will operate the hydrants.

C. Dual temperature wall hydrant shall be Zurn Z1355-5 dual temperature wall faucet less cover, but fitted with permanent handles and vacuum breaker.

D. Hose bibbs shall be Zurn Z1341, American Standard or Crane. The hose bibbs shall be rough chrome finish, loose key handle compression faucets with hose end and male IPS shoulder inlet fitted with Z1399-VB vacuum breaker backflow preventer.

E. Box hydrant shall be bronze construction, non-freeze type, hinged box cover with operating key lock. Hydrant shall have a tapped drain port in the valve housing. Box shall have a space for hose storage. Provide Watts 8A vacuum breaker. Bottom of hydrant connection shall be 3 feet - 6 inches below grade. Provide 18 inch x 18 inch gravel pit starting from the bottom of the hydrant connection and extending down 24 inches.

2.7 HOT WATER MAINTENANCE TAPE

A. Provide a complete UL listed system of heaters and components approved specifically for temperature maintenance of domestic hot water supply piping as indicated on the drawings and specified herein. Obtain components and controllers from a single manufacturer. To meet warranty requirements, only components and controllers supplied by cable manufacturer are to be used.

B. Heating element shall be a pair of parallel No. 16 AWG, nickel-coated, stranded copper bus wires embedded in crosslinked conductive polymer core, which varies heat output in response to temperature along its length. Terminate with waterproof, factory-assembled, non-heating leads with connectors at one end, and seal the opposite end with a watertight end seal. Cable shall be capable of crossing over itself without overheating. Electrical insulating jacket shall be flame-retardant modified polyolefin. Heating cable shall have a laminated aluminum foil layer (Mylar wrap) for additional mechanical protection and shall act as a plasticizer diffusion shield. Heating cable shall have a thicker gauge (5/24) tinned copper braid with minimum 70 percent coverage for ground path. Heating cable shall have a modified polyolefin with ultraviolet inhibitor. Outer jacket to be printed with cable model number, agency listings, batch number and meter marks.

C. The hot water maintenance tape shall operate on line voltage of **208** V without the use of transformers.

D. Provide single circuit local controller for domestic hot water temperature maintenance to provide adjustable maintained temperatures in the range of 105 to 140 deg F. Controller shall be designed to be wall mounted and include a window and digital display that shows the measured temperature, set point temperature and alarm conditions (temperature sensor failure, high or low temperature and ground fault) if detected. Controller shall include integral ground fault protection. Programming the set point temperature, deadband, and high and low alarm thresholds on the controller is accomplished using the built-in digital display and push buttons. A 25-ft thermistor is provided for line temperature control.

E. Provide power connections, splices/tees, and end seal kits to properly connect and terminate heating cable circuit along specified length of piping. Connection kits shall be NEMA 4X to prevent water ingress and corrosion. Components shall be UV stabilized and shall not require cutting into heating cable core to expose bus wires.

F. Fiberglass tape, cable ties, connection kits, and end seals shall be furnished by the manufacturer or as recommended in writing by the manufacturer. Provide “Hot Water Maintenance Tape”) labels on exterior of pipe insulation every 10ft on opposite sides of pipe and on all splices, tees, crosses, and power connections for the entire length of the heat traced piping.

G. The insulation shall not be installed with staples. Insulation jackets should be closed with adhesive to avoid damage to the heating cable. Heating cable should be tested with a megohmeter (megger) between the heating cable bus wires and the metallic ground braid. While a 2,500 Vdc megger test is recommended, the minimum acceptable level for testing is 500 Vdc. This test should be performed a minimum of three times.

1. Prior to installation while the cable is still on a reel.
2. After installation of heating cable and completion of circuit fabrication kits including any splice kits) but prior to installation of thermal insulation.
3. After insulation of thermal insulation but prior to connection to power.

H. Hot Water Maintenance Tape shall be manufactured by Raychem or Chromalox.

2.8 VALVES

A. Provide valves as indicated on Drawings, as specified below and as required. Valves, where possible, shall be of one manufacturer, Stockham, Nibco or Jenkins, Jomar whose figure numbers are used below.

B. Valves 2 inches and smaller, which will be operated frequently, or will be used for throttling services, shall be ball or globe valves. Stop valves shall be ball valves.

C. Valves in the domestic hot water, cold water and hot water recirculating system shall be:

	FOR STEEL PIPE		
Description	Nibco	Jenkins	Stockham
Gate-4" and larger IBBT, OS & Y, flanged	F-617-0	651A	G-623
Gate-3” and smaller BBT,	T-111	47	B-100

rising threaded stem			
Globe–4" and larger IBBT OS&Y, flanged	F-718-B	613	G-512
Globe-3" and smaller BBT, threaded	T-211-Y		B-13-T
Check Valves 4" and larger IBBT, swing, flanged	F-918-B	624	G-931
Check Valves 3" and smaller BBT, swing, threaded	T-413-Y	92A	B-319

	For Copper Tube		
Description	Nibco	Jenkins	Stockham
Gate-2-1/2" and smaller, bronze rising stem, solder end.	S-111	1242	B-108
Globe–2-1/2" and smaller, bronze solder end	S-211-Y		B-14-T
Check Valves 2-1/2"and smaller, bronze, swing solder end	S-413-Y	1222	B-309

D. Circuit Setter Plus Calibrated Balance valves by Bell and Gossett models RF, MC, CB, may be used for balancing and shut off valves in hot water circulating lines. Valve shall be lead free for use in domestic water systems. Adjustable stop and tapping on the downstream side for pressure gauge connections shall be provided with balancing services. This valve may also be used in lieu of gate and globe valves where shown.

E. Flow measuring ball valves may be used for balancing purposes on domestic recirculation systems. Flow measuring ball valves shall be Watts LFCSM-61-S. Provide positive memory feature, positive shut-off, be bi-directional and include blowout resistant stems. Valves shall be Lead Free and meet NSF 61 Annex G.

F. Ball valves may be used for shut off and balancing purposes except on gas piping where they shall not be used except as indicated below. Ball valves shall be NIBCO figure S-580-M, Jomar T-100 or Apollo. Provide memory stop on balancing valves. Ball valves may be used for shut off purposes in gas piping 1 inch and smaller. Ball valves in gas piping shall be NIBCO GB10/GB1A

G. Ball valves may be used for shut off purposes on CPVC domestic water systems 2" and smaller. Ball valves shall be Sioux Chief 648 Series.

H. Butterfly valves may be used for shut off or balancing purposes in lieu of gate or globe valves on piping 2-1/2 inches and larger. Valves shall be 200 pound and have EPDM liner, aluminum bronze disc and lever lock operator. NIBCO LD-2000-3, Jenkins 23ZE, Centerline, or DeZurik. On piping 8 inches and larger provide gear operator NIBCO LB-2000-5.

I. Non-slam check valves shall be installed on discharge of pumps, in vertical piping and elsewhere as shown and shall be 125 pound wafer style iron body, bronze fitted with renewable seat and disc and spring actuator, Miller 162, NIBCO W910, Hager or Smolensky. (These model numbers are for valves 2 inches and larger, should be revised for smaller sizes.)

J. The backflow prevention device serving the domestic water service shall be an ASSE 1013, Reduced Pressure Zone Assembly that consist of two independent spring loaded "Y" pattern check valves and one differential pressure relief valve. The assembly shall automatically reduce the pressure in the zone between the check valves to at least 5 PSI lower than inlet pressure. Mainline valve body and caps including relief valve body and cover shall be Lead Free cast copper silicon alloy. Check valve and relief valve components shall be constructed so they may be serviced without removing the valve body from the line. The assembly shall be rated to 175 PSI working pressure and water temperature range from 32 deg F to 140 deg F. Assembly shall be a Febco LF825Y or Watts Regulator Company LF009.

K. Thermostatic mixing valve installed on the hot water supply to fixtures shall be ASSE 1017, ASSE 1069, and ASSE 1070 certified and IAPMO cUPC certified and approved to CSA B125.3 and CSA B125.70. It shall have a lead free cast copper silicon alloy body. Lead free thermostatic mixing valves shall comply with state codes and standards, where applicable, requiring reduced lead content. The valve shall include integral filter washers and check valves and an adjustment cap with locking feature. The valve shall be provided with union connections. Thermostatic mixing valve shall be Watts Series LFMMVM1.

PART 3 - EXECUTION

3.1 SANITARY AND STORM PIPING

A. Storm drainage shall be extended from roof drains, clear water floor drains and foundation drainage to discharge to the storm drainage system shown on the drawings.

B. Sanitary piping shall be extended from fixtures, appliances, etc., to the existing sanitary sewer. Verify location, size and elevation of the existing line before performing work and notify the Architect if discrepancies are noted.

C. Sanitary and storm drain piping below the lowest finished floor to their connections to existing utilities shall be schedule 40 polyvinyl chloride sewer pipe.

D. Sanitary and storm drain piping within the building, above ground shall be schedule 40 polyvinyl chloride sewer pipe.

E. Drain piping from air conditioning unit condensate pans above the ground shall be schedule 40 polyvinyl chloride sewer.

F. Where lines pass under or through footings, encase them in concrete to uniform thickness as approved by the engineer.

G. In connection with underground piping, connections and turns, unless otherwise specified, shall be made with Y fittings and 1/8 bends.

3.2 WATER PIPING

A. Water service underground outside the building shall be polyethylene (PE) piping. Piping and fittings shall be compliant with AWWA C901, PE4710, ASTM D3035, ASTM D3350 minimum Pressure Class 200 (SDR 11). Piping shall be installed in accordance with AWWA M55, ASTM D2774 and the manufacturer's installation instructions.

B. Water piping inside the building may be manufactured from virgin rigid CPVC (chlorinated polyvinyl chloride) vinyl compounds with a cell class of 24448 as identified in ASTM D 1784.

C. CPVC pipe and fittings shall conform to ASTM D 2846. Pipe and fittings shall be manufactured to the nominal dimension cited in the applicable ASTM standard, and be the product of one manufacturer. Fittings shall be injection-molded. All pipe and fittings shall confirm to National Sanitary Foundation (NSF) Standard 14 and 61.

D. Exposed piping at fixtures shall be IPS red brass, chromium plated.

E. Mains, branches and connections of the hot and cold water distribution piping systems shall be provided with valves placed at the points shown on drawings or directed by the Architect for proper isolation and control of the system. Equipment or appliances shall be separately valved so that service can be shut off and the piece of equipment or appliance removed without disturbing the piping system. Valves shall be located so as to be accessible to the operator. Separate valves for equipment and appliances are in addition to faucets supplied herein or in other Sections.

F. Provide for expansion of piping subject to temperature changes. This shall be accomplished by swings, bends or loops.

3.3 INSULATION

A. After the systems have been installed and tested, insulation as specified below shall be applied. Materials shall be UL, Inc., approved and shall be applied as recommended by the manufacturer's written instructions. Materials used shall be the products of Owens Corning, PPG, Manville, Knauff Corporation, Certainteed, Armstrong, Eagle Picher, Insul Coustic or Benjamin Foster and shall be equal to those products that meet the Specifications below.

B. Insulate new cold water piping, hot water piping, tempered water piping except chrome plated piping exposed at plumbing fixtures and insulate condensate drain lines. At roof drains, insulate from the roof drain body, including the drain body, to the discharge side of the first fitting in the vertical riser. Insulation shall be heavy density long strand fiberglass, sectional insulation with all service vapor barrier jacket and double side adhesive self-sealing lap, Johns Manville Micro-Lok system or equal of Owens Corning. Insulation shall comply with ASTM E84 with a flame spread rating of 25 or less and smoke developed rating of 50 or less. Insulation thickness shall be in accordance with the Energy Code but shall not be less than ½ inch. Fittings, valve bodies, etc., shall be covered with Zeston type precut vinyl insulation jackets with pre-shaped fiberglass insert.

C. On exposed insulated piping in finished areas within seven feet of the floors, provide .010 inch thick galvanized steel insulation jackets. This does not include piping exposed in unfinished areas such as boiler rooms, storage rooms, etc.

D. At pipe hangers, for piping carrying fluids with temperatures below 70 degrees, provide a rigid core of insulation to support the pipe. Rigid insulation shall be the same thickness as the adjacent semi-rigid insulation and have the same flame spread and smoke developed ratings. Vapor barrier shall be continuous and integral between the rigid and semi-rigid sections of insulation. Rigid insulation shall be composed of hydrous calcium silicate. Rigid insulation shall be Johns Manville Thermo-12 Gold or equal of Owens Corning.

END OF SECTION

SECTION 22 13 13 – FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nonpressure-type pipe.
   2. Nonpressure-type transition couplings.
   3. Cleanouts.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Pipe and fittings
   2. Cleanouts
   3. Castings
   4. Detectable warning tape

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. PVC Type PSM Sewer Piping:

   1. Pipe: ASTM D3034, SDR 35 sewer pipe with bell-and-spigot ends for gasketed joints.
   2. Fittings: ASTM D3034, PVC with bell ends.
   3. Gaskets: ASTM F477, elastomeric seals.

2.2 NONPRESSURE-TYPE TRANSITION COUPLINGS

A. Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition coupling; for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and include corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:
   1. For Plastic Pipes: ASTM F477, elastomeric seal or ASTM D5926, PVC.
   2. For Dissimilar Pipes: ASTM D5926, PVC or other material compatible with pipe materials being joined.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling for pipe shall comply with DelDOT Section 207.

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details to indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

D. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

E. Install gravity-flow, nonpressure, drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 2 percent unless otherwise indicated.
2. Install piping with 48-inch minimum cover.
3. Install PVC Type PSM sewer piping according to ASTM D2321 and ASTM F1668.

F. Clear interior of piping of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.3 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure, drainage piping according to the following:
1. Join PVC Type PSM sewer piping according to ASTM D2321 and ASTM D3034 for elastomeric-seal joints or ASTM D3034 for elastomeric-gasket joints.
2. Join dissimilar pipe materials with nonpressure-type, rigid couplings.

3.4 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at final grade.

1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic

2. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic
3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service
4. Use Extra-Heavy-Duty, top-loading classification cleanouts in roads

B. Set cleanout frames and covers in concrete pavement and roads with tops flush with final pavement surface.

3.5 IDENTIFICATION

A. Arrange for installation of green detectable warning tapes directly over piping.

1. Use detectable warning tape over nonferrous piping.

3.6 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of mandrel of size not less than 92.5 percent of piping diameter.
    c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials and repeat testing until leakage is within allowances specified.

END OF SECTION 221313

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SECTION 230000 - HEATING & AIR CONDITIONING

PART 1 - GENERAL

1.1 NOTE

A. The requirements of Section 200000 apply to work performed under this Section.

1.2 SCOPE

A. The Work under this Section of the Specification shall include the furnishing of labor, equipment and materials for the installation of heating, air conditioning and ventilating systems as specified, shown on the Drawings or implied to provide continuous and satisfactory service.

PART 2 - PRODUCTS

2.1 AIR DEVICES

A. Provide air devices to complete the heating, air conditioning and ventilating systems. Air devices in ceiling shall have flat white lacquered finish unless noted otherwise. Coordinate the appropriate border and mount for the specific application.

B. Air devices shall be as manufactured by Titus, Tuttle & Bailey, Price, Anemostat, Krueger, or Metalaire.

C. Air devices used for relief shall have backdraft dampers installed behind the air device or in the ductwork connected to the device. Damper shall be gravity operated with extruded aluminum frame and blades, metal axles turning in synthetic bearings and have extruded vinyl, polyurethane sponge or neoprene blade seals. Backdraft damper shall be Greenheck model EM, or similar of American Warming and Ventilating, or Ruskin.

D. Supply air diffusers in the ceiling shall be square pattern with three removable cones and adjustable damper. Pattern shall be four-way distribution. Construction shall be steel. Nominal face size shall be 12 x 12 or 24 x 24 as indicated on the drawings. Provide diffusers with horizontal to vertical pattern, adjusting tabs.

1. Titus TMSA

E. Supply air registers in the ceiling with square or rectangular necks shall have steel adjustable curved vane face bars with opposed blade damper. Registers shall provide four-way distribution, unless indicated otherwise.

1. Titus 250

F. Sidewall return/exhaust registers (more than 7'-0" above floor) shall be horizontal fixed bar set at 35 degrees or fixed curved bar with opposed blade damper. Register shall be steel construction with white finish. Omit damper where indicated as grilles.

1. Titus 350RL

2.2 DUCTWORK

A. Provide ductwork and plenums of the sizes shown on the Drawings and the materials, gauges and construction as listed below.

B. Ductwork shall not be fabricated or installed until clearances and dimensions have been verified in the field. Discrepancies between the duct sizes and configurations shown on the Contract Documents and those required to meet field conditions shall be brought to the attention of the Architect for his direction. Ductwork fabricated or installed prior to field verification that the ductwork will fit is done at the Contractor's risk and expense.

C. For details of duct construction not specified below refer to the latest editions of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Manuals. Duct systems shall be defined as follows with the applicable manual.

1. All systems "HVAC Duct Construction Standards" metal and flexible.

D. Ductwork shall be galvanized steel except as specified hereinafter of sizes indicated with sheets shaped and constructed as noted in the SMACNA Manual.

E. Ductwork below floor shall be type S, steel spiral duct with polyvinyl coating for direct burial, Foremost Manufacturing Company type PCD. Duct sections shall be secured together with stainless steel screws and coated with PCD tape. Where coating has been scratched, it shall be covered with PCD spray coating. Underflow ductwork shall be bedded in pea gravel and backfilled to top of duct with pea gravel. At the Contractor's option, polyester reinforced fiberglass duct manufactured by Peabody Sunstrand may be used.

F. Flexible ductwork shall consist of a coated spring steel wire helix, polymeric liner, fiberglass insulation and fiberglass reinforced metallized film vapor barrier. Flexible ductwork shall be listed by Underwriters Laboratories under UL 181 standards as Class I flexible Air Duct Material and shall comply with NFPA Standards 90A and 90B. Flexible duct shall be rated for two inches positive and negative pressure and 2500 fpm maximum velocity. Flexible ducts shall be Thermoflex M-KE, Wiremold or General.

G. Where ducts are noted to be acoustically lined, they shall be lined with one half inch thickness of coated and edge sealed lining system. Liner and insulation shall meet requirements of UL 181 and NFPA 90A/B. Liner shall meet bacteriological standards of ASTM C 1071. Seams and cut edges shall be sealed from airstream using metal brackets. Use of adhesive-backed tape is unacceptable. Insulation shall be 3 lb/cubic foot density with a minimum R-Value of 2.0. Duct sizes shown on drawings are the interior sizes of insulated duct. As a minimum, supply and return ducts from heating, ventilating and air conditioning units for a distance of fifteen feet from the units shall be acoustically lined. Duct lining shall be Owens Corning QuietR Duct Liner or equal of Johns Manville, Certain Teed or Knauf.

H. Ductwork shall be galvanized steel except as specified hereinafter of sizes indicated with sheets shaped and constructed as noted in the SMACNA Manual and of the pressure classification required to meet the pressures listed in the equipment schedules.

I. Duct connections to air handling units and elsewhere as required to compensate for

expansion and contraction and noise reduction shall be made with UL approved glass fabric such as Ventglas as manufactured by Vent Fabrics, Inc.

J. On low pressure systems duct details shall be as follows:

1. Square elbows Figure 4-2
2. Hangers Figure 5-1
3. Tee connections Figure 3-6
4. Register on trunk Figure 7-6
5. Volume dampers Figures 7-4 and 7-5

K. Provide manual volume dampers as shown on the Drawing and additionally as required to properly balance the air distribution systems as directed by the independent Test and Balance Agency.

L. Blank-off unused portions of louvers with an aluminum clad plywood panel. Provide rigid insulation board to meet the energy code, at a minimum of R8. Aluminum shall have textured black finish and shall face outside. Inside shall have black painted plywood finish. Blank-off material shall be Weyerhauser Pre-finished Siding/Panel 15 with Ebony exterior finish and black painted plywood interior finish.

2.3 LOUVERS & DAMPERS

A. Provide louvers and dampers required for the operation of the mechanical systems as indicated on the drawings. Units shall be fabricated after field measurements have been made.

B. Louvers shall be constructed of 0.081 inch thick type 6063-T5 aluminum alloy with integral caulking slot and retaining bead for installation in masonry openings. Fasteners shall be aluminum or stainless steel. Louvers shall be stationary type with drainable blades in a 4” louver frame. Each stationary blade shall incorporate an integral drain gutter and each jamb shall incorporate an integral downspout so water drains to blade end, then down the downspouts and out at the louver sill rather than cascading from blade to blade. Each louver shall be equipped with a framed, removable, rear-mounted bird screen of 0.75” x 0.051” expanded, flattened aluminum. Each factory assembled louver section shall be designed to withstand wind loadings of 25 PSF (100.0 MPH wind equivalent). The beginning point of water penetration for the louver shall be above 1250 fpm free area velocity. Louver frames, mullions, and section joints shall be adequately supported from the building structure to withstand this same wind loading. Louver performance data shall be licensed under the AMCA Certified Ratings Program and shall bear the AMCA Certified Ratings Seal. This certified performance data shall include air flow pressure loss and water penetration, and shall demonstrate performance equal to or better than the model specified. Louvers shall be supplied with standard mill finish. Louvers shall be Greenheck ESD-403 drainable type, or similar of American Warming and Ventilating, or Construction Specialties.

C. Provide backdraft dampers behind louvers that are used for relief or exhaust. Damper shall be gravity operated with extruded aluminum frame and blades, metal axles turning in synthetic bearings and have extruded vinyl, polyurethane sponge or neoprene blade seals. Backdraft damper shall be Greenheck model EM, or similar of American Warming and Ventilating, or Ruskin.

D. Barometric relief dampers shall consist of: 16 ga insert mount galvanized steel hat channel frame with 5.000 in. depth; blades from 0.063 in. thick formed aluminum, eccentrically pivoted; 0.375 in. square plated steel axles with galvanized steel press-fit ball bearings; damper shall be equipped with pressure activated vinyl blade seals; and internal plated steel blade-to-blade linkage with blade mounted counterbalance weights. Damper manufacturer's printed application and performance data including pressure, velocity and temperature limitations shall be submitted for approval showing damper suitable for pressures to 2 in. wg, velocities to 2,000 ft/min and temperatures to 180.0 F. Testing and ratings to be in accordance with AMCA Standard 500D. Barometric relief dampers shall be Greenheck model BR-30, or similar of American Warming and Ventilating, or Construction Specialties.

E. Motor operated damper blades shall be 16 ga galvanized steel 3V type with three longitudinal grooves for reinforcement. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper (blades that are non-symmetrical relative to their axle pivot point or utilize blade stops larger than 0.500 in. are unacceptable). Blade seals shall be TPE. Linkage shall be blade-to-blade concealed in jamb (out of the airstream) to protect linkage and reduce pressure drop and noise. Damper frame shall be 16 ga galvanized steel formed into a structural hat channel shape with reinforced corners to meet 11 ga criteria. Bearings shall be corrosion resistant, permanently lubricated, synthetic (acetal) sleeve type rotating in extruded holes in the damper frame for maximum service. Axles shall be square and positively locked into the damper blade. Jamb seals shall be flexible stainless steel compression type to prevent leakage between blade end and damper frame. The Damper Manufacturer's submittal data shall certify all air leakage and air performance pressure drop data is licensed in accordance with the AMCA Certified Ratings Program for Test Figures 5.2, 5.3 and 5.5. Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D. Motor operated dampers shall be Greenheck model VCD-23, or similar of American Warming and Ventilating, or Construction Specialties.

2.4 UNIT HEATERS - ELECTRIC

A. Provide electric unit heaters where shown on the plans of arrangements, capacities and sizes listed on the drawings. Units shall be constructed and rated in accordance with the standards of the Air Moving and Conditioning Association and ASHRAE and have a U.L. approved disconnect means.

B. Heating elements shall be aluminum finned, copper clad steel sheath resistance heating elements.

C. Motors shall be permanent split capacitor type. Unit shall be complete with automatic reset thermal cutouts, fan and motors with built-in thermal overload protection.

D. Unit heaters shall be constructed of 16 gauge die-formed steel housing with individually adjustable discharge louvers. Finish shall be the standard factory baked enamel finish.

E. Provide wall mounted thermostat. Unit shall have fan delay feature.

F. Unit heaters shall be Chromalox, Q-Mark or Berko.

2.5 FAN – HORIZONTAL PROPELLER

A. Provide horizontal propeller fans of the capacity and size and at the locations shown on the drawings. Fans shall be AMCA certified and sealed.

B. Propeller fans shall be panel mounted on reinforced and welded panel with recessed orifice for fan wheel. Fan blades shall be die formed steel, belt driven and provided with oversized shaft and permanently lubricated ball bearings. Provide fan guard. Fan shall be statically and dynamically balanced.

C. Motor shall be standard open drip proof totally enclosed type. Motor pulleys for belt driven fan shall be variable pitch. Belt shall be in same plane as fan bearings.

D. Provide fans with motor side fan and belt guard.

E. Propeller fans shall be Greenheck, Cook, Penn or ILG.

2.6 EXHAUST FANS – CEILING

A. Provide ceiling fans in accordance with the schedule on the drawings and the specification below.

B. Ceiling fans shall be complete with heavy gauge galvanized steel housing lined with 0.5 inch of acoustical insulation, white finish polystyrene/aluminum ceiling grille, spring loaded aluminum back-draft damper, mounting brackets and direct drive centrifugal fan.

C. Fan wheel shall be forward curved centrifugal wheel constructed of galvanized steel or carbonate filled polypropylene that has been both statically and dynamically balanced.

D. Motor enclosures shall be open drip-proof (ODP), opening in the frame body and or end brackets. Motor shall be permanently lubricated sleeve bearing type to match with the fan load and furnished at the scheduled voltage and phase. Motor shall be mounted on vibration isolators and be accessible for maintenance. Motor shall be provided with thermal overload protection.

E. Disconnect means for motor shall be provided inside housing by cord and plug.

F. Provide a time delay switch to automatically turn off the fan with an adjustable setting of 1 to 60 minutes after the light on the fan has been turned off.

G. Ceiling and cabinet fans shall be Greenheck, Cook, or Penn.

2.7 INVERTER DRIVEN SPLIT SYSTEM HEAT PUMP– VERTICAL FAN COIL

A. The Air Conditioner system shall be a split system with Variable Speed Inverter Compressor technology. The system shall consist of a horizontal discharge, single phase outdoor unit, a matched capacity indoor section that shall be equipped with a wired wall mounted controller. All systems shall be Energy Star Qualified and listed.

B. Outdoor Unit – Horizontal Air Discharge

1. The outdoor unit shall be capable of Hyper Heating performance delivering

100% rated heating capacity down to +5° F and 75% rated heating capacity at -13° F outdoor ambient temperature. Further, the outdoor unit shall be capable of cooling operating at 0°F (-18°C) ambient temperature without additional low ambient controls and optional wind baffle.

2. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit must be test run at the factory.
3. The casing shall be constructed from galvanized steel plate, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection. Mounting feet shall be provided and shall be welded to the base of the cabinet and be of sufficient size to afford reliable equipment mount and stability. Easy access shall be afforded to all serviceable parts by means of removable panel sections. The fan grill shall be of ABS plastic.
4. The compressor shall be an injection port equipped, Frame Compliant Scroll compressor with Variable Speed Inverter Drive Technology. The compressor shall be driven by inverter circuit to control compressor speed. The compressor speed shall dynamically vary to match the room loads, increasing the efficiency of the system which shall result in significant energy savings.
5. To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be automatically, intermittently applied to the compressor motor windings to maintain sufficient heat to vaporize any refrigerant.
6. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration.
7. The condenser coil shall be of copper tubing with flat aluminum fins to reduce debris build up and allow maximum airflow. The coil shall be protected with an integral metal guard.
8. Refrigerant flow from the condenser shall be controlled by means of an electronic linear expansion valve (LEV) metering device. The LEV shall be controlled by a microprocessor controlled step motor.
9. All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ARC Type, meeting ASTM B280 requirements. All refrigerant line connections shall be flare type sized as required and tightened to manufacturers specified torque value.
10. The fan blades shall be of high performance, aerodynamic design for quiet operation, and the fan motor bearings shall be permanently lubricated.
11. The outdoor unit shall have horizontal discharge airflow. The fan shall be mounted in front of the coil, pulling air across it from the rear and dispelling it through the front. The fans shall be provided with a raised guard to prevent external contact with moving parts.
12. The outdoor unit shall be equipped with an electronic control board that interfaces with the indoor unit to perform all necessary operation functions.
13. The electrical power of the unit shall be 208volts or 230 volts, single phase, 60 hertz. The unit shall be capable of satisfactory operation within voltage limits of 187 volts to 253 volts. Power for the indoor unit shall be supplied from the outdoor unit using three (3) fourteen (14) gauge AWG conductors plus ground wire connecting the units. The outdoor unit shall be controlled by the microprocessor located in the indoor unit. The control signal between the indoor unit and the outdoor unit shall be pulse signal 24 volts DC. The unit shall have Pulse Amplitude Modulation circuit to utilize 98% of input power supply.

C. Vertical Air Handling Unit

1. The indoor unit components shall be completely factory assembled and tested.

Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, brazed connections, self diagnostics, auto-restart function, 3- minute fused time delay, and test run switch. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory. Refrigerant lines shall be insulted from the outdoor unit. Return air shall be through an optional or field supplied filter. Condensate draining shall be made via gravity or external condensate pump.

2. The cabinet shall be constructed with sound absorbing, foil-faced insulation to control air leakage. Select an installation location with adequate structural support, space for service access and clearance for air return and supply duct connections. A field supplied secondary drain pan must be installed.
3. The fan shall be a direct-drive Sirocco type fan, statically and dynamically balanced impeller with high and low fan speeds available. The fan motor shall be thermally protected.
4. The return air shall be filtered by means of a field supplied filter.
5. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance. The coil shall be a 4-row cross fin copper evaporator coil with 15 fpi design completely factory tested. The refrigerant connections shall be brazed connections and the condensate shall be ¾" OD PVC. A thermistor will be located on the liquid and gas lines.
6. The unit shall have controls provided by the manufacturer to perform input functions necessary to operate the system. The unit shall be capable of interfacing with a BMS system via optional LonWorks or BACnet gateways. The unit shall be compatible with an advanced multi-zone controller.

D. Ductless split air conditioning units shall be Daikin, Mitsubishi, Carrier, or LG.

PART 3 - EXECUTION

3.1 INSULATION

A. After the systems have been installed and tested, insulation as specified below shall be applied. Materials shall be Underwriters Laboratory, Inc., approved and shall be applied as recommended by the manufacturer's written instructions. Materials used shall be the products of Owens Corning, Manville, Knauff Corporation, Armstrong, Certainteed, Miracle Adhesive, Moneco or Benjamin Foster and shall be similar to those products that meet the specifications below.

B. Ductwork

1. Exposed supply ductwork and return air ductwork except where ductwork located in the room supplied and exposed outside air ductwork shall be insulated with a minimum 1-1/2 inch thickness of 3 PCF density, a minimum R-Value of 6.0 for attic/concealed spaces and R 8.0 for exterior use fiberglass board with reinforced foil faced ASJ vapor barrier jacket secured to duct with Graham weld pins or perforated base stick clips set in Moneco M46420 adhesive. Pins shall be covered with finish cap to match insulation. Butt joints and seams and cover with vapor barrier mastic. [Finish with a coat of lagging adhesive such as Benjamin Foster 30-35 or Moneco 55-10 embedding 8.5 glass cloth fabric over the

adhesive. Use corner beads on edges of the duct.] (Note: Select which finish option applies to the project.)

2. Concealed supply air duct, return air duct, outside air duct, and exhaust duct within apartment units shall be covered with minimum 2 inch thickness of 3/4 PCF density, a minimum R-Value of 6.0 for attic/concealed spaces and R 8.0 for exterior use flexible fiberglass duct covering with reinforced foil and kraft paper vapor barrier FRK jacket. Insulation shall be applied to duct over 100 percent coverage of duct adhesive such as Benjamin Foster 85-20. Edges shall be butted together with a vapor barrier lap of 2 inch minimum. Seal joint and punctures with Benjamin Foster 30-35. Where ducts are over 24 inches in width, weld pins and caps shall be used to secure insulation to underside of duct. Secure laps with adhesive and flared staples on 4 inch center.
3. Ductwork that is internally lined with energy code compliant liner is required to be insulated externally as indicated herein.

C. Piping

1. Refrigeration suction piping and condensate drain piping above the ground shall be covered with 1/2 inch thickness of 6 PCF polyethylene foamed closed cell elastomeric pipe covering conforming to Mil Spec 15280, Armstrong Armaflex. Fittings shall be neatly mitered or continuous with piping. Covering on exterior of building shall be finished with 2 coats of Armaflex or other latex base finish to blend with adjacent finishes.
2. On exposed insulated piping in finished areas within seven feet of the floor, provide .010 inch thick galvanized steel insulation jackets. This does not include piping exposed in unfinished areas such as boiler rooms, storage rooms, etc.
3. On exposed insulated piping exposed to outdoor elements, provide. 016 aluminum insulation jackets.
4. At pipe hangers for piping carrying fluids with temperatures below 70 degrees, provide rigid core of insulation to support the pipe. Rigid insulation shall be the same thickness as the adjacent insulation and shall have the same flame spread and smoke developed ratings.

3.2 TESTING AND BALANCING AIR & WATER SYSTEMS

A. The air distribution system and water systems shall be balanced and adjusted by an independent organization specializing in this type of work to distribute the quantities noted on the drawings. The balancing agency shall be a member of the Associated Air Balance Council or the National Environmental Balancing Bureau.

B. Test equipment must be approved by the Architect and properly calibrated prior to starting work. Repairs, alterations, adjustments and readjustments necessary to meet the design conditions shall be made.

C. The balancing agency shall review the drawings before installation and advise the Contractor of additional dampers required in the ductwork, flow devices and balancing valves in the water piping, etc., to effectively and properly balance the systems. These devices shall be installed at no additional cost to the Owner.

D. At the completion of the balancing and adjusting and prior to the operating test, submit to the Architect three (3) certified typewritten reports to be retained by the Architect. Reports shall include:

1. Velocities and air quantities at supply returns and exhaust outlets installed under this contract.
2. Pressure and/or temperature difference across various pieces of equipment.
3. Air temperature delivered from heating and cooling equipment.
4. Water quantities at flow indicators.
5. Schedule of equipment.
6. Speed of belt driven equipment.
7. Nameplate data on motors installed under this contract.
8. Actual operating voltage and ampacity readings on motors.
9. Separate six hour operating tests shall be made during the cooling season and during the heating season in which an hourly record shall be made of the following:
   a. Settings of control equipment.
   b. Outside weather conditions.
   c. Thermostat readings.
   d. Dry and wet bulb temperatures in spaces.

   Outside temperatures shall be below 40 degrees Fahrenheit during the heating test and above 85 degrees Fahrenheit during the cooling test.

3.3 AUTOMATIC TEMPERATURE CONTROLS

A. Provide labor, materials, equipment, services, etc., to install a system of automatic temperature controls to perform the functions noted on the drawings. Coordinate with unit supplied controls.

B. System shall be DDC and shall be installed under the supervision of the manufacturer's authorized representative.

C. Power source for the system shall be taken from 120 volt sources. Provide motors, starters, overload protection, control power transformers and related wiring devices, etc., in accordance with the applicable requirements of the Division 26 as appropriate for the voltage used. Interlock wiring to fans, pumps, motors, dampers, valves, etc., shall be provided as part of this work.

D. Automatic dampers shall be furnished by the temperature control manufacturer, but shall be installed by the trade normally installing such item, under the supervision of the control manufacturer.

E. The temperature control system, as hereinafter specified and designated on the drawings and plans, shall be guaranteed free of original defects in material and workmanship for a period of two years. After completion of the installation, thermostats, control valves, control motors, dampers, etc., shall be regulated and adjusted to perform the proper function.

F. Prepare a schematic drawing of the temperature control system and submit them to the Architect for his review prior to starting work.

G. Upon completion of the work, revise the diagrammatic layouts to record conditions and mount the revised layouts in clear plastic envelopes where directed.

H. Control devices shall be identified by embossed nameplates to identify control devices as shown on control diagram.

I. Dampers shall be Arrow Foil double seal dampers with a maximum 0.5 percent leakage or Honeywell D642 or D643 Type.

END OF SECTION

SECTION 26 00 00 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for work under Division 26.

B. Coordinate the work of this Section with the requirements of the Project.

1.2 DEFINITIONS

A. Following are definitions of terms and expressions used in the Electrical Sections in addition to definitions found in the Contract Conditions:

1. "Wiring" includes wire, fittings, conduit, boxes and other accessories that comprise a system.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements

1. Work shall conform to the requirements of the codes, laws and ordinances of the local authority having jurisdiction, National Fire Protection Association, National Electrical Code (NEC), National Electrical Manufacturer's Association (NEMA) and other authorities having jurisdiction.
2. The requirements of the authorities having jurisdiction shall take precedence over the Drawings and Specifications and changes required by the authorities shall be made after review by the Architect.

1.4 SUBMITTALS

A. Shop drawings are required for the following:

1. Lighting Fixtures (including lighting calculations where required by Specification 265000).
2. Occupancy Sensor/Lighting Control Layout (Layout shall be specific to the project. Generic layouts will not be accepted).
3. Panelboards
4. Wiring Devices
5. Enclosed Switches/Circuit Breakers
6. Motor Starters/Safety Switches
7. Electrical Room Equipment Layout
8. Voltage Drop Calculations
9. Test and Inspection Reports
10. Communications (telephone/data/CATV)

1.5 PROTECTION

A. Protect material and equipment from damage.

B. Cap or plug openings in equipment and conduits with proper caps and plugs.

1.6 VARIANCES

A. Where conflicts exist within the contract documents, request clarification prior to the submission of a bid. If clarification is not requested, provide the work representing the higher cost and quality.

1.7 WARRANTY

A. During the warranty period, make the proper adjustments of systems, equipment and devices installed and perform work necessary to ensure the efficient and proper functioning of the systems, equipment and devices.

B. Certain items of equipment shall be warranted for a longer time than the general warranty period. Provide for service or replacement required in connection with the warranty of these items.

1.8 TEMPORARY POWER AND LIGHT

A. Temporary electric service and lighting is not covered under this Division of the Specifications.

PART 2 - PRODUCTS

2.1 PRODUCTS TO BE USED

A. Items specified by designations such as trade name, manufacturer's name, and catalog number indicate the capacity and quality of the products or materials to be used on this project.

B. Only products indicated on Contract Documents by name, series and/or model number have been coordinated with other trades. Coordinate items of other manufacturers listed with other trades, and make any necessary modifications required by use of the alternate product.

2.2 MATERIALS AND WORKMANSHIP

A. Items shown and not specifically called for, or items specified and not specifically indicated or detailed on the Drawings, or items neither specified nor shown, but which are reasonably incidental to and commonly required to make a complete job, shall be provided.

2.3 FOUNDATIONS AND EQUIPMENT SUPPORTS

A. Provide foundations, supports, curbs and bases for equipment, as indicated or necessary for satisfactory installation and operation of equipment. Furnish and set anchor bolts.

B. Concrete pads shall be 4 inches thick minimum, thicker if necessary to accommodate a particular piece of equipment. Utilize minimum 3500psi concrete. Edges shall be chamfered with outer edge extending 3 inches beyond equipment. Provide concrete pads for floor mounted equipment

C. Floor mounted stands, rods or legs, where required, shall be constructed of structural steel shapes (angles, channels) of Kindorf or Unistrut or steel pipe, and fittings securely braced and fastened to flanges bolted to the floor. Minimum rod size shall be 3/8 inch diameter. Paint steel with rust inhibiting primer.

2.4 ROOF SUPPORTS AND CURBS

A. Provide equipment supports and curbs for the equipment and piping installed on or through the roof. Roof curbs shall be approved for use by the National Roofing Contractors Association and shall be a minimum of 14 inches high. Curbs shall be sloping roof type suitable for pitch of the roof and shall set the equipment level. Curbs shall be double wall insulated type.

B. Provide wood blocking to raise the level of the bottom of the curb to be level with the top of the roof insulation.

C. Pipe curb assemblies shall be constructed of 18 gauge galvanized steel with base plate, raised cant, wood nailer strip and galvanized steel counter flashing. Top shall be provided with acrylic clad ABS plastic cover and graduated neoprene boots secured to cover and pipes by stainless steel band clamps. Pipe curbs shall be Pate Company PCA-5 or Thy Curb.

D. Equipment supports shall be constructed of 18 gauge galvanized steel with base plate, raised cant, wood nailer strip and galvanized steel counter flashing. Equipment supports shall be Pate Company ES-5a or Thy Curb TEMS-1.

E. Where conduits penetrate the roof to feed equipment specified under Division 20, route the conduits through pipe curbs provided under Division 20 or inside the roof curb provided under Division 20.

F. Wherever possible, install conduits to stub up immediately below the rooftop equipment fed by the conduit. Where horizontal routing across rooftop is required, derate cable ampacity per the National Electrical Code.

2.5 HANGERS AND CONDUIT SUPPORTS

A. Provide conduit hangers and supports to maintain required alignment for equipment and conduits.

B. Conduits may not be supported from other conduits. Trapeze hangers may be used for parallel runs of conduit.

C. Provide supports for equipment and materials under these Specifications. Supports shall be structural steel shapes (angles, channels) of Kindorf or Unistrut. Minimum rod size shall be 3/8 inch.

D. For steel bar joist construction, hanger rods shall be supported from the top chord of the joists or from panel points of the lower chord of the joists. Where conduit runs parallel to joists or where hangers are required at other than joist locations, provide steel angles welded to joists to support hangers so that weight is supported from the top chord of the joists.

E. Expansion bolts or wood plugs will not be permitted in slag block walls. Equipment hung on such walls shall be supported by through bolts or approved anchor bolts set into masonry as the wall is laid up.

2.6 OPENINGS, CHASES, LINTELS AND SLEEVES

A. Determine the location and size of chases, lintels and openings necessary for the proper installation of the work and provide them during the erection of the work in which such chases and openings occur.

B. Provide sleeves through walls and floors for conduit. Sleeves through walls shall be flush with the walls.

C. In case cutting of building construction is necessary, including cutting of structural members, such cutting shall be done and repaired to match original condition of the work. Do not cut structural members without Architect’s approval.

D. Where non-combustible conduits pass through sleeves or openings in fire rated wall, floor-ceiling and ceiling-roof assemblies, seal openings with a UL classified firestop method. Firestop method shall be a one part, intumescent (expands with heat), latex elastomer capable of expanding a minimum of three times. Firestop materials shall be UL listed when tested in accordance with ASTM E814 for a two hour fire (F) and temperature (T) rating.

E. If combustible conduit materials are used, a UL listed firestop method shall be provided where the combustible materials penetrate fire rated wall, floor-ceiling and ceiling-roof assemblies. Firestop method shall be classified by UL as a through-penetration firestop device when tested in accordance with ASTM E814 for a two hour fire (F) and temperature (T) rating. Plastic conduit materials, including, but not limited to PVC, CPVC and ABS, are combustible. Firestop method shall be similar to Nelson Firestop Products.

F. Escutcheon plates shall be used to conceal sleeve opening on exposed conduit. Floor plates shall be split, chrome plated, cast brass, similar to Ritter No. 36A.

2.7 IDENTIFICATION

A. Equipment shall be identified with engraved plastic laminate or anodized aluminum nameplates with pressure sensitive backing. Plates shall also be provided with drilled holes and fastened to equipment with moly-rivets. Letters shall be at least 3/8 inch high and larger in proportion to the size of the piece of equipment. Identification shall be the same as noted on schedules on the Drawings. Include voltage and source panel on labels. Label all service disconnects per NEC requirements. Labels shall be provided for the following equipment.

1. Panelboards
2. Motor starting and control switches
3. Disconnects
4. Starters
5. Cabinets

B. Junction boxes and pull boxes, except those located at the fixture or equipment to which system is connected, shall be identified with permanent marker in large legible lettering to indicate system and circuiting on which installed. In exposed areas mark the inside of the cover.

C. Panels shall be provided with a typed directory listing load served and associated circuit numbers.

2.8 FLASHING

A. Conduit passing through the roof shall be provided with conical neoprene boots for any pitch roof with base extending minimum of eight inches from vertical portion of boot. Provide clamp for securing boot to conduit.

B. Flashing assemblies specified above shall be set in place as part of the work under this Division of this Specification, but will be finally installed as specified in another Division of this Specification.

C. Base flashing of conduit and other equipment, if required, is specified in another Division of this Specification. Cap flashings shall be provided to make a water tight seal.

PART 3 - EXECUTION

3.1 MANNER OF INSTALLATION

A. The Drawings showing the layout of the electrical systems indicate the approximate location of outlets and equipment. The runs of feeders and branch circuits as shown on the Drawings are schematic only and are not intended to show the routing and location of conduits. The final determination of routing and location shall be governed by structural conditions, obstructions and connection locations on equipment. Detailed drawings showing major deviations shall be submitted to the Architect for acceptance before such changes are made.

B. The Drawings are generally indicative of the work to be installed, but they do not show all offsets, fittings and similar details required, which shall be provided to meet the job conditions. In areas where work is installed in close proximity to work of other trades or within trades covered by this Division of the Specifications, prepare larger scale drawings consisting of plans and sections to show how work is to be installed in relation to work of other trades.

C. The Architect reserves the right to a reasonable amount of shifting of outlet locations at no additional cost to the Owner until the time of roughing-in the work.

3.2 EXCAVATION AND BACKFILL

A. Provide excavation and backfill necessary to install underground conduits and other work included in this Division of the Specifications. Establish lines and grades required for the proper location of the Work.

B. After the conduit has been placed, the trenches shall be backfilled to the lines of present grades or finished grade as required. No backfill shall be placed, however, until water has been removed from the trenches and joints have been set.

3.3 RECORD DRAWINGS

A. Keep at the site one (1) set of black and white prints for the express purpose of showing changes from the contract Drawings made during construction. Mark up the prints with red pencil during construction and deliver the prints, before final inspection, to the Architect as a final set of “Record Drawings”. Refer to other specification section for additional requirements.

3.4 TESTING

A. Perform tests and inspections as noted below and in specific section for the different electrical systems. Prepare test and inspection reports indicating procedures used, results and corrective action taken to achieve compliance with requirements for items that do not comply with requirements.

B. Tests shall be conducted before equipment is connected that would be subject to damage from the test.

C. Notify the Architect of the date and time of the test at least three days prior to that date.

D. The tests shall demonstrate to the satisfaction of the Architect the following:

1. That lighting, power and control circuits are continuous and free from short circuits.
2. That circuits are free from unspecified grounds, and grounded where specified.
3. That the resistance to ground of non-grounded circuits is at least one megohm.
4. That circuits are properly connected in accordance with the applicable wiring diagrams.
5. That circuits are operable, which demonstration shall include functioning of controls and continuous operation of lighting and power circuits for not less than 1/2 hour.
6. That the resistance of the ground field system does not exceed 5 ohms.

E. Should the performance or capacity of the systems, equipment or devices furnished be questioned by written notice from the Architect after installation, provide necessary test equipment and complete a satisfactory test of the items in question. The test shall be run when and as directed by the Architect and in the presence of his representative. Should the

items furnished not pass such a test, they shall be removed and replaced by systems, equipment or devices satisfactory to the Architect.

F. Refer to Specification 260500 for tests specific to equipment.

3.5 PAINTING

A. Remove rust, scale, grease, and dirt from equipment and material and leave ready for finish painting. Equipment specified with factory baked enamel finish shall be touched up as required to provide a surface visually free of scratches, nicks and blemishes.

3.6 OPERATING AND MAINTENANCE MANUAL

A. Submit operating and maintenance instructions. Unless covered in another specification section, provide a minimum of four copies in three-ring binders and one CD. The manual shall include the following:

1. A brief description of systems and their various components.
2. Full, definite and explicit instructions for starting, stopping, and controlling systems.
3. List of manufacturer's representatives with address and telephone numbers.
4. Manufacturer's printed operating and maintenance instructions, parts lists, illustrations and diagrams for pieces of equipment.
5. One copy of each shop drawing, engineer’s shop drawing review comments, and Contractor's drawings.
6. One copy of other items of equipment where not required as a shop drawing submittal.
7. One copy of each wiring diagram.
8. Manufacturer's data report from UL certifying code compliance for equipment specified.
9. Certificate of field test check by manufacturer's representation of the Fire Detection and Alarm System.
10. Certificate of approval from the code authority.

3.7 FIELD INSTRUCTION

A. Upon completion of work, furnish services of a competent representative to instruct Owner's representative in the proper operation and maintenance of elements of the electrical systems. Submit instructor's name and credentials to the Architect for approval.

B. Spend not less than 2 hours in such formal instruction to prepare Owner to operate and maintain the systems.

3.8 LIGHTING CONTROL SYSTEM COMMISSIONING

A. After lighting control systems are in place and manufacturer’s start-up is complete, perform functional testing to verify proper calibration, adjustment, and programming, in accordance with Contract Documents and manufacturer’s installation instructions. Commissioning Agent shall witness functional performance tests. Where occupant sensors, time switches, programmable schedule controls, photosensors or daylighting controls are installed, the following procedures shall be performed:

1. Confirm that the placement, sensitivity and time-out adjustments for occupant sensors yield acceptable performance.
2. Confirm that the time switches and programmable schedule controls are programmed to turn the lights off.

3. Confirm that the placement and sensitivity adjustments for photosensor controls reduce electric light based on the amount of usable daylight in the space as specified.

B. Installing contractor shall provide operational assistance and documentation required by Commissioning Agent to complete the required commissioning activities.

C. Provide corrective action as required to rectify deficiencies noted in Commissioning Agent's report.

3.9 UTILITY SERVICE COORDINATION

A. Determine from the Owner, Utility Company, Telephone Company, and City or County Departments or Governmental Agency the location of all utility services. Advise the Architect of discrepancies or possible interferences before work commences.

B. Arrange for services with the respective utility companies.

C. Initiate field coordination meeting with utility at project startup to review project requirements, project schedule and provide any final information requested by the utility to maintain proposed project schedule. Notify Engineer or Architect immediately of any items requiring their assistance.

D. It shall be the contractor's responsibility to coordinate with the utility and submit for approval prior to release, fabrication and installation for all proposed metering equipment and arrangements. Any discrepancies shall be brought to the immediate attention of the Engineer or Architect.

3.10 ELECTRIC SERVICE

A. Ducts, conduits and fittings shall be provided as required for the installation. The service installation shall conform to the requirements of the power company and local regulations. Provide structural requirements, manholes, handholes, conduit banks, concrete encasement, etc. as required, associated with the primary service from the property line to the utility company transformer. Provide transformer grounding requirements. Provide a secondary conduit bank, concrete encased if required, from service termination point to transformer pole. The conduit requirements, equipment sizes, and metering arrangement shown on the Drawings are for information purposes only. Verify with the Power Company before making final rough-ins and coordinate the installation with no additional cost to the Owner. Power Company fees shall be paid by the Owner.

3.11 GROUNDING

A. Provide grounding system as shown on the Drawings and as required.

B. Grounds and connections shall be provided in accordance with the latest provisions of the National Electrical Code, and as indicated on the Drawings and specified.

C. Unless otherwise noted, ground conductors shall be of copper, sized as required by the National Electrical Code. Ground lugs and clamps shall be cast non-ferrous metal, bolt-on type. Main ground connections shall be provided with four bolts for connections. Bolts shall be brass. Taps to lugs shall be provided with two bolts.

D. Ground rod connectors shall be Burndy Type GAR or approved equal. Connectors shall be brazed to the ground conductor and ground rod.

E. Ground conductors shall be extended and connected to the main water service piping. Provide bonding jumpers on the main water service piping. Jumpers shall be installed at non-metallic couplings in the main water service piping to a point 10'-0" beyond the

exterior of the building wall. In addition, ground conductors shall be extended and connected to the ground rods in the ground field.

F. Provide ground for service neutral and metallic structures, enclosures, devices, and utilization equipment permanently and effectively in accordance with requirements of the National Electrical Code, and as shown and required. Grounding and bonding connections shall be solderless. Welding of conduit and fittings will not be allowed for bonding purposes.

G. The system neutral ground and the equipment ground system shall be connected to the common ground bus at the main disconnecting device. Service ground shall be extended to the main cold water pipe and the ground field as indicated on the Drawings.

H. Provide a continuous ground conductor around the transformer pad or vault, tied into the ground field, or as required by the utility.

I. The required equipment grounding conductors and straps shall be sized in compliance with National Electrical Code. Equipment grounding conductors shall be provided with green insulation equivalent to the insulation on the associated phase conductors. The related feeder and the branch circuit grounding conductors shall be connected to the grounding bus with approved pressure connectors.

J. Provided a separate green insulated equipment grounding conductor for each feeder and branch circuit. The required grounding conductor shall be installed in the common raceway with the related phase and/or neutral conductors. Flexible metallic conduit equipment connections utilized in conjunction with the above shall be provided with suitable green insulated grounding conductors connected to approved grounding terminals at ends of the flexible conduit.

3.12 MOUNTING HEIGHTS

A. Mounting heights indicated on the drawings provide a general location of the outlets for bidding purposes only. Where mounting height information is not given, or contradicting information is given, request the information from the architect. Field coordinate final location of outlets.

B. Prior to rough-in, coordinate and adjust the location and mounting height of power, data and telephone outlets with architectural casework, shelving, counters, millwork, furniture, or other appurtenance. Adjust locations as necessary to avoid conflicts without having to cut out portions of countertop backsplashes and similar items.

END OF SECTION

SECTION 26 05 00 - ELECTRICAL METHODS AND MATERIALS

PART 1 - GENERAL

1.1 NOTE

A. The requirements of Section 26 00 00 apply to work performed under this Section.

B. The requirements of this Section of the Specifications apply to and form a part of the individual Electrical Sections of the Specifications.

1.2 SCOPE

A. The Work under this Section of the Specification includes the furnishing of labor, materials and equipment for the installation of a complete electrical system as shown and as specified herein.

PART 2 - PRODUCTS

2.1 PANELBOARDS

A. General

1. Provide panelboards constructed in accordance with NEMA Standard PB1 and which bear the UL service entrance label.
2. For main or feeder overcurrent devices with a maximum continuous current trip setting of 1200A or higher, provide device with an arc energy reduction setting, per 2014 NEC 240.87.
3. Provide panelboard enclosures as follows:
   a. General interior – NEMA 1 enclosure.
   b. Exterior work - NEMA 3R enclosure.
   c. Damp Location – NEMA 3R enclosure.
   d. Mounting – as indicated within the contract documents.
4. For multi-section panelboards, provide separate cabinets of the same height and trims for each section, mounted adjacent to one another at the same height.
5. Panelboard enclosures shall contain front hinged to box.
6. Indicate circuit number on or adjacent to circuit breakers and provide a typed circuit directory on the inside of panelboard doors which clearly describes the loads served by breakers. Also provide the following information on the directory:
   a. Panel designation
   b. Voltage, Phase and Amps
   c. AIC rating
   d. Feeder and conduit size
   e. Feeder source and overcurrent protection size.
7. Provide panelboards with copper bus.
8. Provide panelboard assemblies with sufficient ampere interrupting capacity for available fault current. Provide fully-rated panelboard assemblies. Series rating is not permitted.
9. Circuit numbers indicated on plans are to indicate grouping of loads on circuits and do not necessarily indicate actual circuit numbers in panelboard. Arrange circuits such that loads are balanced as closely as practical over the phases and that a branch circuit neutral conductor does not serve as a shared neutral for two or more single phase circuits connected to the same phase in the panelboard.

10. Locate conduits entering flush panels away from the front edge of the panel to allow approximately 2 inches between finished wall surface and conduit.

B. Circuit Breaker Panelboards

1. Subject to compliance with requirements, provide products by one of the following:
   a. Square D
   b. ABB General Electric
   c. Eaton
   d. Siemens
2. Provide bolt-on thermal-magnetic circuit breakers.
3. Provide common trip type two or three-pole breakers. Single pole units with a handle tie are not acceptable. Provide multi-pole breakers for all multiwire branch circuits.
4. Provide circuit breaker type power and distribution panelboards with thermal-magnetic circuit breakers. Breakers feeding HVAC loads shall be HACR rated. When circuit breakers are used in combination with motor starters with overload relay for the protection of motors, provide motor circuit protector (MCP) type breakers with adjustable instantaneous trip which is adjustable and accessible from the front of the circuit breaker.
5. In multi-section panelboards provide conductors required for sub-feed purposes within the panels. Provide sub-feed cables of the same ampacity as the main buses or main circuit breaker. Provide each section of multi-section panelboards with frame rating indicated. Provide sub-feed or through-feed lugs to supply the next section.
6. Provide a minimum of 6" wide gutters where feeders to branch circuit panelboards feed through and tap to panel.

2.2 SURGE PROTECTIVE DEVICES (SPD)

A. Subject to compliance with requirements, provide products by one of the following:

1. Square D
2. ABB General Electric
3. Eaton Cutler Hammer
4. Siemens

B. Where indicated on the drawings, provide SPD units external or integral to equipment that provides both effective high energy surge current diversion as well as attenuation of electrical line noise. Units shall be suitable for applications in ANSI/IEEE C62.41, Location Categories B and C with high exposure levels.

C. SPD units shall be designed for use in parallel connection applications. Series systems that are limited to system current will not be acceptable.

D. SPD units shall conform to the following standards:

1. UL-1449, Fourth Edition
2. UL-1283
3. cUL
4. MIL Standard 220A
5. ANSI/IEEE C62.41.1 – 2002
6. ANSI/IEEE C62.41.2 – 2002
7. ANSI/IEEE C62.45 – 2002

E. SPD units shall conform to the following environmental and operating conditions:

1. Temperature: -40°C to +60°C
2. Humidity: 95% RH, non-condensing atmosphere
3. Operating Altitude: 0-12,000 ft.
4. Frequency: 60 Hz
5. Audible Noise: 35db maximum @ 3ft. from unit
6. Surface Temperature: less than 55°C

F. SPD units shall utilize an individual fused MOV for each mode of operation. At a minimum, there shall be individual fused MOVs in each L-N mode and also a wafer in the N-G mode providing common mode protection.

G. The maximum surge current rating for each SPD unit, based on an 8/20μs test waveform, shall be 240kA per phase for service entrance equipment, 180kA per phase for distribution level equipment, and 100kA per phase for branch level equipment. This rating shall be based on the testing of a complete SPD unit including fuses and all components that make up the SPD system. SPD units that derive a maximum surge current rating by adding test results of individual components shall not be acceptable.

H. SPD units shall be rated as Type 1 for Service Entrance locations. SPD units for downstream locations (distribution or branch level) shall be rated as Type 2.

I. SPD units shall have a Nominal Discharge Current rating of 20kA.

J. The maximum continuous operating voltage for all voltage configurations shall be 115% of nominal.

K. The SPD units shall have been repetitively surge-current-capacity-tested utilizing a 1.2x50μs, 20KV open circuit voltage, 8x20μs, 10KA short circuit Category C3 test waveform at one minute intervals. A failure is defined as either performance degradation or more than 10% deviation of clamping voltage at the specified surge current. At a minimum, SPD units shall be capable of surviving 25,000 impulses without failure or performance degradation.

L. Voltage Protection Rating values shall not exceed the following:

Nominal Voltage	L-N	N-G	L-G	L-L
208Y/120	600	600	600	1200
480Y/277	1200	1200	1200	2500

M. Each phase of the SPD unit shall be fused with fuse capability to allow the rated maximum surge current to pass through the unit without fuse operation. Fusing shall be capable of interrupting up to 200kA symmetrical fault current with 600V applied.

N. Each SPD unit shall be equipped with a display status indication. The display shall have 3 indicating lamps (1 per phase) that remain illuminated under normal operating conditions. Lamps shall extinguish in the event of fuse failure.

O. An audible alarm shall be provided to indicate protection failure. A switch shall be provided to silence the audible alarm, thereby activating a red visible alarm light on the display panel.

P. Each SPD unit shall include a transient voltage surge counter on the enclosure cover. The counter shall be provided with a battery backup capable of storing the number of events in memory when input power is unavailable.

Q. Each SPD unit shall be equipped with form C contacts in order to provide for remote monitoring when so desired.

R. SPD units shall be equipped with a 3-pole breaker to serve as a maintenance disconnect.

S. SPD units not integrally mounted in the electrical equipment shall be housed in a NEMA 1 enclosure (indoor), or NEMA 3R enclosure (outdoor).

T. Where external units are provided, they shall be mounted as close as possible to the bus being protected. In no case shall lead lengths exceed 36".

2.3 SAFETY SWITCHES

A. Subject to compliance with requirements, provide products by one of the following:

1. Square D
2. ABB General Electric
3. Eaton Cutler Hammer
4. Siemens

B. General

1. Horsepower rated switches, of the appropriate size, where applicable.
2. 240 Volt
    a. 30-100 Amp – general duty
    b. 200 and greater - heavy duty
3. Fused
    a. General duty switches - rated 100,000 RMS symmetrical amperes at 240 volts.
4. Cover interlock to prevent operation with cover open.
5. Visible blade
6. Externally handle operated with current carrying parts silver or tin plated.
7. Provisions for two or more external padlocks
8. Capable of accepting copper or aluminum cables.
9. Ground kit and neutral kit as required.
10. Labeled for use as service equipment.
11. Pull out switch type disconnects are not acceptable.

C. Enclosures

1. Provide enclosure at installed locations with the following environmental ratings:
    a. Indoor, dry and clean locations: NEMA 250 Type 1
    b. Indoor damp and wet locations: NEMA 250 Type 3R
    c. Outdoor Locations: NEMA 250, Type 3R
    d. Kitchen or wash down areas: NEMA 250, Type 4X

2.4 FUSES

A. Subject to compliance with requirements, provide products by one of the following:

1. Bussman (basis of design)
2. Mersen (Ferraz-Shawmut)
3. Littlefuse

B. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

1. Type RK-1: 250V and 600V, zero to 600A rating, 200 kAIC time delay.
2. Type L: 600V, 601 to 6000A rating, 200 kAIC time delay.
3. Type L 600V, 601 to 6000A rating, 300 kAIC, fast acting

C. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

2.5 LIGHTING CONTACTORS

A. Subject to compliance with requirements, provide products by one of the following:

1. Square D
2. Eaton Cutler Hammer
3. ABB General Electric
4. Siemens.

B. Electrically operated and mechanically held.

C. Coil voltage: as required for control.

D. Current rating for switching: listing or rating consistent with type of load served. Minimum 30A contact rating.

E. Fault current withstand rating equal to or exceeding the available fault current at the point of installation.

F. Enclosure: NEMA 1 for dry locations, NEMA 3R for damp and wet locations.

G. Switch shall be U.L. listed according to U.L. 508, 10th edition.

2.6 TIMECLOCKS

A. Subject to compliance with requirements, provide products by one of the following:

1. Intermatic
2. Tork
3. Paragon

B. Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917.

1. Contact Configuration: as required for load controlled.
2. Contact Rating: as required for load controlled.
3. Programs: Eight on-off set points on a 24-hour schedule and an annual holiday schedule that overrides the weekly operation on holidays.
4. Circuitry: Allow connection of a photoelectric relay as substitute for on-off function of a program.
5. Astronomic Time: All channels.
6. Automatic daylight savings time changeover.
7. Battery backup to maintain schedules.

2.7 OCCUPANCY/VACANCY SENSOR SWITCHES

A. Subject to compliance with requirements, provide products by one of the following:

1. Sensor Switch (basis of design, model as noted)
2. Leviton
3. Watt Stopper

4. Hubbell
5. Lutron
6. Crestron

B. Unless otherwise noted, all sensors for interior applications (excluding corridors, stairways, restrooms, primary building entrance areas, lobbies, and parking garages) shall be wired as vacancy sensors (manual on, automatic off).

1. Ceiling-mount sensors shall achieve manual-on via low-voltage wall station.

C. All sensors shall utilize dual technology (infrared and ultrasonic).

D. Sensor layout indicated on drawings is for reference only. Submit a sensor layout by sensor manufacturer indicating exact placement of devices and coverage area of each sensor.

E. Ceiling-mount

1. Ceiling sensors shall be rated for 120/277V operation, up to 2000 square feet coverage area, surface-mountable to suspended ceiling.
2. Provide low voltage power packs as required. Each power pack shall be capable of accepting at least six sensors.
3. Sensors shall be equipped with the following: adjustable timer settings; self-adjusting technology to minimize nuisance switching; low voltage auxiliary relay/contacts; optional ambient light sensing override.
4. Basis-of-design product is Sensor Switch CM PDT 10.

F. Low Voltage Wall Station

1. Low voltage wall stations shall be configured for manual on operation to comply with energy code requirements. Stations shall include soft-click buttons and LED indicator lights, and shall be designed for use with low voltage ceiling sensors and related power packs.
2. Provide 0-10V dimming control where indicated on Drawings.
3. Basis-of-design product is Sensor Switch sPODM series.

G. Long-range

1. Wall-mounted long range sensors shall be rated for 120/277V operation, designed for corridor applications, with a coverage area of 130' x 20' at a 10' mounting height.
2. Provide low voltage power packs as required.
3. Sensors shall be equipped with the following: adjustable timer settings; optional ambient light sensing override.
4. Basis-of-design product is Sensor Switch HW13.

2.8 PHOTOELECTRIC SENSORS

A. Subject to compliance with requirements, provide products by one of the following:

1. Intermatic
2. Tork
3. Paragon

B. General

1. Solid state with dry contacts rated for intended load.
2. Light level monitoring range: 1.5 to 10 fc with an adjustment for turn on/off levels with that range.

3. Directional lens in front of photocell to prevent fixed light sources from causing turn off.
4. 15 second time delay to prevent false operation.
5. Surge protection.

2.9 WIRING DEVICES

A. Subject to compliance with requirements, provide products by one of the following:

1. Hubbell
2. Leviton
3. Pass & Seymour

B. Lighting switches:

1. Single pole, Three-way and Four-way
2. Rocker type
3. Back and side wired
4. Commercial specification grade
   a. 120/277V
   b. 20A
5. Color per Architect

C. Receptacle outlets:

1. Duplex or simplex as noted.
2. Polarized grounding
3. Back and side wired
4. Commercial specification grade
   a. 120V
   b. 20A
5. Tamper resistant where required
6. Color per Architect.

D. GFI outlets:

1. Duplex
2. Commercial specification grade
   a. 120V
   b. 20A
3. Tamper resistant where required
4. Weather-resistant type in wet or damp locations
5. Self-testing with red LED for lost capability to provide protection.
6. Color per Architect

E. Wiring Device Coverplates:

1. Interior use
   a. standard sized
   b. sheetmetal
   c. satin finished stainless steel
   d. Color per Architect
2. Exterior use or in damp or wet locations:
   a. Specification grade
   b. Weatherproof cast aluminum construction
   c. Gasketed plate & device covers

d. U.L Listed for its intended use as follows:
   i. Type 1: U.L. Listed & suitable for wet locations while in use (plug inserted at all times). Where “Low Profile” cover is indicated on Drawings, provide recessed in-use box and cover, Arlington InBox or approved equal.
   ii. Type 2: U.L. Listed & suitable for wet locations for portable tools and/or equipment connected to an outlet only when attended. Cover to be closed and sealed when not in use.

F. Provide appropriate DS covers on exposed FS boxes. Plates on narrow partitions or in locations too narrow for standard width plates shall be 1-11/16 inches wide, single or two gang tandem.

2.10 BOXES AND FITTINGS

A. Provide metal boxes manufactured by one of the following:

1. ABB/Steel City
2. ABB/Thomas & Betts
3. Raco
4. Crouse-Hinds
5. Walker

B. Provide non-metallic boxes as follows:

1. Constructed of:
   a. PVC
   b. Fiberglass
   c. Noryl compounds
2. UL listed to comply with the two (2) hour fire test done in accordance with ASTM E-119.
3. Suitable for use in electrical work.

C. Provide pressed steel galvanized boxes, #14 gauge minimum, for boxes less than 50 cubic inches installed:

1. flush in walls and concrete slabs
2. above removable ceilings and similar spaces
3. exposed at ceilings of unfinished spaces

D. Provide O-Z/Gedney type "FS" or "FD" cast aluminum device boxes, equipped with matching covers for boxes less than 50 cubic inches accommodating wiring devices installed:

1. flush in exterior locations
2. exposed on walls of unfinished interior spaces

E. Provide boxes 50 cubic inches and larger and wire troughs as follows:

1. Constructed of sheet steel
2. Equipped with flat sheet steel covers held in place with round headed machine screws
3. Weld and grind joints to remove burrs.
4. Provide hot dip galvanized boxes and covers.
5. Provide covers to flush boxes which overlap box approximately 3/4 inch on sides.

F. Provide pull boxes, junction boxes and wire troughs indicated in the construction documents, or required by field conditions or the National Electrical Code to facilitate wiring installation. Obtain approval prior to installing boxes in finished areas.

G. Provide a 4 inches square, 1-1/2 inches deep or larger box with appropriate raised covers or plaster rings for flush mounted switches and receptacles.

H. Locate boxes in face block, brick or tile walls at the course line and fit with square tile covers similar to Raco Series 782 or 792, or ABB/Steel City Series GW where walls are 6 inches or more in thickness.

I. Provide 4 inch octagonal boxes for ceiling and wall recessed outlets for lighting fixtures, except where required by fixture design.

J. Where switches and receptacles are indicated in close proximity to each other provide one multi-gang box with single plate. Install one device in each gang. Use solid gang boxes or sectional boxes for three or more devices.

K. Provide gang boxes containing both low voltage or communications system wiring and branch circuit conductors or containing normal and emergency system wiring equipped with internal barriers to separate the two systems as required by the National Electrical Code.

L. Do not use, unless specifically indicated, through-wall boxes or boxes mounted back-to-back.

M. In fire-rated assemblies, install boxes in a manner listed for such purpose.

N. Mount flush boxes in or exposed on walls plumb. Install flush boxes such that the distance between the lip of the box and the wall is less than 1/8 inch. Mount receptacles vertically, unless noted otherwise.

O. Provide gasketed covers for boxes in exterior, damp, or wet locations.

P. Provide a foam seal gasket behind every wiring device coverplate located on an exterior wall. Gasket shall be made of UL-listed flame retardant foam, and shall be designed to prevent air infiltration through and around the wiring device.

Q. Provide blank stainless steel device plates as covers for pressed steel pull and junction boxes installed flush in walls of finished areas. Provide flat galvanized steel covers for pressed steel pull and junction boxes in other locations.

R. Provide rigid-wall plastic conduit and ENT fittings made by the same manufacturer and conforming to the same standards as their respective conduits.

S. Provide device-specific cover plates for boxes used to accommodate wiring devices.

T. Provide two-point support for wall and ceiling mounted boxes whose largest surface is less than 200 square inches in area. Provide additional support where the conduit system in conjunction with these supports does not provide a rigid installation. Provide a minimum of four-point support for boxes whose largest surface exceeds 200 square inches in area.

U. Provide 3/8 inch threaded steel rod studs, securely anchored to the building, which pass though the center knockout in the back of boxes for connection and support of lighting fixtures weighing 50 pounds or more.

V. Provide sheet steel pull and junction boxes and wire troughs with metal gauges as follows, the dimensions being those of the largest surface:

Maximum Dim. Inches	Maximum Square Inches	Box Gauge	Cover Gauge
26	600	16	14
40	1000	14	12
60	1500	12	12
over 60	over 1500	10	10

W. Provide wire troughs as follows:

1. Steel enclosed wireway
2. UL listed and labeled for use and application
3. 16 gauge steel for size 6" x 6" and smaller
4. 14 gauge steel for larger sizes.
5. Raintight when installed in wet or damp locations
6. Manufactured by Square D, General Electric, Siemens, Cutler-Hammer, Hoffman, Rittal Corp, or Keystone.

2.11 GROUND RODS

A. Ground rods shall conform to UL 467 and shall be made of copper-clad steel. Rods shall be one piece, 5/8 inch diameter, and 10 feet in length. All connections to ground rods shall be by exothermic weld.

2.12 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Quazite
2. Armorcast Products Company
3. New Basis
4. Carson Industries

B. Description: Comply with SCTE 77 for load rating of enclosure and cover.

1. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or a combination of the two.
2. Configuration: Units shall be designed for flush burial and have open bottom, unless otherwise indicated.
3. Cover: Nonskid, weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Legend: Molded lettering, suited to type of service.
5. Size: Where not indicated on Drawings, provide handholes sized per National Electrical Code to accommodate conduit entry and cable bending space required.

2.13 CONDUCTORS

A. Provide soft drawn, 98 percent conductivity, copper conductors with 600 volt insulation, and manufactured in accordance with the requirements of the National Electrical Code, the Board of Fire Underwriters, A.S.A., N.E.M.A. and I.C.E.A.

B. Unless specifically noted otherwise on Drawings, feeders and conduits are sized for copper.

C. Aluminum conductors may be used on the project for feeders 100 ampere or larger. Size aluminum conductors and conduits for the same ampacity and voltage drop. Submit as a shop drawing, a list of all feeders proposed to be aluminum, including sizes for phase-neutral-ground conductors, conduit sizes and voltage drop calculations. Make terminations for aluminum wire using Burndy Type YA-A one hole aluminum compression terminal lugs, factory filled with Penetrox; or Ilsco type CPM Copper Pigtail, adapter factory filled with DE-OX. Select termination type to match equipment termination requirements. Install per manufacturer's recommendations. Provide aluminum wire made of AA-8000 series electrical grade aluminum alloy conductor material. Provide UL listed aluminum wiring. Provide wiring type "THHN"-THWN" insulation for use as specified hereinafter, which is adequately color coded for identification.

D. Provide conductors with 90 °C "THHN-THWN" insulation.

2.14 CABLE

A. Metal clad cable

1. Provide type "MC" cable with galvanized steel armor, "THHN/THWN" 90º C, 600 volt, insulated copper conductors and insulated green grounding conductor.
2. Comply with Federal Specification A-A-59544 and bears the UL label.

B. Service entrance cable

1. Provide aluminum type "SE" cable (R) with sunlight resistant PVC jacket, reinforcement tape and color coded phase conductors with THHN/THWN insulation.
2. Comply with Federal Specification A-A-59544 and bears the UL label.

2.15 RACEWAYS AND WIRING METHODS

A. Rigid metal conduit (RMC)

1. Galvanized threaded heavy-wall steel conduit and threaded couplings
2. Comply with UL 6 and ANSI Standard C80.1.

B. Electrical Metallic Tubing (EMT)

1. Galvanized steel conduit
2. Comply with UL797 and ANSI C80.3.
3. Couplings and box connectors for use in concrete and masonry walls:
   a. concrete-tight
   b. steel
   c. compression ring type
4. Couplings and box connectors for all other locations:
   a. steel
   b. set-screw type

C. Flexible metal conduit

1. Zinc coated steel.
2. Comply with UL 1.

D. Liquid tight flexible metal conduit

1. Flexible steel conduit with PVC jacket.
2. Comply with UL 360.

PART 3 - EXECUTION

3.1 EQUIPMENT CONNECTIONS

A. Conduit, outlets, wiring and other necessary fittings or accessories for power connections for heating equipment, fans and special furnishings shall be provided under this Section. Motor and equipment of different ratings shall be furnished, and circuit components shall be adjusted accordingly.

B. Make final connections to electrical equipment, whether equipment is specified under this Section or other Sections of the Specifications.

3.2 PANELBOARDS

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install filler plates in unused spaces.

C. For recessed panelboard locations, provide (1) 3/4” inch empty conduit, from panelboard up to accessible ceiling space, for every three spare single pole breaker and/or spaces in the panel (at least one per panelboard), unless otherwise indicated.

3.3 WIRING DEVICES

A. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for device boxes with routers that are guided by riding against outside of boxes.

B. Clean boxes prior to installation of devices.

C. When conductors larger than what is recommended for termination by the manufacturer are installed, splice #12AWG pigtails for device connection. Do not exceed box fill requirements.

D. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

3.4 SAFTEY SWITCHES

A. Coordinate layout of switches to maintain required workspace clearances and clearances/access for equipment access doors and panels.

B. Install fuses in fusible switches.

3.5 FUSES

A. Main Devices

1. 601 to 6000A Class L, time delay.
2. 60 to 600A: Class RK1, time delay.

B. Feeders

1. Class RK1, time delay

C. Motor Circuits Protection

1. Class RK1, time delay.

D. Large Motor Circuits Protection (601-4000A)

1. Class L time delay

E. General Branch Circuit Devices

1. Class RK1, time delay.

F. Fuses shall not be installed until installation is complete. Fuses shall be installed on the job site; they shall not be installed in equipment at the factory and shipped in place in the equipment.

G. Fuses shall be of the same manufacturer and shall be of the sizes indicated. Where not indicated, fuses shall be of the proper size for the equipment protected.

H. Provide one (1) set of fuses in fuse spaces and leave one (1) replacement set in facility in a fuse cabinet.

I. Requests for change in manufacturer or fuse types from that specified below shall be accompanied by a complete coordination study indicating the suitability of the proposed changes.

3.6 MOTORS, EQUIPMENT, CONTROLS AND CONTROL WIRING

A. Motors, air handling units, compressors, etc., and built-in control devices will be provided under other Sections unless noted otherwise.

B. Provide control connections for devices and equipment.

C. Provide power connections for equipment furnished under other Sections.

D. The installation, connections and operation of controls not noted will be done under other Sections, including provisions for conduits, wiring, outlet boxes, control components and connections.

E. Control wiring shall be in accordance with the drawings and/or manufacturer's certified and approved wiring diagrams.

F. Control wires shall be marked with "E-Z" tape markers at terminal points. Terminal blocks shall be marked to correspond to wire terminated.

G. Provide conduit and wires, install and connect control equipment (starters, push buttons, etc.) and connect motors, air handling units, air conditioning equipment, and built-in control devices, in accordance with wiring diagrams furnished under other Sections.

3.7 CONDUCTOR AND CABLE APPLICATIONS

A. Service Entrance (customer side of meter): Type THHN/THWN, single conductors in raceway

B. Exposed Feeders: Type THHN/THWN, single conductors in raceway

C. Feeders concealed in ceilings, wall, partitions and crawl spaces: Type THHN/THWN, single conductors in raceway.

D. Feeders concealed in concrete, below slabs on grade and underground: Type THHN/THWN, single conductors in raceway.

E. Exposed branch circuits: Type THHN/THWN, single conductors in raceway.

F. Branch circuits concealed in ceilings, walls, partitions and crawl spaces:

a. Type THHN/THWN, single conductors in raceway.

b. MC cable (#8 AWG and smaller)

G. Branch circuits in concrete, below slabs on grade and underground:

a. Type THHN/THWN, single conductors in raceway.

3.8 CONDUCTOR AND CABLE INSTALLATION

A. Sizes are AWG or kcmil. Minimum size for power and lighting circuits is #12. Minimum size for 120 volt control circuits is #14. Minimum insulation rating of conductors is 600 volts.

B. Provide stranded wire for No. 8 and larger. Make conductors continuous from outlet with no splices made except within outlet or junction boxes.

C. Conceal cables in finished walls, ceiling and floors unless otherwise indicated.

D. Use manufacturer approved pulling compound or lubricant where necessary. Compound used must not deteriorate conductor or insulations. Do not exceed manufacturer's recommended maximum pulling tensions.

E. Install concealed and exposed cables parallel and perpendicular to structural members.

F. A color coding system shall be as follows throughout the building's network of feeders and circuits and used as a basis of balancing the load. The color code shall be continuous from fixture to fixture or other outlet.

Color System	Phase A	Phase B	Phase C	Neutral
240/120V	Black	Red	N/A	White

G. Wire and cable shall be delivered to the job site in full coils or reels, each bearing a tag containing the UL approval stamp, name of manufacturer, trade name, code, type of wire, and month and year manufactured.

3.9 RACEWAY APPLICATIONS

A. Outdoors:

1. Exposed Conduit: RMC
2. Underground Conduit: PVC Sch 40 except within 5'-0" of foundation walls and pole bases use RMC.
3. Stub-ups into pole and equipment bases: RMC.
4. Electric, Telephone and CATV utilities: RMC and PVC Sch 40 as required by local utility company requirements.

B. Indoors:

1. Exposed (not subject to physical damage): EMT
2. Exposed (subject to physical damage): RMC
3. Concealed in ceilings, interior walls and partitions:
    i. MC cable but transition to EMT within 5'-0" of existing wall/partition and for all homeruns back to panelboard.
4. Connection to vibrating equipment:
    a. Interior dry locations: FMC
    b. Interior/Exterior damp and wet locations: LFMC

c. The use of LFNC is not permitted.

5. Damp or wet locations: RMC
6. Hazardous locations: RMC
7. Below slab: PVC

C. Raceways embedded in concrete:

1. Polyvinyl Chloride Conduit (PVC)
   a. Provide PVC conduit, up to and including 1-1/4 inch size, in concrete floor slabs with the following limitations:
      i. Minimum concrete cover - 3/4 inch.
      ii. Spacing - 3 diameters apart.
      iii. Installed between the bottom and top reinforcing.
      iv. Conduit outside diameter no more than 1/3 the slab thickness.
      v. Conduits are wired to reinforcing in reinforced slabs secured at regular intervals to the structural slab system.
      vi. Integrity of the slab waterproofing is not disturbed.

3.10 RACEWAY INSTALLATION

A. Minimum Raceway Size: 3/4” trade size. 1/2” may be used for control cabling.

B. Raceway Fittings: compatible with raceways and suitable for use and location.

C. Do not fasten conduits onto the bottom side of a metal roof deck.

D. Run conduits and cabling parallel and perpendicular to structural members.

E. Install no more than the equivalent of three 90 degree bends in any conduit run.

F. Provide bushings on the ends of all conduits.

G. Install pull wires in empty raceways. Utilize polypropylene or monofilament plastic line with not less than 200 lb tensile strength.

H. Install devices to seal raceway interiors at accessible locations in the following locations:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Heated to unheated spaces.
3. Where otherwise required by the NEC.

I. Provide expansion joint fittings in the following locations:

1. Where conduits cross building or structure expansion joints
2. Exposed above ground runs of PVC that has a straight run length that exceeds 50 feet.

J. Use a maximum of 6’-0” of flexible conduit or MC cable for connection to recessed/semi-recessed light fixtures, transformers and equipment subject to vibration.

K. Bends in conduits for high voltage, telephone, data, television and similar cables shall be made with wide-sweep field bends. Radius of wide sweep bends shall be as required by the National Electrical Code for conduits containing cables with lead sheath. No manufactured elbows permitted.

L. Conduits in close proximity to one another in concrete slabs (at panelboards, etc.) shall be located and wrapped with wire mesh to prevent cracking of slab.

M. Conduits shall be installed concealed in walls, floors and above ceilings throughout, except as follows:

a. Where suspended ceilings are not provided, and the restrictions below prohibit conduit installation in concrete slab.
b. In vertical shafts, electrical closets, mechanical and electrical equipment spaces, etc. where concealment is not practical.
c. At surface-mounted panelboards in otherwise finished spaces, limited to vertical runs above and below panel.
d. Where required for equipment connections.

3.11 WIRING METHODS

A. Cable methods shall conform to the National Electrical Code requirements and these Specifications and shall produce a complete, safe, well-built electrical system.

B. Conduit nipples connecting outlets in adjoining rooms shall be packed with Johns-Manville "Duxseal" after wires are in place to prevent transmission of noise between rooms unless nipples are 12 inches or more in length.

C. Provide blank cover plates for unused data outlet assemblies.

D. Provide wallplate blanks for unused data termination ports.

E. Provide a grounded (“neutral”) conductor at each light switch location.

F. Any slab penetrations shall be coordinated with the structural engineer. If core drills are required after slabs have been poured, provide X-ray survey to identify and avoid structural elements such as post tension cabling.

G. Where electrical equipment or material is installed in or through fire-rated building elements, provide appropriate UL-listed firestop material to maintain the rated integrity of the affected surface.

H. Provide fiberglass fire-rated outlet boxes or listed putty pads where required to maintain fire rating of wall.

3.12 APPLICATION OF HANDHOLES AND BOXES FOR UNDERGROUND WIRING:

A. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: SCTE 77, Tier 15 structural load rating.

B. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: SCTE 77, Tier 8 structural load rating.

C. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf vertical loading.

D. Provide 12” compacted stone base under handhole and extending 6” from all sides.

3.13 SPLICES AND TERMINATIONS

A. Splices in branch circuits and control wiring shall be made with 3-M Company "Scotchlocks", Ideal "Wirenuts" or equivalent. Splices shall be insulation rated for 90ºC at 600 volts.

B. Splices, taps and terminations for feeder and motor wiring shall be made with approved set screw mechanical taps, sleeves or lugs. Provide terminations with a minimum 75ºC rating at 600 volts.

C. Vinyl electrical tape shall be 90ºC, 600 volt insulation rated for use whenever added insulation is required. Rubber and friction tape shall not be used.

3.14 TESTING

A. Panelboards

1. Perform Tests and Inspections
   a. Test continuity of each circuit.
   b. Perform each visual and mechanical inspection test for low-voltage air circuit breakers stated in NETA ATS, Paragraph 7.6 Circuit Breakers. Certify compliance with test parameters.
      i. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
2. Adjusting
   a. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
3. Prepare and submit test and inspection reports.

B. Disconnect Switches

1. Perform tests and inspections:
   a. Visual and Mechanical Inspection:
      i. Inspect physical and mechanical condition.
      ii. Inspect anchorage, alignment, grounding, and clearances.
      iii. Verify unit is clean.
      iv. Verify blade alignment and mechanical operation.
      v. Verify fuse sizes and types match the specifications and drawings.
      vi. Verify tightness of bolted electrical connections.
   b. Prepare and submit test and inspection report.

C. Wiring Devices

1. Perform the following tests and inspections
   a. Test Instruments: Use instruments that comply with UL 1436.
   b. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
   c. Test for Receptacles:
      i. Line Voltage: Acceptable range is 114 to 126 V.
      ii. GFCI Trip: Test using integral test/reset buttons.
      iii. Using the test plug, verify that the device and its outlet box are securely mounted.
2. Wiring device will be considered defective if it does not pass tests and inspections.
3. Prepare and submit test and inspection reports.

END OF SECTION

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SECTION 26 50 00 - LIGHTING

PART 1 - GENERAL

1.1 SCOPE

A. Provide a lighting fixture for each lighting fixture symbol shown on the Drawings, of the type and quality described herein and on the drawings. Fixtures shall be installed complete with lamps of the wattage indicated, sockets, housing, driver, shades, diffusers and supports, and wired for operation.

1.2 SUBMITTALS

A. Submit product data for each lighting fixture type. Cut sheets shall indicate all options/accessories being provided.

B. When alternate interior fixtures than the basis of design are proposed (and allowed by owner), submit a photometric plan indicating point-by-point footcandle levels. Photometric plan shall include a schedule indicating all data relevant to the calculation (ies file used, LLF, average, avg-to-max, max-to-min, etc.).

C. When alternate exterior fixtures than the basis of design are proposed (and allowed by owner), submit a site lighting photometric plan encompassing all fixture locations/mounting heights including calculation points beyond property lines, building emulations (with proper reflective values and height plus canopies), statistical readings, LLF of .85 for all fixtures, and schedules on the photometric plan indicating items referenced above.

PART 2 - PRODUCTS

2.1 LIGHTING FIXTURES

A. Provide fixtures according to the designation indicated on the plans. Fixture designations are explained and specified in the Lighting Fixture Schedule.

B. Where a letter designating fixture type is adjacent to a row of fixtures, it shall be understood that fixtures in the row shall be of the same type and shall consist of the total lengths indicated. Although the descriptions of the fixtures described may refer to 4 foot units, 2 foot, 3 foot, and 8 foot units may be used where applicable to obtain the fixture length necessary.

C. Construction Features

1. General Requirements
    a. Provide galvanized support hangers, channels and bolts.
    b. Provide rustproof exterior hardware such as screws, nuts, washers and anchor bolts.
    c. Provide stem suspended fixtures with self-aligning type semi-rigid ball joints so that fixtures hang level with vertical stems.
    d. Fixtures shall be wired for polarized system with one wire in each fixture to be distinctly marked for its entire length. Wire shall bear the UL label.
    e. Verify fixture finishes with Architect prior to ordering.
2. Exterior Fixtures:
    a. Cast aluminum housing, unless noted.
    b. UL Listed for damp or wet location, as required.
    c. Weatherproof gasketing.

d. Corrosion resistant stainless-steel hardware.

2.2 LED FIXTURES

A. General

1. Refer to lighting fixture schedule on drawings for manufacturer and fixture information.
2. Individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
3. Lumen output shall not decrease by more than 20% over the minimum operational life of 50,000 hours.
4. Provide thermal management to ensure proper operation of luminaire over its expected useful life. Thermal management shall be passive type only.

B. Driver

1. 120-277V, UL-listed, CSA-certified. Driver shall be at least 80% efficient at full load.
2. Driver shall be suitable for continuous 0-10V dimming without perceivable flicker over a range of 100% to 5% of rated lumen output with a smooth shutoff function.
3. Provide driver disconnect per NEC requirement.
4. Ambient Temperature Range:
   a. Indoor air conditioned/heated spaces: -20 ºC to 40 ºC
   b. Indoor heated/ventilated only spaces: -20 ºC to 50 ºC
   c. Outdoor: -40 ºC to 40 ºC

2.3 EMERGENCY BATTERY PACK (INTEGRAL TO FIXTURE)

A. Subject to compliance with requirements, provide products by one of the following:

1. Bodine
2. Iota
3. Lithonia Power Sentry
4. Dual Lite

B. General Requirements:

1. Provide factory-installed battery pack where indicated on Drawings
2. UL 924-listed to provide indicated lumen output for 90 minutes. If lumen output is not indicated unit shall provide a minimum of 1000 lumens.
3. Provide remote test switch if test switch is not integral to fixture.

2.4 EXIT SIGNS

A. General Requirements:

1. Operating input voltage: 120/277V
2. Red or Green lettering as required by the AHJ.
3. UV stabilized white thermoplastic housing.
4. Integral nickel cadmium battery for self-powered exit signs.
5. UL 924-listed.
6. Integral dual led heads where indicated.
7. Integral self-diagnostic capability.
8. Ceiling or wall mounted.
9. Removable chevrons.
10. Single and dual sided as required.

2.5 SITE LIGHTING POLES

A. Square

B. Straight

C. Steel

D. Height as indicated.

E. Wall thickness as required to meet E.P.A. requirements for fixture assembly.

F. Provide with handhole access at base of pole.

G. Provide with powder coat finish. **Color as selected by Architect.**

2.6 LIGHTING FOUNDATIONS AND ANCHORS

A. Provide cast-in-place galvanized steel anchor bolts with bolt pattern to match fixture base. Provide galvanized steel nuts and washers.

B. Provide cast-in-place concrete pole foundations. Refer to drawings for details.

PART 3 - EXECUTION

3.1 LOCATION

A. Coordinate the location of lighting fixtures with the Architect before final installation. Allow for a reasonable amount of shifting of fixture locations.

B. Consult the Architect's reflected ceiling plans and the installer of the ceilings to ensure that fixtures are properly aligned, ventilated and located.

C. Coordinate actual fixture depths with piping, duct work, bulkheads, etc. prior to rough-in.

D. Install exit signs above a doorway with two active leafs that swing in opposite directions centered above egress leaf, not centered above the doorway.

3.2 INSTALLATION

A. Provide "Earthquake" hold down clips on recessed fixtures where required by AHJ.

B. Provide necessary accessories, as required, to support the fixtures independently of the ceiling suspension system. Securely fasten box and fixture supports to structural system main supports. Where fixtures are surface mounted, cut neat holes in the hung ceilings as required for the fixture supports.

C. Provide at least two (2) grid drop wires, 12 gauge minimum, supported from building structural system on recessed fixtures. Provide additional support wires where required by AHJ.

D. Lighting fixtures installed in rated walls or ceilings shall be listed for the purpose or suitably tented with approved material.

E. Wire emergency light units, emergency battery pack and exit lighting fixtures with unswitched circuit leg, unless otherwise noted.

F. Test all fixtures for proper operation and correct any deficiencies.

END OF SECTION

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SECTION 27 05 00 - COMMUNICATION SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. The requirements of Sections 26 00 00 and 26 05 00 apply to work performed under this Section.

B. The Work covered under this Section of the Specifications includes the installation of complete telephone and data systems as shown on the Drawings, or as hereinafter specified, and as directed by the Architect. All items of labor, materials and equipment, not specified in detail or shown on the drawings but necessary for complete installation and proper operation of work described or implied, shall be furnished and installed.

C. Coordinate the installation with other trades to ensure proper fit, adequate clearances and to avoid interferences with piping, ductwork, conduit, architectural features and structural elements.

D. Arrange and coordinate the installation of building services with the applicable utility companies.

E. IMPORTANT!! PLEASE NOTE THAT this specification references the Delaware State-Wide Information And Architecture Standards, Standard ID: NE=Cabling-002, Title: Structured Cabling System Standards and Specifications for State-Managed Facilities, Domain: Network and Storage, Discipline: Cabling, Revision Date: 2/20/2019, Revision no.: 8, Original date: 7/21/2008 Reviewed: 1/29/2021. As such this document shall be considered as part of this specification. Unless otherwise shown in the project drawings and or specified in the project specifications, all work, materials, standards, etc. called for in the above mentioned document shall be provided. NOTE: At the end of the above mentioned document is a link to the certified contractors list for the work covered under this specification and the above mentioned document. Only contractors listed on this link are permitted to perform the work covered under this specification and the above mentioned document as indicated.

1.2 QUALITY ASSURANCE

A. As applicable, work shall be provided and installed in accordance with the following regulations, standards and publications:

1. NEC - National Electrical Code
2. ASTM - American Society for Testing and Materials
3. UL - Underwriters' Laboratories
4. IPCEA - Insulated Power Cable Engineers Association
5. NEMA - National Electrical Manufacturers Association
6. IEEE - Institute of Electrical and Electronic Engineers
7. ANSI - American National Standards Institute, Inc.
8. BOCA - Building Officials and Code Administrators

9. ISA - Instrument Society of America
10. NESC - National Electrical Safety Code
11. ADA - Americans with Disabilities Act
12. TIA - Telecommunications Industry Association
13. EIA - Electronics Industry Association
14. FM - Factory Mutual Engineering Corp.
15. FCC - Federal Communications Commission

B. Reference Standards

1. EIA/ECA-310 - Cabinets, Racks, Panels, and Associated Equipment.
2. ICEA S-83-596 - Indoor Optical Fiber Cable.
3. NFPA 70 - National Electrical Code.
4. TIA-455-21 - FOTP-21 - Mating Durability of Fiber Optic Interconnecting Devices.
5. TIA-492CAAB - Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak.
6. TIA-526-14 - Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant; Modification of IEC 61280-4-1 Edition 2, Fiber-Optic Communications Subsystem Test Procedures- Part 4-1: Installed Cable Plant-Multimode Attenuation Measurement.
7. TIA-568.3 - Optical Fiber Cabling and Components Standard.
8. TIA-598 - Optical Fiber Cable Color Coding.
9. TIA-568-C.3 - Optical Fiber Cabling Components Standard.
10. TIA-598-D - Optical Fiber Cable Color Coding.
11. TIA-606 - Administration Standard for Telecommunications Infrastructure.
12. TIA-607-C - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.
13. UL 444 - Communications Cables.
14. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
15. UL 1651 - Fiber Optic Cable.

C. The installation shall comply with all Federal, State, and local laws, rules and/or regulations.

D. All electrical equipment and its components and materials shall be new and shall meet all applicable UL criteria and bear the appropriate label of the Underwriters' Laboratory.

E. For each system, the electrical equipment and apparatus shall be the product of a single manufacturer and shall be suitable for use as a unified system.

1.3 SUBMITTALS

A. Submit the manufacturer and model number for all equipment specified for the work contracted. At a minimum, shop drawings shall be submitted for the following:

1. Cables
2. Cable Tray
3. Outlets, Jacks and Faceplates
4. Termination Equipment
5. Equipment Racks
6. Terminal Backboard Enclosures

B. In addition, shop drawings shall include riser diagrams and scaled plans showing equipment locations and types; devices locations and types; wire routing, sizes and types; and conduit routing and sizes.

C. Shop drawings shall clearly indicate the item(s) being submitted.

D. Review of shop drawings does not relieve the Contractor of responsibility for complying with the Contract Documents.

E. Include in shop drawings, equipment layouts within rooms and closets showing equipment sizes as well as clearance requirements for operation and maintenance. Verify that the physical dimensions of equipment being provided comply with the layouts shown within the contract documents. Any adjustments or modifications needed shall be provided at the contractor's expense.

F. Provide samples when requested.

1.4 DELIVERY, HANDLING AND STORAGE

A. Ensure that all system equipment, devices and materials arrive at the designated installation site in good condition, intact in factory packages or crates. Any equipment found to be damaged shall be removed from the project site and replaced by the Contractor at no additional cost.

B. Storage - Store all equipment, devices and materials in their factory containers or packages until ready for use. Storage facilities shall be a clean, dry and indoor space, which provides protection against the weather. Avoid damage by condensation by providing temporary heating when required. Large reels of cable may be stored outdoors provided there is adequate protection from physical damage and the cable ends are properly sealed to prevent moisture ingress. Storage related costs shall be the responsibility of the Contractor. As necessary, coordinate the storage of all materials and equipment.

C. Handling - Handle all equipment, devices and materials carefully to prevent breakage, denting or scoring of the finish or cable jackets. Damaged materials shall be removed from the project site, and replaced by the Contractor at no additional cost. No sheath cuts will be accepted. All cables must be installed with sheath intact to the point of termination.

D. Any cable found to be damaged or defective shall be replaced by the Contractor at no additional cost.

1.5 WORK NOT INCLUDED

A. Handsets, PBX equipment, computers, printers, video equipment and software shall be furnished, installed and configured by the Owner.

1.6 WARRANTY

A. A fifteen (15) year Extended Product Warranty and Systems Assurance Warranty shall be provided by the Manufacturer as follows:

1. Extended Product Warranty: The Extended Product Warranty shall ensure against product and workmanship defects, that all approved cabling components exceed the specifications of TIA/EIA 568A and ISO/IEC IS 11801, exceed the attenuation and NEXT requirements of TIA/EIA TSB 67 and ISO/IEC IS 11801 for cabling links/channels, that the installation will exceed the loss and bandwidth requirements of TIA/EIA TSB 67 and ISO/EIC IS 11801 for fiber link/channels, for a fifteen (15) year period. The warranty shall apply to all passive SCS components, including both cable and connecting hardware as a combined system. Any claims cover replacement costs on any defective product, both material and labor. Extended warranties beyond fifteen (15) years will be considered.
2. System Assurance: The System Assurance shall cover the failure of the wiring system to support the application which it was designed to support as well as additional application(s) introduced in the future by recognized standards or user forums that use the TIA/EIA 568A and ISO/IEC IS 11801 component and link/channel specifications for cabling, for a fifteen (15) year period.
3. System Certification: Upon successful completion of the installation and subsequent inspection, the client shall be provided with a numbered certificate, from the manufacturing company, registering the installation.

B. Warranty shall be one of the following:

1. Hubbell Premise Wiring Mission Critical Warranty
2. Avaya Technologies LIMITED SYSTIMAX Structured Cabling System Assurance
3. Ortonics Extended Product Warranty and Applications Assurance
4. Siemons Systems Products and Applications Assurance
5. Interlink Technologies End-to-End Systems Warranty
6. AMP NETCONNECT Performance Warranty

C. State in bid, which extended product warranty, and systems assurance warranty will apply to this project.

1.7 COMPATIBILITY

A. As applicable, provide products that are compatible with other components in the system with which they interface. Components must fit into the confines indicated, leaving adequate clearance as required by applicable codes or manufacturer for adjustment, repair or replacement.

PART 2 - PRODUCTS

2.1 CABLE

A. CATEGORY 6 CABLE

1. Description:
   a. Category 6 Unshielded Twisted Pair (UTP) type
   b. Plenum rated flexible exterior PVC jacket
   c. 24 AWG unshielded solid copper conductors with color coded polyethylene insulated coating
   d. Cables serving station jacks shall have 4 twisted pairs

e. Refer to drawings for quantities of twisted pairs for trunk (distribution) type cables.
f. Maximum DC resistances per 1000 feet: 29 Ohms
g. Maximum Attenuation:

Frequency	Attenuation
1 MHz	3.1 dB/1000 ft.
4 MHz	11.6 dB/1000 ft.
10 MHz	18.3 dB/1000 ft.
16 MHz	23.2 dB/1000 ft.
20 MHz	25.9 dB/1000 ft.

h. Cable shall conform to one of the following standards:
   1) ANSI/TIA 568.2-D
   2) IEEE Compliance: PoE: IEEE 802.3bt Type 1, Type 2, Type 3, Type 4
   3) ISO/IEC 11801
i. Color of jacket shall be blue for data and white for voice.
j. Cables that are to be inserted into patch panel ports shall be terminated using RJ-45 connectors.

2. Acceptable Cable Manufacturers:
   a. Belden
   b. Leviton Berk-Tek
   c. CommScope
   d. Mohawk
   e. Approved equal

B. CATEGORY 3 CABLE

1. Description:
   a. Category 3 Unshielded twisted pair (UTP) type
   b. Plenum rated flexible exterior PVC jacket
   c. 24 AWG unshielded solid copper conductors with color coded polyethylene insulated coating
   d. Cables serving station jacks shall have 4 twisted pairs
   e. Refer to drawings for quantities of twisted pairs for trunk (distribution) type cables.
   f. Maximum DC resistances per 1000 feet: 28.6 Ohms
   g. Characteristic Impedance from 1 to 25 MHz – 100 Ohms
   h. Maximum Attenuation:

Frequency	Attenuation
1 MHz	7 DB/1000 ft.
4 MHz	12 DB/1000 ft.
10 MHz	26 DB/1000 ft.
16 MHz	35 DB/1000 ft.

   i. Cable shall conform to one of the following standards:
      1) ANSI/ICEA S-80-576 (1983)
      2) REA PE-71
      3) Bell Systems 48007
      4) Near end crosstalk at 16 MHz shall be less than 37 db/1000 ft.
   j. Color of jacket shall be white.

2. Acceptable Cable Manufacturers:
   a. Belden
   b. Leviton Berk-Tek
   c. CommScope
   d. Mohawk
   e. Approved equal

2.2 OUTLET TERMINATIONS

A. For each symbol on the drawings, outlets shall consist of a single UL listed faceplate with the quantities and types of UL listed modular jacks as indicated.

B. Faceplates shall be of the type that will allow up to 6 rear-loading modular jacks per single gang outlet box and up to 12 rear-loading modular jacks per double gang outlet box. Install 1, 2, 3, 4, 6, 9 or 12 port faceplates as necessary to suite the quantities of jacks required at each outlet location. Unused jack ports shall be equipped with blank port plate with same color finish as faceplate. Each faceplate shall be supplied with upper and lower clear and color-matched label fields. Faceplates shall be thermoplastic type with white finish. Faceplates shall be Hubbell "IFP" series or approved equal.

C. Wall phone type plates shall be stainless steel with studs mounted in standard positions to accommodate any standard wall phone. Plate shall be slightly recessed type with integral 8 position, RJ-45 gray jack. Hubbell P630SR1GJ8 or approved equal.

D. Modular jacks for data and voice shall be 8 position, RJ-45, Enhanced Category 5 type with flame retardant housing and IDC 110 conductor contacts. Modular data jacks shall be red. Modular voice jacks shall be green. Hubbell HD58 or approved equal.

2.3 TERMINAL BACKBOARDS

A. Terminal backboards shall consist of ¾" thick fire resistant plywood painted black. Sizes shall be as indicated on the Drawings.

B. Where indicated on the drawings, house backboards within steel enclosures with hinged and lockable access doors. Enclosures shall be NEMA type 1 for interior dry locations and NEMA type 4X stainless steel for exterior, damp or wet locations.

2.4 EQUIPMENT DISTRIBUTION RACKS

A. Wall Mounted Rack:

1. Provide the necessary strain relief, bend radius and cable routing for proper installation of high performance cross connect products, meeting all specifications of ANSI/TIA/EIA-568-B.
2. Have top cable trough to route patch and distribution cables between racks.

3. Have EIA hole pattern on front and rear.
4. Rack height shall be specified as 4.0 ft/1.22 m (22 rack units).
5. Be available with a 14” (356 mm) channel depth.
6. Be available with hook and loop straps for securing cables inside the vertical U-channels.
7. Be available with vertical cable management rings for cord routing organization and strain relief.
8. Be available with vertical U-channels to protect and conceal distribution cables.
9. Provide floor and ceiling access for cable management and distribution.
10. Have wall mount braces with locator posts for easy wall mounting.
11. Have side access points that allow for access to manage/install distribution cables in the vertical channels.
12. Be available in standard color of black.
13. Be manufactured by an ISO 9001 registered company

B. Floor Mounted Rack

1. Wire closet equipment racks shall conform to EIA Standard RS-310C for 19-inch racks and shall be complete with all rack mounting hardware. Racks and cabinets shall be constructed of steel. Racks shall be capable of supporting up to 600 pounds and shall have open type B universal mounting rail hole pattern. Racks and cabinets shall be attached to the floors with appropriate sized lag screws.
2. Lockable floor mounted type cabinets shall be Hubbell HPW78C19X30 or approved equal with Hubbell MCCPSS19 or approved equal 10 outlet surge protection power strip and Hubbell HPWRFAN or approved equal roof mounted fan. Cabinet to be equipped with specified shelving/patch panels and wire management accessories. Unused areas of cabinets shall be closed off with the use of 1-position blank panels.
3. Rack cable management and blank panels to be as follows:
   a. Cable management shall be provided as necessary both vertically between equipment racks and horizontally between terminating hardware (i.e. modular patch panels). All cable management hardware must support cables on the rear and patch cords on the front.
   b. 1 position split ring panels shall be Hubbell MCCMP1 USAD or approved equal
   c. 2 position split ring panels shall be Hubbell MCCMP2USAD or approved equal
   d. 1 position blank panels shall be Hubbell MCCBP175 or approved equal.
4. Anchor all equipment racks to floor where applicable. Secure all equipment racks with a length of 12" wide ladder rack (Chadsworth Products, teleco style cable runway 11252213 or approved equal) from the top rail of each rack to the backboard or wall in the equipment room to prevent movement. Route all cables to the rack on the ladder rack.

2.5 PATCH PANELS

A. Provide patch panels, together with associated connectors and accessories, within equipment racks, of the quantities and types as indicated on the drawings or as needed for terminating UTP data cables. Patch panels and accessories shall be as specified herein.

B. UTP DATA CABLE PATCH PANELS

1. UTP data cable patch panels shall be T568B Enhanced Category 5 modular type with pre-loaded 24, 48 or 96 ports per panel. Refer to drawings for quantities of ports and patch panels per equipment rack. Each patch panel shall be equipped with a rear cable management bar.
   a. Hubbell P5E24B19E or approved equal (24 port)
   b. Hubbell P5E48B19E or approved equal (48 port)
   c. Hubbell P5E96B19E or approved equal (96 port)

2.6 UTP VOICE CABLE TERMINATION BLOCKS

A. Provide 50-pair 110 type wiring blocks, together with associated mounting legs, 4 pair type cross connect blocks and cable identification labels for terminating of UTP voice cables in wiring/electrical closets. Provide quantities of blocks as indicated on Drawings or as required for cable terminations. Hubbell 110BLK50FTK4 or approved equal.

PART 3 - EXECUTION

3.1 ACCEPTANCE TESTING

A. Test and examine all electrical conductors, after completion of installation of wiring and apparatus, to ensure continuity and proper connections. Using testing instruments, i.e. megger, verify that conductors are free from unwanted grounds. Testing shall be performed at no additional cost.

B. At a minimum, each UTP data and voice cable shall be tested for the following:

1. Proper polarity
2. No reversals
3. No transpositions
4. Continuity
5. No shorts
6. No stray AC voltage
7. No stray DC voltage
8. No opens
9. Attenuation

C. For UTP cable, attenuation testing shall be measured and graphically plotted at frequencies of 10, 16, 50 and 100 MHz. Results to be submitted to Owner upon completion of tests.

D. Where problems or defects are discovered, promptly repair and re-test.

3.2 INSTALLATION

A. Assemble equipment, cable and materials and protect them from damage throughout the construction period. Damaged equipment, cable and material cause by noncompliance with this requirement shall be repaired or replaced at no expense to the Owner.

B. Assemble distribution racks and patch panels in accordance with manufacturer’s instructions and terminate all cables with appropriate termination devices.

C. Cable shall be installed with extreme care. Cables shall not be cinched, with bends made in accordance with the recommendations of the cable manufacturer.

D. Cables shall be installed in conduit or shall be bundled and routed in either J-Hooks or cable tray as indicated on drawings. Where J-Hooks are employed, they shall be supported from permanent structures at not more than 5’ on center. Cables installed using J-Hooks or cable tray shall not droop more than 8” between supports.

E. At a minimum, cable shall be installed 24” away from fluorescent light fixtures and 40” away from other sources with high electrical magnetic emissions (i.e. motors). Cables installed in areas that cannot meet this criteria, shall be equipped with shielding.

F. Prior to rough-in, Architect/Engineer/Owner reserves the right to move any outlet up to 10 ten feet at no additional cost.

G. Material, equipment and wiring shall be installed and completed in a high quality and workmanlike manner and in accordance with the best modern methods and practices by skilled mechanics. Materials installed which do not present an orderly and reasonably neat or workmanship appearance, or are not installed in accordance with these specifications, or the contract documents, shall be removed and replaced at Contractor’s expense when so directed by Architect/Engineer/Owner.

H. Furnish and install all required cross-connect cables, patch cords and conductors.

I. Cables shall be continuous between termination points without splices.

J. As applicable, coordinate the work with the Owner’s system vendors.

K. Individual conductors at jacks shall be terminated in accordance with the pin assignment standards set forth by EIA/TIA 568B.

3.3 CABLE AND CONNECTOR IDENTIFICATION

A. Permanently label all cables at each end using approved labels to ensure a neat and organized appearance.

B. Each jack in each outlet shall be labeled with a permanent marking scheme with an identification number as described herein. In addition, each jack’s cable termination point at patch panels or terminal blocks shall also be labeled with the same corresponding identification number.

C. Each jack shall be assigned an eight (8) digit identification number. The first (far left) digit shall identify the wire closet number. The second digit shall identify the patch panel or termination block. The next four (4) digits shall identify the room number and the last two (2) digits will identify the sequence number of the connector within the room.

D. Upon completion of all labeling, provide to the Owner a master cable label spreadsheet. At a minimum, the master cable label spreadsheet shall indicate jack types, jack room locations and jack cable origin at patch panels or terminal blocks.

END OF SECTION

SECTION 28 30 00 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes product specifications and installation requirements for the Fire Detection and Alarm System.

1.2 GENERAL DESCRIPTION

A. The Fire Detection and Alarm System shall monitor addressable points.

B. System shall be divided and circuited into geographical zones with each geographical zone being divided into separate zones per type of device.

C. Circuit Designations shall be as follows:

1. Class B

D. Components shall be U.L. listed for use as a system.

E. Provide 5% spare devices and capacity in system, including batteries, to support 10% spare devices.

F. IMPORTANT!! PLEASE NOTE THAT this specification references the Delaware State-Wide Building Access Systems Standards, Standard ID: DTI240048-BLDG_SECURE. As such this document shall be considered as part of this specification. Unless otherwise shown in the project drawings and or specified in the project specifications, all work, materials, standards, etc. called for in the above mentioned document shall be provided. NOTE: At the end of the above mentioned document is a link to the certified contractors list for the work covered under this specification and the above mentioned document. **Only contractors listed on this link are permitted to perform the work covered under this specification and the above mentioned document as indicated.**

1.3 QUALITY ASSURANCE

A. The fire detection and alarm system devices and equipment shown on the drawings are for minimum requirement. Provide additional devices and/or equipment as required, and any other requirements of the AHJ for a compliant system.

B. Provide a UL Certification that the system meets UL standards and local fire protection code. Provide the services and equipment of an alarm service company listed by Underwriters Laboratories Inc. in its Directory as being capable of furnishing the signaling systems specified herein. Alarm service company shall issue a certificate that all equipment, connected wiring and devices which form the specified system together with installation and maintenance service are in compliance with the requirements established by Underwriters Laboratories Inc. and the local Fire Prevention Code.

C. Equipment manufacturer shall supply proof of having produced similar equipment, now giving satisfactory service, for the past five years.

D. The system shall be manufactured from a single source, by Simplex, Notifier, Honeywell, Siemens, Edwards Systems Technology, or approved equal.

1.4 SUBMITTALS

A. Provide a shop drawing submittal which includes the following:

1. Riser diagram

2. Scaled plan shop drawing showing equipment and device locations, wire sizes and conduits
3. Catalog cuts
4. Battery calculations
5. Voltage drop calculations
6. Fire alarm control panel detailed drawings

B. Submit a copy of shop drawings to the authority having jurisdiction for their review and approval.

PART 2 - PRODUCTS

2.1 FIRE ALARM CONTROL PANEL

A. The fire alarm control panel shall have the following features:

1. Microprocessor based with built-in programmer.
2. Non-volatile memory for program storage.
3. Power Supply - 24Vdc
4. Surge protection device
5. Zoned alarm verification
6. Programmable Alarm Silence/Reset Inhibit Timing
7. Programmable Alarm Silence Timer
8. Automatic Battery Charger with supervision and deep discharge protection
9. Lamp Test
10. Power Limited Initiating Device Circuit and Notification Appliance Circuit wiring

B. Provide number of Initiating Device Circuits and Notification Appliance Circuits required for proper operation of system.

C. Provide additional power supply panels (booster/extender panels) as required.

D. Provide digital alarm communicator transmitter (DACT) for transmission of alarm and supervisory signals to a UL listed Central Station. Alarm and supervisory signals to be transmitted shall be as designated by the Authority Having Jurisdiction. Appropriate power supplies, direct connect cords, phone lines, etc. shall be supplied for a functional system. Selection of a central monitoring station, its fees and fees for telephone lines and connections are the responsibility of the Owner or his representative. Coordinate with owner’s representative as required.

E. Provide batteries for backup as required by Authority Having Jurisdiction.

2.2 FIRE ALARM ANNUNCIATOR PANEL (AS PART OF THE FIRE ALARM CONTROL PANEL)

A. The fire alarm annunciator panel shall have the following features:

1. Alpha-Numeric type remote annunciator
2. Flush mounted
3. LEDs to indicate, normal, alarm, supervisory, and trouble conditions.
4. Lamp test, trouble silence and reset.

B. Provide static graphic display of building layout indicating the following:

1. Main Electrical Room Location
2. Stairs
3. Exits

4. "You Are Here" indicator oriented to installed location.
5. North Arrow
6. Building Address

2.3 NAC POWER EXTENDER PANEL

A. Provide NAC Power Extender panels as required. Extender panel shall be standalone type capable of powering a minimum of 4 notification appliance circuits. Panel shall provide capability to be expanded to 8 notification appliance circuits.

B. Provide panel with internal power supply and battery charger as required.

C. The extender panel may be mounted close to the host control panel or can be remotely located, as required by field devices. The panel shall connect to the host panel via communications channel. Each output NAC shall be individually controllable for general alarm or selective area notification.

D. Alarms from the host fire panel shall signal the NAC power extender panel to activate. The panel shall monitor itself and each of its NACs for trouble conditions and shall report trouble conditions to the host panel

2.4 INITIATING DEVICES

A. Initiating devices shall have the following general features, as well as those listed under the specific category:

1. Intelligent/Analog
2. Plug-in
3. Integrated base (where applicable)

B. Manual Pull Stations

1. Non-coded break glass type
2. Double action
3. Screw terminals
4. Flush mounted
5. Double pole contacts
6. Tool reset
7. General alarm operation
8. Latch action until reset
9. Red housing

C. Heat Detectors

1. Double Pole - Normally open contact
2. Combination Rate-of-Rise 15º per minute (self-restoring) and Fixed Temperature, 135ºF (57ºC) (self-restoring)
3. LED on unit

D. Smoke Detectors - Ionization

1. Unipolar type dual ionization chamber
2. Nominal 1.2%± obscuration per foot sensitivity
3. Built-in test switch
4. LED on unit

2.5 NOTIFICATION DEVICES

A. Notification appliances shall have the following general features, as well as those listed under the specific category:

1. ADA Compliant
2. Red housing
3. Weatherproof when installed in damp or wet locations, with temperature rating suitable for environment.

B. Visual Devices - Strobes

1. Provide strobes with adjustable candela level, set to candela level indicated on plans.
2. Self-synchronizing flash

C. Audible/Visual Combination Devices - Horns & Strobes

1. Provide strobes with adjustable candela level, set to candela level indicated on plans.
2. Self-synchronizing flash
3. Self-synchronizing temporal audible output
4. Adjustable high or low dBA output with a maximum of 98 dBA @ ten feet

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide non-specified equipment required to make system fully functional.

B. Install fire alarm and detection system wiring as follows:

1. In dedicated conduit raceway in exposed dry/wet/damp locations and in concealed damp/wet locations.
2. MC fire alarm cabling, plenum rated in concealed dry locations.

C. Minimum wire size: No. 18 AWG solid copper for initiation and annunciator circuits; No.14 AWG solid copper for indicating circuits.

D. No wiring other than that directly associated with the fire alarm or auxiliary functions shall be permitted in the fire alarm conduits. Wiring splices shall be avoided. Transposing or changing color coding of wires shall not be permitted. Conductors in conduit containing more than one wire shall be color coded and labeled on each end with "E-Z Markers" or equivalent. Fire alarm junction boxes shall be painted red. Conductors in cabinets shall be carefully formed and harnessed so that each drops off directly opposite to its terminal. Cabinet terminals shall be numbered and coded. Controls, switches, etc. shall be clearly labeled on equipment panels.

E. Location for ceiling-mounted equipment shall be coordinated with lights, air outlets and other ceiling fixtures and shall be acceptable to the Architect and to the authorities having jurisdiction.

F. Install required interconnect wiring for:

1. Door lock release
2. Tie-in to Central Station of fire department

G. Mount end-of-line device for each initiating and indicating circuit in a separate box located not more than 6 feet above the finished floor. Device shall be mounted on a terminal strip attached to the box cover with an engraved phenolic plate.

3.2 SEQUENCE OF OPERATION

A. The fire alarm control panel shall be provided with the ability to provide bypass of automatic alarm functions, such as central station/fire department alarm notification, during fire alarm system tests. Bypass of any automatic alarm control function shall initiate a system "trouble" condition.

B. ALARM MODE

1. Operation of a fire alarm initiation device shall automatically:
   a. Sound an audible alarm signal at the fire alarm control panel.
   b. Light the general alarm LED (red) at the fire alarm control panel.
   c. Indicate the device/zone in alarm on the fire alarm control panel.
   d. Sound audible alarm signals throughout the building, or in appropriate zones. Operation of the alarm acknowledge switch at the fire alarm control panel shall permit the silencing of the audible alarm signals during the alarm condition. The silencing of alarm signals shall not prevent the re-activation of alarm signal devices should a subsequent alarm condition occur.
   e. Flash alarm lights throughout the building, or in appropriate zones. Operation of the alarm acknowledge switch at the fire alarm control panel shall permit the deactivation of the visual alarm signals during the alarm condition. The deactivation of alarm lights shall not prevent the re-activation of alarm lights should a subsequent alarm condition occur.
   f. Operate control relay contact to initiate the transmission of an "Alarm" indication to the central monitoring station.
   g. Unlock access-controlled doors

C. TROUBLE MODE

1. The fire alarm system wiring (except control wiring from addressable control element relays to fans, dampers, door holders, etc.) shall be electrically supervised to automatically detect and report trouble conditions to the fire alarm control panel. Any opens, grounds or disarrangement of system wiring and shorts across alarm signaling wiring shall automatically:
   a. Sound an audible signal at the fire alarm control panel.
   b. Light the general trouble LED (yellow) at the fire alarm control panel.
   c. Indicate the device/zone in alarm on the fire alarm control panel and remote annunciator panels.
   d. Operate fire alarm control panel "trouble" relay contact to initiate the transmission of a trouble indication to the central station.
2. The visual indications shall remain on until the trouble condition is repaired.

3.3 TESTING AND ADJUSTING

A. The manufacturer’s representative shall adjust smoke detectors and verify the setting of devices. Verify that circuits are continuous and free from short circuits and from unspecified grounds, and that resistance to ground of non-grounded circuits is not less than one megohm.

B. Testing procedures for the acceptance of the alarm and detection system shall be conducted in accordance with provisions of Chapters 10 of NFPA 72.

END OF SECTION

SECTION 31 31 16 - TERMITE CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil treatment.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include the EPA-Registered Label for termiticide products.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Soil Treatment Application Report: Include the following:

1. Date and time of application.
2. Moisture content of soil before application.
3. Termiticide brand name and manufacturer.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes used, and rates of application.
6. Areas of application.
7. Water source for application.

C. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located and who employs workers trained and approved by manufacturer to install manufacturer's products.

1.6 WARRANTY

A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work consisting of applied soil termiticide treatment will prevent infestation of subterranean termites , including Formosan termites (Coptotermes formosanus) . If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

A. Termiticide: EPA-Registered termiticide acceptable to authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation.

1. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove extraneous sources of wood cellulose and other edible materials, such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated.

3.2 APPLYING SOIL TREATMENT

A. Application: Mix soil treatment termiticide solution to a uniform consistency. Distribute treatment uniformly. Apply treatment at the product's EPA-Registered Label volume and rate for maximum specified concentration of termiticide to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction.

1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Soil adjacent to and along the entire inside perimeter of foundation walls; along both sides of interior partition walls; around plumbing pipes and electric conduit penetrating the slab; around interior column footers, piers, and chimney bases; and along the entire outside perimeter, from grade to bottom of footing.

B. Post warning signs in areas of application.

C. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 31 31 16

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SECTION 31 62 17 - STEEL PILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes steel pipe piles.

B. Work of this Section is affected as follows:

1. Rejected piles, including piles driven out of tolerance, defective piles, or piles damaged during handling or driving, shall be removed and replaced at no additional cost to the owner.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 QUALITY ASSURANCE

A. Steel piles shall be installed by a contractor experienced with pile driving operations in a marine environment of similar nature within the last three (3) years.

B. Provide the services of a qualified third-party inspection agency to perform inspections of all field welds.

1.4 SUBMITTALS

A. Experience: Provide documentation of Contractor experience driving piles in a marine environment of similar nature to this work within the last three (3) years, including job name(s), location(s), owner(s), and owner(s) contact information for similar work experience.

B. Product Data: For each type of product.

1. Piles
2. Pile splice data.
3. Pile tip.
4. Cold galvanized repair paint with a minimum of 95% zinc, by weight.

C. Shop Drawings: For steel pipe piles. Show fabrication and installation details for piles.

1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show location, size, length, and type of each weld.

D. Shop Drawings: For steel driving template.

1. The contractor shall submit details of the driving template, including means of securing it for driving operations.

E. Pile Driving Plan: For method of installation of piles.

1. Plan shall show crane set-up location(s) and all methods of temporary support, including barge size and type, as applicable.

F. Welder certifications.

G. Third party inspection agency qualifications for inspection of field welds.

H. Pile steel mill tests reports.

I. Pile-Driving Equipment Data: Include type, make, and rated energy range; weight of striking part of hammer; weight of drive cap, and type, size, and properties of hammer cushion, as applicable.

J. Pile-driving records.

K. Field quality-control reports, including horizontal alignments and tolerances, and vertical plumb tolerances of pilings, and third-party inspection of field welds.

1.5 INFORMATIONAL SUBMITTALS

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 STEEL PIPE PILES

A. High-Strength, Low-Alloy, Columbium-Vanadium Structural Steel: ASTM A252, ASTM A588, or ASTM A 690, Fy = 50,000 psi. Pile tips shall be closed.

2.2 PILE ACCESSORIES

A. Splice Unit: Manufacturer's standard splice unit, of same material as steel pipe pile or material of equal strength, shaped to encase pipe pile. Splices shall be located at least 20.00’ below the pile Top Elevation.

2.3 FABRICATION

A. Pile-Length Markings: Mark each pile with horizontal lines at 1-foot intervals; label the distance from pile tip at 5-foot intervals. Maintain markings on piles until driven. Markings shall be temporary and shall be removed after approval, or of an approved material that fades out within one year from installation.

B. Fabricate full-length piles to eliminate splicing during driving, with ends square.

C. Piles and accessories shall be hot dipped galvanized in accordance with ASTM A123, after fabrication. Welding following hot dip galvanizing shall be cleaned in accordance with SSPC SP-6 Commercial Blast Cleaning and touched up with three coats of cold applied high-zinc paint.

PART 3 - EXECUTION

3.1 DRIVING PILES

A. General: Continuously drive piles to elevations indicated on drawings. Establish and maintain axial alignment of leads and piles before and during driving.

B. A steel driving template shall be used to ensure accurate placement of the piles.

C. Notify Engineer and owner 48 hours prior to installing first steel pile. Engineer and owner will provide representatives to observe installation of first pile and approve the methods utilized.

D. Heaved Piles: Redrive heaved piles to tip elevation at least as deep as original tip elevation with a driving resistance at least as great as original driving resistance.

E. Driving Tolerances: Drive piles without exceeding the following tolerances, measured at Dock Elevation (5.00') for dock piles and Head Elevation at abutment piles:

1. Location: 2 inches from location indicated after initial driving, and 2 inches after pile driving is completed.
2. Plumb: Maintain 1 inch in 48 inches from vertical, or a maximum of 4 inches, measured when pile is aboveground in leads.

F. Withdraw damaged or defective piles and piles that exceed driving tolerances and install new piles within driving tolerances at no additional expense to the Owner.

G. Piles shall be left uncut, with depth markings legible, until the Architect/Engineer or Owner can confirm the driven depths and installation quality provided.

H. Cut off tops of driven piles square with pile axis and at elevations indicated.

I. Damaged galvanizing shall be cleaned to a SSPC SP-6 Commercial Blasting Finish and coated with three coats of a cold zinc rich paint in accordance with the manufacturer's recommendations.

J. Pile-Driving Records: Maintain accurate driving records for each pile.

3.2 FIELD QUALITY CONTROL

A. Special Inspections: The contractor shall provide the services of a qualified third-party inspection agency to perform inspections of all field welds.

B. Tests and Inspections:

1. Weld Testing: In addition to visual inspection, splice welds shall be tested and inspected according to AWS D1.1/D1.1M.

C. Steel pipe piles will be considered defective if they do not pass tests and inspections.

D. Prepare and submit inspection reports.

END OF STEEL PILE

SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Chain-link fences.
2. Horizontal-slide, motor operated gates.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at the project site with engineer.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, materials, coatings, and attachments to other work.

C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

B. Warranty.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fence and gate as shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.6 WARRANTY

A. Installer Warranty: Warranty shall include requirements for installer to repair or replace components of chain-link fences and gates, excluding the gate controller equipment, that fail in materials or workmanship within 2 years of Substantial Completion.

1. Failures include, but are not limited to, the following:

    a. Failure to comply with performance requirements.
    b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Controller Equipment Warranty: Manufacturer’s 5-year commercial warranty, from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height and under exposure conditions indicated according to ASCE/SEI 7.
    1. Design Wind Load: 100 MPH.
        a. Minimum Post Size: Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

2.2 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:

    1. Fabric Height: Six (6) feet.
    2. Steel Wire for Fabric: Wire diameter, 9 gauge.

        a. Mesh Size: 2 inches.

        b. Zinc-Coated Fabric: ASTM A392, Type II, Class 2, 2.0 oz./sq. ft. with zinc coating applied before weaving.

        c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.

    3. Selvage: Twisted top and knuckled bottom.

2.3 FENCE FRAMEWORK

A. Posts and Rails: ASTM F1043 for framework, including rails, braces, line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 or ASTM F1083 based on the following:
    1. Fence Height: 72 inches.
    2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.
    3. Line Post: 2.375 inches in diameter, minimum.
    4. End, Corner, and Pull Posts: 2.875 inches in diameter, minimum.

5. Horizontal Framework Members: Top and bottom rails according to ASTM F1043.
6. Metallic Coating for Steel Framework: Type A zinc coating.

2.4 TENSION WIRE

A. Metallic-Coated Steel Wire: 0.177-inch diameter, marcelled tension wire according to ASTM A817 or ASTM A824, with the following metallic coating:
   1. Type II: Zinc coated (galvanized) with minimum coating weight matching chain-link fabric coating weight.

2.5 HORIZONTAL-SLIDE GATES

A. General: ASTM F1184 for gate posts and single sliding gate types. Provide automated vehicular gates in accordance with ASTM F2200.

   1. Minimum gate opening clearance as shown on the drawings.
   2. Classification: Type II Cantilever Slide, Class 1 with external roller assemblies.

B. Pipe and Tubing:

   1. Zinc-Coated Steel: Manufacturer's standard protective coating and finish.
   2. Gate Posts: ASTM F1184. Provide round steel posts.
   3. Gate Frames and Bracing: Round or tubular steel.

C. Frame Corner Construction: Welded with 3/8-inch-diameter, adjustable truss rods for panels 60 inches or wider.

2.6 GATE OPERATORS

A. Operators: Factory-assembled, automatic gate-operating system designed for gate size, type, weight, and frequency of use. Control system shall have characteristics suitable for Project conditions, with control stations, safety devices, and weatherproof enclosures.

   1. Operator design shall allow for removal of cover or motor without disturbing limit-switch adjustment and without affecting auxiliary emergency operation.
   2. Electronic components shall have built-in troubleshooting diagnostic feature.
   3. Gate operator shall be LiftMaster Elite Series CSL24UL, with battery backup, gear driven transmission, Smart myQ Technology, integral SMART Security+ 2.0 wireless gate communication, manual disconnect, including all required safety devices, or approved equal by the engineer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   1. Digital keypad entry unit. Post or gooseneck mounted, LiftMaster KPW250, or approved equal by the engineer.
   2. Remote controls. Commercial, eight (8) each, shall be by LiftMaster SMART Security+2.0, model 811LM, or approved equal by the engineer.

C. UL Standard: Manufacture and label gate operators in accordance with UL 325.

D. Motors: Comply with NEMA MG 1.

1. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
2. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
3. Service Factor: 1.15.

2.7 FITTINGS

A. Provide fittings according to ASTM F626.

B. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work. Do not begin installation before final grading is completed unless otherwise permitted by the Owner.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of gates. Indicate locations of utilities, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION OF GATE OPERATORS

A. Ground electric-powered motors, controls, and other devices in accordance with NFPA 70 and manufacturer's written instructions.

3.4 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Automatic Gate Operator: Energize circuits to electrical equipment and devices, start units, and verify proper motor rotation and unit operation.

1. Test and adjust operator, controls, and safety devices. Replace damaged and malfunctioning controls and equipment.
2. Lubricate operator and related components.

C. Lubricate hardware and other moving parts.

3.5 TRAINING

A. Provide training to Owner’s personnel on maintenance and operation of sliding gate operator and controls.

END OF SECTION 32 31 13

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SECTION 330500 – ABOVEGROUND FUEL TANK DISPENSING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. The work includes furnishing all materials, labor, equipment and incidentals for the installation of a 2,000 gallon above ground diesel fuel storage tank, including top filling provisions, tank fuel level monitoring, pump; dispenser, hose reel, piping, and related equipment and appurtenances, permitting, system component testing and inspection, system start-up and training, as shown on the drawings and specified herein, necessary to provide a complete, secure, and operable diesel fuel storage and dispensing system.

B. Any discrepancies identified between the design drawings and specifications should be brought to the attention of the Engineer for clarification.

C. All work shall be performed in accordance with applicable manufacturer's material, handling, installation and testing requirements, and applicable Federal, State, and local rules and regulations.

1.2 DEFINITIONS

A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.

B. Concealed Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

C. Concealed-exposed Installations: Concealed from view but in contact with fuel product and subject to fuel contamination and contact. Examples include vent pipe, fill pipes, delivery pipes and hoses, etc.

1.3 APPLICABLE REGULATIONS AND STANDARDS

A. NFPA 30, Flammable and Combustible Liquids Code, 2024

B. NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, 2024

C. NFPA 70, National Electrical Code, 2026

D. NFPA 303, Fire Protection Standard for Marinas and Boatyards, 2026

E. UL 2085, Protected Above-Ground Tanks for Flammable and Combustible Liquids

F. API RP 1637, Using the API Color-Symbol System to Identify Equipment, Vehicles, and Transfer Points for Petroleum Fuels and Related Products at Dispensing and Storage Facilities and Distribution Terminals, Fifth Edition, 2025

1.4 ACTION SUBMITTALS

A. Permits and Documentation. Prior to proceeding with the work, submit for approval, Delaware State Fire Marshal permit and DNREC Tank Compliance AST Form and Tank ID Number documentation.

B. Product Data and Manufacturer's Installation Instructions. Prior to commencement of the work, submit to the Engineer for approval the following manufacturer's product literature, shop drawings, and installation instructions:

1. Fuel tank and support details.
2. Fuel dispenser, hose reel and support details.
3. Tank monitoring system.
4. Fuel system piping and support details.
5. Miscellaneous fuel system accessory items.
6. Fuel tank, dispenser, and emergency stop signage details.
7. Fuel tank and system piping testing procedures.

C. Manufacturer's Approved Installer Certification: Submit to the Engineer for approval evidence that the tank and dispenser equipment installer is a manufacturer certified installer.

D. Dispenser installer must also be capable of providing follow-up repair service on-demand within twenty-four (24) hours of notification of a problem.

E. Fuel System Independent Third-Party Testing and Inspection Agency. Submit to the Engineer for approval evidence of agency certifications for the testing of all tank and fuel dispensing system components, equipment and system piping.

F. Certification of the approval of the Final Installation. Submit Third-Party Testing and Inspection Agency certification of the completed installation.

G. Electrical Independent Third-Party Testing and Inspection Agency. Submit to the Engineer for approval evidence of agency certifications for the testing of all tank and fuel dispensing system electrical work.

H. Certification of the approval of the Final Installation. Submit Third-Party Testing and Inspection Agency certification of the completed electrical installation.

I. Welding certificates. Submit to the Engineer for approval evidence that welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.5 CLOSEOUT SUBMITTALS

A. Manufacturer's Operation and Maintenance Manuals for all installed equipment, in both hard copy and electronic format.

B. Provide manufacturer's standard warranty to the Engineer for the following:

1. Tank and tank coatings.
2. Dispenser, hose reel.
3. Miscellaneous fuel accessory items.

C. Provide all Third-Party fuel system and electrical inspection certifications.

D. Delaware State Fire Marshal and DNREC Tank Compliance AST approved permits.

1.6 FIELD CONDITIONS

A. Notify the Engineer of discrepancies between existing conditions and Drawings before proceeding with the work.

1.7 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing agency notification regulations for the work, including selective demolition, hauling and disposal, and installation of new items.

1.8 PERMITS AND INSPECTIONS

A. Apply for and obtain necessary permits from, and make required notifications to, and coordinate all inspections with, all Federal, State, and local jurisdictions as applicable for the work.

PART 2 - PRODUCTS

2.1 PRODUCTS BY NAME

A. Specifications of products by name are intended to be descriptive of quality, workmanship, finish, function and approximate characteristics desired and are not necessarily intended to be restrictive. Substitution of products for those named may be considered, provided the substitute offered, in the opinion of the Engineer, is equal or superior in quality, workmanship, finish, function and approximate characteristics to that specified. Bidders may submit proposed substitutions prior to bid opening in accordance with the contract requirements. Bidder must be prepared to demonstrate equivalency to specified unit(s) if requested by the Engineer. Proposed substitutions not submitted in accordance with the contract requirements may not be considered. After contract award, proposed substitutions may also be submitted as an "or approved equal", however they will be reviewed and only approved if determined by the Engineer to be an equal or superior product to the items specified.

B. Wherever a discrepancy exists between this specification, the drawings, or manufacturer's product literature, the Contractor shall bring the discrepancy to the attention of the Engineer for direction using official RFI submissions.

2.2 FUEL TANK

A. Tank: 2,000-gallon Fireguard UL 2085 double-wall tank with integral UL tank support saddles and a factory applied manufacturer's white urethane exterior finish coat. Tank shall be as manufactured by General Industries, or approved equal. Tank shall also be furnished with the manufacturer's factory applied interior coating system which is specially formulated to provide chemical resistance against diesel fuel. The interior coating system shall be Chem-Liner 4000 Novalac Epoxy Lining as manufactured by Chemline Incorporated, or approved equal.

B. Submersible Pump: Veeder-Root, Red Jacket 1.5HP Red Armor, 4" TRJ RA STP – Quick Set (Adjustable), Model AGP150S1 RA1, or approved equal.

C. Mechanical Top Gauge: Cast aluminum, 2" drop tube, stainless steel hardware, float, cable, shaft bushing, 301 stainless steel spring, acrylic lens cover, Item 1518-2520 AG, Morrison Bros. Co., or approved equal.

D. Overfill and Leak Detection Controller: Omntec Manfacturing, Model LU2, or approved equal.

E. Overfill Prevention Valve: Integral pressure relief and anti-siphon function, Item 9095AA0200 AV, 2", Morrison Bros. Co., or approved equal.

F. Spill Container: Powder coated white body and lid, Item 516MO-0400ACEVR, Morrison Bros. Co., or approved equal.

G. Top Seal Fill Cap: Aluminum hard coated body, brass cam levers, Buna-N gaskets, easy to grip pull ring, lockable with padlock, Item 305C-2000 AC, Morrison Bros. Co., or approved equal.

H. Updraft Vent: Aluminum die cast body and cap, 40 mesh stainless steel screen, Item 354-0200, Morrison Bros. Co., or approved equal.

I. Petroleum SS Solenoid Valve: 316 stainless steel, Item 2CF-12XXSVZ-878X, Rancho Factory, or approved equal.

J. Expansion Relief Valve: Stainless steel body and cap, Morrison Bros. Co., or approved equal.

K. Drop Tube: Item 419 – 02061TEVR, Morrison Bros. Co., or approved equal.

2.3 FUEL DISPENSER

A. Bennett 3711BMR-38 Big Fueler, Electronic COMMERCIAL Remote Dispenser, 1-Product, 1-Hose, 60 GPM Max, or approved equal.

B. All fuel dispenser system components shall be constructed of corrosion resistant non-ferrous materials.

1. Stainless steel panel option, pulsers, filters, hoses, nozzles, breakaways, and swivels.

2. Isolation ball valves, shear valves for fuel piping on each dispenser.

3. Stainless steel dispenser containment bases.

C. NFPA 30A warning signage incorporating the following or equivalent wording: a) WARNING! IT IS UNLAWFUL AND DANGEROUS TO DISPENSE DIESEL INTO UNAPPROVED CONTAINERS; b) NO SMOKING; and c) STOP MOTOR.

2.4 FUEL DISPENSER PEDESTAL

A. Morrison Bros. Co. Model 434 Dispenser Pedestal, 12 gauge 304 Stainless Steel, or approved equal.

2.5 NOZZLE

A. Husky Model 503012 without Hold Open Clip and Spout Bushing, with Polymer Handguard and 1808 Waffle Splash Guard, or approved equal.

2.6 NOZZLE SWIVEL

A. Husky Model 004860, 1” M x 1” F FNP Multi-Plance High Volume Swivel, or approved equal.

2.7 HOSE REEL/CABINET

A. PMC Model HR8/9, 316 brushed stainless steel panels, full welded construction, stainless steel Hannay spring rewind, 75’ of 1” hose capacity, or approved equal.

2.8 FUEL HOSE

A. IRPCO 1-Inch ID Marina Refueling Diesel Hose, or approved equal.

2.9 EMERGENCY STOP BUTTON

A. STI Stopper Station Series with Weather Cover, or approved equal.

B. NFPA 30A Emergency Fuel Shut Off sign panel, 10” x 14”, 0.5” radius corners, aluminum (40 mil), laminated plastic labels, red letters on white background, My Safety Sign, or approved equal.

2.10 FIRE EXTINGUISHER

A. Class 2-A:20-B:C Minimum Rating

2.11 FUEL PIPING

A. Provide all above ground piping necessary for a complete and usable fuel storage tank and dispensing system. All system piping and fittings shall be constructed of corrosion resistant 316 Stainless Steel, welded or threaded joints.

1. All fuel pipe support materials and hardware must be corrosion resistant, hot dip galvanized steel rather than carbon steel materials that require painting, Unistrut or approved equal. All welds to be painted after assembly with two coats of zinc rich coating that meets or exceeds MIL-P-46105. Allow for proper drying time between coats and follow all manufacturer's instructions for application.

2. Fuel pipe support clamps shall Stainless steel Type 316, U-bolt assembly style with integral thermoplastic elastomer cushion of the appropriate size for the supported piping, ZSI Inc. Alpha Series, or equivalent and approved equal.

2.12 BALL VALVES

A. Split body, full bore, blowout-proof stem, 316 stainless steel trim, vented ball, 2", NIBCO, or approved equal.

2.13 MISCELLANEOUS

A. All other miscellaneous system components shall be constructed of corrosion resistant non-ferrous materials to the maximum extent possible.

2.14 IDENTIFICATION DEVICES

A. Comply with API RP 1637 for lettering size, length of color field, colors, and viewing angles of identification devices.

B. Equipment Nameplates: Metal permanently fastened to equipment with data engraved or stamped.

1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and essential data.
2. Location: Accessible and visible.

C. Snap-on Plastic Pipe Markers: Manufacturer's standard preprinted, semirigid, snap-on type. Include color-coding according to API RP 1637, unless otherwise indicated.

D. Pressure-Sensitive Pipe Markers: Manufacturer's standard preprinted, color-coded, pressure-sensitive-vinyl type with permanent adhesive.

E. Pipes with OD less than 6 inches: Full-band pipe markers, extending 360 degrees around pipe at each location.

F. Lettering: Use piping system terms indicated and abbreviate only as necessary for each application length.

1. Arrows: Either integrally with piping system service lettering to accommodate both directions of flow, or as separate unit on each pipe marker to indicate direction of flow.

G. Plastic Tape: Manufacturer's standard color-coded, pressure-sensitive, self-adhesive vinyl tape, at least 3 mils thick.

1. Width: 1-1/2 inches on pipes with OD less than 6 inches; 2-1/2 inches for larger pipes.
2. Color: Comply with ASME A13.1, unless otherwise indicated.

H. Valve Tags: Stamped or engraved with 1/4 inch letters for piping system abbreviation and 1/2 inch sequenced numbers. Include 5/32 inch hole for fastener.

1. Material: 0.032 inch thick, polished brass or aluminum, or 0.0375 inch thick stainless steel.
2. Size: 1-1/2 inches in diameter.

I. Valve Tag Fasteners: Brass, wire-link or beaded chain; or brass S-hooks.

PART 3 - EXECUTION

3.1 GENERAL

A. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations.

3.2 TANK INSTALLATION

A. Install where shown on the drawings and in accordance with manufacturer’s installation instructions. Install tank level and plumb. Anchor tank saddles to the concrete pad in accordance with manufacturer’s instructions. Provide stainless-steel epoxy adhesive system anchors as manufactured by Hilti Corporation, or approved equal. Locate tank saddles per manufacturer’s instructions.

B. The Contractor shall provide for delivery of the tank to the project site and arrange for testing and inspection upon arrival. Follow tank manufacturer’s guidelines for air testing of primary tank and/or secondary interstitial space. Report any problems discovered to the manufacturer and make necessary repairs only at their direction and under the manufacturers’ supervision.

C. The Contractor shall exercise caution to avoid damaging the paint system on the tank. Any damage to the paint system must be repaired in accordance with the tank manufacturer’s instructions and approved by the tank manufacturer.

D. The Contractor shall provide the necessary rigging and a suitable crane or lifting equipment and crew for the tank installation. Special precautions shall be taken in rigging the crane and handling of tank. Lifting straps meeting load requirements shall be utilized to protect tank finish. Steel cable, chains, or shackles shall not be permitted to contact the tank painted finish.

E. The tank shall be provided with warning and/or tank product identification signs/decals prominently located on the tank following local and state fire code requirements.

3.3 DISPENSER INSTALLATION

A. Install where shown on the drawings and in accordance with manufacturer's installation instructions. Install equipment level and plumb and positioned parallel or square to the dock. Anchor to the dock with stainless steel fasteners.

B. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations.

3.4 TANK OVERFILL AND ANNULAR ALARM INSTALLATION

A. Install in accordance with manufacturer's installation instructions. Install equipment level and plumb.

3.5 PIPING INSTALLATION

A. Pipe supports are to be provided and installed by the Contractor. Install piping in accordance with equipment manufacturers installation instructions. Install piping plumb, level or sloped as required by equipment manufacturer, free of sags and bends, and positioned parallel or square to the equipment unless otherwise indicated. Install fittings for changes in direction and branch connections. Diagonal runs are prohibited unless specifically indicated otherwise. Install piping to facilitate service, maintenance, and repair or replacement of equipment and components.

B. Install piping to the top of tank and assure adequate support so that the connection to the tank is not stressed. Pipe supports are not permitted to attach to the tank in any way unless the support is provided by the tank manufacturer.

3.6 PIPING JOINT CONSTRUCTION

A. Ream ends of pipes and remove burrs. Bevel plain ends of steel pipe. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

C. Welded Joints: Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.

D. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.7 PIPING CONNECTIONS

A. Make connections according to the following:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install dielectric fittings at connections of dissimilar metals.

3.8 IDENTIFICATION

A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.
   1. Locate pipe markers on exposed piping according to the following:
      a. Near each valve and control device.
      b. Near each branch, excluding short takeoffs for equipment and terminal units. Mark each pipe at branch if flow pattern is not obvious.
      c. Near locations where pipes pass through walls or floors or enter inaccessible enclosures.
      d. Near major equipment items and other points of origination and termination.

B. Equipment: Install equipment marker on or near each major item of equipment.

   1. Lettering Size: Minimum 1/4 inch high for name of unit if viewing distance is less than 24 inches, 1/2 inch high for distances up to 72 inches, and proportionately larger lettering for greater distances. Provide secondary lettering two-thirds to three-fourths of size of principal lettering.
   2. Text of Signs: Provide name of identified unit. Include text to distinguish among multiple units, inform user of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Adjusting: Relocate identifying devices that become visually blocked.

3.9 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to the drawings and the equipment manufacturer's written instructions.
   1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor bolts to elevations required for proper attachment to supported equipment.
   3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.10 PAINTING

A. Paint all exposed steel (not galvanized) for corrosion protection. Mechanically clean metal surfaces of dirt and any oils to prepare surfaces for priming. Paint prepared steel surfaces with Red Oxide primer and follow with two coats of epoxy enamel paint for exterior use. Contractor

must allow for proper drying time between coats of paint and follow all manufacturer's instructions for paint application. Paint color to match tank color.

3.11 TESTING

A. The contractor shall provide the services of an approved independent Third-Party testing and inspection agency for the testing of all tank and fuel filling and dispensing system components, equipment and piping. Provide testing per regulatory agency requirements and as required herein. Provide all regulatory required documentation for performed testing. Both inner and outer tanks shall be pressure tested after arrival to the site and prior to installation. The tank and all system piping and components shall be pressure tested after final installation. Testing of the tank and all fuel system components shall demonstrate full compliance with NFPA 30, NFPA 30A and NFPA 303 as applicable.

B. Air testing of the fuel supply piping shall be at 110% of the maximum anticipated pressure (per NFPA 30). The test should be maintained long enough to permit complete visual inspection of all joints and connections. In no case should the test be less than thirty minutes. Install a pressure gauge with a full-scale reading of no more than twice the test pressure. Use reliable gauges calibrated against a dead weight tester and zeroed for atmospheric pressure. Pressurize piping gradually. Visually check for leaks at fittings with a soap and water solution.

3.12 INSPECTIONS

A. The Contractor shall provide the services of an approved independent Third-Party testing and inspection agencies for the inspection and approval of the final fuel system and electrical construction. Certification of the approval of the final installation shall be issued to the Engineer. Any conditions required by the Third-Party testing and inspection agencies shall be added to the "punch list" and must be corrected before project is considered complete.

B. Third-Party Inspection Agency Qualifications:
   1. API 653 Aboveground Storage Tank Inspection Certification
   2. API 570 Piping Inspection Certification
   3. Steel Tank Institute (STI) SP001 Tank Inspection Certifications
   4. NAPA 70 National Electrical Code Certifications

3.13 SYSTEM START-UP AND TRAINING

A. Provide an operational check and system start-up of all installed equipment.

B. The Contractor shall arrange with the Owner for on-site training for Owner personnel in the operation, programming, and maintenance of all installed equipment. If the Contractor is not knowledgeable in the use of the specified equipment, then it will be the Contractor's responsibility to make necessary arrangements with the manufacturer or the manufacturer's representative to perform the training.

3.14 FIELD WELDING

A. Cut, fit, and place items accurately in location, alignment, and elevation.

B. Comply with AWS D1.1/D1.1M.

END OF SECTION 330500

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SECTION 331113 - POTABLE WATER SUPPLY WELL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Well casing
2. Grout.
3. Water well screen.
4. Pack materials.
5. Plumbness/alignment testing.
6. Submersible well pump.

1.2 DESCTIPTION OF WORK

A. It is the intent and purpose of this specification to prescribe the construction and testing of a potable water supply well with a yield of at least 10 gallons per minute and intermittent yield of up to 25 gallons per minute. The Contractor shall supply all materials, plant, labor and equipment necessary to properly install, equip and place in immediate operation the respective items of the Contract. Any apparatus, materials and labor not hereinafter specifically mentioned in the Specifications or shown on the Drawings, which may be found necessary to complete or perfect any portion of the work in a substantial manner and in compliance with the requirements implied or intended in the Specifications, shall be furnished by the Contractor without additional compensation. This shall include all materials, devices or methods peculiar to the apparatus or system furnished and installed by the Contractor.

B. The specific work to be completed includes, but is not limited to:

1. Well drilling.
2. Casing installation.
3. Estimating well yield.
4. Grouting of casing.
5. Well development.
6. Plumbness and alignment testing.
7. Well disinfection.
8. Well performance testing.
9. Water analyses required but not performed by local health department.
10. State and local permit applications.
11. Well pump, piping, hose outlet.

C. The Contractor shall make all excavations; furnish and place casing; furnish and place screen sections and plain pipe sections of the casing; furnish all material for and mix and place the concrete sanitary seal. The installation of the pitless adapter, wiring, pump, and discharge piping are included and are described in subsequent paragraphs of this specification. The Contractor

shall also furnish, place, and later remove suitable temporary piping for conveying the water pumped from the well during construction to such location remote from the well as required by the authority having jurisdiction; furnish the necessary pumping equipment and all power required to operate the pump for such time as may be necessary to develop the well and for the period of testing; disinfect; and remove all surplus material. Contractor shall also furnish permanent deep well submersible pump, piping, wiring, and piping connections after proving well provides the capacity of water as required herein.

D. The Contractor shall complete and make applications necessary to obtain required permits for drilling and developing the proposed well. Following completion of the development, Contractor shall coordinate with the local health department for inspection and water quality testing, and perform work necessary to obtain the usage of a potable well.

E. Applications and construction shall comply with, or exceed, all minimum Delaware Regulations prescribed at the time of construction, governing the location, design, installation, use, disinfection, modification, and repair of the well and associated pumping equipment as well as requirements for the protection of potable water supply wells.

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Comply with regulatory requirements of the State, County, and other local political subdivision's requirements as may exceed the requirements of codes, standards and approving bodies referenced herein.

B. Testing Agency Qualifications: Certified by the EPA or State to analyze potable water for compliance monitoring.

C. Comply with requirements for both the Underwriters' Laboratories, Inc. (UL) Listings, Labels, and approvals and the National Electrical Manufacturers' Associations (NEMA) Stamps or Seals as applicable to electrical equipment apparatus forming parts of the water well system.

1.4 SUBMITTALS

A. Submit a description of soil sampling methods, and the proposed drilling and well construction method and materials, including type of drilling mud, if any, and method for subsequent removal of the drilling mud. This submission shall also include proposed methods for gravel pack placement, well grouting, and well development.

B. Submit copies of geologic stratum data for the production well. Data shall include well logs showing strata, depths, water table elevations, screen data and intervals. Data shall also include grain size distribution (sieve tests) of strata where well screen is proposed to be placed.

C. In areas where the screen is to be set, submit sieve analysis for each stratum of different geologic material encountered. Sieve analysis to be based on 1-quart minimum samples of each stratum.

D. Submit proposed screen slot size, screen open area, screen type/construction and recommended filter pack gradation based on the sieve analysis.

E. Submit copies of the approved permits for drilling and developing the well to the Engineer.

F. Submit submersible well pump manufacturer's product data including rated capacities, operating characteristics, and furnished specialties and accessories.

G. Submit submersible well pump shop drawings. Include diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

A. Submit manufacturer's Operation and Maintenance Instructions for submersible well pump.

B. Project Record Documents: Record the following data for the potable water supply well:

1. Casings: Material, diameter, thickness, weight per foot of length, and depth below grade.
2. Screen: Material, construction, diameter, and opening size.
3. Log: Formation log indicating strata encountered.
4. Alignment: Copies of well plumbness/alignment test results and certification that well is aligned and plumb within specified tolerances.
5. Pumping Test: Static water level, maximum safe yield, and drawdown at maximum yield.
6. Pump and control system test data.
7. Water quality analysis.
8. Well permit and certificate of completion from authority having jurisdiction.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Transport, store, and handle specified Products in accordance with manufacturer's recommendations to prevent damage and defects.

1.7 FIELD CONDITIONS

A. Well Drilling Water: Provide temporary water and piping for drilling purposes. Provide necessary piping for water supply.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with AWWA A100 for water supply wells.

2.2 PERFORMANCE REQUIREMENTS

A. Minimum Tested Water Supply Well Performance Capacity: 10 gpm.

2.3 DRILLING FLUIDS AND ADDITIVES

A. Drilling fluids and additives shall not impart toxic substances to the water or promote bacterial contamination.

2.4 WATER SUPPLY WELL

A. A single test hole shall be drilled to obtain representative soil samples used to design the well.

B. The gravel developed well shall consist, in general, of the following major items:

1. A permanent outer casing, placed to a depth sufficient to intercept the desired aquifer and provide the required flow. The casing shall be pressure grouted to its full depth.
2. A permanent inner casing of sufficient length to reach from the cutoff height, hereinafter specified, to the top of the well screen. The inner casing shall extend 2'-0" above finished grade.
3. Well screens shall be set at levels determined by data obtained from test hole.
4. Concrete sanitary seal shall fill the annular space between the borehole wall and the outer casing and shall also fill the annular space between the outer and inner casings.

2.5 EXCAVATION AND OUTER CASING

A. Excavation for any temporary casing and the outer permanent casing shall be done with a well drilling rig and by a drilling method acceptable to the Engineer.

B. The outer casing shall be capable of withstanding the structural load imposed during its installation and removal and shall be installed plumb, and sufficient checks shall be made to assure that it is plumb upon completion.

2.6 WELL SCREEN

A. Well screen shall be fabricated of ASTM A666, Type 304 stainless steel, welded, continuous-slot, V-shaped openings that widen inwardly or tube, with slotted or perforated surface, sized to match the permanent inner casing, designed for well-screen applications.

B. Screen couplings shall be butt-type, stainless-steel coupling rings. Screen fittings shall make tight seal between top of screen and well casing.

C. The screen shall have a length of screen surface and slot opening of size as required by capacity of the well. Screen shall be sized to limit entrance velocity to a maximum of 0.1 feet per second.

D. The bottom of the screen section shall be closed by a 1/4-inch stainless steel bottom plate, continuously welded to the bottom of the screen, which shall serve as a bearing plate for the inner casing and screen. A 10-foot sump shall be placed below the bottom screen.

2.7 WELL CASING

A. PVC Casing: ASTM F 480 and NSF 14, PVC, Schedule 40 bell-and-spigot pipe and couplings for solvent-cemented joints. Include NSF listing mark "NSF WC."

B. Pitless Adapter: Fitting, of shape required to fit onto casing, with waterproof seals.

C. Pitless Unit: Factory-assembled equipment that includes pitless adapter.

D. Well Seals: Casing cap, with holes for piping and cables, that fits into top of casing and is removable, waterproof, and vermin proof.

2.8 GROUT

A. Cement: ASTM C150/C150M, Type II.

B. Aggregates: ASTM C33/C33M, fine and coarse grades.

C. Water: Potable.

2.9 PACK MATERIALS

A. Coarse, uniformly graded filter sand, maximum 1/8 inch in diameter.

B. Fine gravel, maximum 1/4 inch in diameter.

2.10 SUBMERSIBLE WELL PUMPS

A. Description: Submersible, vertical-turbine well pump.

B. Standards: HI 2.1-2.2 and HI 2.3.

C. Pump Materials of Construction:

1. The motor, pump and impellers shall be 300 series stainless steel.
2. The shaft and coupling shall be 300 or 400 series stainless steel.
3. No moving parts shall be constructed from plastic or other brittle materials.
4. The intermediate and top bearings shall be compatible with the water pumped.

C. Motor Design

1. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors.
2. Capable of continuous operation under water in conformance with NEMA standards, with protected submersible power cable.
3. The motor shall be rated for 120 or up to 230 volts, 1-phase, 60 hertz, with minimum horsepower as required.

4. The motor shall have a Kingsbury-type thrust bearing or equal capable of carrying the maximum pump thrust loads.
5. The motor shall be water filled for cooling and lubrication. No oils or grease lubrication shall be used.
6. A shaft seal shall be provided to insure the internal motor fluid is not mixed with the pumped fluid.
7. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
8. Controllers, Electrical Devices, and Wiring: Electrical devices and connections are specified in electrical Sections.

D. Controls

1. Controls shall be UL labeled in a NEMA rated enclosure with a combination starter including full voltage magnetic starter with overload heater, heavy duty selector switch, motor circuit protector with NEMA rated thru-the-door-handle on/off switch, run indicating light (green), control terminals and a 120-volt control transformer with fused primary and secondary circuits.

    a. Control Logic: Electromechanical system with switches, relays, and other devices in the controller.
    b. Motor Controller: NEMA 4, dead front cabinet with locking hasp, full-voltage, combination-magnetic type with undervoltage release feature, motor-circuit-protector-type disconnect, and short-circuit protective device.
    c. Provide remotely mounted manual switch with adjustable timer (0 to 30 minute duration) and weatherproof marine grade dockside mounting box.
    d. Control Voltage: 120-V ac, with integral control-power transformer.
    e. Starting Devices: Hand-off-automatic selector switch in cover of control panel, plus pilot device for automatic control.
    f. Pump Operation: Manual switch operation with timer. Controlled “off” condition (manual reset) and pressure controlled “off” condition (automatic reset).
    g. Light: Running light for pump.
    h. On-off status of pump.
    i. Alarm status with flashing light.

2. Electrical components and assemblies for pump and system control shall comply with project electrical specifications.
3. The electrical protection shall be in accordance with motor manufacturer recommendations, State and local codes.
4. Pump shall be supplied with a sufficient length control/power cable to extend to control panel.
5. Controller shall be Deluxe model manufactured by Franklin-Electric, or approved equal.
6. Pump shall be energized via adjustable pressure switch located near outlet to pipe to maintain 50 psi at hose end connection at grade.

D. Accessories – with Code Approvals for NSF/ANSI 61

1. Pressure Gage

    a. Wetted Material: Bronze or Stainless steel
    b. 2” Liquid filled dial.

2. Pressure switch

    a. Compatible with control panel and pump.
    b. Wetted Material: Bronze or Stainless Steel.

3. Water Hammer Arrester

    a. ASSE 1010 bellows or piston type.
    b. Maintenance free.
    c. Threaded inlet.
    d. PDI size “C”.

4. Automatic Air Vent

    a. Pressure range up to 150 psi
    b. Brass body threaded inlet.
    c. Watts FV-4M1 Series.

E. Column Pipe: ASTM A53/A53M, Schedule 40, galvanized-steel pipe with threaded ends and cast-iron or steel threaded couplings.

F. Discharge Piping: ASTM D2239, SIDR Numbers 5.3, 7, or 9 PE pipe; made with PE compound number required to give pressure rating not less than 200 psig. Include NSF listing mark "NSF pw."

1. Insert Fittings for PE Pipe: ASTM D2609, made of PA, PP, or PVC with serrated, male insert ends matching inside of pipe. Include bands or crimp rings.

G. Capacities and Characteristics:

1. Capacity: 25 gpm at point of use.
2. Discharge Head: 60 psig at point of use.
3. Discharge Size: 2 inch.

2.11 WELL HEAD

A. Well cap shall be fully watertight, vermin proof, cast iron with neoprene “O” ring seals, and a factory applied painted finish, capable of being securely attached to a steel well casing, as manufactured by:

1. Baker Manufacturing Co. LLC
    1. Enterprise Street
    Evansville, WI 53536
    800-356-5130

2. Campbell Manufacturing, LLC
    133 E Spring Street
    Bechtelsville, PA 19505
    610-367-2107

3. Approved Equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Construct well using methods approved by authority having jurisdiction.

B. Take samples of substrata formation at 10-foot intervals and at changes in formation throughout entire depth of each water supply well. Carefully preserve samples on-site in glass jars properly labeled for identification.

C. Provide formation log identifying each strata by color, and material, with elevation or depth of top and bottom of each strata. Log shall be completed in in accordance with the DNREC Water Supply Section.

D. Provide aboveground structure, acceptable to authorities having jurisdiction, to allow settlement of cuttings and circulation of drill fluids back to well without discharging to on-site waterways.

E. Set casing and liners round, plumb, and true to line.

F. Join casing pipe as follows:

1. Ream ends of pipe and remove burrs.
2. Remove scale, slag, dirt, and debris from inside and outside casing before installation.
3. Clean and make solvent-cemented joints.

G. Mix grout in proportions of 1 cu. ft. or a 94-lb sack of cement with 5 to 6 gal. of water. Bentonite clay may be added in amounts of 3 to 5 lb/cu. ft. for a 94-lb sack of cement. If bentonite clay is added, water may be increased to 6.5 gal./cu. ft. of cement.

H. Place grout continuously, from bottom to top surface, to ensure filling of annular space in one operation. Do not perform other operations in well within 72 hours after grouting of casing. When quick-setting cement is used, this period may be reduced to 24 hours.

I. Provide permanent casing with temporary well cap. Install with top of casing 36 inches above finished grade.

J. Develop wells to maximum yield per foot of drawdown.

1. Extract maximum practical quantity of sand, drill fluid, and other fine materials from water-bearing formation.
2. Avoid settlement and disturbance of strata above water-bearing formation.
3. Do not disturb sealing around well casings.
4. Continue developing wells until water contains no more than 2 ppm of sand by weight when pumped at maximum testing rate.

K. Install submersible well pumps according to ANSI/HI 2.4 and provide access for periodic maintenance.

1. Before lowering permanent pump into well, lower a dummy pump that is slightly longer and wider than permanent pump to determine that permanent pump can be installed. Correct alignment problems.
2. Before lowering permanent pump into well, start pump to verify correct rotation.
3. Securely tighten discharge piping joints.
4. Connect motor to submersible pump and locate near well bottom.
    a. Connect power cable while connection points are dry and undamaged.
    b. Do not damage power cable during installation; use cable clamps that do not have sharp edges.
    c. Install water-sealed surface plate that will support pump and piping.

3.2 CONNECTIONS

A. Piping installation requirements shall be as shown on the plans. Drawings indicate general arrangement of piping, fittings, and specialties. Contractor shall be responsible for the following:

1. Connect piping between well pump and water piping.
2. Connect water distribution system in trench to well pipe at pitless unit.
3. Connect building water distribution to well pipe inside building.

B. Ground equipment according to requirements in electrical specification sections.

C. Connect wiring according to NEC requirements for Low-Voltage Electrical Power Conductors and Cables.

3.3 FIELD QUALITY CONTROL

A. Test Preparation: Clean water supply wells of foreign substances. Swab casings using alkalis, if necessary, to remove foreign substances.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Plumbness and Alignment Testing: Comply with AWWA A100.
2. Furnish samples of water-bearing formation to testing laboratory and well-screen manufacturer for mechanical sieve analysis.
3. Prepare reports on static level of ground water, level of water for various pumping rates, and depth to water-bearing strata.
4. Performance Test Preparation: Start well pump and adjust controls and pressure setting. Replace damaged and malfunctioning controls and equipment.

5. Performance Testing: Conduct final pumping tests after wells have been constructed, cleaned, and tested for plumbness and alignment.
   a. Arrange to conduct tests, with seven days' advance notice, after test pump and auxiliary equipment have been installed. Note water-level elevations referred to for each assigned datum in wells.
   b. Provide discharge piping to conduct water to locations where disposal will not create a nuisance or endanger adjacent property. Comply with requirements of authorities having jurisdiction.
   c. Provide and maintain equipment of adequate size and type for measuring flow of water, such as weir box, orifice, or water meter.
   d. Measure elevation to water level in wells.
   e. Perform two bailer or air-ejection tests to determine expected yield. Test at depths with sufficient quantity of water to satisfy desired yields.
   f. Test Pump: Variable capacity test pump with capacity equal to maximum expected yields at pressure equal to drawdown in wells, plus losses in pump columns and discharge pipes.
   g. Start and adjust test pumps and equipment to required pumping rates.
   h. Record readings of water levels in wells and pumping rates at 30-minute maximum intervals throughout 24-hour minimum period.
   i. Record maximum yields when drawdown is 60 inches above top of suction screens after designated times.
   j. Operate pumping units continuously for eight hours after maximum drawdown is reached.
   k. Record returning water levels in wells and plot curves of well recovery rates.
   l. Remove sand, stones, and other foreign materials that may become deposited in wells after completing final tests.

E. Water supply well will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

G. Water Analysis Testing:

1. Following completion of the well development, coordinate with the local health department as required for inspection and water quality testing and perform work necessary to obtain the certificate needed to use the well for potable water purposes.
2. Engage a qualified testing agency to make bacteriological, physical, and chemical analyses of water from finished well and report the results. Make analyses according to requirements of authorities having jurisdiction.
3. Analyze water sample from finished well for bacteriological, physical, and chemical quality and report the results. Make analyses according to requirements of authorities having jurisdiction.

3.4 CLEANING

A. Follow water supply well disinfection procedures required by authorities having jurisdiction before testing well pumps.

3.5 PROTECTION

A. Water Quality Protection: Prevent well contamination, including undesirable physical and chemical characteristics.

B. Ensure that mud pit will not leak or overflow into streams or wetlands. When well is accepted, remove mud and solids in mud pit from Project site and restore site to finished grade.

C. Provide casings, seals, sterilizing agents, and other materials to eliminate contamination; shut off contaminated water.

D. Exercise care to prevent breakdown or collapse of strata overlaying that from which water is to be drawn.

E. Protect water supply wells to prevent tampering and introducing foreign matter. Retain temporary well cap until installation is complete.

END OF SECTION 331113

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SECTION 33 14 15 - SITE WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water-distribution piping and related components outside the building for domestic water service and service entrance piping to a point 1 foot above finished floor. Terminate water-service piping with appropriate fitting for extension as required by Division 22.

1.2 ACTION SUBMITTALS

A. Product Data for all water line components, including piping, fittings, valves, valve boxes, dock piping support clamps, detectable warning tape, tracer wire.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: For piping and specialties including relation to other services in same area, drawn to scale. Show piping and specialty items and valves, specialty locations, and elevations. Provide detailed drawings for the dock water line blow off assembly, dock water line installation within dock structure, and water line connection at dock utility pedestal.

B. Disinfection and hydrostatic pressure test methods, equipment and procedures.

C. Field Quality-Control Submittals:

1. Field quality-control reports. Disinfection and hydrostatic pressure test results.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with standards of authorities having jurisdiction for domestic water-service piping, including materials, installation, testing, and disinfection.

B. Piping materials to bear label, stamp, or other markings of specified testing agency.

C. All piping and appurtenances intended to convey or dispense water for human consumption are to comply with the U.S. Safe Drinking Water Act (SDWA), with requirements of the Authority Having Jurisdiction (AHJ), and with NSF 61/NSF 372 or are certified in compliance with NSF 61/NSF 372 by an ANSI-accredited third-party certification body, that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.

2.2 PIPING MATERIALS

A. Comply with requirements in "Piping Applications" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and service sizes.

B. Potable-water piping and components comply with NSF 14, NSF 61, and NSF 372. Include marking “NFS-pw” on piping.

2.3 PE 2” DR 11 and Stainless Steel

A. PE 2-Inch DR11 (Underground Water Service)

1. PE Pipe:

    a. PE4710, DR11.

    b. AWWA C901 or ASTM D3035.

    c. Black pipe with blue stripe for potable water.

    d. Pressure rating: 200 psi minimum.

2. PE Fittings:

    a. Molded or fabricated PE4710 fittings, DR11.

    b. Butt-fusion per ASTM F2620.

    c. Electrofusion per ASTM F1055.

3. Mechanical transition fittings:

    a. Brass or stainless-steel compression-style, NSF 61/372 compliant.

    b. Stainless steel insert stiffeners required.

B. Stainless Steel Tubing – 1-Inch and 2-Inch (Aboveground Dock/Structure Piping)

1. Tubing:

    a. ASTM A269 or A312, Type 316.

    b. Seamless or welded, Schedule 40 as indicated.

2. Fittings:

    a. 316 stainless steel threaded or welded fittings.

    b. ANSI/ASME B16.11 (for threaded) or B16.9 (for welded).

c. Provide appropriate coupling at utility pedestal water line connection for ease of disconnection if needed.

2.4 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

2.5 CURB VALVES

A. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.

1. Service Boxes for Curb Valves: ASTM A48/A48M, Class 25 cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches in diameter.

a. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, matching curb valve.

2.6 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

B. Tracer Wire: Plastic coated copper 12 AWG.

C. Dock Piping Support Clamps: Dock water line pipe support clamps shall Stainless steel Type 316, U-bolt assembly style with integral thermoplastic elastomer cushion of the appropriate size for the supported piping, ZSI Inc. Alpha Series, or equivalent and approved equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Comply with excavating, trenching, and backfilling requirements in other sections of these specifications.

3.2 PIPING APPLICATIONS

A. Transition couplings with pressure ratings at least equal to piping pressure rating may be used unless otherwise indicated.

B. Do not use flanges or unions for underground piping.

C. Welded or threaded couplings may be used on aboveground piping.

D. Underground Water-Service Piping (NPS 3/4 to NPS 3):

1. PE DR11 (2-inch) with fused joints.

E. Aboveground Water-Service Piping:

1. Stainless Steel Tubing – 1-inch and 2-inch, threaded or welded joints.

2. Dock or structure-mounted piping shall use stainless steel supports and clamps.

3.3 VALVE APPLICATIONS

A. General Application: Use curb valves with ends compatible with piping, for NPS 2 and smaller installation.

3.4 INSTALLATAION OF TRACER WIRE

A. Provide a continuous tracer wire in sufficient length over each separate run of underground nonmetallic pipe. Tracer wire shall extend the entire length of the underground nonmetallic pipe run and be terminated and accessible at each end, including from the well to the building and from the building to the dock water line blow off assembly shut off valve.

3.5 INSTALLATION OF PIPING

A. Install HDPE and Stainless Steel water-service piping in accordance with AWWA C600 and AWWA M41.

B. Bury piping with depth of cover over top at least 36 inches.

C. Extend water-service piping and connect to water-supply source and building water-piping systems in locations and pipe sizes indicated.

1. Make connections to building water-piping systems when those systems are installed.

D. Install pipe sleeves and seals for piping penetrations of concrete walls and slabs.

3.6 INSTALLATION OF HANGERS AND SUPPORTS

A. Install pipe supports and clamps for the above ground dock water line as shown on the drawings.

B. Install pipe supports and clamps with maximum spacing to comply with locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

C. Support horizontal piping within 12 inches of each fitting and coupling.

3.7 JOINT CONSTRUCTION

A. Joints:
1. PE: Butt-fusion or electrofusion.
2. Stainless Steel: Threaded or welded.

B. Install dielectric fittings where dissimilar metals are joined.

3.8 INSTALLATION OF VALVES

A. Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.9 CONNECTIONS

A. Connect water-distribution piping to interior domestic water piping.

3.10 IDENTIFICATION

A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping 2’ below grade.

3.11 FIELD QUALITY CONTROL

A. Preparation for Testing

1. Complete all pipe installation before testing, including:

a. Backfilling to required depth except for joints being inspected.

b. Installation of all valves, fittings, and appurtenances.

2. Fill and Soak Period

a. Slowly fill piping at a velocity less than 1 ft/sec to avoid water hammer.

b. Remove all air from piping.

c. After filling, allow the pipeline to remain full for 24 hours prior to applying test

pressure in accordance with AWWA C600 and AWWA M41.

d. Inspect the system for visible leaks before performing the official test.

B. Test Pressure

1. Apply a hydrostatic test pressure equal to 75 psi minimum.

2. Test Pressure Limits:

a. Do not exceed the pressure rating of any component in the system.

b. For PE pipe, test pressure shall not exceed 2 times the pressure class, per AWWA C605.

C. Test Procedure (Per AWWA C600 & AWWA M41)

1. Pressurize the pipeline to the required test pressure.

2. Maintain the test pressure for two (2) hours, unless otherwise indicated.

3. Observe pressure gauge readings:

a. Every 5 minutes for the first 30 minutes.

b. Every 15 minutes for the remainder of the test.

4. During the test:

a. No additional water may be pumped into the pipeline.

b. Any visible leakage is grounds for immediate failure and shall be repaired.

D. Allowable Leakage

1. The system shall be watertight. No allowable visible leakage or pressure drop during testing acceptable.

E. Failure and Retesting

1. If pressure drop or leakage is observed:

a. Locate the leak.

b. Repair or replace defective pipe, joints, or fittings.

c. Repeat the hydrostatic test until results comply with the specification.

2. If repeated failures occur:

   a. Contractor shall investigate and identify the cause.

   b. Submit a corrective action plan to the Engineer for review.

3.12 CLEANING

A. Clean and disinfect water-distribution piping as follows:

1. Purge new water-distribution piping systems.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction, or use procedure described in AWWA C651, or do as follows:

   a. Fill system containing at least 200 ppm of chlorine; isolate and allow to stand for three hours.
   b. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
3. Contractor shall coordinate with Owner or Engineer for the testing. Contractor shall obtain water samples for both bacteria testing and chlorine residual testing and provide to the Owner or Engineer. Provide water samples in sterile bottles. Owner or Engineer will transfer samples to the State of Delaware Office of Drinking Water for testing.

   a. Repeat procedure if biological examination shows evidence of contamination or unacceptable chloring levels.

B. Prepare reports of purging and disinfecting activities.

3.13 FINAL ACCEPTANCE

A. Final acceptance of water distribution piping shall be contingent upon acceptable pressure, bacteria and chlorine residual testing.

END OF SECTION 331415

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APPENDIX #1

State of Delaware Architectural Accessibility Board

STATE OF DELAWARE
Architectural Accessibility Board
540 S. DuPont Highway, Suite 1
Dover, Delaware 19901

December 13, 2024

Mr. Lance Wilgus
Century Engineering
550 Bay Road
Dover, DE 19901

RE: Leipsic Resaearch Dock Facility
Case No. 24137

Dear Mr. Wilgus:

State of Delaware's Architectural Accessibility Board (AAB) met on Thursday, December 12, 2024, at which time your submission for the above referenced project was reviewed. Based on your plans and drawings your submission was approved.

The AAB's review and approval is not to be construed as the assumption of any responsibility or liability for this project. Please know that there may be items pertaining to various codes, or other regulations, that may not have been addressed. You, however, are responsible for ensuring full compliance with all applicable accessibility codes, standards and/or other requirements. Please be advised that this approval pertains only to the above-referenced project and specifically only to the plans and drawing dated December 4, 2024. You are advised that any change or revisions to the approved plans or drawing that have a direct effect on accessibility, should be resubmitted to the AAB for review and approval. Likewise, errors could also occur when the actual construction deviates from the approved design.

If you have any questions regarding this letter, please contact me at (302) 739-5644.

Very truly yours,

Jennifer Lieber

Jennifer Lieber
Chief Administrator, AAB

cc: Board Members

APPENDIX #2

State Historic Preservation Office
Determination of No Historic Properties Affected

Rachel Owrutsky

From: Perash, Rachel M. (DNREC) <rachel.perash@delaware.gov>
Sent: Friday, August 16, 2024 3:14 PM
To: Rachel Owrutsky
Cc: Ashe, Jeremey (DNREC); Reynolds, Taylor L. (DNREC)
Subject: RE: Leipsic Research Dock Facility query

External Email

Hey Rachel!

No comments from SHPO so you are good to go! The only comment from the county is any building permits needed for the project will need to be submitted through the Kent County Division of Inspections and Enforcement.

Rachel M. Perash, M.S., RPA
She/her/hers
Senior Archaeologist, Cultural Resources Unit

302-739-9188 302-535-4199
rachel.perash@delaware.gov
89 Kings Highway, Dover, DE 19901
destateparks.com

From: Rachel Owrutsky <ROwrutsky@kleinfelder.com>
Sent: Thursday, August 15, 2024 3:41 PM
To: Perash, Rachel M. (DNREC) <rachel.perash@delaware.gov>
Subject: RE: Leipsic Research Dock Facility query

Hi Rachel,

Are there any updates in terms of an historical and archaeological review for this project?

Thank you,

Rachel Owrutsky (she/her)
Environmental Scientist

550 S Bay Road
Dover, DE 19901
d| 301.364.7012
o| 302.450.3408

From: Rachel Owrutsky
Sent: Wednesday, April 17, 2024 12:18 PM
To: Perash, Rachel M. (DNREC) <rachel.perash@delaware.gov>
Cc: TJ Austin <tjaustin@kleinfelder.com>
Subject: Leipsic Research Dock Facility query

Hi Rachel,

DNREC Division of Fish and Wildlife is planning to build a new research vessel dock and boat storage building including a parking lot and a diesel fuel tank in Leipsic, DE. The work is anticipated to require a permit from the USACE and DNREC-WSLS. We are requesting information on historical and archaeological resources that may be affected by the project.

Please see attached plans and mapping. Let me know if you have any questions.
Coordinates: 39°14'33.8"N 75°30'46.1"W

Thank you!

Rachel Owrutsky (she/her)
Environmental Scientist

550 S Bay Road
Dover, DE 19901
d| 301.364.7012
o| 302.450.3408

APPENDIX #3

US Fish & Wildlife
Endangered Species Act Section 7 Consultation

Rachel Owrutsky

From: CBFO Project Review, FW5 <cbfoprojectreview@fws.gov>
Sent: Friday, May 17, 2024 12:16 PM
To: Rachel Owrutsky
Subject: Re: [EXTERNAL] Leipsic Research Dock Facility RTE query

External Email

Hi Rachel,

Thank you for sending this project for review. Due to the location away from known occurrence records, this project is **not likely to adversely affect** Eastern Black Rail. The project is also expected to have **no effect** on Northern Long-eared Bat or Tricolored Bat. The Monarch Butterfly is a candidate species and no Section 7 consultation is required at this time. No further Section 7 consultation is required for this project unless project plans change. Please let me know if you have any questions.

Raquel Wetzell
US Fish and Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Dr.
Annapolis, MD 21401

From: Rachel Owrutsky <ROwrutsky@kleinfelder.com>
Sent: Wednesday, April 17, 2024 12:00 PM
To: DNREC_EnvReview@delaware.gov <DNREC_EnvReview@delaware.gov>; CBFO Project Review, FW5 <cbfoprojectreview@fws.gov>
Cc: TJ Austin <tjaustin@kleinfelder.com>
Subject: [EXTERNAL] Leipsic Research Dock Facility RTE query

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

DNREC-SCRP and USFWS,

On behalf of the DNREC Division of Fish and Wildlife, we are pleased to inform you of the Leipsic Research Dock Facility project. The project is located in Leipsic, DE. The project area (site) is located approximately in the northeast section of the area known as Leipsic in Kent County, Delaware. Site coordinates are approximately 39°14'33.8"N 75°30'46.1"W. This project involves the excavation and backfill of previously demolished buildings and pavement, the construction of a new research vessel dock in the Leipsic River, and the construction of a vessel storage building on land. The dock will be roughly 57’x120’. The dock will be made of timber piles and aluminum decking with a concrete dock abutment that has a stone base. Construction surrounding the vessel storage building includes paved areas, a parking lot, and a concrete pad with a 2,000-gallon diesel fuel tank.

The USFWS has indicated: Northern Long-eared Bat (*Myotis septentrionalis*), Tricolored Bat (*Perimyotis subflavus*), Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*) and Monarch Butterfly (*Danaus plexippus*) be considered in an effects analysis for this project.

On behalf of the DNREC Division of Fish and Wildlife, Century Engineering, LLC is requesting your review and response with any information or records that you may have regarding the presence of rare, threatened, or endangered species within the project area to the above location. In addition, please forward any information that you may have regarding State Natural Heritage Sites, Delaware Natural Estuarine Research Reserves, and Fisheries within the project area.

Thank you,

Rachel Owrutsky (she/her)
Environmental Scientist

550 S Bay Road
Dover, DE 19901
d| 301.364.7012
o| 302.450.3408

CENTURY ENGINEERING
A Kleinfelder Company

APPENDIX #4

DNREC Fish & Wildlife
Species Conservation Research Program (SCRP)

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

DIRECTOR'S OFFICE

PHONE
(302) 739-9910

June 4, 2025

Missy Kalb
Century Engineering, LLC
550 Bay Road
Dover, DE 19901

Re: DNREC-CP 2025 Leipsic Research Vessel Dock and Storage Building Tax Parcel #4-13-03910-01-3100-00001

Dear Missy:

Thank you for contacting the Division of Fish and Wildlife (DFW) Species Conservation and Research Program about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

State Natural Heritage Site
A review of our database indicates that there are currently no records of state-rare or federally-listed plants, animals or natural communities at this project site. As a result, at present, this project does not lie within a State Natural Heritage Site, nor does it lie within a Delaware National Estuarine Research Reserve which are two criteria used to identify "Designated Critical Resource Waters" in the U.S. Army Corps of Engineers (USACE) Nationwide Permit General Condition No. 22. A copy of this letter shall be included in any permit application or pre-construction notification submitted to the USACE for activities on this property.

Low Marsh
Currently, there are no records of state-rare or federally-listed marsh bird species at this site. However, aerial imagery and wetland habitat maps indicate that low marsh habitat (i.e., dominated by *Spartina alterniflora*) is present. Several state-rare species of conservation concern frequently nest in low marsh habitat, including the seaside sparrow (*Ammospiza maritimus*), clapper rail (*Rallus longirostris*), and willet (*Tringa semipalmata*). We recommend a time of year restriction of **April 1st to July 31st** to avoid impacts to marsh nesting birds.

Delaware Ecological Network
Habitat on this parcel has been identified as ecologically important by the Delaware Ecological Network (DEN) and is classified as a core area and a hub. The DEN, although non-regulatory, is a statewide conservation network developed using GIS and field collected datasets that help to identify and prioritize ecologically important areas for natural resource protection. The DEN includes ecologically important areas such as forests, wetlands, streams, habitat that supports rare species and areas of especially high quality. The DEN includes the following key elements: 1) Core areas – which contain relatively intact natural ecosystems, and provide high-quality habitat for native plants and animals, 2) Hubs – which are slightly fragmented aggregations of core areas with contiguous natural cover and 3) Corridors – which link core areas together, allowing wildlife movement and seed and pollen transfer between them. The DEN can be accessed through First Map: Delaware Ecological Network 2.0 | Delaware Ecological Network 2.0 | State of Delaware (arcgis.com). We recommend that this DEN designated area be protected to the fullest extent possible.

Fisheries

American Eel
The Leipsic River is used by large numbers of American eel (*Anguilla rostrata)*. We request that in-stream work not take place from **March 1st to May 15th** to allow upstream passage of elvers (young eels).

Anadromous Species
The Leipsic River is utilized by American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), and alewife (*Alosa pseudoharengus*) for spawning, nursery, and adult habitats. Alewife and blueback herring, also known as 'river herring', are listed by the National Marine Fisheries Service as a Species of Concern. These species are important to both commercial and recreational fisheries and support a critical forage base for other fish, mammal, and bird species. The protection of spawning and nursery habitats and migratory corridors during the spawning season is important in maintaining these fisheries resources. We request a time of year restriction on in-water work activities from **March 15th – June 30th** to avoid impacts to these species during the spawning season.

We are continually updating our records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information.

Please feel free to contact me with any questions or if you require additional information.

Sincerely,

Faith Garcia
Environmental Review Coordinator
Phone: (302) 735-8665

Cell: (302) 443-3812
Email: christinefaith.garcia@delaware.gov
89 Kings Highway
Dover, DE 19901

APPENDIX #5

DNREC Division of Watershed Stewardship Sediment And Stormwater Management Standard Plan Approval

DNREC Division of Watershed Stewardship
285 Beiser Boulevard, Suite 102
Dover, DE 19904
(302) 739-9921

APPLICATION FOR STANDARD PLAN APPROVAL

NON-RESIDENTIAL CONSTRUCTION WITH LESS THAN 1.0 ACRE DISTURBED

Applicability Criteria

1. The disturbed area for construction of the improvements will not exceed 1.0 acre.
2. Within the disturbed area, the pre-development land use is not classified as forest.
3. For project site locations within an area previously managed for stormwater quantity and quality under an approved Sediment and Stormwater Plan, the post construction condition meets the original stormwater design criteria.
4. For project site locations within an area previously unmanaged for stormwater quantity and quality under an approved Sediment and Stormwater Plan, one of the following is met:
    a. Comparison of the existing parcel curved number (CN) based upon the Department's 2017 aerial photography to the proposed CN for the parcel after non-residential construction results in less than one whole number change in the CN, OR
    b. No new impervious area is proposed as a result of construction.

Site Information

Project Name: Leipsic Research Dock Facility
Site Location: 86 Lombard Street, Leipsic, DE 19901
Previous Plan Name: N/A
Previous Plan Approval Number: N/A
Tax Parcel ID: 4-13-03910-01-3100-00001

Parcel Total Acres (nearest 0.1ac): 4.5
Disturbed Acres (nearest 0.1ac): 0.9
Proposed Impervious Area (square feet): 24497
Wooded area to be cleared:
Pre CN: 74.71 Post CN: 75.23

Applicant Information

Owner: DNREC Division of Fish & Wildlife
Mailing Address: 89 Kings HWY, Dover DE, 19901
Owner Phone: 302-632-5404
Owner Email: jeremey.ashe@delaware.gov

Applicant: DNREC Division of Fish & Wildlife, c/o Jeremey Ashe
Mailing Address: 89 King HWY, Dover DE, 19901
Applicant Phone: 302-632-5404
Applicant Email: jeremey.ashe@delaware.gov

Fees

The review fee is $80 per disturbed acre to the nearest 0.1 acre with a minimum fee of $80 for any standard plan approvals disturbing less than 1.0 acre. Make checks payable to Division of Watershed Stewardship.

Approval Information (for office use only)

Approval # 2025-107 **Fee Paid: $** 80.00 Check #: 9378
Approved by: Joshua Blandino **Approval Date:** 01/22/2026
Title: Engineer I **Expiration Date:** 01/22/2031

Standard Conditions

1. Discharges from rooftops will be disconnected using one of the following methods or another method approved by the Department or Delegated Agency:
    a. Individual downspouts will discharge to lawn or landscape area.
    b. Discharges from downspouts will be collected to discharge to a rain garden.
    c. Discharges from downspouts will be collected in rain barrels or cisterns for reuse.
2. Driveways, sidewalks, patios, and other impervious surfaces will be graded to sheet flow to lawn or other pervious areas to the maximum extent practicable.
3. Unless waived in writing by the Department or Delegated Agency a Construction Site Stormwater Management Plan (CSSMP) in accordance with Department or Delegated Agency guidance for this Standard Plan shall be followed.
4. Approval of this Standard Plan does not relieve the applicant from complying with any and all federal, state, county or municipal laws and regulations.

Stabilization Conditions

1. Following initial soil disturbance or redisturbance, temporary or permanent stabilization with seed and mulch shall be completed within 14 calendar days to the surface of all disturbed areas not actively under construction.
2. Specific stabilization recommendations may be found in the Delaware Erosion and Sediment Control Handbook, 3.4.3 Standard and Specifications for Vegetative Stabilization.

Applicant Certification

I, the undersigned, certify that the information supplied on this Application for Standard Plan Approval is accurate, the proposed land disturbing activity meets the criteria established, and all conditions of this Standard Plan Approval will be met by the applicant, builder, contractor, and owner during construction and post construction.

Applicant Signature: _____ Date: 11/21/25

Applicant Printed Name: Jeremey Ashe Title: Construction Manager

*****THIS STANDARD PLAN APPLICATION FORM MUST BE MAINTAINED ON THE SITE AT ALL TIMES DURING CONSTRUCTION*****

APPENDIX #6

DNREC Wetlands and Subaqueous Lands Permit

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF WATER
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

WETLANDS & WATERWAYS SECTION

PHONE
(302) 739-9943

SUBAQUEOUS LANDS PERMIT

PERMIT NUMBER: SP-094/25

EFFECTIVE DATE: **April 7, 2026**

CONSTRUCTION EXPIRATION DATE: **April 7, 2029**

PERMITEE: DNREC - DIVISION OF FISH AND WILDLIFE
CARE OF: JEREMEY ASHE

ASSOCIATED AUTHORIZATIONS: N/A

TAX PARCEL NO.: 4-13-03910-01-3100-00001

LOCATED IN: LEIPSIC RIVER

SITE ADDRESS: 86 LOMBARD ST, LEIPSIC, KENT COUNTY, DELAWARE

MAILING ADDRESS: 89 KINGS HIGHWAY, DOVER, DE 19901

Project Summary

The Department of Natural Resources and Environmental Control, Division of Water, Wetlands and Waterways Section ("the Department") hereby authorizes the Permittee ("Permittee") to conduct the above-referenced project pursuant to the provisions of 7 Del. C. §7205, Department's Regulations Governing the Use of Subaqueous Lands, and in accordance with the special and general conditions described below, the attached Plan(s) approved by the Department, and incorporated herein and described below:

TO CONSTRUCT:

- A 10 foot wide by 31 foot long pier
- A 10 wide by 120 foot long dock
- A 4 foot wide by 10 foot long dock extension platform

Furthermore, pursuant to the provisions of *7 Del. C.* §7203, the Secretary of the Department of Natural Resources and Environmental Control through his duly authorized representative finds that it is not contrary to the public interest if this project is approved subject to the terms and conditions herein set forth.

By Matthew Jones, Section Manager
Division of Water, Wetlands and Waterways Section

By _____, Environmental Specialist
Division of Water, Wetlands and Waterways Section

Attachments:

☒Permit General Conditions
☒Permit Special Conditions
☒Approved Plans
☐SPGP-20
☒Post Construction Completion Report

THE FOLLOWING CONDITIONS APPLY TO ALL ACTIVITIES AUTHORIZED BY PERMIT NO. SP-094/25

GENERAL CONDITIONS

1. This approval is in accordance with the plans and application submitted to the Department of Natural Resources and Environmental Control, a copy of which is attached hereto and made a part hereof.
2. The permittee and contractor shall at all times comply with all applicable laws and regulations of the Department of Natural Resources and Environmental Control.
3. A copy of this Permit and the stamped approved plans shall be available on-site during all phases of construction activity.
4. The conditions contained herein shall be incorporated into any and all construction contracts associated with the construction authorized herein. The permittee and contractor are responsible to ensure that the workers executing the activities authorized by this Permit have full knowledge of, and abide by, the terms and conditions of this Permit.
5. No portion of the structure shall be constructed using creosote treated lumber.
6. No portion of the structure(s) authorized by this Permit shall exceed the dimensions for that structure identified on Page Two of this Permit.
7. The issuance of this Permit does not constitute approval for any activities that may be required by any other local, state or federal government agency.
8. The issuance of this Permit does not imply approval of any other part, phase, or portion of any overall project the permittee may be contemplating.
9. This Permit authorizes only the activities described herein. Modifications to the project may require a supplemental approval from this office prior to the initiation of construction. A determination of the need for a supplemental approval will be made by this office pursuant to the permittee submitting written notification and revised plans indicating project changes. Failure to contact the Department prior to executing changes to the project shall constitute reason for this Permit being revoked.
10. The Contractors Completion Report shall be filled out and returned within 10 days of completion of the authorized work.
11. Representatives of the Department of Natural Resources and Environmental Control shall be allowed to access the property to inspect all work during any phase of the construction and may conduct pre and post-construction inspections, collect any samples or conduct any tests that are deemed necessary.
12. All construction materials, waste or debris associated with this activity shall be properly disposed of and contained at all times to prevent its entry into waters or wetlands. Construction materials shall not be stockpiled in subaqueous lands or wetlands.
13. The permittee and contractor shall employ measures during construction to prevent spills of fuels, lubricants or other hazardous substances. In the event of a spill, the permittee and contractor shall make every effort to stop the leak and contain the spill and shall immediately contact the Hazardous Spill Response Team (HAZMAT) at 1-800-662-8802

and this office at (302) 739-9943. The permittee and contractor are responsible to comply with all directives to contain and clean up the spilled material(s) as stipulated by the HAZMAT team, and to restore the site as may be required by this office.

14. No construction shall occur after the construction expiration date identified on Page One of this Permit. The permittee may file a construction expiration date extension request of up to one (1) year if necessary to complete the authorized work. Such requests must be received by the Department at least thirty (30) days prior to the construction expiration date.
15. Disturbance of subaqueous lands or wetlands adjacent to the authorized structures or activities is prohibited unless specifically addressed in the special conditions of this Permit. Disturbance of subaqueous lands or wetlands in the path of construction activities shall be minimized. Any temporarily impacted subaqueous lands or wetlands shall be returned to pre-disturbance elevations and conditions.
16. This Permit is associated with the above referenced tax parcel number and is conveyed to subsequent owners of said parcel.
17. Erosion and sediment control measures shall be implemented in accordance with the specifications and criteria in the current Delaware Erosion and Sediment Control Handbook, so as to minimize entry and dispersal of sediment and other contaminants in surface waters.
18. No portion of the structure shall be installed within ten (10) feet of the adjacent property lines without a letter of no objection.
19. No portion of the structure shall exceed 20% of the width of the water body as measured at mean low water.
20. The structures authorized by this Permit shall be constructed and maintained in a manner so as to assure water access to adjacent properties.
21. This Permit does not authorize any future repairs below the water line, or any additions or modifications to the structures authorized herein. Such activities require separate written authorization from the Department of Natural Resources and Environmental Control.
22. Failure to comply with any of the terms or conditions of this Permit may result in enforcement action which could include the revocation of this Permit and subsequent restoration of the site to preconstruction conditions.

SPECIAL CONDITIONS

1. Time of Year Restrictions from the Division of Fish and Wildlife – Reference the chart below for details on seasonal restrictions (depicted in gray) when no construction shall take place.

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Marsh Nesting Birds				1st			31st					
American Eel			1st		15th							
Anadromous Species			15th			30th						

2. This Permit is granted for the purpose of berthing state research vessels, as indicated on the approved plans. Any other use without prior approval shall constitute reason for this Permit being revoked.
3. The work authorized by this Permit is subject to the terms and conditions of the Department of the Army Permit: NAP-2025-00191-103.
4. All work should be planned for periods of low waterway base flows. If sediment and erosion controls are damaged or destroyed due to storm events, such controls shall be repaired and/or replaced immediately.

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF WATER
WETLANDS AND WATERWAYS SECTION

SUBAQUEOUS LANDS PERMIT POST-CONSTRUCTION CONTRACTOR'S COMPLETION REPORT

Subaqueous Lands Permit Number: SP-094/25

Name: DNREC – DIVISION OF FISH AND WILDLIFE

Address: ADJACENT TO 86 LOMBARD ST, LEIPSIC, KENT COUNTY, DELAWARE

Parcel #: 4-13-03910-01-3100-00001

Instructions:

Use the QR code below to access and complete the Post Construction Completion Report. Submit the form within **ten** days after construction concludes

Submit Report Here

For inquiries, email the Wetlands and Waterways Section at DNREC_Wetlands_Waterways@delaware.gov

APPENDIX #7

DNREC Delaware Coastal Management Program

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF CLIMATE, COASTAL AND ENERGY
STATE STREET COMMONS
100 W. WATER STREET, SUITE 7B
DOVER, DELAWARE 19904

COASTAL PROGRAMS

PHONE
(302) 739-9283

February 11, 2026

Missy Kalb
Century Engineering, LLC
55 S Bay Road
Dover, DE 19901

RE: Delaware Coastal Management Program — Federal Consistency Certification Conditional Concurrence for Leipsic Research Vessel Dock and Storage Building (FC 2025.0035)

Dear Missy Kalb,

The Delaware Department of Natural Resources and Environmental Control (DNREC) Coastal Management Program (DCMP) has completed its review of the above referenced project, received and deemed administratively complete on May 12, 2025. The 6-month review period originally was to end on November 12, 2025. On November 10, 2025, the DCMP and DNREC Division of Fish and Wildlife agreed to stay the review period for three months, to end on February 10, 2026. At this time, the remainder of the six-month review period commenced with a response required by February 11, 2026.

PROPOSED ACTION

DNREC Division of Fish and Wildlife proposes to utilize a U.S. Army Corps of Engineers (USACE) Individual Permit to construct a dock in the Leipsic River at the eastern terminus of Lombard Street, Leipsic, Kent County, Delaware (Tax Parcel 4-13-03910-01-3100-00001). The proposed project includes a 120 ft x 10 ft fixed dock at the end of a 10 ft x 47 ft raised aluminum decking gangway with a 5 ft x 5 ft hose platform and water and electric service. The structures would be supported by 24 galvanized steel pilings and extend approximately 25.2 feet channelward of mean low water. Soft-start pile driving procedures are to be implemented with a vibratory hammer.

The proposed project also includes the construction of a 60 ft x 66 ft storage building. Water for the building and dock hose is proposed to be provided by a new 4-inch well, which will require a permit from the DNREC Well Permits Program. Additionally, the plans include the installation of a fueling facility, with a 2000-gallon above ground storage tank for diesel fuel. As stated in the Division of Fish and Wildlife's application, the design and implementation of the project will need

to comply with Delaware Regulations Governing Aboveground Storage Tank Systems, Delaware Sediment and Stormwater Regulations, and State Fire Marshal Office requirements. In addition, the Division of Fish and Wildlife has agreed to adhere to time-of-year restrictions to protect marsh nesting birds, elvers, and anadromous fish by avoiding construction in water and/or marshes between March 1 and July 31.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act (CZMA) of 1972 administered by the National Oceanic and Atmospheric Administration (NOAA), as amended, any applicant for a required federal license or permit to conduct an activity, in or outside of the coastal zone, that can have reasonably foreseeable effects on any land or water use or natural resource of the coastal zone of that state, shall provide a certification that the proposed activity complies with the enforceable policies of the state's NOAA-approved program and that such activity will be conducted in a manner consistent with the program. Under the CZMA implementing regulations, *Federal Consistency with Approved Coastal Management Programs* (15 CFR 930), subpart D, state agencies are directed to develop a list of federal license or permit activities to be included as part of the management program, with the federal license or permit activities described in terms of the specific licenses or permits involved. Any applicant for a federal license or permit selected for review by a state agency should obtain the views and assistance of the state agency regarding the means for ensuring that the proposed activity will be conducted in a manner consistent with the management program.

PUBLIC PARTICIPATION

In accordance with 15 CFR 930.61, the public was invited to participate in the review of the Leipsic Research Vessel Dock and Storage Building project. Public notice of this proposed action was published on June 1, 2025, in the Daily State News, The News Journal, and on the DNREC public notices website. The notice was also posted in the Dover Public Library. The public was given 30 days to comment on this notice. The DCMP received and considered one public comment during the comment period.

FEDERAL CONSISTENCY ANALYSIS

The DCMP coordinates the review of consistency certifications with agencies administering the enforceable and advisory policies of the program. The following agencies participated in this review:

DNREC, Division of Air Quality
DNREC, Division of Fish and Wildlife
DNREC, Division of Waste and Hazardous Substances
DNREC, Division of Water

The proposed activity is to be implemented in a manner consistent with the enforceable policies of the DCMP under Section 5.0 of the DCMP Federal Consistency Policy and Procedures document.

Please be advised that DNREC Division of Air Quality (DAQ) recommends that retrofitted on-road and non-road diesel engines be used to reduce emissions associated with the project construction. This includes equipment that is used on-site, as well as equipment that is used to transport materials to and from the site. DAQ also advises project managers to minimize air emissions from vessel engines and power equipment by avoiding unnecessary engine idling and ensuring the use of fuels that meet quality standards, such as ultra-low sulfur diesel, whenever possible, throughout the duration of the project.

The following Delaware air quality regulations may apply: Particulate Emissions from Construction and Materials Handling (7 DE Admin. Code 1106), Open Burning (7 DE Admin. Code 1113), Conformity of General Federal Actions to the State Implementation Plan (7 DE Admin. Code 1135), Limiting Emissions of Volatile Organic Compounds from Consumer and Commercial Products (7 DE Admin. Code 1141), and Excessive Idling of Heavy-Duty Vehicles (7 DE Admin. Code 1145).

To mitigate potential impacts from flooding and sea level rise, the DCMP recommends coordinating with a local floodplain manager or DNREC Division of Watershed Stewardship's Floodplain Management Program to implement best practices to ensure that the project design could withstand coastal hazards. The submitted design plans indicate that the proposed diesel tank would be located between the lines of mean high water and highest observed high tide, and the FEMA flood hazard zone is AE with a base flood elevation (BFE) of 9 feet. Information in the 2025 Delaware Climate Action Plan (CAP)[1]and DNREC Flood Planning Tool[2] show that this is a highly vulnerable site to small increases in water level. DNREC Division of Fish and Wildlife should consider current tidal datum and projected water levels over the lifetime of the facility and specifically consider constructing the tank at an elevation of BFE or higher. In addition, the LiMWA line (Limit of Moderate Wave Action) is immediately channelward of the development. The DCMP recommends that the project design include consideration of the effects of waves propagating to the site during a storm event, in addition to still water flooding.

Additionally, the DCMP recommends coordinating with DNREC Division of Waste and Hazardous Substances to meet all storage tank requirements and to develop and implement an emergency response plan.

CONDITIONAL CONCURRENCE

Based on its review and pursuant to 15 CFR 930, the DCMP conditionally concurs that the Leipsic Research Vessel Dock and Storage Building project as proposed above is consistent with the policies of the DCMP.

---

[1] Delaware Climate Action Plan, 2025. https://dnrec.delaware.gov/climate-plan/
[2] DNREC Flood Planning Tool https://floodplanning.dnrec.delaware.gov/

To be consistent with the DCMP's enforceable policies, the following condition must be satisfied related to enforceable policies under Sections 5.3 and 5.4:

- The applicant shall obtain all necessary state permits, authorizations, and/or leases related to subaqueous lands and water quality as regulated by the State of Delaware. The requirement for these authorizations is included in the DCMP enforceable policies and must be obtained to be consistent with these policies.

Failure to comply with 15 CFR §930.4 as it relates to the condition above will result in this conditional concurrence being considered an objection. Under this scenario, the applicant is advised that pursuant to 15 CFR part 930, subpart H, and within 30 days from receipt of this letter, a request may be submitted to the Secretary of Commerce to override the objection. In order to grant an override request, the Secretary must find that the activity is consistent with the objectives or purposes of the CZMA or is necessary in the interest of national security. A copy of the request and supporting information must be sent to the DCMP and the federal permitting or licensing agency. The Secretary may collect fees for administering and processing your request.

Pursuant to 15 CFR 930.66, the applicant shall notify the DCMP of any proposed modifications to activities after receiving a decision from the DCMP. Modifications will be subject to supplemental federal consistency review if effects to any coastal use or resource will be substantially different than originally described.

Please be advised that this federal consistency review does not negate the need for other authorizations that may be required. If you have any questions, please contact me or Stephanie Zmina of my staff at (302) 739-9283.

Sincerely,

Jesse Hayden (Feb 11, 2026 13:37:57 EST)

Jesse Hayden, Administrator
Delaware Coastal Management Program

JH/sz

cc: File FC 2025.0035
Alex Schmidt, CE
Lance Wilgus, CE
Tina Merrill, DAQ
Faith Garcia, DFW
Jeremey Ashe, DFW
Kevin Casula, DW
Michael Seningen, DWHS
Mike Yost, USACE

APPENDIX #8

US Army Corps of Engineers
Nationwide Permit 3

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT
1650 ARCH STREET
PHILADELPHIA PA 19103-2004

April 6, 2026

Regulatory Division

SUBJECT: Nationwide Permit 3 Verification NAP-2025-00191-103
Leipsic Research Facility KE
Central coordinates (39.24274°, -75.512225°)

Jeremey Ashe
DNREC
89 Kings Highway
Dover, Delaware 19901

Dear Mr. Ashe:

This letter is written in regard to your proposal to perform maintenance on a road and parking area impacting 0.23 acre of waters of the United States. This project is located at 67 Lombart Street, Leipsic, Kent County, Delaware. Based upon our review of the information that has been provided, it has been determined that the proposed work is authorized by Department of the Army Nationwide Permit (NWP) 3 (Maintenance) pursuant to Section 404 of the Clean Water Act (33 USC 1344).

This verification of authorization under NWP 3, described in the Federal Register at 86 FR 2744 and 86 FR 73522, is based on your agreement to comply with the general conditions, regional conditions and project specific special conditions listed in this letter. Copies of the NWP descriptions, NWP general conditions and the NWP regional conditions for Delaware can be found at:

2026 NWP Descriptions, General Conditions, and Definitions:
https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Nationwide-Permits/

2026 Delaware Regional Conditions:
https://www.nap.usace.army.mil/Missions/Regulatory/Permits/NWP.aspx

Federal permits require determination from the State that the activities are consistent with the State's coastal zone management (CZM) program if the activity is located within the State's coastal zone. The entire State of Delaware has been designated as a Coastal Zone Management Area. A general CZM consistency concurrence has been issued for this permit. Federal permits also require the State's certification of compliance with section 401 of the Clean Water Act through the receipt of a 401 Water Quality Certification (WQC) if the activity involves a Section 404 discharge. A general water quality certification has been issued for this permit.

This verification of NWP authorization is valid until the 2021 Nationwide Permits expire on **March 15, 2031**, unless the NWP authorization is modified, suspended, or revoked prior to this date. In the event that the NWP authorization is modified during that time period, this expiration date will remain valid, provided the activity complies with any subsequent modification of the NWP authorization.

Activities which have commenced (i.e. are under construction) or are under contract to commence in reliance upon an NWP will remain authorized provided the activity is completed within twelve months of the date of an NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5 (c) or (d). Activities completed under the authorization of an NWP which was in effect at the time the activity was completed continue to be authorized by that NWP.

Special Conditions:

1. All work performed in association with the subject project shall be conducted in accordance with the **enclosed** project plans identified as "Leipsic Research Dock Facility Leipsic, Kent County, Delaware DFW Contract #NAT 202301-Leipsicresearchdock"; prepared by Century Engineering; dated May 1, 2025; unrevised; sheets C100, C103, C104, C105, C106, C111, and C112.

2. Construction activities shall not result in the permanent disturbance or alteration of greater than 0.23 acre of waters of the United States. Construction activities shall not result in the temporary disturbance or alteration of greater than 0.11 acre of water of the United States.

3. Any deviation in construction methodology or project design from that shown on the enclosed project plans must be approved by this office, in writing, prior to performance of the work. All modifications to the enclosed project plans shall be approved, in writing, by this office. No work shall be performed prior to written approval of this office.

4. This office shall be notified prior to the commencement of authorized work by completing and signing the **enclosed** "Notification of Commencement" form. This office shall also be notified within 10 days of the completion of the authorized work by completing and signing the **enclosed** "Notification of Completion" form. Notification is required each time maintenance work is to be done under the terms of this Corps of Engineers permit.

5. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your general permit.

6. The permittee is responsible for ensuring that the contractor and/or workers executing the activity(s) authorized by this permit have knowledge of the terms and conditions of the authorization and that a copy of the permit document is at the project site throughout the period the work is underway.

7. Any areas within the temporary disturbance must be returned to pre-disturbance conditions.

Also **enclosed** with this NWP verification letter is a form seeking any comments, positive or otherwise, on the procedures, timeliness, fairness, etc. of the permit process. You may forward your comments along with the signed "Notification of Commencement" form or "Notification of Completion" form, following the directions provided on the form. If you should have any questions or concerns, please contact James A. Colligan at 302-518-9480 or James.A.Colligan@usace.army.mil.

Sincerely,

Date:
2026.04.06
13:41:28 -04'00'

Todd A. Hoernemann
Chief, Applications Branch - South

Enclosures

cc:
Missy Kalb, Century Engineering
Wetlands and Waterways Section, DDNREC

APPENDIX #9

US Army Corps of Engineers
Individual Permit

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT
1650 ARCH STREET
PHILADELPHIA PA 19103-2004

February 12, 2026

Regulatory Branch

SUBJECT: Letter of Permission NAP-2025-00191-103
DNREC Leipsic Research Facility KE
Center coordinates (39.24274°, -75.512225°)

Jeremey Ashe
DNREC Division of Fish and Wildlife
89 Kings Highway
Dover, Delaware 19901

Dear Mr. Ashe:

This is regarding your application for a Department of the Army permit dated May 15, 2025. Upon recommendation of the Chief of Engineers and under provision of Section 10 of the Rivers and Harbors Act of March 3, 1899, you are authorized by the Secretary of the Army to construct a fixed dock. This project is located at 67 Lombart Street, Leipsic, Kent County, Delaware. This activity shall be conducted in accordance with the **enclosed** plans and subject to the **enclosed** conditions.

This is an initial proffered Letter of Permission (LOP) for your proposed project. If you object to this LOP because of certain terms and conditions therein, you may request that the permit be modified accordingly. **Enclosed** you will find a combined Notification of Appeal Process (NAP) and Request for Appeal (RFA) form. If you object to this initial proffered LOP, you must complete the form and submit it to the Philadelphia District Office within 60 days of the date on the form. The form should be submitted to James A. Colligan at James.A.Colligan@usace.army.mil.

If you do not object, the LOP is considered accepted and your work is authorized. Carefully review all the terms and conditions of the Department of the Army permit and understand them fully. Performing any work not specifically authorized by the permit or failing to comply with its conditions may subject you and/or your contractor to the enforcement provisions of our regulations. If a contractor performs the work for you, both you and the contractor are responsible for assuring the work is done in conformance with the conditions and limitations of this permit. Please be sure the person who will do the work has read and understands the conditions of the permit. The issuance of this permit does not obviate you from your responsibility to obtain any other Federal, State, or local approvals required by law for this work.

Enclosed is your notice of authorization, ENG FORM 4336, which must be conspicuously displayed at the site of work. Additionally, this permit requires that you notify this office of the commencement and completion of the permitted work. To assist you in meeting this requirement, **enclosed** is a "Notification of Commencement" form and a "Notification of Completion" form which must be signed and returned to this office within the specified timeframes (see Special Conditions).

Also **enclosed** is a comment form soliciting your comments on the processing of your permit. Any comments, positive or otherwise, on the procedures, timeliness, fairness, etc., may be made on this form. Should you have questions regarding your permit, please contact James A. Colligan at 302-518-9480 or James.A.Colligan@usace.army.mil.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

Todd A. Hoernemann

Digitally signed by Todd A. Hoernemann
Date: 2026.02.12 14:58:18 -05'00'

Todd A. Hoernemann
Chief, Application Section I

For: Ryan A. Baum
Lieutenant Colonel, Corps of Engineers
District Commander

Enclosures

cc:
Missy Kalb, Century Engineering
Wetlands and Waterways Section, DDNREC
Chesapeake Bay Field Office, USFWS
Greater Atlantic Region Field Office, NMFS HESD, NOAA
Greater Atlantic Region Field Office, NMFS PRD, NOAA

CONDITIONS FOR
DEPARTMENT OF THE ARMY PERMITS

GENERAL CONDITIONS

1. The time limit for completing the work authorized ends on **December 31, 2026**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity, or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with conditions specified in the certification as special conditions to this permit.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

SPECIAL CONDITIONS

1. All work shall be completed in accordance with the attached project plan(s) identified as "Leipsic Research Dock Facility Leipsic, Kent County, Delaware"; prepared by Century Engineering, Incorporated; dated May 1, 2025; unrevised; sheets C100, C101, C102, C104, C106, C107, C113 – C118. These plans are hereby made part of this permit.

2. Construction activities shall not result in the disturbance or alteration of greater than 0.0003 acre of waters of the United States.

3. Any deviation in construction methodology or project design from that shown on the above noted drawings must be approved by this office, in writing, prior to performance of the work. All modifications to the above noted project plans shall be approved, in writing, by this office. No work shall be performed prior to written approval of this office.

4. This office shall be notified at least 10 days prior to the commencement of authorized work by completing and signing the enclosed "Notification of Commencement Form"; and this office shall be notified within 10 days of the completion of the authorized work by completing and signing the enclosed "Notification of Completion Form".

5. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

6. No in-water work shall occur during the protective window for migrating anadromous fish (March 1 – June 30) pursuant to the conditions set forth by the National Marine Fisheries Service. To the greatest extent practicable, pile driving shall be conducted via vibratory hammer. If impact driving is required to achieve final pile depths, a vibratory hammer shall be used until refusal. All impact driving shall be conducted using soft-start procedures and a cushion block to minimize acoustic impacts to fish.

7. All conditions of the 'Delaware Coastal Management Program – Federal Consistency Certification Conditional Concurrence for Leipsic Research Vessel Dock and Storage Building (FC 2025.0035)' shall be conditions of this permit.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

☐ Section 404 of the Clean Water Act (33 U.S.C. 1344).

☐ Section 103 of the Marine Protection, Research and Sanctuaries Act.

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or

enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

7. Transference. When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____

(Transferee) (Date)

APPENDIX #10

FEMA Conditional Letter of Map Revision (CLOMR)

Federal Emergency Management Agency

Washington, D.C. 20472

January 20, 2026

THE HONORABLE JIM FOX
MAYOR, TOWN OF LEIPSIC
207 MAIN STREET
LEIPSIC, DE 19901

CASE NO.: 25-03-0917C
COMMUNITY: TOWN OF LEIPSIC, KENT COUNTY, DELAWARE
COMMUNITY NO.: 100014

DEAR MR. FOX:

This is in reference to a request that the Federal Emergency Management Agency (FEMA) determine if the property described in the enclosed document is located within an identified Special Flood Hazard Area, the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), on the effective National Flood Insurance Program (NFIP) map. Using the information submitted and the effective NFIP map, our determination is shown on the attached Conditional Letter of Map Revision based on Fill (CLOMR-F) Comment Document. This comment document provides additional information regarding the effective NFIP map, the legal description of the property and our comments regarding this proposed project.

Additional documents are enclosed which provide information regarding the subject property and CLOMR-Fs. Please see the List of Enclosures below to determine which documents are enclosed. Other attachments specific to this request may be included as referenced in the Determination/Comment document. If you have any questions about this letter or any of the enclosures, please contact the FEMA Map Insurance eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426.

Sincerely,

David N. Bascom

David N. Bascom, Acting Director
Engineering and Modeling Division
Risk Analysis, Planning and Information Directorate

LIST OF ENCLOSURES:

CLOMR-F COMMENT DOCUMENT

cc: Mr. Jeremey Ashe

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL
COMMENT DOCUMENT

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	TOWN OF LEIPSIC, KENT COUNTY, DELAWARE	A parcel of land, as described in the Deed recorded as Instrument No. 2014-264234, in the Office of the Recorder of Deeds, Kent County, Delaware
	COMMUNITY NO.: 100014	
AFFECTED MAP PANEL	NUMBER: 10001C0157J	
	DATE: 7/7/2014	
FLOODING SOURCE: LEIPSIC RIVER; ATLANTIC OCEAN		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY:39.242354, -75.512668 SOURCE OF LAT & LONG: LOMA LOGIC DATUM: NAD 83

COMMENT TABLE REGARDING THE PROPOSED PROPERTY (PLEASE NOTE THAT THIS IS NOT A FINAL DETERMINATION. A FINAL DETERMINATION WILL BE MADE UPON RECEIPT OF AS-BUILT INFORMATION REGARDING THIS PROPERTY.)

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT WOULD BE REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
--	--	--	86 Lombard Street	Structure	X (shaded)	8.0 feet	8.2 feet	--

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

PORTIONS REMAIN IN THE SFHA
CONDITIONAL LOMR-F DETERMINATION
STATE LOCAL CONSIDERATIONS

This document provides the Federal Emergency Management Agency's comment regarding a request for a Conditional Letter of Map Revision based on Fill for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the proposed structure(s) on the property(ies) would not be located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) if built as proposed. Our final determination will be made upon receipt of a copy of this document, as-built elevations, and a completed Community Acknowledgement form. Proper completion of this form certifies the subject property is reasonably safe from flooding in accordance with Part 65.5(a)(4) of our regulations. Further guidance on determining if the subject property is reasonably safe from flooding may be found in FEMA Technical Bulletin 10-01. A copy of this bulletin can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at http://www.fema.gov/mit/tb1001.pdf. This document is not a final determination; it only provides our comment on the proposed project in relation to the SFHA shown on the effective NFIP map.

This comment document is based on the flood data presently available. The enclosed documents provide additional information regarding this request. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426.

David N. Bascom

David N. Bascom, Acting Director
Engineering and Modeling Division
Risk Analysis, Planning and Information Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

PORTIONS OF THE PROPERTY REMAIN IN THE SFHA (This Additional Consideration applies to the preceding 1 Property.)

Portions of this property, but not the subject of the Determination/Comment document, may remain in the Special Flood Hazard Area. Therefore, any future construction or substantial improvement on the property remains subject to Federal, State/Commonwealth, and local regulations for floodplain management.

CONDITIONAL LOMR-F DETERMINATION (This Additional Consideration applies to the preceding 1 Property.)

Comments regarding this conditional request are based on the flood data presently available. Our final determination will be made upon receipt of this Comment Document, certified as-built elevations and/or certified as-built survey. Since this request is for a Conditional Letter of Map Revision based on Fill, we will also require the applicable processing fee, and the "Community Acknowledgement" form. Please note that additional items may be required before a final as-built determination is issued.

This letter does not relieve Federal agencies of the need to comply with Executive Order 11988 on Floodplain Management in carrying out their responsibilities and providing Federally undertaken, financed, or assisted construction and improvements, or in their regulating or licensing activities.

STATE AND LOCAL CONSIDERATIONS (This Additional Consideration applies to all properties in the CLOMR-F COMMENT DOCUMENT)

Please note that this document does not override or supersede any State or local procedural or substantive provisions which may apply to floodplain management requirements associated with amendments to State or local floodplain zoning ordinances, maps, or State or local procedures adopted under the National Flood Insurance Program.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426.

David N. Bascom

David N. Bascom, Acting Director
Engineering and Modeling Division
Risk Analysis, Planning and Information Directorate

APPENDIX #11

Town of Leipsic
Permit Permission Letter

TOWN OF LEIPSIC
PERMIT PERMISSION LETTER
#2026-001

Upon motion duly made seconded and unanimously approved, the Town Council of Leipsic approved the issuance of this Permit Permission Letter (PPL), as well as the variance approval as applied to this PPL, to the State of Delaware, Department of Natural Resources and Environmental Control, owners of the property known as 68 Lombard St., Leipsic, Delaware.

This PPL is for the construction of a 40x66 building; 20x66 boat storage (attached to building); and 120x10 fixed dock. The property owner is aware that the property is within the floodplain and that they will need to conform to applicable Kent County and State of Delaware floodplain ordinance requirements. Further, the property owner is aware of their responsibility for any and all costs associated with any connection to the Town of Leipsic's public sewer system.

This Permit Permission Letter is effective January 5, 2026 and expires January 4, 2027.

This Permit Permission Letter is to be submitted to the Kent County Dept of Planning & Building Permits for the completion of the Building Permit Process. No work may commence until the required Kent County permits are issued.

The Property Owner certifies that the work to be performed will be in compliance with any and all applicable regulations, laws, provisions, codes or requirements that may be required by governmental entities with authority over building or land improvements or new construction. This includes but is not limited to regulatory agencies in Kent County and the State of Delaware. The Property Owner further agrees to hold harmless and indemnify the Town of Leipsic, its officers, elected officials, appointed officials, volunteers or associates should any lawsuit, cause of legal action or penalties of any sort be imposed or assessed as a result of the Town of Leipsic issuing this Permit Permission Letter. By the Property Owner's acceptance and use of this Permission Slip, the Property Owner consents to and agrees with the foregoing as stated.

Deborah McKeever

_____

Secretary
Town of Leipsic

SEAL

APPENDIX #12

Kent County Inspections and Enforcement

Required Documents for Contractor Application for Building Permit

1) DelDOT Letter of No Impact
2) COMCheck

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

SHANTÉ A. HASTINGS
SECRETARY

March 13, 2026

Mr. Kristopher Connelly, County Supervisor
Kent County
Department of Planning Services
555 Bay Road
Dover, Delaware 19901

SUBJECT: Letter of No Impact
Leipsic Research Dock Facility
Tax Parcel # 4-13-03910-01-3100-00001
LOMBARD STREET (KCR 29004)
Leipsic, Little Creek Hundred, Kent County

Dear Mr. Connelly:

The Department has received an application regarding the above referenced project. This application has been reviewed by the Department with respect to DelDOT's formal review requirements. The Department has determined that the proposal does not appear to create any transportation impacts and does not trigger entrance/access improvements that would require further review by the Department. The County may use this correspondence as the basis to finalize processing of this project/site application.

Sincerely,

Wendy L. Polasko

Wendy L. Polasko, P.E.
Subdivision Engineer,
Development Coordination

DelDOT

cc: Jeremey Ashe, Delaware Division of Fish and Wildlife
Lance Wilgus, Century Engineering, Inc
Steve McCabe, Central District Public Works Engineer
Jeff Steward, Central District Project Reviewer
Will Mobley III, Interim Kent County Review Coordinator
Will T. Mobley III, Kent County Reviewer

COMcheck Software Version 4.1.5.5

Envelope Compliance Certificate

Project Information

Energy Code:	2018 IECC
Project Title:	Leipsic Research Dock Facility
Location:	Leipsic, Delaware
Climate Zone:	4a
Project Type:	New Construction
Vertical Glazing / Wall Area:	20%

Construction Site:
86 Lombard Street
Leipsic, DE 19901

Owner/Agent:
State of Delaware

Designer/Contractor:
Paul Guggenberger
StudioJAED
2500 Wrangle Hill Road
Suite 110
Bear, DE 19701
302-832-1652
guggenbergerp@studiojaed.com

Additional Efficiency Package(s)

Credits: 1.0 Required 1.0 Proposed
Enhanced Envelope Performance, 1.0 credit

Building Area	Floor Area
1-Warehouse : Nonresidential	2640

Envelope Assemblies

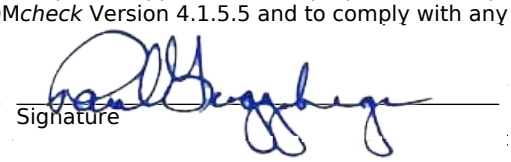
Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Roof 1: Metal Building, Standing Seam, Filled Cavity with Thermal Blocks (c), [Bldg. Use 1 - Warehouse]	2640	30.0	0.0	0.037	0.035
NORTH					
Exterior Wall 1: Metal Building Wall, Single Layer Mineral Fiber (in cavity, thermal block at girt), [Bldg. Use 1 - Warehouse]	1017	30.0	0.0	0.052	0.052
Door 1: Insulated Metal, Swinging, [Bldg. Use 1 - Warehouse]	21	---	---	0.410	0.610
Door 2: Insulated Metal, Garage door 14% glazing, [Bldg. Use 1 - Warehouse]	260	---	---	0.125	0.310
EAST					
Exterior Wall 3: Metal Building Wall, Single Layer Mineral Fiber (in cavity, thermal block at girt), [Bldg. Use 1 - Warehouse]	883	30.0	0.0	0.052	0.052
Door 3: Insulated Metal, Swinging, [Bldg. Use 1 - Warehouse]	21	---	---	0.410	0.610
SOUTH					
Exterior Wall 2: Metal Building Wall, Single Layer Mineral Fiber (in cavity, thermal block at girt), [Bldg. Use 1 - Warehouse]	1298	30.0	0.0	0.052	0.052
WEST					
Exterior Wall 4: Metal Building Wall, Single Layer Mineral Fiber (in cavity, thermal block at girt), [Bldg. Use 1 - Warehouse]	904	30.0	0.0	0.052	0.052
Window 1: Wood Frame:Operable, Perf. Specs.: Product ID AND-N-171, SHGC 0.17, [Bldg. Use 1 - Warehouse] (b)	834	---	---	0.310	0.450

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.
(c) Thermal spacer block with minimum R-3.5 must be installed above the purlin/batt, and the roof deck secured to the purlins.

Envelope PASSES: Design 9% better than code

Envelope Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2018 IECC requirements in COM*check* Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Paul Guggenberger, AIA, NCARB, LEED-AP		3/23/26
Name - Title	Signature	Date

COM*check* Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code:	2021 IECC
Project Title:	Leipsic Dock
Location:	Leipsic, Delaware
Climate Zone:	4a
Project Type:	New Construction

Construction Site:
Lombard St
Leipsic, Delaware

Owner/Agent:
DNREC

Designer/Contractor:
Matthew Hildebrand
Century Engineering
5095 Ritter Rd
Mechanicsburg, Pennsylvania
17055
7172165649
mhildebrand@kleinfelder.com

Additional Efficiency Package(s)

Credits: 10.0 Required 0.0 Proposed

Mechanical Systems List

Quantity	System Type & Description
1	HVAC System (Single Zone): Split System Heat Pump Heating Mode: Capacity = 13 kBtu/h, Proposed Efficiency = 7.50 HSPF2, Required Efficiency = 7.50 HSPF2 Cooling Mode: Capacity = 15 kBtu/h, Proposed Efficiency = 14.30 SEER2, Required Efficiency = 14.30 SEER2 Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00
1	HVAC System (Unknown w/ PerimeterSystem): Heating: 6 each - Unit Heater, Electric, Capacity = 17 kBtu/h No minimum efficiency requirement applies

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2021 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Matthew Hildebrand - Construction Administration		03/25/2026
Name - Title	Signature	Date

COM*check* Software Version 4.1.5.5

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: LEIPSIC DOCK RESEARCH
Project Type: New Construction

Construction Site:
LOMBARD STREET
LEIPSIC, DE

Owner/Agent:
DNREC

Designer/Contractor:
DEVIN WALTERS
CENTURY ENGINEERING
HUNT VALLEY, MD 21093

Additional Efficiency Package(s)

Credits: 1.0 Required 1.0 Proposed
Enhanced Interior Lighting Controls, 1.0 credit

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-BOAT GARAGE & OFFICE (Workshop)	4748	0.90	4273
		Total Allowed Watts =	4273

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-BOAT GARAGE & OFFICE (Workshop)				
LED 1: TYPE A: 4 FT STRIP: LED Linear 33W:	1	11	30	330
LED 2: TYPE B: 1 X 4 FLAT PANEL: LED Linear 20W:	1	8	23	184
LED 3: TYPE C: 2 X 2 FLAT PANEL: LED Panel 33W:	1	1	30	30
LED 4: TYPE D: VANITY LIGHT: LED PAR 18W:	1	1	18	18
LED 5: TYPE F: VAPOR TIGHT: LED Other Fixture Unit 50W:	1	5	49	245
LED 6: TYPE H: LOW BAY GARAGE: LED Other Fixture Unit 60W:	1	15	63	945
			Total Proposed Watts =	1752

Interior Lighting PASSES: Design 59% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2018 IECC requirements in COM*check* Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Scott Phillips - Sr Elec Designer — Name - Title

Scott Phillips — Signature

02/07/2024 — Date

COMcheck Software Version 4.1.5.5

Exterior Lighting Compliance Certificate

Project Information

Energy Code:	2018 IECC
Project Title:	LEIPSIC DOCK RESEARCH
Project Type:	New Construction
Exterior Lighting Zone	2 (Residentially zoned area (LZ2))

Construction Site:
LOMBARD STREET
LEIPSIC, DE

Owner/Agent:
DNREC

Designer/Contractor:
DEVIN WALTERS
CENTURY ENGINEERING
HUNT VALLEY, MD 21093

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
PARKING LOT (Parking area)	19520 ft2	0.04	Yes	781
GARAGE/MAN DOOR (Pedestrian and vehicular entrances and exits)	19 ft of door	14	Yes	266
FISHING PIER (Special feature area)	1700 ft2	0.1	Yes	170
			Total Tradable Watts (a) =	1217
			Total Allowed Watts =	1217
			Total Allowed Supplemental Watts (b) =	400

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.

(b) A supplemental allowance equal to 400 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
PARKING LOT (Parking area 19520 ft2): Tradable Wattage				
LED 1: TYPE P1/P2: SITE POLES: LED Roadway-Parking Unit 54W:	1	6	51	306
LED 3: TYPE P3: SITE POLES: LED Roadway-Parking Unit 67W:	1	4	68	272
GARAGE/MAN DOOR (Pedestrian and vehicular entrances and exits 19 ft of door width): Tradable Wattage				
LED 2: TYPE W: WALL PACK: LED Other Fixture Unit 103W:	1	2	109	218
FISHING PIER (Special feature area 1700 ft2): Tradable Wattage				
LED 4: TYPE K: LIGHTS MTD TO PILING: Other:	1	5	35	175
			Total Tradable Proposed Watts =	971

Exterior Lighting PASSES: Design 40% better than code

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2018 IECC requirements in COM*check* Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Scott Phillips - Sr Elec Designer	Scott Phillips	02/07/2024
Name - Title	Signature	Date

APPENDIX #13

Delaware State Fire Marshal Plan Review Site

OFFICE OF THE STATE FIRE MARSHAL
Technical Services

1537 Chestnut Grove Road
Dover, DE 19904-1544

SFMO PERMIT – SHALL BE POSTED ON JOBSITE UNTIL FINAL INSPECTION

Plan Review Number:
2025-03-222380-MJS-01

Status: Approved as Submitted

Tax Parcel Number:
4-13-03910-01-3100-00001

Date: 11/06/2025

Project

Leipsic Research Dock Facility

86 Lombard Street-Leipsic

86 Lombard Street
Leipsic DE 19901

Scope of Project

Number of Stories:
Square Footage:
Construction Class:
Fire District: 53 - Leipsic Volunteer Fire Co Inc.

Occupant Load Inside:
Occupancy Code:

Applicant

Lance Wilgus
550 Bay Road
Dover, DE 19901

This office has reviewed the plans and specifications of the above described project for compliance with the Delaware State Fire Prevention Regulations, in effect as of the date of this review.

A Review Status of "Approved as Submitted" or "Not Approved as Submitted" must comply with the provisions of the attached Plan Review Comments.

Any Conditional Approval does not relieve the Applicant, Owner, Engineer, Contractor, nor their representatives from their responsibility to comply with the plan review comments and the applicable provisions of the Delaware State Fire Prevention Regulations in the construction, installation and/or completion of the project as reviewed by this Agency.

A final inspection is required.

This Plan Review Project was prepared by:

Jefferson Cerri
Fire Protection Specialist II

FIRE PROTECTION PLAN REVIEW COMMENTS

Plan Review Number:
2025-03-222380-MJS-01

Tax Parcel Number:
4-13-03910-01-3100-00001

Status: Approved as Submitted

Date: 11/06/2025

PROJECT COMMENTS

1002 A	**This project has been reviewed under the provisions of the Delaware State Fire Prevention Regulations (DSFPR) ADOPTED September 1, 2021. The Delaware State Fire Prevention Regulations are available on our website at www.statefiremarshal.delaware.gov.These plans were not reviewed for compliance with the Americans with Disabilities Act (ADA). These plans were not reviewed for compliance with any Local, Municipal, nor County Building Codes. The Office of the State Fire Marshal recommends theinstallation of fire sprinkler systems in all residential occupancies, including one- and two-family dwellings, duplexes, and townhomes. For additional information on residential sprinkler systems, please see here:https://statefiremarshal.delaware.gov /wp-content/uploads/sites /110/2017/07/Home_Sprinkler_Brochure.pdf**
1010 A	**The following water for fire protection requirements apply: NONE. On-Site Wells Proposed. this site meets Water Flow Table 1. therefore the provisions of NFPA 1142 shall apply to this site (DSFPR Regulation 702, Chapter 6, Section 3).Since wells are proposed for this site, no additional requirements will be made by this Agency for water for fire protection.**
1000 A	**The site plans have been approved as submitted. The Office of State Fire Marshal has no objection to recordation. The Office of the State Fire Marshal recommends the installation of fire sprinkler systems in all residential occupancies, includingone- and two-family dwellings, duplexes, and townhomes. For additional information on residential sprinkler systems, please see here: https://statefiremarshal.delaware.gov/ wp-content/uploads/sites /110/2017/07/Home_Sprinkler_Brochure.pdf**
1180 A	**This report reflects site review only. It is the responsibility of the applicant and owner to forward copies of this review to any other agency as required by those agencies.**
2950 A	**The site and/or building plans indicate the installation of tanks containing flammable/combustible liquids/gases and/or dispensing of same. Formal plan submittal to this Agency is required prior to installation. Formal plan submittal requires anapplication, fee, plans, manufacturer's specifications, and other documentation that may be required by the Fire Protection Specialist.**

FOR PROPOSED DIESEL TANK AND DISPENSER

1190 A **Separate plan submittal is required for the building(s) proposed for this project.**

SEPARATE APPLICATIONS/PLANS REQUIRED FOR BUILDING & DOCK

1415 A **Fire Department access shall be provided to all otherwise inaccessible gated communities, subdivisions, developments, gated commercial properties or property by any other name through the use of a system or device as required by theDelaware State Fire Prevention Regulations and approved by the Office of the State Fire Marshal after consultation with the local Fire Chief. (DSFPR Regulation 705, Chapter 2, Section 2.6.2).Please provide specifications for the device. Include how the system works, where the device will be located, and a letter from the Fire Chief accepting the layout.**

KEYPAD NOTED

1092 A **Perimeter Access is that portion of the building that is accessible by emergency services personnel and is within 100 feet of a street and capable of supporting fire ground operations. (DSFPR Regulation 705, Chapter 5, Section 1.4.1). Perimeter Access minimum width shall be 15 feet measured from the face of the building at grade with a maximum slope of ten percent (10%). Plantings and utility services (includes condenser units, transformers, etc.) shall be permitted within the perimeter access, providedthey do not interfere with the emergency services fire ground operations. (DSFPR Regulation 705, Chapter 5, Sections 3.5 and 4.5). If a physical barrier (fence, pond, steep slope, etc) prevents access, that portion of the building perimeter shallnot be included in the calculation of Percent of Perimeter Access. (DSFPR Regulation 705, Chapter 5, Sections 3.5.1 and 4.5.1).**

50% REQUIRED

1501 A **If there are any questions about the above referenced comments please feel free to contact the Fire Protection Specialist who reviewed this project. Please have the plan review number available when calling about a specific project. When changes orrevisions to the plans occur, plans are required to be submitted, reviewed, and approved.**

APPENDIX #14

Delaware State Fire Marshal Plan Review
New Dock

OFFICE OF THE STATE FIRE MARSHAL
Technical Services

1537 Chestnut Grove Road
Dover, DE 19904-1544

SFMO PERMIT – SHALL BE POSTED ON JOBSITE UNTIL FINAL INSPECTION

Plan Review Number:
2025-03-222381-BLD-01

Status: Approved as Submitted

Tax Parcel Number:
4-13-03910-01-3100-00001

Date: 11/12/2025

Project

Leipsic Research Dock Facility
Leipsic Research Dock
86 Lombard Street-Leipsic

86 Lombard Street
Leipsic DE 19901

Scope of Project

Number of Stories:
Square Footage:
Construction Class: II (000) Non-Combustible
Fire District: 53 - Leipsic Volunteer Fire Co Inc.

Occupant Load Inside:
Occupancy Code:

Applicant

Lance Wilgus
550 Bay Road
Dover, DE 19901

This office has reviewed the plans and specifications of the above described project for compliance with the Delaware State Fire Prevention Regulations, in effect as of the date of this review.

A Review Status of "Approved as Submitted" or "Not Approved as Submitted" must comply with the provisions of the attached Plan Review Comments.

Any Conditional Approval does not relieve the Applicant, Owner, Engineer, Contractor, nor their representatives from their responsibility to comply with the plan review comments and the applicable provisions of the Delaware State Fire Prevention Regulations in the construction, installation and/or completion of the project as reviewed by this Agency.

A final inspection is required.

This Plan Review Project was prepared by:

Jefferson Cerri
Fire Protection Specialist II

FIRE PROTECTION PLAN REVIEW COMMENTS

Plan Review Number:
2025-03-222381-BLD-01

Tax Parcel Number:
4-13-03910-01-3100-00001

Status: Approved as Submitted

Date: 11/12/2025

PROJECT COMMENTS

2000 A **This project has been reviewed under the provisions of the Delaware State Fire Prevention Regulations (DSFPR) dated September 1, 2021. The current Delaware State Fire Prevention Regulations are available on our website at www.statefiremarshal.delaware.govThese plans were not reviewed for compliance with the Americans with Disabilities Act. These plans were not reviewed for compliance with any Local, Municipal, nor County Building Codes.Project work must be started within two years from the issuance of the permit, otherwise, the permit will be terminated.**

IAW NFPA 303, Fire Protection Standard for Marinas and Boatyards, 2021 edition

2500 A **A final inspection is required for this project prior to occupancy (DSFPR Part I, Section 4-7). Contact this Agency to schedule this inspection. Please have the plan review number available. A MINIMUM OF FIVE (5) WORKING DAYS NOTICE IS REQUIRED.**

2210 A **Provide portable fire extinguishers (DSFPR Part V, Section 1 9.1). A multipurpose (A:B:C) with at least a 2A:10B:C rating shall be provided (NFPA 10). All portable fire extinguishers shall be serviced on an annual basis (every 12 months) by an individuallicensed under the provisions of the DSFPR, Part III, Chapter 2. The list of current, licensed fire extinguisher companies is found on our web site www.statefiremarshal.delaware.gov.**

7300 A **Warning signs shall be conspicuously posted in the dispensing area incorporating the following or equivalent wording: a) WARNING! It is unlawful and dangerous to dispense gasoline into unapprove containers; b) No Smoking; and c) Stop Motor.(NFPA 30A).**

2220 A **All electrical work shall comply with the provisions of the National Electrical Code (NFPA 70). This project is required to pass an electrical inspection(s) by an approved electrical inspection agency:https://statefiremarshal.delaware.gov/electrical-inspection-agencies/**

1501 A **If there are any questions about the above referenced comments please feel free to contact the Fire Protection Specialist who reviewed this project. Please**

have the plan review number available when calling about a specific project. When changes orrevisions to the plans occur, plans are required to be submitted, reviewed, and approved.

APPENDIX #15

Delaware State Fire Marshal Plan Review
New Building

OFFICE OF THE STATE FIRE MARSHAL
Technical Services

1537 Chestnut Grove Road
Dover, DE 19904-1544

SFMO PERMIT – SHALL BE POSTED ON JOBSITE UNTIL FINAL INSPECTION

Plan Review Number:
2025-03-222616-BLD-01

Status: Approved as Submitted

Tax Parcel Number:
4-13-03910-01-3100-00001

Date: 12/08/2025

Project

Leipsic Research Dock Facility
Leipsic Research Dock Storage and Office
86 Lombard Street-Leipsic

86 Lombard Street
Leipsic DE 19901

Scope of Project

Number of Stories: 1
Square Footage: 4677
Construction Class: II (000) Non-Combustible
Fire District: 53 - Leipsic Volunteer Fire Co Inc.

Occupant Load Inside: 15
Occupancy Code: 9682

Applicant

Paul Guggenberger
2500 Wrangle Hill Road
Bear, DE 19701

This office has reviewed the plans and specifications of the above described project for compliance with the Delaware State Fire Prevention Regulations, in effect as of the date of this review.

A Review Status of "Approved as Submitted" or "Not Approved as Submitted" must comply with the provisions of the attached Plan Review Comments.

Any Conditional Approval does not relieve the Applicant, Owner, Engineer, Contractor, nor their representatives from their responsibility to comply with the plan review comments and the applicable provisions of the Delaware State Fire Prevention Regulations in the construction, installation and/or completion of the project as reviewed by this Agency.

A final inspection is required.

This Plan Review Project was prepared by:

Jefferson Cerri
Fire Protection Specialist II

FIRE PROTECTION PLAN REVIEW COMMENTS

Plan Review Number:
2025-03-222616-BLD-01

Status: Approved as Submitted

Tax Parcel Number:
4-13-03910-01-3100-00001

Date: 12/08/2025

PROJECT COMMENTS

2000 A	**This project has been reviewed under the provisions of the Delaware State Fire Prevention Regulations (DSFPR) dated September 1, 2021. The current Delaware State Fire Prevention Regulations are available on our website at www.statefiremarshal.delaware.govThese plans were not reviewed for compliance with the Americans with Disabilities Act. These plans were not reviewed for compliance with any Local, Municipal, nor County Building Codes.Project work must be started within two years from the issuance of the permit, otherwise, the permit will be terminated.**
2302 A	**The fire alarm system shall be designed and installed by a company licensed by this Agency. Formal plan submittal and approval is required prior to installation. The list of current, licensed fire alarm companies is found on our websitewww.delawarestatefiremarshal.com/license.htm**
2500 A	**A final inspection is required for this project prior to occupancy (DSFPR Part I, Section 4-7). Contact this Agency to schedule this inspection. Please have the plan review number available. A MINIMUM OF FIVE (5) WORKING DAYS NOTICE IS REQUIRED.**
2503 A	**The general contractor shall be responsible for arranging inspection and testing of fire alarm systems, sprinkler systems and any other system that requires an inspection by the fire marshals office. This office will not issue an approval for occupancyuntil all systems are accepted for use by the fire marshal. The subcontractor or installer must be present for systems testing.**
2710 A	**The following items will be field verified by this Agency at the time of final inspection:**
2319 A	**The fire alarm system devices shall be field verified at the final inspection by this Agency.**
2030 A	**Doors shall be non keyed from the inside. This can be a lever, knob, thumb latch, or panic bar. (NFPA 101, Means of Egress).**

2058 A	The elevation of the floor surfaces on both sides of a door shall be maintained for a distance at least equal to the width of the widest door leaf. NFPA 101 Section 7.2.1.3.2 (2006 ed.), (NFPA 101 Section 7.2.1.3 2000 ed.).
2118 A	Interior finish on walls and ceilings in exits and corridors shall be Class A or B Flamespread Rating, and in office areas Class A, B, or C. If finishes other than drywall and paint are proposed, provide this Agency with manufacturer's specifications.2006 NFPA 101, Section 38.3.3.2.
2070 A	Provide emergency lighting designed and installed to illuminate the paths of travel to the exits, the exits themselves, and the exit discharge. The emergency lighting shall be arranged to provide the required illumination automatically in the event of anyinterruption of normal lighting, Such as any failure of public utility or other outside electrical power supply; opening of a circuit breaker or fuse; Or any manual act(s), including accidental opening of a switch controlling normal lighting facilities.(2006 NFPA 101, Section 7 9.2.3).
2080 A	Provide illuminated exit/directional signs. (2006 NFPA 101, Section 7.10).
2175 A	All new stairs shall meet the requirements found in NFPA 101, Table 7.2.2.2.1.1 (a). Maximum riser height shall be 7 inches, with a minimum of 4 inches. Minimum tread depth shall be 11 inches. The minimum width of the stairs for an occupant loads lessthan 2000 persons shall be 44 inches. If the occupant load is fewer than 50 persons the minimum width is 36 inches. The occupant load is the total number of persons on all stories served by the stairs.
2471 A	Means of egress that are more than 30" above the floor or grade below shall be provided with guards to prevent falls over the open side (NFPA 101, Section 7.2.2.4) Means of egress components include stairs, landings, balconies, corridors, passageways,floor or roof openings, ramps, aisles, porches, and mezzanines. Guards shall not be less than 42" high. Handrails on stairs and ramps shall be between 34" and 38" and shall be provided on bothsides. (NFPA 101, 7.2.2.4.1.1).
2210 A	Provide portable fire extinguishers (DSFPR Part V, Section 1 9.1). A multipurpose (A:B:C) with at least a 2A:10B:C rating shall be provided (NFPA 10). All portable fire extinguishers shall be serviced on an annual basis (every 12 months) by an individuallicensed under the provisions of the DSFPR, Part III, Chapter 2. The list of current, licensed fire extinguisher companies is found on our web site www.statefiremarshal.delaware.gov.

2220 A	All electrical work shall comply with the provisions of the National Electrical Code (NFPA 70). This project is required to pass an electrical inspection(s) by an approved electrical inspection agency:https://statefiremarshal.delaware.gov/electrical-inspection-agencies/
2600 A	At the time of final inspection, the individual or firm responsible for the original submission of plans shall provide an Architectural/Engineering grade plan of the building footprint, on an 8 1/2"x11" sheet that will detail the following: (a) Name,address, location of building;
2603 A	(d) The location of all fire alarm signaling systems control and annunciation panels
2605 A	(f) Main entrance(s), and any stairwells which provide access to the roof, and any stairwell(s) that provide access to the penthouse.
2606 A	(g) Name and phone number of personnel responsible (owner and/or manager) for responding during emergencies.
1501 A	If there are any questions about the above referenced comments please feel free to contact the Fire Protection Specialist who reviewed this project. Please have the plan review number available when calling about a specific project. When changes orrevisions to the plans occur, plans are required to be submitted, reviewed, and approved.

APPENDIX #16

Build America, Buy America Requirement

LEIPSIC RESEARCH DOCK FACILITY

PROJECT NO.: NAT202301-LEIPSICRESEARCHDOCK

BUILD AMERICA, BUY AMERICA REQUIREMENT

The Build America, Buy America Act (BABA), section 70914 of Public Law No. 117-58, §§ 70901-52, also known as the Infrastructure Investment and Jobs Act, enacted as part of the Bipartisan Infrastructure Law (BIL) requires iron, steel, manufactured products, and construction materials used in infrastructure projects funded by Federal financial assistance to be produced in the United States.

In accordance with BABA, the following mandatory conditions must be met:

- All iron and steel used in the project are produced in the United States. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
- All manufactured products used in the project are produced in the United States. This means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation.
- All construction materials are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States. Construction materials which are exempt from BABA requirements include cement and cementitious materials and aggregates such as stone, sand, or gravel.

By signing below, I/we certify that: "All materials that will be permanently incorporated into this project will meet the Build America, Buy America material requirements. At the Delaware Department of Natural Resources and Environmental Control's (Department) request, I/we will provide manufacturer's and/or supplier's documentation verifying the above mandatory conditions. All materials accepted on the basis of such a Certificate of Compliance may be sampled by the Department and tested at any time. Use of material on the basis of a Certificate of Compliance shall not relieve the contractor of responsibility for incorporating material in the project conforming to the requirements of the contract. Any material not conforming to such requirements will be subject to rejection whether in place or not. The Department reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance."

Bidder Acknowledgment Signature: _____

Print Name: _____

Title or Authority: _____ Date: _____

Build America, Buy America Acknowledgement

APPENDIX #17

Geotechnical Report

PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT

Proposed Leipsic Research Dock Facility

Leipsic, Delaware

PREPARED FOR:

Delaware Division of Fish and Wildlife

89 Kings Highway SW

Dover, Delaware 19901

PREPARED BY:

550 BAY ROAD
DOVER DELAWARE 19901

FEBRUARY 19, 2024

CEI Project No. 00175013.092A

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1.1 DISCLOSURE STATEMENTS

I, Elizabeth Chandler, P.E., P.G., certify that I am a Registered Professional Engineer who meets the criteria required. I personally oversaw the performance of the geotechnical investigation and preparation of this report.

Elizabeth Chandler, P.E., P.G.
Project Professional

February 26, 2024
Date

1.2 GENERAL

This preliminary report presents the results of Century Engineering's geotechnical study for the proposed Leipsic Research Dock Facility in Leipsic, Kent County, Delaware. The purpose of our geotechnical study was to evaluate soil and groundwater conditions at the site and provide geotechnical recommendations for project design and construction.

This report includes a description of the work performed, a discussion of the geotechnical conditions observed at the site, and recommendations based on our experience with similar projects in the proposed area. We recommend that all individuals utilizing this report read the limitations section of this report.

1.3 PROJECT DESCRIPTION

The project site is situated at the northeast end of Lombard Streets in the Town of Leipsic, Kent County, Delaware (See Appendix 1 – *Project Vicinity Plan*). The Conceptual Sketch Plan prepared by Century Engineering dated August 2022 indicates that development of the site includes a 66 ft by 40 ft building and an attached 20 ft by 66 ft boat storage facility. The site is currently vacant as a building that previously occupied the lot has been removed and the area has been filled in and leveled. There is no record of any geotechnical oversight of the removal and infill of the area such as fill material requirements or compaction testing activity. The future construction will consist of a one-story enclosed building containing 2640 square feet for maintenance of the boats and also an upper level of storage space along the north wall. In addition, a dock will be constructed along the Leipsic River.

1.4 SCOPE OF SERVICES

The purpose of our geotechnical study was to evaluate subsurface soil conditions beneath the site and to provide geotechnical recommendations for design and construction. The scope of our services for this geotechnical evaluation consisted of a subsurface exploration by performing 6 soil borings on the site: Borings 1 and 2 were at the proposed dock location, Borings 3 and 4 were at the proposed retaining wall and the last two, Borings 5 and 6 where within the proposed building footprint. The soil borings were drilled to a depth of 30-feet deep, with continuous sampling for the first 10-feet and 5-foot interval sampling thereafter. Data from the soil borings was used to develop this geotechnical recommendation report for the building structural designer to use for foundation design.

2. SITE EXPLORATION PROGRAM

Century Engineering performed a site exploration program to assess the surface and subsurface conditions at the site. The following sections describe the site exploration activities performed.

2.1 SOIL TEST BORINGS

On January 24th and 25th, 2023, we examined the subsurface conditions within the proposed development area by advancing a total of 6 test borings.

Boring locations coordinates and ground surface elevations were provided by Century Engineering Survey Personnel. The approximate locations of our borings are shown in Appendix 2, *Boring Location Plan*.

Data pertaining to the subsurface exploration was documented in the field and is presented on the *Test Boring Logs* (Appendix 5). The *Test Boring Logs* depict the strata of the subsurface conditions encountered within each test boring, including soil types, depths of individual strata, and recorded "N" values (hammer blows per 6 inches of penetration), and visual classifications of the subsurface materials encountered.

The test borings were drilled with a Mobile B-57 rig using the hollow stem auger method. The borings were advanced to depths ranging from approximately 30 feet below existing ground surface (bgs). Borings were terminated upon achieving target depth. The borings were backfilled with soil cuttings after the final water level readings were taken.

Soil sampling within the borings was performed using the Standard Penetration Test (SPT) in general accordance with ASTM D1586. The SPT involves advancing a 2-inch outer diameter, 1- 3/8-inch inner diameter, split-barrel sampler with a 140-pound weight (known as the hammer) falling 30 inches. The hammer used was an automatic hammer which provides a more uniform test throughout the sampling process. The sampler is advanced up to 24 inches and the number of blows to advance the sampler each 6-inch interval is recorded. If the sampler is advanced less than 6 inches in 50 blows, the test is stopped and the distance the spoon was driven with 50 blows is recorded on the boring logs and is noted as sampler refusal. The number of blows to advance the split spoon from 6 to 18 inches (the second and third intervals) is commonly referred to as the N-value. The first 6 inches is referred to as the seating interval and is not counted as part of the N-value. A Century Engineering geo-professional observed the borings, maintained boring logs, and classified the soils in general accordance with ASTM D2488 Standard Practice for Description and Identification of Soils. Descriptions of the soil strata encountered in the explorations are included in the Boring Logs provided in the Appendix. A key to the symbols used on the logs and a soil description key are also provided in the Appendix.

3 SITE AND SUBSURFACE CONDITIONS

3.1 EXISTING SITE CONDITIONS

The site is bisected by Lombard Street with the proposed Building and Boat Storage Facility to be located to the south and the dock will be situated to the north along the Leipsic River. The elevation of the proposed building area is just above 8 MSL and slopes away in all 4 directions with the steepest being toward Lombard Street which is just above 3 MSL.

3.2 REGIONAL AND SITE GEOLOGY

The project site is situated within the Coastal Plain Physiographic Province. The Coastal Plain consists primarily of unconsolidated marine sediments deposited during successive periods of fluctuating sea levels and moving shorelines. These sediments thicken in a west to east progression, starting at the Fall Line (the western edge of the Coastal Plain) to the ocean shoreline, where the sediments are often thousands of feet in thickness.

According to the Generalized Geologic Map of Delaware the project site is underlain by the Scotts Corners Formation. The Scotts Corners Formation consists of heterogeneous units of light-grey to brown to light-yellowish-brown, coarse to fine sand, gravelly sand and pebble gravel with rare discontinuous beds of organic-rich clayey silts, clayey silt and pebble gravel. Sands are quartzose with some feldspar and muscovite. Commonly capped by one or two feet of silt to fine sandy silt.

3.3 SOIL CONDITIONS

Description of existing surface cover and the major soil groups encountered within the borings advanced by Century Engineering are described in the following sections in the general order of their occurrence. Detailed descriptions of the soils are included in the Appendix.

Surficial Cover

The test borings advanced as part of this subsurface evaluation encountered very little to no topsoil at the ground surface. This report is dedicated to the two borings located within the building footprint, namely Borings 5 and 6.

Stratum I – Silty fine SAND (USCS Classifications: SM**)**

Stratum I soils were generally encountered at the surface and ranged from 2 to 6.5 feet in depth and mainly consisted of Very Loose to Medium Dense Poorly Graded reddish brown to brown Silty Fine SAND.

Stratum II - Silty Sand and Clayey Sand (USCS Classifications: SM and SC)

Below this layer we encountered 7 to 20 feet of poorly graded moist to wet beige SAND. The material was very loose to loose and had a minimal of bearing capacity noted by the low SPT N values noted on the boring logs.

The samples below the 7 foot depth were all wet indicating the presence of the ground water table. STP field N values within the Stratum II soils ranged from 2 to 6 bpf, with an average of about 4 bpf, generally indicative of loose soils.

3.4 GROUNDWATER

During test boring operations, groundwater levels in the boreholes were monitored during the drilling and after pulling the augers prior to backfilling. Groundwater was encountered in all borings at depths ranging from 7 to 8 feet, averaging 7.75 feet below grade, during drilling.

The occurrence of groundwater can vary due to many factors. These factors include seasonal changes, site topography, surface runoff, the layering and permeability of subsurface strata, water levels in waterways, utilities, and other factors not evident at the time of this study. The possibility of groundwater and its fluctuation should be considered when developing this project.

4 GEOTECHNICAL DESIGN RECOMMENDATIONS

4.1 GENERAL

Based on the results of our evaluation, in our professional opinion, the project site can be developed for the proposed structures using conventional grading and foundation construction techniques, provided that the recommendations presented herein are incorporated into the design and construction of the project.

The following opinions, conclusions, and recommendations are based on the properties of the materials encountered in the borings, and our engineering analyses performed, and should be incorporated into the project design and subsequent construction.

4.2 SITE DEVELOPMENT

Based on our review of the available geotechnical data obtained to date, and our general understanding of proposed site grading, the primary items of geotechnical concern for this project are described in the following paragraphs.

Loose Natural Soils – Foundations (Recommend Additional Work)

There is a marked difference between the two borings with regard to the density of the material. Although the materials appear to be similar, they have different layer thicknesses and also different SPT N values. Therefore, in order to minimize the amount of differential settlement withing the building we will treat the entire building as if the boring results were more similar.

The upper six to eight feet contained a reddish brown silty fine sand with varying amounts of gravel. This layer had “N values” ranging from 4 to 23 bpf . This material was possibly the fill that was placed after the former buildings were removed and the site was regraded.

4.3 FOUNDATIONS

For the support of the proposed structures, two alternatives have been prepared for consideration:

Alternative 1.

Stabilized Raft Geogrid System:

The conforming shallow foundation support shall consist of a Mechanically Stabilized Layer (MSL) of defined thickness 18 in to carry imposed loading from a rectangular pressure distribution with maximum imposed pressure of 2000 psf over Granular subgrade soils with a friction angle of 28^0. The resulting MSL will achieve or exceed a target factor of safety for bearing capacity of 3 and the settlement under the footing will be limited to less than 1 inch.

The Mechanically Stabilized Layer shall consist of two components:

- The stabilization geogrid component of the MSL shall be Tensar InterAx™ Foundation geogrid NXF which is manufactured from a coextruded, composite polymer sheet, which is then punched and oriented. The resulting structure consists of continuous and non-continuous ribs forming three aperture geometries (hexagon, trapezoid, and triangle) and an unimpeded suspended hexagon.
- A natural aggregate comprising well-graded, hard, angular particles. The well graded aggregate shall have a maximum particle size of 3 in, a maximum fines content of 15%, and a peak angle of friction of at least 40 degrees.

- The specific configuration of the MSL, starting from the prepared subgrade, shall consist of the initial, bottom layer of NXF, a layer of natural aggregate with a minimum thickness of 12 inches, an additional layer of NXF geogrid, and an upper layer of natural aggregate with a minimum thickness of 6 inches.

The mechanically stabilized layer thickness has been determined to meet or exceed the stated project specific performance targets and is based on the derivation of a project specific "load transfer efficiency" or "T-Value" of the mechanically stabilized layer incorporating stabilization geogrid(s).

The load spread efficiency of the MSL has been determined using the following:

- A suitable constitutive model to simulate mechanically stabilized aggregate material behavior. Design parameters are determined using a large 0.5m diameter triaxial testing on the aggregate and geogrid combinations to determine stabilized strength of the resulting composite layer. Simulation of the application in FEA validated by the full-scale testing.

- An extensive parametric study to derive relationships between MSL-specific T-values and subgrade strength for the design method adopted.

- Full scale testing of mechanically stabilized aggregate layers with the same geogrid products to bearing capacity failure to demonstrate and quantify the stabilization geogrid benefit.

Any alternative proposals or products shall be accompanied by a technical submission demonstrating the equivalence of the alternative composite construction along with the supporting test data, at least three weeks prior to the required product approval date.

The properties for the geogrid component of the mechanically stabilized layer are included below for the purposes of product identification only and should not be associated with expected performance of the geogrid component of the mechanically stabilized layer.

It should be noted that index properties or performance characteristics for any alternative geogrid in isolation, such as tensile properties measured in air, geometric dimensions, aperture stability modulus, or quality control data will not be accepted as an adequate demonstration of equivalent platform performance.

InterAx™ Foundation NXF Properties	Test/Measurement Method	General
Aperture shapes		Hexagonal, Trapezoidal, & Triangular
Structure		Coextruded & Integrally Formed
Rib shape		Rectangular
Continuous parallel rib pitch	Nominal	80 mm (3.2 in)
Rib aspect ratio [2]		>1.2
Color identification		White / Black / White

Upon completion of the ground improvement operations recommended in this report, the proposed spread footing foundations can be designed as follows:

- A maximum allowable bearing pressure of **2,000** pounds per square foot (psf) should be considered for foundation design.
- Foundations should bear a minimum of 24 inches below finish grades for frost protection purposes, per the Kent County Building Code, including foundations in unheated areas.
- Exterior column and wall foundations should be a minimum of 3.0 and 1.5 feet in width, respectively.
- These recommendations are provided by Century Engineering under the assumption that observation and inspection of foundation subgrade materials will be conducted by an experienced and competent inspector acting under the supervision of the Geotechnical Engineer of Record.
- Recommendations pertinent to observation and documentation of foundation construction activities are provided later in this report.

Alternative 2

Deep Foundations

The structure can be supported on a drilled pile system such as augered cast-in-place (ACIP) piles or drilled displacement (DD) piles, which are low-vibration, low-noise, deep foundations. These pile types are designed and installed by specialty contractors. Driven piles are feasible as well; however, we have not included recommendations herein because of the noise caused during installation. We can provide recommendations for driven piles if requested. If the stone columns effectively mitigate the potential for liquefaction, the piles will not need to be designed for the effects of liquefaction only capacity.

Floor slabs can be designed to bear on grade over a combination of engineered fill (select fill or properly prepared subgrade) and stone columns designed to mitigate ground failure and to reduce liquefaction-induced settlement.

The structure can be supported on a drilled pile system such as ACIP piles or DD piles. Because piles will not mitigate liquefaction potential, the piles will need to be designed for the effects of liquefaction on capacity and floor slabs should be designed to span between foundations and the piles. For all of the options, total and differential settlement need to be considered.

Different methods used to support the structure and slab may result in different performance the specialty ground improvement designer should coordinate with the structural engineer to provide a system that will perform as specified.

ACIP piles are installed by drilling to the required depth with a continuous flight auger that will produce spoils, as described above for ACCs.

DD piles are installed using a displacement tool with reverse flights at the bottom that cause displacement and densification of the surrounding soil resulting in little to no spoils. For either pile type, when the auger reaches the required depth, cement grout or concrete is injected through the bottom part of the hollow-stem auger. Grout or concrete is injected continuously as the augers, still rotating in a forward direction, are slowly withdrawn, replacing the soil. While the grout is still fluid, a steel reinforcing cage is inserted into the shaft.

Piles should be designed to limit settlement to less than 1 inch under the design loads, based on the desired performance as determined by the structural engineer.

To confirm the design-build foundation contractor's design capacity, an extensive indicator and test pile program will be needed, including indicator piles and compression and uplift load tests. These piles can range in diameter; 16-, 18- and 24-inch-diameter piles are typical.

4.4 SLABS ON GRADE

Soil-supported grade slabs may be used for the proposed building structures provided the subgrade is prepared according to the recommendations contained in this report.

Slabs-on-grade should be designed and constructed in accordance with the recommendations of the most recent versions of ACI Committee Reports 360R and 302.1R.

Concrete floor slabs are recommended to be jointed around columns and along footing-supported walls so that the slab and foundations can settle differentially without damage. Joints containing smooth dowels or keys may be used in the slab to permit rotational movement between parts of the slab without sharp vertical displacements or cracking. Control joints should be used to control shrinkage cracks.

Based on the subgrade preparation procedures recommended herein and the existing soil conditions, a subgrade modulus (k) of 120 pounds per cubic inch (pci) is estimated for slab design. We recommend supporting the slab on a minimum 6 inches of graded aggregate base (or approved equivalent) material and a vapor barrier a minimum of 10 mils to serve as a capillary break and provide uniform support of the slab.

If portions of the floor slabs may not be subjected to building heat during freezing weather and may be susceptible to frost heave, the soils beneath these slabs should consist of non-frost susceptible, free-draining fill for a minimum one-foot of depth. The soil should contain drainage provisions to mitigate surface water from being trapped within the drainage layer.

It is typical for construction activities to disturb the floor slab area between the time the pad is prepared, and the new floor slab is constructed.

Century Engineering recommends that just prior to vapor retarder installation and slab construction, the slab area subgrade be proofrolled, and any unstable zones be stabilized at the recommendation of Century Engineering.

The moisture content of the subgrade soils should be maintained within the recommended range until floor slabs are completed.

4.5 PAVEMENTS

Development of the site will include constructing auto parking areas, and drive lanes. The following pavement sections are based on the soil conditions encountered during our field exploration, our assumptions regarding final site grades, and limited laboratory testing.

4.5.1 Asphalt Pavement

Pavement design recommendations have been developed in accordance with American Association of State Highway and Transportation Officials (AASHTO) pavement design methodology. More specifically, our design is based upon the following assumptions:

- Pavement subgrade soils consisting of compacted structural fill or Stratum I sandy and/or silty CLAY prepared in accordance with the recommendations provided in this report.
- Based on our results with similar soils, a design California Bearing Ratio (CBR) of 6.0
- Reliability = 85 percent, Standard Deviation = 0.45 and Initial and Terminal Serviceability Index = 4.5 and 2.0, respectively
- Pavement layer coefficients for wearing course, base course, and subbase of 0.44, 0.40 and 0.10, respectively.
- Heavy- and light-duty pavement section Structural Numbers (SN) of 3.5 and 2.95 for the 20-year heavy-duty pavements and 2.3 for the 20-year light-duty pavement sections.

Recommended Light-Duty Asphalt Pavement Section Summary

Paving Material	Light-Duty Pavement	Heavy-Duty Pavement
Hot Mix Asphalt, Surface Course Type C (9.5 mm mix)	1.5 inches	1.5 inches
Hot Mix Asphalt, Intermediate Course Type C (19.0 mm mix)	1.5 inches	-
Hot Mix Asphalt, Base Course (Type B (25.0 mm mix)	-	2.5 inches
Crushed Stone Base Course	6.0 inches	10.0 inches

The recommended pavement sections do not consider “staged” construction, where construction traffic “runs” on the base/binder course and the final wearing surface is placed near project completion. Construction traffic running on the base course will over time result in premature base course failure. The heavy-duty pavement should be placed along the path of any delivery or trash trucks that will be frequently using the travel areas.

Depending upon the magnitude of traffic and time of year, substantial remedial work may be necessary prior to wearing course placement. Pavement construction recommendations are provided later in this report.

4.5.2 Portland Cement Concrete Pavement

Portland Cement Concrete (PCC) pavement designs may also be considered for the project, particularly in areas that will be subjected to heavy concentrated wheel or point loads (dumpster pads or other areas where dumpster trucks or trailers load, back up and turn around). Based on the subgrade and traffic loading parameters discussed above, we recommend the use of a rigid pavement section consisting of a minimum of 4,500 psi, air entrained concrete having a minimum thickness of 8.0 inches. The concrete should be placed on a minimum of 6.0 inches of stone subbase.

5 CONSTRUCTION CONSIDERATIONS

Construction is expected to include the excavations and fills to achieve finished grades and the preparation of subgrades for building foundations and pavements.

Construction site safety is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. The contractor should also be aware that temporary slope height, slope inclination, or excavation depths (including utility trench excavations) should in no-case exceed those specified in local, State, and/or Federal safety regulations, such as OSHA Health and Safety Standard for Excavations, or more stringent applicable regulations.

Surface drainage should be carefully controlled to prevent flow of water into the excavations. The site should be graded to prevent surface water from ponding in construction areas and accumulating in excavations.

Earthwork should be performed under the full-time observation by a Century Engineering representative including but not limited to:

- Initial site preparation and topsoil stripping.
- Proof-rolling and subgrade evaluation.
- Subgrade improvement procedures; and
- Fill placement and compaction.

5.1 EXCAVATION

The test borings completed for the proposed improvements indicate construction of the project will take place primarily in the fill areas identified as Staratum I . These materials may be removed using conventional earth moving equipment and techniques as recommended above. All excavations should be adequately sloped, benched, or supported to minimize collapse and protect personnel.

All excavations should be completed in accordance with OSHA requirements.

5.2 GROUNDWATER

The borings were advanced using techniques that allowed for direct and indirect observations of seepage and groundwater during drilling operations.

Groundwater was generally encountered at depths ranging from about 7.5 to 8 feet below existing grades. Static groundwater levels are not expected to be encountered during earthwork or foundation construction.

The fine-grained soils of Stratum I I are generally considered to be moisture-sensitive and prone to developing perched groundwater tables. In most cases, depending on seasonal conditions, seepage into construction excavations should be handled by conventional dewatering methods such as by pumping from sumps, and the use of interceptor trenches.

5.3 MOISTURE MANAGEMENT

We recommend that construction activities and sequencing be directed to minimize the potential for surficial runoff and precipitation impacts to proposed soil subgrades as follows:

- Construction subgrades should be oriented to direct surficial water away to minimize the accumulation of water within structural areas (building pad and pavement subgrades). This can typically be achieved by use of temporary swales and drainage channels directed to non-structural or green areas of the site.
- If temporary sloping of site subgrades is not feasible, consideration should be given to the use of interceptor trenches.

  These trenches are typically on the order of about 12 to 18 inches in width and depth and are lined with a non-woven filter fabric and backfilled with clean stone. These trenches should be directed to lower-lying non-structural or green areas of the project site.

- Provisions should be made to minimize the potential for off-site surface runoff from entering the site during construction.

5.4 SITE PREPARATION

The area of development is defined herein as the footprint of where cuts and fills are proposed to facilitate development.

According to the initial site plan, within the area of development, sparse vegetation and topsoil should be removed as part of the initial site preparation activities.

The depth of stripping and/or undercutting should be extended to include the root mat and other soft surficial layers as necessary to provide a suitable subgrade for placement and compaction of earthwork. The stripping depth should be based on field observations with particular attention given to old drainage areas, uneven topography, and excessively wet soils.

Topsoil was not encountered within our borings, however there were areas of crabgrass and weeds throughout the site. As such, we recommend that prior to development of the site that 2 to 4 inches of surface material be removed and stockpiled for later use. Deleterious materials, if encountered including, but not limited to, brush, trees, and stumps should be disposed of properly offsite.

The removed topsoil may be considered for re-use in proposed landscaped or stormwater bioretention areas once grading has been completed.

Additional laboratory testing should be conducted upon representative topsoil samples desired for re-use.

5.5 PROOFROLLING

The soil subgrades in the parking and other paved areas to receive new structural fill, and soil subgrades in cut areas, should be compacted in-place and proof-rolled to determine if suitable soils are present. The proof-rolling should be performed with a heavy-duty, 10 ton smooth-drum vibratory roller or a loaded dump truck. Proof-rolling should uniformly cover the subgrade in perpendicular directions in accordance with recommendations by Century Engineering. In areas where it is infeasible or not recommended to have large construction equipment, proof-rolling should be performed using lighter compaction equipment such as a walk-behind trench roller as well as evaluation of the subgrade with a hand probe.

The objective of proof-rolling is to identify zones of weakness in the subgrade where further evaluation and possible stabilization may be required.

Areas of observed or suspected instability should be further explored by methods that may include test pits or laboratory testing, to identify causes and/or extents of instability.

Soft or loose soils with elevated moisture contents are expected to be encountered at exposed subgrade elevations prior to placement of new structural fills. Our experience with similar soils indicates that these materials may be unstable under the weight of compaction and earthmoving equipment. After clearing and grubbing of surficial topsoil and organic materials, we recommend that these areas be temporarily stabilized in-place prior to the placement of new structural fill. This process, described below, should be conducted under the observation of the Geotechnical Engineer:

- Prior to the placement of new structural fill, the exposed subgrades should be proof rolled with available on-site construction equipment.
  Soils displaying rutting greater than approximately 6 to 8 inches should be removed prior to structural fill placement.

- It should be anticipated that minor subgrade instability will remain following the proof-roll operations due to the elevated moisture contents of the subgrade soils. It is anticipated that this instability can be appropriately bridged with the use of bridge lifts utilizing appropriately moisture-conditioned coarse-grained soils or imported materials determined to be suitable by the Geotechnical Engineer. These materials may also be stabilized in place with large-size stone (No. 1 or 2 recycled concrete aggregate or stone aggregate).

- Evidence of severe pumping or instability prior to the placement of structural fill may require chemical treatment or limited undercut and replacement prior to fill placement.

- The conditions should be thoroughly evaluated though prior to the commencement of fill operations to appropriately determine the appropriate course of action.

5.6 STRUCTURAL FILL

Our recommendations regarding suitable imported fill and reuse of on-site soils as structural fill are provided in the sections below.

5.6.1 Imported Fill

Imported structural fill should meet the following criteria:

5.6.1.1 USCS Classification GP, GP-GM, GM, SP, SP-SM, SM
5.6.1.2 Liquid Limit (LL) less than 40
5.6.1.3 Plasticity Index (PI) less than 10
5.6.1.4 Free of large rock or asphalt fragments (greater than 3 inches in diameter) and organic materials (less than 3 percent by weight). The use of larger rock in structural fill must be carefully monitored and tested by Century Engineering
5.6.1.5 Percent passing washed No. 200 sieve of less than 15 percent
5.6.1.6 Free of deleterious, organic, and hazardous materials

Alternate soils proposed for use which differ from those specified above should be evaluated by Century Engineering regarding their suitability prior to placement at the site.

5.6.2 Re-Use of On-Site Soils

Stratum I – Silt, Clay, and Clayey/Silty SAND

The near-surface Stratum I materials on-site were found to consist of silt, silty and sandy clay, and clayey sand (USCS Classifications: SW-SC, and SM) of low to moderate plasticity. Based on this information, these soils are considered marginally suitable for re-use as structural fill.

Therefore moisture-conditioning and/or chemical treatment of these soils (utilizing lime or cement) should generally be anticipated during construction to facilitate the re-use of these soils.

If earthwork operations are scheduled to occur during the summer or fall months, portions of these materials may be properly moisture-conditioned by mixing with coarser sands and gravels or scarified and aerated prior to their re-use. If earthwork operations are scheduled to occur during the winter or spring months, we recommend that a contingency be included for either chemical treatment or removal and replacement of unsuitable soils with imported structural fill.

Stratum II – Silty Sand and Clayey Sands

The test borings generally encountered relatively fine to medium-grained soils, namely silty sand, clayey sands (USCS: SW-SC, SM, SC). These soils are expected to be suitable for re-use as structural fill on-site. Material excavated from perched groundwater areas or below the groundwater table may require additional discing or aeration to facilitate re-use.

Our analysis of the suitability of the on-site soil for reuse as structural fill is based on data collected from the test locations completed at the site. Soil suitability should be confirmed in the field during construction by Century Engineering.

5.7 COMPACTION REQUIREMENTS

Structural fill should be placed in lifts not exceeding 10 inches in loose thickness where heavy compaction equipment can be utilized and 6 inches in loose thickness where hand-operated equipment is necessary.

The optimum lift thickness and number of repetitive passes with compaction equipment necessary to achieve the required percentage compaction values should be determined in the field with test passes of the chosen compaction equipment.

New structural fill should be placed at or deviate nominally from (±2%) the optimum moisture content as determined in accordance with ASTM D698 or ASTM D1557 and compacted to the minimum percentages of maximum dry density as indicated below.

Recommended Compaction Criteria

Fill Area	Percent of Maximum Dry Density per Standard Proctor (ASTM D698)	Percent of Maximum Dry Density per Modified Proctor (ASTM D1557)
Foundation Support	98	95
Foundation Backfill	98	95
Slab-On-Grade & Parking Areas	98	95
Non-Structural / Green Areas	92	90

5.8 FOUNDATIONS

Prior to the placement of concrete, the foundation subgrade should be densified and compacted using a walk-behind vibratory roller, gas-powered automatic tamper, or similar equipment. Densification should be performed to provide uniform density of the foundation subgrade materials. Proper compaction and densification of the foundation subgrade should be verified by Century Engineering prior to placement of concrete.

- It is emphasized that caution should be exercised to not disturb foundation subgrade soils. Should the subgrade be disturbed, the soil should be compacted in place, or weak or yielding materials should be removed and replaced with controlled structural fill.

- Exposure to the environment may weaken the materials present at the footing bearing levels if the foundation excavations remain open for an extended period. Therefore, the use of a concrete "mud-mat" constructed over the bearing materials should be considered.

- Foundation concrete should be placed the same day that excavation occurs.

- Every effort should be made to prevent water from entering open foundation excavations. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete.

- The foundation bearing area should be level.

- Any loosened soil, debris, or ponded water should be removed from the excavation prior to concrete placement.

- Care should be exercised during winter months to prevent freezing of subgrade soils and backfill prior to or after the placement of concrete.

- Foundation concrete should not be placed on frozen or saturated subgrades.

5.9 FLOOR SLABS

Prior to the placement of granular subbase materials, Century Engineering should review slab subgrade conditions prior to grade slab construction and provide corrective recommendations if weak or yielding conditions are identified.

The subgrade should be proof rolled with a loaded dump truck or by other approved methods to detect any excessively yielding subgrade conditions.

Soil-supported grade slabs should not bear on excessively yielding, saturated, or loose soils. The floor slab subgrade should be proof rolled with a loaded dump truck, or by other approved methods, to detect any excessively yielding subgrade conditions.

If at the time of construction, the slab subgrade is found to be excessively wet or soft and yielding, it may be necessary to stabilize the subgrade soils by disking, aerating, and re-compacting. However, if it is not possible to improve the subgrade soils in this manner due to soil moisture, weather conditions, or other constraints, alternate methods may be necessary.

The preferred method for stabilizing the slab subgrade should be determined in the field at the time of construction based upon the actual field conditions in conjunction with the specific soil type encountered at the locations requiring stabilization, the size of the areas requiring stabilization, and the construction schedule.

5.10 PAVEMENTS

The following general recommendations are provided herein relating to pavement subgrade construction:

- The suitability of the subgrade soils for pavement construction should be confirmed by Century Engineering after careful visual examination and by the results of laboratory tests performed on the subgrade soil samples.

- Prior to pavement construction, Century Engineering should review subgrade conditions and provide recommendations for weak or yielding conditions identified. Care should be exercised to thoroughly proof roll the subgrade with a loaded dump truck or by other approved methods to detect any excessively yielding conditions in accordance with the recommendations provided in this report.

- Pavement sections are typically designed to accommodate post-construction traffic only. Partial construction of the pavement sections is not recommended.

- Consideration should be given to the construction of designated haul roads to accommodate heavy construction equipment at the site. This can be accomplished by increasing the thickness of a select granular subbase and/or asphalt course has been increased to account for the heavy construction traffic.

- As paving and grading are typically performed by separate contractors, a time lapse generally occurs between the end of grading operations and the commencement of paving. Disturbance, desiccation, and/or wetting of the subgrade prior to completion of paving can result in deterioration of the previously completed subgrade. Non-uniform subgrades can result in poor pavement performance and local failures relatively soon after pavements are constructed. Where applicable, we recommend the pavement subgrade be proof rolled within two days prior to commencement of actual paving operations. If any significant temperature changes or precipitation events occur after proof-rolling, the subgrade should be reviewed by Century Engineering prior to placing the pavement. The subgrade should be in its finished form at the time of the final review.

- Pavement subbase should be placed as soon as possible after the subgrade has been approved.

- The pavement sections should also be placed as soon as possible after the subbase has been tested and approved. These recommendations are provided to help prevent the subgrade and the subbase from being disturbed by weather and construction traffic. It will also help reduce the potential for the subbase from becoming contaminated with soil.

6 ADDITIONAL SERVICES

Century Engineering is available to provide additional services to help with this project as it goes through final design and into construction. A description of these services is below.

6.10 PLANS AND SPECIFICATIONS REVIEW

We recommend that Century Engineering perform a general review of the project plans and specifications before they are finalized to verify that our geotechnical recommendations have been properly interpreted and implemented during design. If we are not accorded the privilege of performing this review, we can assume no responsibility for misinterpretation of our recommendations.

6.11 CONSTRUCTION OBSERVATION AND TESTING

The construction process is an integral design component with respect to the geotechnical aspects of a project. Because geotechnical engineering is an inexact science due to the variability of natural processes, and because we sample only a limited portion of the soils affecting the performance of the proposed improvements, unanticipated or changed conditions can be encountered during grading. Proper geotechnical observation and testing during construction are imperative to allow the opportunity to verify assumptions made during the design process. Therefore, we recommend that Century Engineering be retained during the construction of the proposed improvements to observe compliance with the design concepts and geotechnical recommendations, and to allow design changes in the event that subsurface conditions or methods of construction differ from those assumed while completing this study.

7 LIMITATIONS

This geotechnical study has been prepared for the exclusive use of the Client and their agents for specific application to the proposed facility mentioned in this report. The findings, conclusions and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made.

The scope of services was limited to a background data review and the field exploration described previously. It should be recognized that definition and evaluation of subsurface conditions are difficult Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions of this assessment are based on our field exploration and laboratory testing programs, and engineering analyses.

Century Engineering offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service, which provide information for their purposes at acceptable levels of risk.

The client and key members of the design team should discuss the issues covered in this report with Century Engineering, so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory tests, and our present knowledge of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Century Engineering is notified immediately so that we may reevaluate the recommendations of this report. If the scope of the proposed construction, including the estimated traffic volumes or locations of the improvements, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed, and the conclusions of this report are modified or approved in writing, by Century Engineering.

The scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

Century Engineering cannot be responsible for interpretation by others of this report, or the conditions encountered in the field. Century Engineering must be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by Century Engineering, including site preparation, preparation of foundations, and placement of structural fill and trench backfill.

These services provide Century Engineering the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Century Engineering is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Century Engineering must also be retained to perform a supplemental evaluation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Because of the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Century Engineering can be contacted to confirm those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report.

Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party, other than the client who wishes to use this report shall notify Century Engineering of such intended use. Based on the intended use of this report and the nature of the new project, Century Engineering may require that additional work be performed and that an updated report be issued.

Non-compliance with any of these requirements by the client or anyone else will release Century Engineering from any liability resulting from the use of this report by any unauthorized party and the client agrees to defend, indemnify, and hold harmless Century Engineering from any claims or liability.

APPENDIX 1

PROJECT VICINITY MAP

CENTURY ENGINEERING
A Kleinfelder Company

PROPOSED LEIPSIC RESEARCH DOCK FACILITY
LOMBARD STREET, LEIPSIC, DELAWARE
PROJECT VICINITY MAP

APPENDIX 1	Designed By:	Drawn By:
Date: 2.19.2024	Project#: 00175013.092A	Scale: None

APPENDIX 2

SOIL BORING LOCATION PLAN

CENTURY ENGINEERING
A Kleinfelder Company

PROPOSED LEIPSIC RESEARCH DOCK FACILITY
LOMBARD STREET, LEIPSIC, DELAWARE
BORING LOCATION PLAN

APPENDIX 2	Designed By:	Drawn By:
Date: 2.19.2024	Project#: 00175013.092A	Scale: None

APPENDIX 3

SOIL DESCRIPTION KEY

PLOTTED: 09/09/2022 01:18 PM BY: WTucker
OFFICE FILTER: OWINGS MILLS
PROJECT NUMBER: 20230485.001A
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB [_KLF_GEO_LEG2_SOIL_DESC_KEY]
gINT FILE: Klf_gint_master_2023

GRAIN SIZE[1]

DESCRIPTION		SIEVE SIZE	GRAIN SIZE
Boulders		>12 in.	>12 in. (304.8 mm.)
Cobbles		3 - 12 in.	3 - 12 in. (76.2 - 304.8 mm.)
Gravel	coarse	3/4 -3 in.	3/4 -3 in. (19 - 76.2 mm.)
	fine	#4 - 3/4 in.	0.19 - 0.75 in. (4.8 - 19 mm.)
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)
Fines		Passing #200	<0.0029 in. (<0.07 mm.)

SECONDARY CONSTITUENT[1]

Term of Use	AMOUNT	
	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

PLASTICITY[1]

DESCRIPTION	CRITERIA
Non-Plastic	A 1/8 in. (3 mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

MOISTURE CONTENT[1]

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CONSISTENCY - FINE-GRAINED SOIL[2,3]

CONSISTENCY	SPT - N (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Easily penetrated several inches by fist
Soft	2 - 4	0.25 ≤ PP <0.5	500 - 1,000	Easily penetrated several inches by thumb
Medium Stiff	4 - 8	0.5 ≤ PP <1	1,000 - 2,000	Can be penetrated several inches by thumb with moderate effort
Stiff	8 - 15	1 ≤ PP <2	2,000 - 4,000	Readily indented by thumb but penetrated only with great effort
Very Stiff	15 - 30	2 ≤ PP <4	4,000 - 8,000	Readily indented by thumbnail
Hard	>30	4 ≤ PP	>8,000	Indented by thumbnail with difficulty

APPARENT DENSITY - COARSE-GRAINED SOIL[2]

APPARENT DENSITY	SPT-N (# blows / ft)
Very Loose	<4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

STRUCTURE[1]

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. (6mm) thick, note thickness.
Laminated	Alternating layers of varying material or color with the layers less than 1/4-in. (6 mm) thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.
Homogeneous	Same color and appearance throughout

ANGULARITY[1]

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

REACTION WITH HYDROCHLORIC ACID[1]

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

CEMENTATION[1]

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or little finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

REFERENCES

1. American Society for Materials and Testing (ASTM), 2017, ASTM D2488: Standard Practice for Description and Identification of Soils (Visual Manual Procedures).
2. Terzaghi, K and Peck, R., 1948, Soil Mechanics in Engineering Practice, John Wiley & Sons, New York.
3. United States Department of the Interior Bureau of Reclamation (USBR), 1998, Earth Manual, Part I.

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 20230485.001A
DRAWN BY:
CHECKED BY:
DATE:

APPENDIX 3
SOIL DESCRIPTION KEY

PROPOSED MILLVILLE PROFESSIONAL BUILDING
35136 ATLANTIC AVENUE
MILLVILLE, DELAWARE

APPENDIX 4

BORING LOG GRAPHICS KEY

DRILLING METHOD/SAMPLER TYPE GRAPHICS

STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)

GROUND WATER GRAPHICS

- WATER LEVEL (level where first observed)
- WATER LEVEL (level after stabilizing period)
- WATER LEVEL (additional levels after exploration)
- OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Solid lines separating strata on the logs represent approximate boundaries only, dashed lines are inferred or extrapolated boundaries. Actual transitions may be gradual or differ from those represented.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System (ASTM D2488/D2487) designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., CL-ML, GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

WOH - Weight of Hammer
WOR - Weight of Rod

REFERENCES

1. American Society for Materials and Testing (ASTM), 2011, ASTM D2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System).

UNIFIED SOIL CLASSIFICATION SYSTEM[1]

COARSE GRAINED SOILS (More than 50% retained on No. 200 Sieve)	**GRAVELS** (More than 50% of coarse fraction retained on No. 4 Sieve)	CLEAN GRAVEL WITH <5% FINES	**GW**	WELL-GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND
			GP	POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND
		GRAVELS WITH 5% TO 12% FINES	**GW-GM**	WELL-GRADED GRAVEL WITH SILT, WELL-GRADED GRAVEL WITH SILT AND SAND
			GW-GC	WELL-GRADED GRAVEL WITH CLAY (OR SILTY CLAY), WELL-GRADED GRAVEL WITH CLAY AND SAND (OR SILT CLAY AND SAND)
			GP-GM	POORLY GRADED GRAVEL WITH SILT, POORLY GRADED GRAVEL WITH SILT AND SAND
			GP-GC	POORLY GRADED GRAVEL WITH CLAY (OR SILTY CLAY), POORLY GRADED GRAVEL WITH CLAY AND (OR SILTY CLAY AND SAND)
		GRAVELS WITH > 12% FINES	**GM**	SILTY GRAVEL, SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL, CLAYEY GRAVEL WITH SAND
			GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL WITH SAND
	SANDS (50% or more of coarse fraction passes the No. 4 Sieve)	CLEAN SANDS WITH <5% FINES	**SW**	WELL-GRADED SAND, WELL-GRADED SAND WITH GRAVEL
			SP	POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
		SANDS WITH 5% TO 12% FINES	**SW-SM**	WELL-GRADED SAND WITH SILT, WELL-GRADED SAND WITH SILT AND GRAVEL
			SW-SC	WELL-GRADED SAND WITH CLAY (OR SILTY CLAY), WELL-GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
			SP-SM	POORLY GRADED SAND WITH SILT, POORLY GRADED SAND WITH SILT AND GRAVEL
			SP-SC	POORLY GRADED SAND WITH CLAY, POORLY GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
		SANDS WITH > 12% FINES	**SM**	SILTY SAND, SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND, CLAYEY SAND WITH GRAVEL
			SC-SM	SILTY, CLAYEY SAND, SILTY, CLAYEY SAND WITH GRAVEL
FINE GRAINED SOILS (50% or more passes the No. #200 sieve)	(Liquid Limit less than 50)		**ML**	SILT, SILT WITH SAND, SILT WITH GRAVEL
			CL	LEAN CLAY, LEAN CLAY WITH SAND, LEAN CLAY WITH GRAVEL
			CL-ML	SILTY CLAY, SILTY CLAY WITH SAND, SILTY CLAY WITH GRAVEL
			OL	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL
	SILTS AND CLAYS (Liquid Limit 50 or greater)		**MH**	ELASTIC SILT. ELASTIC SILT WITH SAND, ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY, FAT CLAY WITH SAND, FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL

NOTE: USE MATERIAL DESCRIPTION ON THE LOG TO DEFINE A GRAPHIC THAT MAY NOT BE PROVIDED ON THIS LEGEND.

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 20233371.002A
DRAWN BY:
CHECKED BY:
DATE:

APPENDIX 4
BORING LOG GRAPHICS KEY

PROPOSED MILLVILLE PROFESSIONAL BUILDING
35136 ATLANTIC AVENUE
MILLVILLE, DELAWARE

gINT FILE: Klf_gint_master_2023
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB [_KLF_GEO_LEG1_GRAPHICS_KEY_W_USCS]
PROJECT NUMBER: 20230485.001A
OFFICE FILTER: OWINGS MILLS
PLOTTED: 09/09/2022 01:17 PM BY: WTucker

APPENDIX 5

TEST BORING LOGS

Date Begin - End: 1/25/2023 **Drilling Company:** John D. Hynes & Associates **BORING LOG SB-1**

Logged By: E. Chandler **Drill Crew:** Brian H., Mike H., Bryan

Hor.-Vert. Datum: Not Available **Drilling Equipment:** B57 Mobile **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Not Available **Auger Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION				LABORATORY RESULTS							
0		**Clayey SILT (ML)**: dark gray, moist, some Shell Fragments		BC=1 1 2 1	4"								
				BC=1 1 1 1	4"								
5		**Clayey SILT with Sand (ML)**: dark gray, moist, very soft, some Shell Fragments and Organics		BC=2 1 1 1	4"								
		SILT with Sand (ML): bluish gray, moist, soft		BC=2 2 2 2	10"								
		Poorly Graded SAND with Silt (SP-SM): gray, moist, loose		BC=4 4 3 2	24"								
10													
				BC=4 4 4	18"								
15													
		SAND with Silt (SM): gray, medium dense		BC=10 9 10	18"								
20													
		SAND with Silt and Gravel (SM): greenish gray, moist, medium dense		BC=10 12 15	18"								
25													
		SAND with Silt (SM): greenish gray, moist, dense		BC=9 15 19	18"								
30													

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with auger cuttings on January 25, 2023.

GROUNDWATER LEVEL INFORMATION:
Boring was performed in the water.
GENERAL NOTES:

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 175013.092A

DRAWN BY:

CHECKED BY:

DATE:

BORING LOG SB-1

Leipsic Dock/Wheddbee
Leipsic, Delaware

gINT FILE: Klf_gint_master_2023
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB [__KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 175013.092A
OFFICE FILTER: DOVER
PLOTTED: 02/13/2023 07:31 AM BY: cstouten

Date Begin - End: 1/25/2023 **Drilling Company:** John D. Hynes & Associates **BORING LOG SB-2**

Logged By: E. Chandler **Drill Crew:** Brian H., Mike H., Bryan

Hor.-Vert. Datum: Not Available **Drilling Equipment:** B57 Mobile **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Not Available **Auger Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION				LABORATORY RESULTS							
				BC=1 1 1 1	NR								
		Silty CLAY with Sand (CL): black, moist, very soft, some Shells		BC=1 1 1 1	8"								
5		**Silty CLAY with Sand (CL)**: dark gray, moist, very soft, some Shells		BC=1 1 1 1	24"								
		Silty CLAY (CL): dark gray, moist, very soft to soft, some Shells		BC=1 1 1 1	24"								
				BC=1 1 1 4	12"								
10													
		SAND with Silt (SM): beige, moist, medium to stiff		BC=5 4 2 5	24"								
15													
		Poorly Graded SAND with Silt (SP-SM): bluish green, moist, dense		BC=12 19 22	18"								
20													
		Poorly Graded SAND with Silt (SP-SM): brown, moist, medium dense		BC=10 10 12	18"								
25													
		Poorly Graded SAND with Silt (SP-SM): bluish green, moist, dense		BC=10 14 18	18"								
30													

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with auger cuttings on January 25, 2023.

GROUNDWATER LEVEL INFORMATION:
Boring was performed in the water.
GENERAL NOTES:

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 175013.092A

DRAWN BY:

CHECKED BY:

DATE:

BORING LOG SB-2

Leipsic Dock/Wheddbee
Leipsic, Delaware

PLOTTED: 02/13/2023 07:31 AM BY: cstouten
OFFICE FILTER: DOVER
PROJECT NUMBER: 175013.092A [__KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf gint_master_2023
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB

Date Begin - End:	1/24/2023	**Drilling Company:**	John D. Hynes & Associates	**BORING LOG SB-3**	
Logged By:	E. Chandler	**Drill Crew:**	Brian H., Mike H., Bryan		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	B57 Mobile	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Not Available	**Auger Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Well-Graded GRAVEL with Sand (GW): black, wet, loose		BC=2 4 3 2	24"								
		Well-Graded GRAVEL with Silt and Sand (GW): dark brown, moist, loose		BC=5 4 1 1	18"								
5		**Well-Graded SAND with Gravel (SW)**: dark gray, moist, very loose		BC=2 1 2 1	18"								
				BC=1 1 1 1	24"								
		Well-Graded SAND with Silt (SW): light gray, moist, very stiff		BC=5 7 11 7	24"								
10													
		Silty SAND (SM): dark gray, moist, very loose		BC=1 WOH WOH	18"								
15		**Silty SAND (SM)**: orange, moist, very loose											
		Poorly Graded SAND with Gravel (SP): orange, moist, very loose		BC=1 1 1	18"								
20													
		Poorly Graded SAND with Silt (SP-SM): brownish gray, moist, medium dense		BC=5 10 14	18"								
25													
				BC=11 13 16	18"								
30		**Poorly Graded SAND with Silt (SP-SM)**: olive green, moist, medium dense											

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with auger cuttings on January 25, 2023.

GROUNDWATER LEVEL INFORMATION:
- ▽ Groundwater was observed at approximately 1 ft. below ground surface during drilling.
- ▼ Groundwater was observed at approximately 2.5 ft. below ground surface at the end of drilling.
- ▼ Groundwater was observed at approximately 1 ft. below ground surface 1 after drilling completion.

GENERAL NOTES:

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 175013.092A
DRAWN BY:
CHECKED BY:
DATE:

BORING LOG SB-3

Leipsic Dock/Wheddbee
Leipsic, Delaware

PLOTTED: 02/13/2023 07:31 AM BY: cstouten
PROJECT NUMBER: 175013.092A OFFICE FILTER: DOVER
gINT FILE: Klf_gint_master_2023 [_KLF_BORING/TEST PIT SOIL LOG]
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB

Date Begin - End:	1/24/2023	**Drilling Company:**	John D. Hynes & Associates	**BORING LOG SB-4**	
Logged By:	E. Chandler	**Drill Crew:**	Brian H., Mike H., Bryan		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	B57 Mobile	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Not Available	**Auger Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION				LABORATORY RESULTS							
0		**Poorly Graded SAND (SP)**: greyish brown, moist, medium dense		BC=5 10 6 3	18"								
		Well-Graded GRAVEL with Sand (GW): black, moist, medium dense **Silty SAND (SM)**: black, wet, medium dense		BC=3 2 1 2	18"								
5		**Silty SAND (SM)**: black, wet, very loose, Wood Fragments		BC=1 WOH WOH WOH	18"								
		Poorly Graded SAND with Silt and Gravel (SP-SM): black, wet, very loose, some Organics **Poorly Graded SAND with Silt and Gravel (SP-SM)**: wet, very loose		BC=WOH WOH WOH WOH	24"								
		SAND with Silt (SM): dark brown to black, wet, very loose		BC=2 3 3 4	24"								
10		**SAND with Silt (SM)**: gray, wet, loose											
		Silty SAND (SM): gray, wet, very loose		BC=1 WOH WOH	18"								
15													
		Silty SAND (SM): greenish gray, wet, medium dense		BC=3 4 9	18"								
20													
		Poorly Graded SAND (SP): gray, wet, medium dense		BC=3 6 7	18"								
25													
		Poorly Graded SAND with Silt (SP-SM): greenish brown, wet, medium dense		BC=5 9 11	18"								
30													

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with auger cuttings on January 25, 2023.

GROUNDWATER LEVEL INFORMATION:
- ▽ Groundwater was observed at approximately 1 ft. below ground surface during drilling.
- ▼ Groundwater was observed at approximately 3.5 ft. below ground surface at the end of drilling.
- ▼ Groundwater was observed at approximately 1.5 ft. below ground surface 1 after drilling completion.

GENERAL NOTES:

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 175013.092A

DRAWN BY:

CHECKED BY:

DATE:

BORING LOG SB-4

Leipsic Dock/Wheddbee
Leipsic, Delaware

PLOTTED: 02/13/2023 07:31 AM BY: cstouten
PROJECT NUMBER: 175013.092A OFFICE FILTER: DOVER
[_KLF_BORING/TEST PIT SOIL LOG]
gINT FILE: Klf .gint_master_2023
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB

PLOTTED: 02/13/2023 07:32 AM BY: cstouten

Date Begin - End: 1/24/2023 **Drilling Company:** John D. Hynes & Associates **BORING LOG SB-5**

Logged By: E. Chandler **Drill Crew:** Brian H., Mike H., Bryan

Hor.-Vert. Datum: Not Available **Drilling Equipment:** B57 Mobile **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Not Available **Auger Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Silty SAND with Gravel (SM): reddish brown, moist, loose		BC=2 3 2 2	24"								
		Poorly Graded SAND with Gravel (SP): reddish brown, moist, very loose to loose		BC=2 1 3 2	18"								
				BC=2 3 2 2	24"								
5		**SAND (SP)**: light beige, moist, loose											
▽		**SAND (SP)**: light beige, wet, very loose to loose		BC=WOH WOH WOH WOH	24"								
				BC=2 2 3 3	24"								
10		**SAND with Silt and Gravel (SM)**: gray, moist, very loose to loose											
				BC=WOH WOH 1 1	24"								
15		**Poorly Graded SAND (SP)**: light gray, moist, very loose											
				BC=WOH WOH 1	24"								
20		**Poorly Graded SAND (SP)**: light gray, moist, very loose, orange banding											
				BC=1 1 1	24"								
25		**Poorly Graded SAND with Silt (SP)**: light gray, moist, very loose											
				BC=5 16 18	24"								
30		**Poorly Graded SAND (SP)**: gray, moist, medium dense											

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with auger cuttings on January 25, 2023.

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 7 ft. below ground surface during drilling.
▼ Groundwater was observed at approximately 0 ft. below ground surface at the end of drilling.
GENERAL NOTES:

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 175013.092A
DRAWN BY:
CHECKED BY:
DATE:

BORING LOG SB-5

Leipsic Dock/Wheddbee
Leipsic, Delaware

gINT FILE: Klf_gint_master_2023
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB [__KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 175013.092A
OFFICE FILTER: DOVER

PLOTTED: 02/13/2023 07:32 AM BY: cstouten

BORING LOG SB-6

Date Begin - End:	1/24/2023	**Drilling Company:**	John D. Hynes & Associates		
Logged By:	E. Chandler	**Drill Crew:**	Brian H., Mike H., Bryan		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	B57 Mobile	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Not Available	**Auger Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Silty SAND with Gravel (SM): reddish brown, moist, medium dense		BC=3 7 8 8	24"								
		Silty SAND (SM): brown, moist, medium dense, some wood chips/mulch, possible concrete fragments		BC=5 8 12 11	24"								
5		**Poorly Graded SAND (SP)**: reddish brown, moist, loose		BC=9 8 6 6	18"								
		CONCRETE: loose, Broken Concrete											
▽		**Silty SAND (SM)**: dark brown, moist, medium dense		BC=5 31 9 9	24"								
		Poorly Graded SAND with Silt (SP): beige, wet, dense											
		Poorly Graded SAND with Silt (SP): beige, moist, loose		BC=2 3 3 3	24"								
10		**Poorly Graded SAND with Silt (SP)**: light gray, moist, very loose to loose											
		Poorly Graded SAND with Silt (SP): light gray, moist, very loose to loose, orange mottling		BC=1 1 1	18"								
15													
				BC=2 3 3	18"								
20													
		SILT and Sand (ML): gray, moist, stiff, some Clay		BC=1 6 7	18"								
25													
		Poorly Graded SAND (SP): orange, moist, medium dense		BC=3 7 8	18"								
30													

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with auger cuttings on January 25, 2023.

GROUNDWATER LEVEL INFORMATION:
- ▽ Groundwater was observed at approximately 6.5 ft. below ground surface during drilling.
- ▼ Groundwater was observed at approximately 0 ft. below ground surface at the end of drilling.
- ▼ Groundwater was observed at approximately 0 ft. below ground surface 1 after drilling completion.

GENERAL NOTES:

CENTURY ENGINEERING
A Kleinfelder Company

PROJECT NO.: 175013.092A

DRAWN BY:

CHECKED BY:

DATE:

BORING LOG SB-6

Leipsic Dock/Wheddbee
Leipsic, Delaware

gINT FILE: Klf_gint_master_2023
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2023.GLB [__KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 175013.092A
OFFICE FILTER: DOVER

APPENDIX 6

IMPORTANT INFORMATION ABOUT

THIS GEOTECHNICAL REPORT

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

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e-mail: info@geoprofessional.org www.geoprofessional.org

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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*