Addendum 03

SUCF Project No. 221033-00

Renovate Agriculture Science Building

at

State University of New York

Alfred State College of Technology

10 Upper College Drive, Alfred, NY 14802

State University Construction Fund

State University Plaza

353 Broadway

Albany, New York 12246

13 June 2024

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SEALS PAGE

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END OF DOCUMENT

ADDENDUM 03

The following additions, deletions, and/or changes, or clarifications to the drawings, specifications, and bidding documents for this project, shall become and are hereby made part of the Contract Documents. They change the original documents only in the manner and to the extent stated. Each bidder shall acknowledge receipt of this Addendum in the appropriate location on the bid proposal form.

This addendum contains of 37 pages, which consists of eight (8) addendum description pages, one (1) page site walkthrough sign in sheet, twenty-seven (27) specification pages, and one (1) drawing.

REQUESTS FOR INFORMATION:

All Requests for Information (RFIs) during the bidding process are to be addressed in writing to Ellenzweig: sucfbidding@ellenzweig.com. Responses will be incorporated into the content of Addenda. RFIs should be received by Ellenzweig no less than **12** calendar days prior to bid opening.

3.1 CLARIFICATIONS

3.1a: Blocking is called out to be both sheet metal and wood in-wall blocking. Provide sheet metal in-wall blocking for wall-mounted casework, equipment, and accessories. Provide wood blocking for anything else or as called out in drawings on plans or details that show wood blocking.

3.1b: HM1.02 includes, “Note 5” however there is none in the legend. Note 5 should be “Note 4”

3.1c: AD1.02 has note regarding removal of flue stack and references to abatement drawings. Note should be disregarded and demolition should refer to Hazardous Material General Note.

3.1d: Refer to both drawings and project manual in full when preparing a bid for any division of work.

3.2 MODIFICATIONS TO PROJECT MANUAL

3.2a: Section 09 29 00, 2.7, Add:

C. Aluminum Partition Closure Trim (Acoustical Mullion Cap): Manufactured spring-tensioned, two-piece aluminum extrusion, designed to maintain acoustical rating of partition by filling gap between exterior glazing mullion and end of interior partition.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Gordon Inc.; Mullion Mate.
    b. Mull-It-Over Products, Mullion Trim Cap.
    c. PAC International; RSIC-AMI.
2. Performance Requirements:
    a. Acoustical Rating: Refer to Partition Schedule.
    b. Fire Resistance: ASTM E 84, Class 1 (Class A).
3. Thickness: 0.125 inch.

4. Gasket Tape: Manufacturer's recommended gasket tape with bonding adhesive on both sides. Provide gasket tape continuously at both ends of the partition closures to provide seal between closure and fenestration glazing or mullion and closure and partition end.
5. Size: Adjustable, as required by installed condition.
6. Length: As indicated.
7. Factory-Applied Finish and Color: Match adjacent aluminum framing system.
8. Accessory Materials: As recommended by manufacturer.

3.2b: Section 13 34 13, Replace section with document attached.

3.2c: Section 26 24 13, Replace section with document attached.

3.3 MODIFICATIONS TO DRAWINGS

3.3a: Reference A9.02, door schedule for previous addendum changes

3.4 QUESTIONS

Q1: Is there a spec for the Mullion Closure for partition terminations at curtainwall?

A1: See modifications to project manual.

Q2: The Aluminum trim details at wood slats call out 4/A11.04 at every opening along column line18 but the details on A11.11 note different size aluminum. Can you please clarify?

A2: Length varies based on wall it is on; intent for depth of wall, face of GWB to face of GWB + full depth of wall slat panel assembly

Q3: What height is required for the abuse board?

A3: 4ft min. AFF

Q4: Is there a UL for the required fireproofing of beams?

A4: UL N759 or equivalent

Q5: No specifications provided for NEW 15kV, 600AMP LOAD INTERRUPTER SWITCH and NEW T1-1000KVA DRY-TYPE TRANSFORMER as indicated on Drawing E5.0. Please provide detailed requirements for equipment indicated.

A5: Refer to specifications: 261323 FL - MEDIUM-VOLTAGE, METAL-ENCLOSED SWITCHGEAR and 261216 FL - DRY-TYPE, MEDIUM-VOLTAGE TRANSFORMERS

Q6: No specifications provided for OVER-CURRENT PROTECTION SHORT-CIRCUIT, COORDINATION AND ARC FLASH STUDIES as indicated on Drawing E5.0. Please provide detailed requirements for requested studies.

A6: Refer to specifications: 260574 - OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY, 260573 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY, and 260572 - OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

Q7: No specifications provided for SMART ENERGY MANAGEMENT CAPABILITES as indicated on SHEET NOTES E5.0, KEYNOTE #1 & #2. Please provide detailed requirements for SMART ENERGY MANAGEMENT.

A7: Specification for equipment not needed. The intent is for breakers capable of metering energy use to be provided for Energy code compliance. Basis of design SquareD Energy type trip units or equal breakers with similar capability.

Q8: Please indicate the locations and quantities of "EQUIPMENT FOR ELECTRICITY METERING BY OWNER" associated with SPECIFICATION 262713.

A8: Contractor shall provide one meter as part of the switchboard lineup for building wide energy monitoring. Meter provided shall be able to communicate with the campus billing management system.

Q9: SPECIFICATION 262413 – SWITCHBOARDS: Multiple discrepancies identified that do NOT correlate with equipment indicated on 1/E5.0, 5/E5.0, and Switchboard Schedule 'MDP'. Please clarify and indicate the equipment associated with the sections listed below. (a.) 2.1,N / P / R (b.) 2.3,A – MOLDED CASE CIRCUIT BREAKER (MCCB) (c.) 2.3,4,F – SPECIFICATION SECTION 260913 – ELECTRICAL POWER MONITORING and CONTROL has NOT been provided. (d.) 2.4 – INSTRUMENTATION: Contradictory Metering requirements listed. Please clarify and indicate the specific Metering Requirements needed and the equipment associated. (e.) 2.5 – CONTROL POWER: Contradictory CONTROL POWER requirements listed. Please clarify and indicate the specific CONTROL POWER Requirements needed and the equipment associated. (f.) 2.6,C / D – NO Drawout Circuit Breakers have been indicated on the contract documents. Please clarify if Portable Circuit Breaker Lifting Device and/or Overhead Circuit Breaker Lifting Device are needed.

A9:

a. N Applies to barrier separation between 100% ERMS main Breaker and the sections downstream being protected. p: does not apply, section has been removed refer to updated spec returned as part of RFI response. R: same as response for P.
b. Contractor shall provide breakers of type required to accommodate trip setting needed per final coordination study. Breakers shall be from the types described in the specification.
c. MCCB that are called out to have energy monitoring capabilities do not need to tie into building systems or campus wide systems. Only main meter installed as part of the Switchboard as mentioned in (4) above needs to connect to campus billing systems.
d. This section refers to metering requirement mentioned in response to question 4. Section 2.4 Instrumentation has been trimmed down to only include the applicable sections A and B as part of the RFI response.
e. Control power shall be provided for instrumentation metering equipment as needed for the equipment being provided by contractor. Control power section only outlines the requirement that that control power needs to meet where provided.
f. There are no Draw out or overhead breakers. Refer to revised spec for updated section.

Q10: On Drawing C0.02, there is a note that states we need to hire an engineer to verify the structural capacity of the retaining wall on the west side of the building. What is the intention if the structural capacity is deemed insufficient? Is it to verify whether or not we can use heavier lifts near the top side of the retaining wall? Would the wall need to be replaced?

A10: The contractor is responsible for determining if their work will impact the existing walls capacity and function. If the structural capacity is deemed insufficient, the contractor shall propose a method to accomplish the work without impacting the wall

Q11: Spec 23 05 29, 3.7 Hanger and Support Schedule, Section N "Spring Hangers and Supports" calls for spring hangers in piping but there is no schedule of what pipes require spring hangers. Are spring hangers required for HVAC piping? If so, could you please provide a schedule of pipe sizes and locations that will require spring hangers?

A11: Spring isolated pipe supports are required at hydronic pipe risers spanning more than two floors as indicated within General Note B on Drawings M3.08 & M3.09 as well as General Note C on Drawing M3.13

Q12: Please provide a 1 week extension, numerous subs and suppliers are requesting one.

A12: The bid date will remain Tuesday 06/18.

Q13: One additional RFI, in regards to the Q&A in addendum 2. Q&A 20, was partially answered. Is the unit price and allowance listed in 5.d strictly in addition to the floor leveling called out on the structural floor plans and is for any addition floor leveling required? Or is this to be used for what is shown on the drawings so we are not carrying any leveling in our base bid?

A13: 5.d is for any additional floor leveling required not called out in drawings or specifications

Q14: You have a spec 12 22 00 – Draperies and tracks. I have been through the drawings multiple times, I do not see anywhere this spec section is used. Spec states Curtains to windows and internal glazed screens where indicated on the drawings. Nothing is indicated. Please advise.

A14: Remove 12 22 00 in its entirety

Q15: Section 12 35 53 Laboratory Casework, Part 2 Products, 2.1 Manufacturer: Will architect accept Lab Design/Fenco casework with product meeting outlined specifications?

A15: Please review procedure in Section 2.20 of the Construction Agreement included in the Project Manual

Q16: 1/A1.01 Plan second floor – door 218 on door schedule A9.02 is called out as an interior door hardware set, is this correct, if not please verify the correct hardware set for this exterior door.

A16: Door 218 to be hardware set 07

Q17: Please clearly identify which doors get automatic operators, or confirm that the only openings that get them are openings 123.1-123.2 and 200.1-200.4

A17: Confirmed 123.1, 123.2, 200.1, 200.2, 200.3, 200.4

Q18: Weld pins are used to hold the 4" mineral wool to the galvanized back pan, burn through of the weld is standard, read through of the weld is visible on the back side of a galvanized pan. The back of a galvanized pan is not industry standard to be visible. We do not believe you will be happy with the appearance galv steel backpan with painted burn through mark visible.

A18: Minimum thickness of painted galvanized steel backpan to be 22 gauge or as necessary to accept weld of insulation pins without deformation to metal

Q19: In Division 123553, Section 2.3.I under Materials, the spec states that the exposed surfaces should be face grade AA White Oak and it notes in parenthesis that the “backs of doors” are also considered exposed. Is it the architect’s intent to have the backs of doors match the exposed door faces, or is an AA/A White Oak option acceptable?

A19: The Design Intent is that the back of the doors will match the face of the doors.

Q20: In Division 123553, Section 2.3.J under Materials, the specs states “Veneers for doors and drawers shall be slip-matched, balance matched, vertically matched and sequenced matched,”. Are they to be balanced and sequenced matched on each cabinet, each elevation, or is it acceptable for the 4’ x 8’ sheet of material?

A20: The Design intent is that the doors / drawers in each elevation are matched.

Q21: In Division 123553, Section 2.3.K under Materials, the specs states that the “Semi-Exposed surfaces shall be hand selected HPVA face grade Birch veneers…”. Will AA/A White Oak also be acceptable in lieu of White Oak/Birch?

A21: Face grade AA White Oak is acceptable in lieu of Birch.

END OF ADDENDUM 03

SECTION 13123 - SPECIAL CONSTRUCTION - GREENHOUSES

PART 1 - GENERAL

1.1 SUMMARY

A. It is the intent of this portion of the specifications to include the furnishing and erecting of the greenhouse superstructure including all glazing, doors, door hardware, greenhouse equipment, greenhouse environmental controller and ventilation equipment as shown on plans and/or hereinafter described, such work to be the responsibility of the Greenhouse Contractor. Greenhouse installation is the responsibility of the greenhouse manufacturer and shall be included with the estimate/bid. Material only bids will not be accepted. Bids received after the bid date shall be considered non-responsive and shall not be accepted.

B. It is not the intent of this portion of the specifications to cover concrete, grouting, masonry work, plumbing, electrical work (power and control wiring), utility connections and counter-flashing to other structures. This portion shall be the responsibility of the General Contractor or his selected Subcontractors other than the Greenhouse Contractor.

C. No masonry or foundation installation shall be made prior to approval of greenhouse drawings. Approved greenhouse drawings shall be used to make all masonry and foundation installations. Dimensions may vary slightly from contract drawings to accommodate manufacturer's standard, but total area shall not be less than 98% of that shown in order to be approved by the Architect.

1.2 SPECIFICATIONS, PLANS AND RELATED WORK

A. These specifications are intended to supplement the drawings and, therefore, it shall not be their purpose to mention any portion of the construction which the drawings are competent to explain and such omissions shall not relieve the Greenhouse Contractor from carrying out such portions indicated only on the drawings and should items and tasks be required by these specifications which are not indicated on the drawings, they shall be supplied and installed by this Contractor.

B. Related Work Specified Elsewhere:

Division 3 – Concrete Work: footings, floor slabs, equipment pads and poured walls.
Division 4 – Masonry Work: block, brick, stucco finishes and grouting.
Division 7 – Thermal & Moisture Protection: Sheet metal flashings and counter-flashings to other non-greenhouse structures.
Division 8 – Doors and Windows: Entrance, passage and overhead doors and door hardware.
Division 15 – Mechanical: Plumbing, sanitary and storm water drainage piping, cold, R.O. and hot water piping, greenhouse equipment requiring water service piping.
Division 16 – Electrical Work: power wiring for all greenhouse equipment and outlets, lighting, control wiring for greenhouse equipment, environmental control system high and low voltage wiring and communication wiring.

1.3 SUBMITTALS

A. Greenhouse Manufacturer shall submit approval drawings in digital format.

B. Approval submittals shall include engineered stamped drawings for the State of New York, a full set of structural engineering calculations, and greenhouse equipment data sheets.

C. Submittals shall include fabricator's technical data covering metal components, glazing components, greenhouse equipment, hardware, fabrication processes, handling procedures and erection/installation schedule.

D. Approval drawings shall include, but not be limited to, the following individual detailed sheets where required by the greenhouse project description:

– Cover Sheet
– Floor/ Post Plan
– Post Feet Details
– Roof Framing Plan and Required Downspout Locations
– Roof Glazing Plan with glazing rafter and cap sections
– Sidewall Elevations with Gutter Conditions
– Gable Elevations
– Aluminum Structural Fame - Elevations and Details
– Foundation Plan
– Greenhouse Equipment location Plan and Schedule
– Control System Components and Wiring Plan
– Plant Bench Layouts
– Double Vent Ridge Section
– Sidewall vent section
– Typical Sidewall Section
– Typical Gable Section
– Roof to Gable Section
– Misc. Connection Details
– Door & Door Hardware Schedule
– Roof Shade/Energy Blanket System and System closure details
– Fin-tube radiant heating layout with under-bench heating where required
– Plant growth lighting plan and light fixture hanging bracket details
–

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: The fabricator shall be able to demonstrate a minimum of ten years experience in manufacturing greenhouse structures and components for institutional and research greenhouse projects similar in size, type and complexity specified and shall submit a minimum of three (3) references that are similar to the proposed project.

B. The entire greenhouse structure, glazing system and ventilation sash system shall be the product of a single supplier. The greenhouse shall be manufactured by a company with a record of successfully fabricating greenhouses for a period of no less than ten (10) years.

C. Installer's Qualifications: The fabricator shall provide supervisors and labor to install the greenhouse who are regularly engaged in greenhouse construction, restoration and installation, skilled and

experienced in the type of erection that is proposed for this project. If the installation of the greenhouse is sub-contracted by the greenhouse manufacturer it shall be erected by a qualified greenhouse specialty contractor/builder, authorized and approved in writing by the manufacturer, showing at least five (5) years experience in building, installing and/or restoring greenhouses of the type specified. Laborers may be required to demonstrate advanced skills in glazing installation proceedures at the discretion of the General Contractor or Greenhouse Contractor.

D. Greenhouse design shall comply with standards of the National Greenhouse Manufacturers Association (NGMA) and shall be in accordance with the 2021 IBC, International Building Code and or the Local Authority Building Code, whichever is more conservative.

E. Any substitutions shall be immediately submitted to the Architect or Project Engineer in writing for approval prior to commencing work of this section.

F. Regulatory Requirements: Comply with local goverening building code, OSHA, and EPA regulations during work on the greenhouse construction.

G. Disposal and hauling of debris, rubbish, scrap, and other non-salvageable materials resulting from construction operations shall comply with all applicable federal, state and local regulations.

1.5 DELIVERY, STORAGE, AND HANDLING

A. All greenhouse metals shall be handled and stored with care, in accordance with manufacturer's published instructions. Time delivery and erection of materials to avoid extended on-site storage. Store materials on skids or platforms; do not store directly on ground. Stored mill finished aluminum components must be protected from moisture or completely separated from contact with each other. Mill finish aluminum components, if stored exposed to the elements, must be protected from surface to surface contact to avoid oxidation. Any oxidized components will be rejected by the Architect/Owner.

B. Greenhouse glazing materials shall be handled and stored with care, in accordance with manufacturer’s published instructions. Protective coverings on plastic glazing materials must not be removed until installation and according to manufacturer’s published instructions.Glass stored on site must be protected from moisture. Glass with etched or calcified surfaces from being stored while wet will be rejected by the Architect/Owner.

1.6 PROJECT CONDITIONS

A. Field measurements: Verify all dimensions, designs and fabrication of all other related construction; foundations, kneewalls, floors and connecting building structures, downspout locations for greenhouse gutters and utility stub-outs. It is the greenhouse contractor’s responsibility to record and document existing conditions to receive his work. Verify all steel, concrete and masonry kneewall conditions, dimensions and elevations before delivery of greenhouse components.

B. If Owner is to be occupying any portions of the buildings adjacent to the greenhouse construction conduct greenhouse construction operations so that the Owner’s operations will not be disrupted.

C. Conditions existing at time of inspection for bidding purpose will be maintained by the Owner or General Contractor as far as possible.

D. Notify Architect or Project Engineer of any discrepancies between existing conditions and Drawings before proceeding with greenhouse construction.

E. Storage or sale of removed items or materials on-site is not permitted.

1.7 COORDINATION WITH OTHER TRADES

A. Greenhouse Contractor and other trades involved in the greenhouse areas and involved with greenhouse equipment shall coordinate all work. Coordination of the electrical work and the mechanical work involved in connecting the greenhouse equipment is the responsibility of the electrical trade sub-contractor and the mechanical trades sub-contractor(s). The greenhouse contractor is required to install, mount or set all greenhouse equipment that is supplied with the greenhouse contractor's package. For all of the greenhouse equipment supplied in his package, the greenhouse contractor is responsible for testing, commissioning and setting any equipment limits after electrical and plumbing connections are complete.

1. The power and control wiring, environmental controller wiring, conduit and conductors that are required for the greenhouse equipment are to be provided, installed and terminated by the electrical sub-contractor. Electrical power and control wiring work is also required for the following equipment that may be incorporated in this project:

    a. Automatic vent machines
    b. Automatic shade machines and tube motors
    c. Circulation fans
    d. Plant growth lighting
    e. Hot water heat system pumps and automatic valves

2. The plumbing and piping required for any of the greenhouse equipment is to be provided, installed and connected by the mechanical sub-contractor(s). Plumbing and piping work is required for the following equipment that may be incorporated in this project:

    a. Fog System pump station (Domestic or R.O.Water)
    b. Hot Water main supply and return piping for the radiant fin tube heating system
    c. Misting system control unit (Domestic Water)
    d. Irrigation system control unit (Domestic or non-potable Water)
    e. Hot, cold and/or tempered water supply hose bibs. (Domestic Water)

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Drawings and specifications are based on products as manufactured by some or all of the following approved greenhouse manufacturers:

Albert J. Lauer, Inc., West Farmington, MN, 55024 (651-423-1651)
Ludy Greenhouse, New Madison, OH, 45346 (937-906-1921)
Nexus Corporation (Prospiant), Northglenn, CO, 80233 (303-457-9199)
Rough Brothers, Inc.(Prospiant), 5513 Vine Street, Cincinnati, OH, 45217 (800-543-7351)
Solar Innovations, Inc., 31 Roberts Road, Pine Grove, PA, 17963 (800-618-0669)
Van Wingerden Greenhouse Company, Mills River, NC, 28759 (828-891-7389)

Manufacturers seeking approval to bid and who have products similar in design and meeting all the requirements of the specifications must submit complete product data and specifications along with a list of seven (7) projects of equal size and magnitude that have been successfully completed and operational for a minimum of four (4) years and evidencing not less than ten (10) years' experience in similar work. Name and location of project, name and address of general contractor,

name and address of architect shall be provided for each of the references. Only those product descriptions received by the architect no later than ten (10) days prior to the bid opening and only those products approved in writing by the architect prior to the bid opening shall be considered. Any bid from a non-pre-approved manufacturer may not be used or accepted.

2.2 MATERIALS

A. Structure shall be designed and detailed according to good engineering practice. It is the responsibility of the greenhouse manufacturer to provide the design and the structural engineering for the structures submitted. Stamped engineered drawings and calculations are required for submittals. All aluminum primary framing shall be 6061-T6 and 6063-T6 alloys. All steel “Shapes” framing shall be hot dipped galvanized, minimum ASTM, A 36 or ASTM A 992 and all steel tubing framing shall be hot dipped galvanized, minimum ASTM A 500, Grade B. Mechanical galvanized, thin-wall steel tubing is not acceptable. Framing shall consist of steel trusses or moment frames on 10’-0” centers spanning the full width of the structure with a 6/12 roof pitch unless otherwise noted. Aluminum shall have the appropriate heat treatment and be mill finish unless otherwise noted. No castings, either of aluminum or aluminum alloy, shall be permitted for joining structural members at joints subject to stress in which tensile strength is a factor. Factory welded aluminum components must have appropriate engineering certification and must be cleaned and finished to consistent mill surfacing – painting of welded areas with silver paint to cover welding oxidation is not acceptable. No field welding of either steel or aluminum is permitted.

B. Sidewall columns shall be attached to top of foundation wall, knee wall or slab with epoxy set anchor bolts and shall be manufactured to provide a minimum 11’-0” eave/gutter height. Drilling for anchors and setting of anchor bolts to be the responsibility of the greenhouse manufacturer.

C. Structural connections shall be made with hot-dipped galvanized steel bolts (A-307). All other connections shall be made with hot-dipped galvanized steel bolts, aluminum bolts, and stainless-steel bolts/screws. Field welded connections will not be accepted.

2.3 STANDARD DESIGN CRITERIA

A. Standard loads specified below

1. Dead Load - structure and equipment.
2. Live Load - 35 lbs. per sq. ft. on horizontal area.
3. Wind Load - 105 mph, exposure B, per IBC 2021.

B. In designing for the above loads, the loads may be considered to act in any of the following combinations:

1. Dead Load plus Wind Load.
2. Dead Load plus Live Load.
3. Dead Load plus Live Load plus Wind Load

C. In addition to the above, roof bars shall be required to carry a 100 lb. concentrated load at the center of any span.

D. Aluminum Structures shall be designed in accordance with current Aluminum Association’s "Specifications for Aluminum Structures” and also meet State and Local code requirements. Steel Structures shall be designed in accordance with the current American Institute of Steel Construction’s (AISC) “Manual for Steel Construction” and also meet State and local code requirements. The maximum allowable deflection shall be 1/120 of the span (Table 1604.3, IBC 2006). Structure shall include adequate bracing for the lateral support of structural members and

framing, and for stability of the structure for the resistance to wind forces. Bottom chord members as well as other truss members shall be adequate to resist compressive loads produced by horizontal wind loads and roof uplift produced by wind.

2.4 EXPANSION CONTROL

A. Suitable expansion joints shall be provided in all longitudinal members to take care of the longitudinal expansion in the aluminum. No longitudinal members shall exceed 24'-0". All members shall be so joined as to require each joint to handle the expansion in the individual member and to prevent an accumulation of expansion in several members in one direction. Allow for a 150° F temperature range.

2.5 STRUCTURAL FRAME

A. Moment frame members and connection plates shall be similar material. Welded connections will not be accepted. Special care shall be taken in the fabrication of this work, and all tolerances shall be held to an absolute minimum in order to secure proper fit of the members specified.

B. Columns shall be furnished and placed through the length of the greenhouse and across all partitions and gables as required. Columns shall be pre-fabricated - punched or drilled - to attach required structural component members.

C. Roof frame members shall be connected to the sidewall columns by plates so designed as to be bolted to the column with all bolts in shear. No joint shall be allowed, either of combined extrusions or a casting that shall be fastened to the column thereby placing fasteners in tension or twist.

D. Purlins in the roof, of the size required shall be furnished and connected to supporting members with a minimum of two hot-dipped galvanized steel bolts into each member. Purlins shall be prefabricated before shipment for the attachment of glazing bars and purlin clips.

E. Provide all other structural members, bracing, clips, and fasteners not mentioned above but required to complete the framework of the greenhouse as designed.

2.6 GUTTER

A. An extruded aluminum gutter or hot dipped galvanized formed steel gutter depending on manufacturer's standard designed with interior drip gutters and internal downspout connections shall be provided where indicated on the drawings. This member shall have an integral or attached flange to receive glazing bars and shall be provided with weep holes to carry condensation collected from the underside of the roof to the drip gutter. Drip gutter shall be located so as to collect condensation from the underside of the gutter and to properly drain to the downspout connections.

B. Connections for gutter downspouts shall be made by the Mechanical Contractor where indicated on drawings. Greenhouse contractor shall provide aluminum downspout gutter fittings, piping and final connection components to Mechanical Contractors for storm water piping connections.

2.7 RIDGE

A. An extruded aluminum ridge shall be furnished and placed at the peak of the structures. Ridge member shall be provided with continuous socket hinge to receive ridge ventilation sash and/or fixed roof glazing.

B. Ridge splices shall be covered with an aluminum splice plate cover and sealed according to the manufacturer's recommendations.

2.8 GABLE ENDRAFTER

A. Specially extruded gable and corner trim shall be provided to receive roof glazing bar, vertical side and gable glazing and glazing bars. The gable and corner trim shall be neatly mitered and spliced at the ridge and at the eave or gutter to provide a smooth detail at this point. These components shall be securely fastened to the structural members, forming the gable end.

2.9 WALL AND VENT SILLS

A. Extruded aluminum sills shall be provided where required. Sills shall be capable of receiving side vents or fixed glazing. Sill corners shall be shop welded and must be cleaned and finished to consistent mill surfacing – painting of welded areas with silver paint to cover welding oxidation is not acceptable. Co-ordinate sill flashing and extruded sill placement with General Contractor for proper installation on masonry walls and/or concrete foundations.

B. Sill splices shall be covered with an aluminum splice plate cover and sealed according to the manufacturer's recommendations.

2.10 GLAZING RAFTERS AND BARS

A. For insulated glass units, extruded aluminum glazing bars shall be installed not exceeding 5'-3" centers and properly attached to structure. Condensation groves on the roof glazing rafters to conduct primary condensation shall extend the full length of the glazing rafters and terminate at the condensation collection gutter. Aluminum rafters shall be furnished and placed in the roof of the greenhouse, extending from the eave or gutter to the ridge. If ridge vents are provided, rafters extend from the eave or gutter to the vent header bar. Aluminum rafters and bars are to be mill finish unless otherwise noted.

1. Gasketed glazing bar caps shall be mill finish aluminum with manufacturer's standard gasket provisions and installed with exposed head stainless-steel sheet metal screws.

~~1. For lapped glass roof, gable, sidewall and partition glazing, glazing bars shall be provided to accept stamped or extruded aluminum bar caps. Caps to be held in place with hex head stainless steel SMS screws placed on a minimum of 9" centers. Bar caps shall be applied to the bar/rafter covering the entire length of each lite of glass and made to conform to the laps in the glass and provide a uniform 3/8" lap. Caps shall be stamped and shaped with proper forming to exert a uniform, but not excessive, pressure along the entire length of the glass lite. Each cap shall be held with a minimum of two stainless steel self-tapping screws. Screws that hold bar caps shall be spaced not over 15 inches apart, nor shall any screw be placed closer than 1-1/2" from the end of the caps.~~

~~2. For stacked glass vertical glazing, extruded aluminum glazing cames, sized for the glass thickness specified, shall be provided and installed according to manufacturer's written recommendations.~~

~~3. At each steel beam structural member, special stainless steel scaffold bracket screws shall be used to hold the caps in place, yet provide sufficient shank protruding above the caps for support of scaffolding brackets. The use of longer sheet metal screws is not acceptable. Submittal of the fastener for approval is required.~~

2.11 ROOF VENTS

A. vents with a continuous socket hinge shall be furnished as shown on the drawings and arranged to open out in a double ridge vent configuration. Sizing of the roof vent is the responsibility of the Greenhouse Manufacturer and must meet a minimum opening of 20% of the floor area of the greenhouse compartment or zone that it ventilates. Vents for any given compartment, when assembled and installed, shall be continuous from one end to the other and provide an open dimension as shown on the drawings. Ridge vents shall be made up of a top rail, bottom rail and mullions of extruded aluminum, complete with vent sash glazing caps, separators and end seals per compartment and bolted together in accordance with manufacturer's instructions. Roof vents are to be furnished with a vent sash bottom/header-sealing gasket of UV resistant EPDM type material.

B. All vents shall have provisions made at the hinge point to prevent movement, “creeping”, of the vent sash assembly.

2.12 SIDEWALL VENTS

A. sidewall vents with a continuous socket hinge shall be furnished as shown on the drawings and arranged to open out. Sizing of the sidewall vents is the responsibility of the Greenhouse Manufacturer and must match or exceed the opening area of the roof vents for any given greenhouse compartment or zone. Vents for any given compartment, when assembled and installed, shall be continuous from one end to the other. Side vent shall be made up of a top rail, bottom rail and mullions of extruded aluminum complete with vent sash glazing caps, separators and end seals per compartment and bolted together in accordance with manufacturer's instructions.

B. All vents shall have provision made at the hinge point to prevent movement, “creeping”, of the vent sash assembly.

2.13 VENT OPERATORS

A. All roof vents shall be operated with aluminum or steel rack arms with zinc alloy or steel pinions and all sidewall and gable vents shall be operated with either aluminum or steel rack arms with zinc or steel pinions or cast aluminum elbow arm assemblies depending on Owner requirements per location of sidewall vent.

B. Provide 1.315" outside diameter galvanized steel tube steel or stainless-steel pipe vent sash drive shafting with aluminum couplings and end stops.

C. Aluminum vent shaft hangers with UV resistant nylon type wear bushings or sealed stainless steel ball bearing bushings shall be provided to support roof and side vent drive shafting as per manufacturer’s specifications.

D. Rack & pinion arms with aluminum or steel rack, zinc or steel pinion gear and extruded aluminum or steel housing assembly to keep rack and pinions in proper mesh and alignment shall be provided. Racks attach to bottom rail of vents with aluminum clips and stainless-steel locking pins. The number of rack & pinion operators required shall be determined by the capacity rating of the selected rack & pinion units. ~~No less than three sets of rack and pinion arms shall be provided for each twelve (12’) foot bay per run of roof vents.~~ Provide rack and pinion sets as manufactured by: Wadsworth Controls, Inc. – *Power Rack*®, Climate Controls, LTD. – *EZ Pinion*®, Lock Drives or approved equal.

2.14 VENT MECHANISM

C. Manual vent machine gear boxes shall have totally enclosed gears with output shafting for 1.315 OD vent shafting and input shaft connection to accommodate a drive tube of ¾" minimum OD. Manual vent gearboxes shall be supplied with all necessary mounting plates, drive shafting, drive shaft bearer brackets, hand or chain wheels, chain guards, and universal joints. All exposed surfaces of the manual vent machine assemblies shall be galvanized, stainless steel, bronze, aluminum or be painted with a high-performance coating to protect assembly from the greenhouse environment. Provide manual vent machine components as manufactured by Dayton Metal Products, Inc. or equal.

2.15 ROOF & SIDE VENT SASH SCREENS

A. Screens shall be provided for all roof and sidewall vent openings in the greenhouse ~~compartments and any vented greenhouse corridor structures~~. Screen rails shall be minimum 5/16" x 7/8" mill finish extruded aluminum with a groove to receive a vinyl insert to hold 16 x 18 aluminum or stainless-steel screen mesh in place.

B. Screen frames shall be assembled with die cast aluminum corners and designed to allow for re-screening of screen frame units in the field. Plastic corner components are not acceptable.

C. Brush seals shall be provided for screen frames where vent operator arms penetrate screen. Brush seal assemblies must be properly secured to the screen framing. Brush assemblies connected to the screen fabric only are not acceptable.

D. Provide aluminum or stainless-steel screen-mounting track for the screen frames to provide easy removal of the screen frame for any future repair or replacement.

E. Acceptable alternate in lieu of traditional screen frames: Provide accordion design type insect screening for both roof and sidewall vent openings

2.16 DOORS AND FRAMES

A. Center of Horizontal rails shall be located at 36" from door bottom. All rails and frame extrusions shall have a .125" minimum wall thickness.

B. Double doors shall be 1 3/4" thick and 7'0" tall. Door width as designated on the drawings. Half panel clear anodized with 5" extruded tube rails and 4" extruded aluminum tube frame with wool pile seals. Hardware shall include (1 ½ pr.)
4 ½ x 4 ½" stainless steel hinges with non-removable pins, [See Hardware Section 08710 for Door Lever handles locksets, cylinder locks and related hardware specifications.], aluminum threshold and door sweep. Provide dummy trim and top and bottom concealed flush bolts for inactive leaf. Upper panels shall be glazed with 1/4" clear safety glazing and lower panels shall be an aluminum-faced solid filler panel.

C. Center of Horizontal rails shall be located at 36"from door bottom. All rails and frame extrusions shall have a .125" minimum wall thickness.

2.17 SIDEWALLS AND GABLES

A. All vertical glazed wall sections, sidewalls, gables and partition walls, shall be constructed in a similar manner to the roof glazing system using extruded aluminum shapes for structural framing – aluminum glazing bars designed for use with gasketed aluminum bar caps for extruded thermoplastic sheet glazing, stamped or extruded aluminum bar caps for lapped glass glazing and extruded or stamped aluminum bar caps with stainless steel glazing cames for stacked glass glazing.

2.18 GLAZING

~~A.~~ Glass for roof glazing shall be 3/4" clear insulated glass units with laminated glass on the inboard surface.
~~tempered glass, ¼" nominal clear laminated glass [1/8" clear annealed glass/.030 PVB/ 1/8" clear heat strengthened glass], "Thin" laminated safety glass [1/10" clear annealed/.030 PVB/ 1/10" clear annealed]~~

~~B.~~ Glass for all vertical glazing, sidewalls, gable ends and partition walls, shall be clear 3/4" insulated glass. ~~5mm, 3/16", ¼" glass or ¾" insulated glass units.~~ Tempered glass shall be used in locations as required by Section 2406.3, Safety Glazing, 2021 IBC, International Building Code and any locations shown on the drawings to be safety glass. ~~Greenhouse manufacturer's glazing system design shall determine either lapped glass method or stacked glass method for installation.~~

C. Glass glazing used in door units and 24" around both vertical sides of passageway door locations is to be clear tempered safety glass. Glass thickness in these locations is determined by size of glass unit and as specified in Section 2406.0, Safety Glazing of the 2006 IBC International Building Code.

2.19 VENTILATION AND COOLING

A. HORIZONTAL AIR FLOW FANS

1. Air circulation system shall be by 8" to 36" diameter (400 to 12,000 CFM) horizontal airflow fans. Sizing and manufacturer's recommended mounting locations of the HAF fans is the responsibility of the greenhouse manufacturer. Sizing for each HAF Fan unit shall be a minimum of 1,000 cfm and total combined HAF fans cubic feet per minute should meet a minimum of 25% of the greenhouse compartment or zone volume. Assembled unit to include totally enclosed fan cooled motor (115v 60Hz), polyvinyl coated guard, aluminum 3 wind fan blade, certified CFM rating and aluminum mounting bracket for hanging. Electric motors are to be suitable for variable speed operation. Provide *PlantAir*® HAF fan assemblies as manufactured by Schaefer Ventilation Equipment, Inc. or equal.

2. Mount horizontal airflow fans in locations as show on the drawings or location recommended by the manufacturer and in such a manner that the fans and mounting brackets do not interfere with the installation of automatic shade systems, lighting systems and fog/misting systems. HAF fans will operate as one piece of equipment per greenhouse compartment. Speed control switch shall control all HAF Fans per greenhouse compartment. Power and control wiring to be provided by the electrical sub-contractor. Coordinate testing and adjustment with appropriate mechanical contractors.

2.20 HEATING

A. Fin-Tube Radiation - Hot Water Heating System: Refer to Division 22 Plumbing and Division 23 Heating, Ventilation and Air Conditioning

2.21 ENVIRONMENTAL CONTROL SYSTEM

A. Refer to Division 23 Heating, Ventilation and Air Conditioning

2.22 RETRACTABLE SHADE/HEAT RETENTION ROOF CURTAIN SYSTEM

A. GENERAL

1. Independently motorized per compartment, suspended or supported type Shading and Heat Retention Curtain System(s) designed for greenhouse compartment size as shown on the drawings. Shade systems as manufactured by Wadsworth Controls, Inc.- *PowerPull*®, Cravo or approved equal.

2. Curtains are to travel simultaneously from truss to truss and have a peaked or "roofline" profile with a flat top.(Slope/flat/Slope)

3. For suspended design, curtains are to be suspended from U.V. stabilized reinforcing tape and suspension hooks which slide on stainless steel suspension wires.

4. All curtains are to be supplied sewn to size complete with reinforcing tape and suspension hooks, for suspended design, factory installed.

5. Curtain fabric to be Ludwig Svensson Brand, *Revolux*™ Product No. XLS- 16 (65% shade factor) or equal.

B. MOTORS AND CONTROLS

1. Shade System in each compartment or Zone to be independently operated by one 115-volt, 60 HZ, single phase motor.

2. Motor is to be U.L. approved.

3. Primary and backup limit switches for each travel direction are to be integrally mounted into the motor.

4. Control panel is to be pre-wired for computer hookup and equipped with a manual override switch in each compartment. . Power and control wiring to be provided by the electrical sub-contractor. Coordinate testing and adjustment with appropriate mechanical contractors.

C. DRIVE SYSTEMS, Rack and Pinion

1.. Motor driven shafting with rack and pinion operators to be aluminum racks and cast zinc pinions with extruded aluminum pinion housing. Rack and Pinion operators to be

EZPinion™ as manufactured by Climate Control, LTD or *PowerRack*™ as manufactured by Wadsworth Control Systems or approved equal.

2. Acceptable alternate: Cable and drum driven design systems

D. SYSTEM HARDWARE

1. All rotating components, i.e. bearing brackets, pinions and pulleys are to utilize pre-greased double sealed ball bearings.

2. All hardware is to be corrosion protected by either galvanizing, plating or high performance coating.

E. SYSTEM SEALING

1. Proper sealing of the curtain system at the trusses is to be accomplished using truss mounted aluminum extrusions.

2. Proper sealing of the curtain at the sidewall for heat retention is to be accomplished with fixed cloth sections installed on support wires mounted against the exterior wall surface and a minimum of 8” into the greenhouse space to provide a positive overlap with the ends of the movable shade cloth panels.

2.23 PLANT BENCHES

A. Freestanding stationary and/or floating aisle benches of the size and quantity shown on the drawings shall be provided by the greenhouse manufacturer. Support system shall be 14 ga., 1.25" square ~~galvanized~~ stainless-steel tubing spaced at 6'-0" intervals. Bench tops shall include 18 ga., 1" square ~~galvanized~~ stainless-steel tubing crosspieces spaced at 18" intervals, extruded aluminum side and end rails with 2” minimum perimeter edge and 3/4" “diamond”, minimum 13 gauge hot dipped galvanized steel expanded metal. Safety plastic corner connectors shall be used at end rails. Exposed metal corners are not acceptable. Two runs of 14 ga., 1.315 o.d. ~~galvanized~~ stainless- steel tubing shall be provided to support bench tops above the support system. Two runs of 14 ga., 1.315" o.d. galvanized steel tubing shall be installed 1'-2" above the floor to stabilize the support system. Extruded aluminum fittings with ~~galvanized~~ stainless-steel bolts and stainless-steel screws shall be used to assemble the benches. Bench height shall be 2'-6" from floor to expanded metal or as show on the drawings. Bench support system for floating aisle benches shall be attached to concrete floor with stainless steel clips and stainless-steel wedge or drive anchors. Benches shall be *Ro-Flo*® as manufactured by Prospiant, Ludy Bench, Paul Boers, Inc. or approved equal.

2.24 PROPAGATION WATER/MISTING SYSTEM

A. Provide Plant Propagation, over bench, misting systems for the plant benches as shown on the drawings.

B. Systems shall include 110v power supply to 12v transformer for control valve, misting heads designed for the size of bench shown, distribution piping, hose connection for water supply, electrical power cord connection, timer controls and water sensor. Provide plant misting equipment as manufactured by: Mr. Mister, Mist-o-matic, Netafim or approved equal.

2.24 GROWTH LIGHTING

A. Refer to Division 26 Electrical

PART 3 – EXECUTION

3.1 EXAMINATION

A. Field measurements: Verify all dimensions, designs and fabrication of all connecting construction. It is the contractor's responsibility to verify existing steel, concrete and masonry conditions,dimensions and elevations before delivery of greenhouse components. Verify that mounting surfaces are correctly prepared for receiving greenhouse structure and glazing systems.

3.2 INSTALLATION

A. Install entire system and all components in strict accord with the greenhouse manufacturer's published instructions and recommendations.

B. Drilling and setting of structural anchor bolts is the responsibility of the greenhouse manufacturer's installer.

C. The fabricator shall provide supervisors and labor to install the greenhouse who are regularly engaged in greenhouse construction, restoration and installation, skilled and experienced in the type of erection that is proposed for this project. If the installation of the greenhouse is sub-contracted by the greenhouse manufacturer it shall be erected by a qualified greenhouse specialty contractor/builder, authorized and approved in writing by the manufacturer, showing at least five (5) years experience in building, installing and/or restoring greenhouses of the type specified. Laborers may be required to demonstrate advanced skills in glazing installation proceedures at the discretion of the Owner, General Contractor or Greenhouse Manufacturer.

3.3 DISSIMILAR MATERIALS

A. For greenhouse structural members, separate dissimilar metals with polyurethane or asphalt coating or Teflon™ type barrier sheet material. Separate aluminum from cementitious material with polyurethane or asphaltic coating.

3.4 GROUTING

A. After the Greenhouse Contractor has placed the wall sills, the Masonry Contractor shall provide the necessary materials and labor to grout between the wall and the sill to eliminate any discrepancies between the two and produce a finished joint.

3.5 FLASHING

A. All flashing and counter-flashing necessary for greenhouse connections to other structures shall be furnished and placed by the sheet metal contractor. The Greenhouse Contractor shall furnish drawings establishing flashing line. All flashing and counter-flashing shall be aluminum or stainless steel.

3.6 GREENHOUSE EQUIPMENT

A. Install, place or mount all greenhouse operational equipment specified in this section in accordance with manufacturer's published recommendations and in locations shown on the

drawings. Coordinate all setting of this equipment with other greenhouse components installation and with the installation of power and control wiring and plumbing and piping connections being executed by electrical and mecanical sub-contractors.

3.7 ADJUSTING

A. Final Adjustments: Upon achieving Substantial Completion of the Work, adjust all operable components and limits to ensure that they are properly installed and functioning correctly as described by the manufacturer. Replace any equipment or component which cannot be adjusted for proper operation.

3.8 INSTRUCTION

A. Greenhouse Manufacturer's project manager shall be certified for having completed an OSHA Construction Safety Training Course, ten (10) hour minimum. Greenhouse Manufacturer shall provide to the jobsite one (1) complete "job-specific" Jobsite Safety Manual.

B. In addition to a minimum of (2) site visits by greenhouse manufacturer project management, Greenhouse manufacturer shall provide two (2) one day instructional presentations to the owner on use of the greenhouse and all greenhouse environmental equipment and controls. Provide all equipment operation and maintenance manuals to the owner.

C. The environmental computer control system manufacturer shall provide two (2) days of training to the Owner for the programming and operation of the environmental control system and all of the system's peripherals.

3.9 CLEANING

A. During progress of the work, remove from project site all discarded materials, packaging, rubbish, and debris resulting from the work.

B. Upon completion, clean all surfaces which have become soiled or coated as a result of work of this section, using proper methods which shall not scratch or otherwise damage finished surfaces. Use only products and techniques acceptable to manufacturer of products being cleaned.

3.11 PROTECTION

A. Institute protective procedures, follow all manufacturers' written procedures for storage and protection and install protective materials as required to ensure that work of this section shall be without damage or deterioration at Substantial Completion.

END OF SECTION 13123

SECTION 262413

SWITCHBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Work of this Section consists of switchboards, and includes but is not limited to the following:

1. Service and distribution switchboards rated 600 V and less.
2. Surge protection devices.
3. Disconnecting and overcurrent protective devices.
4. Instrumentation.
5. Control power.
6. Accessory components and features.
7. Identification.
8. Mimic bus.

B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 01 General Requirements, apply to this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each switchboard, overcurrent protective device, surge protection device, ground-fault protector, accessory, and component.

1. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

B. Shop Drawings: For each switchboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types for types other than NEMA 250, Type 1.
3. Detail bus configuration, current, and voltage ratings.
4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
5. Include descriptive documentation of optional barriers specified for electrical insulation and isolation.
6. Detail utility company's metering provisions with indication of approval by utility company.
7. Include evidence of NRTL listing for series rating of installed devices.
8. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
9. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

10. Include diagram and details of proposed mimic bus.
11. Include schematic and wiring diagrams for power, signal, and control wiring.

C. Samples: Representative portion of mimic bus with specified material and finish, for color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Field Quality-Control Reports:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Routine maintenance requirements for switchboards and all installed components.
b. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
c. Time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Potential Transformer Fuses: Equal to 10 percent of quantity installed for each size and type but no fewer than two of each size and type.
2. Control-Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
3. Fuses and Fusible Devices for Fused Circuit Breakers: Equal to 10 percent of quantity installed for each size and type but no fewer than three of each size and type.
4. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type but no fewer than three of each size and type.
5. Fuses for Fused Power-Circuit Devices: Equal to 10 percent of quantity installed for each size and type but no fewer than three of each size and type.
6. Indicating Lights: Equal to 10 percent of quantity installed for each size and type but no less than one of each size and type.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.

B. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.

B. Remove loose packing and flammable materials from inside switchboards.

C. Handle and prepare switchboards for installation according to NECA 400.

1.8 FIELD CONDITIONS

A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.

B. Environmental Limitations:

1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

a. Ambient Temperature: Not exceeding 104 deg F.
b. Altitude: Not exceeding 6600 feet.

C. Unusual Service Conditions: NEMA PB 2, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet.

D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect Owner no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Owner's written permission.
4. Comply with NFPA 70E.

1.9 COORDINATION

A. Coordinate layout and installation of switchboards 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. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace switchboard enclosures, buswork, overcurrent protective devices, accessories, and factory installed interconnection wiring that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion.

B. Manufacturer's Warranty: Manufacturer's agrees to repair or replace surge protection devices that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SWITCHBOARDS

A. Provide products from one of the following manufacturers or approved equal:
1. Square D; Schneider Electric
2. Eaton Electrical Inc; Cutler-Hammer Buiness Unit
3. General Electrical Company; GE Consumer & Industrial-Electrical Distribution
4. Siemens Energy & Automation, Inc.

B. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

D. 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.

E. Comply with NEMA PB 2.

F. Comply with NFPA 70.

G. Comply with UL 891.

H. Front-Connected, Front-Accessible Switchboards:

1. Main Devices: Fixed, individually mounted.
2. Branch Devices: Panel mounted.
3. Sections front and rear aligned.

I. Nominal System Voltage: 208Y/120 V.

J. Main-Bus Continuous: Refer to electrical equipment schedule on EXX.

K. Indoor Enclosures: Steel, NEMA 250, Type 1.

L. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.

M. Barriers: Between adjacent switchboard sections.

N. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.

O. Service Entrance Rating: Switchboards intended for use as service entrance equipment shall contain from one to six service disconnecting means with overcurrent protection, a neutral bus with disconnecting link, a grounding electrode conductor terminal, and a main bonding jumper.

P. Not applicable

Q. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.

R. Not applicable

S. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.

T. Pull Box on Top of Switchboard:

1. Adequate ventilation to maintain temperature in pull box within same limits as switchboard.
2. Set back from front to clear circuit-breaker removal mechanism.
3. Removable covers shall form top, front, and sides. Top covers at rear shall be easily removable for drilling and cutting.
4. Bottom shall be insulating, fire-resistive material with separate holes for cable drops into switchboard.
5. Cable supports shall be arranged to facilitate cabling and adequate to support cables indicated, including those for future installation.

U. Buses and Connections: Three phase, four wire unless otherwise indicated.

1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from the front of the switchboard.
2. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity.
3. Copper feeder circuit-breaker line connections.
4. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with compression connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
5. Ground Bus: 1/4-by-2-inch hard-drawn copper of 98 percent conductivity, equipped with connectors for feeder and branch-circuit ground conductors.

6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
7. Disconnect Links:

    a. Isolate neutral bus from incoming neutral conductors.
    b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.
8. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with compression connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
9. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.

V. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

W. Bus-Bar Insulation: Factory-applied, flame-retardant, tape wrapping of individual bus bars or flame-retardant, spray-applied insulation. Minimum insulation temperature rating of 105 deg C.

X. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components including instruments and instrument transformers.

2.2 SURGE PROTECTION DEVICES

A. Provide products from one of the following manufacturers or approved equal:
1. Square D; Schneider Electric
2. Eaton Electrical Inc; Cutler-Hammer Buiness Unit
3. General Electrical Company; GE Consumer & Industrial-Electrical Distribution
4. Siemens Energy & Automation, Inc.

B. SPDs: Comply with UL 1449, Type 2.

C. SPDs: Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1449, [Type 2].

1. SPDs with the following features and accessories:

    a. Integral disconnect switch.
    b. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
    c. Indicator light display for protection status.
    d. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status. Contacts shall reverse on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.
    e. Surge counter.

D. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 200 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

E. Protection modes and UL 1449 VPR for grounded wye circuits with 208Y/120 V, three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: 700 V for 208Y/120 V.
2. Line to Ground: 1200 V for 208Y/120 V.
3. Line to Line: 1000 V for 208Y/120 V.

F. SCCR: Equal or exceed 100 kA

G. Nominal Rating: 20 kA.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long and short time adjustments.
    d. Ground-fault pickup level, time delay, and I^2t response.

4. MCCB Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
    c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
    d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    e. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
    f. Communication Capability: Integral communication module with functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."
    g. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

B. Insulated-Case Circuit Breaker (ICCB): 100 percent rated, sealed, insulated-case power circuit breaker with interrupting capacity rating to meet available fault current.

1. Fixed circuit-breaker mounting.
2. Two-step, stored-energy closing.
3. Full-function, microprocessor-based trip units with interchangeable rating plug, trip indicators, and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Time adjustments for long- and short-time pickup.

c. Ground-fault pickup level, time delay, and I^2t response.

4. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
5. Remote trip indication and control.
6. Communication Capability: Web enabled integral Ethernet communication module and embedded Web server with factory-configured Web pages (HTML file format). Provide functions and features compatible with power monitoring and control system specified in Section 260913 "Electrical Power Monitoring and Control."
7. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
8. Control Voltage: 120-V ac.

2.4 INSTRUMENTATION

A. Instrument Transformers: NEMA EI 21.1, and the following:

1. Potential Transformers: NEMA EI 21.1; 120 V, 60 Hz, tapped secondary; disconnecting type with integral fuse mountings. Burden and accuracy shall be consistent with connected metering and relay devices.
2. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker, ground-fault protection.

B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:

1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:

a. Phase Currents, Each Phase: Plus or minus 0.5 percent.
b. Phase-to-Phase Voltages, Three Phase: Plus or minus 0.5 percent.
c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 0.5 percent.
d. Megawatts: Plus or minus 1 percent.
e. Megavars: Plus or minus 1 percent.
f. Power Factor: Plus or minus 1 percent.
g. Frequency: Plus or minus 0.1 percent.
h. Accumulated Energy, Megawatt Hours: Plus or minus 1 percent; accumulated values unaffected by power outages up to 72 hours.
i. Megawatt Demand: Plus or minus 1 percent; demand interval programmable from five to 60 minutes.
j. Contact devices to operate remote impulse-totalizing demand meter.

2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.

C. Voltmeters: **not used**

D. Instrument Switches: **Not used.**

E. Ammeters: **Not used.**

F. Watt-Hour Meters and Wattmeters: **Not used.**

G. Impulse-Totalizing Demand Meter: **Not used.**

2.5 CONTROL POWER

A. Control Circuits: 120-V ac, supplied through secondary disconnecting devices from control-power transformer.

B. Control Circuits: 120-V ac, supplied from remote branch circuit.

C. Electrically Interlocked Main and Tie Circuit Breakers: Two control-power transformers in separate compartments, with interlocking relays, connected to the primary side of each control-power transformer at the line side of the associated main circuit breaker. 120-V secondaries connected through automatic transfer relays to ensure a fail-safe automatic transfer scheme.

D. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.

E. Control Wiring: Factory installed, with bundling, lacing, and protection included. Provide flexible conductors for No. 8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units.

2.6 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

B. Portable Test Set: For testing functions of solid-state trip devices without removing from switchboard. Include relay and meter test plugs suitable for testing switchboard meters and switchboard class relays.

C. Portable Circuit-Breaker Lifting Device: Floor-supported, roller-based, elevating carriage arranged for movement of circuit breakers in and out of compartments for present and future circuit breakers.

D. Overhead Circuit-Breaker Lifting Device: Mounted at top front of switchboard, with hoist and lifting yokes matching each drawout circuit breaker.

E. Mounting Accessories: For anchors, mounting channels, bolts, washers, and other mounting accessories, comply with requirements in Section 260548.16 "Seismic Controls for Electrical Systems" or manufacturer's instructions.

2.7 IDENTIFICATION

A. Mimic Bus: Entire single-line switchboard bus work, as depicted on factory record drawing, on an engraved laminated-plastic (Gravoply) nameplate.

1. Nameplate: At least 0.0625-inch thick laminated plastic (Gravoply), located at eye level on front cover of the switchboard incoming service section.

B. Coordinate mimic-bus segments with devices in switchboard sections to which they are applied. Produce a concise visual presentation of principal switchboard components and connections.

C. Presentation Media: Painted graphics in color contrasting with background color to represent bus and components, complete with lettered designations.

D. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store switchboards according to NECA 400.

1. Lift or move panelboards with spreader bars and manufacturer-supplied lifting straps following manufacturer's instructions.
2. Use rollers, slings, or other manufacturer-approved methods if lifting straps are not furnished.
3. Protect from moisture, dust, dirt, and debris during storage and installation.
4. Install temporary heating during storage per manufacturer's instructions.

B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.

C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work or that affect the performance of the equipment.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install switchboards and accessories according to NECA 400.

B. Equipment Mounting: Install switchboards on concrete base, 4-inch nominal thickness. Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete.

1. Install conduits entering underneath the switchboard, entering under the vertical section where the conductors will terminate. Install with couplings flush with the concrete base. Extend 2 inches above concrete base after switchboard is anchored in place.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to switchboards.
6. Anchor switchboard to building structure at the top of the switchboard if required or recommended by the manufacturer.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and temporary blocking of moving parts from switchboard units and components.

D. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."

E. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

F. Install filler plates in unused spaces of panel-mounted sections.

G. Install overcurrent protective devices, surge protection devices, and instrumentation.

1. Set field-adjustable switches and circuit-breaker trip ranges.

H. Install spare-fuse cabinet.

I. Comply with NECA 1.

3.3 CONNECTIONS

A. Comply with requirements for terminating feeder bus specified in Section 262500 "Enclosed Bus Assemblies." Drawings indicate general arrangement of bus, fittings, and specialties.

B. Comply with requirements for terminating cable trays specified in Section 260536 "Cable Trays for Electrical Systems." Drawings indicate general arrangement of cable trays, fittings, and specialties.

C. Bond conduits entering underneath the switchboard to the equipment ground bus with a bonding conductor sized per NFPA 70.

D. Support and secure conductors within the switchboard according to NFPA 70.

E. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

3.4 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Acceptance Testing:

   a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within the switchboard, and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
   b. Test continuity of each circuit.

2. Test ground-fault protection of equipment for service equipment per NFPA 70.
3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
5. Perform the following infrared scan tests and inspections, and prepare reports:

   a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front and rear panels so joints and connections are accessible to portable scanner.
   b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.
   c. Instruments and Equipment:

      1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

6. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

B. Switchboard will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as indicated.

3.7 PROTECTION

A. Temporary Heating: Apply temporary heat, to maintain temperature according to manufacturer's written instructions, until switchboard is ready to be energized and placed into service.

3.8 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories**,** and to use and reprogram microprocessor-based trip, monitoring, and communication units.

END OF SECTION

DOOR SCHEDULE

DOOR No.	ROOM No.	ROOM NAME	WIDTH	HEIGHT	TYPE	FINISH	TYPE	MATERIAL	FIRE RATING	POWER OPERATED	HDWR SET	COMMENTS
		LOCATION	**DOOR**				**FRAME**					
LV B1												
01	01	ATS ROOM	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		15	
02.1	02	TRANSFORMER/ELECTRICAL	6' - 0"	7' - 0"	D2	HM	F2	HM	2HR		13	
02.2	02	TRANSFORMER/ELECTRICAL	5' - 0"	6' - 11 1/2"	D3	HM	F3	HM			02	
03	03	STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
04.1	04	BOILER ROOM	6' - 0"	7' - 0"	D2	HM	F2	HM			11	
04.2	04	BOILER ROOM	5' - 0"	7' - 0"	D2	HM	F2	HM			11	
04.3	04	BOILER ROOM	5' - 0"	7' - 0"	D2	HM	F2	HM			11	
04.4	04	BOILER ROOM	5' - 0"	7' - 0"	D2	HM	F2	HM			11	
05	05	WATER SERVICES ROOM	5' - 0"	7' - 0"	D2	HM	F2	HM			12	
06	06	CUSTODIAL STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
07A	07A	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
07B	07B	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
08	08	BREAK ROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			20	
09	09	MAIL ROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
10	10	GARBAGE	3' - 0"	7' - 0"	D1	HM	F1	HM	1HR		14	
11	11	CHEM. STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM	1HR		14	
12	12	CORRIDOR	5' - 0"	6' - 11 1/2"	D3	HM	F3	HM			01	
S3-00	S3-00	STAIR 3	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		20	
LV 01												
101A	101A	ADA FAMILY RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
101B	101B	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
101C	101C	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
101D	101D	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
101E	101E	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
101F	101F	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
101G	101G	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
104	104	ELECTRICAL CLOSET	3' - 0"	7' - 0"	D1	AL	F1	AL			14	
105	105	STORAGE	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
106	106	JANITOR'S CLOSET	3' - 0"	7' - 0"	D1	AL	F1	AL			14	
108	108	SONOGRAPHY STORAGE	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
109.1	109	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F1	AL			24	
109.2	109	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
111	111	PATIENT ROOM	4' - 6"	7' - 0"	D6	AL&GL	F5	AL			26	
112	112	X-RAY CLASS/LAB LARGE	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
112A	112A	X-RAY STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM			24	
113	113	MED. TECH. PREP	3' - 0"	7' - 0"	D4	AL&GL	F1	AL			24	
114.1	114	MED. LAB TECH. CLASS/LAB	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
114.2	114	MED. LAB TECH. CLASS/LAB	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			27	
115.1	115	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
115.2	115	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
116	122C	CORRIDOR	3' - 0"	7' - 0"	D4	AL&GL	W6	AL			23	
116A	116A	PRINTING	3' - 0"	7' - 0"	D1	AL	F1	AL			17	
116B	116B	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
116C	116C	SECRETARY	3' - 0"	7' - 0"	D1	AL	F1	AL			17	
116C-1	116C-1	DEPARTMENT CHAIR	3' - 0"	7' - 0"	D1	AL	F1	AL			17	
116D	116D	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
116E	116E	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
116F	116F	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
116G	116G	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
116H	116H	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
116I	116I	SHARED OFFICE	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			17	
117.1	117	SONOGRAPHY CLASS/LAB	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
117.2	117	SONOGRAPHY CLASS/LAB	3' - 0"	7' - 0"	D4	AL&GL	F1	AL			23	
118.1	118	X-RAY STORAGE	4' - 0"	7' - 0"	D3	AL	F3	AL			25	
118.2	118	X-RAY STORAGE	4' - 0"	7' - 0"	D3	HM	F3	HM			30	LEAD LINED DOOR AND FRAME - SEE SECTION 134900
119.1	119	X-RAY CONTROL	3' - 0"	7' - 0"	-	-	F1	HM			-	LEAD LINED FRAME - SEE SECTION 134900
119.2	119	X-RAY CONTROL	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
120.1	120	X-RAY ROOM - ENERGIZED	3' - 0"	7' - 0"	D1	HM	F1	HM			29	LEAD LINED DOOR AND FRAME - SEE SECTION 134900
121	121	X-RAY OBSERVATION	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
123.1	123	VESTIBULE	6' - 0"	8' - 0"	D5	AL&GL	F2	AL			03	
123.2	123	VESTIBULE	6' - 0"	7' - 0"	D5	AL&GL	F2	AL			03	
125	107	STORAGE	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
131	124	GREENHOUSE	4' - 10 3/8"	7' - 1 7/8"							31	
S1-01	S1-01	STAIR 1	6' - 0"	7' - 0"	D2	HM	F2	HM	2HR		18	
S2-01.1	S2-01	STAIR 2	6' - 0"	7' - 0"	D2	HM	F2	HM	2HR		18	
S2-01.2	S2-01	STAIR 2	3' - 0"	7' - 1 1/4"	D1	HM	F1	HM	2HR		10	
S3-01	S3-01	STAIR 3	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		24	
LV 02												
201A	201A	FAMILY RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
201B	201B	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
201C	201C	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
201D	201D	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
201E	201E	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
201F	201F	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
201G	201G	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
204	204	WELLNESS	3' - 0"	7' - 0"	D1	AL	F1	AL			16	
205	205	ELECTRICAL CLOSET	3' - 0"	7' - 0"	D1	AL	F1	AL			14	
207	207	CORRIDOR	3' - 0"	7' - 0"	D1	AL	F1	AL			23	
208	208	STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
209	209	JANITOR'S CLOSET	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
210	210	NETWORK CLOSET	3' - 0"	7' - 0"	D1	HM	F1	HM			24	
211	206	CORRIDOR	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
213.1	213	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			19	
213.2	213	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			19	
213A	213A	STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
214.1	214	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			23	
214.2	214	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			23	
215.1	215	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			23	
215.2	206	CORRIDOR	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			23	
215A	215A	STORAGE	3' - 0"	7' - 0"	D1	HM	F1	HM			14	
216	216	CONFERENCE ROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
217	217	BREAK ROOM	3' - 0"	6' - 8"	D4	AL&GL	F3	AL			24	
218	218	CORRIDOR	3' - 6 3/4"	7' - 0"	D4	HM	F1	HM			07	
218.2	218	CORRIDOR	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			23	
218A	218A	SECRETARY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218A-1	218A	SECRETARY OFFICE	3' - 0"	7' - 0"	D1	AL	F1	AL			17	
218B	218B	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218C	218C	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218D	218D	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218E	218E	GROWTH OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218F	218F	GROWTH OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	

DOOR SCHEDULE

DOOR No.	ROOM No.	ROOM NAME	WIDTH	HEIGHT	TYPE	FINISH	TYPE	MATERIAL	FIRE RATING	POWER OPERATED	HDWR SET	COMMENTS
		LOCATION	**DOOR**				**FRAME**					
218G.1	218G	ADMIN. PRINT/MAIL	3' - 0"	6' - 8"	D1	AL	F1	AL			16	
218G.2	218G	ADMIN. PRINT/MAIL	3' - 0"	6' - 8"	D1	AL	F1	AL			16	
218H	218H	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218I	218I	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218J	218J	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218K	218K	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218L	218L	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218M	218M	FINANCIAL SERVICES OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218N	218N	FINANCIAL SERVICES OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218O	218O	FINANCIAL SERVICES OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218P	218P	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
218Q	218Q	STAFF OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
219.1	218	CORRIDOR	6' - 0"	7' - 0"	D2	AL	F2	AL			26	
219.2	219	STUDENT/STAFF COUNTERS	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
219.3	219B	WAITING AREA	6' - 0 31/32"	7' - 0 1/2"	D5	AL&GL	F8	AL			26	
220.1	220	VESTIBULE	6' - 0"	7' - 0"	D5	AL&GL	F3	AL			05	
220.2	220	VESTIBULE	6' - 0"	7' - 0"	D5	AL&GL	F2	AL			06	
220.3	220	VESTIBULE	6' - 0"	7' - 0"	D5	AL&GL	F2	AL			03	
220.4	220	VESTIBULE	6' - 0"	7' - 0"	D5	AL&GL	F2	AL			04	
S1-02	S1-02	STAIR 1	6' - 0"	7' - 0"	D2	HM	F3	HM	2HR		18	
S2-02	S2-02	STAIR 2	6' - 0"	7' - 0"	D2	HM	F3	HM	2HR		18	
LV 03												
301A	301A	FAMILY RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
301B	301B	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
301C	301C	ADA RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
301D	301D	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
301E	301E	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
301F	301F	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
301G	301G	RESTROOM	3' - 0"	7' - 0"	D1	HM	F1	HM			22	
304	304	ELECTRICAL CLOSET	3' - 0"	7' - 0"	D1	AL	F1	AL			14	
305	305	ELEC.	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		15	
306	306	JANITOR'S CLOSET	3' - 0"	7' - 0"	D1	AL	F1	AL			14	
307	307	STORAGE	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
308.1	308	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
308.2	308	CLASSROOM	3' - 0"	7' - 0"	D4	AL&GL	F4	AL			24	
309	309	PRINTING ROOM	3' - 0"	7' - 0"	D1	AL	F1	AL			24	
310	310	VR LAB	3' - 0"	7' - 0"	D4	AL&GL	F5	AL			24	
311.1	311	ANATOMY AND PHYSIOLOGY	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
311.2	311	ANATOMY AND PHYSIOLOGY	4' - 6"	7' - 0"	D3	AL	F3	AL			27	
312	312	AVT A&P STORAGE	3' - 0"	7' - 0"	D4	AL&GL	F1	AL			23	
313	313	CLINICAL TECH. PREP & STORAGE	3' - 0"	7' - 0"	D4	AL&GL	F1	AL			23	
314.1	314	CLINICAL TECH.	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
314.2	314	CLINICAL TECH.	4' - 6"	7' - 0"	D3	AL	F3	AL			27	
315	315	FACULTY-STUDENT INTERACTION	3' - 0"	7' - 0"	D4	AL&GL	W6	AL			23	
315A	315A	SURGE/EXPANSION OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315B	315B	SHARED ADJUNCT OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315C	315C	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315D	315D	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315E	315E	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315F	315F	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315G	315G	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315H	315H	FACULTY OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315I	315I	DEPARTMENT CHAIR'S OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
315J	315J	ADMIN. OFFICE	3' - 0"	6' - 8"	D1	AL&GL	F6	AL			17	
316.1	316	BOTANY / SOILS LAB	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
316.2	316	BOTANY / SOILS LAB	4' - 6"	7' - 0"	D3	AL	F3	AL			27	
317	317	PARASITOLOGY BOTANY/SOIL PREP	3' - 0"	7' - 0"	D4	AL&GL	F1	AL			23	
318.1	318	PARASITOLOGY	4' - 6"	7' - 0"	D6	AL&GL	F3	AL			26	
318.2	318	PARASITOLOGY	4' - 6"	7' - 0"	D3	AL	F3	AL			27	
319	319	BREAK	3' - 0"	7' - 0 1/4"	D4	AL&GL	W5	AL			24	
S1-03	S1-03	STAIR 1	6' - 0"	7' - 0"	D2	HM	F3	HM	2HR		18	
S2-03	S2-03	STAIR 2	6' - 0"	7' - 0"	D2	HM	F3	HM	2HR		18	
S4-03	S4-03	STAIR 4	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		24	
TOP OF ROOF DECK												
401.1	401	PENTHOUSE	3' - 6"	7' - 0"	D1	FRP	F1	HM			09	
401.2	401	PENTHOUSE	3' - 0"	7' - 0"	D1	FRP	F1	HM			09	
S4-P.1	S4-P	STAIR 4	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		08	
S4-P.2	S4-P	STAIR 4	3' - 0"	7' - 0"	D1	HM	F1	HM	2HR		08	

RENOVATE AGRICULTURE SCIENCE BUILDING
SUCF Project No. 221033-00
10 Upper College Dr Alfred, NY 14802

SUNY State University Construction Fund

ALFRED STATE COLLEGE OF TECHNOLOGY STATE UNIVERSITY OF NEW YORK

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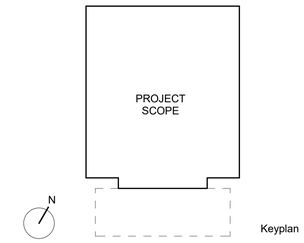
Notes:



Keyplan

Job Number 32102
Drawing By Author
Checked By Checker
Date 05/03/24

Revisions

No.	Date	Description
1	05/22/2024	ADDENDUM 01
2	06/07/2024	ADDENDUM 02
3	06/13/2024	ADDENDUM 03

DOOR SCHEDULE

VOLUME 1

BID DOCUMENTS

Scale:

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