Purchasing Office
P.O. Box 40197 • Lafayette, LA 70504-0197
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24207 SOLICITATION TABLE OF CONTENTS

GREENHOUSE ADDITION - PHASE 3 – BILLEAUD HALL

Page No.

1. BIDDER CERTIFICATION INFORMATION 1
2. SCOPE OF WORK 2
3. COMPLIANCE TO SCHEDULE/LIQUIDATED DAMAGES 2
4. BID SECURITY REQUIREMENTS 2
5. LOUISIANA CONTRACTORS LICENSE REQUIREMENTS 3
6. BUSINESS HOURS 3
7. SITE VISIT CONTACT INFORMATION 3
8. PRE-BID MEETING INFORMATION 3
9. DETAILED SPECIFICATIONS 4
10. ALTERNATE(S) 93
11. INSTRUCTIONS TO BIDDERS (Articles 1-9) 95
12. SUPPLEMENTARY CONDITIONS (Articles 1-5, 7-15) 102
13. INSURANCE REQUIREMENTS 121
14. GENERAL REQUIREMENTS 123
15. BID SUBMISSION GUIDELINES 126
16. VENDOR CHECKLIST 127
17. LOUISIANA UNIFORM PUBLIC WORK BID FORM 128
18. ATTESTATIONS AFFIDAVIT FORM 129
19. NON-COLLUSION AFFIDAVIT FORM 131
20. SPECIFICATIONS / DRAWINGS.....ATTACHMENT A

UNIVERSITY OF LOUISIANA AT LAFAYETTE
Lafayette, Louisiana

SOLICITATION FILE NO. 24207
TITLE: GREENHOUSE ADDITION - PHASE 3 – BILLEAUD HALL

OPTIONAL PRE-BID MEETING (in person): Tuesday, October 31, 2023 3:00PM
BID SUBMISSION DEADLINE: Tuesday, November 21, 2023 2:00PM
ZOOM BID OPENING: Tuesday, November 21, 2023 3:00PM

PROPOSAL FOR FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY FOR THE GREENHOUSE ADDITION – PHASE 3 – BILLEAUD HALL, LOCATED ON THE UL LAFAYETTE CAMPUS, IN LAFAYETTE, LOUISIANA.

BID DEADLINE

The Purchasing Office at the University of Louisiana at Lafayette will electronically receive proposals for this solicitation up to the above-mentioned date and time. Proposals will not be received after this specified hour and date. Bids will be publicly opened and read by a designated employee of the Purchasing Department.

This is a *Competitive Sealed Bid. See Guidelines for Electronic Submission of Bids and Virtual Bid Openings in the following pages of this solicitation, which contains complete details for submitting bids. Further information can be found in the attached* INSTRUCTIONS TO BIDDERS.

Bidders submitting bids in the amount of $50,000.00 or more SHALL show their license number in the subject line of their electronic bid submission; bids not submitted in accordance with this requirement, SHALL be rejected and shall not be read.

Bid must be received by the due date and time in the Purchasing Office as per the instructions outlined in this solicitation. Bid must be submitted with the BID NUMBER IN THE SUBJECT LINE of the electronic submission. The public bid opening will take place on Tuesday, November 21, 2023 at 3:00PM on Zoom, which is available for viewing by registering at https://ullafayette.zoom.us/meeting/register/tJ0ldeCsrTwpGNbDDG3kxhsaWFoO4UHqv4pu .

Meeting ID: 998 2943 7322 Passcode 904516

All inquiries regarding this request shall be directed to the Director of Purchasing at (337) 482-9051 or purchasing@louisiana.edu.

Attached is the completed proposal of the firm listed below. The undersigned certifies that he/she (or they) has/have carefully examined *the Instructions to Bidders, the General Conditions, and the Specifications* hereto attached and made part herein, and agrees to comply with the instructions, conditions, and specifications, as covered by the attached papers. On the basis of the specifications, the undersigned proposes to furnish any or all items listed in the schedule of items hereto attached, upon which prices are requested, and at the price stated for each item.

Firm Name & FEIN Number	Signature [By signing this bid, bidder certifies compliance with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(0)]
Address	Name (Printed)
City, State, Zip Code	Title
Telephone No. including area code	Date
Louisiana Contractor's License Number	Name & E-Mail (Contract Signatory)

GENERAL SPECIFICATIONS

FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY FOR THE GREENHOUSE ADDITION – PHASE 3 – BILLEAUD HALL, LOCATED ON THE UL LAFAYETTE CAMPUS, IN LAFAYETTE, LOUISIANA, AS SHOWN ON THESE SPECIFICATIONS...

SCOPE OF WORK

1. Furnish and install new Greenhouse No. 2 with foundation and reinforcement as required.
2. To layout greenhouse and sidewalks and locate existing utilities.
3. De-grass the required areas and remove dirt required for the correct elevation for the new concrete foundation and sidewalks.
4. Place new wire mesh, reinforcement, keyway joints, and expansion joints for placement of required thickness, 3500 psi concrete paving.
5. Concrete shall be straight concrete mix with no additives.
6. Provide labor and materials for all electrical work in Greenhouse No.2 and rough ins on plans and in specs.
7. Provide labor and materials for all plumbing piping, drains, and sink in Greenhouse No.2 and rough ins on plans and in specs.
8. Provide HVAC equipment, labor, and materials as shown on plans and in specs.
9. Clean up and properly dispose of all construction debris and trash associated with this project.
10. Excess soils and concrete shall be disposed of off of University property.
11. The use of University dumpsters is prohibited.
12. ALTERNATE NO.1 – TO FURNISH AND INSTALL NEW STORAGE SHED WITH FOUNDATION, SIDEWALKS, AND ELECTRICAL WIRING AND DEVICES.

COMPLIANCE TO SCHEDULE/LIQUIDATED DAMAGES

DUE TO THE IMPORTANCE OF THE SCHEDULE, LIQUIDATED DAMAGES IN THE AMOUNT OF ONE HUNDRED DOLLARS ($100.00) PER DAY WILL BE ASSESSED FOR EVERY CALENDAR DAY THAT THIS PROJECT IS NOT COMPLETE BEYOND THREE HUNDRED SIXTY (360) DAYS OF THE NOTICE TO PROCEED.

BID SECURITY REQUIREMENTS

Each bidder MUST accompany his/her proposal with a bid security for five percent (5%) of the total maximum amount of his/her bid. The bid security shall be drawn in favor of the University of Louisiana at Lafayette and SHALL be in the form of a Bid Bond (Insurance Company), Bank Money Order*, Certified Check* or Cashier's Check*. It shall become the property of the Owner in the event the contract and any performance bond are not executed within the time set forth. Bid bond shall be written by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an "A"- Rating in the latest printing of the AM Best's Key Rating Guide to write individual bonds up to ten percent (10%) of policyholders' surplus as shown in the AM Best's Key Rating Guide.

Successful bidder WILL BE required to execute and deliver within ten (10) days of notification, a satisfactory performance bond and payment bond in the amount of one hundred percent (100%) of the contract price. Performance Bond, with Power of Attorney, shall be secured by a surety or insurance company currently on the US Department of the Treasury Financial Management Service List of Approved Bonding Companies, and in accordance with restrictions set by them or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds. In addition, any surety bond written for a public works Project shall be written by a surety or insurance company that is currently licensed to do business in the State of Louisiana. Also, to be provided at the same time is a Labor and Materials payment Bond in an amount equal to one hundred percent (100%) of the contract amount.

*Bid security in the form of a Bank Money Order, Certified Check or Cashier's Check shall be scanned and included with the bid submission (front and back) and the original must be mailed to and received no later than 3 business days after the bid opening.

University of Louisiana at Lafayette
Purchasing Office
PO Box 40197
Lafayette, LA 70504-0197

LOUISIANA CONTRACTORS LICENSE REQUIREMENTS

Contractors or contracting firms submitting bids in the amount of $10,000.00 or more shall certify that they are licensed contractors under Chapter 24 of Title 37 of the Louisiana Revised Statutes 1950 and show their license number ~~on the front of the sealed envelope in which their bid is enclosed~~ in the subject line of the email submission. Bids shall be accepted from Contractors who are licensed under L.A. R.S. 37:2150-2163 in the following classification: **BUILDING CONSTRUCTION.** Bids in the amount of $50,000.00 or more, not submitted in accordance with this requirement, shall be rejected and shall not be read. Additional information relative to licensing may be obtained from the Louisiana State Licensing Board for Contractors, Baton Rouge, Louisiana.

In accordance with La. R.S. 38:2227, LA. R.S. 38:2212.10 and LA. R.S. 23:1726(B) each bidder on this Project must submit a completed Attestations Affidavit (Past Criminal Convictions of Bidders, Verification of Employees and Certification Regarding Unpaid Workers Compensation Insurance) form found within this bid package. The Attestations Affidavit form shall be submitted to the Purchasing Department within 10 days **after** the opening of bids. **Affidavits submitted with the Bid Documents, prior to the opening of bids, will not be accepted in accordance with stated Revised Statute.**

PROHIBITION OF DISCRIMINATORY BOYCOTTS OF ISRAEL

In accordance with LA R.S. 39:1602:1, for any contract for $100,000 or more and for any contractor with five or more employees, Contractor, or any Subcontractor, shall certify it is not engaging in a boycott of Israel, and shall, for the duration of this contract, refrain from a boycott of Israel.

The State reserves the right to terminate this contract if the Contractor, or any Subcontractor, engages in a boycott of Israel during the term of the contract.

BUSINESS HOURS

Please send all correspondence electronically or through USPS. In-person delivery of document(s) will NOT be accepted. Business hours are Monday through Thursday, 7:30 am to 11:45 am, 12:30 pm to 5:00 pm, and Friday, 7:30 am to 12:30 pm. The Purchasing Office will be closed during Federal, State and University holidays. It is the responsibility of the prospective bidder to be aware of such closures.

Please note that courier services such as UPS, FedEx, and DHL will be **UNABLE to deliver to the Purchasing Office**. *See Guidelines for Electronic Submission of Bids and Virtual Bid Openings on page 4 of this solicitation for more detailed information.*

In providing this bid, each bidder represents that: They have read and understand the bid documents and the bid is made in accordance herewith, and the bid is based upon the specifications described in the bid documents without exception.

SITE VISIT/CONTACT INFORMATION

It is the responsibility of the prospective bidder to visit and examine jobsite, take measurements to his/her own satisfaction and determine conditions under which work is to be done. Owner will not accept responsibility for conditions which careful examination of premises would have shown existed.

To visit jobsite and for further information, prospective bidder is to contact Rob McPherson, 337-255-6939.

PRE-BID MEETING INFORMATION

A pre-bid meeting will be held at **3:00 PM, Tuesday, October 31, 2023 at** the Facility Management Department, Parker Hall, 310 E. Lewis Street, Lafayette, Louisiana, at which time details of plans and specifications will be discussed.

TAX RELATED INFORMATION

It is the responsibility of the prospective bidder to pay taxes on materials purchased for this project. The University of Louisiana at Lafayette is a tax-exempt State Agency. However, that tax exempt status does not transfer to its contractors, subcontractors, suppliers, or vendors for their use.

For further information, prospective bidder should contact the Purchasing Department at purchasing@lousiana.edu, or call Mary Borel at 337-482-9051.

END OF SECTION

DETAILED SPECIFICATIONS

PROPOSAL FOR FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TRANSPORTATION, SUPERVISION, PERMITS, ETC. NECESSARY FOR THE GREENHOUSE ADDITION – PHASE 3 – BILLEAUD HALL, LOCATED ON THE UL LAFAYETTE CAMPUS, IN LAFAYETTE, LOUISIANA, AS SHOWN ON THESE SPECIFICATIONS...

Base Bid

SCOPE OF WORK

1. Furnish and install new Greenhouse No. 2 with foundation and reinforcement as required.
2. To layout greenhouse and sidewalks and locate existing utilities.
3. De-grass the required areas and remove dirt required for the correct elevation for the new concrete foundation and sidewalks.
4. Place new wire mesh, reinforcement, keyway joints, and expansion joints for placement of required thickness, 3500 psi concrete paving.
5. Concrete shall be straight concrete mix with no additives.
6. Provide labor and materials for all electrical work in Greenhouse No.2 and rough ins on plans and in specs.
7. Provide labor and materials for all plumbing piping, drains, and sink in Greenhouse No.2 and rough ins on plans and in specs.
8. Provide HVAC equipment, labor, and materials as shown on plans and in specs.
9. Clean up and properly dispose of all construction debris and trash associated with this project.
10. Excess soils and concrete shall be disposed of off of University property.
11. The use of University dumpsters is prohibited.
12. ALTERNATE NO.1 – TO FURNISH AND INSTALL NEW STORAGE SHED WITH FOUNDATION, SIDEWALKS, AND ELECTRICAL WIRING AND DEVICES.

CONTRACTOR SHALL CONTACT “DOTTIE” PRIOR TO ANY AND ALL EXCAVATIONS.

CONTRACTOR SHALL RESEARCH AND HAND DIG TO LOCATE UTILITIES FOR DEPTH AND LOCATION.

FINAL SIDEWALK AND GREENHOUSE LAYOUT SHALL BE APPROVED BY THE UNIVERSITY PRIOR TO CONSTRUCTION.

CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL GRADING OF THE SITE FOR POSITIVE DRAINAGE TO EXISTING CATCH BASINS AND DRAINAGE SWALES AT NO COST TO THE UNIVERSITY.

DEMOLITION

Contractor shall perform any and all demolition necessary to prepare the entire area, including but not limited to, doors and frames, portions of existing walls, etc., as necessary for construction and finishes called for in the specifications for the new floor plan and finishes.

Contractor shall do all other incidental work, not listed, for the proper and complete performance of this contract.

Contractor shall remove all concrete as indicated on plans.

CONSTRUCTION

Contractor shall de-grass areas shown for the foundations of the new greenhouse, sidewalks, and ALTERNATE NO.1 storage shed.

Contractor shall rough-in drain piping, water piping, and electrical conduit for the new greenhouse and storage shed.

Contractor shall form up, install reinforcing steel rebar, and pour concrete slabs for new greenhouses and storage shed.

Contractor shall install new split faced concrete block for the chain wall for the new greenhouses.

GREENHOUSE NO. 2– PHASE 3

Contractor shall furnish and install (CT 22 x 58-DGFW Multi-Chamber Style Model) Greenhouse No. 2 as shown on the plans. Contractor shall hire Gothic Arch Greenhouses to do the installation and assist as needed for a complete operable greenhouse as per plans and specifications. Provide all concrete foundations, slabs, reinforcement, walls, mechanical, plumbing, and electrical etc., as called out in the plans.

DOORS AND HARDWARE – ALTERNATE NO.1

Contractor shall furnish and install new hollow metal doors and WELDED hollow metal frames with high back aluminum thresholds, at all new entrances of the storage shed.

New frames shall be welded type frames with jamb sizes to match the wall thickness.

Provide high back aluminum thresholds for the new doors and frames.

Contractor shall furnish and install all new heavy-duty door locks and hardware, to include but not limited to ball bearing hinges, locks, and closures.

New locks shall receive figure 8, 7-pin cores. New cores shall be provided and installed by the University.

Locks: BEST-9K Series Cylindrical Lock
Closers: SYANLEY- QDC100 Extra Heavy-Duty Grade 1 Closure
Hardware other than those listed, shall be submitted to the University prior to ordering.

HOLLOW METAL DOORS – ALTERNATE NO.1

Hollow metal doors and frames manufacturers offering standard steel doors and frames which may be incorporated in the work shall include one of the following:

Amweld Building Products, Inc.
Curries Company
Steelcraft Manufacturing Co.

All doors both interior and exterior shall meet the following criteria for exterior doors. Doors shall comply with ANSI / SDI 100, Grade III, extra heavy-duty, Model 4, minimum 16-gage galvanized steel faces. Fabricate doors from galvanized sheet steel in accordance with SDI-112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of 16-gage inverted steel channels.

Prepare doors and frames to receive mortised and concealed finish hardware. Comply with ANSI A115 series specifications for door and frame preparation for hardware.

All doors shall be flush with no lites or secondary panels.

All doors shall be 3'0" in width. All doors shall be 7'0" in height.

Exterior doors shall be installed with weather stripping, saddle type extruded aluminum threshold and door bottom vinyl seal in extruded aluminum track.

Provide metal frames for door openings fabricated with mitered corners, welded construction. All frames shall be hot dip galvanized steel.

Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.

Doors and frames shall be HOT DIPPED GALVANIZED and shall receive shop applied rust-inhibitive enamel or paint, suitable as a base for finish paints complying with ANSI A224.1,

All exposed metal surfaces of doors and frames shall be painted with one coat of oil-based metal primer, and two coats of oil based industrial enamel.

WALL CONSTRUCTION – ALTERNATE NO.1

Contractor shall carefully layout for new partitions by placing chalk lines on the existing floor. Rob McPherson shall be called to verify and approve locations prior to beginning wall construction.

EXTERIOR WALLS – STORAGE BUILDING – ALTERNATE NO.1

Contractor shall furnish all materials etc. to install new 5 ½" x 8' wood studs and 1/2" plywood sheeting, 30 mil vinyl flashing, vapor proof barrier, and painted hardy plank siding with trim on all exterior walls of the storage building as indicated in drawings.

New storage building walls shall have ½" sanded face plywood painted on the interior side.

All new walls shall receive 6" non-faced fiberglass insulation.

Ceiling joists shall be 2x6 wood framing insulated.

INTERIOR WALLS – STORAGE BUILDING – ALTERNATE NO.1

All interior walls and ceiling of the storage building shall receive FRP panels and trim glued and pinned.
FRP panels and trim shall be white.

PAINTING – ALTERNATE NO.1

All paint preparation and application shall be according to manufacturer recommendations for application on the substrates to receive paint.

All new doors and frames, walls interior and exterior, ceiling, and trim shall be prepped, primed, and painted with enamel super paint.

Colors shall be selected by the University.

FERROUS METALS

First coat, PPG inhibitive metal primer, tinted with desired color. Second coat, Speedhide, Exterior-interior Alkyd Semi-gloss enamel. Roughen pre-finished items as required for good paint adhesion. (frames, metal doors, AC grilles, etc.)

STORAGE SHED ROOFING – ALTERNATE NO.1

The roof framing shall be 2 x 6 wood framing at a 4:12 pitch.
The roof shall receive 1/2" oriented strand board or plywood decking nailed to the rafters with 2 x wood blocks between rafters nailing the plywood together to substitute for clips.

At the perimeter, a treated 2 x 6 band shall be continuous along the eaves.

Contractor shall nail 30# roofing felt to the decking prior to installing composition roof shingles.

Contractor shall furnish "Architectural style. U.L. rated, Class A, 25 year, laminated, self-sealing, random tab, shingles, over 30# felt.

Shingles shall be Elk brand (or Tampco in Rustic Black) or approved equal shingles (color to be selected by owner).

Drip edge shall be 3” x 1-1/2” and shall be Bronze in color.

Each shingle shall be attached to the roof with no less than six 1 1/4" galvanized roofing nails.
Contractor shall furnish and install new galvanized metal drip edge strip at all perimeter roof edges.

Each ridge cap shingle shall be attached to the roof with no less than four x 2" galvanized roofing nails.

Contractor shall furnish and install new 11” COR-A-VENT V-300 (or approved equal) continuous ridge vent as per detail on the plans at the ridges starting at 12” from each end of the ridge. Ridge vents shall be fastened with 2-1/2” galvanized roofing nails. Install shingle ridge caps on ridge vents.

STORAGE SHED FASCIA, EAVE, AND SOFFIT – ALTERNATE NO.1

The storage shed soffit shall be 12” vented vinyl soffit panels with vinyl trim as needed.
The facial shall be aluminum metal constructed as per details on plans.
Facial and soffit color shall be WHITE.

University of Louisiana, Lafayette (9-18-2023 – Revision)
Lafayette, LA 70504 (Structure C)
SECTION 13120 GLAZED STRUCTURES

PART 1 PRODUCT

Double Glass & Five-Wall Polycarbonate Greenhouse Enclosure of CT 22 x 58-DGFW Multi-Chamber Style Model, with 8.5/12 Roof Slope, 2 each partition walls to divide Room A - 22'11" W x 22' 11" L Growing Room, Room B – 22'11" W x 22' 11" L Class Room, and Room C -Center Storage Room -22'11" W x 13'10" L. by Gothic Arch Greenhouses, Inc. P. O. Box 1564 Mobile, AL 36633

PART 1 GENERAL

1.1 INCLUDED PRODUCTS

Greenhouse Materials

A. Structural Framing
B. Double Glass and Five-Wall Polycarbonate Glazing Materials
C. 6 ea. Continuous Motorized Ridge Vents
D. Doors: 4 set 72" x 84” Double Store-Front Doors w/Double Glass

Panic Bars and ADA-Approved Hardware on all doors – locks to receive Figure 8 cores

E. Exhaust Fans as specified & Motorized Intake Shutters
F. HAF 12" Air-Circulation Fans w/Manual Variable Speed Control
G. 2’ x 4’ Side Vents with Manual Corkscrew Openers
H. Shade Panels in all three rooms

1.2 SUBMITTALS

A. Product data: Available manufacturer and supplier data sheets on each product to be used.
B. Shop drawings: Detailed drawings of the greenhouse prepared specifically for the project by the manufacturer. Includes Plans, elevations, sections, details, and attachments to other work.
C. Engineered stamped drawings: Detailed shop drawings with structural calculations, stamped or sealed by a licensed professional engineer of the required jurisdiction. Includes Plans, elevations, sections, details, isometric, and attachments to other work.
D. Specialized drawings: For instruction of non-standard/custom components that are designed into the greenhouse structure.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum 20-year experience in fabrication and erection of glazed structures for projects of similar scope.
B. Installer Qualifications: Experienced in performing work of this type of structure required for this project.

1.4 DELIVERY, STORAGE AND HANDLING

A. General Contractor will coordinate with the shipper to receive, offload, and quality check materials.
B. Store products in the manufacturer's unopened packaging, covered to protect factory finishes from damage, precipitation, and construction dirt until ready for installation.

1.5 WARRANTY~ *Note: Installation by a factory-trained crew is required.*

A. The manufacturer guarantees the PRODUCT(s) for A LIFETIME* from the date of purchase against defects in workmanship and/or materials. * A lifetime warranty applies to specific products. The following Schedule defines the terms and lengths of our warranty.

1.6 Greenhouse Frame and Frame Components: Lifetime Limited Warranty against defects in workmanship and/or materials. We will process all freight claims if the frame is damaged during shipping, and the greenhouse is shipped 'prepaid' from our plant. Within the first year, all necessary repairs and/or replacements (at GAG 's discretion) will be completed at no expense to the customer. For the duration of the lifetime warranty, any necessary replacement parts will be provided at no cost. However, the customer will be responsible for any shipping and handling costs, as well as installation costs of replacement components.

a) Five-Wall Polycarbonate Roof Glazing: 10-year limited warranty against defects in workmanship and/or materials, and on light transmission, and against breakage caused by hail. Within the first year, all necessary replacements will be completed at no expense to the customer. For the duration of the 10-year warranty, any necessary replacement parts will be provided at no cost, however, the customer will be responsible for any shipping and handling costs, as well as installation costs of materials.
b) Double Glass Units (Regular and Safety): Lifetime Limited Warranty against defects in workmanship and/or materials. Due to the nature of glass, we will guarantee that all glass pieces are manufactured to the correct dimensions and are free from material defects. We will not guarantee that glass will not be broken during customer handling, installation, or use. We will process all freight claims if the glass is damaged during shipping, and the greenhouse is shipped 'prepaid' from our plant. Within the first year, all necessary replacements will be completed at no expense to the customer. For the duration of the lifetime warranty any necessary replacement parts will be provided at no cost, however, the customer will be responsible for any shipping and handling costs, as well as installation costs of glass/ glazing materials. Please note that the seal on these units is guaranteed for TEN (10) years from the date of purchase.
c) Installation(s) Performed by Gothic Arch Greenhouses: Any installation of a greenhouse performed entirely by Gothic Arch Greenhouses is guaranteed for one (1) year from the date of installation. This guarantee ensures the greenhouse is installed properly and completely, and is sealed against leakage under normal weather conditions. However, during periods of extreme Wind-Driven rains, resulting minor water infiltration may occur. Broken glass as a result of a shifting or settling foundation is not guaranteed. Within the one-year warranty, all necessary repairs and/or replacements (at GAG's discretion) will be completed at no expense to the customer. (Except for Greenhouse Accessories – see below)
d) Greenhouse Accessories: All Gothic Arch Greenhouses Accessories are guaranteed for One (1) year from the purchase date. The specific manufacturers of our accessories may offer longer warrantees. We will repair or replace (at our discretion) any defective accessory we sell. It is the customer's responsibility to pay shipping costs on any defective items. Labor for installation of replacement responsibility of others.

e) This warrantee, for all products, does not apply if the damage occurs because of accident, improper handling or operation, abuse, misuse, Act of God, or unauthorized repairs made or attempted.

f) Only parts that prove to be defective during the period of warrantee will be repaired or replaced without charge. Not including Install labor – by others. Warrantee entitlement is only available to the original customer who purchased our products through Gothic Arch Greenhouses, this warrantee is non-transferable and void once the greenhouse is no longer in the possession of the original purchaser. A copy of this warranty should be retained with a copy of the purchase invoice to ensure warranty coverage. Should repair become necessary, contact our office at 1-800-531-4769.

This warranty, for all products, does not apply if the damage occurs because of the accident, improper handling or operation, abuse, misuse, Act of God, or unauthorized repairs made or attempted. Only parts that prove to be defective during the period of warrantee will be repaired or replaced without charge. Warranty entitlement is only available to the original customer who purchased our products through Gothic Arch Greenhouses. This warranty is non-transferable and void once the greenhouse is no longer in the possession of the original purchaser. A copy of this warranty should be retained with a copy of the purchase invoice to ensure warranty coverage. Should repair become necessary, call Gothic Arch Greenhouses at 1-800-531-4769.

PART 2 PRODUCTS

2.1 PERFORMANCE/DESIGN CRITERIA

A. Structural Design: Engage a qualified professional engineer, licensed in the State of LA. to design Greenhouse Structure and glazing.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the Building Code of the City of Lafayette, Louisiana as of 10/16/2020 Structure C, these are specified as Design Wind Pressures of 140 MPH and Snow Loads of 32 PSF.

C. Strength of greenhouse unit is to withstand a positive and negative wind loading of 25.5 pounds per square foot and a snow loading of 32 pounds per square foot. Maximum deflection is not to exceed 1/120 of the total unit span per 2018 International Building Code Table 1604.3 for Greenhouses.

D. Design framing system and glazing material to support design loads as prescribed by the governing building code.

E. Glazing bars to be vertical and horizontal extrusions with internal and external weep/condensation channels to direct moisture, which could collect on the interior of the glazing, to the exterior of the greenhouse. The sill member shall be sloped and weep channeled to the exterior to force moisture, which may be collected, to exit to the exterior. No uncontrolled water leakage in system under normal circumstances. The options of framing system are as follows:
a) GAG-CCG Proprietary aluminum extrusions with screw on glazing cap.

2.1 STANDARD MATERIALS

A. Framing Members: Unless otherwise noted, to be all aluminum alloy and temper of all framework members shall be of 6063-T52. Structural members such as trusses, purlins, bracing, ridge and gutters shall be of 6063-T6. Structural support members shall be as recommended for strength, corrosion resistance and application of required finish; ASTM B 221 for extrusions; ASTM B 209 for sheet/plate. All frameworks to be pre-cut, pre-punched and pre-drilled unless otherwise noted.

B. Vertical glazing bars: to be specified as CC. Standard 24 ½" o/c spacing unless noted otherwise.
   a) Horizontal bracing: Unless otherwise noted, to be standard 1" x 2" x 1/8" channel.
   b) Roof purlins: Unless otherwise noted, to be standard 1 ½" x 3" x 3/16" channel.
   c) Internal truss: Unless otherwise noted, to be standard 1 ½" x 3" x 3/16" channel.
   d) Gusset plates: As noted on drawings.

e) **Perimeter base**: Unless otherwise noted, to be standard 1" x 2" x 3/16" angle.

C. **Fasteners**: shall be non-magnetic stainless steel; or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum components.

D. **Glass**: All glass shall be tempered and comply with the Insulated Glass Certification Council with ASTM E 773-83 and E 774-84a class CBA requirements (IGCC No. IGCC-514CBA). Double glass unless otherwise noted, shall be hermetically sealed, factory insulated, 1/8" tempered-over-1/8" tempered, dual sealed, 5/8" O.A. thick at all flat glass and curved glass applications, made with a molecular sieve desiccant, primary seal of polyisobutylene and a secondary seal of polyurethane.

a) **Clear Double Glass** unit with overall 5/8" (16mm):
1) Air space: 3/8"
2) Interior lite: 1/8" clear
3) Visible light transmittance: 82%
4) SHGC 0.79
5) Winter R-value: 2.0
6) Shading coefficient: 0.9
7) UV transmittance: 58%

E. **Polycarbonate**: shall incorporate a co-extruded UV inhibitor with included non-prorated 10-year warranty against diminishing light transmission and damage due to hail.

a) **Clear five-wall** polycarbonate, 16mm thick. R Value to be no less than 3.0 and visible light transmittance no less than 62%.

F. **Gasket Material**:

a) Gaska Tape V1520 Series medium density closed-cell polyvinyl chloride foam coated both sides with an aggressive, pressure-sensitive adhesive, A3, and 84# polycoated two side, brown kraft liner.

G. **Structural Sealant**: Tremco Proglaze Silicone, clear.

H. **Perimeter Sealant**: Tremco 830 Thermoplastic, Elastomeric Sealant; color to match framing finish if available; otherwise color as selected from manufacturer

2.2 Greenhouse

A. WALL GLAZING

Glazing shall be: Hermetically sealed, factory insulated, 1/8" Guardian Climate Guard 7036 tempered-over- 1/8" clear tempered, dual sealed, 5/8" O.A. thick, made with a molecular sieve desiccant, primary seal of polyisobutylene and a secondary seal of polyurethane. All glass to comply with the Insulated Glass Certification Council with ASTM E 773-83 and #E774-84a class CBA requirements (IGCC No. IGCC-514CBA)

B. ROOF GLAZING

Glazing shall be: shall incorporate a co-extruded UV inhibitor with included non-prorated 10-year warranty against diminishing light transmission and damage due to hail.

Five Wall Clear: FWG02A6C- 16 mm thick Relative (R-Value) Heat Gain 3.03. Approximately 62% of light transmission

C. Glazing Bars are to be Gothic Arch Greenhouse proprietary solid extrusions. The vertical and horizontal extrusions shall have internal and external weep/condensation channels to direct moisture, which could collect on the interior of the glazing, to the exterior of the greenhouse. The sill member shall be sloped and weep channeled to the exterior to force moisture, which may be collected, to exit to the exterior. The moisture shall weep/exit through small weep holes located periodically along the length of the sill member at the center of each bay. The Gothic Arch Greenhouse shall incorporate a screw-on, continuous glazing cap assembly system to secure glazing to the glazing bars.

2.2 **ACCESSORIES:** Provide accessories as scheduled to achieve design intent and environmental control.

A. **Roof Vents**: 6 ea. Continuous Motorized Ridge Vents

Continuous ridge vents, as indicated on drawings, using appropriate size and glazing, Operated with a VC-100A motorized rack and pinion gear system supplied by Wadsworth Control Systems

B. **Doors**

a) 4 ea. 72" x 84" -Double Heavy-Duty Storefront Door Unit w/ (Dbl. Glass) Commercial Storefront shall be Aluminex 100 Series, sealed insulated glass units, as manufactured by Aluminex. Sufficient strength and size fasteners shall be made of corrosion resistant and compatible material. The door hardware shall be supplied and/or installed by Aluminex and shall include: pivots/hinges, lock with cylinder & thumb –turn, standard 150mm/6" extruded aluminum threshold, tubular 12" off-set "D" push/pull back to back mount, optional hardware available upon request.

b) Panic Bar & ADA Approved Hardware, locks shall receive Figure 8 cores

C. Ventilation Package GAVP-183-2 (Room A-Grow Room) and (Room B- Class Room)

a) GAG18 Exhaust Fans, (Metal Shutter Fans painted to match the Greenhouse)
b) Motorized intake shutters painted to match the frame
c) Insect screen for Air-Intake Shutters

D. Bartlett Climate Boss Touch Screen Control with Weather Station

a) Controller Dimensions: 7.17x7.09x3.54"/ea
b) Room A - 22'11" W x 22' 11" L Growing Room,
c) Room B – 22'11" W x 22' 11" L Class Room
d) Room C - 22'11" W x 13'10" L Center Storage Room
e) Climate Boss Add-on: RH Sensor, Automatic Dehumidification Cycle
f) 1 ea Weather Boss w/ Rain Sensor & Wind Speed (wind & rain alarm)
g) 1 ea. Weather Boss w/ Rain Sensor & Wind Speed (wind & rain alarm)

E. 8 ea. HAF 12" Air-Circulation Fans w/Manual Variable Speed Control

F. 4 ea. 2' x 4' Side Vents with Manual Corkscrew Openers (Room A-Grow Room) and (Room B-Class Room)

G. 7 ea 12'W x 28' L - 70 % Decorative Brown Panels – Plain only included Eye bolts.

Shade for both Room A - 22'11" W x 22' 11" L Growing Room &
Room B – 22'11" W x 22' 11" L Class Room and (1) for center room

2.4 FINISHES

A. Finish for all aluminum framing members and trim shall be manufacturer's standard semi-gloss baked-on Duracron enamel finish. Prepared, pre-treated, and applied coating to exposed metal surfaces to comply with AAMA Duracron 2603 specifications and with coating and resin manufacturers' written instructions. Available finishes:

~~a)~~ ~~Arctic White (Standard)~~
~~b)~~ ~~Hartford Green (Standard)~~
c) Rideau Brown (Standard)
~~d)~~ ~~Black (*available for additional cost)*~~

2.5 FABRICATION

A. Fabricate components in accordance with approved shop drawings. Remove burrs and rough edges. Shop fabricates, to greatest extent practicable, to minimize field cutting, splicing, and assembly. Disassembled only to extent necessary for shipping and handling limitations.

B. Fabricate components true to detail, and free from defects impairing appearance, strength or durability.

C. Fabricate components to allow for accurate and rigid fit of joints and corners. Match components carefully ensuring continuity of line and design.

D. Reinforce components at anchorage and support points, at joints, and at attachment points for interfacing work.

2.6 OPTIONAL ACCESSORIES

A. As noted on the quotation, will be supported with available documentation in the form of drawings, product sheets, or supplier-produced technical specifications.

PART 3 EXECUTION

3.1 EXAMINATION

A. The installer must examine the substratum and the conditions under which the work is to be installed and notify the contractor, in writing, of any conditions detrimental to the proper and timely completion of the work. Work is not to proceed until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. If the installers cannot proceed with the installation of the greenhouse structure due to the substratum and foundation not being properly prepared to handle the greenhouse weight, the customer will be responsible for any and all additional costs for the installers' time wasted and travel home and back to the job site when the site is corrected.

C. If substrate preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer to achieve the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Set all items in their correct location as instructed, level, square, and plumb, at proper elevations, and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings.

B. All counter-flashing shall be furnished and placed by Gothic Arch Greenhouses to match the greenhouse structure.

C. Anchor structure securely in place, allowing for required movement, including expansion and contraction.

D. Install glazing and sealants in accordance with the manufacturer's instructions without exception, including surface preparations.

E. Set sill members in the bed of sealant. Set other members with internal sealants to provide weather-resistant construction.

F. Install flashings, bent metal closures, corners, gutters, and other accessories as required or detailed.

G. Clean surfaces and install sealant in accordance with sealant manufacturer's instructions and structure manufacturer's guidelines.

H. Upon completion of the installation, it shall be the contractor's responsibility to make all necessary final adjustments to attain normal operation of each door, vent, accessory, and mechanical hardware.

I. It is not the greenhouse contractor's responsibility for the following: masonry, plumbing, electrical power, or control wiring for components.

3.5 SCHEDULE

A. Installation shall be staged as determined by the Resident Engineer and the General Contractor to ensure that the work of all trades is properly coordinated.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

GENERAL SECTION INCLUDES

TEMPORARY FACILITIES AND CONTROLS

A. Temporary sanitary facilities.
B. Barriers
C. Vehicular access and parking.
D. Waste removal facilities and services.
E. Project Identification sign.

TEMPORARY SANITARY FACILITIES

A. Use of existing facilities located at the University is not permitted
B. Provide and maintain required facilities and enclosures at time of project mobilization.
C. Maintain daily in clean and sanitary condition.

BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building, as applicable.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with Agent.
B. Provide and maintain access to fire hydrants, free of obstructions.
C. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

WASTE REMOVAL

A. Use of Owner's waste removal facilities or dumpsters is not permitted.
B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
C. Provide containers with lids. Remove trash from site periodically.
D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers.

1.2 PROJECT IDENTIFICATION

A. No project identification sign is needed. Any such sign design, construction, and location must be approved by Agent.
B. No other signs are allowed without Owner permission except those required by law.

GENERAL CLEAN-UP

The general Contractor shall be responsible for providing a dumpster and for the proper disposal of all work associated debris at an appropriate (for the type of debris), approved landfill.

The Contractor shall furnish all labor, materials, equipment, transportation, supervision, etc. necessary to remove existing soil, grade existing surfaces, and pour concrete in accordance with the plans.

It is the responsibility of the contractor to examine, study, establish existing grades and provide finish grades on the surface and in the ground to attain positive drainage of the new concrete work with the existing concrete and sidewalks.

Contractor shall be responsible for locating and identifying all existing utilities prior to any work.

SCHEDULING OF WORK

The work will be scheduled by UL Lafayette Physical Plant. The Contractor shall begin the work within ten (10) working days from the date of the University's request. The Contractor shall expedite the construction of sidewalks and striping of drives once the preparations, such as grading, etc., have begun. In other words, the Contractor shall work without interruption (except as due to weather), until the sidewalks and drives are completed. The Contractor shall provide a work force of sufficient size to complete the project within a minimum amount of time.

QUALIFICATIONS

Contractor must be able to furnish qualified concrete finishers, equipment operators, etc. This crew must be qualified to work with a minimum amount of supervision and accomplish the job as drawn and in an acceptable manner. If in the

opinion of the University the crew supplied cannot perform the required work, the University may cancel the remaining portion of this contract. Contractor may be required to supply a summary of experience indicating the ability of the Contractor to perform the required work.

UTILITY SERVICES

Survey existing conditions and correlate with drawings and specifications to determine extent of demolition required. Contractor shall contact DOTTIE to have the existing utilities located before any demolition is performed. The contractor shall be responsible for locating, identifying, and avoiding all underground utility lines as well as power poles supporting overhead electrical and data services.

CONCRETE

MATERIALS

Contractor shall furnish Portland Cement Concrete having a minimum compressive strength of 3500 psi at 28 working days.
Contractor shall provide forms of steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
Contractor shall use six-inch by six-inch six-gauge steel wire mesh reinforcement which shall be lifted during the placement of concrete to ensure that it is not touching the ground or protruding out of the concrete.
Contractor shall place required rebar for concrete placement according to the plan details.
Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.
Expansion joint filler shall be pre-molded, non-extruding type, ASTM D-544.
Joint sealer shall be asphalt filler AASHO M-18 or polyurethane compound ASTM C 920 Type S Class 2 self- leveling grade/type.
Metal keys shall be galvanized steel, 16-gauge tongue and groove joint, with 18-gauge tapered channel type stake pin and dowel holes. Metal keys shall have a removable zip strip for the installation of the joint sealant.
Curing and sealing compound shall conform to TT-C-800, with 30 % solids content minimum.

CONSTRUCTION PROCEDURE

The Contractor shall meet with the University representative to confirm the location of the new paving and to discuss items such as location of joints, grades, site drainage and pedestrian and vehicular controls before the construction begins.
Contractor shall demolish and remove certain portions of existing sidewalks where demolition is indicated in plans and specs.
The Contractor shall break out, remove, and properly dispose of existing concrete to the limits designated in the plans.
The Contractor shall saw cut existing concrete as indicated in plans to ensure straight, clean joints between existing sidewalks and new concrete.
Contractor shall drill and dowel existing concrete where it meets with new concrete 12” on center.
The Contractor shall install an expansion joint material where the new concrete joins the existing concrete.
Contractor shall check for unstable areas and report them to the University representative prior to placing forms.
Set forms to required lines and grades, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
Check completed form work for grade and alignment. Flat work shall be true to plane 1/8 inch in 10 feet.
Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.
Do not place concrete until forms have been checked for line and grade. Moisten sub-base if required to provide a uniform dampened condition at time concrete is placed.
Contractor shall place concrete around existing manholes, catch basins or other structures. This shall be considered in placement and elevation of form work to allow for a smooth uniform finish.
Place concrete using methods which prevent dislocation of dowels and joint devices.
Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

Construct expansion, and construction joints, true-to-line with face perpendicular to surface of concrete.
Construct transverse joints at right angles to the centerline, unless otherwise directed.
When joining to existing concrete, place transverse joints to align with previously placed joints, unless otherwise directed.
Construction joints (CJ) shall utilize standard metal keyway-section forms.
Construction joints shall be located as drawn.
Expansion joints (EJ) shall utilize pre-molded joint filler removable caps for expansion joints abutting catch basins, manholes, inlets, structures, walks and other fixed objects for the installation of joint sealer.
Expansion joints shall be located at 50-foot intervals or shall match exiting expansion joint locations and at locations where new concrete meets existing concrete.
Where load transfer-slip dowel devices are used at tie into existing concrete, install so that one end of each dowel bar is free to move.
Extend joint fillers full-width and depth of joint, and not less than 1/2 " or more than 1" below finished surface where joint sealer is indicated.
Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joints.
After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand method only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
After floating, test surface for trueness with a 10 ' straightedge. Distribute concrete as required to remove surface irregularities and refloat repaired areas to provide a continuous smooth finish.
Work edges of slabs, and formed joints with an edging tool, and round to 1/2" radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing by drawing a fine-hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a line texture acceptable to the University.
Do no remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas of sections with major defects, as directed by the University.
Protect and cure finished concrete paving. Use curing and sealing compound or moist-curing methods. Protect concrete from damage until acceptance of work. Immediately after initial set of concrete, the Contractor shall cover the new sidewalk or drive with plastic sheeting and shall barricade the sidewalk so that passersby cannot deface the concrete. The Contractor shall be responsible for repairing any defaced concrete at his own cost.

BARRICADES AND WARNING SIGNS

The Contractor shall be responsible for erecting and maintaining adequate barricades and warning signs at each work location. These barricades and warning signs shall include, but not be limited to, barricades, streamers, plastic fencing etc.
Pedestrian traffic shall be given a safe route around the work area. Some existing walks and parking areas will require temporary closure. Coordinate closure and temporary fencing with the University. Contractor shall maintain alternate traffic (pedestrian and vehicle) paths during demolition and construction. Where routes are permitted to be closed, provide alternate routes and coordinate with the University prior to rerouting.

PRESERVATION OF EXISTING SURFACES

Contractor shall take whatever precautions necessary to prevent physical, chemical, or permanent visible damage to existing concrete parking, trees and vegetation, curbing, fencing, gates etc. in the performance of this project.
Existing trees and their root structures that are in the construction area shall be protected to the maximum extent by fencing off to the drip line and Contractor shall not allow any material or spoils storage within protected areas, and shall not allow parking of vehicles on grass or in protected areas.

REMOVAL DISPOSAL

Remove the existing grass, soil, and sub-base at the work area to a depth sufficient to allow placement of the new concrete slab.
Excess soils shall be offered to the University and if declined shall be disposed of off University property.
Properly dispose of dirt, concrete, trash, and debris off site.

Contractor shall provide collection bags for concrete from truck wash outs and over pour, which shall be removed and properly disposed of University property.

SUBGRADE

Subgrade soils shall be inspected (not tested) for compaction.
Excavation shall be made to the required depth and width to permit placement of concrete and a turn down along the entire perimeter and as necessary to perform the work under this contract.
All soft and yielding material shall be removed and replaced with approved material, compacted and graded at contractor's expense.

EXPANSION JOINTS (EJ)

Contractor shall use as expansion joint, clear heart redwood or ½" fiber board held down 3/8" below finish elevation or a zip strip cap to allow for paving sealant.
Number 4 (1/2") smooth steel dowels 24" in length shall be spaced 12" apart and placed perpendicular to the expansion joint.
The dowels shall be secured in place with one side set in expansion tubes.

CONTROL JOINTS (CJ)

All control joints shall be cut prior to any walls being constructed.
All control joints shall be sawcut to a depth of 2" and filled with urethane sealant even with the concrete finish.

CONCRETE

Portland cement concrete pavement shall be straight cement with no additives.
Contractor may use Class A concrete, with a minimum of 5.0 bags of Portland cement per cubic yard and must reach 3500 psi compressive strength in 28 days.
No fly ash shall be used.
Concrete Testing Service: Owner may employ and pay for testing laboratory.
Use one brand of cement throughout project, unless otherwise acceptable to University Representative.

REBAR REINFORCEMENT

All rebar shall be #6 rebar and all rebar shall be preformed according to the plans and details.

CONCRETE PLACEMENT

The base shall be moistened prior to placement of concrete but not to the point of creating pools of water or mud.
Concrete shall be placed so as to avoid re-handling and continuous between joints. Intermediate bulkheads will not be allowed.
Concrete shall be screeded as soon as it is placed and screeding shall be repeated until the surface is uniform in texture, and true to grade and cross section.
Floating with a machine float will be required to provide the final smooth surface.

CURING MATERIALS

Liquid membrane-forming compounds shall conform to AASHTO M 148 and be an approved product listed on the DOTD Qualified Products List and shall be either Type 2 white-pigmented or Type 1-D, clear or translucent with a fugitive dye, as specified.

JOINT SEALANT

The contractor may use any of the poured joint sealers in Section 1005.02 of the DOTD Standard Specifications for Roads and Bridges.

NEW CONCRETE SLAB

Contractor shall construct the new concrete footings, greenhouse slab, and sidewalks according to the details on the

drawings.

CONCRETE BLOCK

Contractor shall construct with 8" x 8" x 16" split faced (one side only) concrete blocks the greenhouse chain wall according to the measurements and details on the drawings. Fill all block cells with 3500 psi pea gravel mix concrete IN A MONOLITHIC POUR. Install #6 rebar 32" on center from concrete footing to U-block bond beam and (2) #6 continuous rebars in beam. Install (2) 36" preformed corner bars at all corners. Install Dura-bond masonry anchors at every course. Contractor shall submit color and style of block prior to ordering. Block color, style, and mortar color shall match that on Greenhouse No.1.

BLOCK SEALERS

Contractor shall pressure wash new block and concrete of dirt and mortar then apply (2) heavy coats of PROSOCO Sure Klean H40 Water Repellant on all block surfaces, interior and exterior sides.

FINAL SIDEWALK AND GREENHOUSE LAYOUT SHALL BE APPROVED BY THE UNIVERSITY PRIOR TO CONSTRUCTION.

CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL GRADING OF THE SITE FOR POSITIVE DRAINAGE TO EXISTING CATCH BASINS, NEW YARD DRAINS, AND DRAINAGE SWALES AT NO COST TO THE UNIVERSITY.
CONTRACTOR SHALL HYDRO-SEED ENTIRE CONSTRUCTION AREA AFTER ALL WORK IS COMPLETE.

MECHANICAL GENERAL PROVISIONS

GENERAL

The General Conditions of the Specifications, along with the supplementary conditions, special conditions, information to bidders, and any other pertinent information and documents shall apply the same as if repeated herein.

SCOPE OF WORK

Furnish all labor and material necessary to provide and install the complete plumbing and mechanical portion of this Contract for Plumbing, and Air Conditioning, Heating and Ventilating Systems as called for herein and on accompanying drawings. Parts of the mechanical division may be bid separately or in combination, at the Contractor's option; however, it shall be the responsibility of the Contractor to assure himself that all items covered in the Mechanical Division have been included if he chooses to accept separate bids.

It is the intention of these Specifications that all plumbing and mechanical systems shall be furnished complete with all necessary valves, controls, insulation, piping, devices, equipment, etc. necessary to provide a satisfactory installation in working order.

Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.

This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be sufficient cause for the Owner to reject any piece of equipment.

DEMOLITION

The contractor shall visit the site prior to bid to determine the extent of work required to complete the project.

Contractor shall coordinate demolition with owner. The Owner shall have "First Right of Refusal" regarding salvage of all equipment and materials to be removed. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractor's expense.

Contractor shall coordinate all work with the Owner and phase work as required by project.

All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.

Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.

Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.

Contractor shall be responsible for draining down of existing systems to complete demolition work in phases. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.

All shut-down of services shall be done at night or during a time period approved by the owner. The systems shall be required to be back up and running each morning unless otherwise approved by the owner.

CUTTING AND PATCHING

Initial cutting and patching shall be the responsibility of the Contractor. The Contractor shall be responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimbled without first receiving the approval of the Owner. After initial surfacing has been done, any further cutting, patching and painting shall be done at the Contractor's expense.

FILL AND CHARGES FOR EQUIPMENT

Fill and charge with materials or chemicals all those devices or equipment as required to comply with the manufacturer's guarantee or as required for proper operation of the equipment.

CLEANING AND ADJUSTING

Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.

OPERATING AND MAINTENANCE INSTRUCTIONS

Provide services of authorized representatives of the manufacturer to ensure that the equipment is installed according to the manufacturer’s recommendations and is operating properly and to instruct the owner’s operating personnel during start-up and operating tests of complete mechanical systems. Prove proper operation of equipment to the Owner. Notify the Owner seven (7) days prior to beginning equipment start-up.

Certify in writing that these services have been performed.

Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.

COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.

This information shall be bound in plastic hardbound notebooks with the job name permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Owner for approval.

In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.

The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract.

SERVICE

Place mechanical systems in complete working order and clean and polish fixtures, equipment and materials thoroughly returning to "as new" condition prior to request for final review.

Remove excess material and debris. Clean out lines and fittings and adjust valves. Broom clean areas. Thoroughly clean ductwork inside and outside before grilles are installed.

GUARANTEE

The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of Notice of Final Acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. During this period, make good faults or imperfections that may arise due to defects or omissions in materials or workmanship with no additional compensation and as directed by the Owner. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.

If the Contractor's office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Owner for his approval.

LOCAL CONDITIONS

The location and elevation of all utility services is based on available plans and are reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.

In case major changes are required, this fact, together with the reasons therefor, shall be submitted to the Owner, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

PERMITS, INSPECTIONS AND TESTS

All permits, fees, etc. for the installation, inspections, plan review, service connections locations, equipment inspections and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor throughout the duration of the project.

The Contractor shall make all tests required by the Owner or other governing authorities at no additional cost to the Owner.

The Contractor shall notify the Owner and local governing authorities before any tests are made, and the tests are not to be drawn off a line covered or insulated until examined and approved by the authorities. In event defects are found, these shall be corrected and the work shall be retested.

Prior to requesting final inspection by the Owner, the Contractor shall have a complete coordination and adjustment meeting of all of his sub-contractors directly responsible for the operation of any portion of the system. At the time of this meeting, each and every sequence of operation shall be checked to assure proper operation. Notify the Owner in writing ten (10) days prior to this meeting, instructing him of the time, date and whom you are requesting to be present.

This project shall not be accepted until the above provisions are met to the satisfaction of the Owner.

CODES AND STANDARDS

The entire mechanical work shall comply with the rules and regulations of the City, Parish and State in which this project is being constructed, including the State Fire Marshal, State Office of Public Health, Local Heath Unit, OSHA, ANSI. All modifications required by these authorities shall be made without additional charge to the Owners. The Mechanical Contractor shall report these changes to the Owner and secure his approval before work is started.

In addition to the codes heretofore mentioned, all mechanical work and equipment shall conform to the applicable portions of the following specifications, codes and/or regulations:

1. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
2. National Electrical Code (NEC)
3. National Fire Protection Association (NFPA)
4. American Society of Mechanical Engineers (ASME)
5. American Gas Association (AGA)
6. International Building Code (IBC)
7. International Mechanical Code
8. International Fuel Gas Code
9. Underwriters Laboratories (UL)
10. Louisiana State Plumbing Code (2013 Edition) (Public Health - Sanitary Code)

All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All materials shall be new and of the best quality and first class in every respect. Whenever directed by the Owner, the Contractor shall submit a sample for approval before proceeding.

Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.

All unfired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel.

REVIEW OF MATERIALS

Whenever manufacturers or trade names are mentioned in these Plans or Specifications, the words "or Prior Approved Equivalent" shall be assumed to follow whether or not so stated. Manufacturers or trade names are used to establish a standard of quality only, and should not be construed to infer a preference. Equivalent products which meet the Owner's approval will be accepted; however, these products must be submitted to the Owner a minimum of ten (10) days prior to the Bid Date. Faxed copies or electronic submissions via E-Mail will not be accepted.

Submission shall include the manufacturer's name, model number, rating table and construction features.

Upon receipt and checking of this submittal, the Owner will issue an addendum listing items which are approved as equivalent to those specified. THE CONTRACTOR SHALL BASE HIS BID SOLELY ON THOSE ITEMS SPECIFIED OR INCLUDED IN THE "PRIOR APPROVAL ADDENDUM", AS NO OTHER ITEM WILL BE ACCEPTABLE.

Prior approval of a particular piece of equipment does not mean automatic final acceptance and will not relieve the Contractor of the responsibility of assuring himself that this equipment is in complete accordance with the Plans and Specifications and that it will fit into the space provided. Shop drawings must be submitted on all items of equipment for approval as hereinafter specified.

Before proceeding with work and/or within thirty (30) days after the award of the General Contract for this work, the

Mechanical Contractor shall furnish to the Owner complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves and other pertinent information.

The Owner's approval of shop drawings shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors which may be contained in these drawings. Any omission from the shop drawings or specifications, even though approved by the Owner, shall not relieve the Contractor from furnishing and erecting same.

Ten (10) sets of shop drawings shall be submitted to the Owner for approval. These submittals shall be supplied as part of this Contractor's contract. Any drawings not approved shall be resubmitted until they are approved. Faxed copies and electronic submissions via E-Mail will not be accepted.

MINOR DEVIATIONS

Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes and manner of erecting work. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Owner for approval before proceeding. Extra charges shall not be allowed for these changes. The contractor shall obtain a full set of plans and specifications for the coordination of his work prior to bidding this project. Items which are unclear to the bidding contractor shall be brought to the Owner’s attention prior to bidding the project. An interpretation shall be clarified by the Owner prior to bidding.

The Contractor shall realize that the drawings could delve into every step, sequence or operation necessary for the completion of the project, without drawing on the Contractor's experience or ingenuity. However, only typical details are shown on the Plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.

In general, the drawings are diagrammatic, and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Owner is to state which item was first installed.

AS-BUILT DRAWINGS

The Contractor shall obtain at his cost, two sets of black-line prints of the original bid documents by the Owner. One set shall be kept on the site with all information as referenced below and shall update same as the work progresses. The other set will be utilized to record all field changes to a permanent record copy for the Owner.

If the Contractor elects to vary from the Contract Documents and secures prior approval from the Owner for any phase of the work, he shall record in a neat and readable manner, ALL such variances on the black-line print in red. The original blue lines shall be returned to the Owner for documentation.

All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.

In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.

Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.

For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The Owner's decision in this matter will be final.

The following requirements apply to all "As-Built" drawings:

(1) They shall be maintained at the Contractor's expense.
(2) All such drawings shall be done carefully and neatly, and in a form approved by the Owner.
(3) Additional drawings shall be provided as necessary for clarifications.
(4) These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Owner; and when necessary, to establish clearances for other parts of the work.
(5) "As-built" drawings shall be returned to the Owner upon completion of the work and are subject to approval of the Owner.

MANUFACTURER'S DIRECTION

The mechanical contractor shall install and operate all equipment and materials in strict accordance with the manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement the Drawings and Specifications.

Store equipment in a clean, dry place protected from other construction. While stored, maintain factory wrapping or tightly cover and protect equipment against dirt, water, construction debris, chemical, physical or weather damage, traffic and theft.

BASIC MATERIALS AND METHODS

PIPE

SANITARY SEWER WASTE AND VENT LINES

Sanitary Sewer Waste and Vent Piping and Fittings shall be constructed of American Made solid wall Schedule 40 PVC "DWV" plastic pipe and fittings with solvent welded joints as manufactured by Charlotte Pipe and Foundry or J M Manufacturing. All piping shall conform to ASTM D 1784, all fittings shall conform to ASTM D 2665, and solvent cement joints shall be made in a two (2) step process with colored primer and cement conforming to ASTM D 2564. All piping components shall be NSF Standard 14. Submit piping as specified.

Cellular foam core piping will not be considered for use.

Sanitary sewer pipe penetrating concrete slabs shall be wrapped with Virginia Chemical K-501, Benjamin Manufacturing Model 6200, or equal foam insulation tape.

DOMESTIC WATER LINES

Domestic Water Lines shall be Government Type "L", hard copper water tubing of standard weight and thickness as made by Mueller, Chase, Anaconda or equivalent, unless indicated otherwise. Use lead free solder on all piping above slab. Braze all piping beneath the slab. Submit piping as specified.

Domestic water lines penetrating concrete slabs shall be wrapped with "Protect-O-Sleeve" vinyl flexible tube as manufactured by Robert H. Harris Co., or equivalent. (Color shall be red for hot water and blue for cold water).

Domestic hot water lines shall be insulated at all penetrations through slab per insulation section.

NATURAL GAS PIPING

Natural gas piping shall be American made standard black steel, Schedule 40, National Tube Co., or Wheatland Tube Co. Fittings which are 2 inches and below shall be malleable screw fittings.

Piping above 2 inches shall be electrically welded utilizing weld fittings.

Piping shall be painted yellow at all areas.

CONDENSATE DRAIN LINES

Condensate Drain Lines shall be Schedule 40 PVC plastic pipe and fittings with solvent weld joints. Install trap at all air handling equipment.

Provide air gap between the indirect waste and the building drainage system in accordance with Louisiana State Plumbing Code (2013 Edition) (Public Health - Sanitary Code) (805 & 807).

All condensate drain lines between the AHU or FCU Unit and the independent condensate drainage system shall be Schedule 40 PVC plastic pipe and fittings with solvent weld joints.

Install condensate drain piping in accordance with manufacturer's recommendations.

Condensate Drainage System Pipe shall be supported at no more than 5 ft. intervals with steel hangars secured in the existing structure above.

CHILLED WATER PIPING

Chilled Water Piping shall be standard black steel, Schedule 40. Fittings two inches and below shall be malleable screw fittings. Piping above two inches shall be electrically welded utilizing welded fittings. All elbows shall be long radius type.

Utilize dielectric unions between steel and copper piping.

All new piping, valves and fittings shall be coated with rust-inhibiting primer coat prior to insulation.

HVAC HOT WATER PIPING

HVAC Hot Water Piping shall be standard black steel, schedule 40. Fittings two inches and below shall be malleable screw fittings. Piping above two inches shall be electrically welded utilizing welded fittings. All elbows shall be long radius type.

Utilize dielectric unions between steel and copper piping.

All new piping, valves and fittings shall be coated with rust-inhibiting primer coat prior to insulation.

INSTALLATION OF PIPING

All pipe shall be true and straight, without sags or traps.
The Contractor shall exercise care in cleaning joints after making cuts on pipe to prevent pipe particles from entering the system.

All pipe fittings shall be same as piping specified unless indicated otherwise.

Arrange, install piping approximately as indicated, straight, plumb and as direct as possible; form right angles, or parallel lines with building walls. The most practical appearance of piping runs is required. Keep pipes close to walls, partitions, ceilings; off-set only where necessary to follow walls as directed.

Before installing piping, check plumbing and HVAC drawings with architectural, mechanical, structural, electrical drawings; make accurate layout of HVAC piping. Where interferences may appear and departures from indicated arrangements are required, consult with other trades involved; come to agreement as to changed locations and elevations of piping; obtain approval of proposed changes. Note runs of other contractor's piping and large conduits and cooperate to achieve neat appearance.

Unless otherwise indicated, conceal all piping in building construction in finished areas. Install such piping in time so as not to cause delay to work of other trades and to allow ample time for tests and approval; do not cover before approval is obtained.

Locate groups of pipes parallel to each other and building lines; space them at distance to permit access for servicing, valves, and to create most practical appearance when racked with conduits, refrigerant, etc., provided by other contractors.

Rigidly support pipes in walls and/or utility chases, projecting from walls, chases, etc. to make firm, well-braced installation. Loosely supported pipe or accessory is not acceptable.

Install horizontal piping to coordinate with other trades and install without sags or humps.

Grade inside condensate piping at uniform slope of 1/4 inch per foot, minimum; where this is impossible, maintain slope as directed but in no case less than 1/8 inch per foot. Waste lines 3 inches and smaller must grade at minimum 1/4 inch per foot. See Drawings for fall on exterior sewer lines.

Grade other piping as specified under heading or service where used, or as directed.

Keep piping free from scale and dirt, protect open pipe ends wherever work is suspended during construction. To prevent foreign bodies entering and lodging in pipe, use temporary plugs or other approved material.

Where changes in pipe sizes occur, do not bush down; use only reducing fittings. For drainage piping changes in direction, use long-sweep-bends where possible; otherwise, short sweep 1/4 bends or combination Y and 1/8 bends; also Y's in combination with other bends.

Provide shut off valves at all connections to all equipment. Supplier of equipment shall provide rough-in drawings and this contractor shall fully connect all items, supply necessary piping and fittings as required, unless otherwise noted individually.

Do not locate valves with stems below horizontal.

Locate valves for easy access and operations. Where concealed, verify exact location in order that openings are provided for access panels. Provide access panels.
Provide unions, screwed or flanged, where indicated, and in following locations even if not indicated.

1. In connection to equipment requiring disconnection for repairs or replacement. Locate between shut-off and equipment.

Weld-O-let fittings shall be used in iron pipe.

All screwed fittings and pipe shall have threads cut to standard pipe thread dimensions. Pipe shall be properly reamed after cutting of threads.

Joint compound, Rector Seal Series 100, LACO Series Slick-Tite or equal thread lubricant shall be applied to male threads of the screwed pipe and fittings only.

Approved expansion joints or flexible couplings shall be provided as necessary.

Care shall be taken in making up pipe and fittings such that the pipe does not extend into fitting sufficiently to reduce the waterway.

Standard, one-piece reducing fittings of approved design shall be used wherever a change in size is made. Changes in pipe sizes shall not be made by means of reducing flanges.

Bushings may be used only where standard, one-piece reducing fittings are not available and shall be subject to the following:

(1) Bushings shall be of the face or flush type.
(2) Bushings shall not be used in elbow fittings.
(3) Bushings shall not be used when the reduction in size of the outlet is less than 1/2".
(4) Bushings shall not be used in more than one outlet of any tee or two outlets of any cross fitting.

PIPE SPECIALTIES
Dielectric unions shall be used between copper and iron pipe.

RATED WALL OR FLOOR PENETRATIONS
Piping penetrating fire rated walls, floors, or ceilings shall be sealed with fire rated sealant in accordance with the manufacturer's recommendations for the specific U.L. Assembly.

Piping penetrating fire rated walls or ceilings shall be sealed with fire rated sealant in accordance with the manufacturer's recommendations for the specific U.L. Assembly.

PIPE HANGERS AND SUPPORTS
This Contractor shall furnish and install all foundations and supports required for his equipment unless indicated otherwise on the Drawings.

This Contractor shall furnish and install all escutcheons, inserts, thimbles, hangers, etc. required for the proper support and installation of his equipment and piping and he shall cooperate with other trades in locating and placing these items.

PROVIDE SLEEVES FOR ALL PIPES PASSING THROUGH WALLS, FLOORS, BEAMS, ETC
Sleeves passing through structural members or concrete footings shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through nonstructural walls or floors shall be of 26-gauge galvanized iron. Joints between sleeves and pipes passing through floors shall be made weather-tight with plastic materials. Where pipes pass through waterproofing membrane, flashing sleeves shall be installed.

Provide Grinnell, Fee & Mason, or equivalent malleable iron split ring hangers with rod supports throughout. STRAP HANGERS OR WIRE WILL NOT BE ACCEPTED.

Maximum spacing of hangers for cast iron pipes shall be 5 ft.

Provide galvanized iron shields between hangers and pipe covering.

Provide Grinnel, Fee & Mason, Crane or equivalent heavy steel riser clamps on vertical risers at floors to support pipes.

Provide chrome plated brass escutcheons wherever pipes pass through floors, walls or ceilings in exposed or finished

areas.

All piping projecting from chases shall be rigidly supported in the wall or chase. Loosely supported fixtures or accessories will not be accepted.

VALVES AND UNIONS

Furnish and install all valves, unions, stops, connections, etc. shown on plans as necessary to make a complete system in working order. Provide valves on inlet and outlet of all equipment and fixtures and on branch lines to fixtures or groups of fixtures.

Ball Valves, 3" and smaller, rated for 150 PSI (250 PSI for Compressed Air Piping) saturated steam pressure, 600 PSI WOG pressure; shall be 2-piece construction, bronze body conforming to ASTM B-62, conventional port, chrome-plated brass ball, replaceable TFE seats and seals, blow-out proof stem, and vinyl-covered steel handle. Provide solder ends of Kitz 59/69, Apollo 77C, NIBCO Design S-580-70, Milwaukee BA-150-S, Red & White 5049F or equal, threaded ends of Kitz 58/68, NIBCO Design T-580-70, Milwaukee BA-100-S, Red & White 5044F or equal. For insulated piping systems, provide ball valves with extended stem, insulated handle with protective thermal barrier sleeve to prevent condensate moisture drip and pipe insulation deterioration. Valves shall be rated for use with required fluid used within piping.

Select Valves with the following ends or types of pipe/tube connections:

Copper Tube Size 2 Inch and Smaller: Solder ends, except provide threaded ends for connection to equipment, etc.

Steel Pipe Sizes, 2 Inch and Smaller: Threaded or grooved end.

Steel Pipe Sizes, 2-1/2 Inch and Larger: Grooved end or flanged.

INSTALLATION OF VALVES

Use ball valves for shut-off duty.

Locate valves for easy access and provide separate support where necessary.

Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown. Unions are not required on flanged devices.

Install valves in horizontal piping with stem at or above the center of the pipe.

Install valves in a position to allow full stem movement.

All valves, unions, etc. where pipe is chrome plated shall have similar finish. All exposed supplies to plumbing fixtures shall be chrome plated.

All valves, on insulated piping shall be complete with extended lever handle stem.

ESCUTCHEONS

Provide escutcheons for all exposed lines passing through floors, walls, and ceilings. They shall be chrome plated brass and shall be of such flange size as to cover necessary penetrating openings.

TEST

Make such tests of work as specified, or required by Owner, Manufacturer, or by State and Municipal Bureaus having jurisdiction, and under their supervision. Perform tests in presence of Owner's representative. Notify Owner two days prior to testing.

Provide apparatus, temporary piping connections, or other requirements necessary for tests. Take precautions to

prevent damage to building or contents by tests. Contractor is required to repair and make good at his expense damage so caused.

Correct leaks, defects, or deficiencies discovered as result of tests. Repeat tests until test requirements are met. Caulking of pipe joints to remedy leaks is not permitted.

STERILIZATION
Sterilize all water lines in strict accordance with State Board of Health requirements.

ELECTRICAL WORK
The Mechanical Contractor shall coordinate with the Electrical Contractor for installation of equipment. All electrical work not indicated on the electrical drawings that is required to provide a complete operable HVAC System shall be the responsibility of the Mechanical Contractor. The Mechanical Contractor shall provide sub-contractor(s) capable of preforming the required scope of work. All work shall be coordinated with the Electrical drawings.

PIPE MARKERS
Provide pipe markers and directional arrows on all piping exposed, above ceilings, in utility chase, and/or within cabinets, and on both sides of all valves located above ceiling. Markers shall be as manufactured by W.H. Bradley Co., or the equivalent. All letters shall be color-coded and sized as recommended by OSHA. Samples of the type of letters to be used shall be submitted with shop drawings.

The following pipe shall be identified:

HVAC Hot Water Supply	X
HVAC Hot Water Return	X
HVAC Chilled Water Supply	X
HVAC Chilled Water Return	X
Natural Gas	X
Condensate Drain Piping	X

Pipe markers with arrows shall indicate lines content and shall be located 20 feet on center and at each charge of direction of line. Identification bands shall be color coded to match pipe markers and shall be provided 10 feet on center. Pipe identification markers shall be taped at each end and shall be taped around the entire circumference of pipe.

INSULATION

GENERAL:
Pipe insulation shall not begin until all work has been tested and found to be tight. All insulation jackets, adhesives, sealers, tapes and mastic shall meet the latest NFPA requirements and shall meet 25/50 flame spread and smoke developed ratings.

All insulation shall be installed in strict accordance with the manufacturer's recommendations.

All pipe insulation where recommended by the manufacturer shall be banded with aluminum bands, three to a section and with one band on each side of each fitting, valve, etc.

Insulation shall be continuous through walls and ceilings.

All valves, strainers, etc. shall be insulated the same as its adjacent piping and the covering shall extend all the way up to the equipment.

USE HIGH DENSITY INSULATION INSERTS AT HANGERS ON ALL PIPING 1.5" AND ABOVE TO PREVENT CRUSHING OF INSULATION.

THERMAL INSULATION

After all work has been tested and approved, insulate as follows:

INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

DOMESTIC WATER PIPING

All domestic hot and cold water lines located above in exterior walls shall be insulated with **1" high density fiberglass insulation**. All domestic hot and cold water lines located above slab within interior walls, above ceilings, and in utility chases shall be insulated with **1/2" high density fiberglass insulation**. Insulation shall have Owens/Corning "25 ASJ/SSL" or Knauf ASJ-SSL Universal Fire Retardant Jacket, All laps are to be sealed and stapled in place. **Fittings are to be Zeston 25/50 PVC, Knauf 25/50 rated PVC, pre-molded fitting covers with fiberglass inserts.**

All water lines exposed inside cabinets shall be covered with a **White colored 0.020 PVC jacket** with solvent welded seams and joints. Provide color sample.

CONDENSATE DRAIN PIPING

All condensate drain lines between the AHU and/or FCU and the independent condensate drainage system shall be insulated with **1" thick** flexible closed cell elastomeric thermal tube pipe insulation as manufactured by Armaflex AP, Rubatex or prior approved equal. All joints are to be firmly butted together. All lamp and butt joint strips are to be sealed in place with vapor barrier adhesive. Fittings are to be mitered segments of insulation held in place with vapor barrier sealant. Engineered Polymer Foam Insulation (EPFI) will not be accepted. Insulation shall be applied in accordance with manufacturer's recommendations and instructions. Insulation shall be rated for use in return air plenum applications.

HVAC FLEX-CONNECTIONS

Shall be wrapped on outside with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.

Insulation shall have a minimum R-value of R-6 if located in an unconditioned space or R-8 if located outside of building.

SUPPLY AIR DIFFUSERS WITH PLENUMS

Plenums shall be completely covered with 2.125" minimum thickness, 3/4# density, minimum installed R-value of R-6.0, fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations. Overlap insulation 6" around perimeter of diffuser.

CHILLED WATER SUPPLY AND RETURN PIPING

Existing piping within work area shall have existing pipe insulation removed, piping dried, and piping shall be re-insulated with foamglass or approved equivalent pipe covering with factory applied Flame Bar Jacket to pipe with all joints firmly butted together. Seal all laps and butt joint strips with vapor barrier adhesive. Fittings to be insulated with pre-fabricated fitting covers and finished with an envelope coverage of solvent based, vapor barrier mastic reinforced with Foster 30-35, Childers CP-30LO, Insulacoustic 501-C or prior approved equal. Coat all service jacket (ASJ) seams with same vapor barrier coating to prevent moisture ingress.

Seal all Foamglass insulation butt and longitudinal joints with Foster 95-50 or Childers CP-76 sealant. Thickness to be 1" thick for pipe sizes up to and including 2", 1.5" thick for pipe sizes from 2.5" to 6", and 2" thick for pipe sizes 8" and above.

Finish entire installation with a white 0.020 PVC covering fittings with clear solvent weld joints and seams suitable for installation in return air plenum.

At Contractor's Option: Pipe insulation may be Armaflex closed cell elastomeric foam insuation with self seal longitudinal seal sealer. Insulation thickness shall be **2" thick** for pipe diameters 1.5" diameter and above. Insulation thickness may be **1" thick** for piping 1" diameter and below. Insulation shall be firmly butted together and seams shall be sealed with Armaflex 520, Foster 85-75, or Childers CP-82 adhesive. Fabricated fittings shall be used at all elbows and tees. Armafix IPH, NPH Pipe Hangers shall be used at all supports. The entire installation shall be coated with two (2) coats of Armaflex WB, or Foster 30-64. Finish white water-based latex enamel coating or prior approved equivalent prior installing PVC or Aluminum Jacket. 0.020 PVC Jackets and Aluminum Jackets with sheetmetal saddles at supports shall be required as noted above. At Contractor's option may cover piping with Venture Clad 1577CW multi-layered laminate coated, acrylic pressure sensitive adhesive jacket system.

Control and shut-off valves shall be completely covered and reinsulated to prevent condensation on exposed surfaces.

HOT WATER HEATING SUPPLY AND RETURN LINES

Existing piping within work area shall have existing pipe insulation removed, piping dried, and piping shall be re-insulated with 3.5 pound density fiberglass pipe covering. Finish to be factory applied flame safe vapor barrier jacket sealed and stapled in place.

Thickness to be 1/2" for run-outs up to and including 2" and 1.5" thick for other pipe sizes.

Finish entire installation with white 0.020 PVC covering and fittings similar to above.

At Contractor's Option: Pipe insulation may be Armaflex closed cell elastomeric foam insuation with self seal longitudinal seal sealer. Insulation thickness shall be 2" thick for pipe diameters 1.5" diameter and above. Insulation thickness may be 1" thick for piping 1" diameter and below. Insulation shall be firmly butted together and seams shall be sealed with Armaflex 520, Foster 85-75, or Childers CP-82 adhesive. Fabricated fittings shall be used at all elbows and tees. Armafix IPH, NPH Pipe Hangers shall be used at all supports. The entire installation shall be coated with two (2) coats of Armaflex WB, or Foster 30-64. Finish white water-based latex enamel coating or prior approved equivalent prior installing PVC or Aluminum Jacket. PVC and Aluminum Jackets with sheetmetal saddles at supports shall be required as noted above or Venture Clad 1577CW multi-layered laminate coated, acrylic pressure sensitive adhesive jacket system.

Control and shut-off valves shall be completely covered and reinsulated to prevent condensation on exposed surfaces

INSULATION THROUGH HANGERS AND SLEEVES

The insulation shall be continuous through pipe hangers and pipe sleeves. At hangers where the pipe is supported by insulation, provide a galvanized iron protection shield. Provide pipes 1.5-inch i.p.s. and larger with insulation inserts at points of hanger supports. The inserts shall be of calcium silicate, cellular glass, pre-stressed molded glass fiber of minimum 13-pound density, or other approval material of the same thickness as adjacent insulation and not less than 13-pound density. The inserts shall have sufficient compression strength to adequately support the pipe without compressing the inserts to a thickness less than the adjacent insulation. Inserts shall be 180 degrees and not less than the length of the protection shield. Vapor barrier facing of the insert shall be the same as the facing on the adjacent insulation. Where copper clad hangers are used on domestic copper pipe, insulation may cover pipe and hanger. Provide 18 gauge metal saddles (minimum 12" long) between all hangers and insulation.

INSULATION THROUGH FLANGES, VALVES, ELBOWS, ETC.

The insulation shall be continuous around flanges, valves, elbows, and other devices located in the piping system. Provide fiberglass packing around devices where rigid insulation will not meet the contour of the device. Cover insulation with universal jacket and vapor barrier mastic and reinforcing mesh Fosters 30-35, Childers CP-30LO, Insulacoustic 501-C or prior approved equal. Cover entire installation as indicated above.

WATER SUPPLY

SERVICE

The Contractor shall extend water throughout the project as indicated on the Drawings.

GENERAL

All water supply piping shall be of materials hereinbefore specified. Make provisions for expansion and contraction of hot water lines by means of expansion bends or loops as required.

All water lines shall be disinfected in accordance with the latest State of Louisiana Sanitary/Plumbing Code, (with Louisiana amendments).

All solvent cements and primers used to join or seal PVC pipes shall comply with the requirements of coANSI/NSF 14.

Make up the complete water supply system. Connect to all fixtures and outlets requiring water. All exposed piping shall be

chrome plated.

At each fixture or group of fixtures with lines 1-1/4" or below, furnish and install a 12" high air chamber of same size as branch feed line. On lines 1-1/4" and above and at fixtures with quick closing valves such as dishwashers, tempered water valves, etc., install "Shocktrol", "Precision Plumbing Products" or equal water hammer arrester properly sized for each unit.

All piping and outlets conveying nonpotable water shall be adequately and durably identified by a distinctive yellow - colored paint so that it is readily distinguished form piping carrying potable water. See ANSE A13.1. Where nonpotable water is used, all valves, branch fittings and branch terminals shall be identified by the words “nonpotable water.” This identification shall be done in accordance with ANSI A13.1. Such identifications shall not be concealed by pipe insulation and when insulated the insulation shall be painted the same color as is required for the pipe.

All plumbing fixtures equipped with flushometers shall be provided with approved vacuum breakers. The vacuum breaker shall be installed on the discharge side of the flushing valve with critical level at least four inches above the overflow rim of the bowl.

All materials used for plumbing installation shall comply with standards and specifications of MATERIALS FOR PLUMBING INSTALLATIONS of the standard plumbing code. Each length of pipe and each pipe fitting, trap, fixture and device used in the plumbing system shall be marked in accordance with the approved standard and specifications to which it is manufactured. All materials used shall be installed in strict accordance with the standards under which materials are accepted and approved.

All new potable water pipes, pipe related products and materials that join or seal pipes and pipe related products shall be evaluated and listed as conforming with a national consensus product (or material) standard and ANSI/NSF Standard 61.

All plastic plumbing pipes, plastic plumbing piping components and related material shall be listed as conforming with NSF Standard 14.

All backflow preventers shall comply with appropriate American Society of Sanitary Engineering Standards (ASSE).

All piping in a plumbing system shall be installed without undue strains or stresses and provision shall be made for expansion, contraction and structural settlement. Vertical and horizontal piping shall be secured at sufficiently close intervals to keep the pipe in alignment and prevent sagging. Hangar/support spacing for vertical piping shall be in accordance with the standard plumbing code. Hangar/support spacing for horizontal piping shall be in accordance with the standard plumbing code.

New plumbing shall be disinfected with chlorine solution containing at least 50 parts per million of available chlorine and allowed to remain in the lines for at least 6 hours, a chlorine residual of at least 5 ppm should remain before the lines are put into use.

TESTING

All domestic water lines, unless elsewhere specified, shall be tested under 200 psi hydrostatic pressure for a minimum of five hours.

WASTEWATER DISPOSAL

SERVICE

Extend sanitary sewer waste and vent lines as indicated on Plans.

CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF SEWER MAIN PRIOR TO ROUGH-IN.

GENERAL

The system of sewage and drainage in general shall be as hereinbefore specified.

All work shall be in strict accordance with the latest Louisiana State Sanitary/Plumbing Code (with Louisiana amendments) and in accordance with all local codes. Piping shall be routed as shown on Plans or in an acceptable manner to meet building conditions. Venting shall be as shown on plumbing riser diagrams.

Connections between traps and below slab shall be deep-seal p-traps.
Provide reducers, increasers, special flanges, wax seals, and fittings where required between piping work and fixtures in order to connect and complete work and render it ready for use. Make any offsets required to avoid construction.

All water closets shall be mounted with 4" closet bends.

Offset water closet flanges shall be prohibited. Incorrect rough-in dimensions for water closets shall be corrected below slab to meet water closet installation requirements.

All lines 2" and smaller shall be sloped 1/4" per foot; all lines 3" and larger shall be sloped 1/8" per foot. Piping shall be laid so slope is continuous.

All horizontal sewer vent piping located in walls connecting fixture batteries shall be sloped upwards towards vent thru roof and be a minimum of 48" above finished floor. In no case shall a vent be less than 6" above the fixture flood rim.

All materials used for plumbing installation shall comply with standards and specifications of MATERIALS FOR PLUMBING INSTALLATIONS of the standard plumbing code. Each length of pipe and each pipe fitting, trap, fixture and device used in the plumbing system shall be marked in accordance with the approved standard and specifications to which it is manufactured. All materials used shall be installed in strict accordance with the standards under which materials are accepted and approved.

All plastic plumbing pipes, plastic plumbing piping components and related material shall be listed as conforming with NSF Standard 14.

All piping in a plumbing system shall be installed without undue strains or stresses and provision shall be made for expansion, contraction and structural settlement. Vertical and horizontal piping shall be secured at sufficiently close intervals to keep the pipe in alignment and prevent sagging. Hangar/support spacing for vertical piping shall be in accordance with the standard plumbing code. Hangar/support spacing for horizontal piping shall be in accordance with the standard plumbing code.

TESTING
Test all sanitary sewer waste and vent lines inside building with a minimum of 10' water head for 15 minutes, in accordance with the latest State Sanitary/Plumbing Code (with Louisiana amendments).

NATURAL GAS DISTRIBUTION

GENERAL

Gas piping shall be of materials as hereinbefore specified and installed in accordance with NFPA 54.

Provide valved outlet and rigid pipe connection at each piece of equipment requiring gas service.

All gas piping shall be run exposed. All gas piping not exposed shall be encased with Schedule 40 galvanized steel sleeves with open ends. ALL PIPING THROUGH WALLS SHALL BE SLEEVED.

TESTING
All low-pressure gas piping (New and Existing) shall be tested with a 10" mercury column for thirty (30) minutes.

PLUMBING

GENERAL

Furnish all labor and materials as hereinbefore specified, indicated or reasonably implied for the complete installation of the following systems:

Greenhouse and Exterior Drainage System (Yard Drains)
Storage Shed Drainage System
Water Supply System
Natural Gas System

YARD DRAINS (MARKED "YD")

Furnish and install 6" yard drains in Greenhouses and on the exterior of each greenhouse where shown on plans. Yard drains shall be constructed as per details on the plans.

Tops shall be: East Jordan Drains with Grate, Model# GR6212-M2 with frame set in concrete as shown.

FLOOR DRAINS (MARKED "FD")

Furnish and install a 3" cast iron floor drain with 6" square top (JR Smith – 2005B) (or approved equal) in storage shed.

Provide Proset Systems Trap Guard assembly in floor drain.

SINK

Furnish and install new Stainless-Steel Sinks where shown on plans in Greenhouse No.2.

Sinks shall be as follows:
24" x 36" Stainless Steel Utility Sink with 24" Drain Board on Legs
Regency – Item # 600S13624BKT MFR#: KIT, Complete with sink, faucet, 2-1/2" outlet basket strainer, 2-1/2" drain, and hardware.

Sink in Greenhouses shall have a stainless-steel backing riveted to frame to hide faucet piping above block wall.

Contractor shall make final water and drain connections.

Extend cold water piping (type "L" copper) to both hot and cold side of sink faucet. Provide double stop at wall.

Contractor shall extend 2-1/2" drain piping from sink tail piece to 3" drain riser with 3" x 4" bell reducer from below slab. Sink drain shall be indirect. All piping shall be against block wall and shall be sleeve protected from mortar and concrete.

NO TRAPS ARE NEEDED FOR FLOOR DRAINs, YARD DRAINS, AND SINKS.

HVAC, AIR CONDITIONING, HEATING AND VENTILATING

GENERAL

The air conditioning system, in general, shall be for the entire building, providing cooling and dehumidification in summer and heating in winter. A constant amount of fresh air shall be taken into the system and all air shall be filtered.

VARIABLE REFRIGERANT FLOW EQUIPMENT

The heat pump air conditioning system shall be a Mitsubishi Electric split system with Variable Speed Inverter Compressor technology. The system shall consist of a horizontal discharge, single phase outdoor unit, a matched capacity indoor section that shall be equipped with a wired wall-mounted, wireless wall-mounted, wireless handheld, or other remote controller. The systems shall provide simultaneous cooling and heating split system outdoor units and indoor units.

The heat pump system shall consist of an outdoor units, indoor horizontal suspended units, and thermostats controllers.

The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.

Equipment shall meet the latest requirements of ASHRAE 90.1 2010 Standards.
All wiring shall be in accordance with the National Electrical Code (N.E.C.).

A full charge of R-410A for the condensing unit only shall be provided in the condensing unit. The contractor shall provide refrigerant as required to properly charge the refrigerant piping system.
Units shall be stored and handled according to the manufacturer's recommendation.

The units shall be covered by the manufacturer's limited warranty for a period of one (1) year from date of substantial completion of the project. The contractor shall be responsible for one (1) years labor warranty for the entire installation (including but not limited to material/equipment provided by the owner.

Contractor shall be responsible for (1) one year parts and labor warranty for all materials furnished and installed by the contractor.

Contractor shall also be responsible for any refrigerant lost during the (1) one year warranty period resulting from any leaks that develop.
The contractor shall provide the following system features:

1) The system, refrigerant piping, and controls designed by a factory certified Designer.
2) The system, refrigerant piping, and controls shall be installed by a certified Dealer.
3) The entire system shall be verified with a completed commissioning report submitted to the manufacturer by a factory authorized agent.
4) The units shall then be covered by an extended manufacturer's limited warranty for a period of five (5) years from date of installation. The contractor will be required to provide a certified designer, Commissioning Report, etc.

In addition, the compressors shall have a manufacturer's limited warranty for a period of six (6) years from date of substantial completion of the project.

If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

This extended warranty shall not include labor.

The VRF system shall be installed by an authorized manufacturer's Dealer with extensive manufacturer's installation and service training. The mandatory contractor service and installation training should be performed by the equipment manufacturer.
In order to obtain the manufacturer's extended warranty, the contractor installing the VRF equipment must have completed the installation, service, and designer training prior to first date of advertisement for bids for this project. A minimum of two (2) people must be actively employed by the contractor and have certificates showing successful completion of the installation, service, and designer training by an approved VRF manufacturer. The sub-contractor shall only bid on equipment that they have completed the training (noted above) from the manufacturer of the product that the contractor intends to use on the project prior to bid date of the project. Training certificates must be submitted with the construction schedule and schedule of values at the Pre-Construction Conference at the beginning of the project.

The mechanical contractor shall be responsible for informing the electrical contractors bidding the project of any differences in electrical required by specific manufacturers (e.g.: individual motor rated switches for Refrigerant Flow Controllers (e.g.: BC, etc.), additional power wiring, etc.) to accommodate a specific manufacturer. These modifications required to accommodate a manufacturer shall be provided at no additional cost to the owner.

Refrigerant piping throughout the entire project shall be installed in accordance with manufacturer's recommendations. The manufacturer shall provide a qualified representative to visit the site (minimum of 2 visits) to review installation and submit a written report indicating that the system is being installed in accordance with the manufacturer's recommendations.

All refrigerant piping shall be installed in accordance with manufacturer's recommendations with proper spacing between joints, between joints and elbows, between elbows and refrigerant flow controllers, etc. Refrigerant Flow Diagrams and control wiring diagrams shall be included with shop drawings.

OUTDOOR UNIT (SIMULTANEOUS COOLING & HEATING)

General

The PUZ Series outdoor units are specifically designed to work with the wall mounted, ducted, 4-way cassette, ceiling suspended and multi-position air handler indoor units. The connected indoor unit shall be of the same capacity as the outdoor unit. The outdoor units must have a thermally fused powder coated finish. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit shall be run tested at the factory.
If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor. Contractor responsible for ensuring alternative brand compatibility in terms of availability, physical dimensions, weight, electrical requirements, etc.
Outdoor unit shall have a sound rating no higher than 53 dB(A). If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.
Refrigerant lines from the outdoor unit to the indoor units shall be insulated in accordance with the installation manual.
The outdoor unit shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non-published product capabilities or performance data are not acceptable.
The outdoor unit shall be capable of guaranteed operation in heating mode down to -13□F ambient temperatures and cooling mode up to 115□F without additional restrictions on line length & vertical separation beyond those published in respective product catalogs. Models with capacity data for required temperature range published as "for reference only" are not considered capable of guaranteed operation and are not acceptable. If an alternate manufacturer is selected, any additional material, cost, and labor to meet ambient operating range and performance shall be incurred by the contractor.
The outdoor unit shall be provided with a manufacturer supplied 20 gauge hot dipped galvanized snow /hail guard. The snow/hail guard protects the outdoor coil surfaces from hail damage and snow build-up in severe climates.
Four-legged outdoor unit mounting systems shall be provided by manufacturer. Stand shall be made from 7 gauge plate steel with thermally fused polyester powder coat finish that meets ASTM D3451-06 standards. Stands shall be provided with galvanized mounting hardware and meets all ASCE 7 overturning safety requirement.
The outdoor unit shall be provided with a manufacturer supplied 20 gauge hot dipped galvanized wind baffle. The wind baffle shall allow for continuous cooling to 0FDB without any additional modifications to the unit.

Unit Cabinet:

The casing shall be fabricated of galvanized steel, bonderized, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection. Assembly hardware shall be cadmium plated for weather resistance.
Cabinet color shall be Munsell 3Y 7.8/1.1.
Easy access shall be afforded to all serviceable parts by means of removable panel sections.
Two (2) mild steel mounting feet, traverse mounted across the cabinet base pan, welded mount, providing four (4) slotted mounting holes shall be furnished. Assembly shall withstand lateral wind gust up to 155 MPH to meet applicable weather codes. The casing(s) shall be fabricated of galvanized steel, bonderized and finished.
Outdoor unit components shall be coated with the Seacoast Protection Coating (Brine Spray – BS coating) to protect components from premature corrosion due to a seacoast environment. Coating shall be applied to components before original outdoor unit assembly to ensure manufacturer quality standards are not compromised and shall meet the following minimum requirements:
a. Acrylic-Polyester Resin coating on External Panels
b. Acrylic Resin coating on External Panel Base, Support Plate and Compressor Cover
c. Anti-Corrosion, Hydrophilic coating on heat exchanger fins
d. Anti-Humidification paint coating on printed circuit boards

The outdoor unit shall be tested in compliance with JRA9002 such that no unusual rust shall develop after 960 hours of salt spray testing.
Panels on the outdoor unit shall be scratch free at system startup. If a scratch occurs the salt spray protection is compromised, and the panel should be replaced immediately.

Fan:
1, 1.5, 2 and 2.5 ton units shall be furnished with a single direct drive propeller type fan. 3, 3.5 ton units shall be furnished with a two (2) direct drive propeller type fans.
2The outdoor unit fan motor(s) shall be a direct current (DC) motor and have permanently lubricated bearings.
3The fan motor shall be mounted for quiet operation.
The fan shall be provided with a raised guard to prevent contact with moving parts.The outdoor unit shall have horizontal discharge airflow.

Refrigerant and Refrigerant Piping:
:R410A refrigerant shall be required for systems.
Polyester (POE) oil—widely available and used in conventional domestic systems—shall be required. Prior to bidding, manufacturers using alternate oil types shall submit material safety data sheets (MSDS) and comparison of hygroscopic properties for alternate oil with list of local suppliers stocking alternate oil for approval at least two weeks prior to bidding.
Refrigerant piping shall be phosphorus deoxidized copper (copper and copper alloy seamless pipes) of sufficient radial thickness as defined by the equipment manufacturer and installed in accordance with manufacturer recommendations.
All refrigerant piping must be insulated with ½" closed cell, CFC-free foam insulation with flame-Spread Index of less than 25 and a smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. R value of insulation must be at least 3.
Refrigerant line sizing shall be in accordance with manufacturer specifications.

Coil:
The outdoor unit coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
The coil shall be protected with an integral metal guard.
Refrigerant flow from the outdoor unit shall be regulated by means of an electronically controlled, precision, linear expansion valve.
All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ARC Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refrigerant pipes and tubes with thermal conductivity equal to or better than 0.27 BTU-inch/hour per Sq Ft / °F, a water vapor transmission equal to or better than 0.08 Perm-inch and superior fire ratings such that insulation will not contribute significantly to fire and up to 1" thick insulation shall have a Flame-Spread Index of less than 25 and a Smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102.
All refrigerant connections between outdoor and indoor units shall be flare type.

Compressor:
The compressor shall be a high performance, hermetic, inverter driven, variable speed, dual rotary type manufactured by Mitsubishi Electric Corporation.
The compressor motor shall be direct current (DC) type equipped with a factory supplied and installed inverter drive package.
The compressor will be equipped with internal thermal overload protection.
To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be automatically, intermittently applied to the compressor motor windings to maintain sufficient heat to vaporize any refrigerant. No crankcase heater is to be used.
Filters, sight glasses, and traps shall not be used, and no additional refrigerant oil shall be required.
The compressor shall be mounted so as to avoid the transmission of vibration.
The outdoor unit shall have an accumulator and high pressure safety switch.

Operating Range:

Operating Range		Indoor Intake Air Temp	Outdoor Intake Air Temp
Cooling	Maximum	95°F (35°C) DB, 71°F(21°C) WB	115°F (46°C) DB
	Minimum	67°F (19°C) DB, 57°F(14°C) WB	14°F (-10°C) DB
Heating	Maximum	80°F (27°C) DB, 67°F(19°C) WB	75°F (24°C) DB, 65°F(18°C) WB
	Minimum	70°F (21°C) DB, 60°F(16°C) WB	6°F (-14°C) DB, 5°F(-15°C) WB
			-12°F (-24°C) DB, -13°F(-25°C) WB*

Electrical

The outdoor unit electrical power supply shall be 208/230 volts, 1-phase, 60 hertz.
The unit shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.
The outdoor unit shall be controlled by microprocessors located in the indoor unit and outdoor unit. A 12 to 24 volt DC data stream shall communicate between the units providing all necessary information for full function control.
The outdoor unit shall be equipped with Pulse Amplitude Modulation (PAM) compressor inverter drive control for maximum efficiency with minimum power consumption.
CEILING SUSPENDED INDOOR UNIT:

General

The indoor unit shall be factory assembled, wired, and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. The unit shall have an auto-swing function for the horizontal vane. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Unit Cabinet

The casing shall have a Munsell 6.4Y 8.9/0.4 white finish.
The cabinet panel shall have provisions for a field installed filtered outside air intake.

Fan

The indoor unit fan shall be an assembly with two, three, or four Sirocco fan(s) direct driven by a single motor.
The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
An integral, motorized, multi-position, horizontal air sweep flow louver shall provide for uniform air distribution, up and down from the upper air outlet. Five (5) positions plus Auto and Swing shall be provided, controlled from the remote controller.
The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature. The indoor fan shall be capable of five (5) speed settings, Low, Med1, Med2, High and Auto.

Filter

Return air shall be filtered by means of an easily removable, washable filter.
EXTRA MATERIALS: The supplier shall provide two (2) sets of filters for each indoor unit. Filters shall be turned over to the owner at the completion of the project.

Coi

The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. A plastic or stainless steel condensate pan and drain shall be provided under the coil. All refrigerant lines to the indoor units shall be insulated.

The coils shall be pressure tested at the factory.
Each indoor unit shall be provided with service stop valves with service port on the liquid, gas, and/ recovery lines. The valves shall be located adjacent to the unit to allow the unit to be serviced and/or removed and/or installed in the system without the need to shut down the entire system.

Condensate Drain Connection
The contractor shall remove the plastic condensate hose clamp (at the indoor unit connection) on each unit. Furnish and install a stainless steel hose clamp on the condensate drain hose (at the indoor unit connection) on each unit. The stainless steel hose clamp shall be appropriately sized to create a water tight seal.

Electrical
The unit electrical power shall be 208/230 volts, 1 phase, 60 hertz.
The system shall be equipped with A-Control – a system directing that the indoor unit be powered directly from the outdoor unit using a 3-wire, 14 gauge AWG connections plus ground.
The indoor unit shall not have any supplemental electrical heat elements.

Controls
Indoor unit shall be controlled by thermostat mounted on unit.
The drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

The ceiling-suspended indoor unit section providing powerful airflow and shall have a modulating linear expansion device. The unit shall be used with the simultaneous cooling and heating outdoor unit and BC Controller(s) or heat pump outdoor unit. The unit shall support individual control using DDC controllers.

Each system shall perform in accordance to the ratings shown in the table below. Performance shall be based on nominal cooling conditions of 80°FDB, 67°FWB for the indoor unit and 95°FDB for the outdoor unit and nominal heating conditions of 70°FDB for the indoor unit and 47°FDB, 43°FWB for the outdoor unit.

Indoor Unit: The indoor unit shall be factory assembled, wired, and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Electrical: The unit electrical power shall be as indicated on drawings. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz)

Controls: This unit shall use controls provided by manufacture to perform functions necessary to operate the system.

Each unit shall be complete with a Plasma Air needle point brush type ionizer. The device shall be completely installed within the indoor unit by the product supplier.

INTERFACE WITH THE CAMPUS BAS
Interface to the existing Campus Building Automation System (BAS) shall be thru BACNET, and a detailed point mapping list shall be provided to the BAS contractor for the interface programming by the BAS contractor. All control work, BACnet cards, and software required for the VRF system controls and BAS controls work, panels, programming, etc. shall be included as part of the project. The requirement of the project is to have a complete and fully commandable, monitored system, viewable and controllable from the Central Campus graphical workstation (Siemen's workstation). Contractor shall contact Barton Dupre (337-447-0481 cell or 877-473-7802 work) with Select Building Controls to complete BACnet interface connections and front end graphics modifications required for this project.

REFRIGERANT LINE COVER SYSTEM
All exposed refrigerant line piping exposed within the building (except in: Attic Areas, Mechanical Room, and IT Rooms) shall be covered with an approved modular piping cover system.

Provide pipe covering system as manufactured by DecoShield Systems, Line-Hide Lineset Cover System, or prior approved equivalent.

REFRIGERANT LINE SIZING

Refrigerant lines sizes for each system shall be sized in accordance with the equipment manufacturer's sizing guide lines.

Sizing for each system shall be submitted with equipment shop drawings. The contractor will be required to install refrigerant lines in accordance with equipment manufacturer's requirements. Service stop valves with service port shall be installed on each unit (inside and outside) for servicing systems without shutting down the entire system.

TESTING REFRIGERANT PIPING SYSTEMS:

Refrigerant lines shall be tested under 600 (minimum) psi carbon dioxide pressure (or as recommended by manufacturer for refrigerant type used in each system) for 24 hours using soap suds at joints to test for leaks. Contractor shall compete a vacuum test (triple pull down test) at 1500 microns with nitrogen break, then 1000 microns with nitrogen break, then 500 microns – disconnect vacuum pump and hold vacuum for one (1) hour (maximum of 100 point rise within the 1 hour time period). If any test fails, the contractor shall repair leak(s) and completely re-test the piping system(s) (pressure and vacuum tests). Evacuate system and properly charge with refrigerant.

LABELING A/C UNITS

All indoor and outdoor A/C units, thermostats, fans, and other HVAC equipment shall be labeled with permanent laminated plate riveted to unit. Units shall be labeled as indicated in schedules and as addressed for the manufacturer's commissioning of equipment. Plate shall be black with white unit numbers. Height of unit number shall be minimum of one (1) inch. Label shall also indicate area serviced by unit as noted in schedules. Height of letters shall be minimum of one-half (1/2) inch. Height of letters for thermostats shall be 1/8". Submit sample to Engineer for approval.

PROTECTION

HVAC Equipment, ductwork, filters, etc. Shall be clean when installed and kept clean during construction.

Provide temporary closures of metal or taped polyethylene on openings on equipment, open ductwork, vent systems, etc. during construction to prevent construction dust from entering equipment or the duct system.

Equipment and system components that are not protected shall be cleaned by the contractor at the contractor's expense prior to acceptance.

All materials stored on site during construction shall be properly covered and protected from dust, rain, etc.

Materials damaged during construction shall be replaced with new materials.

Filters in equipment shall be replaced during construction if equipment is used during the construction phase. A final clean set of filters shall be installed in equipment when the systems(s) are turned over to the Owner.

ELECTRICAL

ALL ELECTRICAL WORK SHALL BE BY A LISCENSE AND/OR CERTIFIED ELECTRICIAN.

ALL WORK SHALL BE INSPECTED AND APPROVED BY THE UNIVERSITY'S REPRESENTATIVE PRIOR TO ACCEPTANCE AND BEFORE ANY PANEL IS ENERGIZED.

ALTERNATE NO.1:

Provide all materials and labor for power to Storage Shed with devices.

The contractor shall include in his bid all labor, materials, and work to perform all electrical work indicated in the plans and specifications.

All work shall be done as per NEC.

Contractor shall install temporary lighting sufficient for the General Contractor's needs.

All panels, lighting, raceways, switches, receptacles, cover plates, and wiring shall be by the electrical contractor.

Contractor shall furnish and install a NEMA-3, 200-amp, 120/240 volt, 1-phase, 24 space panel board with 200 amp main and required circuitry breakers where shown on plan for Greenhouse No.2 "Room-A". Provide a 200-amp breaker in Panel "GH" in Mechanical Building and run (3) 4/0 copper wires with (1) #2 ground in existing 2" conduit to Greenhouse No.2 room "A" panel marked "G2". Provide 100-amp breaker for Panel "G2-A" in Room "B". Label panel directory. All underground conduit shall be schedule 80 PVC. All conduit penetrating concrete slab shall be Rigid Conduit. Provide all circuitry from panels to devices as shown. Install a 10' ground rod for each greenhouse panel.

Contractor shall furnish and install a NEMA-3, 100-amp, 120/240 volt, 1-phase, 24 space panel board with 100 amp main and required circuitry breakers where shown in Greenhouse No.2 "Room B". Run a 1-1/2" PVC conduit from Room "A" panel location to Room "B" panel location with (3) 1/0 copper wires and (1)-#6 ground from Panel "G2" to Panel "G2-A". Label panel directory. All underground conduit shall be schedule 80 PVC. All conduit penetrating concrete slab shall be Rigid Conduit. Install a 10' ground rod for each greenhouse panel.

Contractor shall furnish and install new LED strip light fixture (Johnny's Selected Seeds – Sunblaster LED Strip Light Kit) with waterproof connections and conduit in each greenhouse where shown. Hang light fixture from structure at bottom of roof trusses, approximately 7'-6" to 8'-0" AFF. Install ¾" Unistrut as needed at structure for anchoring. Provide junction boxes as needed to connect each light fixture to power with waterproof connection.

Provide new 20 amp, 3-way light switches as shown on the drawings in waterproof boxes with waterproof cover and hinged covers.

Contractor shall hang or otherwise support new and existing conduits, junction boxes etc. to meet code requirements.

Contractor shall furnish all wiring, labor etc. to install the new light fixtures.

Contractor shall provide 20 amp rated switches, 20 amp - 5-20R Duplex GFCI receptacles, where indicated in plans.

All switches and receptacles shall be in waterproof boxes with waterproof cover and hinged covers. Conduit and fittings shall be waterproof. All boxes and conduit shall be PVC.

All switches and receptacles shall be white.

Contractor shall furnish and install all conduit, wiring, and motor rated switches at each new exhaust fan, each motorized intake shutter, each HAF fan, and each motorized ridge vent. Label each motor rated switch for identification.

Provide all conduit and control wiring for Bartlett Climate Boss and Control with Weather Station.

WIRING DEVICES

GENERAL

Submittals: Product Data for each product specified.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing

agency acceptable to authorities having jurisdiction.

Comply with NEMA WD 1.

Comply with NFPA 70.

PRODUCTS

Straight-Blade and Locking Receptacles: General-Duty grade.

GFCI Receptacles: Feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.

Snap Switches: Heavy-duty, quiet type

EXECUTION

Install devices and assemblies plumb and secure.

Connect wiring device grounding terminal to outlet box with bonding jumper.

Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.

Replace damaged or defective components.

SUBMITTALS:

Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:

Dimensions of fixtures.

Certified results of laboratory tests for fixtures and lamps for photometric performance.

Types of lamps. LED.

Coordination Drawings: Reflected ceiling plans and sections drawn to scale and coordinating fixture installation with ceiling grid, ceiling-mounted items, and other components in the vicinity. Include work of all trades that is to be installed near lighting equipment.

QUALITY ASSURANCE:

Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
Comply with NFPA 70.
NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

COORDINATION:

Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

WARRANTY:

General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

PRODUCTS

MANUFACTURERS:

Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products indicated in the Lighting Fixture Schedule on drawings.

FIXTURES AND FIXTURE COMPONENTS, GENERAL:

Metal Parts: Free from burrs, sharp corners, and edges.

Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position. Delete paragraph below except for special applications where freedom from conducted electromagnetic interference is critical. Coordinate with Drawings.

FINISHES:

Fixtures: Manufacturer's standard, unless otherwise indicated.

Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.

Metallic Finish: Corrosion resistant.

EXECUTION

INSTALLATION

Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

Support for Fixtures in or on Grid-Type Suspended Ceilings: Use building structure for support.

Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than six inches (6") from fixture corners.

Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.
Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4 inch metal channels spanning and secured to ceiling tees.

CONNECTIONS:

Ground equipment.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

FIELD QUALITY CONTROL

Inspect each installed fixture for damage. Replace damaged fixtures and components.

Tests: As follows:

Verify normal operation of each fixture after installation.

Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
Verify normal transfer to battery source and retransfer to normal.
Report results in writing.

Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

Corrosive Fixtures: Replace during warranty period.

CLEANING AND ADJUSTING

Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

SECTION 16010 - ELECTRICAL GENERAL CONDITIONS

THE WIRING OF THIS CONTROLLER IS PART OF ELECTRICAL REQUIREMENTS.

GHK12X2 GREENHOUSE CONTROLLER

Installation Manual

BARTLETT Instrument Co.

Revised: 3/3/14

Installation Overview

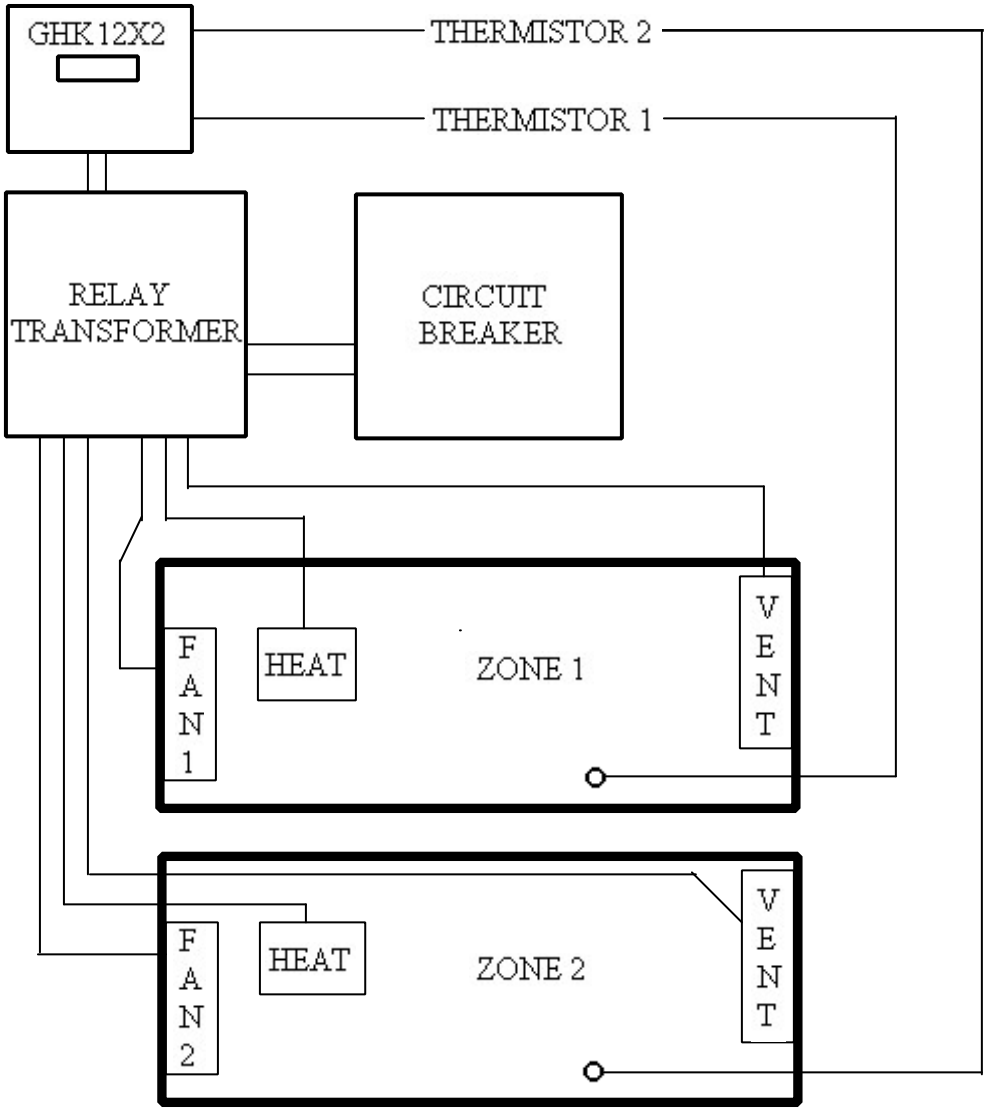


Figure 1

A typical installation consists of a circuit breaker box, relay/transformer box and a GHK12x2. The circuit breaker box provides overload protection. The relay/transformer box switches line power to the appliances. And the GHK12x2 senses temperature and provides control signals.

BE SURE ALL POWER IS OFF BEFORE INSTALLATION!

INSTALLATION SHOULD BE DONE BY A LICENSED ELECTRICIAN.

BE SURE ALL WIRING AND EQUIPMENT IS INSTALLED ACCORDING TO LOCAL ELECTRICAL CODES.

THE GHK12X2 IS A LOW VOLTAGE DEVICE. LIMITED TO 24V AC CONTROL VOLTAGES.

CAUTION: The GHK12X2 is designed to be reliable but as with all equipment, failures do occur. Therefore, in situations where loss could result from the failure of the GHK12X2, separate backup thermostat or alarm systems should be installed.

The reliability and performance of the GHK12X2 can be compromised by locating the controller in direct sunlight or in direct water spray.

PLACEMENT AND MOUNTING

Mount the GHK12X2 in an easy-access location. Usually close to the breaker box and relay box. Protect it from direct sunlight for better reliability and readability. Moisture can cause corrosion and premature failure, so avoid direct water and have all wires enter and leave through liquid-tight connectors, waterproof conduit, or seal the wires with silicone sealant.

WARNING:

Some sealants release acetic acid while curing. Be sure sealant is completely cured (up to 3 days) before closing control box to avoid corrosion damage. All openings for wiring should be in the bottom of the box when mounted.

To mount the GHK12X2, remove the front cover and unplug ribbon cable from the relay board. Insert the 4 self-drilling screws provided with the GHK12X2 through the 4 screw-hole knockouts and fasten the box to the wall. Cover the screw heads with plastic cups provided. After all wiring is complete and any sealant cured, reattach the ribbon cable and screw on the front cover.

As an alternative, you can mount the GHK12X2 with drywall screws placed through the corner holes of the box.

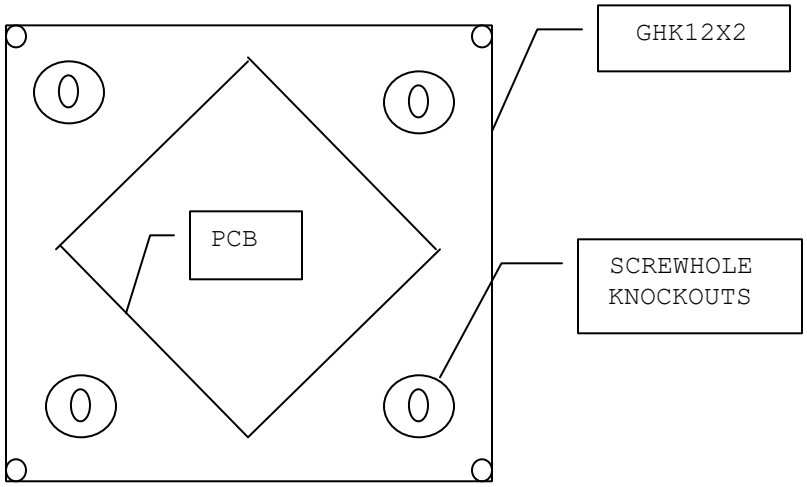


Figure 2

GHK12X2 OUTPUTS

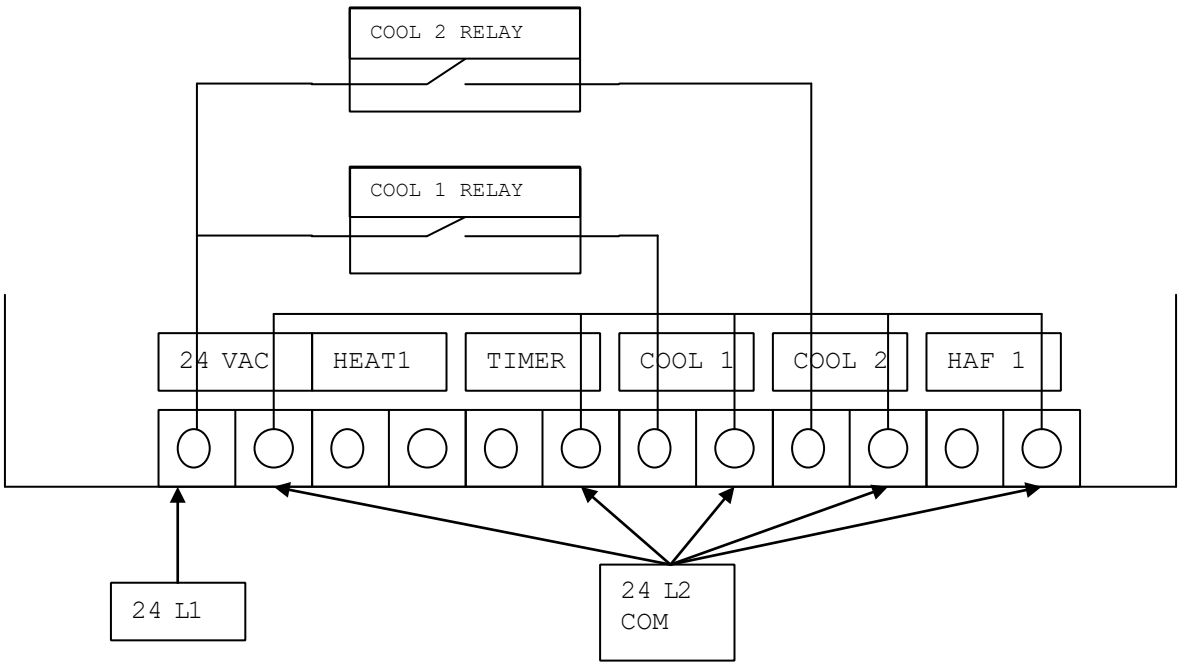
OUTPUT SPECIFICATIONS

OUTPUT	CONTACT TYPE	VOLTAGE RATING	CURRENT RATING
HEAT	OPEN/CLOSED OR SOURCE 24V AC	24V AC	2A RESISTIVE LOAD
COOL HAF TIMER	SOURCE 24V AC	24V AC	2A RESISTIVE LOAD
ALARM	OPEN/CLOSED	24V AC	2A RESISTIVE LOAD

All cool, horizontal airflow (HAF), and timer outputs, source 24V AC to drive a relay or contactor. The GHK12X2's drive relays are rated at 2A when driving a resistance load. For reliability, snubber circuits are on each output. For even greater reliability, load currents on the GHK12X2's relays should be less than 1A (24 VA load or less).

OUTPUT CONFIGURATION

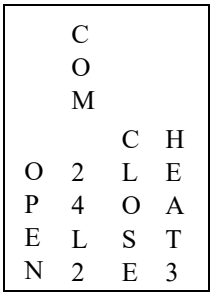
Each 24 VAC output has a contact that is common to 24VAC input line 2 (24L2) and a contact that is 24VAC line 1 switched through a relay.

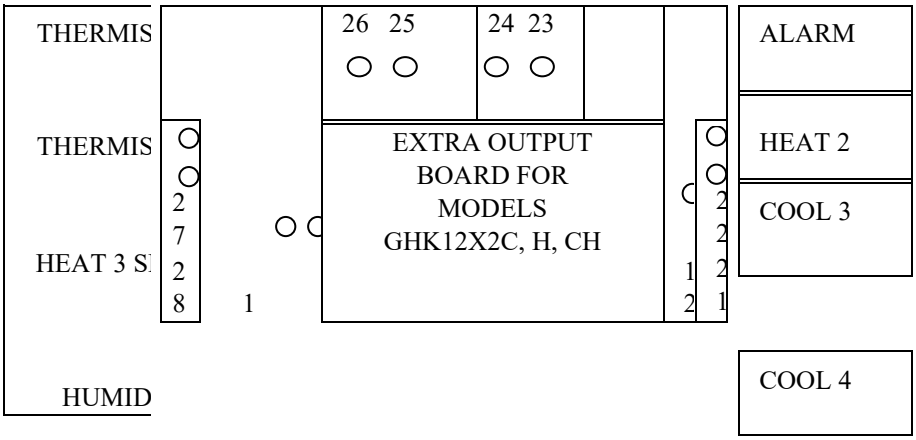


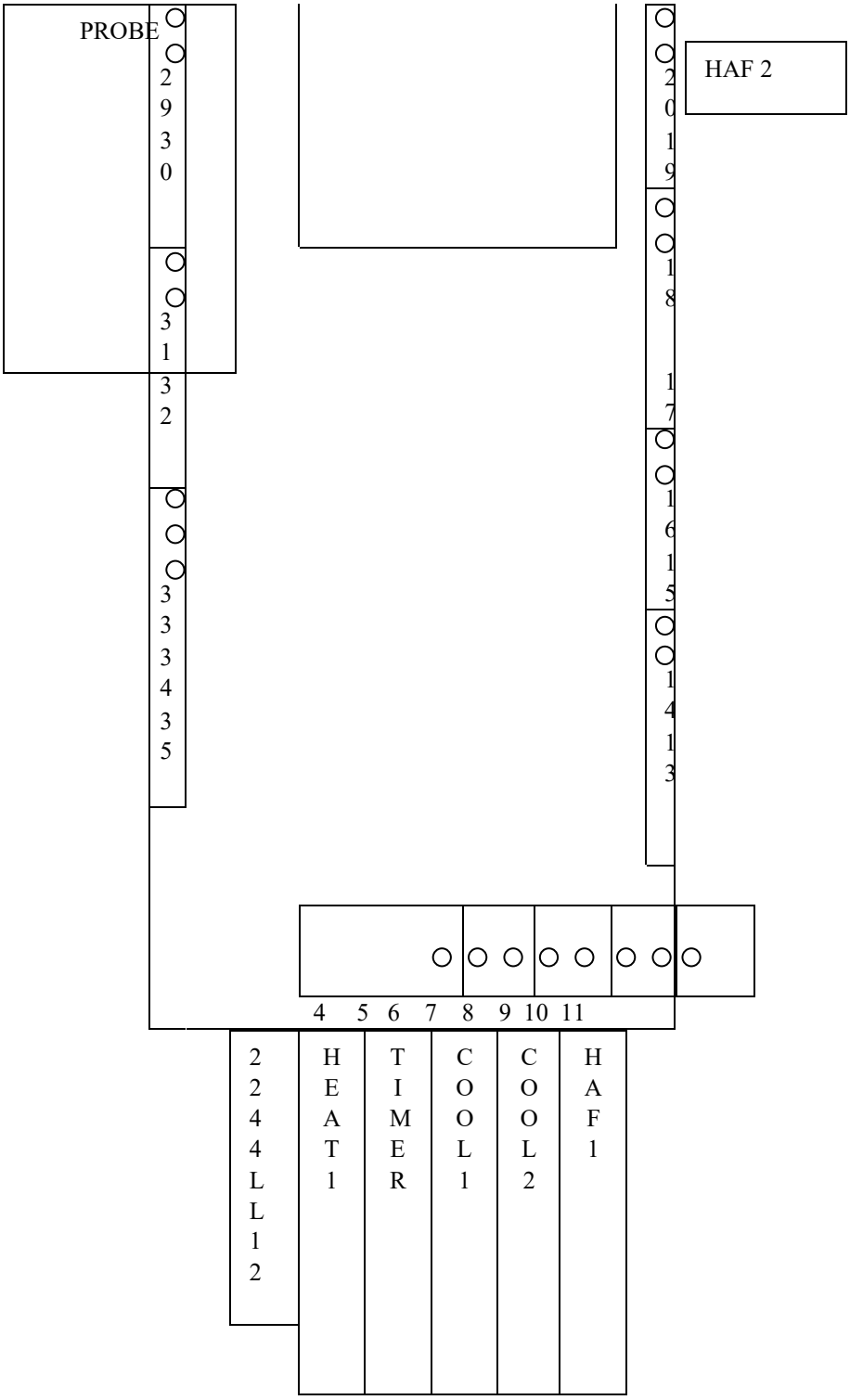
OUTPUT CONFIGURATION

Figure 3

CONNECTION LOCATIONS






PROBE
29
30
31
32
33
34
35
20
19
18
17
16
15
14
13
HAF 2
4 5 6 7 8 9 10 11
24
LL
12
HEAT 1
TIMER
COOL 1
COOL 2
HAF 1

TERMINAL	DESCRIPTION
1	24VAC L1
2	24VAC L2 COM
3	HEAT 1 OUT
4	HEAT 1 COM
5	TIMER OUT
6	TIMER COM
7	COOL 1 OUT
8	COOL 1 COM
9	COOL 2 OUT
10	COOL 2 COM
11	HAF 1 OUT
12	HAF 1 COM

TERMINAL	DESCRIPTION
13	HAF 2 OUT
14	HAF 2 COM
15	COOL 4 OUT
16	COOL 4 COM
17	COOL 3 OUT
18	COOL 3 COM
19	HEAT 2 OUT
20	HEAT 2 COM
21	ALARM
22	ALARM
23	HEAT 3 OUT
24	CLOSE OUT

TERMINAL	DESCRIPTION
25	COM
26	OPEN
27	THERMISTOR 1
28	THERMISTOR 1
29	THERMISTOR 2
30	THERMISTOR 2
31	THERM. HEAT 3
32	THERM. HEAT 3
33	HUM. IN
34	HUM. POWER 5V
35	HUM. GROUND

Figure 4

COOL OUTPUTS

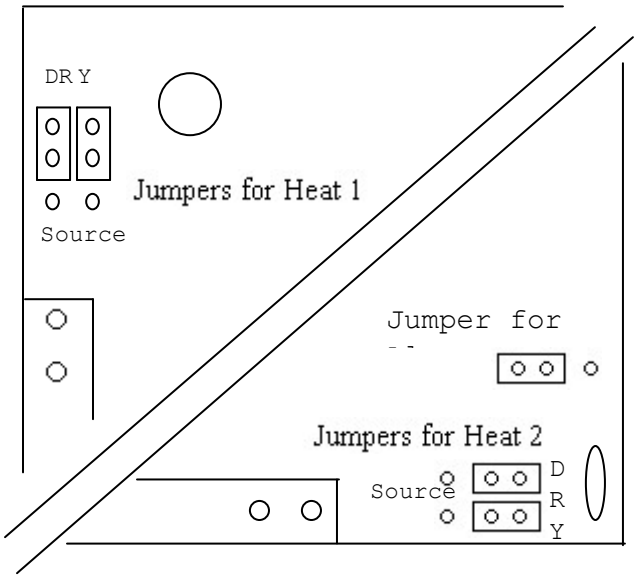
In 2-zone mode, outputs Cool 1 and Cool 3 are designed to open the vents. Outputs Cool 2 and Cool 4 control the fans. The controller has a 30 second delay between Cool 1 (Cool 3) activating and Cool 2 (Cool 4) coming on to ensure the vents are open before the fans start. In 1-zone mode, Cool 1 is used to open vents, Cool 2 and Cool 3 for fans and Cool 4 for additional fans or pad cooler.

HAF OUTPUTS

The HAF 1 output is the normally closed side of the Cool 2 relay and HAF 2 is the normally closed side of the Cool 4 relay. Therefore HAF 1 (HAF 2) is off when the Cool 2 (Cool 4) fan is on and HAF 1 (HAF 2) is on when Cool 2 (Cool 4) is off.

HEAT OUTPUTS

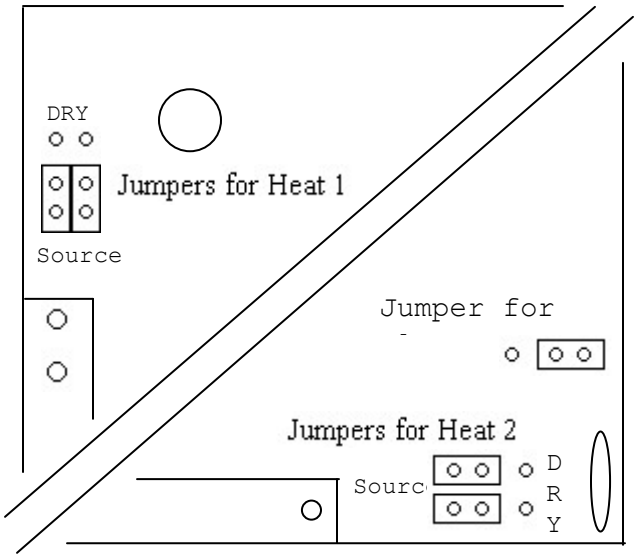
The heat outputs can be configured as an open/closed contact like a thermostat (dry contact) or to source 24V AC to drive a relay. Open/closed contact is the factory setting.



Jumpers shown for Heat 1 and Heat 2 are configured as OPEN/CLOSED contacts.

Jumper for Alarm is showing a normally open configuration.

Figure 5



Jumpers shown for Heat 1 and Heat 2 are configured to SOURCE 24VAC.

Jumper for Alarm is showing a normally closed configuration.

Figure 6

HEAT OUTPUTS cont.

When controlling more than one heater from one heat output, configure the output to source 24V AC to drive a relay(s) to keep the control loops separate.

Also, when controlling a line voltage heater, configure the heat output to source 24V AC to drive a relay of sufficient capacity to run the heater.

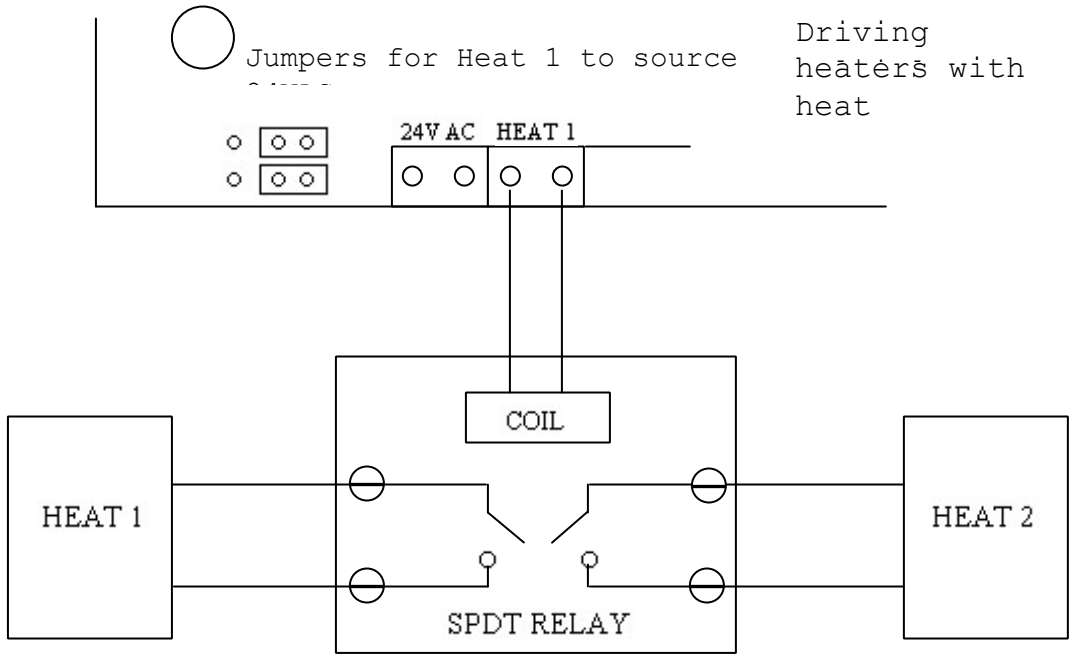


Figure 7

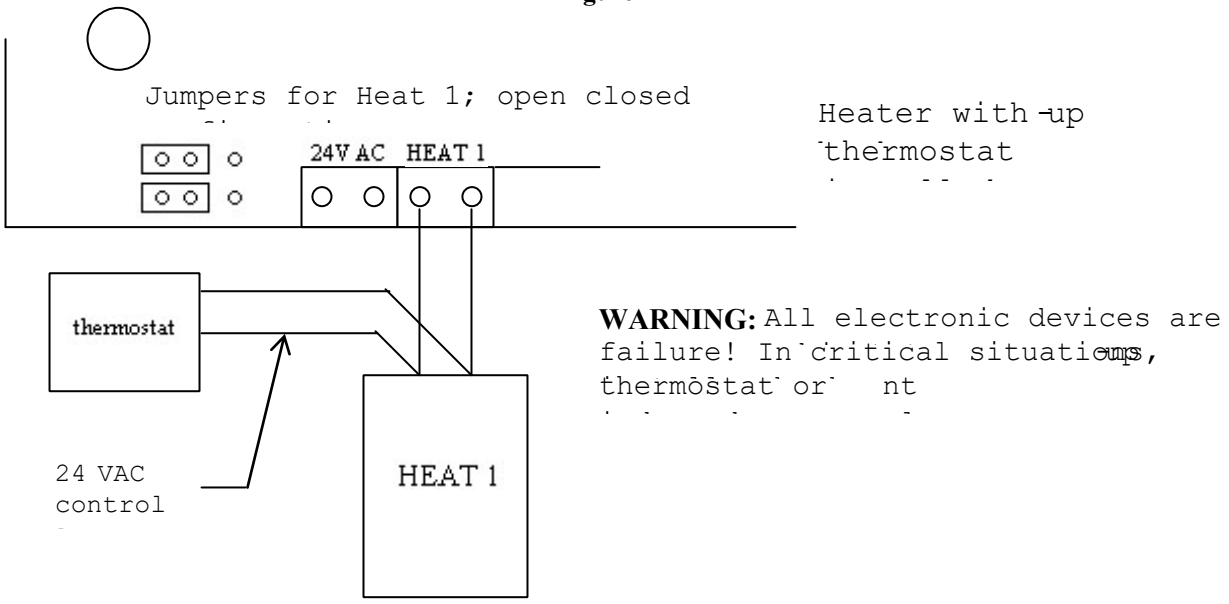


Figure 8

TIMER OUTPUT

The timer output sources 24V AC to drive a solenoid or relay(s). The solenoid should have a coil with less than a 24VA load.

ALARM OUTPUT

The alarm is an open/closed contact. When the GHK12X2 is powered and operating properly the contacts are CLOSED. The contacts OPEN when power is lost or when the high or low alarm is triggered. The alarm output can be configured for either normally open or normally closed by changing the jumper for the alarm output. See **Figure 5** and **Figure 6** for jumper placement.

THERMISTOR

The thermistor is the temperature sensor. The GHK12X2 has two thermistor inputs labeled TH1 and TH2. In 1-zone mode, the readings are averaged and displayed. In the 2-zone mode, Heat 1, Cool 1, and Cool 2 work to keep TH1 at the correct temperature. Also, Heat 2, Cool 3, and Cool 4 work together to keep TH2 at the desired temperature.

The thermistors should be slightly above the plant height. To ensure proper readings, it should not be in direct sunlight or where it will be sprayed with water. It is generally placed closer to the cool air inlet and further from the heat. In 1 zone mode separate the thermistors across the width of the greenhouse to give the best average temperature. See **Figure 9**.

The thermistors come with 24’ leads and can be connected directly to the two terminals for TH1 and to the two terminals for TH2. There is no special orientation to the thermistor leads. Should you need to extend the leads of the thermistor, use the 3M Scotchlock^{TM} sealed connectors provided. Use only wire size of 22-14 AWG to ensure proper connection. A faulty connection will cause erroneous temperature readings. Up to 300’ of wire can be added without affecting the temperature reading.

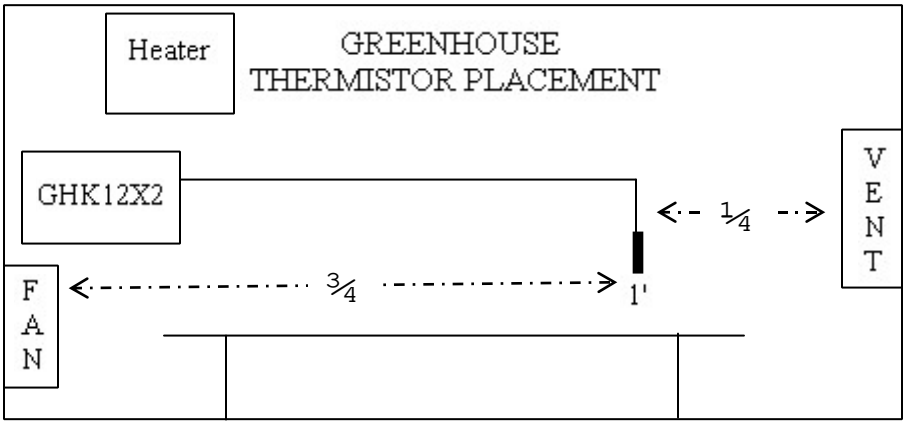


Figure 9

SECTION 16010 - ELECTRICAL GENERAL CONDITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The General Conditions and all pertinent sections are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to his work. He shall consult all other sections of the specifications to determine if he is required to perform any work relative to that particular section.

1.2 SCOPE OF WORK

A. The work contemplated under this specification comprises the furnishing of all labor and materials required and necessary for the complete installation of electrical wiring in conduit for lighting control and power from the various panelboards to each ultimate outlet hereinafter specified and/or shown on the accompanying drawings. Said work shall be done in accordance with the latest edition of the National Electrical Code and all local codes and ordinances. The specifications are intended to describe a complete workable system and bidders shall report any discrepancies or omissions preventing such workability prior to the time their bids are submitted.

B. The work covered by this specification shall be as shown on the plans and called for herein, and shall be comprised generally of the following:

1. Furnish and install light fixtures, wiring, etc.
2. Furnish and install panelboards, electrical devices, wiring.
3. Furnish and install Fire Alarm System.
4. Furnish and install low voltage and Data Cabling System.

C. All equipment installed by this contractor shall be installed in strict accordance with instructions of the manufacturer.

D. He shall install his work to meet existing conditions as found at the building site.

E. The Electrical contractor is referred to the Architectural and Structural details for information in regards to the Architectural details. His work shall be done in strict accordance with local and state ordinances governing this class of work.

1.3 REJECTED WORK AND MATERIALS

A. Should contractor introduce any materials different from those called for and described in specifications or shown on plans, it must on notification from the engineers, be immediately removed from building or premises.

1.4 SHOP DRAWINGS

A. Before proceeding with work and/or within fifteen (15) days award of the General Contract for this work, the Electrical Contractor shall furnish to the Architect/Engineer, complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves, and other pertinent information. Shop drawings to be submitted as listed below.

1. Lighting Fixtures.
2. Panelboards, disconnects.
3. Data Cabling.
4. Fire Alarm
5. Conduit/Cabling.
6. Wiring Devices and Switches.

B. The contractor may be required to submit shop drawings on any other material he supplies in construction of this project. These drawings shall be submitted at time requested by Architect/Engineer.

1.5 ADDITIONS AND CHANGES

A. The accompanying drawings show approximate location of feeders, branch circuits, light and power circuits, etc. Complete and accurate details in regard to location of outlets, apparatus, etc. from location shown shall be made before roughing-in and without additional cost to the owner.

1.6 STANDARDS OF MATERIALS AND WORKMANSHIP

A. All materials shall be new and listed by UL as conforming to its standards. Work shall be executed in a workmanlike manner and present a neat finished appearance when completed.

1.7 GUARANTEE

A. The Contractor for this work shall be required to keep the work installed by him in repair and perfect working order for one year from date of completion and final acceptance; said guarantee shall be based on defective materials and substandard workmanship. Contractor shall furnish, free of cost to owner, all materials and labor necessary to comply with this guarantee.

1.8 LAWS, PERMITS AND INSPECTIONS

A. This contractor shall at his own cost obtain all necessary permits, pay all legal fees and charges, and comply with all building and safety laws, ordinances and regulations relating to the building and the public health and safety, including NEC, NFPA, IBC and OSHA.

1.9 TESTS

A. After installation is complete and at such time as the Engineers may direct, Contractor shall conduct an operating test for approval. Equipment shall be demonstrated to operate in accordance with requirements of this specification. The test shall be performed in the presence of Engineers. Contractor shall furnish all instruments and personnel required for the test.

1.10 CUTTING AND PATCHING

A. Contractor shall do all cutting and patching where necessary at his own expense with approval of the Engineers as to cutting of any structural beams or joists, but all patching shall be done by crafts whose work is involved. After initial surfacing has been done, all further cutting, patching, and painting shall be done at this contractor's expense.

1.11 SAFETY PRECAUTIONS

A. Contractor shall furnish and place proper guards for prevention of accidents. He shall provide and maintain any other necessary construction required to secure safety of life or property, including maintenance of sufficient lights during all night hours to secure such protection.

1.12 SUPERVISION

A. Contractor shall personally, or through an authorized and competent representative, constantly supervise the work done from beginning to completion and final acceptance. To the best of his ability he shall keep the same foreman and workmen throughout the project duration. During the progress of the work, it shall be subject to inspection by the representatives of the Engineers, and at these times, the contractor shall furnish the required information.

1.13 INSERTS AND OPENINGS

A. Contractor shall furnish and install all inserts and hangers required to support conduit, cables, wireways, disconnect switches, etc.

1.14 OPENINGS THROUGH WALLS AND FLOORS

A. Provide all slots, sleeved holes and other openings necessary through walls and floors, and through any other parts of the structure. Where conduits pass through walls which are intended as rated fire walls, leave-outs, penetrations or sleeves shall be sealed so as not to interfere with the rating of the wall.

1.15 BACKFILLING

A. Contractor shall be responsible to backfill any trenches for electrical runs under the building, paving, or any area of the site by backfilling the bottom of the trench-up to the top of the conduit with sand, then placing compacted fill in 4" layers using power tamping equipment.

1.16 RECORD DRAWINGS

A. The Contractor shall be provided with a set of prints of the original bidding documents by the Architect. The Contractor shall then have a set of sepia (reproducible plans) made.

B. If the Contractor elects to vary from the contract documents and secures prior approval from the architect for any phase of the work, he shall record in a neat and readable manner, ALL such variances on the print in red. These changes shall then be transferred to the permanent set (sepia) at the completion of the job. Both the sepia and the original print shall be returned to the Engineer for documentation.

C. All deviations from sizes, locations and from all other features of the installations shown in the Contract Documents shall be recorded.

D. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions, and the like, as well as other features of work which will be concealed underground and/or in the finished building. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc. and by properly referenced centerline.

E. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. Architect's/Engineer's decision in this matter will be final.

F. The following requirements apply to all “record” drawings:

1. They shall be maintained at the contractor's expense.
2. All such drawings shall be done carefully and neatly and in a form approved by the Engineer.
3. Additional drawings shall be provided as necessary for clarification.
4. They shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by Engineer and when necessary, to establish clearances for other parts of the work.
5. "Record" drawings shall be returned to the Architect upon completion of the work and are subject to approval of the Engineer.
6. The Contractor shall refer to the Architectural section under "RECORD DRAWINGS" for further requirements and procedures.

END OF SECTION 16010

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
1.2 SUMMARY
A. This Section includes the following:
1. Supporting devices for electrical components.

2. Concrete equipment bases.
3. Cutting and patching for electrical construction.
4. Touchup painting.

1.3 SUBMITTALS

A. Shop Drawings: Dimensioned plans and sections or elevation layouts of electricity-metering equipment.
B. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
C. Coordinate electrical service connections to components furnished.
1. Coordinate installation and connection of exterior underground utilities and services, including provision for electricity-metering components.
2. Comply with requirements of authorities having jurisdiction.
D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Specification Section "Access Doors."
E. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.
F. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

PART 2 - PRODUCTS

2.1 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.
C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- diameter slotted holes at a maximum of 2 inches o.c., in webs.
D. Slotted-Steel Channel Supports: Comply with Specification Section "Metal Fabrications" for slotted channel framing.
1. Channel Thickness: Selected to suit structural loading.
2. Fittings and Accessories: Products of the same manufacturer as channel supports.
E. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
F. Pipe Sleeves: Schedule 40, galvanized steel, plain ends.
G. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.
H. Expansion Anchors: Carbon-steel wedge or sleeve type.
I. Toggle Bolts: All-steel springhead type.
J. Powder-Driven Threaded Studs: Heat-treated steel.

2.2 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

A. Temperature ratings of all equipment lugs and terminations shall be compatible with those of the wire or cable per NEC 110-14(C) and 110-40 as applicable.

B. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
C. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
E. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 ELECTRICAL SUPPORTING DEVICE APPLICATION
A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.
B. Dry Locations: Steel materials.
C. Support Clamps for PVC Raceways: Click-type clamp system.
D. Selection of Supports: Comply with manufacturer's written instructions.
E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.

3.3 SUPPORT INSTALLATION
A. Install support devices to securely and permanently fasten and support electrical components.
B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
F. Install 1/4-inch- diameter or larger threaded steel hanger rods, unless otherwise indicated.
G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.
H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
I. Simultaneously install vertical conductor supports with conductors.
J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.
K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.
L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.
M. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
1. Wood: Fasten with wood screws or screw-type nails.
2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
3. New Concrete: Concrete inserts with machine screws and bolts.
4. Existing Concrete: Expansion bolts.
5. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.
6. Steel: Welded threaded studs or spring-tension clamps on steel.
7. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
8. Light Steel: Sheet-metal screws.
9. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.4 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly.

3.5 CUTTING AND PATCHING
A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.6 FIELD QUALITY CONTROL
A. Inspect installed components for damage and faulty work, including the following:
1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Electrical identification.
5. Electricity-metering components.
6. Concrete bases.
7. Cutting and patching for electrical construction.
8. Touchup painting.
B. Test Owner's electricity-metering installation for proper operation, accuracy, and usability of output data.
1. Connect a load of known kW rating, 1.5 kW minimum, to a circuit supplied by the metered feeder.
2. Turn off circuits supplied by the metered feeder and secure them in the "off" condition.
3. Run the test load continuously for eight hours, minimum, or longer to obtain a measurable meter indication. Use a test load placement and setting that ensure continuous, safe operation.
4. Check and record meter reading at end of test period and compare with actual electricity used based on test load rating, duration of test, and sample measurements of supply voltage at the test load connection. Record test results.
5. Repair or replace malfunctioning metering equipment or correct test setup; then retest. Repeat for each meter in installation until proper operation of entire system is verified.

3.7 REFINISHING AND TOUCHUP PAINTING
A. Refinish and touch up paint. Paint materials and application requirements are specified in Specification Section "Painting."
1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.8 CLEANING AND PROTECTION
A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 16050

SECTION 16060 - GROUNDING AND BONDING

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1

Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.3 SUBMITTALS
A. Product Data: For each type of product indicated.
B. Product Data: For the following:
1. Ground rods.
C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

1.4 QUALITY ASSURANCE
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS
2.1 GROUNDING CONDUCTORS
A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."
B. Material: Copper.
C. Equipment Grounding Conductors: Insulated with green-colored insulation.
D. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.
E. Grounding Electrode Conductors: Stranded cable.
F. Underground Conductors: Bare (uninsulated), tinned, stranded, unless otherwise indicated.
G. Copper Bonding Conductors: As follows:
1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch in diameter.
2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
3. Bonding Jumper: Bare (uninsulated) copper tape, braided bare (uninsulated) copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
H. Grounding Bus: Bare (uninsulated), annealed copper bars of rectangular cross section, with insulators.

2.2 CONNECTOR PRODUCTS
A. Listed for use for specific types, sizes, and combinations of conductors and connected items.
B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.
C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.3 GROUNDING ELECTRODES
A. Ground Rods: Sectional type; copper-clad steel.
1. Size: 3/4 by 120 inches in diameter.

PART 3 - EXECUTION
3.1 APPLICATION
A. Use only copper conductors for both insulated and bare (uninsulated) grounding conductors in direct contact with earth, crushed stone, and similar materials.
B. In raceways, use insulated equipment grounding conductors.
C. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.
D. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.
E. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.

3.2 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install equipment grounding conductors in all feeders and circuits.

C. Install insulated equipment grounding conductor with circuit conductors for the following items, in addition to those required by NEC:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Flexible raceway runs.

3.3 INSTALLATION

A. Drive ground rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging copper coating.

B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.

F. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

G. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

3.4 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare (clean) metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare (uninsulated) grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare (uninsulated) grounding conductors, unless otherwise indicated.

E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and ground rods.

F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values.
G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
H. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.5 FIELD QUALITY CONTROL
A. Testing: Perform the following field quality-control testing:
1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.
3. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
a. Equipment Rated 500 kVA and Less: 10 ohms.
b. Equipment Rated 500 to 1000 kVA: 5 ohms.
c. Equipment Rated More Than 1000 kVA: 3 ohms.
d. Substations and Pad-Mounted Switching Equipment: 5 ohms.
e. Manhole Grounds: 10 ohms.
4. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.
END OF SECTION 16060

SECTION 16075 - ELECTRICAL IDENTIFICATION

Part 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes electrical identification materials and devices required to comply with, NFPA 70, and authorities having jurisdiction.

1.3 SUBMITTALS
A. Product Data: For each electrical identification product indicated.
B. Schedule of Nomenclature: An index of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE
A. Comply with NFPA 70.

PART 2 - PRODUCTS
2.1 RACEWAY AND CABLE LABELS
A. Comply with NFPA 70, for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

1. Color: Black letters on orange field.
2. Legend: Indicates voltage and service.

B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend overlaminated with a clear, weather- and chemical-resistant coating.

C. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

D. Underground-Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape.

1. Not less than 6 inches wide by 4 mils thick.
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend indicating type of underground line.

E. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

2.2 NAMEPLATES AND SIGNS

A. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.

B. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.
2. Tensile Strength: 50 lb minimum.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.

1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Install painted identification according to manufacturer's written instructions and as follows:

1. Clean surfaces of dust, loose material, and oily films before painting.
2. Prime surfaces using type of primer specified for surface.
3. Apply one intermediate and one finish coat of enamel.

F. Color Banding Raceways and Exposed Cables: Band exposed and accessible raceways of the systems listed below:

1. Bands: Pretensioned, wraparound plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
3. Apply the following colors to the systems listed below:

a. Fire Alarm System: Red.
b. Security System: See Plans.
c. Telecommunication System: See Plans.
G. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.
H. Circuit Identification Labels on Boxes: Install labels externally.
1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
2. Concealed Boxes: Plasticized card-stock tags.
3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.
I. Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches below finished grade. Where width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches overall, use a single line marker. Install line marker for underground wiring, both direct-buried cables and cables in raceway.
J. Color-Coding of Secondary Phase Conductors: Use the following colors for service, feeder, and branch-circuit phase conductors:
1. 208/120-V Conductors:
a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue
d. Neutral White
2. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:
a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch-wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.
K. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.
1. Legend: 1/4-inch- steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
2. Tag Fasteners: Nylon cable ties.
3. Band Fasteners: Integral ears.
L. Apply identification to conductors as follows:
1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.
M. Apply warning, caution, and instruction signs as follows:
1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch-high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.
N. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch- high lettering on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:
1. Panelboards, electrical cabinets, and enclosures.
2. Access doors and panels for concealed electrical items.
3. Disconnect switches.
4. Enclosed circuit breakers.

5. Power transfer equipment.
6. Transformers.

END OF SECTION 16075

SECTION 16120 - CONDUCTORS AND CABLES

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
1.2 SUMMARY
A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.
1.3 SUBMITTALS
A. Product Data: For each type of product indicated.
1.4 QUALITY ASSURANCE
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.

PART 2 - PRODUCTS
2.1 CONDUCTORS AND CABLES
A. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.
B. Conductor Material: Copper complying with NEMA WC 5; solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.
C. Conductor Insulation Types: Type THW or THHN-THWN complying with NEMA WC 5.
D. Multiconductor Cable: Multi-conductor cable assemblies shall not be used on this project, unless specifically accepted by the Engineer prior to installation. When armored cable assemblies are allowed for special conditions, the cable assembly shall include an extra phase conductor for future use.
2.2 CONNECTORS AND SPLICES
A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION
3.1 CONDUCTOR AND INSULATION APPLICATIONS
A. Service Entrance: Type XHHW, single conductors in raceway.
B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
C. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
D. Feeders below Slabs-on-Grade, and in Crawlspaces: Type THHN-THWN, single conductors in raceway.
E. Exposed Branch Circuits, including in Crawlspaces: Type THHN-THWN, single conductors in raceway.
F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
G. Branch Circuits below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.
H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.
I. Fire Alarm Circuits: Power-limited, fire-protective, signaling circuit cable in raceway.
J. Class 1 Control Circuits: Type THHN-THWN, in raceway.
K. Class 2 Control Circuits: Type THHN-THWN, in raceway.
3.2 INSTALLATION
A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, hat will not damage cables or

raceway.
D. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."
E. Seal around cables penetrating fire-rated elements according to Specification Section "Through-Penetration Firestop Systems."
F. Identify and color-code conductors and cables according to Division 16 Section "Electrical Identification."
3.3 CONNECTIONS
A. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values.
B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
C. Wiring at Outlets: Install conductor at each outlet, with at least 2 inches of slack.
3.4 FIELD QUALITY CONTROL
A. Testing: Perform the following field quality-control testing:
1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
END OF SECTION 16120

SECTION 16130 - RACEWAYS AND BOXES

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
B. Related Sections include the following:
1. Specification Section "Through-Penetration Firestop Systems" for firestopping materials and installation at penetrations through walls, ceilings, and other fire-rated elements.
2. Division 16 Section "Basic Electrical Materials and Methods" for supports, anchors, and identification products.
3. Division 16 Section "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.3 DEFINITIONS
A. EMT: Electrical metallic tubing.
B. ENT: Electrical nonmetallic tubing.
C. FMC: Flexible metal conduit.
D. IMC: Intermediate metal conduit.
E. LFMC: Liquidtight flexible metal conduit.
F. LFNC: Liquidtight flexible nonmetallic conduit.
G. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS
A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 QUALITY ASSURANCE
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.

1.6 COORDINATION
A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS
2.1 METAL CONDUIT AND TUBING
A. Rigid Steel Conduit:
B. Aluminum Rigid Conduit:
C. IMC:
D. Plastic-Coated Steel Conduit and Fittings:
E. Plastic-Coated IMC and Fittings:
F. EMT and Fittings:
1. Fittings: compression type.
G. FMC: Zinc-coated steel.
H. LFMC: Flexible steel conduit with PVC jacket.
I. Fittings: compatible with conduit and tubing materials.

2.2 NONMETALLIC CONDUIT AND TUBING
A. RNC: Schedule 40 and Schedule 80 PVC.

2.3 METAL WIREWAYS
A. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 1 or 3R as required.
B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.
D. Wireway Covers: Hinged type.
E. Finish: Manufacturer's standard enamel finish.

2.4 SURFACE RACEWAYS
A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.
B. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.5 BOXES, ENCLOSURES, AND CABINETS
A. Sheet Metal Outlet and Device Boxes:
B. Cast-Metal Outlet and Device Boxes: Type FD, with gasketed cover.
C. Floor Boxes: Cast metal, fully adjustable, rectangular.
D. Small Sheet Metal Pull and Junction Boxes:
E. Cast-Metal Pull and Junction Boxes: cast aluminum with gasketed cover.
F. Hinged-Cover Enclosures: Type 1, with continuous hinge cover and flush latch.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.
G. Cabinets: Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

2.6 FACTORY FINISHES
A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.

PART 3 - EXECUTION
3.1 RACEWAY APPLICATION
A. Outdoors:
1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC.

4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes and Enclosures: Nema Type 3R.
B. Indoors:
1. Exposed: Rectangular Metal Raceway (Wirmold)
2. Concealed: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
4. Damp or Wet Locations: Rigid steel conduit.
5. Boxes and Enclosures: Nema Type 1, except as follows:
a. Damp or Wet Locations: Nema Type 4.
C. Minimum Raceway Size: 1/2-inch trade size.
D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.
E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
F. Do not install aluminum conduits embedded in or in contact with concrete.

3.2 INSTALLATION
A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
B. Complete raceway installation before starting conductor installation.
C. Support raceways as specified in Division 16 Section "Basic Electrical Materials and Methods."
D. Install temporary closures to prevent foreign matter from entering raceways.
E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.
F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
H. Raceways shall not be embedded in concrete slabs.
I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
1. Run parallel or banked raceways together on common supports.
2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
J. Join raceways with fittings designed and approved for that purpose and make joints tight.
1. Use insulating bushings to protect conductors.
K. Tighten set screws of threadless fittings with suitable tools.
L. Terminations:
1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
N. Telephone and Signal System Raceways, 2-Inch Trade Size and Smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths

with pull or junction boxes where necessary to comply with these requirements.
O. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.
P. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.
Q. Flexible Connections: Use maximum of 48 inches of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.
R. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.
S. Set floor boxes level and flush with finished floor surface.
T. Set floor boxes level. Trim after installation to fit flush with finished floor surface.
U. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 PROTECTION
A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.4 CLEANING
A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION 16130

SECTION 16140 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY
A. This Section includes the following:

1.Single and duplex receptacles, ground-fault circuit interrupters, integral surge suppression units, and isolated-ground receptacles.
2. Single- and double-pole snap switches and dimmer switches.
3. Device wall plates.
4. Pin and sleeve connectors and receptacles.
5. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.

1.3 DEFINITIONS
A. EMI: Electromagnetic interference.
B. GFCI: Ground-fault circuit interrupter.

C. PVC: Polyvinyl chloride.
D. RFI: Radio-frequency interference.
E. TVSS: Transient voltage surge suppressor.
F. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
C. Samples: One for each type of device and wall plate specified, in each color specified.
D. Field quality-control test reports.

1.5 QUALITY ASSURANCE
A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.
B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
C. Comply with NFPA 70.

1.6 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wiring Devices:

a. Hubbell Incorporated; Wiring Device-Kellems.
b. Leviton Mfg. Company Inc.
c. Pass & Seymour/Legrand; Wiring Devices Div.

2. Wiring Devices for Hazardous (Classified) Locations:

a. Crouse-Hinds/Cooper Industries, Inc.; Arrow Hart Wiring Devices.
b. EGS/Appleton Electric Company.
c. Killark Electric Manufacturing Co./Hubbell Incorporated.

3. Multioutlet Assemblies:

a. Hubbell Incorporated; Wiring Device-Kellems.
b. Wiremold Company (The).

2.2 RECEPTACLES (Leviton 5362 or approved equal)

A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498.
B. Straight-Blade and Locking Receptacles: Heavy-Duty grade.
C. GFCI Receptacles: Straight blade, non-feed-through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch-deep outlet box without an adapter. (Leviton Model # GFNT2 or approved equal)

D. Isolated-Ground Receptacle: Straight blade, Heavy-Duty grade, duplex receptacle, with equipment grounding contacts connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. (Leviton Model # 5362-IG or approved equal)

1. Devices: Listed and labeled as isolated-ground receptacles.
2. Isolation Method: Integral to receptacle construction and not dependent on removable parts.

E. TVSS Receptacles: Straight blade, NEMA WD 6, Configuration 5-20R, with integral TVSS in line to ground, line to neutral, and neutral to ground.

1. TVSS Components: Multiple metal-oxide varistors; with a nominal clamp level rating of 500 volts and minimum single transient pulse energy dissipation of 140 J line to neutral, and 70 J line to ground and neutral to ground.
2. Active TVSS Indication: Visual only with light visible in face of device to indicate device is "active" or "no longer in service.
3. Identification: Distinctive marking on face of device to denote TVSS-type unit.

F. Industrial Heavy-Duty Pin and Sleeve Devices: Comply with IEC 309-1.

G. Hazardous (Classified) Location Receptacles: Comply with NEMA FB 11.

H. Weather Resistant (WP): Leviton Commercial Heavy Duty Grade 20Amp to comply with NEC Section 406.8

I. Tamper Resistant (TR): Leviton TBR20 or approved equal.

J. USB: Leviton T5832-I or approved equal.

2.3 PENDANT CORD/CONNECTOR DEVICES

A. Description: Matching, locking-type plug and receptacle body connector, NEMA WD 6, Configurations L5-20P and L5-20R, Heavy-Duty grade.

1. Body: Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.
2. External Cable Grip: Woven wire-mesh type made of high-strength galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.4 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.

1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.
2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.5 SWITCHES (Leviton Models 1221-2,1222-2,1223-2 and 1224-2 or approved equal)

A. Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.
B. Snap Switches: Heavy-Duty grade, quiet type.
C. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.

1. Switch: 20 A, 120/277-V ac.

2. Receptacle: NEMA WD 6, Configuration 5-15R.

D. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on/off switches and audible frequency and EMI/RFI filters.

1. Control: Continuously adjustable toggle switch; with single-pole or three-way switching to suit connections.
2. Incandescent Lamp Dimmers: Modular, 120 V, 60 Hz with continuously adjustable rotary knob, toggle switch, or slider; single pole with soft tap or other quiet switch; EMI/RFI filter to eliminate interference; and 5-inch wire connecting leads.
3. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.6 WALL PLATES (Hubbell or approved equal)

A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

2.7 FLOOR SERVICE FITTINGS

A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
B. Compartments: Barrier separates power from voice and data communication cabling.
C. Service Plate: Rectangular, with satin finish.
D. Power Receptacle: NEMA WD 6, Configuration 5-20R, gray finish, unless otherwise indicated.
E. Voice and Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 Category 6 jacks for UTP cable.

2.8. MULTIOUTLET ASSEMBLIES

A. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
B. Raceway Material: Metal, with manufacturer's standard finish.
C. Wire: No. 12 AWG.

2.9 FINISHES
A. Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70.
2. TVSS Devices: Blue.
3. Isolated-Ground Receptacles: As specified above, with orange triangle on face.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies level, plumb, and square with building lines.
B. Install wall dimmers to achieve indicated rating after derating for ganging according to manufacturer's written

instructions.
C. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' written instructions.
D. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
E. Remove wall plates and protect devices and assemblies during painting.
F. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

A. Comply with Division 16 Section "Electrical Identification."

1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding."
B. Connect wiring according to Division 16 Section "Conductors and Cables."
C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Remove malfunctioning units, replace with new units, and retest as specified above.

END OF SECTION 16140

SECTION 16145 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY
A. This Section includes the following lighting control devices:

1. Time switches.
2. Outdoor and indoor photoelectric switches.
3. Switch-box occupancy sensors.
4. Indoor occupancy sensors.
5. Outdoor motion sensors.
6. Multipole contactors.

B. Related Sections include the following:

1. Division 16 Section "Wiring Devices" for wall-box dimmers and manual light switches.
2. Division 16 Section "Dimming Controls" for architectural dimming system equipment.

1.3 DEFINITIONS

A. LED: Light-emitting diode.

B. PIR: Passive infrared.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation details for occupancy and light-level sensors.

1. Lighting plan showing location, orientation, and coverage area of each sensor.
2. Interconnection diagrams showing field-installed wiring.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 COORDINATION

A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

A. Line-Voltage Surge Protection: An integral part of the devices for 120- and 277-V solid-state equipment. For devices without integral line-voltage surge protection, field-mounting surge protection shall comply with IEEE C62.41 and with UL 1449.

2.3 TIME SWITCHES

A. Manufacturers:

1. Area Lighting Research, Inc.
2. Fisher Pierce.
3. Grasslin Controls Corporation.
4. Intermatic, Inc.
5. Leviton Mfg. Company Inc.
6. Lightolier Controls; a Genlyte Company.
7. Lithonia Lighting.
8. Paragon Electric Co.
9. Touchplate Technologies, Inc.
10. Watt Stopper (The).

B. Digital Time Switches: Electronic, solid-state programmable units with alphanumeric display complying with UL 917.

1. Contact Configuration: As indicated.
2. Contact Rating: As indicated..
3. Program: Single channel, 2 on-off set points on a 24-hour schedule with skip-a-day weekly schedule.
4. Circuitry: Allow connection of a photoelectric relay as substitute for on and off function of a program.
5. Astronomical Time: All channels.
6. Battery Backup: For schedules and time clock.

2.4 OUTDOOR PHOTOELECTRIC SWITCHES

A. Manufacturers:

1. Area Lighting Research, Inc.
2. Fisher Pierce.
3. Grasslin Controls Corporation.
4. Intermatic, Inc.
5. Lithonia Lighting.
6. Novitas, Inc.
7. Paragon Electric Co.
8. Square D.
9. TORK.
10. Touchplate Technologies, Inc.
11. Watt Stopper (The).

B. Description: Solid state, with DPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, microprocessor input, and complying with UL 773A.

1. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range, and a directional lens in front of photocell to prevent fixed light sources from causing turn-off.
2. Time Delay: 15-second minimum, to prevent false operation.
3. Surge Protection: Metal-oxide varistor type, complying with IEEE C62.41 for Category A1 locations.
4. Mounting: Twist lock complying with IEEE C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the North sky exposure.

2.5 INDOOR PHOTOELECTRIC SWITCHES

A. Manufacturers:
1. Allen-Bradley/Rockwell Automation
2. Area Lighting Research, Inc.
3. Cutler-Hammer; Eaton Corporation.
4. Fisher Pierce.

5. Grasslin Controls Corporation.
6. Intermatic, Inc.
7. Lithonia Lighting.
8. MicroLite Corporation.
9. Novitas, Inc.
10. Paragon Electric Co.
11. Square D.
12. TORK.
13. Touchplate Technologies, Inc.
14. Watt Stopper (The).

B. Ceiling-Mounting Photoelectric Switch: Solid-state, light-level sensor unit, with separate relay unit mounted on luminaire, to detect changes in lighting levels that are perceived by the eye. Cadmium sulfide photoresistors are not acceptable.

1. Sensor Output: Contacts rated to operate the associated relay, complying with UL 773A. Sensor shall be powered from the relay unit.
2. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
3. Light-Level Monitoring Range: 10 to 200 fc, with an adjustment for turn-on and turn-off levels within that range.
4. Time Delay: Adjustable from 5 to 300 seconds to prevent cycling, with deadband adjustment.
5. Indicator: Two LEDs to indicate the beginning of on and off cycles.

C. Skylight Photoelectric Sensors: Solid-state, light-level sensor; housed in a threaded, plastic fitting for mounting under skylight, facing up at skylight; with separate relay unit mounted on luminaire, to detect changes in lighting levels that are perceived by the eye. Cadmium sulfide photoresistors are not acceptable.

1. Sensor Output: Contacts rated to operate the associated relay, complying with UL 773A. Sensor shall be powered from the relay unit.
2. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
3. Light-Level Monitoring Range: 1000 to 10,000 fc, with an adjustment for turn-on and turn-off levels within that range.
4. Time Delay: Adjustable from 5 to 300 seconds to prevent cycling, with deadband adjustment.
5. Indicator: Two LEDs to indicate the beginning of on and off cycles.

2.6 SWITCH-BOX OCCUPANCY SENSORS

A. Manufacturers:

1. Bryant Electric; a Hubbell Company.
2. Hubbell Lighting Inc.
3. Leviton Mfg. Company Inc.
4. Lightolier Controls; a Genlyte Company
5. Lithonia Lighting.
6. MYTECH Corporation.
7. Novitas, Inc.
8. RAB Electric Manufacturing, Inc.
9. Sensor Switch, Inc.
10. TORK.
11. Unenco Electronics; a Hubbell Company.
12. Watt Stopper (The).

B. Description: PIR type with integral power-switching contacts rated for 800 W at 120-V ac, suitable for incandescent

light fixtures, flourescent light fixtures with magnetic or electronic ballasts, or 1/6-hp motors; and rated for 1000 W at 277-V ac, suitable for incandescent light fixtures, flourescent light fixtures with magnetic or electronic ballasts, or 1/3-hp motors, minimum.

2.7 INDOOR OCCUPANCY SENSORS

A. Manufacturers:

1. Hubbell Lighting Inc.
2. Leviton Mfg. Company Inc.
3. Lithonia Lighting
4. MYTECH Corporation.
5. Novitas, Inc.
6. RAB Electric Manufacturing, Inc
7. Sensor Switch, Inc.
8. TORK
9. Unenco Electronics; a Hubbell Company.
10. Watt Stopper (The).

B. General Description: Wall- or ceiling-mounting, solid-state units with a separate relay unit.

1. Operation: Unless otherwise indicated, turn lights on when covered area is occupied and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
2. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit.
3. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.

4. Mounting:
a. Sensor: Suitable for mounting in any position on a standard outlet box.
b. Relay: Externally mounted though a 1/2-inch knockout in a standard electrical enclosure.
c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.

5. Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
6. Bypass Switch: Override the on function in case of sensor failure
7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present.
8. FailSafe: In case of sensor failure, lighting fixtures shall remain on.

C. Dual-Technology Type: Ceiling mounting; detect occupancy by using a combination of PIR and ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on and off functions shall be selectable in the field by operating controls on unit.

1. Sensitivity Adjustment: Separate for each sensing technology
2. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in., and detect a person of average size and weight moving at least 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s
3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch- high ceiling.

2.8 OUTDOOR MOTION SENSORS (PIR)

A. Manufacturers:

1. Bryant Electric; a Hubbell Company
2. Hubbell Lighting Inc
3. Lithonia Lighting
4. Paragon Electric Co
5. RAB Electric Manufacturing, Inc.
6. TORK.
7. Watt Stopper (The).

B. General Description: Suitable for operation in ambient temperatures ranging from minus 40 deg F to 130 deg F, UL 773A rated as raintight.

1. Operation: Turn lights on when sensing infrared energy changes between background and moving body in area of coverage; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes
2. Sensor Output: Suitable for switching 300 W of tungsten load at 120- or 277-V ac. Lampholders shall comply with UL 1571 for wet locations.
3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit
4. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
5. Mounting:
a. Sensor: Suitable for mounting in any position on a standard outdoor junction box
b. Relay: Internally mounted in a standard weatherproof electrical enclosure.
c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door
6. Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
7. Bypass Switch: Override the on function in case of sensor failure.
8. Automatic Light-Level Sensor: Adjustable from 1 to 20 fc; keeps lighting off during daylight hours.

C. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in.

2.9 MULTIPOLE CONTACTORS

A. Manufacturers:
1. Allen-Bradley/Rockwell Automation.
2. ASCO Power Technologies, LP; a division of Emerson Electric Co
3. Cutler-Hammer; Eaton Corporation.
4. Fisher Pierce.
5. GE Industrial Systems; Total Lighting Control.
6. Grasslin Controls Corporation.
7. Hubbell Lighting Inc.
8. Lithonia Lighting.
9. MicroLite Corporation
10. TORK.
11. Touchplate Technologies, Inc.
12. Watt Stopper (The).

B. Description: Electrically operated and electrically held, complying with NEMA ICS 2 and UL 508.

1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current)
2. Control-Coil Voltage: Match control power source.

2.10 CONDUCTORS AND CABLES

1. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG, complying with Division 16 Section" Conductors and Cables."
2. Install unshielded, twisted-pair cable for control and signal transmission conductors, complying with Division 16 Section "Voice and Data Communication Cabling."

PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

A. Install and aim sensors in locations to achieve at least 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION

A. Wiring Method: Comply with Division 16 Section "Conductors and Cables." Minimum conduit size shall be ½ inch
B. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
C. Install field-mounting transient voltage suppressors for lighting control devices in Category A locations that do not have integral line-voltage surge protection.
D. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.
E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 IDENTIFICATION

A. Identify components and power and control wiring according to Division 16 Section "Electrical Identification."
B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.

2. Operational Test: Verify actuation of each sensor and adjust time delays.

B. Remove and replace lighting control devices where test results indicate that they do not comply with specified requirements.

C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose.

END OF SECTION 16145

SECTION 16410 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
1.2 SUMMARY
A. This Section includes the following individually mounted, enclosed switches and circuit breakers:
1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit switches.
4. Molded-case switches.
5. Enclosures.
1.3 DEFINITIONS
A. GD: General duty.
B. GFCI: Ground-fault circuit interrupter.
C.HD: Heavy duty.
D. RMS: Root mean square.E.SPDT: Single pole, double throw.
1.4 SUBMITTALS
A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current rating.
4. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
B. Shop Drawings: Diagram power, signal, and control wiring.
C. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section include the following:
1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
2. Time-current curves, including selectable ranges for each type of circuit breaker.
1.5 QALITY ASSURANCE
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.
C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
1.6 PROJECT CONDITIONS
A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
2. Altitude: Not exceeding 6600 feet.
1.7 COORDINATION
A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
1.8 EXTRA MATERIALSA. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Spares: For the following:
a. Potential Transformer Fuses: 1% but not less than one of each type.

b. Control-Power Fuses: 1% but not less than one of each type.
c. Fuses and Fusible Devices for Fused Circuit Breakers: 1% but not less than one of each type.
d. Fuses for Fusible Switches: 1% but not less than one of each type.
e. Fuses for Fused Power Circuit Devices: 1% but not less than one of each type.
2. Spare Indicating Lights: Six of each type installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FUSIBLE AND NONFUSIBLE SWITCHES

A. Manufacturers:
1. General Electric Co.; Electrical Distribution & Control Division.
2. Square D/Group Schneider.
B. Fusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
C. Nonfusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
D. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.
3. Auxiliary Contact Kit: Auxiliary set of contacts arranged to open before switch blades open.

2.3 FUSED POWER CIRCUIT DEVICES

A. Bolted-Pressure Contact Switch: UL 977; operating mechanism shall use a rotary-mechanical-bolting action to produce and maintain high-clamping pressure on the switch blade after it engages the stationary contacts.
1. Manufacturers:
a. Boltswitch, Inc.
b. General Electrical.
c. Square D/Group Schneider.
B. High-Pressure, Butt-Type Contact Switch: UL 977; operating mechanism shall use butt-type contacts and a spring-charged mechanism to produce and maintain high-contact pressure when switch is closed.
1. Manufacturers:
a. General Electric Co.; Electrical Distribution & Control Division.
b. Square D/Group Schneider.
2. Main Contact Interrupting Capability: Twelve times the switch current rating, minimum.
3. Operating Mechanism: Manual handle operation to close switch stores energy in mechanism for closing and opening.
a Electrical Trip: Operation of lever or push-button trip switch, or trip signal from ground-fault relay or remote-control device, causes switch to open.
b Mechanical Trip: Operation of mechanical lever or push button or another device causes switch to open.
4. Auxiliary Switches: Factory installed, SPDT, with leads connected to terminal block, and including one set more than quantity required for functional performance indicated.
5. Service-Rated Switches: Labeled for use as service equipment.
6. Ground-Fault Relay: Comply with UL 1053. Self-powered type with mechanical ground-fault indicator, test function, tripping relay with internal memory, and three-phase current transformer/sensor.
a. Configuration: Remote-mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground fault indicator.
b. Internal Memory: Integrates the cumulative value of intermittent arcing ground-fault currents and uses the effect to initiate tripping.
c. No-Trip Relay Test: Operation of "no-trip" test control permits ground-fault simulation test without tripping switch.
d. Test Control: Simulates ground fault to test relay and switch (or relay only if "no-trip" mode is selected).
7. Open-Fuse Trip Device: Arranged to trip switch open if a phase fuse opens.

2.4 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. Manufacturers:

1. General Electric Co.; Electrical Distribution & Control Division.
2. Square D/Group Schneider.

B. Molded-Case Circuit Breaker: NEMA AB 1, 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-Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:
a. Instantaneous trip.
b. Long- and short-time pickup levels.
c. Long- and short-time time adjustments.
d. Ground-fault pickup level, time delay, and I^2t response.
4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.
5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.
6. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

C. Molded-Case Circuit-Breaker Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
4. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
5. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
7. Auxiliary Switch: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
8. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
9. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.

D. Molded-Case Switches: Molded-case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

E. Molded-Case Switch Accessories:

1. Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage. Provide "dummy" trip unit where required for proper operation.
4. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay. Provide "dummy" trip unit where required for proper operation.
5. Auxiliary Switch: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
6. Key Interlock Kit: Externally mounted to prohibit operation; key shall be removable only when switch is in off position.

2.5 ENCLOSURES

A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
4. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.

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

3.2 CONCRETE BASES

A. Coordinate size and location of concrete bases. Verify structural requirements with structural engineer.

B. Concrete base is specified in Division 16 Section "Basic Electrical Materials and Methods," and concrete materials and installation requirements are specified in Division 3.

3.3 INSTALLATION

A. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.

B. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated. Anchor floor-mounting switches to concrete base.

C. Comply with mounting and anchoring requirements specified in Division 16 Section "Seismic Controls for Electrical Work."

D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.4 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate as specified in Division 16 Section "Electrical Identification."

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections. Report results in writing.

1. Inspect mechanical and electrical connections.
2. Verify switch and relay type and labeling verification.
3. Verify rating of installed fuses.

B. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Infrared Scanning:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Open or remove doors or panels so connections are accessible to portable scanner.

b. Follow-Up Infrared Scanning: Perform an additional follow-up infrared scan of each unit 11 months after date of Substantial Completion.

c. Instruments, Equipment and Reports:

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

2) Prepare a certified report that identifies enclosed switches and circuit breakers included and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

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

3.7 CLEANING

A. On completion of installation, vacuum dirt and debris from interiors; do not use compressed air to assist in cleaning.

B. Inspect exposed surfaces and repair damaged finishes.

END OF SECTION 16410

SECTION 16442 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Distribution panelboards.

2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. RFI: Radio-frequency interference.

D. RMS: Root mean square.

E. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

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

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Enclosure types and details for types other than NEMA 250, Type 1.

b. Bus configuration, current, and voltage ratings.

c. Short-circuit current rating of panelboards and overcurrent protective devices.Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
2. Wiring Diagrams: Power, signal, and control wiring.

C. Field quality-control test reports including the following:

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.
D. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

E. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and

maintenance manuals.

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of panelboards and are based on the specific system indicated

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with NEMA PB 1.

E. Comply with NFPA 70.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Not exceeding 104 deg F.

2. Altitude: Not exceeding 6600 feet.

1.7 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

1.8 EXTRA MATERIALS

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

1. Keys: Six spares for each type of panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

a. General Electric Co.; Electrical Distribution & Protection Div.

b. Square D.

c. Eaton / Cutler Hammer

2.2 MANUFACTURED UNITS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Division 16 Section "Seismic Controls for Electrical Work."

B. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1.

1. Rated for environmental conditions at installed location.

a. Outdoor Locations: NEMA 250, Type 3R.

b. Kitchen Areas: NEMA 250, Type 4X, stainless steel.

c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.

3. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

4. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

C. Phase and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

3. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box.

D. Conductor Connectors: Suitable for use with conductor material.

1. Main and Neutral Lugs: Compression type.

2. Ground Lugs and Bus Configured Terminators: Compression type.

E. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

2.3 PANELBOARD SHORT-CIRCUIT RATING

A. Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.4 DISTRIBUTION PANELBOARDS

A. Doors: Secured with vault-type latch with tumbler lock; keyed alike. Omit for fused-switch panelboards.

B. Main Overcurrent Protective Devices: Circuit breaker.

C. Branch Overcurrent Protective Devices:

1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

2.5 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.6 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: 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-unit circuit breakers shall have RMS sensing; field-replaceable rating plug; and with the following field-adjustable settings:

a. Instantaneous trip.

b. Long- and short-time pickup levels.

c. Long- and short-time time adjustments.

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

4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.

5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.

6. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at [55] [75] percent of rated voltage.

5. Multipole units enclosed in a single housing or factory-assembled to operate as a single unit.

2.7 ACCESSORY COMPONENTS AND FEATURES

A. Furnish accessory set including tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

2.8 TVSS DEVICES

A. Integrally mounted in panelboard.

B. See panel schedule for Transient Voltage Suppression requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Mount top of trim 74 inches above finished floor, unless otherwise indicated.

C. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

D. Install overcurrent protective devices and controllers.

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

E. Install filler plates in unused spaces.

F. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

G. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

H. ALL panel cans and covers with-in the same space shall be the same height.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable. Provide room being served identification for each circuit.

C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

3.3 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding."

B. Connect wiring according to Division 16 Section "Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

C. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.

2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.

3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.

4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

E. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scanning of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.

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

3. Record of Infrared Scanning: Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 16442

SECTION 16512 - LED INTERIOR LIGHTING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior solid-state luminaries that use LED technology.

2. Lighting fixture supports.

B. Related Requirements.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Fixture: See “Luminaire”.

D. IP: International Protection or Ingress Protection Rating.
E. LED: Light-emitting diode.
F. Lumen: Measured output of lamp and luminaire, or both.
G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.
1.3 ACTION SUBMITTALS
A. Product Data: For each type of product, arranged by designation.
B. Shop Drawings: For nonstandard or custom luminaires.
1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

3. Include diagrams for power, signal, and control wiring.
C. Product Schedule: For luminaires and lamps. (See Plans.)
1.4 INFORMATIONAL SUBMITTALS
A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale and coordinated with each other, using input from installers of the items involved:
B. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
C. Product Certificates: For each type of luminaire.
D. Sample warranty.
1.5 CLOSEOUT SUBMITTALS
A. Operation and maintenance data.
1.6 WARRANTY
A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
B. Warranty Period: Seven (7) years from date of Substantial Completion.
1.7 EXTRA MATERIALS
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Plastic Diffusers and Lenses: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

2. Battery and Charger Data: One for each emergency lighting unit.

3. Globes and Guards: 1 for every 20 of each type and rating installed. Furnish at least one of each type.

PART 2 – PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. Recessed Fixtures: Comply with NEMA LE 4.

E. Lamps dimmable from 100 percent to 0 percent of maximum light output.

F. Internal driver.

G. Nominal Operating Voltage: Field verify. All fixtures shall be rated 120VAC – 277VAC

1. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.

2.2 MATERIALS

A. Metal Parts:

1. Free of burrs and sharp corners and edges.

2. Sheet metal components shall be steel unless otherwise indicated.

3. Form and support to prevent warping and sagging

B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Diffusers, and Globes:

1. Acrylic: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

2. Glass: Annealed crystal glass unless otherwise indicated.

3. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.

2.3 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.4 LUMINAIRE SUPPORT COMPONENTS

A. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.

B. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel.

C. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.

D. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.
B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
C. Install lamps in each luminaire.
D. Supports: Sized and rated for luminaire weight.
E. Flush-Mounted Luminaire Support: Secured to outlet box.
F. Suspended Luminaire Support:
1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.

2. Stem-Mounted, Single-Unit Luminaires: Suspend with four-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.

3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and rod for suspension for each unit length of luminaire chassis, including one at each end.

4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
G. Ceiling-Grid-Mounted Luminaires:
1. Secure to any required outlet box.
2. Secure luminaire using approved fasteners in a minimum of four locations, spaced near corners of luminaire.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
B. Luminaire will be considered defective if it does not pass operation tests and inspections.
C. Prepare test and inspection reports.
END OF SECTION

PROTECTION OF EQUIPMENT AND MATERIALS:

The contractor shall at all times take such precautions as may be necessary to properly protect all equipment and materials from damage; failure on the part of the contractor to comply with the above to the entire satisfaction of the University will be sufficient cause for rejection of the particular piece of equipment in question.

GENERAL CLEAN-UP
The general Contractor shall be responsible for providing a dumpster and for the proper disposal of all work associated debris at an appropriate (for the type of debris), approved landfill.

THE USE OF A UNIVERSITY DUMPSTER IS PROHIBITED.

The general Contractor shall be responsible for leaving the space, free of dust and mopped clean.

All surfaces shall be wiped down and free of dust.

END OF SECTION

BUILDING PLANS/DRAWINGS

If drawings and plans are included with this solicitation, they will be provided to bidders as Attachment A.

END OF SECTION

ALTERNATES

Alternate No. 1 – Add – To furnish and install new storage shed with foundation, sidewalks, and electrical wiring and devices.

Alternate No. 2 – N/A

Alternate No. 3 – N/A

END OF SECTION

Special Requirements Specific to the New Iberia Research Center

MEDICAL REQUIREMENTS

The Contractor shall have all on-site technicians/crew members provide proof of Measles immunization or positive Measles Titer to the Center representative prior to entering the Facility. The Contractor shall also supply proof of a negative TB test every 6 months for all on-site technicians/crew members for the duration of the Contract. Failure to supply appropriate medical documentation will restrict the technician(s)/crew member(s) from entry onto the Center premises until such time as the requirements are satisfactorily met. In addition, technicians/crew members shall be in overt good health with no signs of infectious disease to include fever, respiratory disease, gastrointestinal dysfunction or cold sores.

There will be no grace period for the performance of the medical requirements.

ENHANCED SECURITY CLEARANCE (CONTRACTORS):

The Contractor shall have all technicians/crew members submit to an Enhanced Security Clearance screening, prior to granting the individual access to the University of Louisiana at Lafayette's New Iberia Research Center's (NIRC) Facility. The screening of technicians/crew members will be conducted through Information Network Associates (INA), www.ina-inc.com and will be the sole responsibility of the New Iberia Research Center. The New Iberia Research Center will contact INA directly to request the "UL-NIRC Enhanced Security Clearance screening" be performed.

Eligibility for contracted employment with NIRC and access to the Facility, will be classified as a "Security Clearance", and will be granted only to those individuals whom have undergone the appropriate Enhanced Security Screening. Continued association with NIRC and access to the Facility is contingent upon maintaining a satisfactory Security Clearance.

A successful Security Clearance shall be considered a condition of the Contract. Any existing and/or new technician/crew member failing to satisfactorily pass the Enhanced Security Clearance will not be allowed to enter the Facility. The Contractor shall use its best efforts to assign technicians/crew members reasonably believed to be able to meet the Enhanced Security Clearance requirements.

There will be no grace period for the performance of the Enhanced Security Clearance screening.

GENERAL CLEAN-UP

The general Contractor shall be responsible for providing a dumpster and for the proper disposal of all work associated debris at an appropriate (for the type of debris), approved landfill.

The general Contractor shall be responsible for leaving the space, free of dust and mopped clean.

All surfaces shall be wiped down and free of dust.

END OF SECTION

INSTRUCTIONS TO BIDDERS

https://www.doa.la.gov/.../24_Instructions_to_Bidders_July2018.docx

ARTICLE 1

DEFINITIONS

1.1 The Bid Documents include the following:

Advertisement for Bids (if applicable)
Instructions to Bidders
Bid Form
Bid Bond Instruction
General Conditions of the Contract for Construction,
AIA Document A201, 2017 Edition
Supplementary Conditions
Contract Between Owner and Contractor and Performance and Payment Bond
Mandatory Affidavits
User Agency Documents (if applicable)
Change Order Form (if applicable)
Partial Occupancy Form (if applicable)
Recommendation of Acceptance (if applicable)
Asbestos Abatement (if applicable)
Other Documents (if applicable)
Specifications & Drawings
Addenda issued during the bid period and acknowledged on the Bid Form (if applicable)

1.2 All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201 and the Supplementary Conditions are applicable to the Bid Documents.

1.3 Addenda are written and/or graphic instruments issued by the Architect or Purchasing Office prior to the opening of bids, which modify or interpret the Bid Documents by additions, deletions, clarifications, corrections and prior approvals.

1.4 A bid is a complete and properly signed proposal to do the work or designated portion thereof for the sums stipulated therein supported by data called for by the Bid Documents.

1.5 Base bid is the sum stated in the bid for which the Bidder offers to perform the work described as the base, to which work may be added, or deleted for sums stated in alternate bids.

1.6 An alternate bid (or alternate) is an amount stated in the bid to be added to the amount of the base bid if the corresponding change in Project scope or materials or methods of construction described in the Bid Documents is accepted.

1.7 A Bidder is one who submits a bid for a prime Contract with the Owner for the work described in the Bid Documents.

1.8 A Sub-bidder is one who submits a bid to a Bidder for materials and/or labor for a portion of the work.

1.9 Where the word "Architect" is used in any of the documents, it shall refer to the Prime Designer of the Project, regardless of discipline.

ARTICLE 2

PRE-BID CONFERENCE

2.1 A Pre-Bid Conference shall be held at least 10 days before the date for receipt for bids. The Architect shall coordinate the setting of the date, time and place for the Pre-Bid Conference with the User Agency and shall notify in writing the

Owner and all who have received sets of the Bid Documents to attend. The purpose of the Pre-Bid Conference is to familiarize Bidders with the requirements of the Project and the intent of the Bid Documents, and to receive comments and information from interested Bidders. If the Pre-Bid Conference is stated in the Advertisement for Bids to be a Mandatory Pre-Bid Conference, bids shall be accepted only from those bidders who attend the Pre-Bid Conference. Contractors who are not in attendance for the entire Pre-Bid Conference will be considered to have not attended.

2.2 Any revision of the Bid Documents made as a result of the Pre-Bid Conference shall not be valid unless included in an addendum.

ARTICLE 3

BIDDER'S REPRESENTATION

3.1 Each Bidder by making his bid represents that:

3.1.1 He has read and understands the Bid Documents and his bid is made in accordance therewith.

3.1.2 He has visited the site and has familiarized himself with the local conditions under which the work is to be performed.

3.1.3 His bid is based solely upon the materials, systems and equipment described in the Bid Documents as advertised and as modified by addenda.

3.1.4 His bid is not based on any verbal instructions contrary to the Bid Documents and addenda.

3.1.5 He is familiar with Code of Governmental Ethics requirement that prohibits public servants and/or their immediate family members from bidding on or entering into contracts; he is aware that the Designer and its principal owners are considered Public Servants under the Code of Governmental Ethics for the limited purposes and scope of the Design Contract with the State on this Project (see Ethics Board Advisory Opinion, No. 2009-378 and 2010-128); and neither he nor any principal of the Bidder with a controlling interest therein has an immediate family relationship with the Designer or any principal within the Designer's firm (see La. R.S. 42:1113). Any Bidder submitting a bid in violation of this clause shall be disqualified and any contract entered into in violation of this clause shall be null and void.

3.2 The Bidder must be fully qualified under any State or local licensing law for Contractors in effect at the time and at the location of the work before submitting his bid. In the State of Louisiana, Revised Statutes 37:2150, et seq. will be considered, if applicable.
The Contractor shall be responsible for determining that all of his Sub-bidders or prospective Subcontractors are duly licensed in accordance with law.

ARTICLE 4

BID DOCUMENTS

4.1 Copies

4.1.1 Bid Documents may be obtained from the Architect for a deposit as stated in the Advertisement for Bids. The deposit will be refunded as stated in the Advertisement for Bids. No deposits will be refunded on Bid Documents returned later than ten days after receipt of bids.

4.1.1.2 As an alternative method of distribution, the Designer may provide the Bid Documents in electronic format. They may be obtained without charge and without deposit as stated in the Advertisement for Bids.

4.1.1.2.1 If electronic distribution is available, printed copies will not be available from the Designer, but arrangements can be made to obtain them through most reprographic firms and/or plan rooms.

4.1.1.2.2 If electronic distribution is available, the reproduction cost on the first paper plan set acquired by bona fide prime bidders will be fully refunded by the Designer upon

delivery of the documents to the Designer in good condition no later than ten days after receipt of bids.

4.1.1.2.3 If electronic distribution is available, all other plan holders are responsible for their own reproduction costs.

4.1.2 Complete sets of Bid Documents shall be used in preparing bids; neither the Owner nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.

4.1.3 The Owner or Architect in making copies of the Bid Documents available on the above terms, do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

4.2 Interpretation or Correction of Bid Documents

4.2.1 Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Bid Documents or of the site and local conditions.

4.2.2 Bidders requiring clarification or interpretation of the Bid Documents shall make a written request to the Architect, to reach him at least seven days prior to the date for receipt of bids.

4.2.3 Any interpretation, correction or change of the Bid Documents will be made by addendum. Interpretations, corrections or changes of the Bid Documents made in any other manner will not be binding and Bidders shall not rely upon such interpretations, corrections and changes.

4.3 Substitutions

4.3.1 The materials, products and equipment described in the Bid Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution. No substitutions shall be allowed after bids are received.

4.3.2 No substitution will be considered unless written request for approval has been submitted by the Proposer and has been received by the Architect at least seven (7) working days prior to the opening of bids. (La. R.S. 38:2295(C)) Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including model numbers, drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. It shall be the responsibility of the proposer to include in his proposal all changes required of the Bid Documents if the proposed product is used. Prior approval, if given, is contingent upon supplier being responsible for any costs which may be necessary to modify the space or facilities needed to accommodate the materials and equipment approved.

4.3.3 If the Architect approves any proposed substitution, such approval shall be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

4.4 Addenda

4.4.1 Addenda will be transmitted to all who are known by the Architect to have received a complete set of Bid Documents.

4.4.2 Copies of addenda will be made available for inspection wherever Bid Documents are on file for that purpose.

4.4.3 Except as described herein, addenda shall not be issued within a period of seventy-two (72) hours prior to the advertised time for the opening of bids, excluding Saturdays, Sundays, and any other legal holidays. If the necessity arises of issuing an addendum modifying plans and specifications within the seventy-two (72) hour period prior to the advertised time for the opening of bids, then the opening of bids shall be extended at least seven but no more than twenty-one (21) working days, without the requirement of re-advertising. UL Lafayette Purchasing shall be consulted prior to issuance of such an addendum and shall approve such issuance. The

revised time and date for the opening of bids shall be stated in the addendum.

4.4.4 Each Bidder shall ascertain from the Architect prior to submitting his bid that he has received all addenda issued, and he shall acknowledge their receipt on the Bid Form.

4.4.5 The Owner shall have the right to extend the bid date by up to (30) thirty days without the requirement of re-advertising. Any such extension shall be made by addendum issued.

ARTICLE 5

BID PROCEDURE

5.1 Form and Style of Bids

5.1.1 Bids shall be submitted on the Louisiana Uniform Public Work Bid Form provided by the Architect for this Project.

5.1.2 The Bidder shall ensure that all applicable blanks on the bid form are completely and accurately filled in.

5.1.3 Bid sums shall be expressed in both words and figures, and in case of discrepancy between the two, the written words shall govern.

5.1.4 Any interlineation, alteration or erasure must be initialed by the signer of the bid or his authorized representative.

5.1.5 Bidders are cautioned to complete all alternates should such be required on the Bid Form. Failure to submit alternate prices will render the bid non responsive and shall cause its rejection.

5.1.6 Bidders are cautioned to complete all unit prices should such be required in the Bid Form. Unit prices represent a price proposal to do a specified quantity and quality of work. Unit prices are incorporated into the base bid or alternates, as indicated on the Unit Price Form, but are not the sole components thereof.

5.1.7 Bidder shall make no additional stipulations on the Bid Form nor qualify his bid in any other manner.

5.1.8 Written evidence of the authority of the person signing the bid for the public work shall be submitted in accordance with La. R.S. 38:2212 (B)(5).

5.1.9 On any bid in excess of fifty thousand dollars ($50,000.00), the Contractor shall certify that he is licensed under La. R.S. 37: 2150-2173 and show his license number on the bid above his signature or his duly authorized representative.

5.2 Bid Security

5.2.1 No bid shall be considered or accepted unless the bid is accompanied by bid security in an amount of five percent (5.0%) of the base bid and all alternates.
The bid security shall be in the form of a certified check, cashier’s check drawn on a bank insured by the Federal Deposit Insurance Corporation, or a Bid Bond written by a surety company licensed to do business in Louisiana and signed by the surety's agent or attorney-in-fact. The surety for the bond must meet the qualifications stated thereon. The Bid Bond shall include the legal name of the bidder be in favor of the University of Louisiana at Lafayette, and shall be accompanied by appropriate power of attorney. The Bid Bond must be signed by both the bidder/principal. Failure by the bidder/principal or the surety to sign the bid bond shall result in the rejection of the bid.
Bid security furnished by the Contractor shall guarantee that the Contractor will, if awarded the work according to the terms of his proposal, enter into the Contract and furnish Performance and Payment Bonds as required by these Bid Documents, within fifteen (15) days after written notice that the instrument is ready for his signature.
Should the Bidder refuse to enter into such Contract or fail to furnish such bonds, the amount of the bid security

shall be forfeited to the Owner as liquidated damages, not as penalty.

5.2.2 The Owner will have the right to retain the bid security of Bidders until either (a) the Contract has been executed and bonds have been furnished, or (b) the specified time has elapsed so that bids may be withdrawn, or (c) all bids have been rejected.

5.3 Submission of Bids

See Guidelines for Electronic Submission of Bids and Virtual Bid Openings included in this solicitation.

5.3.1 ~~The Bid shall be sealed in an opaque envelope. The bid envelope shall be identified on the outside the name, address, and license number of the Bidder.~~
~~The envelope shall not contain multiple bid forms, and will be received until the time specified and at the place specified in the Advertisement for Bids. It shall be the specific responsibility of the Bidder to deliver his sealed bid to The University at the appointed place and prior to the announced time for the opening of bids. Late delivery of a bid for any reason, including late delivery by United States Mail, or express delivery, shall disqualify the bid.~~

~~If the bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "Bid Enclosed" on the face thereof. Such bids shall be sent by Registered or Certified Mail, Return Receipt Requested, addressed to:~~

~~University of Louisiana at Lafayette~~
~~Purchasing Department,~~
~~P. O. Box 40197~~
~~Lafayette, LA 70504~~
~~Bids sent by express delivery shall be delivered to:~~
~~University of Louisiana at Lafayette~~
~~Purchasing Department~~
~~Martin Hall, Room 123~~
~~104 University Circle~~
~~Lafayette, LA 70503~~

IMPORTANT: BIDS WILL NOT BE ACCEPTED BY U.S. MAIL OR IN-PERSON DELIVERY TO THE PURCHASING OFFICE. ANY REFERENCE TO SEALED ENVELOPES AND OR MAILED DOCUMENTS ARE TO BE DISREGARDED BY POTENTIAL BIDDERS. COURIER SERVICES SUCH AS UPS, FedEx, and DHL WIL NOT BE ABLE TO DELIVERY TO OUR PHYSICAL LOCATION AND THE BUILDING MAY BE LOCKED OR UNSTAFFED.

5.3.2 Bids shall be deposited at the designated location prior to the time on the date for receipt of bids indicated in the Advertisement for Bids, or any extension thereof made by addendum. Bids received after the time and date for receipt of bids will be returned unopened.

5.3.3 Bidder shall assume full responsibility for timely delivery at location designated for receipt of bids.

5.3.4 Oral, telephonic or telegraphic bids are invalid and shall not receive consideration. Owner shall not consider notations written on outside of bid form ~~envelope~~ which have the effect of amending the bid. Written modifications enclosed in the bid ~~envelope~~, and signed or initialed by the Contractor or his representative, shall be accepted.

5.4 Modification or Withdrawal of Bid

5.4.1 A bid may not be modified, withdrawn or canceled by the Bidder during the time stipulated in the Advertisement for Bids, for the period following the time and bid date designated for the receipt of bids, and Bidder so agrees in submitting his bid, except in accordance with R.S. 38:2214 which states, in part, "Bids containing patently obvious, unintentional, and substantial mechanical, clerical, or mathematical errors, or

errors of unintentional omission of a substantial quantity of work, labor, material, or services made directly in the compilation of the bid, may be withdrawn by the contractor if clear and convincing sworn, written evidence of such errors is furnished to the public entity within forty- eight hours of the bid opening excluding Saturdays, Sundays, and legal holidays".

5.4.2 Prior to the time and date designated for receipt of bids, bids submitted early may be modified or withdrawn only by notice to the party receiving bids at the place and prior to the time designated for receipt of bids.

5.4.3 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids provided that they are then fully in conformance with these Instructions to Bidders.

5.4.4 Bid Security shall be in an amount sufficient for the bid as modified or resubmitted.

5.5 Prohibition of Discriminatory Boycotts of Israel

By submitting a bid, the bidder certifies and agrees that the following information is correct:
In preparing its bid, the bidder has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not, in the solicitation, selection, or commercial treatment of any subcontractor or supplier, refused to transact or terminated business activities, or taken other actions intended to limit commercial relations, with a person or entity that is engaging in commercial transactions in Israel or Israel-controlled territories, with the specific intent to accomplish a boycott or divestment of Israel. The bidder has also not retaliated against any person or other entity for reporting such refusal, termination, or commercially limiting actions. The state reserves the right to reject any bid if this certification is subsequently determined to be false and to terminate any contract awarded based on such a false response.

ARTICLE 6
CONSIDERATION OF BIDS

6.1 Opening of Bids

See Guidelines for Electronic Submission of Bids and Virtual Bid Openings on page 5 of this solicitation.

6.1.1 The properly identified Bids received on time will be opened publicly and will be read aloud, and a tabulation abstract of the amounts of the base bids and alternates, if any, will be made available to Bidders.

6.2 Rejection of Bids

6.2.1 The Owner shall have the right to reject any or all bids and in particular to reject a bid not accompanied by any required bid security or data required by the Bid Documents or a bid in any way incomplete or irregular.

6.3 Acceptance of Bid

6.3.1 It is the intent of the Owner, if he accepts any alternates, to accept them in the order in which they are listed in the Bid Form. Determination of the Low Bidder shall be on the basis of the sum of the base bid and the alternates accepted. However, the Owner shall reserve the right to accept alternates in any order which does not affect determination of the Low Bidder.

ARTICLE 7
POST-BID INFORMATION

7.1 Submissions

7.1.1 At the Pre-Construction Conference, the Contractor shall submit the following information to the Architect.

7.1.1.1 A designation of the work to be performed by the Contractor with his own forces.

7.1.1.2 A breakdown of the Contract cost attributable to each item listed in the Schedule of Values Form (attached). No payments will be made to the Contractor until this is received.

7.1.1.3 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the work.

7.1.1.4 A list of names and business domiciles of all Subcontractors, manufacturers, suppliers or other persons or organizations (including those who are to furnish materials or equipment fabricated to a

special design) proposed for the principal portions of the work. It is the preference of the Owner that, to the greatest extent possible or practical, the Contractor utilize Louisiana Subcontractors, manufacturers, suppliers, and labor.

7.1.2 The General Contractor shall be responsible for actions or inactions of Subcontractors and/or material suppliers.

The General Contractor is totally responsible for any lost time or extra expense incurred due to a Subcontractor's or Material Supplier's failure to perform. Failure to perform includes, but is not limited to, a Subcontractor's financial failure, abandonment of the Project, failure to make prompt delivery, or failure to do work up to standard. Under no circumstances shall the Owner mitigate the General Contractor's losses or reimburse the General Contractor for losses caused by these events.

7.1.3 The lowest responsive and responsible bidder shall submit to the Architect and the Owner within ten days after the bid opening a letter/letters from the manufacturer stating that the manufacturer will issue the roof system guarantee complying with the requirements of Facility Planning and Control based on the specified roof system and include the name of the applicator acceptable to the manufacturer at the highest level of certification for installing the specified roof system. This manufacturer shall be one that has received prior approval or is named in the specifications.

In accordance with La. R.S. 38:2227 [references La R.S. 38:2212(A)(3)(c)(ii), which has since been renumbered as La R.S. 38:2212(B)(3)], La. R.S. 38:2212.10 and La. R.S. 23:1726(B) the apparent low bidder on this Project shall submit the completed Attestations Affidavit (Past Criminal Convictions of Bidders, Verification of Employees and Certification Regarding Unpaid Workers Compensation Insurance) form found within this bid package to the University of Louisiana at Lafayette within 10 days after the opening of bids.

ARTICLE 8
PERFORMANCE AND PAYMENT BOND

8.1 Bond Required

8.1.1 The Contractor shall furnish and pay for a Performance and Payment Bond written by a company licensed to do business in Louisiana, which shall be signed by the surety's agent or attorney-in-fact, in an amount equal to 100% of the Contract amount. Surety must be listed currently on the U. S. Department of Treasury Financial Management Service List (Treasury List) as approved for an amount equal to or greater than the contract amount or must be an insurance company domiciled in Louisiana or owned by Louisiana residents. If surety is qualified other than by listing on the Treasury list, the contract amount may not exceed fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance and may not exceed the amount of $500,000. However, a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A. M. Best's Key Rating Guide shall not be subject to the $500,000 limitation, provided that the contract amount does not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide nor fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance. The Bond shall be signed by the surety's agent or attorney-in-fact. The Bond shall be in favor of the University of Louisiana at Lafayette.

8.2 Time of Delivery and Form of Bond

8.2.1 The Bidder shall deliver the required bond to the Owner simultaneous with the execution of the Contract.

8.2.2 A surety company's bid bond form/document will be sufficient for any bid submission.

8.2.3 The Bidder shall require the Attorney-in-Fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of his power of Attorney.

ARTICLE 9
FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

9.1 Form to be Used

9.1.1 Form of the Contract to be used shall be furnished by the University of Louisiana at Lafayette, an example of which is bound in the Bid Documents.

9.2 Award

9.2.1 After award of the Contract, the successful Bidder, if a corporation, shall furnish to the Owner the most current copy of a Disclosure of Ownership Affidavit on file with the Secretary of State.

9.2.2 In accordance with Louisiana Law, when the Contract is awarded, the successful Bidder shall, at the time of the signing of the Contract, execute the Non-Collusion Affidavit included in the Contract Documents

9.2.3 When this Project is financed either partially or entirely with State Bonds, the award of this Contract is contingent upon the sale of bonds by the State Bond Commission. The State shall incur no obligation to the Contractor until the Contract Between Owner and Contractor is duly executed.

END OF SECTION

SUPPLEMENTARY CONDITIONS

https://www.doa.la.gov/.../27_Supplementary_Conditions_April2018.docx

These Supplementary Conditions modify, change, delete from or add to the General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition. Where any Article of the General Conditions is modified or any Section, Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Section, Article, Paragraph, Subparagraph or Clause shall remain in effect.

Articles, Sections, Paragraphs, Subparagraphs or Clauses modified or deleted have the same numerical designation as those occurring in the General Conditions.

ARTICLE 1

GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1. The Contract Documents

In Section 1.1.1 delete the third sentence, and add the following sentence:

The Contract Documents shall include the Bid Documents as listed in the Instructions to Bidders and any modifications made thereto by addenda.

1.1.8 Initial Decision Maker

Delete all after the words, “shall not show partiality to the Owner or Contractor”.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE [REFER TO *La R.S. 38:2317*]

1.5.1 Delete the first sentence of the paragraph.

1.5.1 In the third sentence: delete the remainder after the word “publication”.

1.7 DIGITAL DATA USE AND TRANSMISSION

In the first sentence after the words, “in digital form” delete “. The parties will use AIA Document E203 2013, Building Information Modeling and Digital Data Exhibit”.

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Delete Section 1.8.

ARTICLE 2

OWNER

2.2 EVIDENCE OF THE OWNER'S FINANCIAL ARRANGEMENTS

Delete Section 2.2.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.1 In the first sentence, delete: all before "the Owner shall secure…"

Delete Section 2.3.2 and substitute the following:

2.3.2 The term Architect, when used in the Contract Documents, shall mean the prime Designer (Architect, Engineer, or Landscape Architect), or his authorized representative, lawfully licensed to practice architecture, engineering, or landscape architecture in the State of Louisiana, identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

2.3.3 Delete the words: "to whom the Contractor has no reasonable objection and".

ARTICLE 3

CONTRACTOR

3.4 LABOR AND MATERIALS

3.4.2 Delete Section 3.4.2.

Delete Section 3.4.3 and substitute with the following:

3.4.3 Contractor and its employees, officers, agents, representatives, and Subcontractors shall conduct themselves in an appropriate and professional manner, in accordance with the Owner's requirements, at all times while working on the Project. Any such individual who behaves in an inappropriate manner or who engages in the use of inappropriate language or conduct while on Owner's property, as determined by the Owner, shall be removed from the Project at the Owner's request. Such individual shall not be permitted to return without the written permission of the Owner. The Owner shall not be responsible or liable to Contractor or any Subcontractor for any additional costs, expenses, losses, claims or damages incurred by Contractor or its Subcontractor as a result of the removal of an individual from the Owner's property pursuant to this Section. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

3.5 WARRANTY

3.5.2 Replace reference to "Section 9.8.4" with "Section 9.8.6".

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS (La R.S. 40:1724[A])

3.7.1 Delete Section 3.7.1.

3.7.2 In Section 3.7.2, replace the word "public" with the word "State".

Delete Section 3.7.5 and substitute the following:

3.7.5 If, during the course of the Work, the Contractor discovers human remains, unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Documents, the Contractor shall follow all procedures mandated by State and Federal law, including but not limited to La R.S. 8:671 et seq., the Office of Coastal Protection and Restoration, and Sections 401 & 404 of the Federal Clean Water Act. Request for adjustment of the Contract Sum and Contract Time arising from the existence of such remains or features shall be submitted in writing to the Owner pursuant to the Contract Documents.

3.8 ALLOWANCES

Delete Sections 3.8.1, 3.8.2, and 3.8.3 in their entirety and add the following new Section 3.8.1:

3.8.1 Allowances shall not be made on any of the Work.

3.9 SUPERINTENDENT

3.9.1 Add the following to the end of the paragraph:
Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add the following: For Projects with a contract sum greater than $1,000,000.00, the Contractor shall include with the schedule, for the Owner's and Architect's information, a network analysis to identify those tasks which are on the critical path, i.e., where any delay in the completion of these tasks will lengthen the Project timescale, unless action is taken. A revised schedule shall be submitted with each Application and Certificate for Payment. No payment shall be made until this schedule is received.

3.10.3 In the first sentence, delete the word "general".

After the first sentence, add the following:
If the Work is not on schedule, as determined by the Architect, and the Contractor fails to take action to bring the Work on schedule, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory. Such default may be considered grounds for termination by the Owner for cause in accordance with Section 14.2.

Add the following Sections:

3.10.4 Add the following: Submittal by the contractor of a schedule or other documentation showing a completion date for his Work prior to the completion date stated in the contract shall not impose any obligation or responsibility on the Owner or Architect for the earlier completion date.

3.10.5 In the event the Owner employs a commissioning consultant, the Contractor shall cooperate fully in the commissioning process and shall require all subcontractors and others under his control to cooperate. The purpose of such services shall be to ensure that all systems perform correctly and interactively according to the provisions of the Contract Documents.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following: This requirement is of the essence of the contract. The Architect shall determine the value of these documents and this amount shall not be approved for payment to the Contractor until all of the listed documents are delivered to the Architect in good order, completely marked with field changes and otherwise complete in all aspects.

ARTICLE 4
ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.1 In the first sentence, delete the phrase: "the date the Architect issues the final Certificate for Payment" and replace with the phrase "final payment is due, and with the Owner's concurrence, from time to time during the one year period for correction of Work described in Section 12.2."

4.2.2 In the first sentence, after the phrase: “become generally familiar with”; insert the following: “and to keep the Owner informed about”.

In the first sentence, after the phrase “portion of the Work completed”, insert the following: “to endeavor to guard the Owner against defects and deficiencies in the Work,”

4.2.4 In the first sentence, delete all after “The Owner and Contractor”, and add the following “may communicate directly with each other, when deemed necessary by the Owner, and the Owner will notify the Architect of any decision.”

4.2.10 Add the following sentence to the end of Section 4.2.10: There shall be no restriction on the Owner having a Representative.

4.2.11 Add the following sentence to the end of Section 4.2.11:
If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.
4.2.14 Insert the following sentence between the second and third sentences of Section 4.2.14:
If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

ARTICLE 5

SUBCONTRACTORS

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

Delete Section 5.2.1, and substitute the following:

5.2.1 Unless otherwise required by the Contract Documents, the Contractor shall furnish at the Pre-Construction Conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. No Contractor payments shall be made until this information is received.

5.2.2

Delete Section 5.2.2, and substitute the following:

5.2.2 The Contractor shall be solely responsible for selection and performance of all subcontractors. The Contractor shall not be entitled to claims for additional time and/or an increase in the contract sum due to a problem with performance or nonperformance of a subcontractor.

Delete Sections 5.2.3 and 5.2.4 and substitute the following:

5.2.3 The Contractor shall notify the Architect and the Owner when a subcontractor is to be changed and substituted with another subcontractor.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS
Delete Sections 5.4, 5.4.1, 5.4.2 and 5.4.3

ARTICLE 7

CHANGES IN THE WORK

7.1 GENERAL
Add the following Sections:

7.1.4 As part of the pre-construction conference submittals, the Contractor shall submit the following prior to the Contractor's initial request for payment:

7.1.4.1 Fixed job site overhead cost itemized with documentation to support daily rates.

7.1.4.2 Bond Premium Rate with supporting information from the General Contractor's carrier.

7.1.4.3 Labor Burden by trade for both Subcontractors and General Contractor. The Labor Burden shall be supported by the Worker's Compensation and Employer's Liability Insurance Policy Information Page. Provide for all trades.

7.1.4.4 Internal Rate Charges for all significant company owned equipment.

7.1.5 If the General Contractor fails to submit the aforementioned documentation as part of the pre-construction submittals, then pay applications shall not be processed until such time as the Owner receives this information.

7.2 CHANGE ORDERS

Delete Section 7.2.1, and substitute the following Sections:

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, the Architect, and the Contractor issued after execution of the Contract, authorizing a change in the Work and/or an adjustment in the Contract Sum and/or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time. Any reservation of rights, stipulation, or other modification made on the change order by the contractor shall have no effect.

7.2.2 "Cost of the Work" for the purpose of Change Orders shall be the eligible costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors which eligible costs shall be limited to:

7.2.2.1 Actual wages paid directly to labor personnel, with a labor burden markup exclusively limited to applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes for those labor personnel performing the Work. Wages shall be the basic hourly labor rate paid an employee exclusive of fringe benefits or other employee costs. The labor burden percentage for the "Cost of the Work" is limited to categories listed herein. Employer-provided health insurance, fringe benefits, employee training (whether a requirement of employment or not), vacation pay, etc., are examples of ineligible labor burden costs which *shall not* be included, as these costs are already compensated by the Overhead and Profit markup.

Supervision shall not be included as a line item in the "Cost of the Work", except when the change results in a documented delay in the critical path, as described in Section 7.2.7.

7.2.2.2 Cost of all materials and supplies necessary and required to perform the Work, identifying each item and its individual cost, including taxes. Incidental consumables are not eligible costs and shall not be included.

7.2.2.3 Cost of each necessary piece of machinery and equipment required to perform the Work, identifying each item and its individual cost, including taxes. Incidental small tools of a specific trade (i.e., shovels, saws, hammers, air compressors, etc.,) and general use vehicles, such as pickup trucks even for moving items around the site, fuel for these general use vehicles, travel, lodging, and/or meals are not eligible and shall not be included.

7.2.2.4 Eligible Insurance costs shall be limited to documented increases in "Builder's Risk" insurance

premium / costs only. Commercial General Liability, Automobile Liability, and all other required insurances, where referenced in the Contract shall be considered part of normal overhead. These costs are already compensated by the Overhead and Profit markup.

7.2.2.5 Cost for the General Contractor Performance and Payment Bond premium, where the documented cost of the premiums have been increased due to the Change Order.

7.2.3 Overhead and Profit - The Contractor and Subcontractor shall be due home office fixed overhead and profits on the Cost of the Work but shall not exceed a total of 16% of the direct cost of any portion of Work. The credit to the Owner resulting from a change in the Work shall be the sum of those items above, except credit will not be required for Overhead and Profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit shall only be computed on the net extra cost to the Contractor.

7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of: Cost of the Work (as defined at Section 7.2.2) and Overhead and Profit (as defined at Section 7.2.3), and shall be computed as follows:

7.2.4.1 When all of the Work is General Contractor Work; 8% markup on the Cost of the Work.

7.2.4.2 When the Work is all Subcontract Work; 8% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 8% markup on the Cost of the Work, not including the Subcontractor's Overhead and Profit markup, for General Contractor's Overhead and Profit.

7.2.4.3 When the Work is a combination of General Contractor Work and Subcontract Work; that portion of the direct cost that is General Contract Work shall be computed per Section 7.2.4.1 and that portion of the direct cost that is Subcontract Work shall be computed per Section 7.2.4.2.

Premiums for the General Contractor's bond may be included, but after the markup is added to the Cost of the Work.
Premiums for the Subcontractor's Bond shall not be included.

7.2.4.4 Subcontract cost shall consist of the items in Section 7.2.2 above plus Overhead and Profit as defined in Section 7.2.3.

7.2.5 Before a Change Order is prepared, the Contractor shall prepare and deliver to the Architect the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

A detailed, itemized list of labor, material and equipment costs for the General Contractor's Work including quantities and unit costs for each item of labor, material and equipment.

An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's Work including quantities and unit costs for each item of labor, material and equipment.

7.2.6 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered for that Change Order.

7.2.7 Extended fixed job-site costs are indirect costs that are necessary to support the work in the field. Examples of fixed job-site costs are field office rental, salaries of field office staff, field office utilities and telephone.

Extended fixed job-site costs or equitable adjustment, may be included in a Change Order due to a delay in the critical path, with the exception of weather related delays. In the event of a delay in the critical path, the Contractor shall submit all changes or adjustments to the Contract Time within twenty-one (21) days

of the event giving rise to the delay. The Contractor shall submit documentation and justification for the adjustment by performing a critical path analysis of its most recent schedule in use prior to the change, which shows an extension in critical path activities.
The Contractor shall notify the Architect in writing that the Contractor is making a claim for extended fixed job-site overhead as required by Section 15.1.2. The Contractor shall provide proof that the Contractor is unable to mitigate financial damages through Alternate Work within this Contract or replacement work. "Replacement Work" is that work which the Contractor is obligated to perform under any construction contract separate from this Contract. Reasonable proof shall be required by the Architect that the delays affected the Completion Date.

7.2.8 "Cost of the Work" whether General Contractor cost or Subcontractor cost shall not apply to the following:

7.2.8.1 Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.

7.2.8.2 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work.

7.2.8.3 Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work.

7.2.8.4 Cost of supervision, refer to section 7.2.2.1, with exception as provided in Section 7.2.7.

7.2.9 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover cost of Material, Labor, Equipment, Overhead and Profit.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.3 In the first sentence after "following methods" insert: ", but not to exceed a specified amount".

7.3.4 From .1 of the list, delete all after "Costs of labor, including" and substitute the following "social security, old age and employment insurance, applicable payroll taxes, and workers' compensation insurance;"

Delete the following from .4 of the list: "permit fees,"
Delete Section 7.3.9 and substitute the following:

7.3.9 Pending final determination of the total costs of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs.

ARTICLE 8
TIME

8.1 DEFINITIONS
Add the following:

8.1.5 The Contract Time shall not be changed by the submission of a schedule that shows an early completion date unless specifically authorized by change order.

8.2 PROGRESS AND COMPLETION

Add to Section 8.2.1 the following:
Completion of the Work must be within the Time for Completion stated in the Agreement, subject to such

extensions as may be granted under Section 8.3. The Contractor agrees to commence Work not later than fourteen (14) days after the transmittal date of Written Notice to Proceed from the Owner and to substantially complete the Project within the time stated in the Contract. The Owner will suffer financial loss if the Project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's Surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed and liquidated damages for each consecutive calendar day (Saturdays, Sundays and holidays included) of delay until the Work is substantially complete. The Owner shall be entitled to the sum stated in the Contract Documents. Such Liquidated Damages shall be withheld by the Owner from the amounts due the Contractor for progress payments.

Delete Section 8.2.2.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 In the first sentence after the words "Owner pending" delete the words "mediation and binding dispute resolution" and add the word "litigation", and delete the last word "determine" and add the following: "recommend, subject to Owner's approval of Change Order. If the claim is not made within the limits of Article 15, all rights for future claims for that month are waived."

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

Delete Section 9.1.2.

Delete Section 9.2 and substitute the following:

9.2 SCHEDULE OF VALUES

At the Pre-Construction Conference, the Contractor shall submit to the Owner and the Architect a Schedule of Values prepared as follows:

9.2.1 The attached Schedule of Values Format shall be used. If applicable, the cost of Work for each section listed under each division, shall be given. The cost for each section shall include Labor, Materials, Overhead and Profit.

9.2.2 The Total of all items shall equal the Total Contract Sum. This schedule, when approved by the Architect, shall be used as a basis for the Contractor's Applications for Payment and it may be used for determining the cost of the Work in deductive change orders, when a specific item of Work listed on the Schedule of Values is to be removed. Once the Schedule of Values is submitted at the Pre-Construction Conference, the schedule shall not be modified without approval from the Owner and Architect.

9.3 APPLICATIONS FOR PAYMENT

Delete Sections 9.3.1, 9.3.1.1, and 9.3.1.2 and substitute the following:

9.3.1 Monthly, the Contractor shall submit to the Architect an Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage as follows, per La R.S. 38:2248:

9.3.1.1 Projects with Contract price up to $500,000.00 – 10% of the Contract price.

9.3.1.2 Projects with Contract price of $500,000.00, or more –5% of the Contract price.

9.3.1.3 No payment shall be made until the revised schedule required by Section 3.10.1 is received.

9.3.1.4 The normal retainage shall not be due the Contractor until after substantial completion and

expiration of the forty-five day lien period and submission to the Architect of a clear lien certificate, consent of surety, and invoice for retainage.

Delete Section 9.3.2 and substitute the following:

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payments for materials or equipment stored on the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, including applicable insurance.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Section 9.5.1.7: Delete the word "repeated".

Delete Section 9.5.4.

9.6 PROGRESS PAYMENTS

Delete Section 9.6.1 and substitute the following:

9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment within twenty days except for Projects funded fully or in part by a Federal reimbursement program. For such Projects the Owner will make payment in a timely manner consistent with reimbursement.

9.6.2 Delete the phrase: "no later than seven days" from the first sentence.

After the end of the second sentence, add the following:

La R.S. 9:2784 (A) and (C) require a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of ½ of 1% per day is due, up to a maximum of 15% from the expiration date until paid. The contractor or subcontractor, whichever is applicable, is solely responsible for payment of a penalty.

9.6.4 Delete the first two sentences of Section 9.6.4 and add the following to the end of the Section:

Pursuant to La. R.S. 38:2242 and La. R.S. 38:2242.2, when the Owner receives any claim of nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the recorder of mortgages of the parish where the Work has been done. When the Owner receives original proof of such guarantee from the recorder of mortgages, the claim deduction will be added back to the Contract Sum.

Delete Section 9.7 FAILURE OF PAYMENT.

Delete Section 9.8 and substitute the following:

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Architect shall determine if the Project is substantially complete in accordance with this Section.

9.8.2 When the Contractor considers that the Work is Substantially Complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final

payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

9.8.3 Upon receipt of the Contractor's list, the Architect shall make an inspection to determine whether the Work is substantially complete. A prerequisite to the Work being considered as substantially complete is the Owner's receipt of the executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing Work is part of the Contract. Prior to inspection by the Architect, the Contractor shall notify the Architect that the Project is ready for inspection by the State Fire Marshal's office. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, the Contractor shall, before the Work can be considered as Substantially Complete, complete, or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

9.8.4 When the Architect determines that the Project is Substantially Complete, he shall prepare a punch list of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material, and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the forty-five day lien period payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be considered as substantially complete. If funds remaining are less than that required to complete the Work, the Contractor shall pay the difference.

9.8.5 When the preparation of the punch list is complete the Architect shall prepare a Recommendation of Acceptance incorporating the punch list and submit it to the Owner. Upon approval of the Recommendation of Acceptance, the Owner may issue a Notice of Acceptance of Building Contract which shall establish the Date of Substantial Completion. The Contractor shall record the Notice of Acceptance with the Clerk of Court in the Parish in which the Work has been performed. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the Acceptance at the Contractor's expense. All additive change orders must be processed before issuance of the Recommendation of Acceptance. The Owner shall not be responsible for payment for any Work associated with change orders that is not incorporated into the contract at the time of the Recommendation of Acceptance.

9.8.6 Warranties required by the Contract Documents shall commence on the date of Acceptance of the Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by the Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

9.8.7 If all punch list items have not been completed by the end of the forty-five (45) day lien period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within forty-five (45) days after notification, the Surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at his option, contract to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract sum. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts. If the surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the surety.

9.9 PARTIAL OCCUPANCY OR USE

Delete Section 9.9.1 and substitute the following:

9.9.1 Partial Occupancy is that stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The Owner may occupy or use any substantially completed portion of the Work so designated by separate agreement with the Contractor and authorized by public authorities having jurisdiction over the Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers the designated portion substantially complete the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 After the second sentence, add the following:

If the Architect does not find the Work acceptable under the Contract Documents, the Architect shall make one additional inspection; if the Work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid $175.00/hour for their time at the Project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract sum. The payment shall be made by the Owner and deducted from the construction contract funds.

Delete Section 9.10.4 and replace with the following:

9.10.4 The making of final payment shall not constitute a waiver of Claims by the Owner for the following:

9.10.4.1 Claims, security interests, or encumbrances arising out of the Contract and unsettled;

9.10.4.2 failure of the Work to comply with the requirements of the Contract Documents irrespective of when such failure is discovered;

9.10.4.3 terms of special warranties required by the Contract Documents; or

9.10.4.4 audits performed by the Owner, after final payment.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.2 In the first sentence, between the words: "bearing on" and "safety", add the words: "the health and,"

10.3 HAZARDOUS MATERIALS

10.3.1 In the second sentence after (PCB) add: "or lead".

10.3.2 After the first sentence, delete all remaining sentences.

Add at the end: "The Contract time shall be extended appropriately."

Delete Section 10.4 and substitute the following:

10.4 EMERGENCIES

In an emergency affecting the safety of persons or property, the Contractor shall notify the Owner and Architect immediately of the emergency, simultaneously acting at his discretion to prevent damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency Work shall be determined as provided in Article 15 and Article 7.

ARTICLE 11

INSURANCE AND BONDS

AIA A101 – 2017 Exhibit A is not a part of these documents. Delete all of Sections 11.1, 11.2, 11.3, 11.4, and 11.5, and substitute the following:

INSURANCE REQUIREMENTS FOR NEW CONSTRUCTION, ADDITIONS AND RENOVATIONS

11.1 CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall purchase and maintain without interruption for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, its agents, representatives, employees or subcontractors. The duration of the contract shall be from the inception of the contract until the date of final payment.

11.2 MINIMUM SCOPE AND LIMITS OF INSURANCE

11.2.1 Worker's Compensation

Worker's Compensation insurance shall be in compliance with the Worker's Compensation law of the Contractor's headquarters. Employers Liability is included with a minimum limit of $1,000,000 per accident/per disease/per employee. If Work is to be performed over water and involves maritime exposure, applicable LHWCA, Jones Act or other maritime law coverage shall be included. A.M. Best's insurance company rating requirement may be waived for Worker's compensation coverage only.

11.2.2 Commercial General Liability

Commercial General Liability insurance, including Personal and Advertising Injury Liability and Products and Completed Operations Liability, shall have a minimum limit per occurrence based on the Project value. The Insurance Services Office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims- made form is unacceptable.

The aggregate loss limit must apply to <u>each Project</u>. ISO form CG 25 03 (current form approved for use in Louisiana), or equivalent, shall also be submitted. The State Project number, including part number, and Project name shall be included on this endorsement.

COMBINED SINGLE LIMIT (CSL) PER OCCURRENCE

Type of Construction	Projects up to $1,000,000	Projects over $1,000,000 up to $50,000,000	Projects over $50,000,000
New Buildings: Each Occurrence Minimum Limit	$1,000,000	$2,000,000	$4,000,000
Per Project Aggregate	$2,000,000	$4,000,000	$8,000,000
Renovations:	The building(s) value for the Project is $_____.		
Each Occurrence Minimum Limit	$1,000,000**	$2,000,000**	$4,000,000**
Per Project Aggregate	2 times per occur limit**	2 times per occur limit**	2 times per occur limit**

**While the minimum Combined Single Limit of $1,000,000 is required for any renovation, the limit is calculated by taking 10% of the building value and rounding it to the nearest $1,000,000 to get the insurance limit. Example: Renovation on a $33,000,000 building would have a calculated $3,000,000 combined single limit of coverage (33,000,000 times .10 = 3,300,000 and then rounding down to $3,000,000). If the calculated limit is less than the minimum limit listed in the above chart, then the amount needed is the minimum listed in the chart. Maximum per occurrence limit required is $50,000,000 regardless of building value. The per Project aggregate limit is then calculated as twice the per occurrence limit.

11.2.3 Automobile Liability

Automobile Liability Insurance shall have a minimum combined single limit per occurrence of $1,000,000. ISO form number CA 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. This insurance shall include third-party bodily injury and property damage liability for owned, hired and non-owned Automobiles.

11.2.4 Excess Umbrella

Excess Umbrella Insurance may be used to meet the minimum requirements for General Liability and Automobile Liability only.

11.2.5 Builder's Risk

11.2.5.1 Builder's Risk Insurance shall be in an amount equal to the amount of the construction contract including any amendments and shall be upon the entire Work included in the contract. The policy shall provide coverage equivalent to the ISO form number CP 10 20, Broad Form Causes of Loss (extended, if necessary, to include the perils of wind, earthquake, collapse, vandalism/malicious mischief, and theft, including theft of materials whether or not attached to any structure). The policy must include architects' and engineers' fees necessary to provide plans, specifications and supervision of Work for the repair and/or replacement of property damage caused by a covered peril, not to exceed 10% of the cost of the repair and/or replacement.

11.2.5.2 Flood coverage shall be provided by the Contractor on the first floor and below for all Projects, except as otherwise noted. The builder's risk insurance policy, sub-limit for flood coverage shall not be less than ten percent (10%) of the total contract cost per occurrence. If flood is purchased as a separate policy, the limit shall be ten percent (10%) of the total contract cost per occurrence (with a max of $500,000 if NFIP). Coverage for roofing Projects shall not require flood coverage.

11.2.5.3 A Specialty Contractor may provide an installation floater in lieu of a Builder's Risk policy, with the similar coverage as the Builder's Risk policy, upon the system to be installed in an amount equal to the amount of the contract including any amendments. Flood coverage is not required.

11.2.5.4 The policy must include coverage for the Owner, Contractor and any subcontractors as their interests may appear.

11.2.6 Pollution Liability *(required when asbestos or other hazardous material abatement is included in the contract)*

Pollution Liability insurance, including gradual release as well as sudden and accidental, shall have a minimum limit of not less than $1,000,000 per claim. A claims-made form will be acceptable. A policy period inception date of no later than the first day of anticipated Work under this contract and an expiration date of no earlier than 30 days after anticipated completion of all Work under the contract shall be provided. There shall be an extended reporting period of at least 24 months, with full reinstatement of limits, from the expiration date of the policy if the policy is not renewed. The policy shall not be cancelled for any reason, except non-payment of premium.

11.2.7 Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and accepted by the Owner. The Contractor shall be responsible for all deductibles and self-insured retentions.

11.3 OTHER INSURANCE PROVISIONS

11.3.1 The policies are to contain, or be endorsed to contain, the following provisions:

11.3.1.1 Worker's Compensation and Employers Liability Coverage

11.3.1.1.1 To the fullest allowed by law, the insurer shall agree to waive all rights of subrogation against the Owner, its officers, agents, employees and volunteers for losses arising from Work performed by the Contractor for the Owner.

11.3.1.2 Commercial General Liability Coverage

11.3.1.2.1 The Owner, its officers, agents, employees and volunteers are to be added as additional insureds as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. ISO Form CG 20 10 (for ongoing work) AND CG 20 37 (for completed work) (current forms approved for use in Louisiana), or equivalent, are to be used.

11.3.1.2.2 The Contractor's insurance shall be primary as respects the Owner, its officers, agents, employees and volunteers for any and all losses that occur under the contract. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers. Any insurance or self-insurance maintained by the Owner shall be excess and non-contributory of the Contractor's insurance.

11.3.1.3 Builder's Risk

The policy must include an endorsement providing the following:
In the event of a disagreement regarding a loss covered by this policy, which may also be covered by a State of Louisiana self-insurance or commercial property policy through the Office of Risk Management (ORM), Contractor and its insurer agree to follow the following procedure to establish coverage and/or the amount of loss:

Any party to a loss may make written demand for an appraisal of the matter in disagreement. Within 20 days of receipt of written demand, the Contractor's insurer and either ORM or its commercial insurance company shall each select a competent and impartial appraiser and notify the other of the appraiser selected. The two appraisers shall select a competent and impartial umpire. The appraisers shall then identify the policy or policies under which the loss is insured and, if necessary, state separately the value of the property and the amount of the loss that must be borne by each policy. If the two appraisers fail to agree, they shall submit their differences to the umpire. A written decision by any two shall determine the policy or policies and the amount of the loss. Each insurance company agrees that the decision of the appraisers and the umpire if involved shall be binding and final and that neither party will resort to litigation. Each of the two parties shall pay its chosen appraiser and bear the cost of the umpire equally.

11.3.1.4 All Coverages

11.3.1.4.1 All policies must be endorsed to require 30 days written notice of cancellation to the Agency. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in the Contractor's policy. In addition, Contractor is required to notify Agency of policy cancellations or reductions in limits.

11.3.1.4.2 Neither the acceptance of the completed Work nor the payment thereof shall release the Contractor from the obligations of the insurance requirements or indemnification agreement.

11.3.1.4.3 The insurance companies issuing the policies shall have no recourse against the Owner for payment of premiums or for assessments under any form of the policies.

11.3.1.4.4 Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, agents, employees and volunteers.

11.3.2 Acceptability of Insurers

All required insurance shall be provided by a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located. Insurance shall be placed with insurers with an A.M. Best's rating of A-: VI or higher. This rating requirement may be waived for Worker's compensation coverage only.

If at any time an insurer issuing any such policy does not meet the minimum A.M. Best rating, the Contractor shall obtain a policy with an insurer that meets the A.M. Best rating and shall submit another certificate of insurance within 30 days.

11.3.3 Verification of Coverage

Contractor shall furnish the Owner with Certificates of Insurance reflecting proof of required coverage. The Certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The Certificates are to be received and approved by the Owner before Work commences and upon any contract renewal or insurance policy renewal thereafter. The Certificate Holder must be listed as follows:

State of Louisiana
University of Louisiana at Lafayette
PO Box 40197
Lafayette, LA 70504
Ref: Solicitation File No. _____

The Owner reserves the right to request complete certified copies of all required insurance policies at any time.

Upon failure of the Contractor to furnish, deliver and maintain required insurance, this contract, at the election of the Agency, may be suspended, discontinued, or terminated. Failure of the Contractor to purchase and/or maintain any required insurance shall not relieve the Contractor from any liability or indemnification under the contract.

If the Contractor does not meet the insurance requirements at policy renewal, at the option of the Owner, payment to the Contractor may be withheld until the requirements have been met, OR the Owner may pay the renewal premium and withhold such payment from any monies due the Contractor, OR the contract may be suspended or terminated for cause.

11.3.4 Subcontractors

Contractor shall include all subcontractors as insureds under its policies OR shall be responsible for verifying and maintaining the certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements stated herein. The Owner reserves the right to request copies of subcontractor's certificates at any time.

If Contractor does not verify subcontractors' insurance as described above, Owner has the right to withhold payments to the Contractor until the requirements have been met.

11.3.5 Worker's Compensation Indemnity

In the event Contractor is not required to provide or elects not to provide Worker's compensation coverage, the parties hereby agree the Contractor, its Owners, agents and employees shall have no cause of action against, and shall not assert a claim against, the state of Louisiana, its departments, agencies, agents and employees as an employer, whether pursuant to the Louisiana Worker's Compensation Act or otherwise, under any circumstance. The parties also hereby agree that the State of Louisiana, its departments, agencies, agents and employees shall in no circumstance be, or considered as, the employer or statutory employer of Contractor, its Owners, agents and employees. The parties further agree that Contractor is a wholly independent Contractor and is exclusively responsible for its employees, Owners, and agents. Contractor hereby agrees to protect, defend, indemnify and hold the State of Louisiana, its departments, agencies, agents and employees harmless from any such assertion or claim that may arise from the performance of this contract.

11.3.6 Indemnification/Hold Harmless Agreement

Contractor agrees to protect, defend, indemnify, save, and hold harmless, the State of Louisiana, all State Departments, Agencies, Boards and Commissions, its officers, agents, servants, employees and volunteers, from and against any and all claims, damages, expenses and liability arising out of injury or death to any person or the damage, loss or destruction of any property which may occur, or in any way grow out of, any act or omission of Contractor, its agents, servants and employees, or any and all costs, expenses and/or attorney fees incurred by Contractor as a result of any claims, demands, suits or causes of action, except those claims, demands, suits or causes of action arising out of the negligence of the State of Louisiana, all State Departments, Agencies, Boards, Commissions, its officers, agents, servants, employees and volunteers.

Contractor agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands, suits or causes of action at its sole expense and agrees to bear all other costs and expenses related thereto, even if the claims, demands, suits, or causes of action are groundless, false or fraudulent. The State of Louisiana may, but is not required to, consult with the Contractor in the defense of claims, but this shall not affect the Contractor's responsibility for the handling and expenses of all claims.

11.4 PERFORMANCE AND PAYMENT BOND

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

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

11.4.3 Recordation of Contract and Bond [La R.S. 38:2241 thru 38:2241.1]

The *Owner shall require the Contractor to record* within thirty (30) days the Contract Between Owner and Contractor and Performance and Payment Bond with the Clerk of Court in the Parish in which the Work is to be performed.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.2 CORRECTION OF WORK

12.2.1 Before Substantial Completion

At the end of the paragraph, add the following sentences:
"If the Contractor fails to correct Work identified as defective within a thirty (30) day period, through no fault of the Designer, the Owner may hold the Contractor in default. If the Owner finds the Contractor in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the nonconforming Work, through no fault of the Architect or Owner, the Owner may contract to have nonconforming Work corrected and hold the Surety and Contractor responsible for the cost, including architectural fees and other indirect costs. If the Surety fails to correct the Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may elect not to accept bonds submitted in the future by the Surety. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts.

12.2.2 After Substantial Completion

12.2.2.1 At the end of the paragraph delete the last sentence and add the following sentences:
"If the Contractor fails to correct nonconforming Work, or Work covered by warranties, within a thirty (30) day period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the non-conforming or warranty Work, through no fault of the Architect or Owner, the Owner may contract to have the nonconforming or warranty Work corrected and hold the Surety responsible for the cost including architects fees and other indirect costs. Corrections by the Owner shall be in accordance with Section 2.4. If the Surety fails to correct the nonconforming or warranty Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may not accept bonds submitted, in the future, by the Surety."

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW
Delete all after the word "located".

13.2 SUCCESSORS AND ASSIGNS
13.2.1 In the second sentence, delete "Except as … 13.2.2"
Delete Section 13.2.2.

13.3 RIGHTS AND REMEDIES
Add the following Section 13.3.3:

13.3.3 The Nineteenth Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana shall have sole jurisdiction and venue in any action brought under this contract.

13.4 TESTS AND INSPECTIONS
In Section 13.4.1, delete the second sentence and substitute the following:

The Contractor shall make arrangements for such tests, inspections and approvals with the Testing Laboratory provided by the Owner, and the Owner shall bear all related costs of tests, inspections and approvals.

Delete the last two sentences of Section 13.4.1.

13.5 INTEREST
Delete Section 13.5.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

Delete Section 14.1.1.4.

In Section 14.1.3, after the word "profit," delete the words "on Work not executed" and substitute the following: "for Work completed prior to stoppage".

14.2 TERMINATION BY THE OWNER FOR CAUSE

Add the following Section:

14.2.1.5 failure to complete the punch list within the lien period as provided in 9.8.7.

14.2.3 Add the following sentence:

"Termination by the Owner shall not suspend assessment of liquidated damages against the Surety."

Add the following Section:

14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article shall not relieve the Contractor and/or Surety of his obligations under the liquidated damages provisions and the Contractor and/or Surety shall be liable to the Owner for per diem liquidated damages.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

In Section 14.4.3, delete all after "incurred by reason of the termination," and add "along with reasonable profit on the Work not executed."

ARTICLE 15
CLAIMS AND DISPUTES

15.1 CLAIMS

Delete Section 15.1.2, Time Limit on Claims, (See La R.S. 38:2189, and 38:2189.1).

15.1.3.1 Add the following to the end of the paragraph:

"A Reservation of Rights and similar stipulations shall not be recognized under this contract as having any effect. A party must make a claim as defined herein within the time limits provided."

15.1.4.2 In the first sentence of the Section, delete "Initial Decision Maker's" and replace with "Architect's". In the second sentence of the Section, delete "the decision of the Initial Decision Maker" and replace with: "his/her decision".

Delete Section 15.1.6.2 and substitute the following:

15.1.6.2 If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the contract time due to weather shall not be cause for an increase in the contract sum. At the end of each month, the Contractor shall make one Claim for any adverse weather days occurring within the month. The Claim must be accompanied by sufficient documentation evidencing the adverse days and the impact on construction. Failure to make such Claim within twenty-one (21) days from the last day of the month shall prohibit any future claims for adverse days for that month. No additional adverse weather days shall be granted after the original or extended contract completion date, except those adverse weather days associated with a National Weather Service named storm or federally declared weather related disaster directly affecting the Project site.

Add the following Section:

15.1.6.3 The following are considered reasonably anticipated days of adverse weather on a monthly basis:

January	11 days	July	6 days
February	10 days	August	5 days
March	8 days	September	4 days
April	7 days	October	3 days
May	5 days	November	5 days
June	6 days	December	8 days

The Contractor shall ask for total adverse weather days. The Contractor's request shall be considered only for days over the allowable number of days stated above.

Note: Contract is on a calendar day basis.

15.2 INITIAL DECISION

15.2.1 In the second sentence, delete the word “will” and replace with: “shall always”.

In the second sentence, delete the phrase: “, unless otherwise indicated in the Agreement.”

In the third sentence, delete the word “mediation” and replace with: “litigation”.

At the end of the third sentence, add: “arising prior to the date final payment is due”.

Delete the fourth sentence.

15.2.5 In the middle of the first sentence, delete all after the phrase: “rejecting the Claim”.

In the second sentence, delete the phrase: “and the Architect, if the Architect is not serving as the Initial Decision Maker,”.

In the third sentence, delete all after: “binding on the parties” and add the following: “except that the Owner may reject the decision or suggest a compromise or both”.

Delete Section 15.2.6.

Delete Section 15.2.6.1.

15.3 MEDIATION

Delete Section 15.3.

15.4 ARBITRATION

Delete Section 15.4.

END OF SECTION

INSURANCE REQUIREMENTS

Contractor shall purchase, at its own cost and expense, and maintain for the duration of the Contract, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees, or subcontractors. The insurance shall be obtained from a company or companies lawfully authorized to do business in the State of Louisiana with a A.M. Best's rating of A-:VI or higher. Failure to comply with all terms of this section for the duration of the Contract places Contractor in breach of this Contract.

A. Minimum Scope of Insurance and Limits

1. Workers Compensation

Contractor shall be in compliance at all times with the Louisiana Workers' Compensation Law with respect to workers' compensation insurance or proper certification of self- insured status.

2. Commercial General Liability

Contractor shall maintain Commercial General Liability insurance, including Personal and Advertising Injury Liability, which coverage shall have a minimum limit per occurrence of
$1,000,000 and a minimum general aggregate of $2,000,000. The Insurance Services Office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims- made form is unacceptable.

Additionally, if alcohol is served in the execution of this Contract, then Contractor shall maintain Liquor Liability coverage in the minimum amount of $1,000,000 per occurrence.

Additionally, if valet parking is performed in the execution of this Contract, then Contractor shall maintain Garage Keepers Liability coverage in the minimum amount of
$1,000,000 per occurrence.

3. Automobile Liability

If a motor vehicle owned, hired, or rented by the Contractor is used in the performance of the Contract, Contractor shall maintain Automobile Liability Insurance, which coverage shall have a minimum combined single limit per occurrence of $1,000,000. ISO form number CA 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. This insurance shall include third-party bodily injury and property damage liability for owned, hired, and non-owned automobiles.

4. Professional Liability, Errors and Omissions, and Malpractice Insurance

If any of the following professionals provide services in the execution of the Contract, Contractor shall purchase and maintain Professional Liability Insurance, which coverage shall have minimum limits of $1,000,000:

1. Medical Professionals, such as physicians, nurses, dentists, and pharmacists;
2. Architects and Engineers;
3. Attorneys;
4. Accountants and Professional Financial Advisors;
5. Real Estate Brokers and Appraisers;
6. Insurance Agents; and
7. Consultants.

Claims-made coverage for Professional Liability Insurance is acceptable. The date of the inception of the policy must be no later than the first date of the anticipated work under this Contract. It shall provide coverage for the duration of this Contract and shall have an expiration date no earlier than 30 days after the anticipated completion of the Contract. The policy shall provide an extended reporting period of at least 24 months, with full reinstatement of limits, from the expiration date of the policy, if policy is not renewed.

5. Cyber Liability Insurance

For Contracts in which the Contractor shall be granted access to electronic data belonging to the University or others, including but not limited to corporate confidential information (CCI), personal financial information (PII), personal health information (PHI), payment card information (PCI), and all personal student information (PSI) stored in electronic format, and for which there is a risk of electronic security breaches of this confidential data, including inadvertent release, hacking, viruses, improper destruction, etc., Cyber Liability insurance, including first-party costs, shall be required with a minimum limit per occurrence of $1,000,000. Claims-made coverage is acceptable. The date of the inception of the policy must be no later than the first date of the anticipated work under this Contract. It shall provide coverage for the duration of this Contract and shall have an expiration date no earlier than 30 days after the anticipated completion of the Contract. The policy shall provide an extended reporting period of not less than 36 months from the expiration date of the policy, if the policy is not renewed. The policy shall not be cancelled for any reason, except non-payment of premium.

B. Other Insurance Provisions

Contractor shall either (i) require each subcontractor and vendor to procure and maintain all applicable insurance of the type and limits specified herein, or (ii) include all subcontractors as insureds under its policies.

Any deductibles or self-insured retentions must be declared to and accepted by University. Contractor shall be responsible for all deductibles and self-insured retentions. Any insurance or self-insurance maintained by University shall be excess and non-contributory of Contractor's insurance. Contractor's coverage shall contain no special limitations on the scope of protection afforded to University. Contractor's insurance shall be primary as respects
University, The Board of Supervisors for the University of Louisiana System ("Board"), and all of their respective officers, agents, employees, and volunteers.

Except for workers' compensation coverage, University and Board, and all of their respective officers, agents, employees, and volunteers, shall be named as an additional insured for the full occurrence and aggregate limits of the applicable insurance policies as regards negligence by Contractor. ISO Form CG 20 10 (current form approved for use in Louisiana), or equivalent, is to be used when applicable.

Contractor shall provide to University Certificates of Insurance ("Certificates") evidencing the foregoing coverage in advance of Contractor's delivery of goods and/or performance of work or services, and in all events, prior to any payment by University to Contractor. In addition to Certificates, Contractor shall submit to University the declarations page and the cancellation provisions for each insurance policy. University reserves the right to request complete certified copies of all required insurance policies at any time.
Certificates and all notices regarding coverage shall be addressed to: University of Louisiana at Lafayette
ATTN: Purchasing Department
P.O. Box 40197 Lafayette, LA 70504

Certificates of Insurance shall reflect that, to the fullest extent allowed by law, the insurer shall agree to waive all rights of subrogation against University, its officers, agents, employees, and volunteers for losses arising from work performed by the Contractor for University.

Coverage shall not be canceled, suspended, reduced, or voided by either Contractor or the insurer except after 30 days written notice has been given to University. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in Contractor's policy.

Acceptance of goods or completed work by University, payment by University, failure of University to require proof of compliance, or University's acceptance of a non-compliant Certificate shall not release Contractor from its obligations under these insurance requirements. Failure of Contractor to purchase and/or maintain any required insurance shall not relieve Contractor from any liability or indemnification required by law or contract.

END OF SECTION

GENERAL REQUIREMENTS

The Contractor shall furnish and install all labor and material necessary to provide and install the complete portion of this contract, including all materials and equipment as shown on the plans. It is the intention of these specifications that all systems be furnished complete with whatever necessary items are required to produce a satisfactory installation in a working order. The Contractor shall be responsible for bringing to the attention of the Owner any shortcomings of the design, or thereby, shall be responsible in full to meet the conditions set forth, that being, the system is to be in a satisfactory working order.

All material shall be installed in accordance with the instructions of the manufacturers. The work shall be done in strict compliance with state and local ordinances governing this class of work. The prospective bidder shall visit the job site and become familiar with all existing conditions found at the site. The Contractor shall become acquainted with all existing factors and conditions which affect the work. Failure to do so shall not relieve meeting the responsibility to install the work correctly.

The Contractor shall protect the entire installation from injury on the Project until final acceptance.
Failure to do so shall be sufficient cause for the Agent to reject any work.

CONSTRUCTION FORCE

The Contractor shall provide and maintain in full operation at all times during the performance of the contract a sufficient work crew to execute the work with dispatch. The Contractor shall provide a full time superintendent who shall be on the job during all working periods.

The Contractor shall be responsible for maintenance and repair of all equipment installed by him which fails due to substandard workmanship.

PARKING

Contractor shall be responsible for all fees for temporary campus parking permits. The Facility Management department shall request the permits through the UL Parking and Transit department. Contractor shall be required to display the permit on their vehicles at all times while on campus. Failure to do so may result in parking citation.

DEQ NOTIFICATION

The Contractor shall be responsible for the proper notification of the Department of Environmental Quality whenever demolition work is to be performed. Copies of the DEQ Notification Form AAC-2 and any additional correspondence with DEQ shall be copied to the University.

STANDARDS

All materials furnished under this contract shall be designed, constructed and rated in accordance with the latest applicable standards, and shall pass tests as recommended therein.

WORKMANSHIP AND MATERIALS

The workmanship shall conform to the best accepted construction practice. Should it become evident that during the course of construction that the items indicated on the plans, are for any reason undesirable, the Contractor shall immediately bring the situation to the attention of the Agent for a decision. The Contractor shall be responsible for installing the proper materials as described by the drawings and specifications.
All materials furnished for this Project shall be new, undamaged, and bear the label of the Underwriters' Laboratories, Inc. Deliver materials in manufacturer’s original package and store on skids so that the materials are off the ground, and so that product labels are exposed for easy inspection.

The Bidder shall base the proposal on materials herein specified. Reference to specific manufacturers or trade names is not intended to limit or indicate preference to specific manufacturers, but to indicate a standard of quality. Written approval from the Agent is required on all substitutions prior to installations.

GUARANTEE

The Contractor shall guarantee new materials and workmanship for a minimum of one (1) full year after formal acceptance of the Project. The Contractor will replace defective material and repair all workmanship defects promptly, and absorb all costs.

This provision shall not override any other warranties that are specified herein.

CAMPUS SAFETY POLICY

Contractor shall adhere to the campus safety policy. Information regarding campus safety can be found on the UL Lafayette website at: http://www.louisiana.edu/ehs

LOUISIANA ONE CALL

UL Lafayette is a member in the Louisiana One Call system. At least 72 hours before digging anywhere on UL Lafayette property the contractor must call 1-800-272-3020 to verify the location of utilities.

EXISTING LANDSCAPING

Contractor is liable for any damages caused to the existing landscaping. All landscaping must be protected from root compaction and other physical damage. Contractor must provide three foot high orange construction fencing around the drip line of all trees within the construction site.

ASBESTOS

The contractor will not be required to interface with any asbestos containing material (ACM) during this Project. The State of Louisiana has conducted an asbestos survey of all buildings on the UL Lafayette campus. The results of the survey are compiled in management plans for each building. The management plans were assembled according to the requirements set forth in the Department of Environmental Quality Required Elements Index. These plans are available for review to anyone interested in the results. The plans are kept on file in the Reserve Reading Room of Edith Garland Dupre' Library.

COORDINATION OF WORK

The Contractor shall inform the Agent each day of his work location before proceeding to work, and each time the Contractor moves into a different area.

STORM WATER RUN OFF PROTECTION

Contractor shall protect the entire construction site from erosion due to storm water run-off. A retention barrier shall be constructed around the entire construction site perimeter to prevent erosion from infiltrating the storm water drainage system.

PAYMENT

The Contractor may invoice the Owner for work performed on a monthly basis. The work performed shall meet the approval of UL Lafayette. UL Lafayette shall process payment after verification of the invoice.

On Projects where a performance bond is specified, the University will withhold ten percent (10%) retainage from all payments for completed work. The retainage will be released to the contractor according to the procedures set forth in the "INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS", section 10.

FINAL PAYMENT WILL NOT BE ISSUED UNTIL ALL UNIVERSITY KEYS HAVE BEEN RETURNED TO THE FACILITY MANAGEMENT OFFICE.

CLEAN-UP

The Contractor is responsible for the daily clean-up and disposal of all trash and construction debris relating to this Project. University dumpsters shall not be used for the disposal of debris. Should the Contractor dispose of any debris into University facilities, the cost of removal will be deducted from the University's final payment under this contract. Occupied areas (e.g.: Classrooms, Offices, Labs, etc.) shall be broom cleaned and vacuumed at the end of the work day to allow use of the room by the University. Debris and materials shall be removed from the rooms to allow use of the room by the University.

INDEMNIFICATION

The Contractor will indemnify and hold harmless the Owner and all of their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from operations under the Contract Documents by the Contractor, and subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, which are caused in whole or in part by any error, omission, or act of any of them. If any and all claims against the Owner or any of their agents or employees by any employee of the Contractor, subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable,

the indemnification obligation of the Contractor under this article shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under Workmen's Compensation laws.

SPECIAL HEALTH & SAFETY RELATED CONTRACT CLAUSES:

ADDITIONAL CONTRACTOR REQUIREMENTS AND LIMITATION OF LIABILITY

It is expressly understood and agreed by the parties that:

(a) CONTRACTOR shall not visit or utilize the facilities of university if CONTRACTOR (i) experiences symptoms of COVID-19, including, without limitation, fever, cough, or shortness of breath, or (ii) has a suspected or diagnosed/confirmed case of COVID-19, and CONTRACTOR shall notify University immediately if he or she believes that any of the foregoing access/use restrictions may apply;

(b) University has taken certain steps to implement recommended guidance and protocols issued by the Centers for Disease Control ("CDC") and Louisiana Department of Health ("LDH") for slowing the transmission of COVID-19, including, without limitation, the access/use restrictions, and distancing and sanitization requirements set forth herein, and that University may revise its procedures at any time based on updated recommended guidance and protocols issued by the CDC and LDH and CONTRACTOR agrees to comply with University's current and revised procedures prior to utilizing the facilities of University;

(c) CONTRACTOR acknowledges and agrees that, due to the nature of the facilities and the services CONTRACTOR is providing to University, social distancing of six (6) feet per person may not always be possible and CONTRACTOR fully understands and appreciates both the known and potential dangers of utilizing the facilities of University and acknowledges that use thereof by CONTRACTOR may, despite University's reasonable efforts to mitigate such dangers, result in exposure to COVID-19, which could result in quarantine requirements, serious illness, disability, and/or death; and

(d) while University has instituted measures to sanitize common areas, CONTRACTOR shall be responsible for the daily sanitization of his/her personal workspace prior to and immediately preceding CONTRACTOR's use of the space. Under no circumstances shall University be liable to CONTRACTOR, or CONTRACTOR's personal representatives, assigns, heirs, and next of kin for any loss or damage, or any claim or demands on account of any property damage or any injury to, or an illness or the death of, the CONTRACTOR (or any person who may contract COVID-19, directlyor indirectly, from the CONTRACTOR) whether caused by the negligence, active or passive, of University or otherwise while CONTRACTOR is in, upon, of about the premises or ay facilities or equipment therein of University.

FORCE MAJEURE

Notwithstanding anything to the contrary in this Agreement, neither party shall be liable to the other or be deemed to be in breach of this Agreement for any failure or delay in whole or partial performance under this Agreement when such failure or delay is caused in whole or in part by a "Force Majeure Event," which shall be defined as any event beyond the control of a party, including, but not limited to: labor disputes, strike, riot, vandalism, sabotage, terrorist act, war (whether declared or undeclared), inclement weather, flood (whether naturally occurring or manmade), tidal surge or tsunami, landslide, earthquake, fire (whether naturally occurring or manmade), explosion, power shortage or outage, fuel shortage, embargo, congestion or service failure, epidemic, or government regulation, proclamation, order, or action; and in each case not involving the fault or negligence of a party.

If any Force Majeure Event occurs affecting a party's performance under this Agreement, the affected party will give written notice within five (5) days of the occurrence of the Force Majeure Event to the other party and will use commercially reasonable efforts to minimize the impact of the Force Majeure Event. In the event of a Force Majeure Event resulting in a total or partial performance or service failure by either party, the University, in its sole discretion, may immediately terminate this Agreement. To the extent that services have been rendered and deemed acceptable by university, the service fee and other fees and charges payable by University hereunder shall be paid to the Contractor on a pro-rata basis. For those services which the Contractor is unable to perform under this Agreement as a result of such Force Majeure Event, University shall suspend all related payments until such services are restored.

END OF SECTION

Guidelines for Electronic Submission of Bids and Virtual Bid Openings

In keeping with the physical distancing guidelines associated with COVID-19 Public Health Emergency declared by Governor John Bel Edwards in Proclamation Numbers 41, 33, 32, 30, 27, and 25 JBE 2020, the Purchasing Department at the University of Louisiana at Lafayette is suspending in-person attendance at public bid openings. All tasks associated with sealed bids and corresponding bid openings will be completed electronically to the greatest extent possible.

BID SUBMISSIONS - *USPS Mail bid submittal and In-person delivery of bids at the Purchasing Office ARE NO LONGER ACCEPTED.*

This information applies to competitive sealed bids. Bidders shall submit proposals by EMAIL ONLY:

Electronic submittal: Bidders must submit bids electronically containing the mandatory information detailed in the bid specifications to be considered for the bid award. Without exception, the bid must be received at ULLafayetteBids@louisiana.edu on or before the date and time specified as its deadline. Bidders e-mailing their bids should allow sufficient time to ensure receipt of their proposal by the time specified. The timestamp recorded in the email acknowledgement shall be the official time of the submission.

The electronic submittal must contain the following information in the Subject Line:

File Number Company Name

LA Contractor's License No. (if applicable)

If the file size of the email submission exceeds server requirements, the email submission may be broken into smaller email messages with "Part 1 of__" included at the end of each original Subject Line (e.g. File No. 22200 – ABC Contractors, License No. 12345, Part 1 of 3).

The University assumes no responsibility for assuring accurate/complete e-mail transmission and receipt. The responsibility lies solely with each bidder to ensure their submission is received at the specified email address prior to the deadline. Proposals received after the deadline, corrupted files, and incomplete submissions (e.g. Part 1 and Part 2 of 3 are received, but Part 3 is not) shall not be considered.

Bids advertised on LAPAC will show a solicitation file number formatted like 50011-ULLAF#####. It is only necessary to include the last five (5) digits of that number in the Subject Line.

Bids shall be submitted in .pdf format. Faxed submittals will not be accepted.

Bid Submissions for Public Works/Construction

In addition to the above, the following applies to Title 38 Public Works electronic bid submittals.

The bidder must sign electronically or submit a scanned signature on the Louisiana Uniform Public Works Bid Form.

As stated on the Louisiana Uniform Public Works Bid Form, a corporate resolution or written evidence of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5) shall be enclosed, if your business is a corporation.

Bid submittal shall include security equal to 5% of bid. bid security shall be drawn in favor of the University of Louisiana at Lafayette and SHALL be in the form of a Bid Bond (Insurance Company), Bank Money Order*, Certified Check* or Cashier's Check*.

Bid security in the form of a Bank Money Order, Certified Check* or Cashier's Check* shall be accepted as bid security when submitting bids electronically if both the front and back of the bid security is scanned and included with the bid submission. The hard copy of that document must be received no later than three (3) business days after the bid opening at:

University of Louisiana at Lafayette Purchasing Office
PO Box 40197
Lafayette, LA 70504-0197

Louisiana Contractor's License Number shall be in the subject line of the bid for ALL bids greater than or equal to $50,000.00. Bids for Plumbing/Electrical/Mechanical Work greater than or equal to $10,000.00 shall disclose the Louisiana Contractor's License Number in the Subject Line.

Asbestos Abatement bids exceeding $1.00 shall disclose the Louisiana Contractor's License Number in the Subject Line.

BID OPENINGS

Bid openings will continue to be open to the public, conducted virtually using Zoom. To ensure an accurate list of attendees, parties interested in viewing the opening must register for the meeting.

The link to register for each bid opening shall be provided with the Invitation to Bid. The link will be live at that time and will provide live audio access to the bid opening.

The Bid Opening Zoom meeting shall begin at the top of the hour listed in the specifications as the Bid Opening time. The actual opening of bids shall begin at five (5) past the hour to allow all attendees to log in and sign in properly. The public bid opening for this solicitation will take place on Tuesday, November 21, 2023 at 3:00PM on Zoom, which is available for viewing by registering at https://ullafayette.zoom.us/meeting/register/tJ0ldeCsrTwpGNbDDG3kxhsaWFoO4UHqv4pu.

Meeting ID: 998 2943 7322 Passcode 904516 Requests for bid tabulations and solicitation inquiries should be directed to purchasing@louisiana.edu as listed in the solicitation/ITB.

END OF SECTION

VENDOR CHECK LIST

REQUIRED FORMS/ITEMS UPON BID SUBMISSION

_____ Louisiana Uniform Public Works Bid Form

_____ Bid Security Equal to 5% of Bid

_____ Louisiana Contractor's License Number (If Applicable) in Subject Line of email

_____ If company bidding is a corporation, Corporate Resolution or written evidence of authority of person signing the bid for the public work (*See **annotation on Louisiana Public Work Bid Form.*)

REQUIRED FORMS AFTER BID OPENING/UPON BID AWARD

_____ Attestation Affidavit (ALL BIDDERS, WITHIN 10 DAYS OF BID OPENING)

_____ Non-Collusion Affidavit (LOW BIDDER, WITHIN 10 DAYS OF REQUEST)

_____ Disclosure of Ownership Affidavit (LOW BIDDER, WITHIN 10 DAYS OF REQUEST)

_____ Performance and Payment Bond (LOW BIDDER, WITHIN 10 DAYS OF REQUEST)

_____ Certificate of Insurance (*Insurance requirements revised February 2019*)

_____ Certificate of Recordation of Contract and Bonds

_____ Clear Lien Certificate

CONTACT INFORMATION

ELECTRONIC BID SUBMISSIONS (ONLY) *Do not email questions about the bid to this email address.*

ULLafayetteBids@louisiana.edu

Be sure to include the solicitation number in the subject line.

Do not send your submission to any other University email address.

QUESTIONS/CONCERNS ABOUT SPECIFICATIONS

purchasing@louisiana.edu mary.borel@louisiana.edu

Do not *email bid submissions to either of these addresses.*

To contact Purchasing by phone: 337.482.9051.

CAMPUS DELIVERIES

The campus is not fully open for receiving deliveries by courier at this time. Please send samples or other associated documents via US Mail only when a hard copy is requested or deemed necessary. The UL- Lafayette Post Office (located inside the Student Union) will accept packages with proper postage to place in the Purchasing Department's mailbox. The phone number is 337.482.6113.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: University of Louisiana at Lafayette
Purchasing Office, Martin Hall Room 123
104 University Circle
PO Box 40197
Lafayette, LA 70504

BID FOR: GREENHOUSE ADDITION - PHASE 3 – BILLEAUD HALL
BLD: BILLEAUD HALL
File No. 24207

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the Project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced Project, all in strict accordance with the Bidding Documents prepared by:

University of Louisiana at Lafayette and dated: October 2023
(Owner to provide name of entity preparing bidding documents.)

Bidder must acknowledge all addenda. The Bidder acknowledges receipt of the following ADDENDA: (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging)_____

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid"* but not alternates) the sum of:

_____ Dollars ($_____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1: - ADD - (To furnish and install new storage shed with foundation, sidewalks, and electrical wiring and devices.
_____ Dollars ($_____)

Alternate No. 2: (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:
_____N/A_____Dollars ($_____N/A_____)

Alternate No. 3: (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:
_____N/A_____Dollars ($_____N/A_____)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER:_____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER**: _____

DATE: _____

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise, it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** A CORPORATE RESOLUTION OR WRITTEN EVIDENCE of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5). BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38:2218(A) attached to and made a part of this bid.

ATTESTATIONS AFFIDAVIT – PAGE 1 OF 2

GREENHOUSE ADDITION - PHASE 3 – BILLEAUD HALL **24207**

Name of Project Project No.

STATE OF LOUISIANA

PARISH OF LAFAYETTE

ATTESTATIONS AFFIDAVIT

Before me, the undersigned notary public, duly commissioned and qualified in and for the parish and state aforesaid, personally came and appeared Affiant, who after being duly sworn, attested as follows:

LA. R.S. 38:2227 PAST CRIMINAL CONVICTIONS OF BIDDERS

A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes:

(a) Public bribery (R.S. 14:118)
(b) Corrupt influencing (R.S. 14:120)
(c) Extortion (R.S. 14:66)
(d) Money laundering (R.S. 14:23)

B. Within the past five years from the Project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

(a) Theft (R.S. 14:67)
(b) Identity Theft (R.S. 14:67.16)
(c) Theft of a business record (R.S.14:67.20)
(d) False accounting (R.S. 14:70)
(e) Issuing worthless checks (R.S. 14:71)
(f) Bank fraud (R.S. 14:71.1)
(g) Forgery (R.S. 14:72)
(h) Contractors; misapplication of payments (R.S. 14:202)
(i) Malfeasance in office (R.S. 14:134)

LA.R.S.38:2212.10 Verification of Employees

A. At the time of bidding, Appearer is registered and participates in a status verification system to verify that all new hires in the state of Louisiana are legal citizens of the United States or are legal aliens.

B. If awarded the contract, Appearer shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.

C. If awarded the contract, Appearer shall require all subcontractors to submit to it a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

ATTESTATIONS AFFIDAVIT – PAGE 2 OF 2

GREENHOUSE ADDITION - PHASE 3 – BILLEAUD HALL **24207**

Name of Project Project No.

LA. R.S. 23:1726(B) Certification Regarding Unpaid Workers Compensation Insurance

A.R.S. 23:1726 prohibits any entity against whom an assessment under Part X of Chapter 11 of Title 23 of the Louisiana Revised Statutes of 1950 (Alternative Collection Procedures & Assessments) is in effect, and whose right to appeal that assessment is exhausted, from submitting a bid or proposal for or obtaining any contract pursuant to Chapter 10 of Title 38 of the Louisiana Revised Statutes of 1950 and Chapters 16 and 17 of Title 39 of the Louisiana Revised Statutes of 1950.

B.By signing this bid /proposal, Affiant certifies that no such assessment is in effect against the bidding / proposing entity.

NAME OF BIDDER

NAME OF AUTHORIZED SIGNATORY OF BIDDER

DATE

TITLE OF AUTHORIZED SIGNATORY OF BIDDER

SIGNATURE OF AUTHORIZED
SIGNATORY OF BIDDER/AFFIANT

Sworn to and subscribed before me by Affiant on the_____day of_____, 20___.

Notary Public

NON-COLLUSION AFFIDAVIT

STATE OF LOUISIANA

[X] PARISH OF LAFAYETTE [ ] COUNTY OF_____

AFFIDAVIT ATTESTING THAT PUBLIC CONTRACT WAS NOT NOR WILL BE SECURED THROUGH EMPLOYMENT OR PAYMENT OF SOLICITOR

KNOW ALL MEN BY THESE PRESENCE, that a public contract is contemplated between

University of Louisiana at Lafayette and

_____,

represented by (print or type)_____attests that s/he is empowered and authorized to execute said documents.

FURTHER, (signature)_____, who being duly sworn, does depose and attest that:

1) Affiant employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or Project or in securing the public contract wherein the regular course of their duties for affiant; and

2) That no part of the contract price received by affiant was paid or will be paid to any person, Corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or Project were in the regular course of their duties for affiant.

BEFORE ME, the representing authority, personally appeared, who being duly sworn, deposes and states that the above is true and correct in all respects recited.
SWORN TO AND SUBSCRIBED before me, this_____day of_____, 20_____.

_____
Notary Public

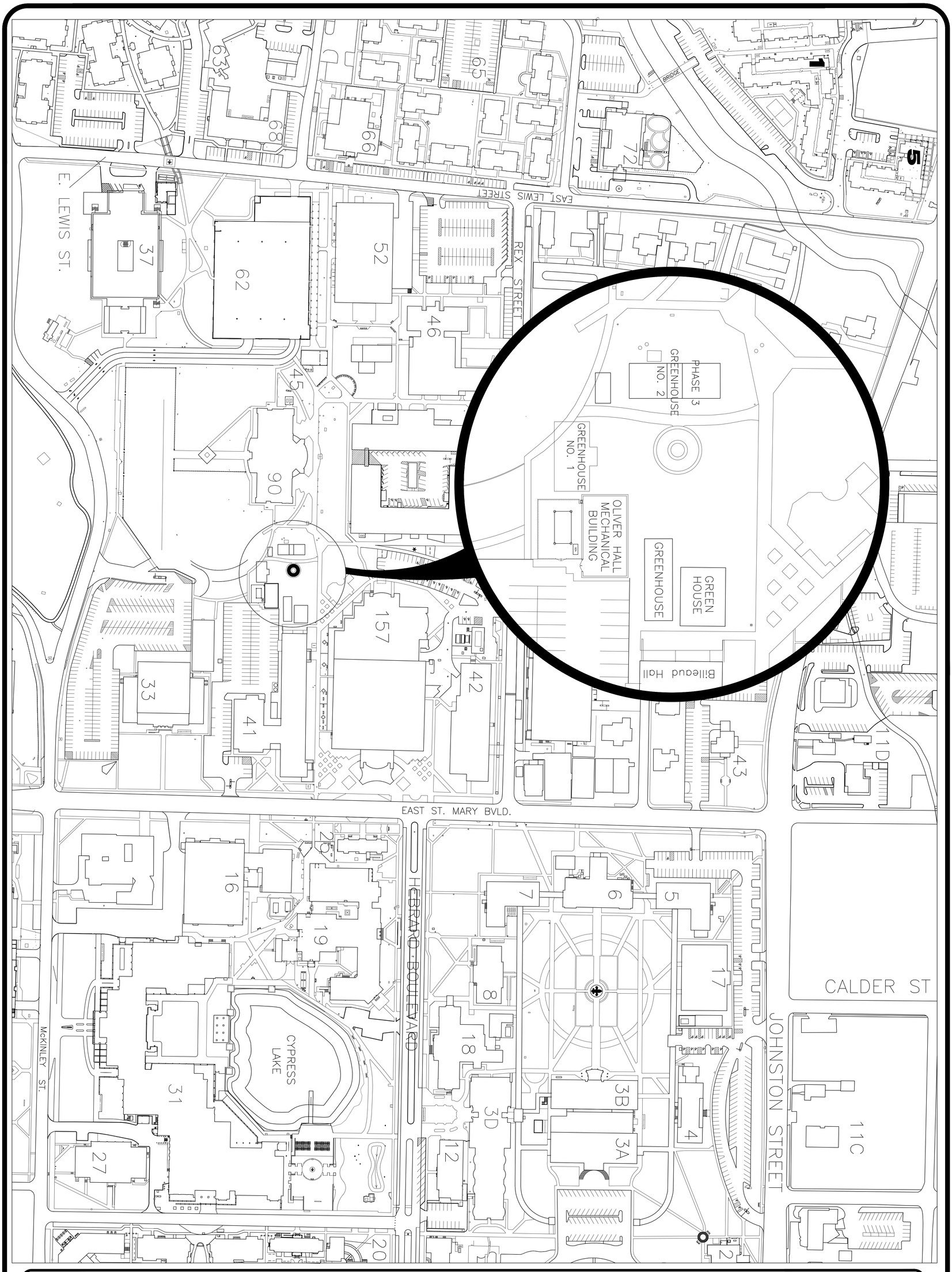
ATTACHMENT A
TO FOLLOW
IMMEDIATELY

UL

UNIVERSITY OF LOUISIANA
AT LAFAYETTE

GREENHOUSE ADDITION
PHASE 3
BILLEAUD HALL

AUGUST 2023



GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

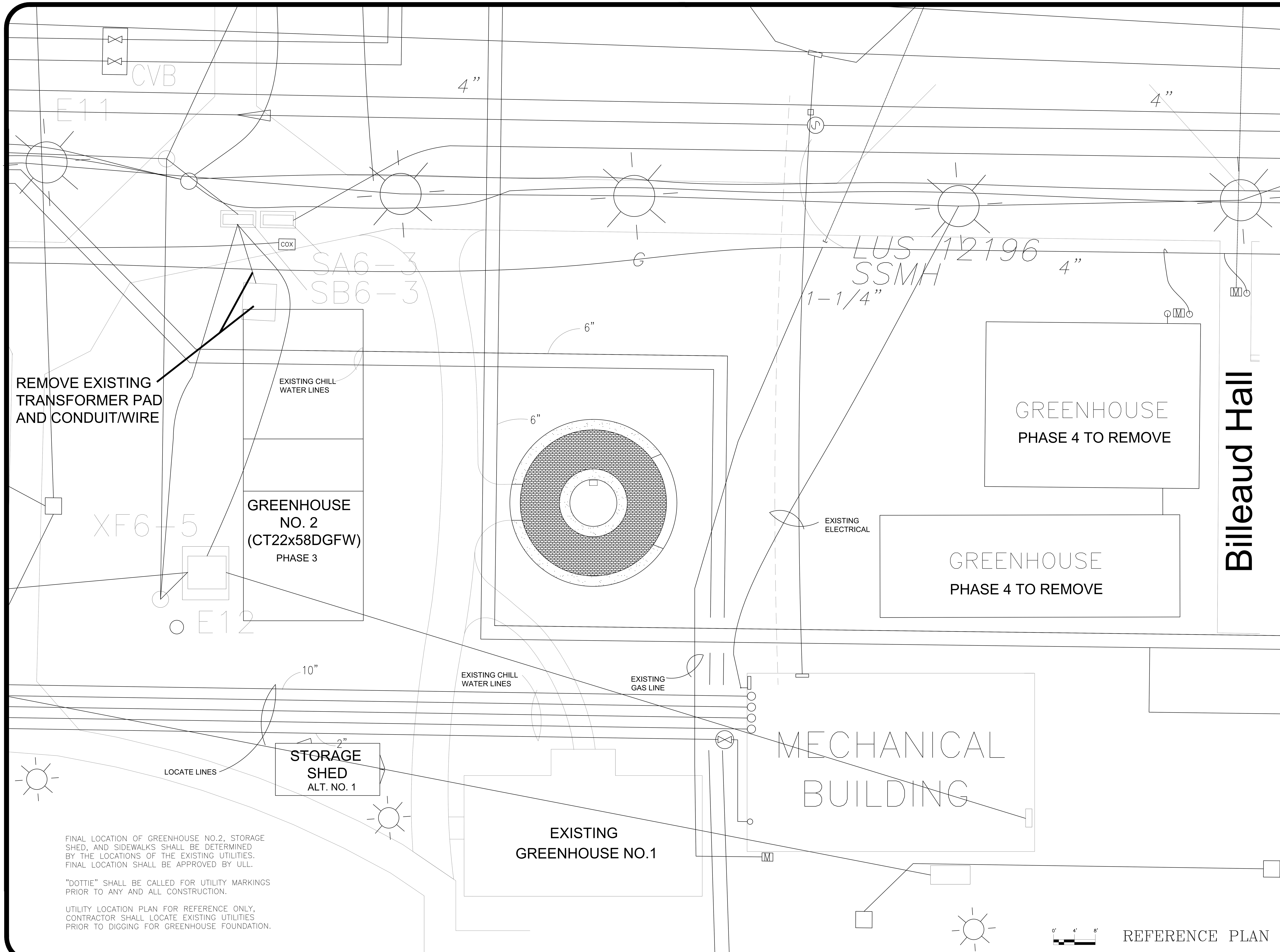
UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

PROJECT NO:
DATE: AUGUST 2023
SCALE: 1" = 0"
SHEET: A1

REGISTRATION STAMP

UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

NO: GENERAL NOTES
REVISIONS:
DATE:



FINAL LOCATION OF GREENHOUSE NO.2, STORAGE SHED, AND SIDEWALKS SHALL BE DETERMINED BY THE LOCATIONS OF THE EXISTING UTILITIES. FINAL LOCATION SHALL BE APPROVED BY ULL.

"DOTTIE" SHALL BE CALLED FOR UTILITY MARKINGS PRIOR TO ANY AND ALL CONSTRUCTION.

UTILITY LOCATION PLAN FOR REFERENCE ONLY, CONTRACTOR SHALL LOCATE EXISTING UTILITIES PRIOR TO DIGGING FOR GREENHOUSE FOUNDATION.

REFERENCE PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

REGISTRATION STAMP

PROJECT NO:
SHEET: A2
DATE: AUGUST 2023
SCALE: 1/8" = 1' – 0"

GREENHOUSE NO. 2 (CT22x58DGFW)
PHASE 3

PHASE 3

7'-6"

EJ

EJ

16'

EJ

7'-6"

EJ

4'

4'-0"

PHASE 3

EJ

EXISTING CHILL WATER

ALT. NO.1

7'-6"

ALT. NO.1

STORAGE SHED
ALT. NO. 1

7'-6"

EJ

ALT. NO.1

ALT. NO.1

PHASE 3:
FURNISH AND INSTALL NEW GREENHOUSE #2 (CT2258DGFW) WITH NEW EQUIPMENT, GREENHOUSE FOUNDATION, AND SIDEWALKS AS SHOWN.

LOCATE EXISTING UTILITY ROUGH-INS FOR NEW GREENHOUSE #2 AND EXTEND UTILITIES TO NEW LOCATIONS AS SHOWN.

FINAL LOCATION OF GREENHOUSES, STORAGE SHED, AND SIDEWALKS SHALL BE DETERMINED BY THE LOCATIONS OF THE EXISTING UTILITIES. FINAL LOCATION SHALL BE APPROVED BY ULL.

"DOTTIE" SHALL BE CALLED FOR UTILITY MARKINGS PRIOR TO ANY AND ALL CONSTRUCTION.

UTILITY LOCATION PLAN FOR REFERENCE ONLY, CONTRACTOR SHALL LOCATE EXISTING UTILITIES PRIOR TO DIGGING FOR GREENHOUSE FOUNDATION.

ALTERNATE NO. 1
1. FURNISH AND INSTALL NEW STORAGE SHED, FOUNDATION, AND SIDEWALKS AS PER DETAILS ON PLAN SHEET "A6".
2. PROVIDE AND EXTEND A 1" PVC CONDUIT WITH #10-3 WITH GROUND FROM PANEL "G2" TO NEW STORAGE SHED. PROVIDE (2) LED STRIP LIGHTS, (2) 3-WAY SWITCHES, AND (3) 20-AMP RECEPTACLES WITH COVER PLATES AS SHOWN ON PLAN. CONNECT TO EACH 20-AMP BREAKER IN PANEL "G2" AS SHOWN ON PANEL SCHEDULE.

ALTERNATE NO.1
REMOVE EXISTING SECTIONS OF SIDEWALK IN THE WAY OF THE NEW FOOTPRINT OF NEW SHED. FORM UP AND RE-POUR TO RECONNECT ALL SIDEWALKS. FURNISH AND INSTALL STORAGE SHED, BUILDING FOUNDATION, ELECTRICAL COMPONENTS, AND CONCRETE SIDEWALKS.

EXISTING GREENHOUSE

EXISTING GREENHOUSE

MECHANICAL BUILDING

PHASE 2
GREENHOUSE NO.1
(CT2244DGFW)
EXISTING

0' 4' 8'

CONSTRUCTION PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

Billeaud Hall

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

REGISTRATION STAMP

PROJECT NO:	SHEET:
DATE: AUGUST 2023	A3
SCALE: 1" = 1' - 0"	

NO GUTTERS OR DECORATIVE TRIM

*** SHADE SCREENS AT ROOF BETWEEN EACH ROOF TRUSS THROUGHOUT - ALL THREE ROOMS

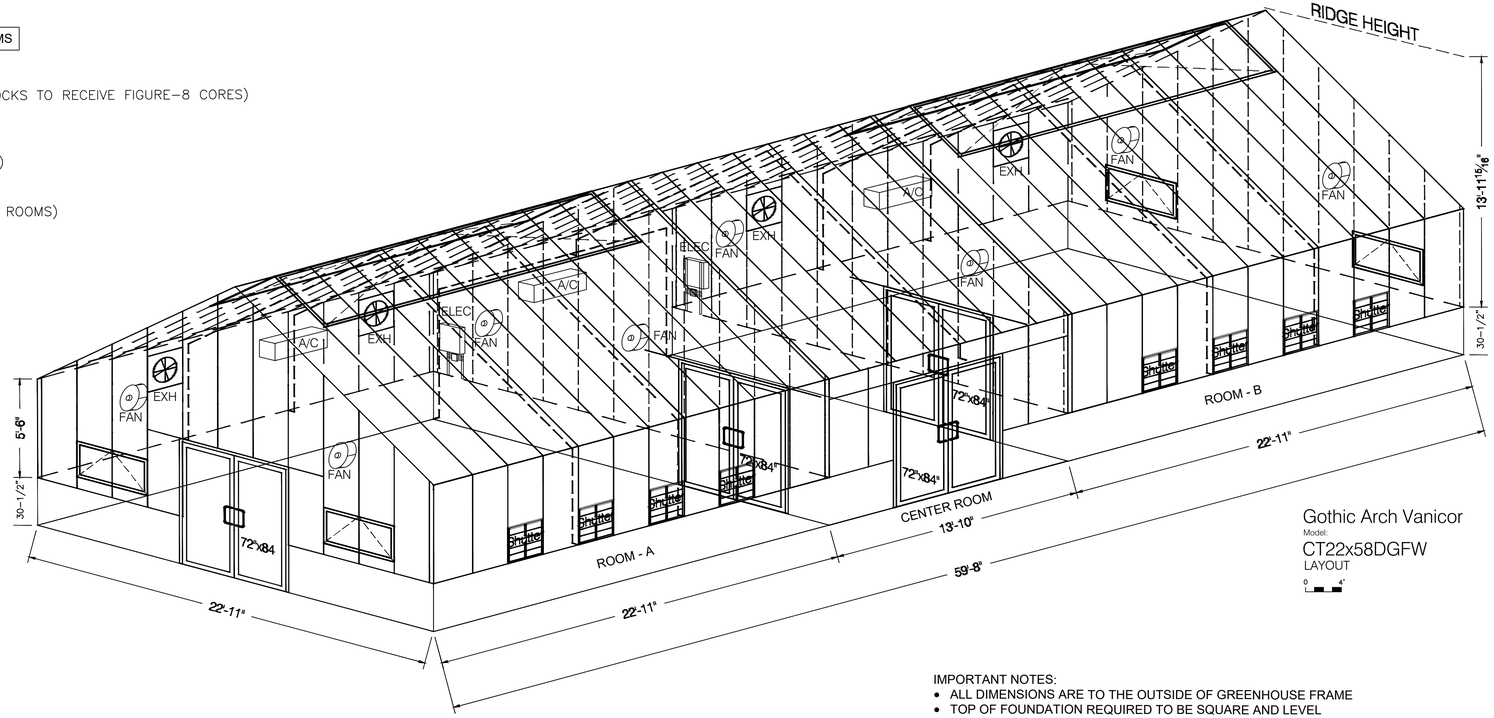
GREENHOUSE COMPONENTS BY GOTHIC, INC.:

1. (4) SETS OF 72" x 84" DOUBLE H.D. STOREFRONT DOORS W/ HARDWARE (LOCKS TO RECEIVE FIGURE-8 CORES)
2. (4) 18" VARIABLE SPEED EXHAUST FANS
3. (8) MOTORIZED SHUTTERS W/INSECT SCREENS
4. (4) DOUBLE SIDE VENTS (2) IN ROOM "A" AND (2) IN ROOM "B"
5. (8) HAF 12" AIR-CIRCULATING FANS ((4) IN ROOM "A" AND (4) IN ROOM "B")
6. (6) CONTINUOUS MOTORIZED RIDGE VENTS
7. (3) BARLETT CLIMATE BOSS TOUCH SCREEN CONTROL W/WEATHER STATION
8. SHADE SCREENS AT ROOF THROUGHOUT BETWEEN ROOF TRUSSES (ALL THREE ROOMS)

GREENHOUSE COMPONENTS BY CONTRACTOR:

1. (3) MINI-SPLIT HEAT PUMPS-(1) 2-TON, (2) 3-TON
2. ALL ELECTRICAL EQUIPMENT, RACEWAYS, AND WIRING TO ALL DEVICES
3. ALL CONTROL WIRING/CONNECTIONS AND RACEWAYS TO ALL DEVICES
4. (1) 24" x 36" SS SINK WITH 24" x 24" DRAIN BOARD
5. ALL PLUMBING PIPING AND CONNECTIONS
6. ALL YARD DRAINS, PIPING, AND CONNECTIONS
7. ALL CONCRETE (FOUNDATION, SIDEWALKS, A/C PADS)
8. 6" BUILDING SLAB WITH FOOTINGS
9. SPLIT-FACE BLOCK KNEE WALL (SMOOTH FACE ON INTERIOR KNEE WALL)
10. ALL SLAB AND BLOCK REINFORCEMENT
11. KNEE WALL BRONZE METAL FLASHING CAP THROUGHOUT
12. TURNBUCKLES AND HANGING WIRE FOR SHADE SCREENS

ALTERNATE NO.1:
TO FURNISH AND INSTALL STORAGE SHED WITH FOUNDATION, SIDEWALKS, AND ELECTRICAL AS SHOWN ON PLAN AND DETAILS.



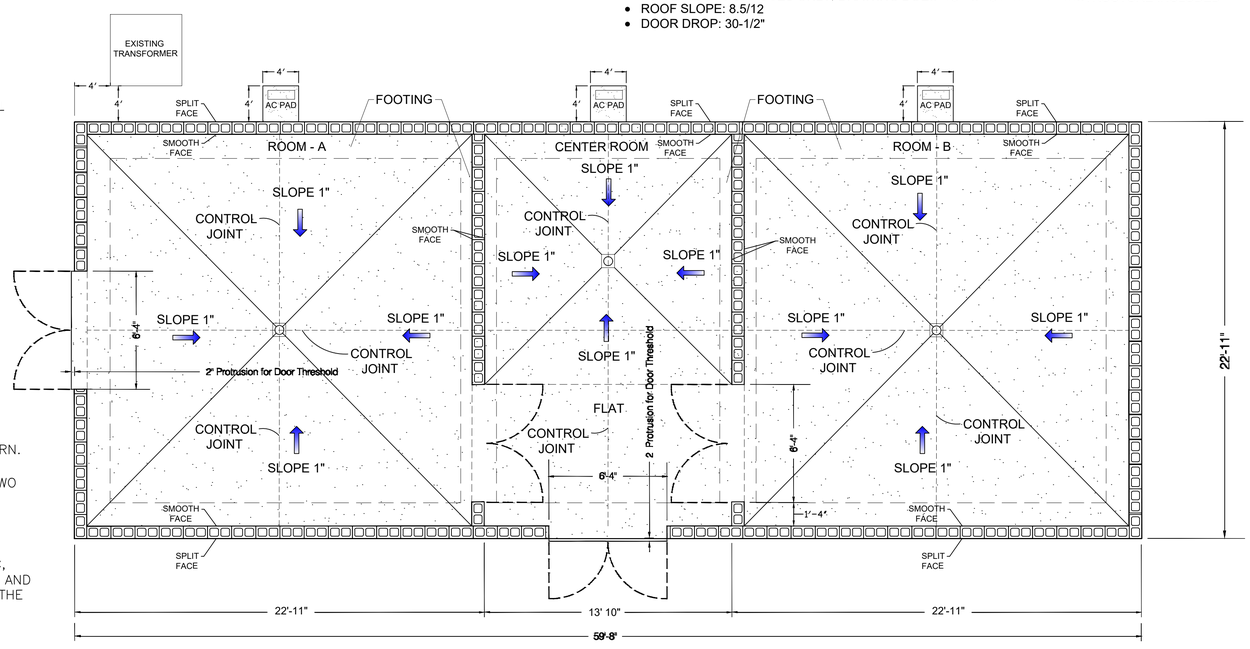
Gothic Arch Vanicor
Model:
CT22x58DGFW
LAYOUT
0 4'

IMPORTANT NOTES:
- ALL DIMENSIONS ARE TO THE OUTSIDE OF GREENHOUSE FRAME
- TOP OF FOUNDATION REQUIRED TO BE SQUARE AND LEVEL
- DO NOT USE LEVELING STRIPS OR ANCHOR BOLTS IN TOP OF WALL
- FOUNDATION: 6" SLAB WITH FOOTING - WALL: 8" BLOCK CONCRETE FILLED (MONO)
- DOOR DROP: 30-1/2"; PROVIDE A 1-1/2" BLOCK LEDGE, COORDINATE FOR DOOR DROP
- DOOR THRESHOLD REQUIRES 2" EXTENDING FROM OUTSIDE OF FOUNDATION WALL
- FOR LAYOUT PURPOSES ONLY, DRAWING DOES NOT SHOW ALL INFRASTRUCTURE INCLUDED
- ROOF SLOPE: 8.5/12
- DOOR DROP: 30-1/2"

GENERAL NOTES:

1) CONTRACTOR SHALL CALL "DOTTIE" PRIOR TO DIGGING.
2) CONTRACTOR SHALL LOCATE THE EXISTING UTILITIES PRIOR TO NEW CONSTRUCTION LAYOUT. EXISTING UTILITY LOCATIONS SHALL DETERMINE THE EXACT LOCATION OF THE GREENHOUSE CONCRETE FOUNDATION.
3) CONTRACTOR SHALL CONTACT THE UNIVERSITY FOR FINAL LOCATION, ELEVATIONS, AND SLOPES PRIOR TO ANY FORM WORK.
4) REMOVE AND DISPOSE ALL EXCESS DIRT TO REQUIRED SUB-GRADE ELEVATIONS FOR SIDEWALK AND CONCRETE FOUNDATION.
5) FURNISH AND INSTALL ALL REQUIRED REINFORCEMENT ACCORDING TO THE DETAILS. REBAR SHALL BE PREFORMED FOR THE PROJECT TO THE CORRECT RADIUS.
6) FURNISH AND INSTALL CONCRETE AS PER DETAILS AND SPECIFICATIONS:
   A) 5.75 BAG TYPE 1 PORTLAND CEMENT MIX (540 LB/CU. YD.) NO FLY ASH (3500 PSI)
   B) MID RANGE WATER REDUCER ACCEPTED (SUPER PLASTICIZER NOT ALLOWED)
   C) SLUMP CONTROL-MIN. 4" ; MAX. 6"
   D) TROWEL FINISH (EXPOSED CONCRETE RUBBED)
   E) APPLY SEAL AT COMPLETION OF FINISHING OPERATIONS WITH SONNEBORNE KURE & SEAL
   F) F F VALUE = 38 (FLOOR FLATNESS AND LEVELNESS)(SLOPE EACH SECTION TO DRAIN)
   G) MIX DESIGN SUBMITTED BY GC FOR APPROVAL A MIN. OF 10 DAYS PRIOR TO CONCRETE OPERATIONS
7) CONCRETE POUR SHALL BE SCHEDULED WITH THE UNIVERSITY 2-3 DAYS IN ADVANCE.
8) INSTALL 1/2" EXPANSION MATERIAL AND URETHANE CAULKING AT EXPANSION JOINT NOTED ON THE PLANS.
9) FURNISH AND INSTALL DRAIN PIPING AND YARD DRAINS IN SLAB AS PER DETAILS ON SHEET A6.
10) FURNISH AND INSTALL 8" SPLIT FACED BLOCK TO CREATE THE KNEE WALL AS PER DETAILS FOR GREENHOUSE NO.2.
11) INTERIOR BLOCK SHALL BE SMOOTH FACE ON BOTH SIDES BUT SHALL MATCH COLOR.
12) INSTALL #6 REBAR IN CONCRETE FOR BLOCK WALL REINFORCEMENT AT 32" ON CENTER. FILL ALL CELLS IN BLOCK WITH 3500 PSI CONCRETE. COORDINATE BLOCK INSTALLATION WITH OTHER SUBS. WALL POUR SHALL BE MONOLITHIC.
13) INSTALL DURA-BOND MASONRY REINFORCEMENT AT EACH COURSE. BLOCK SHALL BE INSTALLED IN A RUNNING BOND PATTERN.
14) SUBMIT SAMPLES OF BLOCK TO THE UNIVERSITY PRIOR TO ORDERING. MATCH EXISTING GREENHOUSE.
15) AFTER ALL WORK IS COMPLETE, CONTRACTOR SHALL ACID WASH ALL SURFACES, CONCRETE AND BLOCK, THEN APPLY (2) TWO HEAVY COATS OF PROSOCO SURE KLEAN WEATHER SEAL H40 WATER REPELLANT (OR APPROVED EQUAL) ON ALL SURFACES.
16) FURNISH AND INSTALL NEW YARD DRAINS WITH REQUIRED APRONS WHERE SHOWN ON PLANS AND PER DETAILS.
17) RE-GRADE EXCESS DIRT AROUND GREENHOUSE FOR PROPER DRAINAGE TO NEW YARD DRAINS AT THE EXTERIOR OF THE GREENHOUSE. HYDRO-SEED ENTIRE CONSTRUCTION AREA AROUND GREENHOUSE NO.2 WHEN COMPLETE.
18) FURNISH NEW GREENHOUSE NO.2 WITH SPECIFIED COMPONENTS. CONTRACTOR SHALL PURCHASE GREENHOUSE FROM GOTHIC, INC. AND HIRE GOTHIC, INC. TO INSTALL THE GREENHOUSE. GOTHIC, INC. AND CONTRACTOR SHALL INSTALL ALL COMPONENTS AND EQUIPMENT AND CONTRACTOR SHALL MAKE ALL CONNECTIONS. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS FOR THE CONNECTIONS OF COMPONENTS AND EQUIPMENT.
19) PROVIDE (3) 4' X 4' X 4" THICK A/C CONCRETE PADS WITH TURN DOWNS TO 4" BELOW GRADE WHERE SHOWN. PROVIDE SLEEVES IN BLOCK WALL FOR ALL ELECTRICAL AND MECHANICAL PIPING. SEAL ALL PENETRATIONS.
20) PROVIDE NEW SIDEWALKS AS SHOWN ON PLAN SHEET "A3".
21) SAWCUT 2" DEEP CONTROL JOINTS WHERE SHOWN. FILL GROOVE WITH URETHANE CAULKING EVEN WITH CONCRETE FINISH.

PHASE 3



Gothic Arch Vanicor
Model:
CT22x58DGFW
LAYOUT
0 4'

GREENHOUSE #2 PLAN

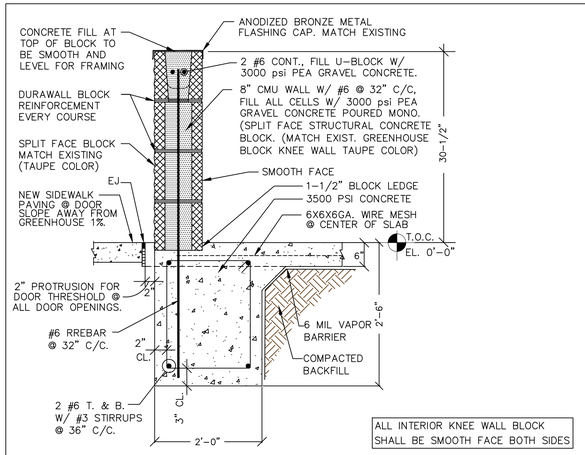
GENERAL NOTES
NO: REVISIONS: DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

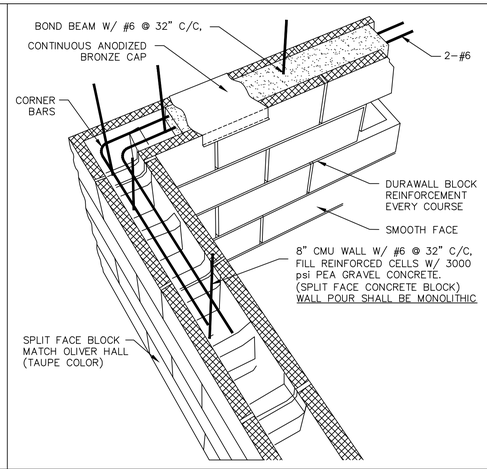
UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

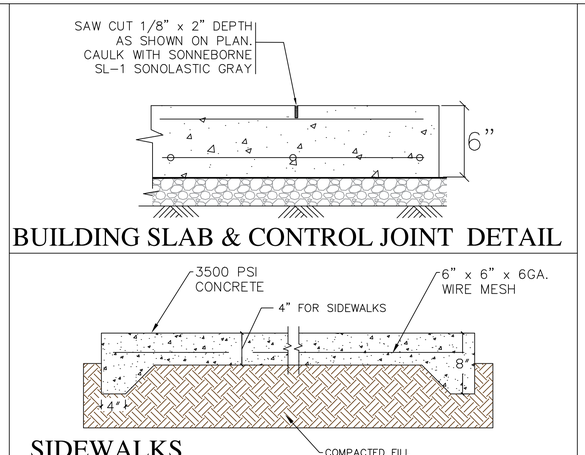
PROJECT NO:
DATE: AUGUST 2023
SCALE: 1" = 1' - 0"
SHEET: A4



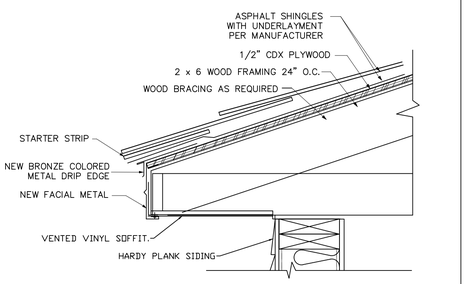
1 GREENHOUSE FOUNDATION DETAIL NO SCALE



2 BLOCK BOND BEAM DETAIL NO SCALE

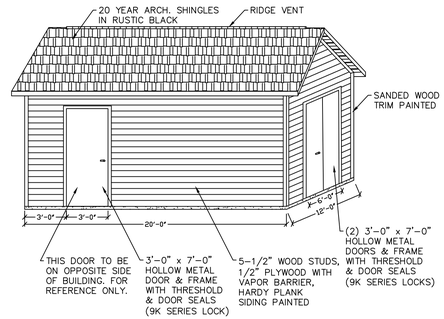


3 ABOVE GRADE CONCRETE DETAIL NO SCALE



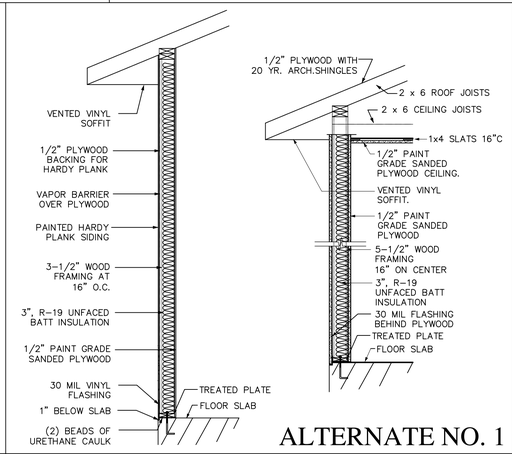
ALTERNATE NO. 1

4 ROOF DETAIL NO SCALE



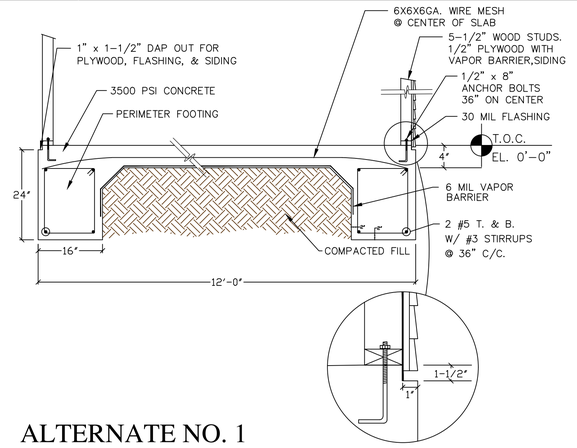
ALTERNATE NO. 1

5 STORAGE SHED DETAIL NO SCALE



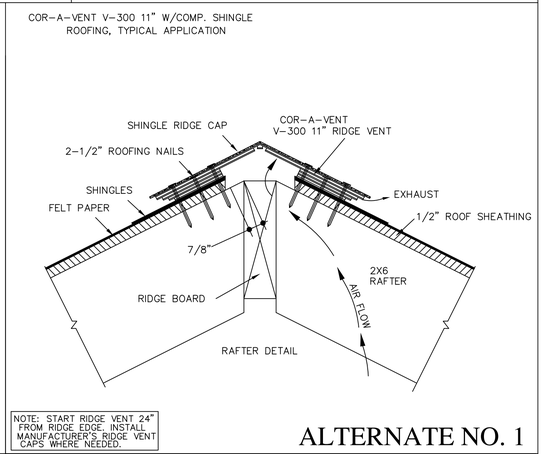
ALTERNATE NO. 1

6 STORAGE SHED WALL DETAIL NO SCALE



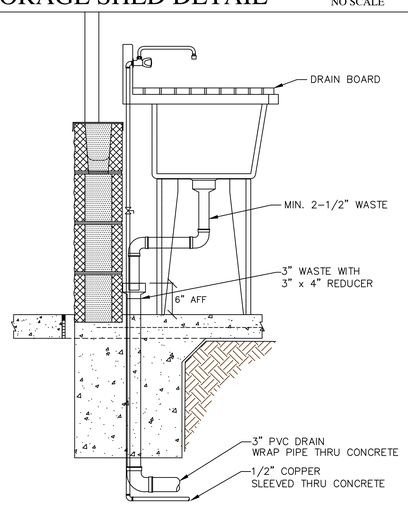
ALTERNATE NO. 1

7 STORAGE SHED CONCRETE DETAIL NO SCALE

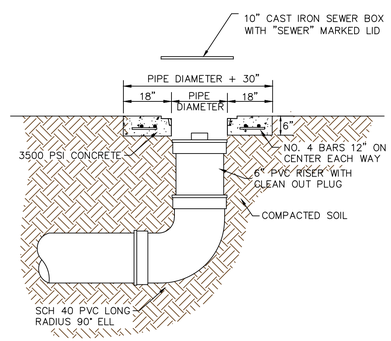


ALTERNATE NO. 1

8 RIDGE VENT DETAIL NO SCALE

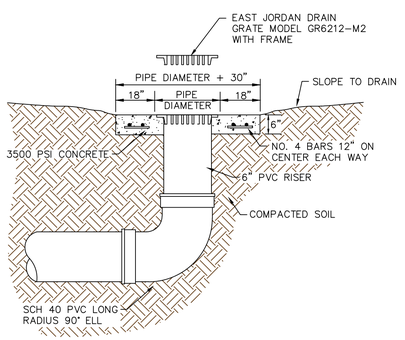


9 SINK PIPING DETAIL NO SCALE



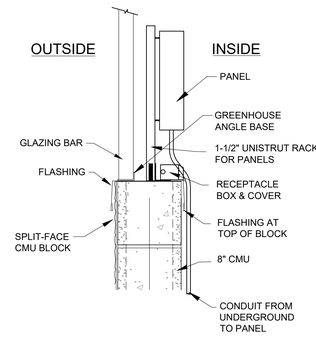
YARD DRAIN PIPING CLEAN OUT

10 CLEAN OUT DETAIL NO SCALE



YARD DRAIN AND GREENHOUSE DRAIN

11 YARD DRAIN DETAIL NO SCALE



SILL SECTION

12 YARD DRAIN DETAIL NO SCALE

DETAIL PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

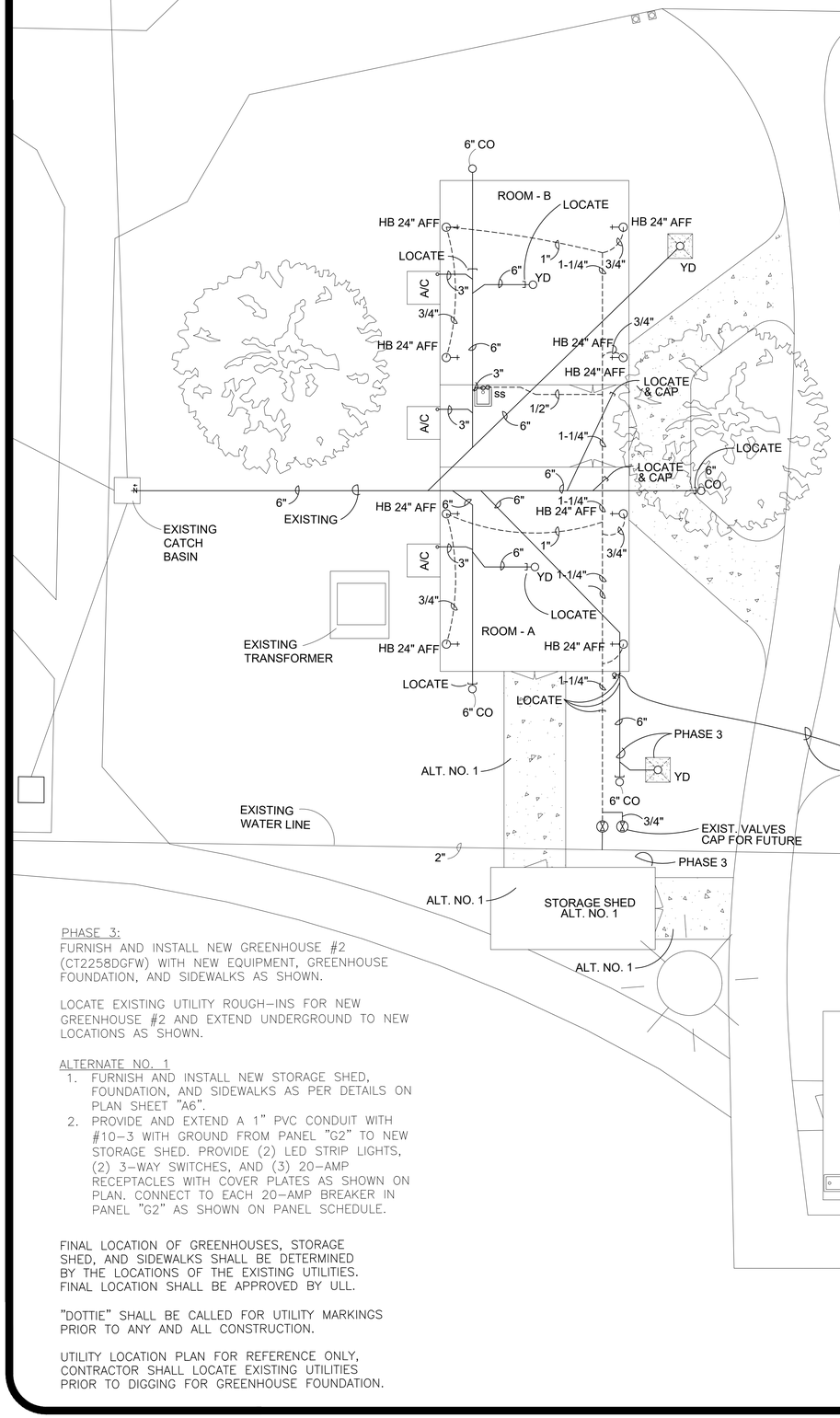
UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

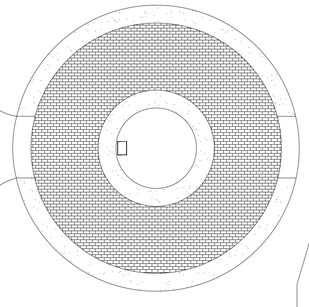
REGISTRATION STAMP

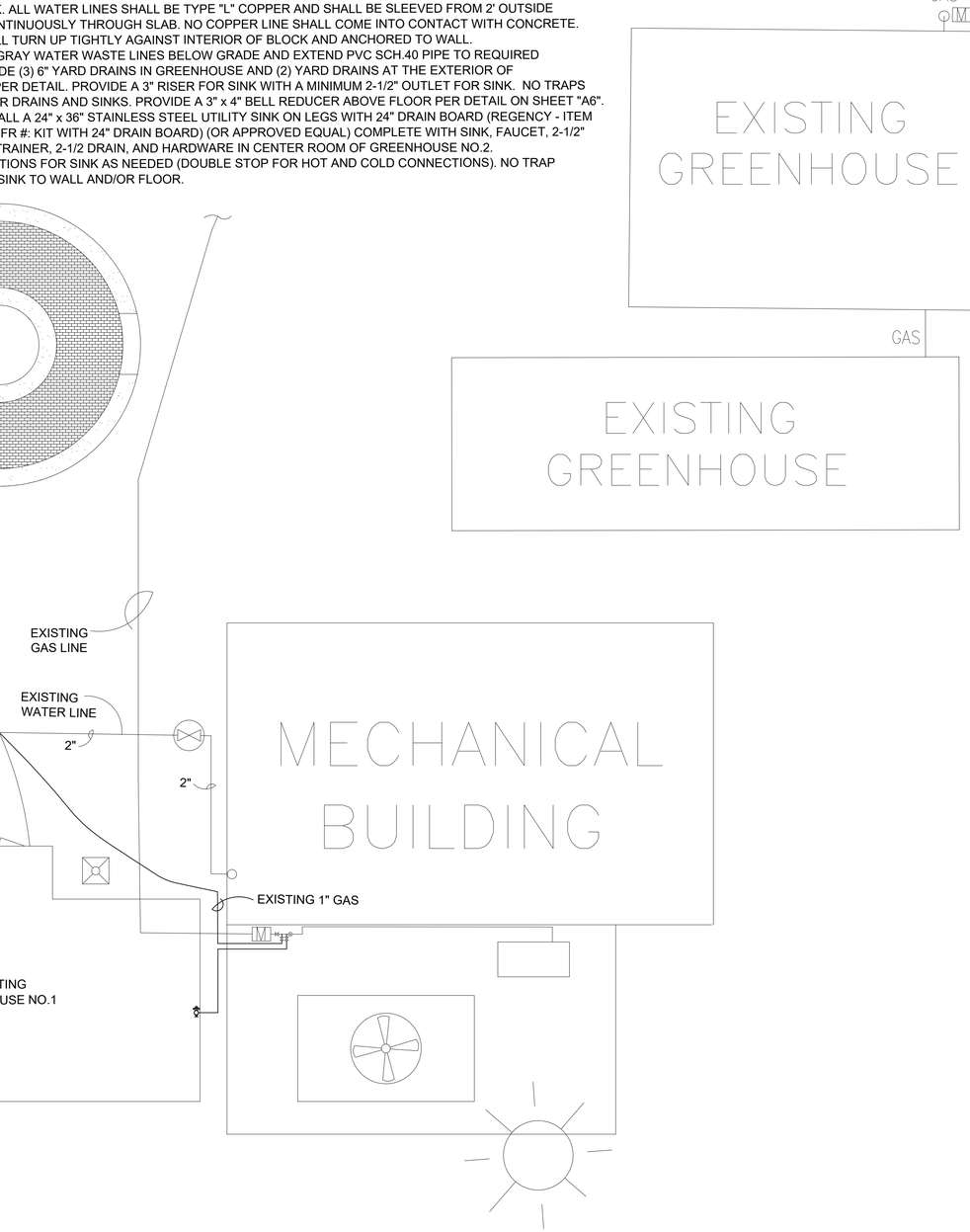
PROJECT NO:	SHEET:
DATE: AUGUST 2023	A5
SCALE: 1" = 1' - 0"	

NOTES:

1. PROVIDE ALL MATERIALS AND LABOR FOR A COMPLETE GAS, WATER, AND DRAINAGE SYSTEM FOR GREENHOUSE NO.2 AS SHOWN. LOCATE ALL EXISTING UTILITY ROUGH-INS UNDERGROUND AND EXTEND TO REQUIRED LOCATIONS.
2. LOCATE EXISTING PLASTIC GAS LINE UNDERGROUND, EXTEND TO REQUIRED LOCATION, TURN UP WITH STEEL RISER, INSTALL A NEW SHUT OFF VALVE ABOVE GRADE, ENTER GREENHOUSE THROUGH PVC SLEEVE IN BLOCK, TURN UP TO ABOVE WALL HEIGHT AND EXTEND TO EACH TO NEW HEATER. CONNECT EACH HEATER WITH VALVE AND DRIP LEG AT HEATER. ALL UNDERGROUND GAS PIPING SHALL BE PE POLYETHYLENE GAS LINE WITH STEEL RISERS.
3. LOCATE EXISTING WATER LINE BELOW GRADE AND EXTEND NEW 1-1/4" COPPER WATER LINE TO GREENHOUSE NO.2 AS SHOWN. PROVIDE A SHUT-OFF VALVE AND BOX AT GREENHOUSE. PROVIDE A 3/4" HOSE BIB WITH VACUUM BREAKER 24" AFF AT EACH LOCATION SHOWN. PROVIDE A 1/2" WATER LINE TO SERVICE SINK WITH SHUT OFF STOP VALVE UNDER SINK. ALL WATER LINES SHALL BE TYPE "L" COPPER AND SHALL BE SLEEVED FROM 2' OUTSIDE BUILDING SLAB CONTINUOUSLY THROUGH SLAB. NO COPPER LINE SHALL COME INTO CONTACT WITH CONCRETE. WATER LINES SHALL TURN UP TIGHTLY AGAINST INTERIOR OF BLOCK AND ANCHORED TO WALL.
4. LOCATE EXISTING GRAY WATER WASTE LINES BELOW GRADE AND EXTEND PVC SCH.40 PIPE TO REQUIRED LOCATIONS. PROVIDE (3) 6" YARD DRAINS IN GREENHOUSE AND (2) YARD DRAINS AT THE EXTERIOR OF GREENHOUSE AS PER DETAIL. PROVIDE A 3" RISER FOR SINK WITH A MINIMUM 2-1/2" OUTLET FOR SINK. NO TRAPS NEEDED FOR FLOOR DRAINS AND SINKS. PROVIDE A 3" x 4" BELL REDUCER ABOVE FLOOR PER DETAIL ON SHEET "A6".
5. FURNISH AND INSTALL A 24" x 36" STAINLESS STEEL UTILITY SINK ON LEGS WITH 24" DRAIN BOARD (REGENCY - ITEM #: 600S13624BKT MFR #: KIT WITH 24" DRAIN BOARD) (OR APPROVED EQUAL) COMPLETE WITH SINK, FAUCET, 2-1/2" OUTLET BASKET STRAINER, 2-1/2 DRAIN, AND HARDWARE IN CENTER ROOM OF GREENHOUSE NO.2.
6. MAKE ALL CONNECTIONS FOR SINK AS NEEDED (DOUBLE STOP FOR HOT AND COLD CONNECTIONS). NO TRAP NEEDED. ANCHOR SINK TO WALL AND/OR FLOOR.







PHASE 3:
FURNISH AND INSTALL NEW GREENHOUSE #2 (CT2258DGFW) WITH NEW EQUIPMENT, GREENHOUSE FOUNDATION, AND SIDEWALKS AS SHOWN.

LOCATE EXISTING UTILITY ROUGH-INS FOR NEW GREENHOUSE #2 AND EXTEND UNDERGROUND TO NEW LOCATIONS AS SHOWN.

ALTERNATE NO. 1

1. FURNISH AND INSTALL NEW STORAGE SHED, FOUNDATION, AND SIDEWALKS AS PER DETAILS ON PLAN SHEET "A6".
2. PROVIDE AND EXTEND A 1" PVC CONDUIT WITH #10-3 WITH GROUND FROM PANEL "G2" TO NEW STORAGE SHED. PROVIDE (2) LED STRIP LIGHTS, (2) 3-WAY SWITCHES, AND (3) 20-AMP RECEPTACLES WITH COVER PLATES AS SHOWN ON PLAN. CONNECT TO EACH 20-AMP BREAKER IN PANEL "G2" AS SHOWN ON PANEL SCHEDULE.

FINAL LOCATION OF GREENHOUSES, STORAGE SHED, AND SIDEWALKS SHALL BE DETERMINED BY THE LOCATIONS OF THE EXISTING UTILITIES. FINAL LOCATION SHALL BE APPROVED BY ULL.

"DOTTIE" SHALL BE CALLED FOR UTILITY MARKINGS PRIOR TO ANY AND ALL CONSTRUCTION.

UTILITY LOCATION PLAN FOR REFERENCE ONLY, CONTRACTOR SHALL LOCATE EXISTING UTILITIES PRIOR TO DIGGING FOR GREENHOUSE FOUNDATION.

0' 4' 8'

MECHANICAL SITE PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

Billeaud Hall

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

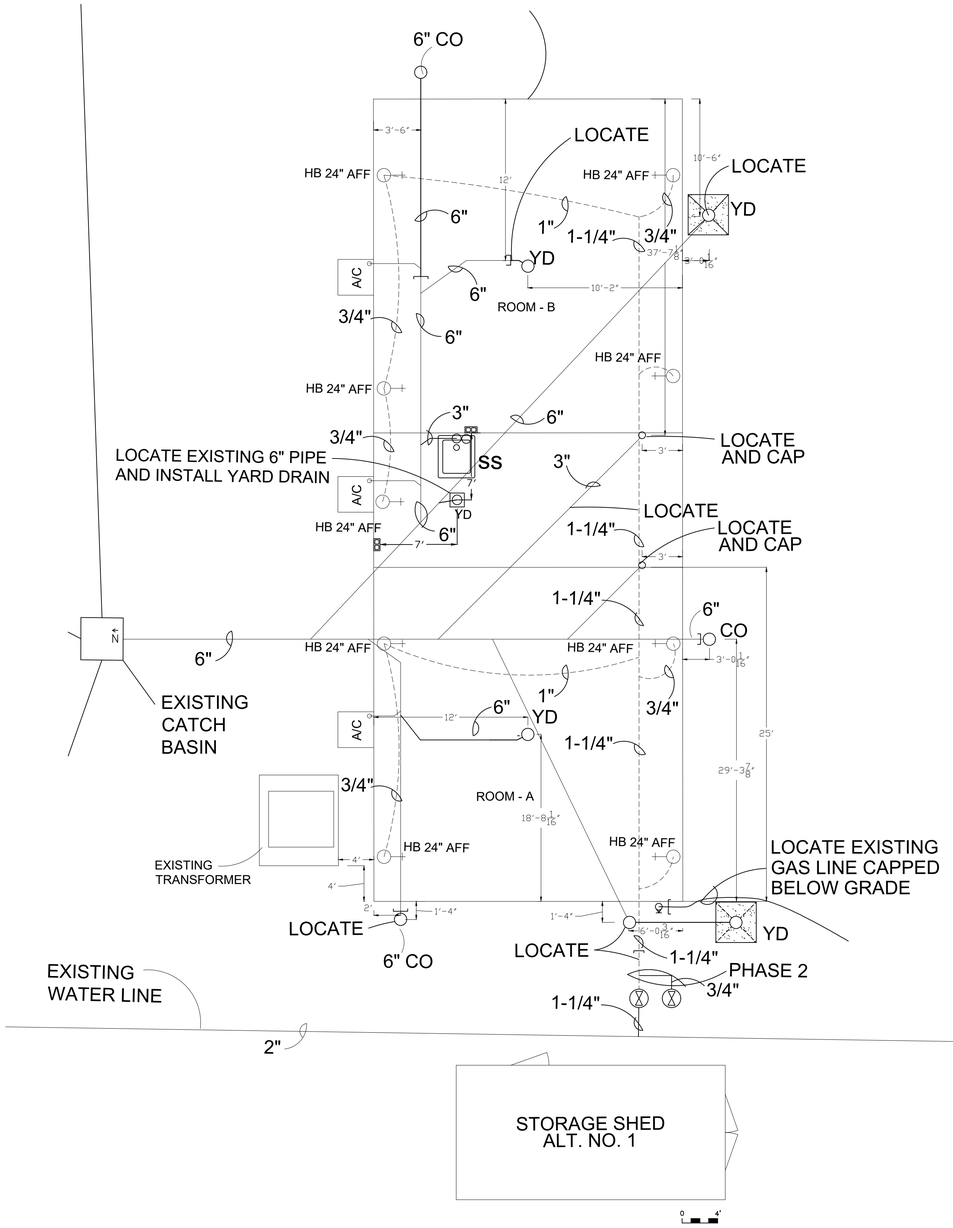
UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

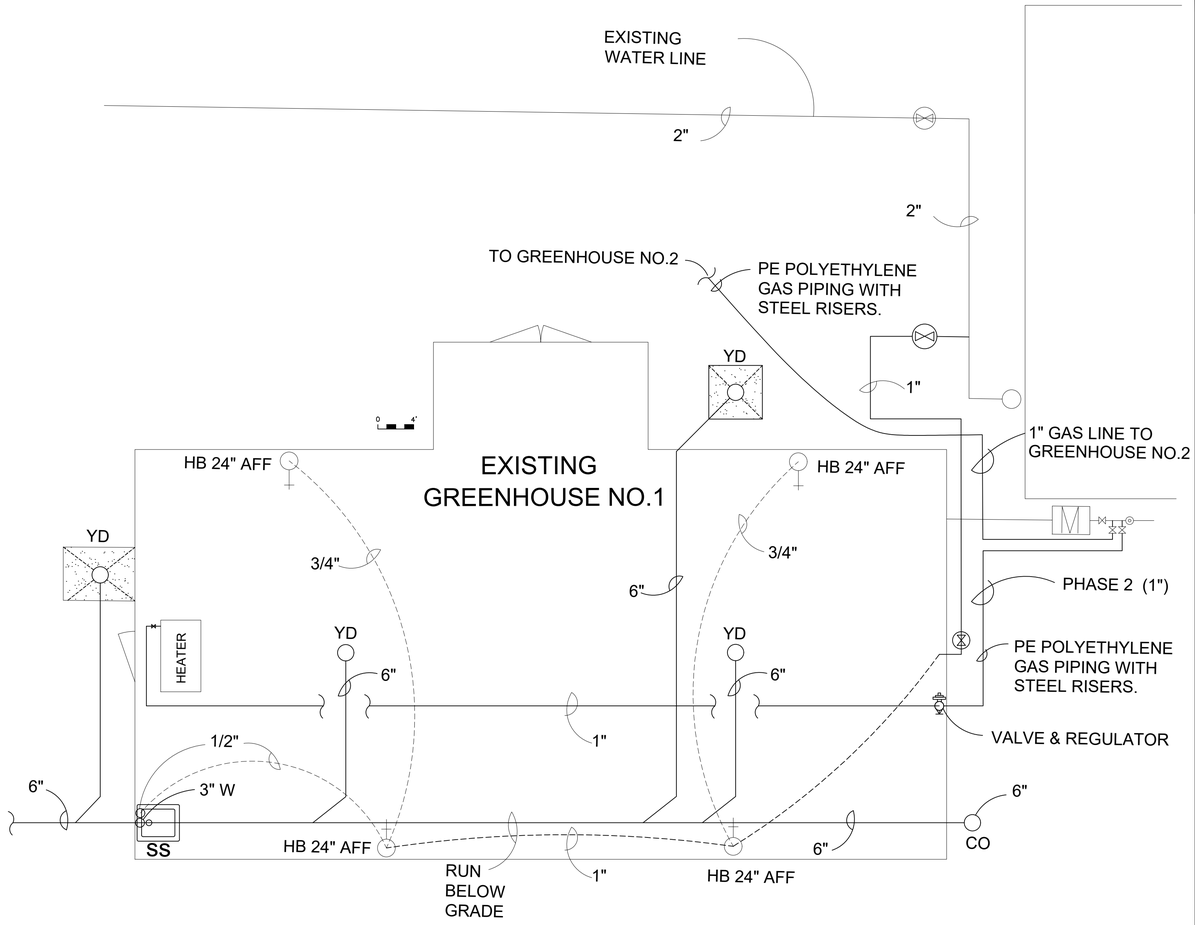
REGISTRATION STAMP

PROJECT NO:	SHEET:
DATE: AUGUST 2023	P1
SCALE: 1" = 1' - 0"	

GREENHOUSE NO. 2



ALL WATERLINES SHALL BE IN A CONTINUOUS PVC JACKET/SLEEVE FROM 2' OUTSIDE OF SLAB THROUGHOUT BUILDING FOUNDATION, UP AND THROUGH BLOCK WALLS. JACKET/SLEEVE SHALL BE VISIBLE AT ALL TIMES. ALL JACKET/SLEEVE JOINTS SHALL BE OVERLAPPED INSIDE OF EACH OTHER AND THOROUGHLY TAPED WITH PVC TAPED.



THIS SECTION FOR REFERENCE ONLY

NOTES:

1. PROVIDE ALL MATERIALS AND LABOR FOR A COMPLETE GAS, WATER, AND DRAINAGE SYSTEM FOR GREENHOUSE NO.2 AS SHOWN. LOCATE ALL EXISTING UTILITY ROUGH-INS UNDERGROUND AND EXTEND TO REQUIRED LOCATIONS.
2. LOCATE EXISTING PLASTIC GAS LINE UNDERGROUND, EXTEND TO ABOVE GRADE WITH STEEL RISER NEXT TO GREENHOUSE WALL AT LOCATION SHOWN, INSTALL A NEW SHUT OFF VALVE ABOVE GRADE AND PLUG VALVE.
3. LOCATE EXISTING WATER LINE BELOW GRADE AND EXTEND NEW 1-1/4" COPPER WATER LINE TO GREENHOUSE NO.2 AS SHOWN. PROVIDE A SHUT-OFF VALVE AND BOX AT GREENHOUSE. PROVIDE A 3/4" HOSE BIB WITH VACUUM BREAKER 24" AFF AT EACH LOCATION SHOWN. PROVIDE A 1/2" WATER LINE TO SERVICE SINK WITH SHUT OFF STOP VALVES UNDER SINK.
4. LOCATE EXISTING GRAY WATER WASTE LINES BELOW GRADE AND EXTEND PVC SCH.40 PIPE TO REQUIRED LOCATIONS. PROVIDE (3) 6" YARD DRAINS IN GREENHOUSE NO.2 AND (2) YARD DRAINS AT THE EXTERIOR OF GREENHOUSE AS PER DETAIL. PROVIDE A 3" DRAIN LINE THROUGH SLAB FOR SINK DRAIN WITH A MINIMUM 2-1/2" OUTLET FOR SINK. NO TRAPS NEEDED FOR FLOOR DRAINS AND SINKS. PROVIDE A 3" x 4" BELL REDUCER ABOVE FLOOR PER DETAIL ON PLAN SHEET "A6".
5. FURNISH AND INSTALL A 24" x 36" STAINLESS STEEL UTILITY SINK ON LEGS WITH 24" DRAIN BOARD (REGENCY - ITEM #: 600S13624BKT MFR #: KIT WITH 24" DRAIN BOARD)(OR APPROVED EQUAL) COMPLETE WITH SINK, FAUCET, 2-1/2" OUTLET BASKET STRAINER, 2-1/2 DRAIN, AND HARDWARE IN CENTER ROOM OF GREENHOUSE NO.2. MAKE ALL CONNECTIONS FOR SINK AS NEEDED (DOUBLE STOP FOR HOT AND COLD CONNECTIONS). NO TRAP NEEDED. ANCHOR SINK TO WALL OR FLOOR. SINK DRAIN SHALL BE INDIRECT TO DRAIN PIPE IN FLOOR. PROVIDE A 3" x 4" BELL REDUCER ABOVE FLOOR AS PER DETAIL ON PLAN SHEET "A6".
6. FURNISH AND INSTALL A 3" DRAIN LINE CONNECTED TO EXISTING 6" DRAIN PIPE FOR EACH A/C UNIT AT CONDENSER PAD. EXTEND EACH 3" LINE UP THROUGH A/C PAD 1" ABOVE CONCRETE. COORDINATE WITH GENERAL CONTRACTOR AND HVAC CONTRACTOR FOR THE INSTALLATION AND LOCATION OF THE DRAINS.

MECHANICAL PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

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UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

REGISTRATION STAMP

PROJECT NO:	SHEET:
DATE: AUGUST 2023	P2
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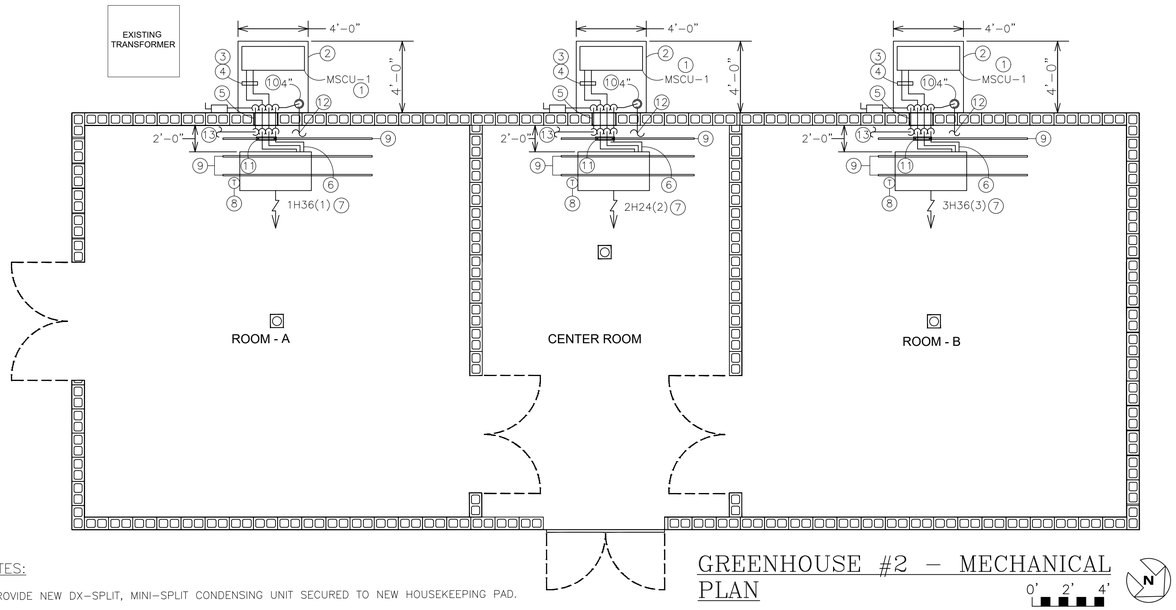


GREENHOUSE #2 – MECHANICAL PLAN

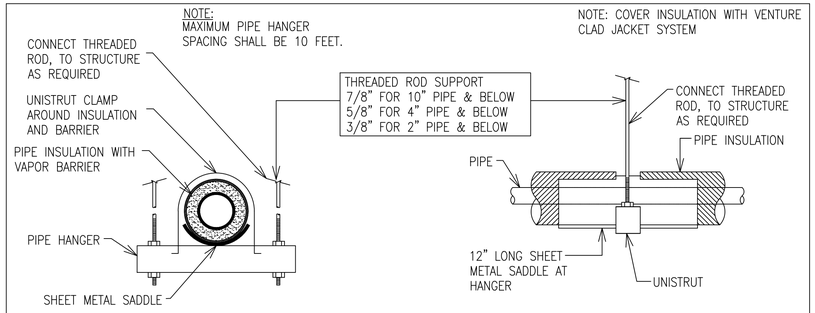
0' 2' 4'

KEYNOTES:

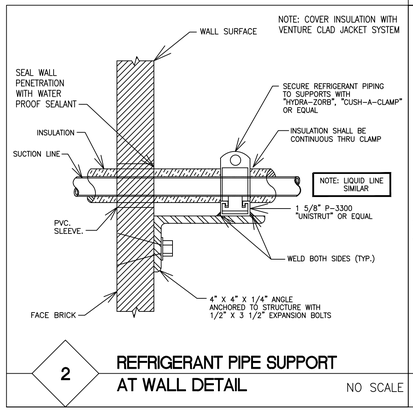
1. – PROVIDE NEW DX–SPLIT, MINI–SPLIT CONDENSING UNIT SECURED TO NEW HOUSEKEEPING PAD.
2. – PROVIDE 4" CONCRETE HOUSE KEEPING PAD FOR NEW MINI–SPLIT CONDENSING UNIT. PAD SHALL BE CONSTRUCTED OF 3000 PSI CONCRETE WITH WIRE MESH. TOP OF PAD SHALL BE LEVEL WITH BUILDING FLOOR ELEVATION.
3. – PROVIDE AND INSTALL NEW COPPER REFRIGERANT PIPING AS PER MANUFACTURER'S RECOMMENDATIONS FOR CAPACITY AND DISTANCE. INSULATE ALL REFRIGERANT PIPING WITH 1/2" ARMAFLEX INSULATION AND WRAP WITH "VENTURECLAD" COVERING FROM CONDENSING UNIT TO INDOOR UNIT.
4. – PROVIDE AND INSTALL GALVANIZED UNISTRUT SUPPORT SECURED TO HOUSEKEEPING PAD. PROVIDE SHEET METAL SADDLE BETWEEN INSULATION AND UNISTRUT. SECURE NEW REFRIGERANT PIPING WITH GALVANIZED UNISTRUT CLAMP INSTALLED OVER INSULATION AND SADDLE. NO EXPOSED COPPER PIPING. TYPICAL ALL MINI–SPLIT UNITS.
5. – PENETRATE EXTERIOR WITH REFRIGERANT PIPING CONDENSATE DRAIN PIPING, AND ELECTRICAL CONDUIT. MECHANICAL CONTRACTOR SHALL PROVIDE PVC SLEEVE. CAULK SEAL PENETRATIONS. COORDINATE WITH GENERAL CONTRACTOR FOR HOLE LOCATIONS.
6. – PROVIDE SCHEDULE 40 PVC CONDENSATE DRAIN LINE FROM INDOOR UNIT, ROUTE TO EXTERIOR WALL. OFFSET AS REQUIRED. DROP AND PENETRATE EXTERIOR WALL SAME ELEVATION AS REFRIGERANT PIPING. INSULATE ALL EXPOSED DRAIN PIPING WITH 1/2" ARMAFLEX AND WRAP WITH "VENTURECLAD".
7. – PROVIDE AND INSTALL NEW HORIZONTAL MINI–SPLIT INDOOR UNIT AS SCHEDULED.
8. – MOUNT THERMOSTAT ON UNIT.
9. – PROVIDE GALVANIZED UNISTRUT SECURED TO MINIMUM THREE (3) ROOF PANEL SUPPORTS. ALIGN UNISTRUT TO MATCH NEW HORIZONTAL, VRF, SUPPORT POINTS. PROVIDE 3/8" THREAD ROD FROM UPPER SUPPORT SYSTEM. REFER TO MANUFACTURER'S MOUNTING REQUIREMENTS. MOUNT BOTTOM OF UNIT AT 8'–0" ABOVE FINISHED FLOOR.
10. – REFER TO PLUMBING PLAN.
11. – SUPPORT NEW REFRIGERANT LINES, AND CONDENSATE DRAIN PIPING FROM STRUCTURE ABOVE WITH UNISTRUT AND THREADED ROD. PROVIDE SHEET METAL SADDLE AND UNISTRUT CLAMP AROUND INSULATION AND "VENTURECLAD". SEE DETAIL 1 THIS SHEET.
12. – REFER TO PLUMBING PLANS FOR CONNECTION TO EXISTING UNDERGROUND DRAINAGE.

KEYNOTES (CONTINUED):

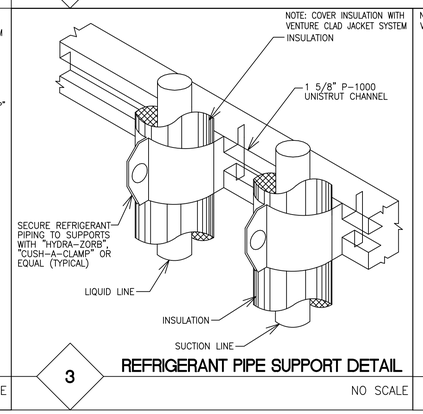
13. – INDOOR UNIT IS POWERED BY OUTDOOR UNIT. COORDINATE WITH ELECTRICAL CONTRACTOR FOR CONNECTION OF OUTDOOR UNIT WITH INDOOR SUSPENDED HORIZONTAL VRF UNIT.



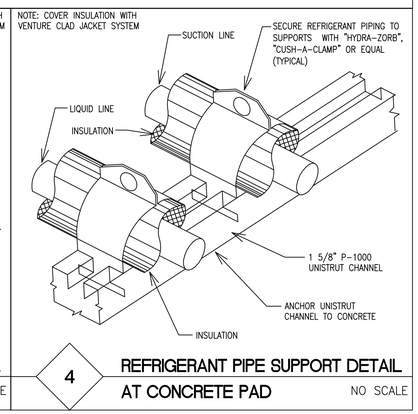
1 INSULATED PIPE HANGER DETAIL (REFRIGERANT AND CONDENSATE) — NO SCALE



2 REFRIGERANT PIPE SUPPORT AT WALL DETAIL — NO SCALE



3 REFRIGERANT PIPE SUPPORT DETAIL — NO SCALE



4 REFRIGERANT PIPE SUPPORT DETAIL AT CONCRETE PAD — NO SCALE

INDOOR UNIT NO. KEY

___ ___ ___(___)

- OUTDOOR UNIT No. (e.g.: MSCU–1, CONDENSING UNIT No. 1) (e.g.: MSCU–2, CONDENSING UNIT No. 2)
- INDOOR UNIT COOLING CAPACITY
  06 = 6,000 BTU/H
  08 = 8,000 BTU/H
  12 = 12,000 BTU/H
  18 = 18,000 BTU/H
  24 = 24,000 BTU/H
  30 = 30,000 BTU/H
  36 = 36,000 BTU/H
- INDOOR UNIT TYPE
  C = CEILING RECESSED CASSETTE UNIT
  H = HORIZONTAL SUSPENDED UNIT
  W = WALL MOUNTED UNIT
  F = FLOOR MOUNTED UNIT
- INDOOR UNIT SEQUENCE No. (1,2,3,...,etc.)

VARIABLE REFRIGERANT FLOW (VRF) – HEAT PUMP – INDOOR UNIT SCHEDULE

UNIT NO.	OUTDOOR UNIT NO.	SERVICE	BC CONTROLLER CONNECTION	FAN CFM		COOLING			HEATING		ELECTRICAL SERVICE	MCA	SOUND LEVEL dB(A)		UNIT CONTROL TSTAT OR INTERNAL SENSOR	COMMENTS	NOTES
				HIGH	LOW	MIN. BTU/H OUTPUT	EAT (°F) DB	EAT (°F) WB	MIN. BTU/H OUTPUT	INDOOR TEMP.			HIGH	LOW			
1H36(1)	MSCU–1	ROOM A SECTION	NA	990	775	36,000	80	67	40,000	70° D.B.	POWERED BY OUTDOOR		43	37	MOUNTED ON UNIT	MITSUBISHI PCA–A36KA7 (SUSPEND HORIZ. MOUNTED UNIT)	1–3
2H24(2)	MSCU–2	CENTER SECTION	NA	990	775	24,000	80	67	28,000	70° D.B.	POWERED BY OUTDOOR		43	37	MOUNTED ON UNIT	MITSUBISHI PCA–A24KA7 (SUSPEND HORIZ. MOUNTED UNIT)	1–3
3H36(3)	MSCU–3	ROOM B SECTION	NA	990	775	36,000	80	67	40,000	70° D.B.	POWERED BY OUTDOOR		43	37	MOUNTED ON UNIT	MITSUBISHI PCA–A36KA7 (SUSPEND HORIZ. MOUNTED UNIT)	1–3

NOTES:
1. ALL UNITS SHALL BE COMPLETE WITH STOP VALVE WITH SERVICE PORT ON LIQUID, GAS AND RECOVERY LINES. VALVES SHALL BE LOCATED SUCH THAT UNIT CAN BE REMOVED AND REPLACED WITHOUT SHUTTING DOWN THE ENTIRE SYSTEM.
2. UNIT CONTROL: PROVIDE HARD WIRED WALL MOUNTED THERMOSTAT. UNIT SHALL BE PROVIDED WITH LONG LIFE FILTER IN UNIT. PROVIDE ONE (1) SPARE SET OF FILTERS WITH EACH INDOOR UNIT.
3. CONTRACTOR SHALL REMOVE PLASTIC CONDENSATE HOSE CLAMP (AT UNIT CONNECTION) ON EACH INDOOR UNIT. FURNISH AND INSTALL A STAINLESS STELL HOSE CLAMP ON THE CONDENSATE DRAIN HOSE (AT THE UNIT CONNECTION) ON EACH INDOOR UNIT. THE STAINLESS STEEL HOSE CLAMP SHALL BE APPROPRIATELY SIZED TO CREATE A WATER TIGHT SEAL.

VARIABLE REFRIGERANT FLOW (VRF) – HEAT PUMP – OUTDOOR UNIT SCHEDULE

M–NET ADDRESS	UNIT NO.	INDOOR UNIT NO.	SERVICE	COOLING		HEATING				ELECTRICAL SERVICE	REFRIG.	MIN. EER	SOUND LEVEL dB(A)	MCA (AMPS)	FUSE SIZE (AMPS)	MOCP (AMPS)	COMMENTS	NOTES
				MIN. BTUH OUTPUT	AMBIENT TEMP	MIN. BTUH OUTPUT	INDOOR TEMP	OUTDOOR D.B.°F	OUTDOOR W.B.°F									
NA	MSCU–1	1H36(1)	ROOM A SECTION	36,000	95°F	40,000	70°F	47°F	43°F	208–1–60	R410–A	19.5	53/52	25.0	30.0	–	MITSUBISHI PUZ–A36NKA7 (HEAT PUMP)	1–10
NA	MSCU–2	2H24(2)	CENTER SECTION	24,000	95°F	28,000	70°F	47°F	43°F	208–1–60	R410–A	21.0	47/48	19.0	30.0	–	MITSUBISHI PUZ–A24NKA7 (HEAT PUMP)	1–10
NA	MSCU–3	3H36(3)	ROOM B SECTION	36,000	95°F	40,000	70°F	47°F	43°F	208–1–60	R410–A	19.5	53/52	25.0	30.0	–	MITSUBISHI PUZ–A36NKA7 (HEAT PUMP)	1–10

NOTES:
1. MAXIMUM DISTANCE BETWEEN COMBINED UNITS ON ONE REFRIGERANT SYSTEM – 32 FEET.
2. INSULATE SUCTION, LIQUID AND RECOVERY REFRIGERANT LINES.
3. ALL UNITS SHALL BE COMPLETE WITH STOP VALVE WITH SERVICE PORT ON LIQUID, GAS, AND RECOVERY LINES. VALVES SHALL BE LOCATED SUCH THAT UNIT CAN BE REMOVED AND REPLACED WITHOUT SHUTTING DOWN THE ENTIRE SYSTEM.
4. INSTALLATION OF REFRIGERANT PIPING, CONTROL WIRING, POWER WIRING, ETC. SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
5. EACH INDIVIDUAL OUTDOOR UNIT REQUIRES A DEDICATED ELECTRICAL CIRCUIT.
6. COORDINATE ELECTRICAL REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
7. EFFICIENCY VALUES OF EER, IEER, COPO ARE BASED ON AHRI 1230 TEST METHOD OF MIXTURE OF DUCTED AND NON–DUCTED INDOOR UNITS.
8. FOR SYSTEMS OF MULTIPLE MODULES, REFRIGERANT PIPE DIMENSIONS INDICATE TOTAL SYSTEM COMBINED PIPING DOWNSTREAM OF MODULE TWINNING.

MECHANICAL SCHEDULES AND DETAILS

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

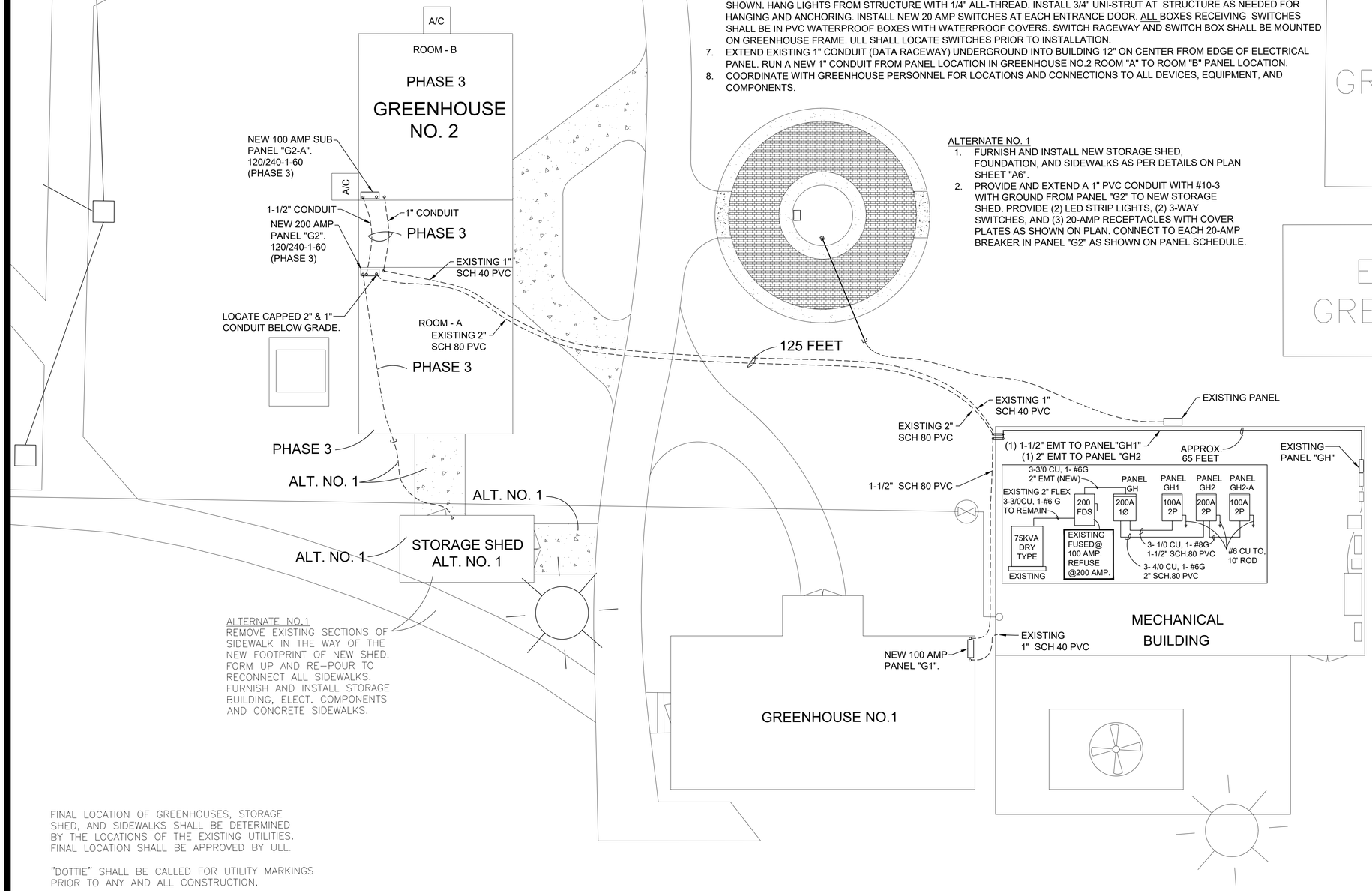
PROJECT NO:
DATE: AUGUST 2023
SCALE: 1" = 1' – 0"
SHEET: M1

NOTES:

1. PROVIDE ALL MATERIALS AND LABOR FOR A COMPLETE ELECTRICAL SYSTEM FOR GREENHOUSE NO.2.
2. LOCATE EXISTING 2" PVC CONDUIT UNDERGROUND WHERE SHOWN AND EXTEND TO PANEL "G2" LOCATION IN GREENHOUSE NO.2, ROOM "A". RUN (3) 4/0 WIRES WITH #2 AWG GROUND FROM EXISTING PANEL "GH" IN MECHANICAL BUILDING, PROVIDE 200 AMP BREAKER FOR PANEL "G2". RUN A 1-1/2" PVC CONDUIT FROM PANEL "G2" IN ROOM "A" TO PANEL "G2-A" IN ROOM "B" WHERE SHOWN. RUN (3) 1/0, (1) #8 G, IN 1-1/2" PVC CONDUIT AND CONNECT TO CORRESPONDING BREAKERS.
3. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 200 AMP, 1-PH, 24 SPACE, PANEL WITH 200 AMP MAIN BREAKER AND REQUIRED BREAKERS AS PER PANEL SCHEDULE IN GREENHOUSE NO.2, ROOM "A" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANEL SHALL BE LABELED AS "G2". CONVERT TO RIGID PIPE FROM BELOW GRADE.
3. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 100 AMP, 24 SPACE, PANEL WITH 100 AMP MAIN BREAKER AND REQUIRED CIRCUIT BREAKERS PER PANEL SCHEDULE IN GREENHOUSE NO. 2 ROOM "B" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANELS SHALL BE LABELED AS "G2-A" WITH LAMINATE PLATE.
4. FURNISH AND INSTALL ALL RACEWAYS, WIRING, AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS IN GREENHOUSE NO.2, ROOMS "A" AND "B" AND CENTER ROOM.
5. FURNISH AND INSTALL 20 AMP DUPLEX RECEPTACLES IN WATERPROOF BOX (LEVITON - IUM1V-GY WHILE IN-USE GFCI DUPLEX RECEPTACLE BOX - 120V - 5-20R DUPLEX GFCI RECEPTACLE) IN LOCATIONS SHOWN IN EACH GREENHOUSE. ALL RECEPTACLES SHALL BE ON BLOCK WALL. VERIFY WITH ULL FOR LOCATIONS PRIOR TO INSTALLATION.
6. FURNISH AND INSTALL NEW LED LIGHT FIXTURES (JOHNNY'S SELECTED SEEDS - SUNBLASTER LED STRIP LIGHT KIT-48") WHERE SHOWN. HANG LIGHTS FROM STRUCTURE WITH 1/4" ALL-THREAD. INSTALL 3/4" UNI-STRUT AT STRUCTURE AS NEEDED FOR HANGING AND ANCHORING. INSTALL NEW 20 AMP SWITCHES AT EACH ENTRANCE DOOR. ALL BOXES RECEIVING SWITCHES SHALL BE IN PVC WATERPROOF BOXES WITH WATERPROOF COVERS. SWITCH RACEWAY AND SWITCH BOX SHALL BE MOUNTED ON GREENHOUSE FRAME. ULL SHALL LOCATE SWITCHES PRIOR TO INSTALLATION.
7. EXTEND EXISTING 1" CONDUIT (DATA RACEWAY) UNDERGROUND INTO BUILDING 12" ON CENTER FROM EDGE OF ELECTRICAL PANEL. RUN A NEW 1" CONDUIT FROM PANEL LOCATION IN GREENHOUSE NO.2 ROOM "A" TO ROOM "B" PANEL LOCATION.
8. COORDINATE WITH GREENHOUSE PERSONNEL FOR LOCATIONS AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS.

ALTERNATE NO. 1

1. FURNISH AND INSTALL NEW STORAGE SHED, FOUNDATION, AND SIDEWALKS AS PER DETAILS ON PLAN SHEET "A6".
2. PROVIDE AND EXTEND A 1" PVC CONDUIT WITH #10-3 WITH GROUND FROM PANEL "G2" TO NEW STORAGE SHED. PROVIDE (2) LED STRIP LIGHTS, (2) 3-WAY SWITCHES, AND (3) 20-AMP RECEPTACLES WITH COVER PLATES AS SHOWN ON PLAN. CONNECT TO EACH 20-AMP BREAKER IN PANEL "G2" AS SHOWN ON PANEL SCHEDULE.



FINAL LOCATION OF GREENHOUSES, STORAGE SHED, AND SIDEWALKS SHALL BE DETERMINED BY THE LOCATIONS OF THE EXISTING UTILITIES. FINAL LOCATION SHALL BE APPROVED BY ULL.

"DOTTIE" SHALL BE CALLED FOR UTILITY MARKINGS PRIOR TO ANY AND ALL CONSTRUCTION.

UTILITY LOCATION PLAN FOR REFERENCE ONLY, CONTRACTOR SHALL LOCATE EXISTING UTILITIES PRIOR TO DIGGING FOR GREENHOUSE FOUNDATION.

0' 4' 8'

ELECTRICAL SITE PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

Billeaud Hall

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
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UL
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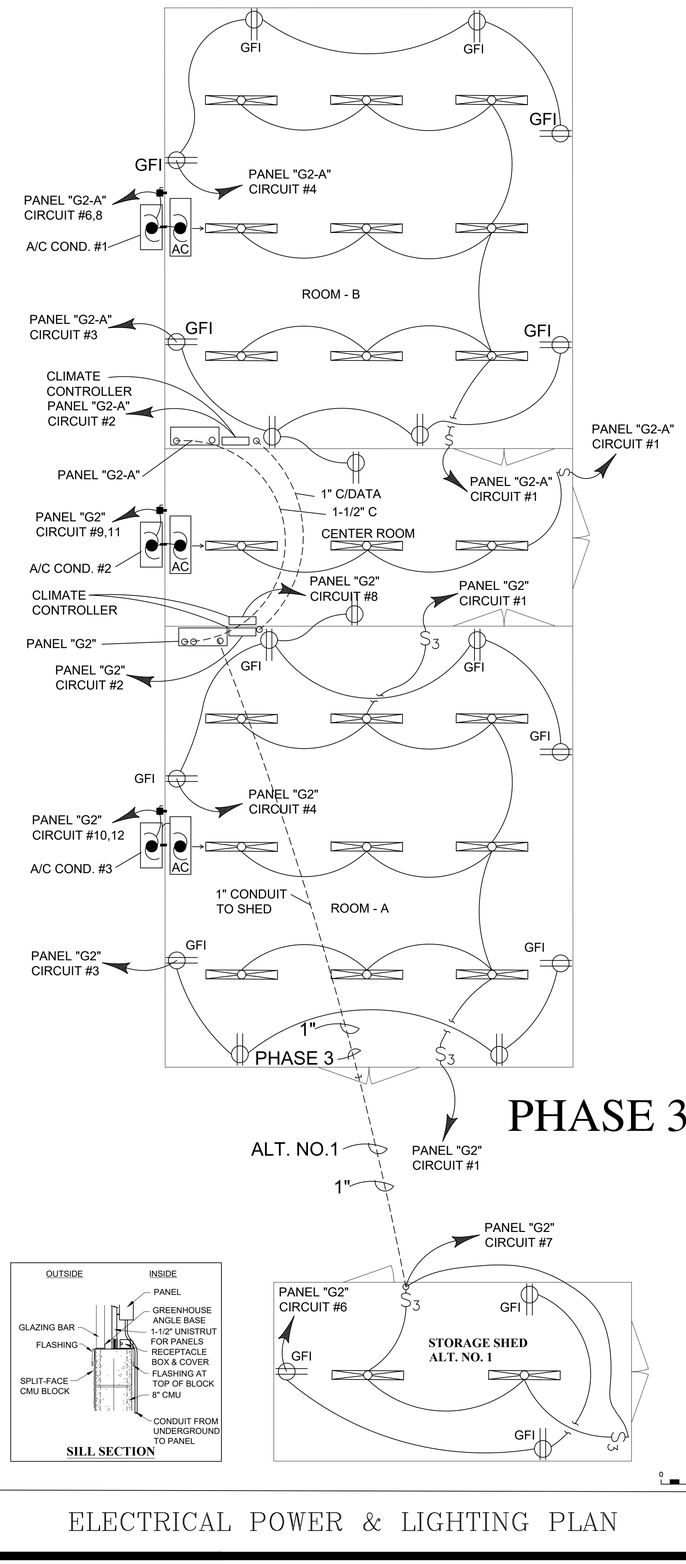
DATE: AUGUST 2023	E1
SCALE: 1" = 1' - 0"	



ELECTRICAL POWER & LIGHTING PLAN

NOTES:

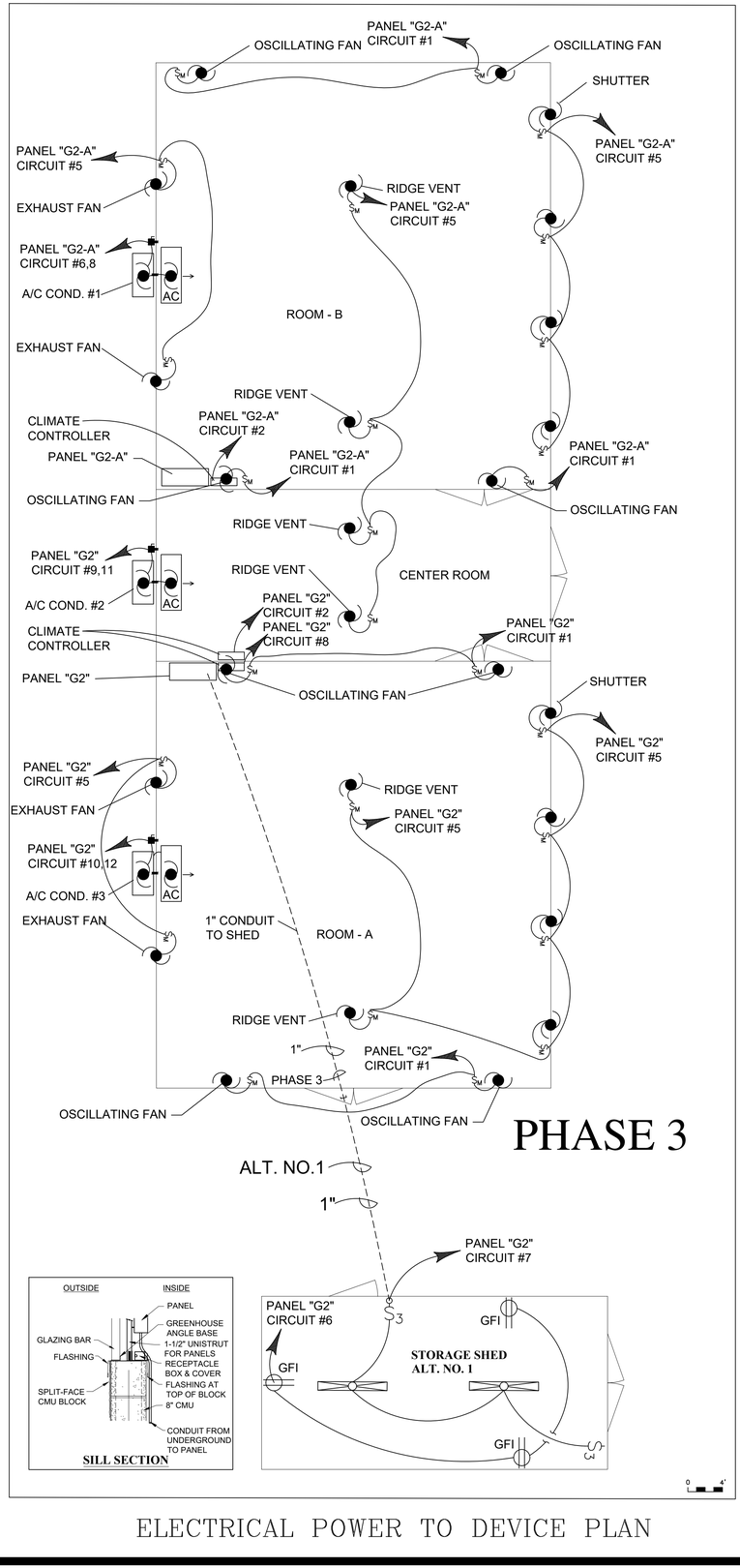
1. PROVIDE ALL MATERIALS AND LABOR FOR A COMPLETE ELECTRICAL SYSTEM FOR GREENHOUSE NO.2.
2. LOCATE EXISTING 2" PVC CONDUIT UNDERGROUND WHERE SHOWN AND EXTEND TO PANEL "G2" LOCATION IN GREENHOUSE NO.2, ROOM "A". RUN (3) 4/0 WIRES WITH #2 AWG GROUND FROM EXISTING PANEL "GH" IN MECHANICAL BUILDING, PROVIDE 200 AMP BREAKER FOR PANEL "G2". RUN A 1-1/2" PVC CONDUIT FROM PANEL "G2" IN ROOM "A" TO PANEL "G2-A" IN ROOM "B" WHERE SHOWN. RUN (3) 1/0, (1) #6 G, IN 1-1/2" PVC CONDUIT AND CONNECT TO CORRESPONDING BREAKERS.
3. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 200 AMP, 1-PH, 24 SPACE, PANEL WITH 200 AMP MAIN BREAKER AND REQUIRED BREAKERS AS PER PANEL SCHEDULE IN GREENHOUSE NO.2, ROOM "A" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANEL SHALL BE LABELED AS "G2" WITH LAMINATE PLATE.
4. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 100 AMP, 24 SPACE, PANEL WITH 100 AMP MAIN BREAKER AND REQUIRED CIRCUIT BREAKERS PER PANEL SCHEDULE IN GREENHOUSE NO. 2 ROOM "B" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANELS SHALL BE LABELED AS "G2-A" WITH LAMINATE PLATE.
5. FURNISH AND INSTALL ALL RACEWAYS, WIRING, AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS IN GREENHOUSE NO.2, ROOMS "A" AND "B" AND CENTER ROOM.
6. FURNISH AND INSTALL 20 AMP DUPLEX RECEPTACLES IN WATERPROOF BOX (LEVITON - IUM1V-GY WHILE IN-USE GFCI DUPLEX RECEPTACLE BOX - 120V - 5-20R DUPLEX GFCI RECEPTACLE) IN LOCATIONS SHOWN IN GREENHOUSE NO.2. ALL RECEPTACLES SHALL BE IN WATERPROOF BOXES ON WALL. ALL RECEPTACLE AND SWITCH LOCATIONS SHALL BE LOCATED BY ULL PRIOR TO INSTALLATION. PROVIDE WATERPROOF COVERS.
7. FURNISH AND INSTALL NEW LED LIGHT FIXTURES (JOHNNY'S SELECTED SEEDS - SUNBLASTER LED STRIP LIGHT KIT - 48") WHERE SHOWN. HANG LIGHTS FROM STRUCTURE WITH 1/4" ALL-THREAD. INSTALL 3/4" UNI-STRUT AT STRUCTURE AS NEEDED FOR HANGING AND ANCHORING. INSTALL NEW 20 AMP, SWITCHES AT EACH ENTRANCE DOOR. ALL BOXES RECEIVING SWITCHES SHALL BE IN WATERPROOF BOXES WITH WATERPROOF COVERS (LEVITON - 1432 COVER). SWITCH RACEWAY AND BOX SHALL BE MOUNTED ON GREENHOUSE FRAME. FINAL LOCATION BY ULL.
8. EXTEND EXISTING 1" CONDUIT (DATA RACEWAY) UNDERGROUND INTO BUILDING 12" ON CENTER FROM EDGE OF ELECTRICAL PANEL. RUN A NEW 1" CONDUIT FROM PANEL LOCATION IN GREENHOUSE NO.2 ROOM "A" TO ROOM "B" PANEL LOCATION.
9. COORDINATE WITH GREENHOUSE PERSONNEL FOR LOCATIONS AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS.
10. DEVICES FED FROM NEW PANEL "G2" AND "G2-A" ARE AS FOLLOWS:
    1) (3) BARTLETT CLIMATE BOSS AND CONTROL WITH WEATHER STATION (ONE IN ROOM "A", ONE IN ROOM "B", ONE IN CENTER ROOM) 115 VOLT, 1-PH, 15 AMPS EA.
    2) (4) EXHAUST FANS (TWO IN ROOM "A" & TWO IN ROOM "B") - 1/3 HP, 115V/240V, 1-PH, 5.7 AMPS EA., 11.4 TOTAL AMPS EACH ROOM
    3) (8) INTAKE SHUTTERS (FOUR IN ROOM "A" & FOUR IN ROOM "B") - MOTORIZED - 115V, 1-PH, 0.5 AMPS EA., 2 TOTAL AMPS EACH ROOM
    4) (6) RIDGE VENTS (TWO IN ROOM "A", TWO IN ROOM "B", TWO IN CENTER ROOM) - MOTORIZED - 1/20 HP, 115 VOLTS, 60-HTZ, 0.68 AMPS EA., 1.36 TOTAL AMPS EACH ROOM
    5) (8) HAF OSCILLATING FANS (FOUR IN ROOM "A" & FOUR IN ROOM "B") - 1/10 HP, 115V, 1-PH, 1.3 AMPS EA., 5.2 TOTAL AMPS EACH ROOM

    THE DEVICES ABOVE ARE FURNISHED BY GOTHIC GREENHOUSES, INC. THESE DEVICES WILL BE INSTALLED BY THE CONTRACTOR WITH GREENHOUSE SUPERVISOR DIRECTION AND ASSISTANCE.
    6) (2) 3-TON A/C MINI-SPLIT HEAT PUMPS (ONE IN ROOM "A", & ONE IN ROOM "B") - 230V/208V, 1-PH, 25 AMPS, (1) 2-TON A/C MINI-SPLIT HEAT PUMP IN CENTER ROOM - 230V208V, 1-PHASE, 23 AMPS. BY THE MECHANICAL CONTRACTOR.
    7) FURNISH AND INSTALL (3) NEMA-3R, 30-AMP FUSIBLE DISCONNECTS ON BLOCK WALL AT EACH A/C CONDENSER UNIT. PROVIDE PVC SLEEVES IN BLOCK WALL FOR RACEWAYS FOR ELECTRICAL FEED FROM PANEL TO UNITS. BY THIS CONTRACTOR.

    ALL A/C UNITS AND COMPONENTS FURNISHED AND INSTALLED BY THE CONTRACTOR.
11. ALL RACEWAYS, WIRING, AND MOUNTING OF CLIMATE CONTROLLER AND ALL ELECTRICAL DEVICES SHALL BE BY THIS ELECTRICAL CONTRACTOR.
12. ALL CONTROL WIRING AND RACEWAYS TO DEVICES BY THIS CONTRACTOR.
13. PROVIDE PVC SLEEVES IN BLOCK WALLS FOR ALL PIPE PENETRATIONS. CAULK SEAL ALL PENETRATIONS.

ALTERNATE NO. 1

1. PROVIDE A 1" PVC CONDUIT WITH #10-3 WITH GROUND FROM PANEL "G2" TO NEW STORAGE SHED. PROVIDE (2) LED STRIP LIGHTS, (2) 3-WAY SWITCHES, AND (3) 20-AMP RECEPTACLES WITH COVER PLATES AS SHOWN ON PLAN. CONNECT TO 20-AMP BREAKERS AS SHOWN ON PANEL SCHEDULE.



ELECTRICAL POWER TO DEVICE PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

REGISTRATION STAMP

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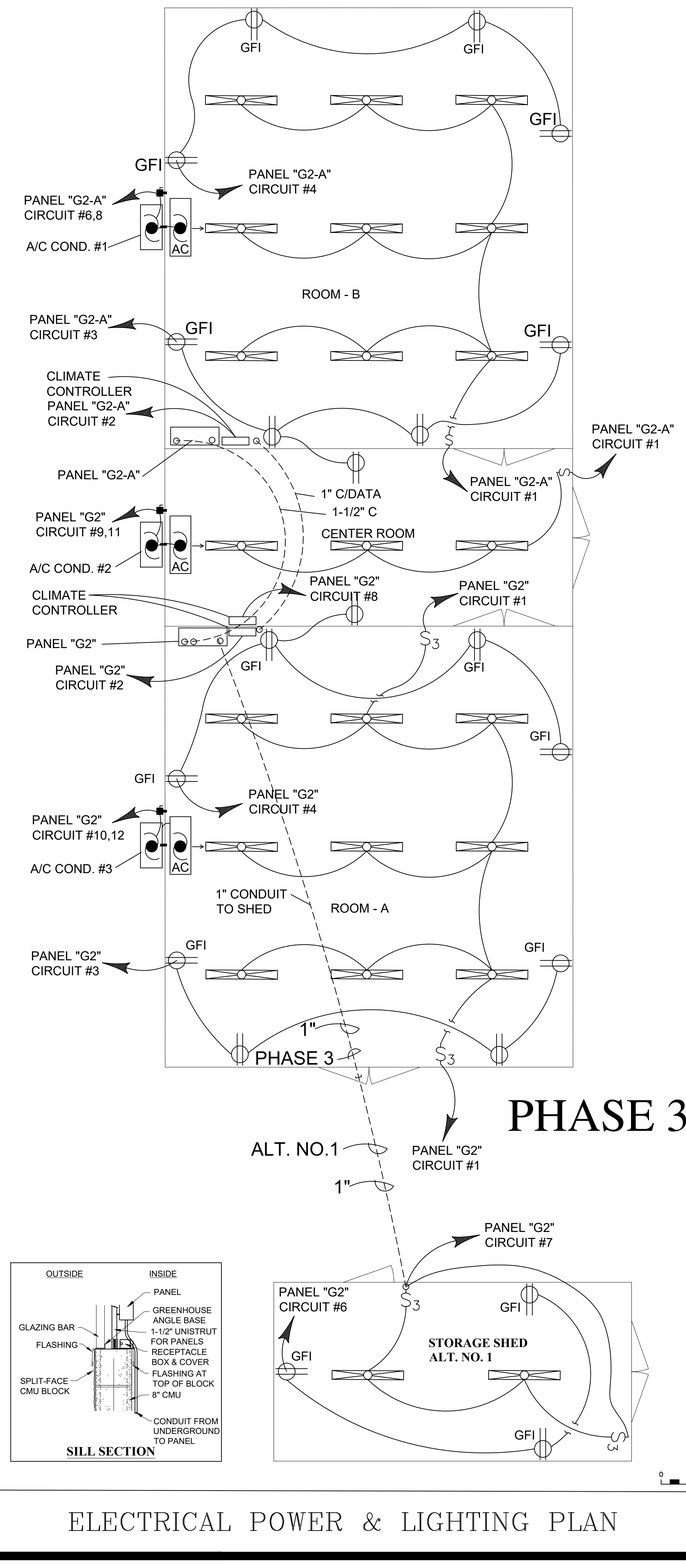

ELECTRICAL POWER & LIGHTING PLAN

NOTES:

1. PROVIDE ALL MATERIALS AND LABOR FOR A COMPLETE ELECTRICAL SYSTEM FOR GREENHOUSE NO.2.
2. LOCATE EXISTING 2" PVC CONDUIT UNDERGROUND WHERE SHOWN AND EXTEND TO PANEL "G2" LOCATION IN GREENHOUSE NO.2, ROOM "A". RUN (3) 4/0 WIRES WITH #2 AWG GROUND FROM EXISTING PANEL "GH" IN MECHANICAL BUILDING, PROVIDE 200 AMP BREAKER FOR PANEL "G2". RUN A 1-1/2" PVC CONDUIT FROM PANEL "G2" IN ROOM "A" TO PANEL "G2-A" IN ROOM "B" WHERE SHOWN. RUN (3) 1/0, (1) #6 G, IN 1-1/2" PVC CONDUIT AND CONNECT TO CORRESPONDING BREAKERS.
3. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 200 AMP, 1-PH, 24 SPACE, PANEL WITH 200 AMP MAIN BREAKER AND REQUIRED BREAKERS AS PER PANEL SCHEDULE IN GREENHOUSE NO.2, ROOM "A" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANEL SHALL BE LABELED AS "G2" WITH LAMINATE PLATE.
4. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 100 AMP, 24 SPACE, PANEL WITH 100 AMP MAIN BREAKER AND REQUIRED CIRCUIT BREAKERS PER PANEL SCHEDULE IN GREENHOUSE NO. 2 ROOM "B" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANELS SHALL BE LABELED AS "G2-A" WITH LAMINATE PLATE.
5. FURNISH AND INSTALL ALL RACEWAYS, WIRING, AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS IN GREENHOUSE NO.2, ROOMS "A" AND "B" AND CENTER ROOM.
6. FURNISH AND INSTALL 20 AMP DUPLEX RECEPTACLES IN WATERPROOF BOX (LEVITON - IUM1V-GY WHILE IN-USE GFCI DUPLEX RECEPTACLE BOX - 120V - 5-20R DUPLEX GFCI RECEPTACLE) IN LOCATIONS SHOWN IN GREENHOUSE NO.2. ALL RECEPTACLES SHALL BE IN WATERPROOF BOXES ON WALL. ALL RECEPTACLE AND SWITCH LOCATIONS SHALL BE LOCATED BY ULL PRIOR TO INSTALLATION. PROVIDE WATERPROOF COVERS.
7. FURNISH AND INSTALL NEW LED LIGHT FIXTURES (JOHNNY'S SELECTED SEEDS - SUNBLASTER LED STRIP LIGHT KIT - 48") WHERE SHOWN. HANG LIGHTS FROM STRUCTURE WITH 1/4" ALL-THREAD. INSTALL 3/4" UNI-STRUT AT STRUCTURE AS NEEDED FOR HANGING AND ANCHORING. INSTALL NEW 20 AMP, SWITCHES AT EACH ENTRANCE DOOR. ALL BOXES RECEIVING SWITCHES SHALL BE IN WATERPROOF BOXES WITH WATERPROOF COVERS (LEVITON - 1432 COVER). SWITCH RACEWAY AND BOX SHALL BE MOUNTED ON GREENHOUSE FRAME. FINAL LOCATION BY ULL.
8. EXTEND EXISTING 1" CONDUIT (DATA RACEWAY) UNDERGROUND INTO BUILDING 12" ON CENTER FROM EDGE OF ELECTRICAL PANEL. RUN A NEW 1" CONDUIT FROM PANEL LOCATION IN GREENHOUSE NO.2 ROOM "A" TO ROOM "B" PANEL LOCATION.
9. COORDINATE WITH GREENHOUSE PERSONNEL FOR LOCATIONS AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS.
10. DEVICES FED FROM NEW PANEL "G2" AND "G2-A" ARE AS FOLLOWS:
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    5) (8) HAF OSCILLATING FANS (FOUR IN ROOM "A" & FOUR IN ROOM "B") - 1/10 HP, 115V, 1-PH, 1.3 AMPS EA., 5.2 TOTAL AMPS EACH ROOM

    THE DEVICES ABOVE ARE FURNISHED BY GOTHIC GREENHOUSES, INC. THESE DEVICES WILL BE INSTALLED BY THE CONTRACTOR WITH GREENHOUSE SUPERVISOR DIRECTION AND ASSISTANCE.
    6) (2) 3-TON A/C MINI-SPLIT HEAT PUMPS (ONE IN ROOM "A", & ONE IN ROOM "B") - 230V/208V, 1-PH, 25 AMPS, (1) 2-TON A/C MINI-SPLIT HEAT PUMP IN CENTER ROOM - 230V208V, 1-PHASE, 23 AMPS. BY THE MECHANICAL CONTRACTOR.
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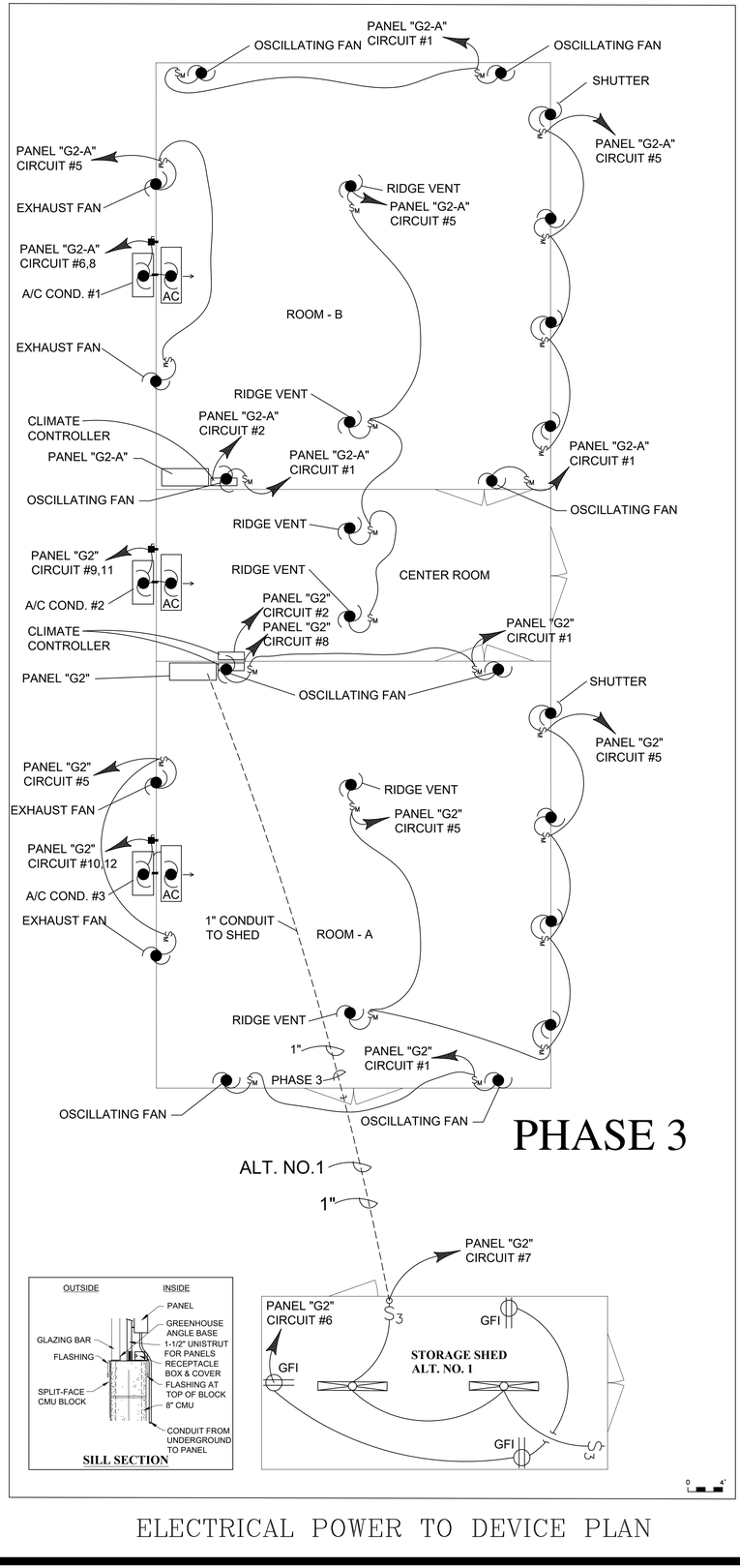
12. ALL CONTROL WIRING AND RACEWAYS TO DEVICES BY THIS CONTRACTOR.
13. PROVIDE PVC SLEEVES IN BLOCK WALLS FOR ALL PIPE PENETRATIONS. CAULK SEAL ALL PENETRATIONS.

ALTERNATE NO. 1

1. PROVIDE A 1" PVC CONDUIT WITH #10-3 WITH GROUND FROM PANEL "G2" TO NEW STORAGE SHED. PROVIDE (2) LED STRIP LIGHTS, (2) 3-WAY SWITCHES, AND (3) 20-AMP RECEPTACLES WITH COVER PLATES AS SHOWN ON PLAN. CONNECT TO 20-AMP BREAKERS AS SHOWN ON PANEL SCHEDULE.



ELECTRICAL POWER TO DEVICE PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
THE UNIVERSITY OF LOUISIANA AT LAFAYETTE
P.O. BOX 43210
LAFAYETTE, LOUISIANA 70504

UL
UNIVERSITY OF LOUISIANA AT LAFAYETTE
PHYSICAL PLANT
FILE NO: 04886 Billeaud Greenhouse.DWG

REGISTRATION STAMP

PROJECT NO:	SHEET:
DATE: AUGUST 2023	E2
SCALE: 1" = 1' - 0"	

NOTES:

1. PROVIDE ALL MATERIALS AND LABOR FOR A COMPLETE ELECTRICAL SYSTEM FOR GREENHOUSE NO.2.
2. LOCATE EXISTING 2" PVC CONDUIT UNDERGROUND WHERE SHOWN AND EXTEND TO PANEL "G2" LOCATION IN GREENHOUSE NO.2, ROOM "A". RUN (3) 4/0 WIRES WITH #2 AWG GROUND FROM EXISTING PANEL "GH" IN MECHANICAL BUILDING, PROVIDE 200 AMP BREAKER FOR PANEL "G2". RUN A 1-1/2" PVC CONDUIT FROM PANEL "G2" IN ROOM "A" TO PANEL "G2-A" IN ROOM "B" WHERE SHOWN. RUN (3) 1/0, (1) #8 G, IN 1-1/2" PVC CONDUIT AND CONNECT TO CORRESPONDING BREAKERS.
3. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 200 AMP, 1-PH, 24 SPACE, PANEL WITH 200 AMP MAIN BREAKER AND REQUIRED BREAKERS AS PER PANEL SCHEDULE IN GREENHOUSE NO.2, ROOM "A" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANEL SHALL BE LABELED AS "G2".
3. FURNISH AND INSTALL A NEW NEMA 3R, 120/240 VOLT, 100 AMP, 24 SPACE, PANEL WITH 100 AMP MAIN BREAKER AND REQUIRED CIRCUIT BREAKERS PER PANEL SCHEDULE IN GREENHOUSE NO. 2 ROOM "B" WHERE SHOWN. MOUNT NEW PANEL ON A UNI-STRUT FRAME RACK MOUNTED TO THE TOP OF THE BLOCK KNEE WALL AS PER DETAIL. NEW PANELS SHALL BE LABELED AS "G2-A" WITH LAMINATE PLATE.
4. FURNISH AND INSTALL ALL RACEWAYS, WIRING, AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS IN GREENHOUSE NO.2, ROOMS "A" AND "B" AND CENTER ROOM.
5. FURNISH AND INSTALL 20 AMP DUPLEX RECEPTACLES IN WATERPROOF BOX (LEVITON - IUM1V-GY WHILE IN-USE GFCI DUPLEX RECEPTACLE BOX - 120V - 5-20R DUPLEX GFCI RECEPTACLE) IN LOCATIONS SHOWN IN EACH GREENHOUSE. ALL RECEPTACLES SHALL BE ON TOP OF BLOCK KNEE WALL. VERIFY WITH ULL FOR LOCATIONS PRIOR TO INSTALLATION.
6. FURNISH AND INSTALL NEW LED LIGHT FIXTURES (JOHNNY'S SELECTED SEEDS - SUNBLASTER LED STRIP LIGHT KIT-48") WHERE SHOWN. HANG LIGHTS FROM STRUCTURE WITH 1/4" ALL-THREAD. INSTALL 3/4" UNI-STRUT AT STRUCTURE AS NEEDED FOR HANGING AND ANCHORING. INSTALL NEW 20 AMP SWITCHES AT EACH ENTRANCE DOOR. ALL BOXES RECEIVING SWITCHES SHALL BE IN PVC WATERPROOF BOXES WITH WATERPROOF COVERS. SWITCH RACEWAY AND SWITCH BOX SHALL BE MOUNTED ON GREENHOUSE FRAME. ULL SHALL LOCATE SWITCHES PRIOR TO INSTALLATION.
7. EXTEND EXISTING 1" CONDUIT (DATA RACEWAY) UNDERGROUND INTO BUILDING 12" ON CENTER FROM EDGE OF ELECTRICAL PANEL. RUN A NEW 1" CONDUIT FROM PANEL LOCATION IN GREENHOUSE NO.2 ROOM "A" TO ROOM "B" PANEL LOCATION.
8. COORDINATE WITH GREENHOUSE PERSONNEL FOR LOCATIONS AND CONNECTIONS TO ALL DEVICES, EQUIPMENT, AND COMPONENTS.

ALTERNATE NO. 1

1. PROVIDE AND EXTEND A 1" PVC CONDUIT WITH #10-3 WITH GROUND FROM PANEL "G2" TO NEW STORAGE SHED. PROVIDE (2) LED STRIP LIGHTS, (2) 3-WAY SWITCHES, AND (3) 20-AMP RECEPTACLES WITH COVER PLATES AS SHOWN ON PLAN. CONNECT TO 20-AMP BREAKERS AS SHOWN ON PANEL SCHEDULE.

⇒	DUPLEX RECEPTACLE, NEMA 5-20R, IVORY IN COLOR, UNLESS OTHERWISE NOTED.
▌	PANELBOARD, NEMA-3R, MOUNTING AS INDICATED
M	ELECTRIC MOTOR
⟹	LED STRIP (JOHNNY'S SELECTED SEEDS - SUNBLASTER LED STRIP LIGHT KIT-48")
$	TOGGLE SWITCH, MTD. 48" AFF
$3	THREE-WAY SWITCH, MTD. 48" AFF
$M	MOTOR RATED TOGGLE SWITCH WITH THERMAL PROTECTION. MOUNTED AT DEVICE.
	CIRCUIT HOMERUN

ALREADY INSTALLED

EXISTING PANEL "GH"

PANEL: "GH"
120/240V,1ø3W - 2" COND.
SURFACE MOUNTED

NEMA-1
TYPE: PANELBOARD
SINGLE SECTION
200 AMP MAIN

BRK	AMP	SERVICE	BRK	AMP	SERVICE
1	100	PANEL "GH1"	2	200	PANEL "GH2"
3			4		
5		SPACE	6		SPACE
7		SPACE	8		SPACE
9		SPACE	10		SPACE
11		SPACE	12		SPACE
13		SPACE	14		SPACE
15		SPACE	16		SPACE
17		SPACE	18		SPACE
19		SPACE	20		SPACE
21		SPACE	22		SPACE
23		SPACE	24		SPACE

EXISTING ELECTRICAL PANEL "G1"

PANEL: "G1"
120/240V,1ø3W - 1-1/2" COND.
SURFACE MOUNTED

GREENHOUSE NO.1
ALREADY INSTALLED

NEMA-3R
TYPE: PANELBOARD
SINGLE SECTION
100 AMP MAIN

BRK	AMP	SERVICE	BRK	AMP	SERVICE
1	20	LIGHTS	2	20	RECEPTACLES
3	20	RECEPTACLES	4	20	SHUTTERS,RIDGEVENTS,OSC.FANS,HEATERS
5	20	EXHAUST FANS	6	20	EXHAUST FANS
7	20	CLIMATE BOSS CONTROLLER	8	20	SPARE
9	20	SPARE	10	20	SPARE
11	20	SPARE	12	20	SPARE
13	20	SPACE	14	20	SPACE
15	20	SPACE	16	20	SPACE
17	-	SPACE	18	-	SPACE
19	-	SPACE	20	-	SPACE
21	-	SPACE	22	-	SPACE
23	-	SPACE	24	-	SPACE

NEW ELECTRICAL PANEL "G2" ROOM "A"

PANEL: "G2"
120/240V,1ø3W - 2" COND.
SURFACE MOUNTED

GREENHOUSE NO.2
PHASE 3

NEMA-3R
TYPE: PANELBOARD
SINGLE SECTION
200 AMP MAIN

BRK	AMP	SERVICE	BRK	AMP	SERVICE
1	20	LIGHTS, OSCILLATING FANS	2	20	CLIMATE CONTROLLER-ROOM "A"
3	20	RECEPTACLES	4	20	RECEPTACLES
5	20	EXHAUST FANS, SHUTTERS, RIDGE VENTS	6	20	STORAGE SHED - RECEPTACLES
7	20	STORAGE SHED - LIGHTS	8	20	CLIMATE BOSS CONTROLLER-CENTER ROOM
9	30	A/C CONDENSER #2 -CENTER ROOM	10	30	A/C CONDENSER #3 - ROOM "A"
11			12		
13	20	SPARE	14	20	SPARE
15	20	SPARE	16	20	SPARE
17	-	SPACE	18	-	SPACE
19	-	SPACE	20	-	SPACE
21	-	SPACE	22	100	"G2-A" SUBPANEL IN ROOM "B"
23	-	SPACE	24		

NEW ELECTRICAL PANEL "G2-A" ROOM "B"

PANEL: "G2-A"
120/240V,1ø3W - 1-1/2" COND.
SURFACE MOUNTED

GREENHOUSE NO.2
PHASE 3

NEMA-3R
TYPE: PANELBOARD
SINGLE SECTION
100 AMP MAIN

BRK	AMP	SERVICE	BRK	AMP	SERVICE
1	20	LIGHTS "B"& CNT.ROOMS,OSCILLATING FANS	2	20	CLIMATE CONTROLLER-ROOM "B"
3	20	RECEPTACLES	4	20	RECEPTACLES
5	20	EXHAUST FANS, SHUTTERS, RIDGE VENTS	6	30	A/C CONDENSER #1 - ROOM "B"
7	20	SPARE	8		
9	20	SPARE	10	20	SPARE
11	20	SPARE	12	20	SPARE
13	20	SPARE	14	-	SPACE
15	-	SPACE	16	-	SPACE
17	-	SPACE	18	-	SPACE
19	-	SPACE	20	-	SPACE
21	-	SPACE	22	-	SPACE
23	-	SPACE	24	-	SPACE

ELECTRICAL SCHEDULE PLAN

GENERAL NOTES

NO:	REVISIONS:	DATE:

GREENHOUSE ADDITION
PHASE 3 - BILLEAUD HALL

UL PHYSICAL PLANT
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