ITB20KO-136 ATTACHMENT A
CONTRACT DOCUMENTS
FOR

IFAS 20037

IFAS DEMONSTRATION PAVILION
BUILDING 08325

LIVE OAK, FL

SVM PROJECT NO. 1460-30

100% REVIEW DOCS

DATE ISSUED: 01/29/2020

CONSULTANTS:

MITCHELL GULLEDGE ENGINEERING, INC.
210 SW 4th Avenue
Gainesville, FL 32601

WAYLAND STRUCTURAL ENGINEERING
2801 SW 81 Street
Gainesville, FL 32608

SVM | P. 352.378.4400 | 1628 NW 6TH STREET
F. 352.377.5378 | GAINESVILLE FL 32609
SKINNER VIGNOLA McLEAN, INC. | FL CERTIFICATE AA3478

SVM

To the best of my knowledge, the plans, specifications, and addenda comply with the applicable minimum building codes.

TECHNICAL SPECIFICATIONS

FOR

IFAS 20037

NEW DEMONSTRATION PAVILION BUILDING # 8325

LIVE OAK, FL

PROJECT NO. 1460-30

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DIVISION 3	**CONCRETE**	
	SEE STRUCTURAL	
DIVISION 4	**MASONRY**	
	04455	CULTURED STONE VENEER
DIVISION 5	**METALS**	
	05202	LIGHT STEEL FRAMING
DIVISION 6	**CARPENTRY**	
	NOT USED	
DIVISION 7	**THERMAL AND MOISTURE BARRIER**	
	07175	WATER REPELLANT COATINGS
	07200	INSULATION – RADIANT BARRIER (ALTERNATE)
	07624	FLASHING AND SHEET METAL
	07900	CAULKING AND SEALANTS
DIVISION 8	**DOORS AND WINDOWS**	
	08340	ROLL-UP CURTAINS – REFERENCE ONLY
DIVISION 9	**FINISHES**	
	09265	FIBERGLAS MAT GYPSUM SHEATHING
DIVISION 10	**SPECIALTIES**	
	10230	ALUMINUM WALKWAY COVERS
	10520	FIRE EXTINGUISHERS AND CABINETS & AEDs
	10600	SIGNS

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DIVISION 11 EQUIPMENT

NOT USED

DIVISION 12 FURNISHINGS

NOT USED

DIVISION 13 SPECIAL CONSTRUCTION

13125	PREFABRICATED BUILDINGS

DIVISION 14 CONVEYING SYSTEMS

NOT USED

DIVISION 15 MECHANICAL

NOT USED

DIVISION 16 ELECTRICAL

16305	CEILING FANS

DIVISION 22 PLUMBING

See Plumbing specifications table of contents*

DIVISION 26 ELECTRICAL

See Electrical specifications table of contents*

***Responsibility for these sections: Mitchell Gulledge Engineering.**

END OF SECTION

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01000 SCOPE OF THE WORK

1. GENERAL

A. Description

1. Work Included: Work includes but is not necessarily limited to the following:

Demolition: Site work as required for the new construction and utilities.

Construction of a 1 –story, 60’ x 75’’x 13’ high, Type I construction, unsprinklered, pre-engineered, galvanized metal building structure with an assembly occupancy. There will be a 10’ roof extension along the north side of the building. The building will be on a concrete slab with open bays. Columns will be finished with synthetic stone on framing. The framing will allow for future installation of rolling weather curtains. Walls will be open up to 10’, with metal exterior siding extending up to the eaves. The work includes new electrical with fans, electrical power and lighting.

2. Related Work:

a. Construction of a concrete walk leading to the adjacent building. The walk will have a pre-engineered aluminum walkway cover.
b. Installation of a water bubbler on the adjacent building.
c. Construction of an accessible route to the restrooms in the adjacent building to the north of the proposed construction.
d. Contractor and all trades shall be required to coordinate work with drawings and/or specifications of equipment suppliers and other consultants as related to this project. It is the Contractor's responsibility to ensure proper inclusion and location of electrical, mechanical and plumbing connections and other features as required for a complete job.

b. All mounted fixtures or equipment shall be securely anchored to adjacent finish surface with appropriate anchorage devices in accordance with manufacturer's directions.

c. All utility connections (e.g. Plumbing, Mechanical, Gas, Fire Protection, Electrical, Fire Alarm, DataCOM, etc.) to equipment shall be performed by the Contractor of that specific trade, unless noted otherwise on the Drawings.

END OF SECTION

01015 CONTRACTOR'S USE OF THE PREMISES

1. GENERAL

A. Description

1. Work included: This Section applies to situations in which the Contractor or his representatives, including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon the Owner's property.

2. Contractor shall provide full-time, on-site supervision. Should the supervisor leave the project site, he/she must appoint someone to act as supervisor until he/she returns. The Supervisor shall be responsible for job-site safety conditions, knowledge of MSDS sheets, and emergency contact numbers as well as for the performance of the work.

3. Related work:

a. Documents affecting work of this Section include, but are not necessarily limited to, the University of Florida Design and Construction Standards, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Quality Assurance

1. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.

2. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

3. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Notification

1. Secure Owner's approval prior to entering upon the Owner's property in connection with the work of the Contract.

D. Contractor's Vehicles

1. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the job site.

2. Require Contractor's vehicles, vehicles belonging to employees of the Contractor, and all other vehicles entering upon the Owner's property in performance of the work of the Contract, to use only the direct access route and actual site of the work.

3. Do not permit such vehicles to park on any street or other area of the Owner's property unless directed by the Owner.

E. Security

1. Restrict the access of all persons entering upon the Owner's property in connection with the work to the access route and to the actual site of the work.

F. Safety

1. Safety is PARAMOUNT at this facility. Contractor shall use every means to protect the safety of the occupants and staff and visitors. Contractor shall, at a minimum, provide the following safety standards:

a. Keep vehicle and tools and materials locked at all times when unattended.
b. Temporary toilets shall be locked and protected from overturning.
c. Vehicles removing debris shall be properly covered.
d. Dumpsters must be located within a fenced enclosure with a minimum of 6 ft. high portable fence and locked.
e. Submit Contractors Safety Plan/Policy and Sexual Harassment Policy.
f. Comply with other safety items as may be requested from time to time by the Owner or Architect.

G. Sexual Harassment Policy Minimum Requirements:

1. It is the policy of the Owner that it will not tolerate verbal or physical conduct by any employee which harasses, disrupts, or interferes with another's work performance or which creates an intimidating, offensive, or hostile environment on the Project Site or to those members of the Public in the immediate vicinity of the Project Site.

2. While all forms of harassment are prohibited, it is the Owner's policy to emphasize that sexual harassment is specifically prohibited. The Contractor's designated Superintendent has a responsibility to maintain the work place free of any form of sexual harassment. No superintendent is to threaten or insinuate, either explicitly or implicitly, that an employee's or subcontractor's refusal to submit to sexual advances will adversely affect the employee's or subcontractor's employment, evaluation, wages, advancement, assigned duties, shifts, or any other condition of employment or career development. In addition, no superintendent is to favor in any way any applicant, subcontractor or employee because that person has performed or shown a willingness to perform sexual favors for the superintendent.

2. Other sexually harassing conduct in the work place, whether committed by the Contractor's or any of the Subcontractor's personnel, and whether committed to another person on the Project Site or a person in the immediate vicinity of the Project Site is also prohibited. Such conduct includes but is not limited to:

   a. Sexual flirtations, touching, advances, or propositions.
   b. Verbal abuse of a sexual nature.
   c. Graphic or suggestive comments about an individual's dress or body.
   d. Sexually degrading words to describe an individual.
   e. The display in the work place of sexually suggestive objects or pictures, including nude photographs.

3. Any employee of the contractor, subcontractor, or member of the public who believes that the actions or words of the superintendent, subcontractors or employees thereof constitute unwelcome harassment has a responsibility to report or complain as soon as possible to the superintendent or to the Owner's

representative, if the complaint involves the superintendent or other employees of the Contractor.

5. All complaints of harassment must be investigated promptly and in an impartial and in as confidential a manner as possible by the superintendent or Owner's representative. If a person is not satisfied with the processing of a complaint or the action taken by the supervisor, then that person should bring the complaint to the attention of the Owner's Representative. In all cases, the person is to be advised of the superintendent's or Owner's Representative's findings and conclusions.

6. Any employee of the Contractor, subcontractor, or superintendent who is found after appropriate investigation to have engaged in harassment of another employee or member of the public while on the Project Site will be subject to appropriate disciplinary action, depending on the circumstances, up to and including termination.

H. Dress Code

1. All workers on the job site shall wear OSHA approved work shoes and hardhats. Pants or shorts shall be no shorter than mid-thigh length, and shall not have any offensive holes, tears, or slits. Shirts shall have sleeves at least 3" in length. Clothing may not display any offensive language or images. AOffensive@ shall be as determined by the Owner or Architect. Workers found in violation will be instructed to leave the job site and not to return until compliant attire is worn.

I. Ventilation/Dust and Odor Control

1. Provide negative pressurization (use large explosion-proof exhaust fan) of all work areas so that to the maximum extent possible odors and dust will be pulled away from occupied areas of the building and exhausted to the exterior.

2. Use extreme care with volatile substances such as paint or stain which have objectionable odors. Remove materials (doors, trim) to the outside to stain and varnish whenever possible.

3. Construct plastic (6 mil [min.] visqueen) dust barriers between work areas and occupied spaces or equipment.

4. Isolate HVAC systems from work areas to prevent odors and dust from entering ductwork. Replace all filters weekly during construction and again at substantial completion.

END OF SECTION

01070 CUTTING AND PATCHING

1. GENERAL

A. Description

1. Work included: This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work required to:

a. Make the several parts fit properly.

b. Uncover Work to provide for installation, inspection, or both, of ill-timed Work.

c. Remove and replace Work not conforming to requirements of the Contract Documents.

d. Remove and replace defective Work.

2. Related Work described elsewhere:

a. In addition to other requirements specified, upon the Architect/ Engineer's request, uncover Work to provide for inspection by the Architect/Engineer of covered Work, and remove samples of installed materials for testing.

b. Do not cut or alter work performed under separate contract without the Architect/Engineer's written permission.

B. Quality Assurance

Perform all cutting and patching in strict accordance with pertinent requirements of these Specifications and, in the event no such requirements are determined, in conformance with the Architect/Engineer's written direction.

C. Submittals

1. Request for the Architect/Engineer's consent:
a. Prior to cutting which affects structural safety, submit written request to the Architect/Engineer for permission to proceed with cutting.

b. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect/Engineer and secure his written permission prior to proceeding.

2. Notices to the Architect/Engineer:

a. Prior to unanticipated cutting and patching performed pursuant to the Architect/Engineer's instructions, submit cost estimate to the Architect/Engineer. Secure the Architect/Engineer's approval of cost estimates and type of cost reimbursement before proceeding with cutting and patching.

b. Submit written notice to the Architect/Engineer designating time the Work will be uncovered, to provide for the Architect/Engineer's observation.

2. PRODUCTS

A. Materials

For replacement of Work removed, use materials which comply with the pertinent Sections of these Specifications.

B. Payment for Costs

The Owner will reimburse the Contractor for unanticipated cutting and patching performed pursuant to the Architect/Engineer's written request after claim for such reimbursement is submitted by the Contractor. Perform all other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

3. EXECUTION

A. Conditions

1. Inspection:

a. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, backfilling, and patching.
b. After uncovering the Work, inspect conditions affecting installation of new Work.

2. Discrepancies:

   a. If uncovered conditions are not as anticipated, immediately notify the Architect/Engineer and secure needed directions.

   b. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

B. Preparation prior to Cutting

Provide all required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

C. Performance

1. Perform all required excavating and backfilling as required under pertinent Sections of these Specifications. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and will provide proper surfaces to receive installation of repair and new work. Perform fitting and adjustment of products to provide finished installation complying with the specified tolerances and finishes.

2. Contractor shall remove all walls indicated on the Plan to be removed. Patch floors and ceilings where walls once were. Relocate any existing light fixtures, air supply diffusers, electrical or signal outlets or switches, and plumbing as required to accommodate the new wall layout.

END OF SECTION

01085 APPLICABLE STANDARDS

1. GENERAL

A. Description

1. Work Included:

a. Comply with all applicable codes and laws as prescribed by the Authorities Having Jurisdiction (AHJ) including the University of Florida Department of Environmental Health and Safety and as may be listed below or elsewhere in these documents.

b. Throughout the Contract Documents, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.

c. Where materials or workmanship are required by these Contract Documents to meet or exceed the specifically named code or standard, it is the Contractor's responsibility to provide materials and workmanship which meet or exceed the specifically named code or standard.

d. It is also the Contractor's responsibility, when so required by the Contract Documents or by written request from the Architect/ Engineer, to deliver to the Architect/Engineer all required proof that the materials or workmanship, or both, meet or exceed the requirements of the specifically named code or standard. Such proof shall be in the form requested in writing by the Architect/Engineer, and generally will be required to be copies of a certified report of tests conducted by a testing agency approved for that purpose by the Architect/Engineer.

2. Related work described elsewhere: Specific naming of codes or standards occurs on the Drawings and in other Sections of these Specifications.

B. Quality Assurance

1. Familiarity with Pertinent Codes and Standards: In procuring all items used in this Work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes

and standards and to verify that the items procured for use in this Work meet or exceed the specified requirements.

2. Rejection of Noncomplying Items: The Architect/Engineer reserves the right to reject items incorporated into the Work which fail to meet the specified minimum requirements. The Architect/Engineer further reserves the right, and without prejudice to other recourse the Architect/Engineer may take, to accept noncomplying items subject to an adjustment in the Contract Amount as approved by the Architect/Engineer and the Owner.

3. Applicable Standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

AASHTO = American Association of State Highway and Transportation Officials, 341 National Press Building, Washington, D.C. 20004.

ACI = American Concrete Institute, Box 19150, Redford Station, Detroit, MI 48129.

AISC = American Institute of Steel Construction, Inc., 1221 Avenue of the Americas, New York, NY 10020.

ANSI = American National Standards Institute (successor to USASI and ASA), 1430 Broadway, New York, NY 10018.

APA = American Plywood Association.

ASCE = American Society of Civil Engineering

ASTM = American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

AWS = American Welding Society, Inc., 2501 N.W. 7th Street, Miami, FL 33125.

AWWA = American Water Works Association, Inc., 6666 West Quincy Avenue, Denver, CO 80235.

CRSI = Concrete Reinforcing Steel Institute, 228 North Lasalle Street, Chicago, IL 60610.

ECC = Energy Conservation Code, Rule 13D-10, and Section 255.251, Florida Statues, Florida Energy Conservation Act of 1974.

ELEVATORS = *FBC-B* Chapter 30, Chapter 11, and Chapter 7

DBPR Chapter 399 FS

Florida Administrative Code Section 61C-5

Comply with ASME A17.2.1, including ASME A17.2.1a, Addenda and ASME A17.2.1b, Addenda.

Comply with National Fire Protection Association, NFPA-70, National Electrical Code, 2014 edition.

Comply with the Uniform Fire Safety Standards for Elevators, Chapter 4A-47, Florida Administrative Code

Safety Code for Elevators and Escalators ASME

And those codes referenced therein.

FBC-B = Florida Building Code-Building, 2017 edition

FBC-E = Florida Building Code-Existing, 2017 edition

FBC-A = Florida Building Code- Accessibility, 2017 edition

FBC-P = Florida Building Code-Plumbing, 2017 edition

FBC-M = Florida Building Code-Mechanical, 2017 edition

FBC-FG = Florida Building Code-Fuel Gas, 2017 edition

FBC-EC = Florida Building Code-Energy Conservation, 2017 edition

FGMA = Flat Glass Marketing Association, 3310 Harrison, Topeka, KS 66611.

FM = Factory Mutual

GC = Glass Code, Chapter 553 Florida Statutes, Part III.

NAAMM = National Association of Architectural Metal Manufacturers, 1033 South Boulevard, Oak Park, IL 60302.

NEC = *National Electrical Code* (see NFPA), NFPA 70 - local adopted edition.

NEMA = National Electrical Manufacturers Association, 155 East 44th Street, New York, NY 10017.

NFPA = National Fire Protection Association, 470 Atlantic Avenue, Boston, Massachusetts, 02210, NFPA 101, *Life Safety Code*, local adopted edition, and NFPA 1 the *Fire Prevention Code*, local adopted edition.

SDI = Steel Deck Institute, 135 Addison Avenue, Elmhurst, IL 60125.

SSPC = Steel Structures Painting Council, 4400 5th Avenue, Pittsburgh, PA 15213.

TCA = Tile Council of America, Inc., Post Office Box 326, Princeton, NJ 08540.

UL = Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60600.

FED SPECS AND FED STANDARDS:

Specifications Sales (3FRI), Bldg. 197, Washington Navy Yard, General Services Administration, Washington, D.C. 20402.

MIL-SPECS:

Military Specifications, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

OTHER:

- Chapter 10D-28, Florida Administrative Code (FAC), Hospital Licensure
- Chapter 10D-38, Florida Administrative Code (FAC), Intermediate Care Facilities for the Developmentally Disabled
- Chapter 64E-6 (formerly10D-6), Florida Administrative Code (FAC), Standards for On Site Sewage Treatment and Disposal Systems
- Chapter 17-761, Florida Administrative Code (FAC), Underground Storage Tank Systems

- Chapter 61C-4, Florida Administrative Code (FAC), Public Food Services Establishments
- Chapter 509, Part I, Florida Statutes (FS), Lodging and Food Service Establishments
- Chapter 33-8, Florida Administrative Code (FAC), County and Municipal Detention Facilities
- Chapter 10D-7, Florida Administrative Code (FAC), State and Local Detention Facilities
- American Correctional Association (ACA) Standards, Revised 1996
- Chapter 6A-2, Florida Administrative Code (FAC), Educational Facilities, 1994 and adopted publication "State Requirements for Educational Facilities," 1994, and Supplemental 92-4, Part III, Section A.
- Chapter 10D-9, Florida Administrative Code (FAC), Plumbing
- Chapter 40C-4, Florida Administrative Code (FAC), Environmental Resource Permits: Surface Water Management Systems
- Chapter 65C-22, Florida Administrative Code (FAC), Child care Standards

END OF SECTION

01340 SUBMITTALS AND SUBSTITUTIONS

1. GENERAL

A. Description

1. Work Included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

2. Related Work

a. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

b. Individual requirements for submittals also may be described in pertinent Sections of these Specifications.

3. Work Not Included

a. UNREQUIRED SUBMITTALS WILL NOT BE REVIEWED BY THE ARCHITECT/ENGINEER.

b. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Architect/Engineer.

B. Quality Assurance

1. Coordination of Submittals

a. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.

b. Verify that each item and the submittal for it conform in all respects with the specified requirements.

c. **The Contractor's signature, date and stamped approval to each submittal, shall certify that this coordination has been performed.**

i. The architect will return all submittals not properly reviewed and stamped by the Contractor.

2. Substitutions

a. The Contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when submitted with required data within 45 calendar days after award of the Contract. **IF SUBSTITUTIONS ARE PROPOSED, CONTRACTOR SHALL FURNISH INFORMATION STATING:**

i. **EVIDENCE THAT THE PROPOSED ITEM IS CONSIDERED EQUIVALENT**.

ii. **ONE (1) COPY OF ORIGINAL ITEM FOR COMPARISON.**

iii. **WHAT BENEFITS THERE ARE TO THE OWNER, INCLUDING BUT NOT LIMITED TO:**

1. **A BETTER PRODUCT FOR NO ADDITIONAL COST.**

2. **SAVINGS THAT CAN BE ACHIEVED FOR THE OWNER (SUBMITTAL MUST BE ACCOMPANIED BY A CHANGE ORDER PROPOSAL SHOWING DECREASED COST TO OWNER).**

3. **PRODUCT DURABILITY**

4. **PRODUCT AVAILABILITY:**

a. **ORDERING TIME WOULD NOT DELAY THE PROJECT IF THERE ARE DELAYS WITH**

THE ORIGINAL SPECIFIED ITEM.

b. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved in writing for this Work by the Architect/Engineer.

3. "Or Equivalent":

a. Where the phrase "or equivalent" or "or equivalent as approved by the Architect/Engineer," occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equivalent unless the item has been specifically so approved for this Work by the Architect/Engineer.

b. The decision of the Architect/Engineer shall be final.

C. Submittals

1. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section, and appropriate Sections of the non-technical and technical specifications.

2. PRODUCTS

A. Manufacturers' Literature / Product Data

1. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.

2. Submit the number of copies which are required to be returned, plus three (3) copies which will be retained by the Architect/Engineer and the Owner.

B. Shop Drawings

1. Scale and Measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

2. Submittals: Comply with pertinent Sections of the non-technical and technical specifications regarding submittal of Shop Drawings.

C. Samples

1. Provide Sample or Samples identical to the precise article proposed to be provided. Identify as described under "Identification of Submittals" below.

2. Number of Samples Required

a. Unless otherwise specified, submit Samples in the quantity which is required to be returned, plus two (2) which will be retained by the Architect/Engineer and the Owner.

b. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Architect/Engineer.

D. Colors and Patterns

1. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect/Engineer for selection.

3. EXECUTION

A. Identification of Submittals

1. Consecutively number all submittals according to CSI Section number. (Number sequentially in order that electronic files will sort in order).

EXAMPLE:

08410.01 - Aluminum Entrances & Storefront - Product Data
08410.02 - Aluminum Entrances & Storefront – Shop drawings

a. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.

EXAMPLE:

08410.02-R1 - Aluminum Entrances & Storefront – Shop drawings

b. On resubmittals, cite the original submittal number for reference.

c. The ENTIRE re-submittal MUST be resubmitted in it's entirety. Indivuatld sheets will be returned.

2. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

3. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

4. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Architect/Engineer for his review upon request.

B. Grouping of Submittals

1. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.

a. Partial submittals may be rejected as not complying with the provisions of the Contract.

b. The Contractor may be held liable for delays so occasioned.

C. Timing of Submittals

1. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

2. In scheduling, allow at least 10 working days for review by the Architect/Engineer following his receipt of the submittal.

D. Architect/Engineer's Review

1. Review by the Architect/Engineer does not relieve the Contractor from responsibility for errors which may exist in the submitted data.

2. Revisions

   a. Make revisions required by the Architect/Engineer.

   b. If the Contractor considers any required revision to be a change, he shall so notify the Architect/Engineer as provided for in Paragraph 12.3 of the General Conditions.

   c. Make only those revisions directed or approved by the Architect/ Engineer.

END OF SECTION

01520 CONSTRUCTION AIDS

1. GENERAL

A. Conditions of the Contract and Division 1 apply.

B. Work includes:

1. Furnish, install, and maintain required construction aids, and remove on completion of work.

C. Comply with UF Department of Environmental Health and Safety, applicable federal, state, and local codes and regulations.

D. Maintain all facilities and equipment in a first-class condition.

2. PRODUCTS

A. Products may be new or used, suitable for the intended purpose.

B. Construction aids and equipment: scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other facilities and equipment.

3. EXECUTION

A. Review site conditions and factors which affect construction procedures and construction aids including adjacent properties and public facilities which may be affected by execution of the work.

B. Comply with applicable requirements specified in other Sections.

C. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Owner and other Contractors employed at the site.

D. Completely remove construction aids upon completion of work.

E. Repair damage caused by installation and use of construction aids.

END OF SECTION

01530 BARRIERS

1. GENERAL

A. Conditions of the Contract and Division 1 apply.

B. Furnish, install, and maintain suitable barriers as required to prevent public and unauthorized persons' entry to the work and construction staging areas and as required to protect existing facilities, landscaping site improvements, and private property from damage caused by construction activities; remove when no longer needed or at completion of work. Barriers should be used to isolate the ground beneath the roof areas being worked on as well as work equipment including asphalt kettles, etc. The Contractor shall as much as practical limit the sizes of these areas and relocate the barriers as the work progresses.

C. Comply with applicable federal, state, and local codes and regulations.

D. Comply with UF Department of Environmental Health and Safety.

2. PRODUCTS

A. Products may be new or used, suitable for the intended purpose.

3. EXECUTION

A. Install barriers in a neat and reasonably uniform appearance.

B. Maintain barriers during the entire construction period.

C. Relocate barriers as required by progress of construction.

D. Removal

1. Completely remove barricades, including their foundations, when construction has progressed to the point that they are no longer needed and when approved by the Project Architect/Engineer.

2. Clean and repair damage caused by the installation of barriers.

END OF SECTION

01600 MATERIAL AND EQUIPMENT

1. GENERAL

A. Conditions of the Contract and Division 1 apply.

B. Manufacturer's Instructions

1. When the Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation including one (1) copy to the Project Architect/Engineer.

a. Maintain one (1) set of complete instructions at the job site during installation and until completion.

2. Perform work in accordance with manufacturer's instructions. Do not omit preparatory steps or installation procedures unless specifically modified or exempted by Contract Documents.

a. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Project Architect/Engineer for clarification.

b. Do not proceed with work without clear instructions.

C. Transportation and Handling

1. Arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

a. Deliver products in undamaged condition, in manufacturer's original containers of packaging, with identifying labels intact and legible.

b. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.

2. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

D. Packaging

1. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

    a. Maintain packaged materials with seals unbroken and labels intact until time of use.

    b. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

2. The Architect/Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Architect/ Engineer as to manufacturer, grade, quality, and other pertinent information.

E. Storage and Protection

1. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.

    a. Store products subject to damage by elements in weathertight enclosure.

    b. Maintain temperature and humidity within the range required by manufacturer's instructions.

2. Exterior Storage

    a. Store fabricated products above the ground on blocking or skids; prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, and provide adequate ventilation to avoid condensation.

    b. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

3. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to

assure that products are maintained under specific conditions and free from damage or deterioration.

F. Protection After Installation

1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

G. Repairs and Replacements

1. In event of damage, promptly make replacements and repairs to the approval of the Architect/Engineer and at no additional cost to the Owner.

2. Additional time required to secure replacements and to make repairs will not be considered by the Architect/Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

01640 PRODUCT HANDLING

1. GENERAL

A. Description

1. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

2. Related work:

a. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

b. Additional procedures also may be prescribed in other Sections of these Specifications.

B. Quality Assurance

1. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

C. Manufacturer's Recommendations

1. Except as otherwise approved by the Architect/Engineer, determine and comply with manufacturer's recommendations on product handling, storage, and protection.

D. Packaging

1. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

a. Maintain packaged materials with seals unbroken and labels intact until time of use.

b. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

2. The Architect/Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Architect/ Engineer as to manufacturer, grade, quality, and other pertinent information.

E. Protection

1. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.

2. Provide protection for paving, walkways and finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

3. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

F. Repairs and Replacements

1. In event of damage, promptly make replacements and repairs to the approval of the Architect/Engineer and at no additional cost to the Owner.

2. Additional time required to secure replacements and to make repairs will not be considered by the Architect/Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

01710 CLEANING

1. GENERAL

A. Description

1. Work included: Throughout the construction period, maintain the building site in a standard of cleanliness as described in this Section.

2. Related work described elsewhere: In addition to standards described in this Section, comply with all requirements for cleaning up as described in various other Sections in these Specifications.

B. Quality Assurance

1. Inspection: Conduct daily inspection, and more often if necessary, to verify that requirements of cleanliness are being met.

2. Codes and standards: In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

2. PRODUCTS

A. Cleaning Materials and Equipment

Provide all required personnel, equipment, and materials needed to maintain the specified standards of cleanliness.

B. Compatibility

Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as provided by the Architect/Engineer.

3. EXECUTION

A. Progress Cleaning

1. General

a. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.

b. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.

c. At least once a day, and more often if necessary, completely remove all scrap, debris, and waste material from the job site. "Clean" shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom

d. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the ecology.

e. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.

f. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials have been installed. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Architect/Engineer, may be injurious to the finish floor material.

B. Final Cleaning

1. Definition: Except otherwise specifically provided, "clean" (for the purpose of this Article) shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

2. General: Prior to completion of the Work, remove from the job site all tools, surplus materials equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.A. above.

a. Interior: Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only the specified cleaning materials and equipment.

b. Polished surfaces: To all surfaces requiring the routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

c. Timing: Schedule final cleaning as approved by the Architect/Engineer to enable the Owner to accept a completely clean project.

C. Cleaning during Owner's Occupancy

Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the Architect/Engineer in accordance with the General Conditions of the Contract.

END OF SECTION

01 88 13 CONSTRUCTION TOLERANCES

1. GENERAL:

A. In the case of any conflicts or discrepancies among the codes, laws, standards and guidelines compared to the drawings:

1. Upon discovery and prior to construction (whichever comes first), Contractor shall immediately report (via RFI) to the Architect such conflict or discrepancy.

2. Accessibly “code” compliance will generally overrule a “guideline” or a “standard”, but confirm with the Architect by submitting an RFI.

B. Unless specified in another section, comply with the following general construction tolerances.

1. Asphalt Paving (except for Accessible parking spaces, access aisles, Curb Ramps and other similar areas regulated by ADAAG, FBC-A or UFAS):
   a. Standard: +/- 1/8 inch in 6 feet.
   b. Reference: FDOT Standard Specifications for Road and Bridge Construction

2. Concrete Paving:
   a. Standard: +/- 1/4 inch in 10 feet for drives, parking surfaces, sidewalks and other site paving.
   b. Reference: ACI 117-90.

3. Themed Paving: (and “like” hardened trails)
   a. Standard: 1/4 inch in 12 inches for patterned deformations. Joints or depressed patterns may be ½ inch deep where the upper 1/4 inch is beveled at no more than 1 unit vertical for every 2 units horizontal.
   b. Reference: ADAAG 4.5.2

4. Interior Concrete Slabs for Flatness and Straightness:
   a. Standard: Bull float slab is +/- ½" in 10 feet.
   b. Reference: ACI 117-90 and ASTM E1155-87

5. Cast-in-Place Concrete Walls:
   a. Standard: Plumb is 1/4 inch in 10 feet.
   b. Reference: ACI 117-90

6. Concrete Masonry Unit and Masonry Construction:
   a. Standard: 1/4 inch in 10 feet vertical or horizontal.
   b. Reference: ACI 117-90

7. Brick Wall Construction:
   a. Standard: 1/4 inch in 10 feet vertical or horizontal.
   b. Reference: ACI 117-90

8. Granite and Marble Installation:
   a. Standard: 1/4 inch in 10 feet vertical or horizontal.
   b. Reference: *Dimension Stone Design Manual*, Marble Institute of America, Inc.

9. Limestone Installation:
   a. Standard: 1/4 inch in 10 feet vertical or horizontal
   b. Reference: Determined by Architect.

10. Slate Tile Installation for Flooring or Walls:
   a. Standard: 1/4 inch in 10 feet vertical or horizontal
   b. Reference: Determined by Architect.

11. Floor and Wall Tile:
   a. Standard: 1/4 inch in 8 feet for wall or flooring. This does not apply to thresholds.
   b. Reference: ANSI A108.1, A108.2 and A108.5.

12. Terrazzo Flooring:
   a. Standard: 1/4 inch in 10 feet
   b. Reference: Terrazzo Information Guide, National Terrazzo and Mosaic Association, 1993.

13. Wood Flooring:
   a. Standard: 1/4 inch in 10 feet
   b. Reference: ANSI/HPMA LHF, 1982.

14. Other Stone Installations:
   a. Standard: 1/4 inch in 10 feet
   b. Reference: *Dimension Stone Design Manual*, Marble Institute of America, Inc.

15. Cabinet and Counter Tops:
   a. Standard: 1) 1/4 inch in 12 feet out-of-parallel with the floor

2) 1/4 inch in 8 feet for flatness of counter top

b. Reference: *Quality Standards for the Professional Remodeler*, National Association of Home Builders, Remodelers Council and *Architectural Woodwork Quality Standards*, AWI.

16. Storefront Installations:
    a. Standard: +/- 1/8 inch in 12 feet vertically
    b. Reference: *Aluminum Storefront and entrance Manual*, American Architectural Manufacturer's Association.

17. Framing for Gypsum Wallboard:
    a. Standard: 1/8 inch in 10 feet vertical or horizontal
    b. Reference: GA-216

18. Wallboard Partitions, Ceilings and Trim:
    a. Standard: 1/4 inch in 10 feet
    b. Reference: ANSI A108.11 and GA-216

19. Lath and Plaster:
    a. Standard: 1/4 inch in 10 feet
    b. Reference: ASTM C296

20. Doors and Frames: Square and Plumb
    a. Standard: Numerous standards for door and frame flatness, warp, plumbness, squareness, straightness, alignment, clearance, etc.
    b. Reference: *WDMA I.S. 1A, Industry Specification for Architectural Wood Flush Doors*, Window and Door Manufacturing Association (WDMA) and *Manufacturing Tolerances for Standard Steel Door and Frames*, Steel Door Institute (SDI).

C. Comply with the following Accessibility Construction tolerances:

All references are:

Florida Building Code, Building, Chapter 11, which references Florida Building Code, Accessibility which upon opening the binder, the title page states "2012 FLORIDA ACCESSIBILTY CODE FOR BUILDING CONSTRUCTION, ADOPTED PURSUANT TO SECTION 553.503, FLORIDA STATUTES, BASED ON THE 2010 ADA STANDARD FOR ACCESIBLE DESIGN"

(herein referred to as “FBC-A”);

and/or:

Uniform Federal Accessibility Standards (UFAS).

1. Doors: Clear Width
   a. Standard: Zero (0) inch tolerance for all minimums. 32 inch Clear required - measured from stop at latch side to face of door when door is open 90 degrees. [Must use 36 inch wide door for both 1 3/8 inch and 1 3/4 inch thick doors. A 34 inch wide door does not quite provide 32 inches clear on a 1 3/8 inch door and not at all for a 1 3/4 inch door].
      1) Exception: 5/8 inch tolerance at latch side stop is allowed in Alterations.
   b. Reference:
      FBC-A, paragraph 404.2.3
      UFAS, paragraph 4.13.5
      1) Reference: FBC-A, paragraph 404.2.3, Exception 1.

2. Doors: Maneuvering Clearances
   a. Standard: Zero (0) inch tolerance for all minimums.
   b. Reference:
      FBC-A, paragraph 404.2.4.
      UFAS, paragraph 4.13.6, and Figure 25

3. Doors: in Series
   a. Standard: Zero (0) inch tolerance for all minimums.
   b. Reference:
      FBC-A, paragraph 404.2.6.
      UFAS, paragraph 4.13.7.

4. Doors: Thresholds:
   a. Standard: Zero (0) inch tolerance for all maximums.
   b. Reference:
      FBC-A, paragraph 404.2.5.
      UFAS, paragraph 4.13.8.

5. Water Closets: Toilet and Bathing Rooms or Toilet Compartments (aka – stalls)
   a. Standard: Zero (0) inch tolerance. (Therefore, design and construct with a margin for error).
   b. Reference:
      FBC-A, paragraph 603.2 and 604.2 and Figure 604.2.
      UFAS, paragraph 4.17.2 and Figures 29 and 30.

6. Water Closets: Seat Height
   a. Standard: Zero (0) inch tolerance outside of range. 17 inches to 19 inches from FFE to top of seat (Except single occupant/private office fixtures are not required to comply with 604.4 and Dwelling Units: 15 inches to 19 inches).
   b. Reference:
      FBC-A, paragraph 604.4.
      UFAS, paragraph 4.16.3 and Figure 29(b).
      UFAS, paragraph 4.34.5.2(2) - At Dwelling Units only.

7. Water Closets: Clear Floor Space / Offsets from Adjoining Fixtures
   a. Standard: Zero (0) inch tolerance for minimum. (Therefore, design and construct with a margin for error).
   b. Reference:
      FBC-A, paragraph 604.3 and Figures 604.3.1 and 604.3.228.
      UFAS, paragraph 4.16.2 and Figure 28.
      UFAS, paragraph 4.34.5.2 and Figure 47(a) - At Dwelling Units only.

8. Grab Bars: Size and Heights
   a. Standard: Zero (0) inch tolerance outside of range.
   b. Reference:
      FBC-A, paragraph 609, 604.5, 604.8.1.5, 604.8.2.3, 604.9.4, 607.4, 608.3, 608.3.2, 608.3.3 and Figures 604.5.1, 604.5.2, 607.4.1,607.4.2, 608.3.1, 608.3.2, and 608.3.3.
      UFAS, paragraph 4.16.4, 4.26 and Figures 29, 30, 34, 37, and 39.

9. Flush Controls:
   a. Standard: Zero (0) inch tolerance outside of range.
   b. Reference:
      FBC-A, paragraph 604.6.
      UFAS, paragraph 4.16.5.

10. Urinals: Height and Projection
   a. Standard: Zero (0) inch tolerance outside of range.
   b. Reference:
      FBC-A, paragraph 605.2 and Figure 605.2
      UFAS, paragraph 4.18.2.

11. Urinals: Clear Floor Space

a. Standard: Zero (0) inch tolerance outside of range.
b. Reference:
FBC-A, paragraph 605.3 and 306 and Figures 305.5, 305.7.1, 306.2 and 306.3.
UFAS, paragraph 4.18.3.

12. Urinal: Flush Controls
a. Standard: Zero (0) inch tolerance outside of range.
b. Reference:
FBC-A, paragraph 605.4.
UFAS, paragraph 4.18.4.

13. Lavatories: Height
a. Standard: Zero (0) inch tolerance outside of range. (Except single occupant/private office fixtures are not required to comply with 604.3).
b. Reference:
FBC-A, paragraph 606.3.
UFAS, paragraph 4.19.2.

14. Operable Parts:
a. Standard: Zero (0) inch tolerance outside of range.
b. Reference:
FBC-A, paragraph 309.
UFAS, paragraph 4.27.2.

15. Forward Reach: High, Over Obstruction, Low
a. Standard: Zero (0) inch tolerance outside of range.
b. Reference:
FBC-A, paragraph 308.1 and Figures 308.2.1 and 308.2.2.
UFAS, paragraph 4.2.5

16. Side Reach: High, Over Obstruction, Low
a. Standard: Zero (0) inch tolerance outside of range.
b. Reference:
FBC-A, paragraph 308.3 and Firgures 308.3.1 and 308.3.2.
UFAS, paragraph 4.2.6.

17. Mirror Height:
a. Standard: Zero (0) inch tolerance outside of range.

b. Reference:

FBC-A, paragraph 603.3.
UFAS, paragraph 4.19.6.

18. Drinking Fountain:
    a. Standard: Zero (0) inch tolerance outside of range. (Therefore, design and construct with a margin for error).
    b. Reference:
        FBC-A, paragraph 602.4 and 602.7.
        UFAS, paragraph 4.15.2.

19. Ramps: Slope
    a. Standard: Zero (0) inch tolerance outside of range. (Therefore, design and construct with a margin for error).
    b. Reference:
        FBC-A, paragraph 405.2. (Table 405.2 allows steeper slopes for specific situations).
        UFAS, paragraph 11-4.8.1 and 11-4.8.2. (11-4.1.6(4)(a) allows steeper slopes for specific situations).

20. Ramps: Width
    a. Standard: Zero (0) inch tolerance outside of range. (Therefore, design and construct with a margin for error).
    b. Reference:
        FBC-A, paragraph 405.5 and 405.7 (+ 405.9.1 OR 405.9.2) and Figure 405.7 (+ 405.9.1 OR 405.9.2)
        UFAS, paragraph 4.8.3.

21. Ramps (and Stairs): Handrails - Height, gripping and clearances
    a. Standard: Zero (0) inch tolerance outside of range. (Note regarding size: For round, steel pipe, must use 1 inch, 1-1/4 inch or 1-1/2 inch (nominal) diameter pipe with actual 1.315 inch OD, 1.66 inch OD, and 1.9 inch OD respectively; therefore, all comply.
    b. Reference:
        FBC-A, paragraph 505 and Figures 505.4, 505.5, 505.6, 505.7.2, 505.10.1, 505.10.2 and 505.10.3.
        UFAS, paragraph 4.8.5 (4.9.4) and Figures 17, 19 and 39.
22. Ramps: Accessible Route - Cross Slope
    a. Standard: Zero (0) inch tolerance. (Therefore, design and construct with a margin for error).

b. Reference:
FBC-A, paragraph 405.3.
UFAS, paragraphs 4.3.7 and 4.8.6.

C. Other Constructed Elements, which are not specifically regulated above, shall be permitted to have a construction tolerance of +/-1/4", unless in the opinion of the Architect or Engineer, such variation impedes access and intention for finish quality.

2. PRODUCTS

A. There are no products required for this Section.

END OF SECTION

04455 CULTURED STONE VENEER

1. GENERAL

A. Description

1. Work included: Provide cultured stone veneer where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

2. Related work:

a. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Quality Assurance

Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Submittals

1. Product data: within 60 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

a. Materials list of items proposed to be provided under this Section.

b. Samples of the proposed stone, showing color range, color variation, and textures.

2. Mock-ups:

a. At a location on the site where directed by the Architect/Engineer, construct a sample panel approximately 4'-0" high and 6'-0" long.

b. Provide one panel for each combination of stone, mortar color, and pattern of installation.

c. Revise as necessary to secure the Architect/Engineer's approval.

d. The mock-up panels, when so approved by the Architect/Engineer, may become part of the work and may be incorporated into the finished work of this Section.

e. The approved mock-up panels, will be used as datum for comparison with work actually provided under this Section, and for acceptance or rejection of such work.

2. PRODUCTS

A. Cultured Stone Veneer

1. System shall be equivalent to “Cultured Stone” as manufactured by Owens Corning. Stone type shall be equivalent to the “Drystack Ledgestone” Color shall be selected by Owner from manufacturer’s list of standard colors.

B. Mortar

1. Portland cement: Comply with ASTM C150, Type II, low alkali.

2. Sand: Comply with ASTM C144, with not less than 5% passing the No. 100 sieve.

3. Hydrated lime: Comply with ASTM C207, Type S, unless otherwise specifically approved by the Architect/Engineer.

4. Water: Clean, potable, and free from organic materials.

5. Mortar color shall blend with color of stone.

6. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect/Engineer.

3. EXECUTION

A. Surface Conditions

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Installation

1. Coordinate with other trades as required to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

2. Mortar:

a. Provide mortar consisting of one part Portland cement, from 1/4 to 1/2 part hydrated lime, and clean well graded sand in the proportion of three times the sum of the cementitious material.

b. Mix in a batch mixer for not less than five minutes, and long enough for thorough intimate mixing of all ingredients.

c. Retempering:

1. Retemper on mortar boards by adding water within a basin formed with the mortar and working the mortar into the water.

2. Do not dash or pour water over the mortar.

3. Do not use or retemper harsh non-plastic mortar.

C. Cleaning

1. Use clear water and clean brushes or cloths, and remove all mortar stains as the work progresses.

2. Upon completion of the stone installation, clean all exposed surfaces with a 10% solution of commercial muriatic acid, removing all stains with fiber brushes, and then washing with clear water.

3. In the event ordinary cleaning is not adequate, use other methods such as sandblasting or chipping, as approved by the Architect/Engineer, and at no additional cost to the Owner.

END OF SECTION

05202 LIGHT STEEL FRAMING

1. GENERAL

A. Description

1. Work included: Provide light steel framing system, complete with accessories, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

2. Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

a. Section 09260 - Gypsum Wallboard System.

B. Quality Assurance

1. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. In addition to complying with pertinent requirements of governmental agencies having jurisdiction, comply with the "Standard Load Tables" and pertinent standard specifications of the Steel Joist Institute.

C. Submittals

1. Comply with pertinent provisions of Section 01340.

2. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to proceed, submit:

a. Materials list of items proposed to be provided under this Section;

b. Manufacturers' specifications and other data needed to prove compliance with the specified requirements;

c. Shop Drawings showing sizes, spacing, and location of studs, joists, connections, bridging, reinforcing, anchoring, cambers, loads, and other pertinent data, and showing welded

connections and the length thereof, using AWS standard welding symbols;

d. Manufacturers' recommended installation procedures which, when approved by the Architect/Engineer, will become the basis for accepting or rejecting actual installation procedures used on the work.

D. Calculations

1. Engineering calculations or data shall be submitted verifying the framing assembly's ability to meet or exceed design requirements as required by local codes and authorities.

2. Steel framing used to support rigid materials shall be designed for an allowable deflection of L/360. Steel framing used to support semi-rigid materials shall be designed for an allowable deflection of L/240.

3. All connections (member-to-member and member-to-structure) shall be carefully designed.

4. Selected exterior and interior walls shall be designed to provide frame stability and lateral load resistance. If diagonal steel strapping is used to transfer lateral loads to the structure and foundation, additional studs may be required to resist the vertical component of the load from the diagonal bracing.

5. Wall bridging shall be designed to provide resistance to minor axis bending and rotation of wall studs.

E. Product Handling

1. Comply with pertinent provisions of Section 01640.

2. PRODUCTS

A. Materials

1. Provide steel joists, studs, and accessories system in dimensions and arrangements shown on the Drawings.

a. Maximum allowable height of galvanized metal studs shall be the following typical gauge and spacing:

0' to 9' x 3-5/8" (20 gauge) @ 16" o.c.

9' to 10' x 3-5/8" (18 gauge) @ 16" o.c.
10' to 11' x 3-5/8" (16 gauge) @ 16" o.c.
11' to 12' x 3-5/8" (14 gauge) @ 16" o.c.
12' to 14' x 6" (20 gauge) @ 16" o.c.
14' to 15' x 6" (18 gauge) @ 16" o.c.
15' to 16' x 6" (16 gauge) @ 16" o.c.
16' to 18' x 6" (14 gauge) @ 16" o.c.
18' to 20' x 6" (12 gauge) @ 16" o.c.
Over 20' x 6" (12 gauge) @ 12" o.c.

2. Provide Fire Retardant treated wood blocking and furring.

B. Fabrication

1. Fabricate the steel joists system in strict accordance with the approved Shop Drawings and the requirements of governmental agencies having jurisdiction, and in accordance with the following as pertinent:

a. Verify dimensions prior to fabrication.

b. Provide top and bottom joist chord extensions where indicated on the Drawings or otherwise required.

c. Where wood nailers are required:

1. Drill holes at proper locations in top chords.

2. Weld threaded lugs to top chords for attachment of the nailers.

3. Make allowance in bottom chords to compensate for reduction in cross-sectional area of top chords.

d. Camber joists to accommodate dead load deflection.

e. All galvanized studs, joists, and accessories, 16 gauge or heavier, shall be formed from steel that conforms to the requirements of ASTM A446, with a yield of 50 ksi, and as set forth in Section 1.2 of the AISI "Specification for the Design of Cold-Formed Steel Structural Members," latest edition (1980).

f. All galvanized studs, joists, and accessories, 18 gauge, shall be formed from steel that conforms to the requirements of ASTM A446, with a yield of 37 ksi, and as set forth in Section

1.2 of the AISI "Specification for the Design of Cold-Formed Steel Structural Members," latest edition (1980).

g. All galvanized studs, joists, and accessories, 20 gauge, shall be formed from steel that conforms to the requirements of ASTM A446, with a yield of 33 ksi, and as set forth in Section 1.2 of the AISI "Specification for the Design of Cold-Formed Steel Structural Members," latest edition (1980).

h. All galvanized studs, joists, and accessories shall have a minimum G-60 coating.

2. Except where galvanizing may be called for on the Drawings or the approved Shop Drawings, shop-prime the joist system using one (1) coat of "10-99 Tnemec Primer," "Rustoleum No. 5769 Primer," or equivalent approved in advance by the Architect/Engineer, to a dry film thickness between 2.0 and 3.5 mils.

C. Other Materials

1. Provide other materials not specifically described, but required, for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect/Engineer.

3. EXECUTION

A. Surface Conditions

1. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

B. Installation

1. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
   a. Connections shall be accomplished with self-drilling screws or welding so that the connection meets or exceeds the design loads required at that connection.

   b. Transversely loaded studs need not sit squarely in tracks, but must be attached to them.

c. Axially loaded studs shall be installed seated squarely (within 1/16") against the web portion of the top and bottom tracks. Tracks shall rest on a continuous uniform bearing surface.

d. Cutting of steel framing members may be accomplished with a saw or shear. Torch cutting of load bearing members is not permitted.

e. Temporary bracing shall be provided and left in place until work is permanently stabilized.

f. Bridging shall be of size and type shown on the Drawings and as called for in the design calculations.

g. Diaphragm rated materials may be submitted for bridging, however, it shall be installed prior to loading the wall. If such a material is installed on one (1) side of the wall, only then the other stud flanges shall be bridged with suitable bridging. Bridging may be removed or left in place when this material is installed.

h. Install headers in all openings in axially loaded walls that are larger than the stud spacing in that wall. Form headers as shown on the Drawings.

i. Insulation equivalent to the job requirements shall be placed in al jamb and header type conditions that will be inaccessible after their installation into the wall.

j. Jack studs provide support at each end of headers. These studs shall be securely connected to the header and must seat squarely in the lower track of the wall and be properly attached to it.

k. If, by design, a header is low in the wall, the less than full-height studs (cripples) that occur over the header shall be designed to carry all imposed loads.

l. Wall track shall not be used to support any load unless specifically designed for that purpose.

m. All axially loaded members shall be aligned vertically to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections, or alternate provisions for load transfer may be made.

n. Holes that are field cut into steel framing members shall be within limitations of the product and its design. Provide reinforcement, where holes are cut through load bearing members, in accordance with manufacturers' recommendations and as approved by Project Architect/Engineer.

o. Touch up all steel bared by welding using zinc-rich paint.

p. Studs shall be spaced to suit the design requirements and limitations of collateral facing materials.

q. Gypsum board shall be attached to steel studs in accordance with ASTM Specification C840, except that the steel drill screws used (Specification ASTM C954) shall be spaced not more than 12" o.c. in the field of the board.

r. Metal plaster bases shall be attached in accordance with ASTM Specification C841, except screw heads shall be of size and type suitable for positive (no movement) attachment.

s. Care should be taken to allow for additional studs at intersections, corners, doors, windows, control joints, etc., and as called for in the Shop Drawings or design calculation.

t. Provision for structure movement shall be allowed where indicated and necessary by design or code requirements.

u. Splicing of axially loaded members shall not be permitted.

2. Installation: Non-Panelized (Stickbuilt) Construction

a. Align track accurately at supporting structure, and fasten to structure as shown on Shop Drawings.

b. Track intersections shall butt evenly.

c. Studs shall be plumbed, aligned, and securely attached to flange or web of upper and lower tracks. Axially loaded studs shall be seated squarely in both top and bottom tracks.

d. When splicing of track is necessary between stud spacings, a piece of stud shall be placed in the track fastened with two (2) screws or welds per flange to each piece of track.

e. Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. If the erecting

contractor is bearing on work set by another trade, it is his responsibility to ensure that bearing criteria are met. Any discrepancy shall be brought to the attention of the Project Architect/Engineer.

3. Installation: Joists

a. Joist shall be located directly over bearing studs of a load distribution member and shall be provided to transfer loads.

b. Provide web stiffeners, where necessary at reaction points and at points of concentrated loads, as shown on the Shop Drawings.

c. Joists shall be installed with their web area perpendicular to the bearing surface.

d. Bridging, either steel strap or solid, shall be provided as shown on the Shop Drawings.

e. Provide additional joists under parallel partitions where the partition length exceeds 1/2 of the joist span.

f. Provide additional framing around all floor/roof openings which are larger than the joist spacing and as noted on the Shop Drawings.

g. End blocking shall be provided where joist ends are not otherwise restrained from rotation.

h. All bridging, bracing, blocking, strapping, masonry construction, web reinforcement, etc., must be in place prior to loading of floors.

i. Care must be taken by all trades not to disturb joist placement, alignment, plumbness, etc., prior to the completion of the floor system.

j. Care must be taken not to overload the floor system during construction. Place heavy loads, materials, equipment, etc., directly over structural supports, bearing walls, or as directed by the Architect/Engineer.

4. Fastenings and Attachments

a. Anchorage of the tracks to the structure shall be with methods designed for the specific application of sheet steel to that surface. Size, penetration, type, and spacing shall be determined by design.

b. Welds shall conform to the requirements of AWS D.1.1, AWS D.1.3., and AISI Manual Section 4.2. Welds may be butt, fillet, spot, or groove type, the appropriateness of which shall be determined by and within the design calculations. All welds shall be touched up using zinc-rich paint.

c. Steel drill screws shall be of the minimum diameter indicated by the design of that particular attachment detail. Penetration through joined materials shall not be less than three (3) exposed threads.

d. Screws shall have a protective coating at least equivalent to cadmium plating (ASTM A165, Type NS) for use in exterior assemblies, except where finishing of screw heads with joint compound is necessary.

e. Wire tying in structural applications is not permitted.

5. Tolerances

a. Vertical alignment (plumbness) of studs shall be within 1/960th (1/8" in 10'-0") of the span.

b. Horizontal alignment (levelness) of walls shall be within 1/960th (1/8" in 10'-0") of their respective lengths.

c. Spacing of studs shall not be more than +/- 1/8" from the designed spacing, providing that the cumulative error does not exceed the requirements of the finishing materials.

d. Prefabricated panels shall not be more than 1/8" out of square within the length of that panel.

6. Inspections

a. Inspections shall be performed in order to assure strict conformance to the Shop Drawings at all phases of construction.

b. All members shall be checked for proper alignment, bearing, completeness of attachments, proper alignment, reinforcement, etc.

c. All attachments shall be checked for conformance with the Shop Drawings. All welds shall be touched up in accordance with Section 3.B.4.

d. General inspection of structure shall be completed prior to applying loads to those members.

7. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturers' recommended installation procedures as approved by the Architect/Engineer, anchoring all components firmly into position for long life under hard use.

END OF SECTION

07175 WATER REPELLANT COATINGS

1. GENERAL

A. At exposed concrete slabs, provide a water repellant coating.

B. Related work: See Division 1.

2. PRODUCTS

A. Provide clear, water based alkylalkoxysilane penetrating sealer suitable for traffic bearing surfaces equivalent to “Enviroseal 40" manufactured by Clariant Life Science Molecules, Post Office Box 1466, Airport Industrial Rd., Gainesville, FL 32602, (352) 376-8246.

3. EXECUTION

A. Before applying waterproofing, the surface should be dry, free of efflorescence, dirt, loose particles, and foreign matter. All cracks, openings, and structural defects must be repaired

B. Apply waterproofing either by brush or low-pressure spray to virgin, concrete surfaces. Verify compliance with manufacturer’s recommended application temperature before commencing work.

C. Use material as it comes from factory container without thinning. Apply generously. Flood onto the surface for maximum absorption.

D. Coating application shall be done in strict accordance with the manufacturer's published recommendations and good workmanship.

END OF SECTION

07200 INSULATION – ALTERNATE

1. GENERAL

A. Description

This shall be provided as an alternate to no insulation under the roof deck.

B. Quality Assurance

Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. MATERIALS

A. Provide radiant barrier insulation equivalent to ProDex HighR reflective insulation on the underside of the roof deck.

3. EXECUTION

A. Installation:

1. Installation shall be in strict accordance with the manufacturer's requirements for optimal thermal performance.

END OF SECTION

07624 FLASHING AND SHEET METAL (ALUMINUM)

1. GENERAL

A. Description

1. Work included:

a. Provide all flashing and sheet aluminum not specifically described in other Sections of these Specifications but required to prevent penetration of water through exterior shell of the building.

b. Provide materials and labor for flashing vent stacks, equipment curbs, and flashing as illustrated in the Drawings.

2. Definitions (as used in these documents):

a. Girth: Width of the unformed metal stock.

4. Quality Assurance

a. Standards: Comply with standards specified in this Section.

b. **ALL metal work shall be fabricated and installed in accordance with SMACNA.**

c. Qualifications of Manufacturer: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production.

d. Qualifications of Installers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Product Handling

1. Protection: Use all means necessary to protect materials of this Section before, during, and after installation and to protect installed work and materials of all other trades.

2. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect/Engineer and at no additional cost to the Owner.

2. PRODUCTS

A. Design

1. Standard commercial items may be used for flashing, trim, and reglets, provided all such items meet or exceed the quality standards specified herein.

2. Quality Standards: In addition to complying with all pertinent codes and regulations, comply with all pertinent recommendations contained in "Architectural Sheet Metal Manual," current edition, of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA).

B. Materials and Thickness

1. Where sheet aluminum is required, and no thickness is indicated on the Drawings, provide the highest quality with a minimum thickness commensurate with the following standards, based on SMACNA.

2. Finish of all gutters, flashing and downspouts shall match that of metal roof panels, unless noted otherwise.

3. Minimum inside bend radius on flashings shall be 3T, and all edges shall have open hem for stiffness.

4. Unless shown otherwise on the drawings, the following gauges shall be used:

.040" - gravel stops and counter flashing
.032" - all other miscellaneous flashing

MINIMUM THICKNESS FOR GUTTER*

GIRTH (INCHES)	ALUMINUM (INCHES)
Up to 15	0.032
16 to 20	0.040
21 to 25	0.051
26 to 30	0.063

*Unless otherwise noted on the drawings, gutters shall be a minimum of 6" x 6" rectangular, style "F" per SMACNA.
*Note: Provide .032" thick minimum at all locations where a Kynar (or equivalent) finish is specified.

DIMENSIONS AND MINIMUM THICKNESS OF STANDARD DOWNSPOUTS*

TYPE	AREA (SQ. IN.)	NOMINAL SIZE (INCHES)	ACTUAL SIZE (INCHES)	ALUMINUM (INCHES)
PLAIN ROUND	7.07 12.57 19.63 28.27		3 4 5 6	0.025
CORRUGATED ROUND	5.91 11.01 17.72 25.97	3 4 5 6		0.025
PLAIN RECTANGULAR	3.94 6.00 12.00 20.00 24.00	2 3 4 5 6	1¾ x 2 ¼ 2 x 3 3 x 4 3 ¾ x 4 ¾ 4 x 6	0.025

	3.80	2	1 ¾ x 2 ¼	
RECTANGULAR	7.73	3	2 d x 3 ¼	0.025
CORRUGATED	11.70	5	2 ¾ x 4 ¼	
	18.75	5	3 ¾ x 5	

* Unless otherwise noted on the drawings, downspouts shall be a minimum of 3" x 4" plain rectangular.
*Note: Provide .032" thick minimum at all locations where a Kynar (or equivalent) finish is specified.

C. Aluminum

1. General: Sheet aluminum shall be a standard brand of sheet aluminum, equivalent to Reynolds.

2. Aluminum Sheets:

a. All aluminum sheets shall meet ASTM B-209 with both coil and cut length sheets.

b. Aluminum flashing shall be formed from sheet stock or extruded shapes and all clips and caps shall be at least Series 300 non-magnetic stainless steel.

c. Color for flashing, gutters, downspouts and all related components, such as brackets, shall be chosen by A/E from samples provided. Finishes shall be factory-applied with a 20-year guarantee against fading and chipping. Brackets and supports shall match the color of the gutter or downspout as appropriate.

D. Nails, Rivets, and Fasteners

Use only aluminum rivets having rust-resistive coating, aluminum nails, and stainless steel screws and washers in connection with aluminum.

E. Joint Caulking

All joint caulking shall be clear silicone type. See Section 07900.

F. Other Materials

All other materials, not specifically described but required for a complete and proper installation of the work of this Section, shall be new, first quality of their respective kinds, and as selected by the Contractor subject to the approval of the Architect/Engineer.

3. EXECUTION

A. Inspection

Examine the areas and conditions under which work of this Section will be installed. Correct conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

B. Workmanship

1. General

a. Form all sheet metal accurately and to the dimensions and shapes required, finishing all molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit, mechanically fastening securely and caulking water-tight with gutter caulk material.

b. Unless otherwise specifically permitted by the Architect/Engineer, turn all exposed edges back 1/2".

2. Expansion: Form, fabricate, and install all sheet metal so as to adequately provide for expansion and contraction in the finished work.

a. **Gutters shall be generally seamless for straight runs unless length exceeds that as specified in SMACNA. For Gutter Expansion Joints - Comply with SMACNA, Plate 6.**

b. **Where gutters are continuous at inside and outside roof corner, corner sections shall be shop-fabricated. Utilize corner section joints to allow for expansion and contraction of straight runs.**

3. Weatherproofing:

   a. Finish watertight and weathertight where so required.

   b. Make all lock seam work flat and true to line.

   c. Make all lock seams and lap seams, when sealing, at least 1/2" wide.

   d. Where lap seams are not sealed, lap according to pitch but in no case less than 3".

   e. Make all flat and lap seams in direction of flow.

4. Joints:

   a. Join parts with rivets or sheet metal screws where necessary for strength or stiffness.

   b. Provide suitable watertight expansion joints for all runs of more than 40', except where closer spacing is indicated on the Drawings or required for proper installation.

5. Nailing:

   a. Whenever possible, secure metal by means of clips or cleats without nailing through the metal.

   b. In general, space all nails, rivets, and screws not more than 8" apart and, where exposed to the weather, use neoprene washers.

   c. For nailing into wood, use ring shank aluminum roofing nails 1-1/4" long by 11 gauge.

   d. For nailing into concrete, use drilled plugholes and plugs.

6. Cleaning: After installation, thoroughly wash with a mild cleaning solution or as recommended by flashing manufacturer.

C. Tests

Upon request of the Architect/Engineer, demonstrate by hose or standing water that all flashing and sheet metal is completely watertight.

END OF SECTION

07900 CAULKING AND SEALANTS

1. GENERAL

A. General Requirements: Applicable provisions of general conditions and special conditions govern work in this Section. The Contractor shall provide all items, articles, materials, operations, or methods listed, mentioned, or scheduled on the drawings or herein, including all labor, materials, equipment, and incidentals necessary and required for their completion. Caulking and sealants shall not be applied when the temperature is below 40 degrees F. Caulking and sealing work shall only be done by an applicator who is normally engaged in work of this nature.

B. Work Included: Furnish all labor and materials to complete all work shown, mentioned or noted on the drawings, specified herein, or both to include, but not necessarily limited to the following.

1. Caulking of all joints exposed on the exterior of the building in the area of the work shown on these documents.

2. Caulking all flashing joints indicated in the area of the work on these documents.

C. Quality Assurance

1. Applicator

a. Qualifications: Shall have a minimum of two (2) years of experience installing sealants.

b. Identification: Shall be listed on bid form with major subcontractors.

c. Compatibility with Substrate: Applicator shall be responsible for verifying that sealants used are compatible with joint substrates.

2. Joint Tolerance: All joints varying over 1/8" from design dimension shall be called to the attention of the Architect/Engineer prior to sealant installation. Joint width/depth ratios are critical to sealant performance and compliance with those limitations is required.

D. Submittals

1. For general description of submittals and substitutions, see Section 01340.

E. Product Delivery and Storage

1. For general description of product delivery, storage and handling, see Section 01640.

F. Guarantees

1. Sealed joints shall be guaranteed against adhesive or cohesive failure of sealant and watertightness of sealed joint for five (5) years.

2. PRODUCTS

A. Materials

1. Sealants

REFERENCE #		DESCRIPTION & REQUIRED PRODUCT CHARACTERISTICS
1.	TT-S-227(e) Class A (Type I or II as required)	Two component polyurethane or polysulfide, with Shore A hardness of 30-40. Acceptable: Vulkem 245, Vulkem 227 and Vulkem 922 by Mameco International; Dynatrol II and NR-200 by Pecora; Dualthane and Pourthane by W.R. Meadows.
2.	TT-S-230(c) Class A (Type I or II as required)	One component polyurethane or polysulfide with Shore A hardness of 25-45. Acceptable: Vulkem 45, Vulkem 116 and Vulkem 921 by Mameco International; Dynatrol I and NR-201 by Pecora; Sikaflex 1A by Sika.
3.	TT-S-1543 Class A (Amide cure only)	One component silicone, non-acid cure construction sealant, minimum 1500% elongation, shore A hardness of 15-25. Acceptable: Dow Corning 790.
4.	TT-S-1543 Class A (Acetoxy cure or Amide cure)	One component silicone (primer or primerless) for structural glazing; Shore A hardness of 25-30. Acceptable: Dow Corning 999, Dow Corning 795, GE 1200 by General Electric, 863 by Pecora.
5.	SSS-S-200(d) Type H	Two component, coal tar extended, fuel resistant, polyurethane sealant, Shore A hardness of 10-35. Acceptable: Vulkem 202 by Mameco; NR-300 by Pecora; Gardox by W.R. Meadows.
6.	TT-S-1543 Class A (Mildew resistant)	One component silicone, mildew resistant, Shore A hardness of 20-30. Acceptable: Dow Corning 786.

2. Caulking

REFERENCE #	DESCRIPTION & REQUIRED PRODUCT CHARACTERISTICS

7.	ASTM C834-76	One component Acrylic Latex caulking with a minimum of 75% recovery when tested in accordance with ASTM C-736-72. Acceptable: AC-20 by Pecora; Easaply by W.R. Meadows.
8.	(N/A)	One component acoustical caulking, non-drying, non-hardening, synthetic rubber. Acceptable: BA-98 by Pecora; Acoustical Sealant by Temco.

3. Primers

a. Shall be in accordance with Manufacturer's instructions. Manufacturer shall be consulted for all surfaces not specifically covered in submitted application instructions

4. Backer Rod

a. Shall be open or closed cell polyethelene or polyurethane as recommended by the sealant manufacturer. Bond breaker tape shall be used to prevent three-sided adhesion in locations where backer rod cannot be used.

5. Solvents, cleaning agents, and other accessories shall be as recommended by the Manufacturer.

3. EXECUTION

A. Inspection

1. Substrate surface shall be inspected to ensure that no bond-breaker materials contaminate the surface to which the sealant is to adhere and to ensure that unsound substrates are repaired.

2. Joint dimensions shall be verified to ensure that all dimensions are within tolerances established in Paragraph 1C above.

B. Preparation

1. Prepare all joints in accordance with Manufacturer's recommended instructions to ensure maximum adhesion. Prime as required, protecting all adjacent exposed surfaces.

2. Porous material shall be cleaned where necessary to provide a base for sealant adhesion by grinding, blast-cleaning, acid washing, or a combination of these methods.

3. Laitance shall be removed by acid cleaning.

4. Non-porous surfaces shall be cleaned either mechanically or chemically. Protective coatings on metal surfaces shall be removed by a solvent that leaves no residue. Do not allow solvent to dry before wiping all solvent off the surface.

C. Installation

1. Sealant shall be mixed (if multi-component) and installed in accordance with Manufacturers' recommendations and instructions to ensure complete mixing and an installed proper width/depth ratio with maximum adhesion contact. Three-sided adhesion must be prevented.

2. Backer rod shall be installed using only blunt or rounded tools which will ensure a uniform (∀ 1/8") depth without puncturing the material. Backer rod shall be a minimum of 33% oversized for closed cell and a minimum of 50% oversized for open-cell backer rod, unless otherwise required by the Manufacturer.

3. Surrounding surfaces shall be protected as required to ensure no sealant contaminates these surfaces.

4. Joints to receive caulking and sealants shall be a minimum of ¼" deep unless indicated or specified otherwise.

5. Joints in Masonry and Concrete: Depth of the caulking may be equal to the width in joints up to ½" wide. For joints ½" to 1" wide, depth shall be ½". For expansion and other joints 2" to 2½" wide, depth shall not be greater than ½ the applied sealant width.

6. Joints in Metal: Caulking shall be a minimum of ½ the applied sealant width, and in no case exceed the applied sealant width.

7. Primer shall be applied to all surfaces as recommended by the Manufacturer.

8. Caulking and sealant shall be applied with guns in accordance with the Manufacturers' printed recommendations. Materials shall completely fill joints.

D. Cleaning of Surfaces: Adjacent surfaces shall be cleaned of soiling and materials resulting form this work with solvent or cleaning agent recommended by the Manufacturer.

E. Concrete slabs shall receive two coats of sealant according to Manufacturer's instructions and in recommended quantities per unit of area. Concrete walls shall be sealed by applying one coat of sealer according to Manufacturer's instructions and recommended quantity per unit of area. Sealer shall be Thompson's Water Seal or Crystal Clear by Lambert or Enviroseal by Clariant Life Science Molecules.

F. Both temperature and dampness conditions may restrict applications of these sealants. Comply with Manufacturer's instructions.

G. Schedule (unless shown otherwise on the Drawings)

JOINT TYPE	SEALANT REFERENCE NUMBER							
	1	2	3	4	5	6	7	8
A. Exterior and Interior Sealants								
1. Significant movement (panel, coping, control and expansion joints)	X		X					
2. Minimal movement (Reglet and perimeter joints)	X	X	X					
3. Paving (requiring fuel resistant sealants)					X			
B. Glazing Sealants								
1. Structural				X				
2. Non-Structural		X	X	X				
C. Interior								
1. General							X	
2. Special								
a. Bathrooms						X		
b. Exposed Acoustical							X	
c. Non-exposed Acoustical								X

END OF SECTION

PART 1 GENERAL

A. Prepare openings in building bays to receive installation of roll-up weather curtains

PART 2 PRODUCTS

A. Manufacturer: FENETEX clear vinyl weather screens. With motors and controls for retractable opertation.

PART 3 EXECUTION

A. Prepare head condition of openings for future mounting of the curtain housing and motor.
B. Prepare jamb condition of openings for the curtain tracks.
C. Provide junction boxex and conduit with pull-strings to controls and motors.

END OF SECTION

09265 FIBERGLASS MAT GYPSUM SHEATHING

1. GENERAL

A. Description

1. Work Included: Provide all exterior grade gypsum sheathing at metal building columns with all accessories complete in place as shown on the Drawings, specified herein, and needed for a complete and proper installation.

B. Quality Assurance

1. Standards: Comply with standards in the *Gypsum Construction Handbook*.

2. Qualifications of Manufacturer: Products used in the Work of this Section shall be produced in the U.S. by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Architect/Engineer.

3. Qualifications of Installers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

4. Manufacturer's Recommended Installation Procedures: The manufacturer's recommended installation procedures, when approved by the Architect/Engineer, will become the basis for inspecting and accepting or rejecting actual installation procedures used on the Work.

C. Product Handling

1. Protection: Use all means necessary to protect materials of this Section before, during, and after installation and to protect installed work and materials of all other trades.

2. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect/Engineer and at no additional cost to the Owner.

3. Delivery and Storage: Deliver all materials to the job site in their original unopened containers with all labels intact and legible at time of use. Store in strict accordance with the manufacturer's recommendation as approved by the Architect/Engineer.

2. PRODUCTS

A. Gypsum Wallboard

1. General:

a. Comply with Federal Specification SS-L-30, Type III, Class I, Style 3, taper-edge, and of the grade and form specified below, in 48" widths and in such lengths as will result in the minimum of joints. All gypsum wall board shall be manufactured in the USA.

b. Products listed herein shall be used unless other specific products are listed for a designated UL Design Assembly where noted on the drawings.

2. Sheathing: Equivalent to Dens-Glass Gold, 1/2" thick. Install on exterior wall systems at building columns as designated on the drawings.

B. Studs & Furring

1. Metal Studs: Comply with Specification Section 05202 LIGHT STEEL FRAMING.

2. Furring: Where noted in the drawings or specifications, provide galvanized hat channels or 1x4 PT or FR framing for attachment of Gypsum board to masonry. For attachment to structural steel, “The Claw” single step beam and column drywall clips. (888-613-6085) or approved equivalent may be utilized.

C. Fastening Devices

1. For fastening gypsum wallboard in place on metal studs and metal channels, use flat-head screws, shouldered, specially designed for use with power-driven tools, not less than 1" long, with self-tapping threads and self-drilling points.

D. Other Materials

All other materials, not specifically described but required for a complete and operable installation of the work of this Section, shall be new, first quality of their respective kinds, and subject to the approval of the Architect/Engineer.

3. EXECUTION

A. General

1. All framing and sheathing shall be installed in accordance with the 2017 Florida Building Code, Building , Chapter 16.

B. Surface Conditions

1. Inspection: Prior to installation of the work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Verify that gypsum drywall may be installed in strict accordance with all pertinent codes and regulations, the manufacturers' recommendations as approved by the Architect/ Engineer, and the original design.

2. Discrepancies: Do not install gypsum drywall until all unsatisfactory conditions have been corrected.

C. Installation

1. Install the sheathing to studs at right angles to the furring or framing members. Make end joints, where required, over furring or framing members.

4. Attaching: Spacing of fasteners shall be as required per windloading in Chapter 16 of the 2017 Florida Building Code, Building.

D. Cleaning Up: In addition to the requirements of these Specifications, use all necessary care during execution of this portion of the Work to prevent scattering of scraps and dust onto floor surfaces. Promptly pick up and

remove from the working area all scraps, debris, and surplus material of this Section.

END OF SECTION

09960 FIBER REINFORCED PLASTIC PANELS (FRP)

1. GENERAL

A. Description

1. Work Included: Furnish and install fiber reinforced panels as called for in the drawings and/or specified herein.

2. Related Work: Porcelain tile base. Caulking and Sealants.

B. Quality Assurance

1. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. MATERIALS

A. Standard FRP panels with pebble finish, as manufactured by Marlite; 202 Harger Street, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: info@marlite.com www.marlite.com Color shall be P100 White. Flame Spread Rating: Class "C" or better. Provide standard panel sizes 4’ x 9’ [1.2m x 2.7m] x .120”

B. MOLDINGS: Extruded white PVC Trim Profiles.

M 350 Inside Corner
M 360 Outside Corner
M 365 Division
M 370 Edge

1.1 ACCESSORIES

A. Fasteners: Non-staining nylon drive rivets.
1. Match panel colors.
2. Length to suit project conditions.

B. Adhesive: Marlite C-551 FRP Adhesive - Water- resistant, non-flammable.

C. Sealant: Marlite Brand MS-251 White Silicone Sealant

3. EXECUTION

A. Comply with manufacturer's recommended procedures and installation sequence.

B. Cut sheets to meet supports allowing 1/8” inch (3 mm) clearance for every 8 foot (2.43m) of panel.
   1. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
   2. Pre-drill fastener holes 1/8 inch (3.175mm) oversize with high speed drill bit.
      a. Space at 8 inches (20.32cm) maximum on center at perimeter, approximately 1 inch from panel edge.
      b. Space at in field in rows 16 inches (40.64cm) on center, with fasteners spaced at 12 inches (30.48 cm) maximum on center.

C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
   1. Install panels with manufacturer's recommended gap for panel field and corner joints.
      a. Adhesive trowel and application method to conform to adhesive manufacturer’s recommendations.
      b. Drive fasteners for snug fit. Do not over-tighten.

D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
   1. All moldings must provide for a minimum 1/8 inch (3.18mm) of panel expansion at joints and edges, to insure proper installation.
   2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

1.2 CLEANING

A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.

B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION

10230 ALUMINUM WALKWAY COVERS

1. GENERAL

A. Description

1. Work Included: Provide all aluminum flashing not specifically described in other Sections of these Specifications but required to prevent penetration of water through walkway cover.

2. Aluminum walkway cover or canopy shall be entirely of anodized aluminum extrusions equivalent to product manufactured by Dittmer Architectural Aluminum, 1006 Shepard Road, Winter Springs, FL 32708. The structure shall be capable of sustaining severe icing, hail, hurricane winds and being walked upon.

3. Quality Assurance

a. Standards: Comply with standards specified in this Section.

b. Qualifications of Manufacturer: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production.

c. Qualifications of Installers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of the Section.

B. Product Handling

1. Protection: Use all means necessary to protect materials of this Section before, during and after installation and to protect installed work and materials of all other trades.

2. Replacement: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect/Engineer and at no additional cost to the Owner.

2. PRODUCTS

A. Materials: All sections shall be 6063 alloy heat-treated to a T-6 temper. Deck screws shall be type 18-8 stainless steel, sealed with neoprene "0" ring beneath stainless steel; trim rivets may be aluminum. A dip-coat of clear acrylic enamel shall insulate column ends from electrolytic reaction with grout. Grout shall be 3:1 Portland cement to masonry sand, 2000# compressive strength.

B. Internal Drainage: Water flow is directed from deck to beams and columns, as indicated by the drawings, for discharge out "weep holes" at ground level.

C. Bent Construction: Anodized beams and columns shall be heli-arc welded into rigid, one-piece units in the manufacturer's plant. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

D. Roof Deck: Extruded, self-flashing deck sections interlock into a composite unit, spanning double bays for superior loading. Deck shall be staked into a camber sufficient to offset dead-load deflection and to cause positive drainage on spans over 15'-0". Staking shall consist of an abrupt local deformation of deck-lock metal, each stake having a shear value in excess of 350# and shall occur as detailed.

E. Finish:

1. Painted finish shall consist of baked acrylic enamel, for maximum chalk and fade resistance, over chromate conversion pretreatment on deck and fascia. Bents, after solvent cleaning, shall receive one coat of vinyl wash-etch primer (Mil. #125-880) and a 1 mil. minimum coating of exterior grade, two-part, polyurethane for maximum abrasion resistance and maintainability.

4. Finish shall be selected by the Architect/Engineer from samples provided.

F. Dimensions: Contractor shall field-confirm bent location dimensions and elevations as shown on shop drawings prior to fabrication by manufacturer.

.

3. ERECTION

A. Installation:

1. Sleeves (styrofoam block-outs) shall be furnished by manufacturer and set by General Contractor, or authorized installer, shall be scheduled to erect after all adjacent roofing and masonry have been completed.

2. Concrete footings, anchor bolts and/or flashing, where required shall be by others.

3. Bents shall be carefully aligned prior to grouting; downspout column interiors shall be grouted to lower edge of "weep hole"; deflectors shall be installed after grouting.

4. All deck ends at beam joints shall be capped as detailed. Butt and miter joints shall be executed in a workmanlike manner.

B. Approval: Written approval of the Architect/Engineer must be obtained 10 days prior to bid opening. Interested manufacturers must furnish full details of proposed product, engineering calculations on all sections involved, physical samples of all shapes, and a list of installations similar in size and design.

C. Tests: Upon request of the Architect/Engineer, demonstrate by hose or standing water that all flashing and sheet metal is completely watertight.

END OF SECTION

10520 FIRE EXTINGUISHERS, CABINETS & AEDs

1. GENERAL

A. Description

1. Work Included: Provide fire extinguishers and cabinets where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. At minimum, install one fire extinguisher adjacent to every exterior door.

2. The builder is responsible for supplying and maintaining fire extinguisher coverage for the building portion of a building under construction or renovation.

2. Related Work:

a. Documents affecting Work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Quality Assurance

1. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

C. Submittals

1. Comply with pertinent provisions of the Section on Submittals.

2. Product Data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

a. Materials list of items proposed to be provided under this Section;

b. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

c. Dimensioned drawings as needed to depict the space required for these items, and their interface with the work of other trades.

d. Manufacturer's recommended installation procedures which, when approved by the Architect/Engineer, will become the basis for accepting or rejecting actual installation procedures used on the Work.

D. Product Handling

1. Comply with pertinent provisions of the Section on Product Handling.

2. PRODUCTS

A. Cabinets (for buildings with fire extinguisher cabinets)

1. Where shown on the Drawings, provide cabinets, equivalent to the following manufacturers:

a. Potter-Roemer, 3715 Northcrest Rd., S-8, Atlanta, GA 30340, (707) 451-4800; (800) 762-0542.

b. Larsen's, 3130 N.W. 17th St., Ft. Lauderdale, FL 33311, (954) 486-3325.

c. J.L. Industries, (Thomas Enterprise), 5758 Corporation Circle, Fort Myers, FL 33905, (941) 693-7500.

3. Provide the following cabinet type(s) or feature(s):
a. Be semi-recessed and shall not protrude more than 4" from the wall.
b. Not be lockable unless they are placed on the exterior of the building.
c. Be sized to hold a minimum of ten-pound ABC extinguisher.
d. Maintain the appropriate fire ratings when the cabinets are placed in rated walls.
e. Have the words "Fire Extinguisher" clearly visible on the exterior of the cabinet.
f. Have signage placed to guide occupants to their location when hidden by columns or other building components.
g. Be Constructor-supplied and Constructor-installed.

h. If the building has a fire alarm system, the keys to the Cabinets shall match those of the Fire Alarm.

B. Fire Extinguishers

1. Fire extinguishers are UF-supplied and UF-installed items. They shall be purchased directly by the University entity administering the project through the University of Florida, Environmental Health & Safety Division Fire Equipment Services Unit using project funds.

2. The UF Fire Equipment Services Unit shall determine the appropriate type(s) of extinguisher(s) to supply for proper coverage.

C. Automatic External Defibrillators (AEDs)

Include the addition of one or more AEDs, with the cabinet(s) specified, furnished, and installed by the project and the device(s) themselves purchased by the project and installed by UF EH&S. Consult with EH&S during design regarding type/size, quantity, and location(s).

3. EXECUTION

A. Prior to Construction: If a building is to be renovated, the Constructor shall call the UF Fire Equipment Services Unit at (352) 392-1904 prior to the start of construction to April 2016 104000 Safety Specialties UF Design and Construction Standards Page 1 of 2 arrange for removal of existing fire extinguishers and hoses from the construction areas. The project shall be credited with the cost of extinguishers.

B. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

C. Installation

1. Coordinate as required with other trades to assure proper and adequate provision in the Work of those trades for interface with the work of this Section.

2. Construction Completion: At the conclusion of the project, the Constructor shall call the UF Fire Equipment Services Unit to install fire extinguishers throughout the project. Any credit for extinguishers removed at the start of construction shall be applied towards the purchase of replacement extinguishers for this project.

END OF SECTION

10600 SIGNS

1. GENERAL

A. All signs shall comply with *FBC-A, Florida Building Code- Accessibility*, and all other applicable codes, standards, and ordinances.

B. Signs shall be as detailed on the drawing or as noted herein and shall be equivalent to "Seton Co., New Haven, Connecticut. Signs shall have contrasting colors with raised symbols, text and Braille. Signs shall be provided in stock colors available from the manufacturer and approved in advance by the Architect. In renovation projects, provide signage to match existing.

1. Other approved equivalent manufacturers:
   a. ADA Signage Distributors, Inc., Newton, KS
   b. Best Manufacturing Sign Systems, Montrose, CO

C. Quality Assurance

1. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

D. Submittals

Contractor shall submit samples to the Engineer for approval within 45 days after contract award.

2. PRODUCTS

A. Room Identification and similar interior signs are REQUIRED at the following indoor locations whether or not noted on the drawings: Floor Identification signs at each stairwell door at each level, public restrooms, public conference rooms, and adjacent to all exit doors which require illuminated exit signs, a Tactile sign: “EXIT” (w/Braille) (Per NFPA 101, 7.10.1.3). Other signs with tactile, raised Braille text at existing or new, unidentified rooms and spaces shall be installed to identify room numbers.

B. Accessible parking space signs: The Accessible symbol shall be stenciled on the asphalt (36" x 36" min.) Parking sign shall be equivalent to "Seaton

Co. beaded Embossed Reflective 12" x 18" blue/white steel #SA1222 E" mounted on a deformed steel post 7'-0" above finished grade to the bottom of the sign.

C. Accessible “Entrance” sign at building entrance on accessible route. White “Scotchcal” reflective graphics on blue “scotchlite” background with 2” high Palatino lettering. No border.

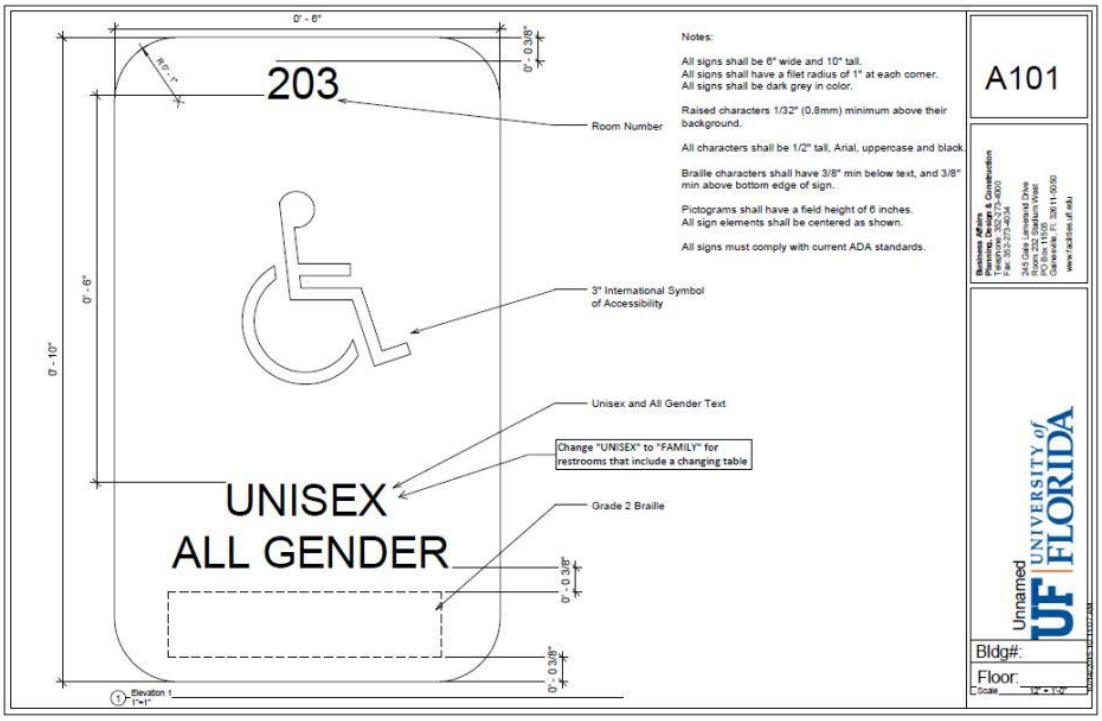
D. Building Signage: On west gable end provide 16” high, ½” thick, post mounted, brushed aluminum, Palatino font signage as shown on the drawings. Finish and style of signage shall match existing.

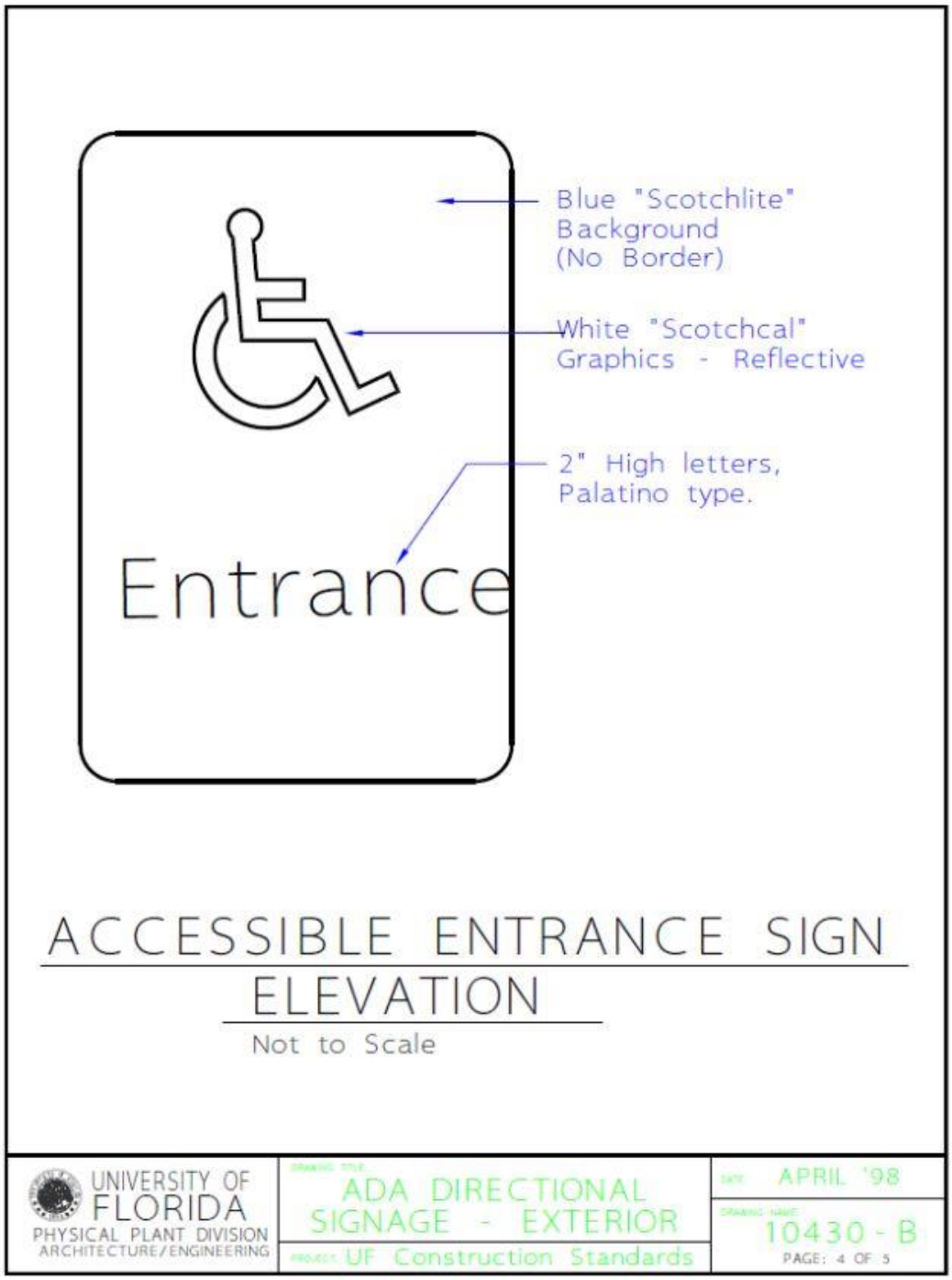
E. UF Building Number Signage: The address shall be numeric only, with minimum 6” high, brushed aluminum post-mounted numerals #8325.

F. Directional Signage: Directional signs shall comply with the Florida Building Code and the UF "Campus Exterior Sign Policy" (http://identity.ufl.edu).
   1. Colors shall be blue background (PMS #287) with white lettering.
   2. Location of signs for existing buildings shall be reviewed and approved by Planning Design & Construction and the O&M entity.
   3. See sign drawings in this section for clarification.

3. EXECUTION

A. Install plumb, level and securely following manufacturer’s written instructions.
B. Install signs where directed by EH & S.


0' - 6"
0' - 0 3/8"
R0' - 1"
203
Room Number
0' - 6"
0' - 10"
3" International Symbol of Accessibility
Unisex and All Gender Text
Change "UNISEX" to "FAMILY" for restrooms that include a changing table
UNISEX
ALL GENDER
Grade 2 Braille
0' - 0 3/8"
0' - 0 3/8"
1 Elevation 1
1" = 1'
Notes:
All signs shall be 6" wide and 10" tall.
All signs shall have a filet radius of 1" at each corner.
All signs shall be dark grey in color.
Raised characters 1/32" (0.8mm) minimum above their background.
All characters shall be 1/2" tall, Arial, uppercase and black.
Braille characters shall have 3/8" min below text, and 3/8" min above bottom edge of sign.
Pictograms shall have a field height of 6 inches.
All sign elements shall be centered as shown.
All signs must comply with current ADA standards.
A101
Business Affairs
Planning, Design & Construction
Telephone: 352-273-4000
Fax: 352-273-4034
243 Gale Lemerand Drive
Room 232 Stadium West
P.O. Box 115550
Gainesville, FL 32611-5550
www.facilities.ufl.edu
Unnamed
UF UNIVERSITY of FLORIDA
Bldg#:
Floor:
Scale 1/2" = 1'-0"


Blue "Scotchlite"
Background
(No Border)
White "Scotchcal"
Graphics - Reflective
2" High letters,
Palatino type.
Entrance
ACCESSIBLE ENTRANCE SIGN
ELEVATION
Not to Scale
UNIVERSITY OF
FLORIDA
PHYSICAL PLANT DIVISION
ARCHITECTURE/ENGINEERING
ADA DIRECTIONAL
SIGNAGE - EXTERIOR
UF Construction Standards
APRIL '98
10430 - B
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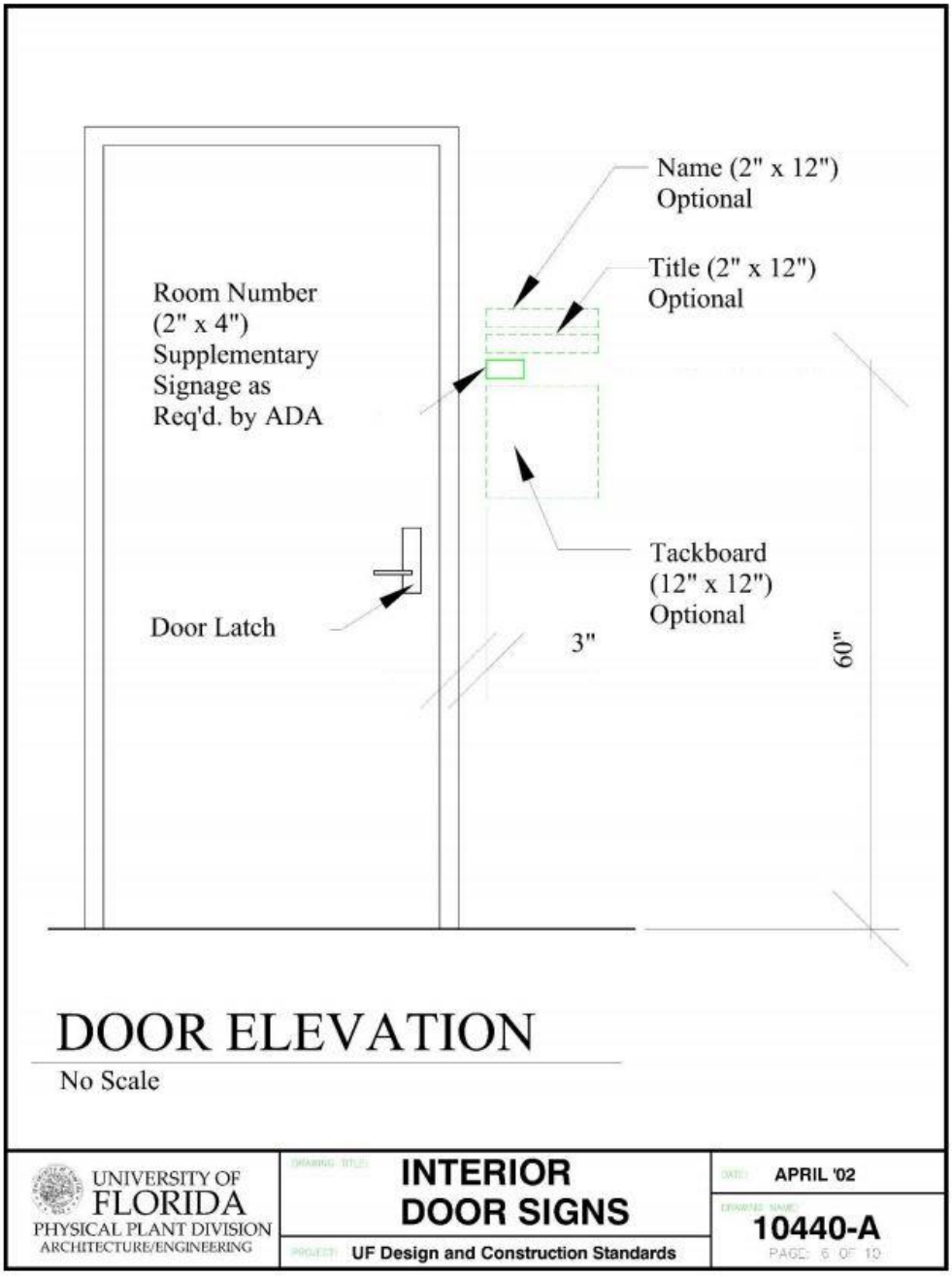
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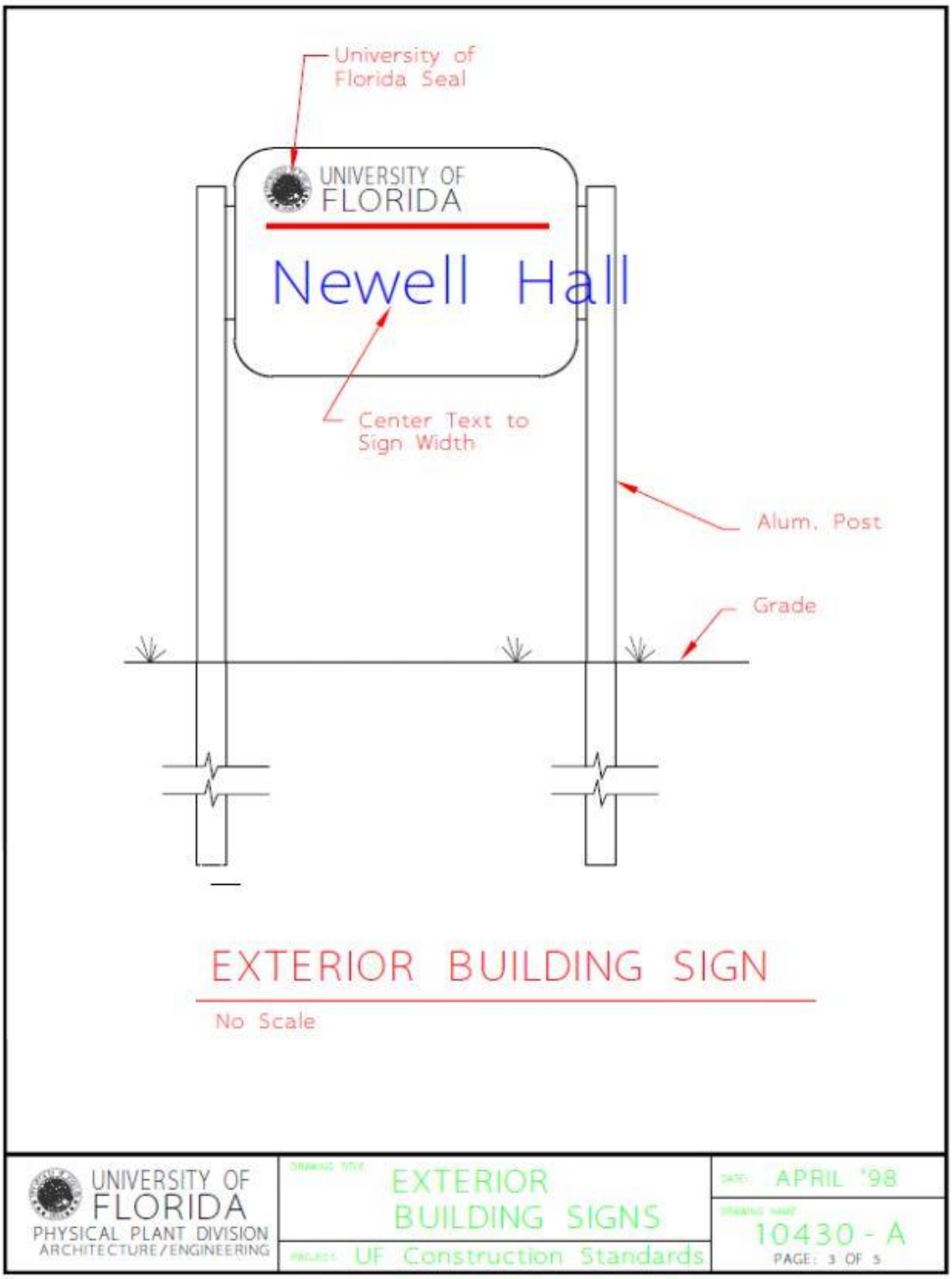
Optional
Title (2" x 12")
Optional
Room Number
(2" x 4")
Supplementary
Signage as
Req'd. by ADA
Tackboard
(12" x 12")
Optional
Door Latch
3"
60"
DOOR ELEVATION
No Scale
UNIVERSITY OF
FLORIDA
PHYSICAL PLANT DIVISION
ARCHITECTURE/ENGINEERING
INTERIOR
DOOR SIGNS
UF Design and Construction Standards
APRIL '02
10440-A
PAGE: 6 OF 10



END OF SECTION

13125 PREFABRICATED STRUCTURES

1. GENERAL

A. The intent of these specifications and drawings is to establish a quality and performance level for structural design, material, durability and workmanship for:

1. Structural steel main building frames and secondary framing including purlins and girts, engineered and fabricated by the building systems supplier.

2. Wall and Roof panels including soffits, fascia, gutters and downspouts.

B. The building design shall be equivalent to “Union Lasteel Metal Buildings”.
Contact: Matt Denson, (386) 496-0681.

C. General Contractor shall include in his bid submittal a complete list of the following:

1. Building Manufacturer and specific building proposed.

2. Statement that building proposed meets or exceeds all specification requirements.

D. Comply with all provisions of the "Florida Building Code". The following standards and criteria (of most recent issue) shall be used where applicable in the structural design of the building covered by this specification:

"Recommended Design Practices Manual"
Metal Building Manufacturers Association
"Steel Construction Manual"
American Institute of Steel Construction
"Cold Formed Steel Design Manual"
The Aluminum Association
"Code for Welding in Building Construction"
American Welding Society

The following criteria shall also be applicable in other phases of design:

Structural Steel Painting Council-Standards
Federal, Military and Commercial Standards
ASTM Standards.

E. Related Sections:
1. 07624 - FLASHING AND SHEET METAL (ALUMINUM)

2. 08340 – ROLL UP CURTAINS. Reference for coordination of curtain installation requirements.

2. DESIGN LOADS

A. General

The basic design loads shall include live, wind, and earthquake (if applicable), in addition to dead load. All other design loads, whether they be of static, dynamic or kinetic nature shall be considered as auxiliary loads.

ROOF LIVE LOAD = 20 PSF
FLOOR LIVE LOAD = N/A (SLAB-ON-GRADE)
WIND LOAD = 110 MPH PER FBC
EARTHQUAKE LOAD = N/A
SNOW LOADS = N/A
AUXILIARY LOADS = 5 PSF
EQUIPMENT LOADS = N/A
WIND IMPORTANCE FACTOR = 1.0
EXPOSURE = B
EAVE HEIGHT = 12 FEET

B. Vertical Live Loads

1. Purlins to be designed for a roof live load of 20 psf.

C. Wind Loads

1. The wind load of the structure shall be for 110 mph wind speeds with pressures proportioned and applied as horizontal and vertical forces according to and as recommended by the Metal Building Manufacturer's Association "Design Practices Manual" of current issue and the Standard Building Code latest editions.

D. Combination of Loads

1. The combining of normal loads and auxiliary loads for design purposes shall be as prescribed and recommended by the Metal Building Manufacturer's Association "Design Practices Manual" of recent issue, unless otherwise specified.

E. Certification

1. All bidders must submit within 5 days after bid opening, a letter from the metal building manufacturer certifying that the building proposed will be furnished to meet or exceed all the above design load criteria and that all structural design will be in strict conformance with that prescribed in the MBMA "Design Practices Manual" of recent issue, or as otherwise specified.

2. After the awarding of the contract, complete structural analysis shall be submitted by the metal building manufacturer to the Owner or his Agent upon request for same.

3. DESCRIPTION

A. The pre-engineered metal building covered by this specification is to be a beam and column structure of steel rafter beams and columns.

B. The bay spacing shall be as shown on plans.

C. The nominal dimensions shall be as shown on plans.

D. The minimum unobstructed clear height located throughout the interior of the building shall be as shown on plans.

E. Roof slope to be as shown on the plans.

4. ROOF COVERING AND SUPPORTS

The roof construction shall carry an Underwriters Laboratories Construction (Uplift) classification of not less than Class 90.

A. Roof Panels

1. The roof covering shall consist of long span sculptured nonembossed unfinished surfaced panels of not less than #26

gauge commercially pure aluminum coated steel or "galvalume". All roof panels shall be of steel tested in accordance with ASTM Designation A-446 (of current issue) to meet or exceed a minimum yield point of 37,000 psi, the protective coating of which shall be in accordance with the building manufacturer's standards.

B. Guarantee

1. Durability of the roof panels due to rupture, structural failure or perforating shall be guaranteed for a period of 15 years by the building manufacturer. A specimen copy of the document must accompany the bid, clearly stating the conditions under which the guarantee is valid.

5. WALL COVERING AND SUPPORTS

A. Wall Panels

1. The wall covering shall consist of non-embossed surfaced panels of not less than #24 U.S. gauge polyester acrylic coated steel. All wall panels shall be of steel tested in accordance with ASTM Designation A-446 (of current issue) to meet or exceed a minimum yield point of 48,000 psi. Color to be selected from manufacturer's standards by Architect/Engineer.

B. Guarantee

1. The exterior color (baked-on or laminated) finish for the wall panels shall be guaranteed by the building manufacturer for 15 years against blistering, peeling, cracking, flaking, checking and chipping. Excessive color change and chalking shall be guaranteed for 10 years, prorated years 6 through 10. Color change shall not exceed 5 N.B.S. units (per ASTM D-2244.64T) and chalking shall not be less than a rating of 8 per ASTM D-659.

C. Girts

1. The girt's configuration and thickness shall be the building manufacturer's standard provided all design criteria, including deflection and girt spacing is met.

2. Based on a simple span, the deflection of the girts (supporting the wall covering) shall be proportioned with due regard to that produced by the previously prescribed design (wind) load and its effect on the type of interior finish specified hereafter.

6. STRUCTURAL STEEL PROTECTION

A. All uncoated structural steel shall be hot dip galvanized with a G90 coating thickness in accordance with ASTM A123.

7. ACCESSORIES

A. Roof Ridge Vent - provide roof ridge vent; submit shop drawings for approval as per plans.

B. Ridge Vent Inserts - Ridge vents shall be installed with breathable foam vent system equivalent to ProfileVent Ridge Venting.

C. Gutter & Downspouts

Gutter to be full length along sides and ends of building. Color for gutters, downspouts and related components, including brackets and supports, to be selected from manufacturer's standards. Gutter brackets and downspout supports shall match gutter or downspout. See Section 07624 - FLASHING AND SHEET METAL (ALUMINUM) for material and thickness.

8. SPECIAL PROVISIONS

A. Shop drawings shall be submitted in quadruplet (4) of metal building showing all intended materials, accessories, details, etc., required for completed building as shown on Architect's/Engineer's drawings. No fabrication will begin until approval has been received by Architect/Engineer.

B. The structural analysis and shop drawings shall be signed and sealed by a Professional Architect/Engineer registered in the State of Florida.

C. Purlins & Girts

1. Purlins shall be galvanized with a coating of ¼ ounce per square foot, .002" thick. All field cuts on purlins must be treated with a cold zinc compound spray in accordance with the

manufacturer's recommendations. Galvanized purlins shall be supplied and installed in natural galvanized finish.

D. All purlins shall be G90 hot dip galvanized steel.

END OF SECTION

16305 CEILING FANS

1. GENERAL

A. Description

1. Work Included: Provide and install all electrical fixtures as described and called for on the drawings and/or herein.

2. Related Work: See electrical fixture legend on drawings for description of fixtures and manufacturer's numbers.

B. Quality Assurance

1. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. 7 year mechanical warranty.

3. 3 year electrical warranty.

2. PRODUCTS AND MATERIALS

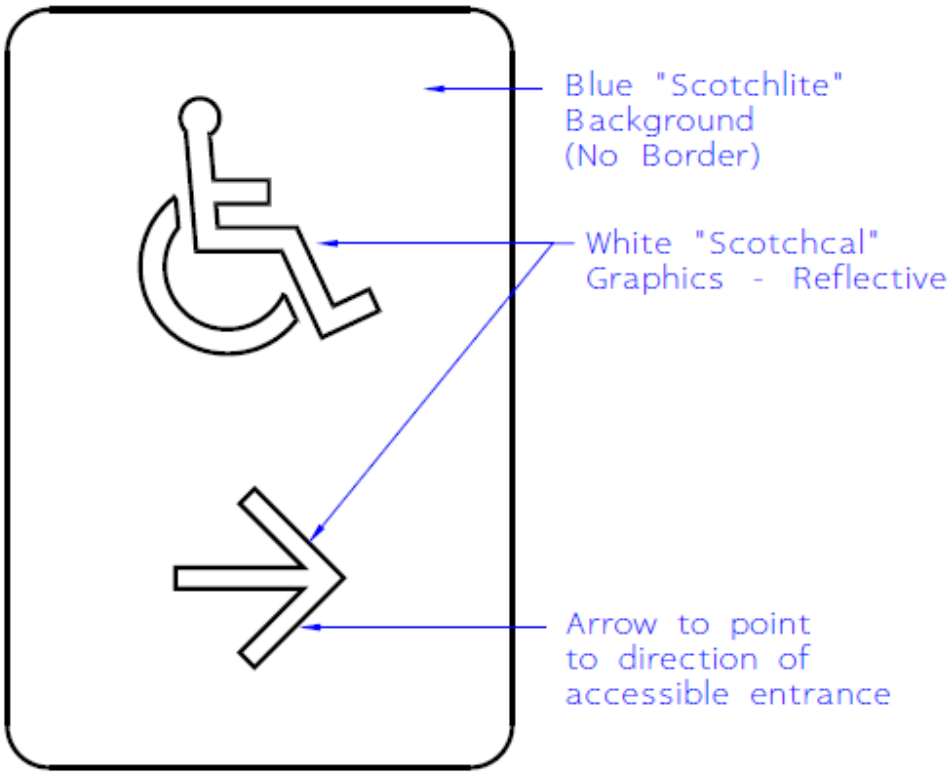
A. All fixtures shown are suggestions. Equivalent fixtures may be provided by the following manufacturers: Grainger

1. Ceiling Fan: BigAssFans Powerfoil 8, model # PF8-12.
2. Provide with all controls and mounting components required for full operation.

3. EXECUTION

A. Install with blades at 10’-0” a.f.f. minimum, in strict accordance with the manufacturer’s written instructions.

END OF SECTION



ACCESSIBLE ENTRANCE
DIRECTIONAL SIGN
ELEVATION

Not to Scale

UNIVERSITY OF FLORIDA
PHYSICAL PLANT DIVISION
ARCHITECTURE/ENGINEERING

DRAWING TITLE: ADA DIRECTIONAL SIGNAGE - EXTERIOR

PROJECT: UF Construction Standards

DATE: APRIL '98

DRAWING NAME: 10430 - C

PAGE: 5 OF 5

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PART 1 - GENERAL

1.1 The work covered by this division consists of providing all labor, equipment, and materials and performing all operations necessary for the installation of the plumbing work as herein called for and shown on the drawings.

1.2 Related Documents:

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

B. This is a Basic Requirements Section. Provisions of this section apply to work of all Division 22 sections.

C. Review all other contract documents to be aware of conditions affecting work herein.

D. Definitions:

1. Provide: Furnish and install, complete and ready for intended use.
2. Furnish: Supply and deliver to project site, ready for subsequent requirements.
3. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work and pay all fees and charges incidental thereto.

1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the said data.

1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be construed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

1.7 Field Measurements and Coordination:

A. The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.

B. Verify all field dimensions and locations of equipment to ensure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.

C. Coordinate work in this division with all other trades in proper sequence to ensure that the total work is completed within contract time schedule and with a minimum cutting and patching.

D. Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only

on plumbing drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others.

E. Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings, and passageways. Cut no structural members without written approval.

F. Carefully examine any existing conditions, piping, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.

G. Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or piping cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.

1.8 Guarantee:

A. The Contractor shall guarantee labor, materials, and equipment for a period of one (1) year from Substantial Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.

B. Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.

1.9 Approval Submittals:

A. When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.

1. Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.

a. Submittals shall be properly organized in accordance with the approved submittal control log.
b. Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.
c. Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.

d. Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.
e. Submittals that include a series of fixtures or devices (such as plumbing fixtures or valves) shall be organized by the fixture number or valve type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether or not those items are used on other fixtures.
f. The electrical design shown on the drawings supports the plumbing equipment basis of design specifications at the time of design. If plumbing equipment is submitted with different electrical requirements, it is the responsibility of the plumbing contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the plumbing submittal with a written statement that this change will be provided at no additional cost. Plumbing submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.

B. If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
C. Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.
D. Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations, and details to scale (not smaller than 1/4" per foot), with dimensions clearly showing the installation. Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.

1.10 Test Reports and Verification Submittals: Submit test reports, certifications, and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports, and take corrective action within the scheduled contract time.

1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein. Submit manuals at the Substantial Completion inspection.

PART 2 - PRODUCTS

2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.

2.2 Equipment and Materials:

A. All equipment and materials shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.

B. Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings, and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated, or painted.

C. The label of the approving agency, such as UL or FM, by which a standard has been established for the particular item shall be in full view.

D. The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.

E. A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.

F. Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.

G. Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material, and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate manufacturer's products, or the particular products of named manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.

H. Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.

2.3 Requests for Substitution:

A. Where a particular system, product, or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product, or material specified.

B. Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.

1. Required product cannot be supplied in time for compliance with Contract time requirements.
2. Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.

3. Substantial cost advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services, and similar considerations.

C. All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:

1. Principal of operation.
2. Materials of construction or finishes.
3. Thickness of gauge of materials.
4. Weight of item.
5. Deleted features or items.
6. Added features or items.
7. Changes in other work caused by the substitution.
8. Performance curves.
9. If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

PART 3 - EXECUTION

3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.

3.2 Coordination:

A. The Contractor shall be responsible for full coordination of the plumbing systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping or other equipment passing through slabs or walls.

B. Any additional steel supports required for the installation of any plumbing equipment or piping shall be furnished and installed under the section of the specifications requiring the additional supports.

C. It shall be the Contractor's responsibility to see that all equipment such as valves, filters, and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.

D. All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

E. The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.

F. Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.

G. Start of work will be construed as acceptance of suitability of work of others.

3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.

3.4 Phasing: Provide all required temporary valves, piping, equipment, and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.

3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.

3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts, and washers. Level equipment.

3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 22. Obtain matched color coatings from the manufacturer and apply as directed. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.

3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.

3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.

3.10 Record Drawings:

A. During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all piping, equipment, and other systems which are not installed exactly as shown on the contract drawings.

B. Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.

3.11 Acceptance:

A. Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.

B. Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.

C. Operation and Maintenance Manuals: Furnish complete manual Table of Contents, organized, and tabbed by specification section. Manuals shall contain:

1. Detailed operating instructions and instructions for making minor adjustments.

2. Complete wiring and control diagrams.
3. Routine maintenance operations.
4. Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
5. Copies of approved submittals.
6. Copies of all manufacturer's warranties.
7. Copies of test reports and verification submittals.

D. Record Drawings: Submit record drawings.

E. Acceptance will be made on the basis of tests and inspections of job. Contractor shall furnish necessary mechanics to operate system, make any necessary adjustments and assist with final inspection.

PROJECT NAME
PROJECT NUMBER

ARCHITECT: Company Name

ENGINEER: Mitchell Gulledge Engineering

CONTRACTOR: Contractor Name

SUBCONTRACTOR: Sub Name

SUPPLIER: Supply Company

MANUFACTURER: Manufacturer

DATE: mm/dd/yyyy

SECTION: 22 XX XX/Section Name

1. Product 1: Manufacturer, Model

2. Product 2: Manufacturer, Model

3. Product 3: Manufacturer, Model

4. Product 4: Manufacturer, Model

5. Product 5: Manufacturer, Model

SAMPLE

Any standard heading is acceptable.

List each product individually. Include manufacturer name and model.

Include GC or CM Approval stamp indicating review and acceptance by responsible contractor.

END OF SECTION

PART 1 - GENERAL

1.1 The work covered by this division consists of providing all labor, equipment, and materials and performing all operations necessary for the installation of the plumbing work as herein called for and shown on the drawings.

1.2 This is a Basic Plumbing Requirements section. Provisions of this section apply to work of all Division-22 sections.

PART 2 - CODES

2.1 All work under Division 22 shall be constructed in accordance with the codes listed herein. The design has been based on the requirements of these codes; and while it is not the responsibility of the Contractor to verify that all work called for complies with these codes, he shall be responsible for calling to the Architect/Engineer's attention any drawings or specifications that are not in conformance with these or other codes prior to ordering equipment or installing work.

2.2 Comply with regulations and codes of utility suppliers.

2.3 Where no specific method or form of construction is called for in the contract documents, the Contractor shall comply with code requirements when carrying out such work.

2.4 Where code conflict exists, generally the most restrictive requirement applies. Comply with current code edition, unless noted.

2.5 Additional codes or standards applying to a specific part of the work may be included in that section.

2.6 The following codes and standards shall govern all work:

A. Florida Building Code - Sixth Edition (2017)
B. Florida Building Code - Sixth Edition (2017) - Existing Building
C. Florida Building Code - Sixth Edition (2017) - Energy Conservation
D. Florida Building Code - Sixth Edition (2017) - Mechanical
E. Florida Building Code - Sixth Edition (2017) - Plumbing
F. Florida Building Code - Sixth Edition (2017) - Fuel Gas
G. Florida Building Code - Sixth Edition (2017) - Accessibility
H. Florida Fire Prevention Code Sixth Edition
    1. Fire Code (NFPA 1 - 2015 Edition)
    2. Life Safety Code (NFPA 101 - 2015 Edition)
I. National Electric Code (NFPA 70 - 2014).

PART 3 - STANDARDS

All materials, installation, and systems shall meet the requirements of the following standards, including the latest addenda and amendments, to the extent referenced:

3.1 Underwriters' Laboratories (UL)
3.2 American National Standards Institution (ANSI)
3.3 American Society of Testing Materials (ASTM)
3.4 Air Conditioning and Refrigeration Institute (ARI)
3.5 National Fire Protection Association (NFPA)
3.6 National Electrical Manufacturers Association (NEMA)
3.7 Standards of the Hydronic Institute (IBR)

END OF SECTION

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PART 1 - DIVISION 01 - GENERAL REQUIREMENTS

1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 This is a Basic Plumbing Requirements section. Provisions of this section apply to work of all Division-22 sections.

1.3 Coordinate with the General Contractor for all cutting and patching. Contractors performing Division-22 work shall inform the General Contractor of all cutting and patching required prior to bidding and shall coordinate installation.

PART 2 - DIVISION 03 - CONCRETE

2.1 Refer to Division 03, Concrete for:

A. Rough grouting in and around plumbing work.
B. Patching concrete cut to accommodate plumbing work.

2.2 The following is part of Division-22 work, complying with the requirements of Division 03:

A. Curbs, foundations, and pads for plumbing equipment.
B. Basins, sumps, and vaults of plumbing work.
C. Underground structural concrete to accommodate plumbing work.
D. Inertia bases.

PART 3 - DIVISION 05 - METALS

3.1 Refer to Division 05, Metals for:

A. Framing openings for plumbing equipment.

3.2 The following is part of Division-22 work:

A. Supports for plumbing work.

PART 4 - DIVISION 07 - THERMAL AND MOISTURE PROTECTION

4.1 Refer to Division 07, Thermal and Moisture Protection for:

A. Caulking and waterproofing of all wall and roof mounted plumbing work.

PART 5 - DIVISION 09 - FINISHES

5.1 Refer to Division 09, Finishes for:

A. Painting exposed piping and equipment.
B. Painting structural metal and concrete for plumbing work.
C. Painting access panels.
D. Painting color-coded plumbing work indicated for continuous painting. See color schedule in Division-22 section, "Plumbing Identification".
E. Installation of access doors in gypsum drywall.

5.2 Colors shall be selected by the Architect for all painting of exposed plumbing work in occupied spaces, unless specified herein. Do not paint insulated or jacketed surfaces.

5.3 Perform the following as part of Division-22 work:

A. Touch up painting of factory finishes.
B. Painting of all hangers.

PART 6 - DIVISION 26 - ELECTRICAL

6.1 Plumbing contractor shall coordinate the exact electrical requirements of all plumbing equipment being provided with the electrical contractor. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the plumbing equipment basis of design. If plumbing equipment is submitted with different electrical requirements, it is the responsibility of the plumbing contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the plumbing submittal with a written statement that this design will be provided at no additional cost. Plumbing submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.

6.2 Electrical contractor shall provide disconnect switches, starters, and contactors for plumbing equipment unless specifically noted as being furnished as part of plumbing equipment.

6.3 Electrical contractor shall provide all power wiring, raceway and devices, and make final electrical connections to all plumbing equipment, switches, starters, contactors, controllers, and similar equipment.

END OF SECTION

PART 1 - GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to the work of this section.

1.2 This section is a Division-22 Basic Materials and Methods section, and is part of each Division-22 section making reference to or requiring valves specified herein.

1.3 Extent of valves required by this section is indicated on drawings and/or specified in other Division-23 sections.

1.4 Quality Assurance:

A. Valve Dimensions: For face-to-face and end-to-end dimensions of flanged or welding-end valve bodies, comply with ANSI B16.10.

B. Valve Types: Provide valves of same type by same manufacturer.

1.5 Approval Submittals: When required by other Division-22 sections, submit product data, catalog cuts, specifications, and dimensioned drawings for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valves with Division-22 section using the valves, not as a separate submittal. For each valve, identify systems where the valve is intended for use.

A. Ball Valves: Type BA.

PART 2 - PRODUCTS

2.1 General: Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes as indicated, and connections which properly mate with pipe, tube, and equipment connections.

2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide valves of one of the producers listed for each valve type. The model numbers are listed for contractor’s convenience only. In the case of a model number discrepancy, the written description shall govern.

2.3 Ball Valves:

A. General: Select with port area equal to or greater than connecting pipe area, include seat ring designed to hold sealing material.

B. Construction: Ball valves shall be rated for 600 psi non-shock cold water. Pressure containing parts shall be constructed of ASTM B-584 alloy 844, or ASTM B-124 alloy 377. Valves shall be furnished with blow-out proof bottom loaded stem constructed of ASTM B-371 alloy 694 or other approved low zinc material. Provide TFE packing, TFE thrust washer, chrome-plated ball and reinforced teflon seats. Valves 1" and smaller shall be full port design. Valves 1-1/4" and larger shall be conventional port design. Stem extensions shall be furnished for use in insulated piping where insulation exceeds 1/2" thickness.

C. Comply with the following standards:

D. MSS SP-72. Ball Valves with Flanged or Butt Welding Ends for General Service.

E. MSS SP-110. Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

F. Types of ball (BA) valves:

1. Threaded Ends 2" and Smaller (BA1): Bronze two-piece full port body with adjustable stem packing. Nibco T-585-70. Stockham S216-BR-R-T. Milwaukee BA125. Apollo 77-100.

2. Soldered Ends 2" and Smaller (BA2): Bronze three-piece full port body with adjustable stem packing. Nibco S-595-Y-66. Milwaukee BA350. Apollo 82-200.
3. Threaded Ends 1" and Smaller (BA3): Bronze two-piece full port body, UL listed (UL 842) for use with flammable liquids and LP gas. Nibco T-585-70-UL.
4. Flanged Ends 2-1/2" and Larger (BA7): Class 150, carbon steel full bore two-piece body with adjustable stem packing. Nibco F515-CS series. Apollo 88-240.

2.4 Valve Features:

A. General: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined by Installer for installation requirements. Comply with ANSI B31.1.
B. Valve features specified or required shall comply with the following:

1. Threaded: Provide valve ends complying with ANSI B2.1.
2. Solder-Joint: Provide valve ends complying with ANSI B16.18.
3. Trim: Fabricate pressure-containing components of valve, including stems (shafts) and seats from brass or bronze materials, of standard alloy recognized in valve manufacturing industry unless otherwise specified.
4. Non-Metallic Disc: Provide non-metallic material selected for service indicated in accordance with manufacturer's published literature.
5. Renewable Seat: Design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.

PART 3 - EXECUTION

3.1 Installation:

A. General: Install valves where required for proper operation of piping and equipment, including valves in branch lines to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward below horizontal plane.
B. Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.
C. Applications Subject to Corrosion: Do not install bronze valves and valve components in direct contact with steel, unless bronze and steel are separated by dielectric insulator.
D. Mechanical Actuators: Install mechanical actuators as recommended by valve manufacturer.

3.2 Selection of Valve Ends (Pipe Connections): Except as otherwise indicated, select and install valves with the following ends or types of pipe/tube connections:

A. Tube Size 2" and Smaller: Threaded valves. Soldered-joint valves may also be used.
B. Pipe Size 2" and Smaller: Threaded valves.
C. Pipe Size 2-1/2" and Larger: Flanged valves.

3.3 Non-Metallic Disc: Limit selection and installation of valves with non-metallic disc to locations indicated and where foreign material in piping system can be expected to prevent tight shutoff of metal seated valves.

3.4 Renewable Seats: Select and install valves with renewable seats, except where otherwise indicated.

END OF SECTION

PART 1 - GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-23 section making reference to pipes and pipe fittings specified herein.

1.3 Extent of pipes and pipe fittings required by this section is indicated on drawings and/or specified in other Division-23 sections.

PART 2 - PRODUCTS

2.1 Piping Materials: Provide pipe and tube of type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade, or class is not indicated, provide proper selection as determined by Installer for installation requirements, and comply with governing regulations and industry standards.

2.2 Pipe/Tube Fittings: Provide factory-fabricated fittings of type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube, valve, or equipment connection in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.

2.3 Piping Materials/Products:

A. Soldering Materials:

1. Tin-Antimony (95-5) Solder: ASTM B-32, Grade 95TA.
2. Silver-Phosphorus Solder: ASTM B-32, Grade 96TS.

B. Pipe Thread Tape: Teflon tape.

2.4 Copper Tube and Fittings:

A. Copper Tube:

1. Copper Tube: ASTM B88; Type K or L as indicated for each service; hard-drawn temper unless specifically noted as annealed.

B. Fittings:

1. Wrought-Copper Solder-Joint Fittings: ANSI B16.22.
2. Copper Tube Unions: Provide standard products recommended by manufacturer for use in service indicated.
3. Wrought-Copper Solder-Joint Drainage Fittings: ANSI B16.29.
4. Cast-Copper Flared Tube Fittings: ANSI B16.26.

2.5 Plastic Pipes and Fittings:

A. Pipes:

1. PVC DWV Pipe: ASTM D-2665, Schedule 40.

B. Fittings:

1. PVC Solvent Cement: ASTM D-2564.
2. PVC DWV Socket: ASTM D-2665.

PART 3 - EXECUTION

3.1 Installation:

A. General: Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently-leakproof piping systems, capable of performing each indicated service without piping failure. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance or replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings, not bushings. Align piping accurately at connections, within 1/16" misalignment tolerance.
B. Comply with ANSI B31 Code for Pressure Piping.
C. Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, columns and other structural and permanent-enclosure elements of building; limit clearance to 1/2" where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1" clearance outside insulation.
D. Concealed Piping: Unless specifically noted as "Exposed" on the drawings, conceal piping from view in finished and occupied spaces, by locating in column enclosures, chases, in hollow wall construction or above suspended ceilings; do not encase horizontal runs in solid partitions, except as indicated.
E. Electrical Equipment Spaces: Do not run piping through transformer vaults and other electrical, communications, or data equipment spaces and enclosures unless shown. Install drip pan under piping that must run through electrical spaces.
F. Cut pipe from measurements taken at the site, not from drawings. Keep pipes free of contact with building construction and installed work.

3.2 Piping System Joints: Provide joints of the type indicated in each piping system.

A. Solder copper tube-and-fitting joints where indicated, in accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply non-acid type solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
B. Thread pipe in accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed. Paint exposed threads to retard rusting.
C. Plastic Pipe Joints: Comply with manufacturer's instructions and recommendations, and with applicable industry standards.
    1. Solvent-cemented joints shall be made in accordance with ASTM D-2235 and ASTM F-402.
    2. PVC sewer pipe bell/gasket joints shall be installed in accordance with ASTM D-2321.

3.3 Piping Installation:

A. Install piping to allow for expansion and contraction.

B. Isolate all copper tubing from steel and concrete by wrapping the pipe at the contact point, and for one inch on each side, with a continuous plastic sleeve. Isolate all copper tubing installed in block walls with a continuous plastic sleeve.

END OF SECTION

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PART 1 - GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.
1.3 Extent of potable water systems work, is indicated on drawings and schedules, and by requirements of this section.

PART 2 - PRODUCTS

2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with Referenced Codes in Specification Section 22 05 01 – Plumbing Codes and Standards where applicable. Provide sizes and types matching pipe materials used in potable water systems. Where more than one type of materials or products is indicated, selection is Installer's option.
2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
2.3 Refer to appropriate Division-2 sections for exterior potable water system; not work of this section unless noted.
2.4 Code Compliance: Comply with applicable portions of Standard Plumbing Code pertaining to selection and installation of plumbing materials and products. Comply with local utility requirements.
2.5 Approval Submittals:

A. Product Data: Submit manufacturer's technical product data and installation instructions for:

1. Valves
2. Water hammer arresters

2.6 Test Reports and Verification Submittals:

A. Disinfection: Submit report by Health Department.

2.7 O&M Data Submittals: Submit a copy of all approval submittals.
2.8 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

A. Interior Water Piping:

1. Above Grade: Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.

2.9 Piping Specialties: Provide piping specialties complying with Division-22 Basic Plumbing Materials and Methods section "Piping Specialties".
2.10 Supports and Anchors: Provide supports and anchors complying with Division-22 Basic Plumbing Materials and Methods section "Supports and Anchors".
2.11 Interior Valves: Provide valves complying with Division-22 Basic Plumbing Materials and Methods section "Valves", in accordance with the following listing:

A. Sectional and Shutoff Valves: BA1, BA2.

2.12 Water Hammer Arresters: Provide bellows or piston type water hammer arresters with stainless steel casing, pressure rated for 250 psi, tested and certified in accordance with PDI Standards. Precision Plumbing Products, Josam, Zurn, Amtrol, Wade, Jay R. Smith, or approved equal.

PART 3 - EXECUTION

3.1 General: Examine areas and conditions under which potable water systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Install water distribution piping in accordance with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings".

A. Install piping with 1/32" per foot (1/4%) downward slope towards drain point.
B. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

3.3 Install valves in accordance with Division-22 Basic Plumbing Materials and Methods section "Valves".

A. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.

3.4 Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Standard Plumbing Code.

3.5 Install water hammer arresters in upright position, in locations and of sizes indicated in accordance with PDI Standard WH-201.

3.6 Piping Tests: Test, clean, and sterilize potable water piping in accordance with testing requirements of Division-22 Basic Plumbing Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION

PART 1 - GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.

1.3 Extent of soil waste and vent systems work is indicated on drawings and schedules, and by requirements of this section.

1.4 Refer to Division-7 section "Flashing and Sheet Metal" for flashings required in conjunction with soil and waste systems; not work of this section.

1.5 Code Compliance: Comply with applicable portions of Standard Plumbing Code pertaining to plumbing materials, construction and installation of products. Comply with local utility requirements.

PART 2 - PRODUCTS

2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in soil and waste systems. Where more than one type of materials or products is indicated, selection is Installer's option.

2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.

2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

A. Above Ground Soil, Waste, and Vent Piping:

1. Polyvinyl chloride plastic pipe (PVC); Type DWV; PVC plastic type DWV socket-type fitting, solvent cement joints. Do not use in fire-rated assemblies or return air plenums.

B. Underground Building Drain Piping (within 5 feet of the building):

1. Polyvinyl chloride sewer pipe (PVC); Type DWV; PVC plastic type DWV socket-type.

2.4 Pipe Specialties: Provide piping specialties complying with Division-22 Basic Materials and Methods section "Piping Specialties".

2.5 Supports and Anchors: Provide supports and anchors complying with Division-22 Basic Plumbing Materials and Methods section "Supports and Anchors".

2.6 Cleanouts: Provide factory-fabricated drainage piping products of size and type indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and governing regulations. Josam, Jay R. Smith, Wade, Zurn.

A. Cleanout for PVC Systems:

1. Cleanouts in Piping: PVC cleanout adaptor with threaded PVC plug.
2. Wall Cleanouts: PVC cleanout adaptor with tapped, countersunk, threaded brass plug and round stainless steel access cover with screw. Wade W-8304-75.

PART 3 - EXECUTION

3.1 Examine substrates and conditions under which soil and waste systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 Piping Installation:

A. Install above grade soil and waste piping in accordance with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", and with Standard Plumbing Code.

B. Install underground soil and waste pipes as indicated and in accordance with Standard Plumbing Code. Lay underground piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

C. Install building soil and vent piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller, and 1/8" per foot (1%) for piping 4" and larger.

3.3 Install piping specialties in accordance with Division-22 Basic Plumbing Materials and Methods section "Piping Specialties".

3.4 Install supports and anchors in accordance with Division-22 Basic Plumbing Materials and Methods section "Supports and Anchors".

3.5 Installation of Cleanouts: Install in above ground piping and building drain piping as indicated, as required by Standard Plumbing Code; and at each change in direction of piping greater than 45°; at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping, select type to match adjacent building finish.

A. Size: Cleanouts shall be full size up to 4". Piping over 4" shall have a reducing fitting to accommodate a 4" cleanout unless indicated otherwise on drawings.

B. Install cleanouts to allow adequate clearance for rodding.

C. Protect all finished surfaces of cleanouts with a suitable adhesive covering until construction is completed.

3.6 Piping Runouts to Fixtures: Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Standard Plumbing Code.

3.7 Test, clean, flush, and inspect soil and waste piping in accordance with requirements of Division-22 Basic Plumbing Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION

PART 1 - GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 This section is a Division-22 Basic Plumbing Materials and Methods section and is part of each Division-22 section making reference to or requiring the testing and other procedures specified herein.

1.3 Notify the Architect/Engineer when system tests are ready to be witnessed at least 24 hours prior to the test.

1.4 All materials, test equipment, and devices required for cleaning, testing, sterilizing or purging shall be provided by the Contractor.

PART 2 - PRODUCTS

2.1 None.

PART 3 - EXECUTION

3.1 Pressure Tests:

A. General: Provide temporary equipment for testing, including pump and gauges. Test piping systems before insulation is installed wherever feasible and remove control devices before testing. Test each natural section of each piping system independently but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with indicated medium and pressurize for indicated pressure and time.

B. Required test period is 2 hours.

C. No piping, fixtures, or equipment shall be concealed or covered until they have been tested. The contractor shall apply each test and ensure that it is satisfactory for the period specified before calling the Architect/Engineer to observe the test. Test shall be repeated upon request to the satisfaction of those making the inspection.

D. Observe each test section for leakage at the end of the test period. Test fails if leakage is observed or if pressure drop exceeds 5% of the test pressure.

E. Check of systems during application of test pressures should include visual check for water leakage and soap bubble or similar check for air and nitrogen leakage.

F. During heating and cooling cycles, linear expansion shall be checked at all elbows and expansion joints for proper clearance.

G. Repair piping systems sections which fail required piping test. Disassemble and re-install using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

3.2 Pressure Test Requirements:

A. Soil, Waste, Vent: Test all new piping within the building with a 10 foot head of water. Test piping in sections so that all joints are tested. Provide test tees as required. A smoke test can be used at the Contractor's option.

B. Domestic Water: Perform hydrostatic test on all piping within the building at twice the normal static pressure at service point, but not less than 100 psig. Once tested, flush out piping and leave under pressure of the supply main or 40 psig for the balance of the construction period.

3.3 Cleaning and Sterilization:

A. General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Flush out piping systems

with clean water or blowdown with air before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

B. Flush and drain all water systems at least three times. Reverse flush systems from smallest piping to largest piping. Replace startup strainers with operating strainers.

C. Blowdown all gas, air and vacuum systems with air or nitrogen (at a rate of flow exceeding design) at least three times or until no residue shows at each outlet. Reverse blowdown systems from smallest piping to largest piping.

D. Cleaning: After completion of all work and operational check out of the plumbing installations and prior to acceptance of the project by the Owner, the following shall be accomplished. The completed piping systems shall be thoroughly flushed (reversed flushing) and chemically cleaned as needed to remove all dirt, debris, and any foreign matter that may have been trapped in the piping systems during construction. After flushing of systems is complete, the Contractor shall clean all main strainers and all strainers at air handlers, fan coil units, VAV boxes, reheat coils.

3.4 Sterilization of Domestic Water Systems:

A. Prerequisites: All new hot and cold water piping installed (complete), all fixtures connected, system flushed out, and system filled with water.

B. The shut off valve at the point of connection shall be closed, all fixture outlets opened slightly, and a sterilizing solution shall be introduced at a manifold connection installed by the Contractor at the point of connection.

C. The solution shall contain 50 parts per million of available chlorine. The chlorinating material shall be either liquid chlorine or calcium hypochlorite. The solution shall be allowed to stand in the system for at least eight hours after which the entire system shall be flushed.

D. After final flushing, all aerators shall be removed, cleaned, and reinstalled. After final flush the residual chlorine shall not exceed 0.2 parts per million.

E. The Architect/Engineer shall be notified 24 hours prior to the procedure so that it can be witnessed.

F. Provide sampling and certified report by an independent testing lab. Provide written Health Department approval of disinfection samples.

3.5 Medical Gas: Purge all medical gas systems in accordance with NFPA 99.

END OF SECTION

PART 1 - GENERAL

1.1 The work covered by this division consists of providing all labor, equipment, and materials and performing all operations necessary for the installation of the electrical work as herein called for and shown on the drawings.

1.2 Related Documents:

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

B. This is a Basic Requirements Section. Provisions of this section apply to work of all Division 26 sections.

C. Review all other contract documents to be aware of conditions affecting work herein.

D. Definitions:

1. Provide: Furnish and install, complete and ready for intended use.
2. Furnish: Supply and deliver to project site, ready for subsequent requirements.
3. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work pay all fees and charges incidental thereto.

1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the said data.

1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be construed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

1.7 Field Measurements and Coordination:

A. The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.

B. Verify all field dimensions and locations of equipment to ensure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.

C. Coordinate work in this division with all other trades in proper sequence to ensure that the total work is completed within contract time schedule and with a minimum cutting and patching.

D. Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on electrical drawings, be guided by architectural details and conditions existing at job

and coordinate this work with that of others.

E. Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings, and passageways. Cut no structural members without written approval.

F. Carefully examine any existing conditions, wiring, devices, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.

G. Because of the small scale of the drawings, it is not possible to indicate all precise locations for all devices and equipment. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate devices, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or raceway cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.

1.8 Guarantee:

A. The Contractor shall guarantee labor, materials, and equipment for a period of one (1) year from Substantial Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.

B. Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.

1.9 Approval Submittals:

A. When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.

1. Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.

a. Submittals shall be properly organized in accordance with the approved submittal control log.
b. Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.
c. Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.
d. Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.

e. Submittals that include a series of fixtures or devices (such as lighting or panelboards) shall be organized by the device name or type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether those items are used on other fixtures.
f. Do not include pages in submittal which do not apply to the project. If submittal includes products not intended for installation, clearly indicate all materials in the submittal which are intended for installation.
g. The electrical design shown on the drawings supports the equipment basis of design specifications at the time of design. If equipment by any division is submitted with different electrical requirements, it is the responsibility of the submitting contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the proposed electrical configuration in the relevant submittal with a written statement that this change will be provided at no additional cost. Submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.

B. If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
C. Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.
D. Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations, and details to scale (not smaller than 1/4" per foot), with dimensions clearly showing the installation. Direct copies of small-scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.

1.10 Test Reports and Verification Submittals: Submit test reports, certifications, and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports, and take corrective action within the scheduled contract time.

1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein. Submit manuals at the Substantial Completion inspection.

PART 2 - PRODUCTS

2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the

best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.

2.2 Equipment and Materials:

A. All equipment and materials shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.

B. Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings, and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated, or painted.

C. The label of the approving agency, such as UL, by which a standard has been established for the particular item, shall be in full view.

D. The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.

E. A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.

F. Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.

G. Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material, and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate manufacturer's products, or the particular products of named manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.

H. Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.

2.3 Requests for Substitution:

A. Where a particular system, product, or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product, or material specified.

B. Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.

1. Required product cannot be supplied in time for compliance with Contract time requirements.
2. Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.
3. Substantial cost advantage is offered to Owner after deducting offsetting disadvantages including delays, additional compensation for redesign,

investigation, evaluation, and other necessary services and similar considerations.

C. All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:

1. Principal of operation.
2. Materials of construction or finishes.
3. Thickness of gauge of materials.
4. Weight of item.
5. Deleted features or items.
6. Added features or items.
7. Changes in other work caused by the substitution.
8. Electrical ratings and properties.
9. If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

PART 3 - EXECUTION

3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any installation which is not orderly and reasonably neat, or does not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.

3.2 Coordination:

A. The Contractor shall be responsible for complete coordination of the electrical systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for raceway or other appurtenances passing through slabs or walls.

B. Any additional steel supports required for the installation of any electrical equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.

C. It shall be the Contractor's responsibility to see that all equipment such as terminal cabinets, fire alarm components, control panels, and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.

D. All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

E. The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.

F. Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.

G. Start of work will be construed as acceptance of suitability of work of others.

3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.

3.4 Phasing: Provide all required temporary wiring, lighting, fire alarm, equipment, and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.

3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.

3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts, and washers. Level equipment.

3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 26. Obtain matched color coatings from the manufacturer and apply as directed. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.

3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.

3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.

3.10 Record Drawings:

A. During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all switches, receptacles, devices, equipment, and other systems which are not installed exactly as shown on the contract drawings.

B. Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.

3.11 Acceptance:

A. Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.

B. Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.

C. Operation and Maintenance Manuals: Provide O&M manual as dictated by Division 1.

Manuals shall contain:

1. Detailed operating instructions and instructions for making minor adjustments.

2. Complete wiring, control, and single line diagrams.
3. Routine maintenance operations.
4. Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
5. Copies of approved submittals.
6. Copies of all manufacturer's warranties.
7. Copies of test reports and verification submittals.

D. Record Drawings: Submit record drawings.
E. Acceptance will be granted on the basis of tests and inspections of job. A representative of firm that performed test and balance work shall be in attendance to assist. Contractor shall furnish necessary mechanics to operate system, make any necessary adjustments and assist with final inspection.
F. Control Diagrams: Frame under clear plastic and mount on equipment room wall.
G. Single Line Diagrams: Frame under clear plastic and mount on equipment room wall.

PROJECT NAME

PROJECT NUMBER

ARCHITECT: Company Name

ENGINEER: Mitchell Gulledge Engineering

CONTRACTOR: Contractor Name

SUBCONTRACTOR: Sub Name

SUPPLIER: Supply Company

MANUFACTURER: Manufacturer

DATE: mm/dd/yyyy

SECTION: 26 XX XX/Section Name

1. Product 1: Manufacturer, Model
2. Product 2: Manufacturer, Model
3. Product 3: Manufacturer, Model
4. Product 4: Manufacturer, Model
5. Product 5: Manufacturer, Model

SAMPLE

Any standard heading is acceptable.

List each product individually. Include manufacturer name and model.

Include GC or CM Approval stamp indicating review and acceptance by responsible contractor.

END OF SECTION

PART 1 - GENERAL

1.1 The work covered by this division consists of providing all labor, equipment, and materials and performing all operations necessary for the installation of the fire protection work as herein called for and shown on the drawings.

1.2 This is a Basic Electrical Requirements section. Provisions of this section apply to work of all Division 26 sections.

PART 2 - CODES

2.1 All work under Division 26 shall be constructed in accordance with the codes listed herein. The design has been based on the requirements of these codes; and while it is not the responsibility of the Contractor to verify that all work called for complies with these codes, he shall be responsible for calling to the Architect/Engineer's attention any drawings or specifications that are not in conformance with these or other codes prior to ordering equipment or installing work.

2.2 Comply with regulations and codes of utility suppliers.

2.3 Where no specific method or form of construction is called for in the contract documents, the Contractor shall comply with code requirements when carrying out such work.

2.4 Where code conflict exists, generally the most restrictive requirement applies. Comply with current code edition, unless noted.

2.5 Additional codes or standards applying to a specific part of the work may be included in that section.

2.6 The following codes and standards shall govern all work:

A. Florida Building Code – Sixth Edition (2017)
B. Florida Building Code – Sixth Edition (2017) – Existing Building
C. Florida Building Code – Sixth Edition (2017) – Energy Conservation
D. Florida Building Code – Sixth Edition (2017) – Mechanical
E. Florida Building Code – Sixth Edition (2017) – Plumbing
F. Florida Building Code – Sixth Edition (2017) – Fuel Gas
G. Florida Building Code – Sixth Edition (2017) – Accessibility
H. Florida Fire Prevention Code Sixth Edition
    1. Fire Code (NFPA 1 – 2015 Edition)
    2. Life Safety Code (NFPA 101 – 2015 Edition)
I. National Electric Code (NFPA 70 – 2014)

PART 3 - STANDARDS

All materials, installation and systems shall meet the requirements of the following standards, including the latest addenda and amendments, to the extent referenced:

3.1 Underwriters' Laboratories (UL)
3.2 American National Standards Institution (ANSI)
3.3 American Society of Testing Materials (ASTM)
3.4 National Electrical Manufacturers Association (NEMA)
3.5 Institute of Electrical and Electronics Engineers (IEEE)
3.6 National Electrical Contractors Association (NECA)
3.7 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
3.8 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
3.9 Lightning Protection Institute (LPI)

END OF SECTION

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PART 1 - DIVISION 1 - GENERAL REQUIREMENTS

1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 This is a Basic Electrical Requirements section. Provisions of this section apply to work of all Division 26 sections.

1.3 Coordinate with the General Contractor for all cutting and patching. Contractors performing Division 26 work shall inform the General Contractor of all cutting and patching required prior to bidding and shall coordinate installation.

PART 2 - DIVISION 3 - CONCRETE

2.1 Refer to Division 3, Concrete for:

A. Rough grouting in and around electrical work.
B. Patching concrete cut to accommodate electrical work.

2.2 The following is part of Division 26 work, complying with the requirements of Division 3:

A. Curbs, foundations, and pads for electrical equipment.
B. Man holes, hand holes, and vaults of electrical work.
C. Underground structural concrete to accommodate electrical work.
D. Concrete encasement of electrical conduits and cables.

PART 3 - DIVISION 4 - MASONRY

3.1 Refer to Division 4, Masonry for:

A. Installation of access doors in walls.

PART 4 - DIVISION 5 - METALS

4.1 Refer to Division 5, Metals for:

A. Framing openings for electrical equipment.

4.2 The following is part of Division 26 work:

A. Supports for electrical work.

PART 5 - DIVISION 6 - WOOD AND PLASTIC

5.1 Refer to Division 6, Wood for:

A. Framing openings for electrical equipment

PART 6 - DIVISION 7 - THERMAL AND MOISTURE PROTECTION

6.1 Refer to Division 7, Thermal and Moisture Protection for:

A. Installation of all roof curbs and roof supports for electrical work.
B. Caulking and waterproofing of all wall and roof mounted electrical work.
C. Providing all roof curbs and all flashing for metal roofs.

6.2 The following is part of Division 26 work, complying with the requirements of Division 7.

A. Fire barrier penetration seals.

PART 7 - DIVISION 9 - FINISHES

7.1 Refer to Division 9, Finishes for:

A. Painting piping, and equipment.
B. Painting structural metal and concrete for electrical work.
C. Painting access panels.
D. Painting color-coded electrical work indicated for continuous painting. See color schedule in Division 26 section, "Electrical Identification".
E. Installation of access doors in gypsum drywall.

7.2 Colors shall be selected by the Architect for all painting of exposed electrical work in occupied spaces, unless specified herein. Do not paint insulated or jacketed surfaces.

7.3 Perform the following as part of Division 26 work:

A. Touch up painting of factory finishes.
B. Painting of all hangers.

PART 8 - DIVISION 10 - SPECIALTIES

8.1 Refer to Division 10 - Specialties for:

A. Fire extinguishers and fire extinguisher cabinets and accessories.

PART 9 - DIVISION 11 - EQUIPMENT

9.1 Refer to Division 11 - Equipment for all food service equipment to be provided. This includes the cooking hoods with fire suppression.

9.2 Refer to Division 11 - Equipment for all laboratory equipment including cabinets, casework, student stations, demonstration desks, fume hoods, snorkel exhausts, canopy hoods, safety stations, eyewashes, and all related fixtures, fittings, and trim.

PART 10 - DIVISION 21 - FIRE PROTECTION

10.1 Fire Protection and Electrical Contractors shall coordinate the exact electrical requirements of all fire protection equipment being provided. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the fire protection equipment basis of design. If fire protection equipment is submitted with different electrical requirements, it is the responsibility of the fire protection contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the fire protection submittal with a written statement that this design will be provided at no additional cost. Fire Protection submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost to the Owner.

10.2 Electrical contractor shall provide disconnect switches, starters, and contactors for fire protection equipment unless specifically noted as being furnished as part of fire protection equipment.

10.3 Electrical contractor shall provide all power wiring, raceway and devices, and make final electrical connections to all fire protection equipment, switches, starters, contactors, controllers, and similar equipment.

PART 11 - DIVISION 22 - PLUMBING

11.1 Plumbing and Electrical Contractors shall coordinate the exact electrical requirements of all plumbing equipment being provided. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the plumbing equipment basis of design. If

plumbing equipment is submitted with different electrical requirements, it is the responsibility of the plumbing contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the plumbing submittal with a written statement that this design will be provided at no additional cost. Plumbing submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost to the Owner.

11.2 Electrical Contractor is expected to be familiar with the entirety of the plumbing scope. Review plumbing sheets, specifications, and other portions of the Contract Documents prior to bidding. Electrical Contractor is responsible for all line voltage (greater than 100V) work unless otherwise noted. Electrical Contractor shall coordinate with Plumbing Contractor, and shall make themselves available as necessary to support the plumbing scope.

11.3 Electrical contractor shall provide disconnect switches, starters, and contactors for plumbing equipment unless specifically noted as being furnished as part of plumbing equipment.

11.4 Electrical contractor shall provide all power wiring, raceway and devices, and make final electrical connections to all plumbing equipment, switches, starters, contactors, controllers, and similar equipment.

PART 12 - DIVISION 23 - HVAC

12.1 Mechanical and Electrical Contractors shall coordinate the exact electrical requirements of all mechanical equipment being provided. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the mechanical equipment basis of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this design will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost to the Owner.

12.2 Mechanical contractor shall provide all HVAC control wiring including the Energy Management Control system sensors, alarms, and input/output signals and all relays, interlocks, warning lights, and control devices, complying with the requirements of Division 26. The intent is for the mechanical contractor to be responsible for the entire HVAC control system, including point-to-point wiring, and associated raceway and boxes. Electrical contractor shall notify mechanical contractor upon discovery of any mechanical controls installation which does not meet Division 26 requirements.

12.3 Electrical Contractor is expected to be familiar with the entirety of the mechanical scope. Review mechanical sheets, specifications, and other portions of the Contract Documents prior to bidding. Electrical Contractor is responsible for all line voltage (greater than 100V) work unless otherwise noted. Electrical Contractor shall coordinate with Mechanical Contractor, and shall make themselves available as necessary to support the mechanical scope.

12.4 Electrical contractor shall provide disconnect switches, starters, and contactors for mechanical equipment unless specifically noted as being furnished as part of mechanical equipment.

12.5 Electrical contractor shall provide all power wiring, raceway and devices, and make

final electrical connections to all mechanical equipment, switches, starters, contactors, controllers, and similar equipment.

PART 13 - DIVISION 27 - COMMUNICATIONS

13.1 Electrical and Communications Contractors shall coordinate the exact Communications requirements of all electrical equipment being provided. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The Communications design shown on the drawings supports the electrical equipment basis of design. If electrical equipment is submitted with different Communications requirements, it is the responsibility of the electrical contractor to resolve all required Communications design changes (e.g. input/output voltage) and clearly show the new Communications design on the electrical submittal with a written statement that this design will be provided at no additional cost. Electrical submittals made with no written reference to the Communications design will be presumed to work with the Communications design. Any corrections required will be at no additional cost to the Owner.

13.2 Unless otherwise instructed by Construction Manager or General Contractor, Division 26 shall be responsible for Division 27.

PART 14 - DIVISION 28 - ELECTRONIC SAFETY AND SECURITY (ESS)

14.1 Electrical and ESS Contractors shall coordinate the exact electrical requirements of all ESS equipment being provided. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the ESS equipment basis of design. If ESS equipment is submitted with different electrical requirements, it is the responsibility of the ESS contractor to resolve all required electrical design changes (e.g. input/output voltage) and clearly show the new electrical design on the ESS submittal with a written statement that this design will be provided at no additional cost. Electrical submittals made with no written reference to the ESS design will be presumed to work with the electrical design. Any corrections required will be at no additional cost to the Owner.

14.2 ESS contractor shall provide ESS modules, detectors, and other appurtenances for unless specifically noted as being furnished as part of electrical equipment.

14.3 ESS contractor shall provide all ESS wiring, raceway and devices, and make final ESS connections to all electrical equipment, detectors, modules, contacts, controllers, and similar equipment.

14.4 Unless otherwise instructed by Construction Manager or General Contractor, Division 26 shall be responsible for Division 28.

PART 15 - DIVISION 31 - EARTH WORK

15.1 <u>Refer to Division 31, Sitework for</u>:

A. Coordination with work of other trades.
B. Site domestic water piping.
C. Additional site electrical work.

15.2 <u>The following work is part of Division 26</u>:

A. All site electrical conduit, wiring, boxes, lights, and other appurtenances, except where provided by Utility.

END OF SECTION

PART 1 - GENERAL

1.1 Related Documents:

A. Conform to Division 1 and other sections of this division.
B. Division 26 Basic Materials and Methods sections apply to work of this Section.

1.2 Summary:

A. The extent of electrical grounding and bonding work is indicated by drawings and schedules and as specified herein. Grounding and bonding work is defined to encompass systems, circuits, and equipment.
B. The type of electrical grounding and bonding work specified in this Section includes the following:

1. Solidly grounded.

C. Applications of electrical grounding and bonding work in this Section include the following:

1. Electrical power systems.
2. Grounding electrodes.
3. Separately derived systems.
4. Raceways.
5. Service equipment.
6. Enclosures, pull boxes, junction boxes, etc.
7. Equipment.
8. Lighting standards.
9. Landscape lighting.
10. Signs.
11. Separate buildings.
12. Transformers.

D. Refer to other Division 26 sections for wires/cables, electrical raceways, boxes and fittings, and wiring devices which are required in conjunction with electrical grounding and bonding work.

1.3 Submittals:

A. Submit in accordance with General, Supplementary, and Special Conditions.
B. Product Data: Submit manufacturer's data on grounding and bonding products and associated accessories.

1.4 Codes and Standards:

A. Codes and Standards:

1. Electrical Code Compliance: Comply with applicable local electrical code requirements of the authority having jurisdiction, and current NEC as applicable to electrical grounding and bonding, pertaining to systems, circuits, and equipment.
2. UL Compliance: Comply with applicable requirements of UL Standards No.'s 467, "Electrical Grounding and Bonding Equipment", and 869, "Electrical Service Equipment", pertaining to grounding and bonding of systems, circuits, and equipment. In addition, comply with UL Std. 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors". Provide grounding and bonding products which are UL listed and labeled for their intended usage.

Solder lugs are not acceptable.

PART 2 - PRODUCTS

2.1 Acceptable Manufacturers:

A. All products shall be the produce of reputable and reliable manufacturers.
B. The following manufacturers are recognized as being reputable and reliable:

1. Burndy, Inc.
2. Erico, Inc.
3. Harger, Inc.
4. Thermoweld, Inc.

C. Additional manufacturers shall be considered reputable and reliable only if they verifiably satisfy the following requirements:

1. History: Acceptable manufacturers shall have a history of producing similar products at least the past ten years. Such products shall have been sold in the state of Florida for at least the past five years.
2. Volume: Acceptable manufacturers shall have produced and sold similar products in excess of one hundred (100) times annually the amount of product projected for used in this project. This requirement shall apply to each of the past ten years.
3. Similar projects: Acceptable manufacturers shall have sold similar products which have been used in at least five similar projects in the past five years. Similar projects must be of a similar use, overall cost, and overall size.

D. Documentation of the above manufacturer requirements shall be provided to Engineer upon request, but is otherwise unnecessary. If documentation is required, it shall consist of a signed statement from Manufacturer's representative on Manufacturer's letterhead (or the letterhead of Manufacturer's approved representative). Additional documentation may be required in rare cases.
E. Any submittal by Contractor shall be considered indication by Contractor that Contractor stands behind for the suitability of a manufacturer, and that the manufacturer satisfies of the above requirements.
F. Contact Engineer prior to bid with any questions regarding acceptable manufacturers.

2.2 Grounding and Bonding:

A. Provide complete grounding and bonding assemblies, including, but not limited to,

1. Cables/Wires,
2. Connectors,
3. Solderless Lug Terminals,
4. Grounding Electrodes and Plate Electrodes,
5. Bonding Jumper Braid,
6. Surge Arresters, and
7. Additional accessories needed for a complete installation.

B. Where more than one type component product meets indicated requirements, selection is Contractor's option.
C. Where materials or components are not indicated, provide products which comply with NEC, UL, and applicable industry standards.
D. Conductors:

1. Unless otherwise indicated, provide electrical grounding conductors for

grounding system connections that match power supply wiring materials and are sized according to NEC.

E. Bonding Plates, Connectors, Terminals, and Clamps:

1. Provide electrical bonding plates, connectors, terminals, lugs, and clamps as recommended by bonding plate, connector, terminal, and clamp manufacturers for indicated applications.

F. Grounding Electrodes:

1. Grounding Electrodes shall consist of minimum three 3/4"x 20'-0" long copper clad rods arranged in a triangle configuration with ground rods placed at least ten feet apart.

a. Provide concrete box (flush in grade) with cast iron cover. Concrete box to house each individual ground rod for testing. Cast iron cover to have the words "GROUND ROD" inscribed on top.

PART 3 - EXECUTION

3.1 Examination:

A. Examine areas and conditions under which electrical grounding and bonding connections are to be made and notify Engineer in writing of any condition detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Engineer and Owner.

3.2 Installation of Electrical Grounding and Bonding Systems:

A. General: Install electrical grounding and bonding systems as indicated, in accordance with manufacturer's instructions and applicable portions of current NEC, NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that products comply with requirements.
B. Coordinate with other electrical work as necessary to interface installation of electrical grounding and bonding system work with other work.
C. Provide all circuits with an insulated equipment grounding conductor. Under no circumstances shall raceways be the sole equipment grounding conductor.
D. Terminate insulated equipment grounding conductors with grounding lug, bus, or bushing. Conductors shall not be looped under screw or bolt heads.
E. Grounding Electrode System and Grounding Electrode Conductor:

1. Grounding electrode system for main service and separately derived systems: Grounding electrode conductors shall be sized according to NEC 250.66 and shall be connected to the following electrodes: Metal cold water pipe, concrete encased electrodes, building steel, and three rod electrodes.
2. Grounding electrode system for separate buildings: The connection of the grounded circuit conductor (neutral) to the grounding electrode at each separate building shall not be made. An equipment grounding conductor shall be installed with the circuit conductors and shall be connected to an equipment ground bar located in each building's panel. Grounding electrode conductors shall be sized according to NEC 250.66 excluding exceptions and shall be installed unspliced from the panel equipment ground bar to the following electrodes: Metal cold water pipe, building steel, and three rod electrode.
3. Prior to substantial completion, Contractor shall perform the following tests in the presence of Engineer or Owner:

a. Grounded conductor (neutral) has a low-impedance path to equipment grounding system.
b. Removal of bonding conductor at main service disconnects grounded conductor (neutral) from equipment grounded system.
c. Removal of bonding conductor at each separately derived system disconnects grounded conductor (neutral) from equipment grounded system.
d. Grounded conductor maintains low-impedance equipment grounding system connection regardless of ATS state.

4. Grounding electrode requirements:

a. Metal underground water piping shall be in direct contact with the earth for a minimum of twenty feet.
b. Concrete encased electrodes shall be encased in at least three inches of concrete footing or foundation that is in direct contact with the earth, consisting of a continuous 5/8"x20'-0" rebar with a 20'-0" section of bare 4/0 copper wire connected to the rebar by exothermic welding and extended 4'-0" above the slab and sleeved with Sch 40 PVC at slab penetration. This size wire is constant; it is not to be sized by NEC 250.66. The exposed conductor above the slab shall be protected from concrete, paint, dirt, etc.
c. Rod electrodes shall consist of three (minimum) 3/4"x20'-0" (minimum) copper clad rods with threaded connections, placed at least ten feet apart in a triangular configuration. No aluminum rods are permitted.

5. Grounding electrode conductors shall be spliced only by means of:

a. listed exothermic welding process, or
b. listed irreversible crimp connection. Note: irreversible crimp connections shall not be utilized except where applied with the indicated listing tool, where such tool contains an embossing die which leaves UL mark.

6. Building steel shall be effectively grounded through direct connections from footer reinforcing to I-beam or bar joists with 4/0 copper conductors.
7. Connections shall be made to the interior metal water piping within 5'-0" of entry into building. Piping shall be one-inch minimum.
8. Grounding electrode conductors shall be protected with schedule 40 PVC where exposed to damage.
9. Underground electrode connections shall be accessible by way of concrete box enclosure.
10. Underground electrode connections shall be made by exothermic welding process.

F. Connect together service equipment enclosures, exposed noncurrent carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.

1. Provide minimum #12 AWG equipment grounding conductor in each conduit unless otherwise indicated. Equipment grounding conductor shall have continuous green insulation if #6 or smaller, green marking tape if #4 or larger.
2. Equipment grounding conductor shall be connected to ground buses in equipment enclosures.
3. Equipment grounding conductor bonded to all outlet, pull, and junction boxes by a lug or screw approved for the purpose before installation of the boxes. Ground

pigtails and/or ground clips are not acceptable.

G. Grounding type bushings shall be installed on all feeder and subfeeder conduits entering panelboards, pull boxes, and transformers, and all conduit entering oversized, concentric, and eccentric knock-outs.

H. Tighten grounding and bonding connectors and terminal, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torqueing requirements are not indicated, tighten connections to comply with tightening torque values specified in UL 486A to assure permanent and effective grounding.

I. Install clamp-on connectors on clean metal contact surfaces, to ensure electrical conductivity and circuit integrity. All ground clamps and lugs shall be listed for application and shall be made completely of bronze or brass.

3.3 Field Quality Control:

A. Ground Resistance Test:

1. Upon completion of installation of electrical grounding and bonding systems, test ground resistance with ground resistance tester while the ground conductor disconnected from the equipment.
2. Where tests show resistance to ground is over five (5) ohms:
    a. Reduce resistance to five (5) ohms or less by driving additional ground rods.
    b. Retest after mitigation to demonstrate compliance.
    c. Any necessary additional ground rods shall be provided at no cost to Owner.
3. Provide Owner and Engineer 72 hours' notice prior to ground resistance testing. Coordinate with Owner and/or Engineer, if Owner and/or Engineer indicate a desire to observe the testing.

END OF SECTION

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PART 1 - GENERAL

1.1 Related Documents:

A. Conform to Division 1 and other sections of this division.
B. This Section is a general Division 26 materials and methods section, and applies to all other Division 26 sections involving materials and methods specified herein.

1.2 Description of Work:

A. Extent of electrical wire and cable work is indicated by drawings and schedules.
B. Types of electrical wire, cable, and connectors specified in this Section include the following:

1. Copper conductors.
2. Fixture wires.
3. Split bolt connectors.
4. Wirenut connectors.

C. Applications of electrical wire, cable, and connectors required for project are as follows:

1. For power distribution circuits.
2. For lighting circuits.
3. For appliance and equipment circuits.
4. For motor branch circuits.
5. For control circuits.

1.3 Codes and Standards:

A. NEC Compliance: Comply with NEC requirements as applicable to construction, installation, and color coding of electrical wires and cables.
B. IEEE Compliance: Comply with applicable requirements of IEEE Stds. 82, "Test Procedures for Impulse Voltage Tests on Insulated Conductors", and Std. 241, "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to wiring systems.
C. ASTM Compliance: Comply with applicable requirements of ASTM B1, 2, 3, 8, and D 753.

1.4 Submittals:

A. Submit in accordance with General, Supplementary, and Special Conditions.
B. Product Data: Submit manufacturer's data.

PART 2 - PRODUCTS

2.1 General Wiring Products:

A. Unless otherwise noted, all wiring shall be copper, with conductivity of not less than 98% at 20°C (68°F).

2.2 Acceptable Manufacturers:

A. All products shall be the produce of reputable and reliable manufacturers.
B. The following manufacturers are recognized as being reputable and reliable:

1. Cerro Wire
2. Encore Wire Corporation
3. General Cable

4. Southwire Company

C. Additional manufacturers shall be considered reputable and reliable only if they satisfy the following requirements:

1. History: Acceptable manufacturers shall have a history of producing similar products at least the past ten years. Such products shall have been sold in the state of Florida for at least the past five years.
2. Volume: Acceptable manufacturers shall have produced and sold similar products in excess of one hundred (100) times annually the amount of product projected for used in this project. This requirement shall apply to each of the past ten years.
3. Similar projects: Acceptable manufacturers shall have sold similar products which have been used in at least five similar projects in the past five years. Similar projects must be of a similar use, overall cost, and overall size.

D. Documentation of the above manufacturer requirements shall be provided to Engineer upon request, but is otherwise unnecessary. If documentation is required, it shall consist of a signed statement from Manufacturer's representative on Manufacturer's letterhead (or the letterhead of Manufacturer's approved representative). Additional documentation may be required in rare cases.

E. Any submittal by Contractor shall be considered indication by Contractor that Contractor stands behind for the suitability of a manufacturer, and that the manufacturer satisfies of the above requirements.

F. Contact Engineer prior to bid with any questions regarding acceptable manufacturers.

2.3 Building Wires: Provide factory fabricated wires of sizes, ampacity ratings, and materials for applications and services indicated.

A. Dual-listed THHN/THWN-2: For dry, damp, and wet locations.

B. All wiring for conventional devices shall be stranded wire with the exceptions as noted on the electrical drawings.

2.4 Color Coding: The following systems of color coding shall be strictly adhered to. There shall be no color change for switch legs. Switch legs shall be marked at all junctions with colored tape on each wire with tape of contrasting color. Three-way travelers shall be purple. In cases where more than one set of travelers are in the same conduit, travelers shall be marked with circuit number and colored tape. Colored tape shall be same color as corresponding switch leg marking.

A. All wiring shall be the indicated color. Tape is not an acceptable method of indicating phase legs.

B. 120/208V Wye

1. Phase A: Black
2. Phase B: Red
3. Phase C: Blue
4. Neutral: White
5. EGC (Ground): Green

C. The color code assigned to each phase wire shall be consistently followed throughout.

PART 3 - EXECUTION

3.1 Delivery, Storage, and Handling:

A. Deliver wire and cable properly packaged in factory fabricated type containers, or wound on NEMA specified type wire and cable reels.
B. Store wire and cable in clean dry space in original containers. Protect products from weather, damaging fumes, construction debris, and traffic.
C. Handle wire and cable carefully to avoid abrading, puncturing, and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wires/cables is maintained.

3.2 Installation of Wires and Cables:

A. General: Install electrical cables, wires, and wiring connectors in compliance with applicable requirements of NEC, NEMA, UL, and NECA's "Standard of Installation" and in accordance with recognized industry practices.
B. Unless otherwise noted, all branch circuit conductors shall be 12 AWG minimum.
C. Install all line voltage wiring in conduit, unless otherwise indicated in writing by Engineer.
D. Pull conductors simultaneously where more than one is being installed in same raceway.
E. Use lubricant for pulling conductors. Use only products indicated for the purpose by the manufacturer.
F. Use pulling means including, fish tape, cable, rope, and basket weave wire/cable grips which will not damage cables or raceway.
G. Minimize conductor splices.
H. Install splices and taps which possess equivalent or better mechanical strength and insulation ratings than conductors being spliced. Use splice and tap connectors which are compatible with conductor material.
I. Provide a 6" loop in each conductor in all joint boxes and pull boxes.
J. Conductors of systems of different voltages or types shall not enter the same conduit or junction box. The number of current carrying conductors and total number of conductors to be installed in conduits shall be as noted below.

    1. Single phase 120V circuits: Limit three per raceway.
    2. All other circuits: Dedicated raceway.
    3. Deviation of installation as identified above requires prior written approval from Engineer.

K. Circuits shall be installed such that the continuity of the ground, neutral, and hot circuits shall not be interrupted by the removal of any device or fixture.
L. For the purposes of thermal derating calculations, neutrals shall be considered current carrying except for balanced three-phase linear loads.
M. Multiwire branch circuits are prohibited. All 120V circuits shall be provided a dedicated neutral conductor.

3.3 Field Quality Control:

A. Prior to energization of circuitry, check installed feeder wires and cables with megohmmeter to determine insulation resistance levels to ensure requirements are fulfilled. A list of feeders tested shall be submitted to the Engineer indicating the insulation resistance level for each cable. Owner shall be given the option to witness all tests.
B. Prior to energization, test wires and cables for electrical continuity and for short circuits.
C. Subsequent to wire and cable hook ups, energize circuitry and demonstrate

functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

END OF SECTION

PART 1 - GENERAL

1.1 Related Documents:

A. Conform to Division 1 and other sections of this division.
B. This Section is a general Division 26 materials and methods section, and applies to all other Division 26 sections involving materials and methods specified herein.

1.2 Description of Work:

A. Extent of raceway work is indicated by drawings and schedules.
B. Types of raceways specified in this section include the following:

1. Rigid metal conduit, galvanized (RMC)
2. Rigid nonmetallic conduit (RNC)
3. Liquid tight flexible metal conduit (LFMC)

1.3 Submittals:

A. Submit in accordance with General, Supplementary, and Special Conditions.
B. Product Data: Submit manufacturer's data.

PART 2 - PRODUCTS

2.1 Acceptable Manufacturers:

A. All products shall be the produce of reputable and reliable manufacturers.
B. The following manufacturers are recognized as being reputable and reliable:

1. Allied Tube & Conduit
2. Carlon
3. Cantex
4. Wiremold
5. Wheatland Tube

C. Additional manufacturers shall be considered reputable and reliable only if they verifiably satisfy the following requirements:

1. History: Acceptable manufacturers shall have a history of producing similar products at least the past ten years. Such products shall have been sold in the state of Florida for at least the past five years.
2. Volume: Acceptable manufacturers shall have produced and sold similar products in excess of one hundred (100) times annually the amount of product projected for used in this project. This requirement shall apply to each of the past ten years.
3. Similar projects: Acceptable manufacturers shall have sold similar products which have been used in at least five similar projects in the past five years. Similar projects must be of a similar use, overall cost, and overall size.

D. Documentation of the above manufacturer requirements shall be provided to Engineer upon request, but is otherwise unnecessary. If documentation is required, it shall consist of a signed statement from Manufacturer's representative on Manufacturer's letterhead (or the letterhead of Manufacturer's approved representative). Additional documentation may be required in rare cases.
E. Any submittal by Contractor shall be considered indication by Contractor that Contractor stands behind for the suitability of a manufacturer, and that the manufacturer satisfies of the above requirements.
F. Contact Engineer prior to bid with any questions regarding acceptable manufacturers.

2.2 UL Listed Materials:

A. Provide raceway products and components which have been UL listed and labeled for the intended use.
B. Comply with applicable requirements of UL safety standards pertaining to electrical raceway systems.

2.3 Products – Metal Conduit and Tubing:

A. General: Provide metal conduit, tubing, and fittings of types, grades, sizes, and weights (wall thicknesses) for each indicated use.
B. Where types and grades are not indicated, provide proper selection determined by Contractor to fulfill wiring requirements, and comply with applicable portions of NEC for raceways.
C. Minimum size conduit shall be 1/2" for all systems.
Minimum size flexible conduit shall be 1/2" for all systems (3/8" for pre-assembled light fixture whips). Maximum length shall be 6 feet. Minimum length shall be 4 feet.
D. Cast zinc conduit fittings are prohibited. Any cast zinc fitting installed by this project shall be replaced at Contractor's expense.
E. All fittings shall be provided with insulated throats or plastic bushings prior to pulling wires or cables.
F. Rigid Steel Conduit:

1. Conduit: Shall be mild steel, manufactured, hot-dipped galvanized, and produced to ANSI specifications C80.1 and Federal Specification WW-C 581, latest revisions, and shall be labeled with the Underwriters' Laboratories marking.
2. Fittings: Cast malleable iron, galvanized, or cadmium plated.

a. Use Type 1 fittings for rain-tight connections.
b. Use Type 2 fittings for concrete tight connections.

G. Liquid Tight Flexible Metal Conduit:

1. Conduit: Provide liquid tight flexible metal conduit; construct of single strip, flexible, continuous, interlocked, and double wrapped steel; galvanized inside and outside; coat with liquid tight jacket of flexible polyvinyl chloride (PVC).
2. Fittings: Provide cadmium plated, malleable iron fittings with compression type steel ferrule and neoprene gasket sealing rings, with insulated, or noninsulated throat.

H. No ENT, corrugated flexible conduit, or MT cable shall be installed or reused.
I. No intermediate metal conduit (IMC) shall be installed.

2.4 Products – Nonmetallic Conduit and Ducts:

A. General: Provide nonmetallic conduit, ducts, and fittings of types, sizes, and weights for each indicated use. Where types and grades are not indicated, provide proper selection determined by Contractor to fulfill wiring requirements which comply with provisions of NEC and Specifications for raceways.
B. 90°C, UL rated, constructed of polyvinyl chloride. For direct burial, UL listed and in conformity with NEC Article 352.
C. Conduit and Tubing Accessories: Provide conduit, tubing, and accessories of types, sizes, and materials, complying with manufacturer's published product information, which mate and match conduit and tubing.

PART 3 - EXECUTION

3.1 Examine areas and conditions under which raceways are to be installed, and substrate which will support raceways. Notify Owner and Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in acceptable manner.

3.2 Provide raceways for each installation location as follows:

A. Below grade: PVC
B. Within concrete: PVC
C. Exterior above-grade locations: rigid galvanized steel
D. Damp and wet locations: rigid galvanized steel
E. Whips to light fixtures: 48" to 72" LFMC or prefabricated whip.
F. Connections to any vibrating or mechanically active equipment: LFNC
    1. Exception: Utilize LFMC in exterior locations, or where subject to moist or humid atmosphere, or where subject to water, oil, or grease exposure.
G. Connection to any equipment subject to movement: LFNC
    1. Exception: Utilize LFMC in exterior locations, or where subject to moist or humid atmosphere, or where subject to water, oil, or grease exposure.
H. LFMC, and LFNC shall not be used for any other applications without written consent from Engineer.

3.3 Raceway Size:

A. Sizes of raceways shall be not less than NEC requirements using THHN/THWN2 for sizing and shall not in any case be less than indicated on the drawings.
B. Larger size raceways and/or pull boxes shall be installed if there is excessive length of unbroken run or excessive number of bends.

3.4 General Requirements:

A. Install conduits without damaging or penetrating structural members.
B. Metallic conduit in contact with concrete, grout, mortar, or other cementitious products such as grouted cells, headers, lintels, etc. shall be provided a bituminous coating before installation.
C. All conduit installed in walls and above ceilings shall be 100% complete and approved by inspectors before covering is installed. Such coverings include drywall, insulation, ceiling tiles, and any other material which obscures the installation.
D. Conduit installed above accessible ceilings shall be supported from the building structure and shall not be supported from or attached to the suspended ceiling suspension system.
E. Where feasible, avoid conduit runs within partitions and walls.
F. Mechanically assemble metal enclosures, and raceways for conductors to form a continuous conductive system.
G. Connect to electrical boxes, fittings, and cabinets to provide effective electrical continuity and rigid mechanical assembly.
H. Avoid use of dissimilar metals throughout system to eliminate possibility of electrolysis. Where dissimilar metals are in contact, coat all surfaces with corrosion inhibiting compound before assembling.
I. Install expansion fittings in all raceways wherever structural expansion joints are crossed.
J. Raceway penetrations of fire rated walls and/or floors shall be sealed to maintain the rating(s). All relevant materials and methods shall be per a UL detail satisfying NFPA

rating requirements.

K. Submit complete data on fire stopping materials and construction methods for review by Architect prior to proceeding with work.
L. Coordinate with other work including wires/cables, boxes, and panel work, as necessary to interface installation of electrical raceways and components with other work.
M. Use Manufacturer-provided dimensions to lay out all equipment electrical connections. Set conduit and boxes for connection to units only after receiving review of dimensions and coordinating with other trades.
N. Provide nylon pull cord in empty conduits.
O. Cut conduits straight, properly ream, and cut threads for heavy wall conduit deep and clean.
P. Field bend conduit with benders designed for the purpose.
Q. Any conduit with kinks, tears, or other material damage shall be replaced at Contractor's expense.
R. Keep conduits a minimum distance of six inches (6") from parallel runs of flues, hot water pipes, or other sources of heat. Wherever possible, install horizontal raceway runs above water and steam piping.
S. Support riser conduit at each floor level with clamp hangers.
T. Use of running threads at conduit joints and terminations is prohibited.
U. Complete installation of electrical raceways before starting installation of cables/wires within raceways.

3.5 Flexible Conduit:

A. Flexible conduit shall not pass through walls or ceilings. Provide a junction box at the point of transition.
B. Flexible conduit shall not be used within walls, except where written permission is given by Engineer and Owner.

3.6 Conduits Installed in Exterior, Wet, or Damp Locations:

A. Metallic raceways exterior, wet, or damp locations shall have conduit threads painted with cold galvanizing paint. Remove oil and clean prior to painting. Draw up coupling and conduit sufficiently tight to ensure water tightness.
B. All wall penetrations entering wet locations shall be sloped downward at least 1/2".

3.7 Conduits Installed Below Grade:

A. All underground wiring and ductbanks shall have metalized warning tape installed above conduit, ductbank, or electrical line that identifies the specific system buried below. Tape shall consist of a minimum 3.5 mil solid foil core encased in a protective plastic jacket (total thickness 5.5 mils) and be 6" wide with black lettering imprinted on a color coded background that conforms to APWA color code specifications. Tape shall be installed from 18" to 30" above a conduit, ductbank, or electrical line, and in no case less than 6" below grade. No additional tracer wire is required.
B. All rigid metal conduit below grade shall be provided a bituminous coating.
C. Metallic raceways installed below grade shall have conduit threads painted with cold galvanizing paint. Remove oil and clean prior to painting. Draw up coupling and conduit sufficiently tight to ensure water tightness.
D. Install all underground conduits a minimum of 42" below finished grade (to top of conduit), except where below building foundation. Underground conduit shall be inspected and approved prior to backfilling. Primary raceway shall be buried 48" to top of conduit.

E. Conduit below concrete slabs and footers under or inside building foundations shall be minimum of 6" below bottom of concrete and/or at an adequate depth to conceal radius of bends.

3.8 Conduits within Concrete Slabs or Encased in Concrete:

A. No conduit shall be installed within slabs without prior written approval from Structural Engineer. Provide Structural Engineer with whatever description and drawings of the proposed installation which Structural Engineer may require.
B. All of the following are subject to the alteration by Structural Engineer:
   1. Place conduits between bottom reinforcing steel and top reinforcing steel. Place conduits either parallel, or at 90 degrees, to main reinforcing steel.
   2. Separate conduits by not less than diameter of largest conduit to ensure proper concrete bond.
   3. Conduits crossing in slab must be reviewed for proper cover by Engineer, Architect, and Owner.
   4. Embedded conduit diameter is not to exceed one-third (1/3) of slab thickness.

3.9 Coatings:

A. Apply any coatings in accordance with manufacturer's instructions and recommendations.
B. Reapply bituminous coating locally after making threaded connections.
C. Any conduit requiring bituminous coating shall be coated without holidays. Inspect coating prior to burial or pouring, and touch up as needed.
D. In lieu of bituminous coatings, raceways with factory-applied polyethylene or PVC protective coatings may be utilized. Install per manufacturer’s instructions and recommendations. Seal all joints.

3.10 Conduits Above Grade:

A. Install exposed conduits and all conduit above grade and extensions from concealed conduit systems neatly, parallel with, or at right angles to walls and building structure.
B. Install exposed conduit work as not to interfere with ceiling inserts, lights, or ventilation ducts or outlets.
C. Securing and Supporting:
   1. Secure conduits within three feet of fittings, boxes, etc., and on spacing not to exceed ten feet.
      a. Conduits may be supported in lieu of securing, where permitted by Code.
   2. Support conduits by use of hangers, clamps, or clips.
   3. Conduit shall not be supported from suspended ceiling supports or grid systems.
D. Limit penetrations of vapor- and water-barriers. Utilize curbs, etc. wherever possible. Seal any penetrations of vapor- and water-barriers with approved methods.
E. Conduit shall not be installed on roof tops or walkway covers.
F. Conduit penetrating concrete floors not within 12" of walls shall have couplings installed flush with top slab.

3.11 PVC Conduits:

A. PVC subject to physical damage shall be Schedule 80. All other PVC shall be heavy wall type (Schedule 40) conduit.
B. PVC conduit shall be installed with rigid steel elbows and risers. (Exception: low

voltage with inner ducts may be PVC.)

C. Make solvent cemented joints in accordance with recommendations of manufacturer.
D. Install PVC conduits in accordance with NEC and in compliance with local utility practices.
E. Conduit and elbows shall be installed on the secondary side at power company's transformers. Wire and cable installation shall be such that wire pulling rope or cable will not damage elbows.
F. Conduit, elbows, and risers shall be installed for all primary services per Utility and Owner requirements.
G. All elbows shall be RMC, except where required otherwise by Utility.
H. All risers shall be RMC, except where required otherwise by Utility.

3.12 General Conduit Fitting Requirements:

A. Grounding type bushings shall be installed on all feeder and subfeeder conduits entering panelboards, pull boxes, and transformers and all conduit entering oversized, concentric, and eccentric knock-outs.
B. Miscellaneous fittings such as reducers, chase nipples, 3 piece unions, split couplings, and plugs shall be designed and listed for the specific use.
C. Provide either plastic bushings or plastic insulating throats for all fittings prior to pulling wire.
D. Install insulated-type bushings for terminating conduits 1" and larger. Bushings are to have flared bottom and ribbed sides. Upper edge shall have phenolic insulating ring molded into bushing. Bushings shall be installed during rough-in and before installing conductors.
E. Snap-on bushings are prohibited.

3.13 Threaded Conduit Fitting Requirements:

A. Provided locknuts for securing conduit to metal enclosure with sharp edge for digging into metal, and ridged outside circumference for proper fastening.
B. Bushings for threaded conduits smaller than 1" shall have flared bottom and ribbed sides, with smooth upper edges to prevent injury to cable insulation. Bushings shall be installed during rough-in and before pulling wire.
C. Bushing of standard or insulated type shall have screw type grounding terminal. Bushings shall be installed on all threaded conduit.

END OF SECTION

PART 1 - GENERAL

1.1 Related Documents:

A. Conform to Division 1 and other sections of this division.
B. This Section is a general Division 26 materials and methods section, and applies to all other Division 26 sections involving materials and methods specified herein.

1.2 Description of Work:

A. Extent of electrical box and associated fitting work is indicated by drawings and schedules.
B. Types of electrical boxes and fittings specified in this Section include the following:

1. Outlet boxes.
2. Junction boxes.
3. Pull boxes.
4. Floor boxes.

1.3 Codes and Standards:

A. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wiring boxes and fittings.
B. UL Compliance: Comply with applicable requirements of UL 50, UL 514 Series, and UL 886 pertaining to electrical boxes and fittings. Provide electrical boxes and fittings which are UL listed and labeled.

1.4 Submittals:

A. Submit in accordance with General, Supplementary, and Special Conditions.
B. Product Data: Submit manufacturer's data.

PART 2 - PRODUCTS

2.1 Acceptable Manufacturers:

A. All products shall be the produce of reputable and reliable manufacturers.
B. The following manufacturers are recognized as being reputable and reliable:

1. CDR
2. Hubbell-Raco
3. MacLean Highline
4. Republic Steel
5. Square D
6. Thomas & Betts
7. Quazite
8. Wiremold
9. Legrand

C. Additional manufacturers shall be considered reputable and reliable only if they verifiably satisfy the following requirements:

1. History: Acceptable manufacturers shall have a history of producing similar products at least the past ten years. Such products shall have been sold in the state of Florida for at least the past five years.
2. Volume: Acceptable manufacturers shall have produced and sold similar products in excess of one hundred (100) times annually the amount of product projected for used in this project. This requirement shall apply to each of the

past ten years.

3. Similar projects: Acceptable manufacturers shall have sold similar products which have been used in at least five similar projects in the past five years. Similar projects must be of a similar use, overall cost, and overall size.

D. Documentation of the above manufacturer requirements shall be provided to Engineer upon request, but is otherwise unnecessary. If documentation is required, it shall consist of a signed statement from Manufacturer's representative on Manufacturer's letterhead (or the letterhead of Manufacturer's approved representative). Additional documentation may be required in rare cases.

E. Any submittal by Contractor shall be considered indication by Contractor that Contractor stands behind for the suitability of a manufacturer, and that the manufacturer satisfies of the above requirements.

F. Contact Engineer prior to bid with any questions regarding acceptable manufacturers.

2.2 Products – Fabricated Materials:

A. Outlet Boxes:

1. Outlet wiring boxes shall be galvanized coated flat rolled sheet steel, of shapes, volumes, and dimensions as indicated, suitable for installation at respective locations.
2. Outlet boxes shall be constructed with mounting holes, and with cable and conduit size knockout openings in bottom and sides.
3. Minimum dimensions for device boxes, junction boxes, pull boxes, and other boxes in walls shall be four-inch (4") square. Depth shall be

   a. three and one-half inches (3-1/2”) for wiring devices using Lev-Lok connection technology,
   b. two and one-eight inches (2-1/8”) deep for IT (telecom, AV, access controls, etc),
   c. one and one-half inches (1-1/2”) for other locations.

4. Dimensions of ceiling boxes shall be a minimum four-inch (4") square or octagonal. Depth shall be

   a. three and one-half inches (3-1/2”) for wiring devices using Lev-Lok connection technology,
   b. three inches (3") for concrete work,
   c. two and one-eight inches (2-1/8”) deep for IT (telecom, AV, access controls, etc.),
   d. one and one-half inch (1-1/2") deep for exposed work or furred ceiling work, and
   e. one and one-half inches (1-1/2”) for other locations.

5. Plaster rings and/or fixture studs shall be provided where required.
6. Flush-mounted boxes shall be provided with extension rings and/or covers with sufficient depth to bring the covers flush with the finished wall.
7. Outlet boxes for exposed wall mounting shall be cast metal type "FS" or "FD" boxes with suitable cast aluminum covers.
8. Exterior boxes:

   a. All exterior boxes shall be appropriately listed or indicated for the use.
   b. Boxes for exterior receptacles shall be provided with in-use weatherproof receptacle covers. Such covers shall have spring hinged lids.

c. Weatherproof covers shall meet code requirements for covers intended for use with attachment plugs.

9. Sectional or gangable boxes shall not be installed.
10. Through-wall boxes shall not be installed.
11. Box extensions or "goofings" shall not be installed.
12. "Handy" boxes, etc. shall not be permitted.

B. All pull boxes used outside and underground shall be pre-cast concrete polymer, with concrete polymer cover. Such boxes shall be of sufficient size to make all entrances and exits from box in one horizontal plane.

C. Junction and Pull Boxes: Provide galvanized code gauge sheet steel junction and pull boxes, with screw on covers; of types, shapes and sizes, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws, and washers.

D. Cover Plates:

1. All cover plates shall be abuse resistant nylon or stainless steel.

PART 3 - EXECUTION

3.1 General:

A. Install all electrical boxes and fittings as indicated, in accordance with manufacturer's instructions, applicable code, and recognized industry practices, to fulfill project requirements.

B. The location of any pull box shall be approved by Architect and Owner before installation, unless said pull box is installed in an accessible above-ceiling space, or a dedicated mechanical or electrical room.

C. Coordinate installation of electrical boxes and fittings with wire/cable, wiring devices, and raceway installation work.

D. Provide weatherproof outlets for interior and exterior locations exposed to weather or moisture.

E. Provide knockout closures to cap unused knockout holes where blanks have been removed.

F. All outlet and device boxes shall be independently supported from structure.

G. Install electrical boxes only in accessible locations.

H. Orient all boxes for ease of accessibility. Install overhead boxes cover-down unless otherwise directed.

I. Coordinate all boxes with other trades.

1. Any box without a minimum 6" front clearance will be adjusted or reinstalled at Contractor's expense.
2. Any box installed such that access is effectively blocked by other trades shall be adjusted or reinstalled at Contractor's expense.

J. Secure electrical boxes firmly and rigidly to structure, or solidly embed electrical boxes in concrete or masonry.

K. Protect installed boxes from construction debris and damage.

L. All outside, above grade pull boxes shall be galvanized.

M. All flush mounted boxes, regardless of system or voltage, shall be installed flush within 1/8" of wall finish or finished face of tackboards, sound boards, cabinets, etc. Box extension or goof rings shall not be installed.

N. Boxes shall not be installed back-to-back.

O. Boxes within the same stud cavity shall be separated by a minimum of 12".

P. Boxes for flush mounting in concrete block:

1. Boxes for flush mounting in concrete block shall be provided covers with square corners on the raised portion of the cover.
2. Such covers shall be of sufficient depth to be flush with the face of the block.
3. The bottom side of the covers or boxes shall be installed at the masonry course nearest to the dimension specified or noted, but not more than applicable code.
4. Boxes installed in block walls shall be secured in place with mortar.
5. Boxes shall be flush with any combustible surface including black splash, tack board or sound board.

Q. Exterior Boxes:

1. Unless otherwise noted, exterior boxes on walls shall be installed flush with wall. Coordinate with masonry as required.
2. Provide suitable installation for each application, including face plate gaskets and corrosion resistant plugs and fasteners.

3.2 Boxes in Rated Partitions:

A. Maintain all fire and heat ratings by installing boxes in rated partitions according to a UL detail for an acceptable product. No UL rating detail shall be used prior to approval by Architect.
B. All boxes installed in rated walls shall be rigidly secured to structure.
C. All voids between boxes and surrounding wall surfaces shall be completely filled with an approved material.

3.3 Outlet Boxes:

A. Position recessed outlet boxes accurately to allow for surface finish thickness.
B. Set floor boxes level and flush with finish flooring material.
C. Outlet Box Accessories: Provide compatible outlet box accessories as required for installation, including:

1. box supports,
2. bonding accessories,
3. mounting ears and brackets,
4. wallboard hangers,
5. box extension rings,
6. fixture studs,
7. cable clamps, and
8. metal straps for supporting outlet boxes.

D. Rigidly support all outlet boxes from both sides, or from back, such that box cannot move or deflect into the wall when devices are installed or modified.

3.4 Identification:

A. Box lids and conduit couplings shall be color coded as follows:

1. 120/208V Wye: Black, with hand-written white labels.
2. All others: Paint a unique color.
3. Exception: Coordinate color coding requirements with Architect and Owner where boxes are visible in public spaces.

B. Covers of all junction boxes, pull boxes, etc. shall be marked by circuit number using indelible ink, 3/4" minimum height. Locate marker so it can be readily identified without

removal of the cover plate.

1. Exception: Where box covers are visible in public spaces, marker label shall be on the inside of the box cover.

END OF SECTION

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PART 1 - GENERAL

1.1 Related Documents:

A. Conform to Division 1 and other sections of this division.
B. This Section is a Division 26 Basic Electrical Materials and Methods section, and is part of each Division 26 section making reference to wiring devices specified herein.

1.2 Description of Work:

A. Extent of electrical identification work is indicated by drawings, schedules, and other specification sections.
B. Types of electrical identification work specified in this Section include the following:
    1. Equipment/System identification signs.
C. See other specification sections for additional identification requirements for specific equipment and system components. Where electrical system signage is called for elsewhere in the Contract Documents, but not described in detail, provide signage per the requirements of this section.

1.3 Submittals:

A. Submit in accordance with General, Supplementary, and Special Conditions.
B. Product Data: Submit manufacturer's data.

PART 2 - PRODUCTS

2.1 Electrical Identification Materials:

A. Engraved Plastic Laminate Signs:
    1. Provide engraving stock melamine plastic laminate, in sizes and thicknesses indicated.
    2. Engrave with engraver's standard letter style, of sizes and wording indicated.
    3. Default color shall be white face with black core plies, resulting in black letters on a field of white. Provide alternative colors as indicated on plans or in other specification sections.
    4. Thickness: Minimum one-sixteenth inch (1/16"), except as otherwise indicated.
    5. Fasteners: Self-tapping stainless steel screws, except contact type permanent adhesive where screws cannot or should not penetrate substrate.

2.2 Lettering and Graphics:

A. General: Coordinate names, abbreviations, and other designations used in electrical identification work with corresponding designations shown, specified or scheduled.
B. Provide numbers, lettering, and wording as indicated, or, if not otherwise indicated, as recommended by manufacturer or as required for proper identification and operation/maintenance of electrical systems and equipment.

PART 3 - EXECUTION

3.1 Application and Installation:

A. General Installation Requirements:
    1. Install electrical identification products as indicated, in accordance with manufacturer's written instructions, and requirements of NEC.
    2. Coordination: Where identification is to be applied to surfaces which require finish, install identification after completion of painting.

3. Regulations: Comply with governing regulations and requests of governing authorities for identification of electrical work.

B. Equipment/System Identification:

1. Provide engraved plastic laminate signs with text matching terminology and numbering of the contract documents. Provide signs for each unit of the following categories of electrical work:

   a. Panelboards,
   b. Electrical cabinets,
   c. Disconnect enclosures,
   d. Starters,
   e. Time clocks,
   f. Contactors,
   g. Transformers,
   h. Terminal cabinets,
   i. Any other enclosure housing active components.

2. Unless otherwise noted, install signs and labels to maximize visibility and readability without interference with operation and maintenance of equipment.
3. All power junction box covers shall be marked with panel name and circuit numbers. All other (Intercom, etc.) junction box covers shall be marked according to system type. These markings shall be made with a permanent type marker.
4. Panel schedules shall be typed, and shall indicate room numbers and load information.
5. Above ceiling identification: to electrical equipment installed above finished ceiling, identification shall be placed:

   a. on access panel,
   b. next to access panel, or
   c. on to a permanent part of the ceiling system, such as a tee-bar of a lay-in type ceiling.

6. Secure all labels and signs to substrate with approved fasteners, unless fasteners would violate listings or create an unsafe condition. Where fasteners cannot be used, utilize approved permanent adhesive means of attachment.

END OF SECTION

PART 1 - GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 This section is a Division 26 Basic Electrical Materials and Methods section, and is part of each Division 26 section making reference to or requiring excavation and backfill specified herein.

1.3 Existing Utilities: Any depicted underground utilities were taken from old drawings. The exact location of these utilities and irrigation branches and abandoned services are not known. Use extreme caution when excavating.

1.4 Refer to other Division 26 sections and/or drawings for specific requirements of the particular conduit system being installed. Where another Division 26 section or the drawings conflict with requirements of this section, the other Division 26 section or the drawings shall take precedence over the general requirements herein.

1.5 OSHA: Contractor employee worker protection for all trenching and excavation operations shall comply with 29 CFR 1926.650 Subpart P and all current OSHA requirements.

1.6 Trench Safety Act: Contractor shall comply with all requirements of Florida Statutes Chapter 553, including the requirement to provide a separate line item to identify the cost to comply on a per lineal foot of trench and per square foot of shoring.

PART 2 - PRODUCTS

2.1 Sand: Clean, hard, uncoated grains free from organic matter or other deleterious substances. Sand for backfill shall be of a grade equal to mortar sand.

2.2 Gravel: Clean, well graded hard stone or gravel, free from organic material. Size range to be from No. 4 screen retentions to 1".

2.3 Earth: Fill free of clay, muck, stones, wood, roots or rubbish.

2.4 Identification Tape: See Electrical Identification specification.

PART 3 - EXECUTION

3.1 Ditching and Excavation: Shall be performed by hand wherever there is a possibility of encountering obstacles or any existing utility lines of any nature whatsoever. Where clear and unobstructed areas are to be excavated, appropriate machine excavation methods may be employed. Avoid use of machine excavators within the limits of the building lines.

3.2 Bedding: Excavate to bottom grade of conduits to be installed, and shape bed of undisturbed earth to contour of conduit for a width of at least 50% of conduit diameter. If earth conditions necessitate excavation below grade of the conduit, such as due to the presence of clay, muck, or roots, subcut and bring bed up to proper elevation with clean, new sand (as described in paragraph 2.1), deposited in 6" layers and tamped. Notify Architect/Engineer if subcut exceeds 12", or if bed is of an unstable nature. In this case a 6" minimum layer of gravel will be required before sand bedding begins. Submit cost proposal if the earth conditions require subcut in excess of 12" or if gravel is required to achieve proper bedding.

3.3 Placing: Conduit shall be carefully handled into place. Avoid knocking loose soil from the banks of the trench into the conduit bed. Rig heavier sections with nylon slings in lieu of wire rope to avoid crushing or chipping.

3.4 Backfilling: Deposit clean new sand (as described in paragraph 2.1) to 6" above the conduit and tamp. Then deposit sand or earth carefully in 6" layers, maintaining adequate side support, especially on nonferrous conduit materials. Compact fill in 6" layers, using mechanical means, up to the top elevation of the conduit, and in 12"

layers to rough or finish grade as required. Fine grade and restore surface to original condition.

3.5 Special: Excavations shall be installed and maintained in satisfactory condition during the progress of the work. Subsurface structures are to be constructed in adequately sized excavations. De-watering equipment shall be installed and properly maintained where required. Shoring shall be employed in the event of unstable soil condition, and in all cases where required by OSHA regulations and necessary to protect materials and personnel from injury.

3.6 Identification: Install identification tape directly above all underground conduit. See Electrical Identification specification.

3.7 Depth of Cover: Minimum cover for underground conduit is three feet unless indicated otherwise.

3.8 Existing Pavement: Where new conduit passes below existing streets, driveways, parking lots, or other paved areas, the pavement shall be saw cut. Backfill shall be compacted to 95% density and the pavement shall be patched to match existing pavement. Provide compaction tests and reports as required.

3.9 Landscape Restoration:

A. Lawn or Unpaved Areas: The soil shall be replaced according to the original profile. Compact the top 6" of subgrade and each 6" layer of backfill or fill material at 85% maximum density for cohesive soils and 90% relative density for cohesionless soils.

1. If additional soil is required, the Contractor shall supply weed free topsoil of a type to match existing topsoil.

B. Grass: Fine grade and solid sod with the type of grass to match the existing species and cultivar.

C. Landscape Maintenance: Contractor shall be responsible for watering and other grounds maintenance in the area of construction until the project is accepted.

END OF SECTION

PART 1 - GENERAL

1.1 Summary:

A. Scope: Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, erection, and installation for panelboards as required for the complete performance of the work, and as shown on the Drawings and as herein specified.
B. Section Includes: The work specified in this Section includes, but shall not be limited to, the following:

1. Provide lighting and appliance panelboards as specified herein and where shown and scheduled on the Drawings.

1.2 Submittals:

A. General: See submittal procedures in Division 1.
B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Clearly indicate all variations and options proposed for installation.
C. Configuration: Submit panelboard configuration information, including the physical locations and connections of all active and conductive components.
D. Shop Drawings: Submit scaled shop drawings depicting the intended installation location for each panelboard, relevant clearance requirements, and all other equipment intended for installation nearby. Indicate all relevant dimensions, and document that installation is feasible as proposed.
E. Include panelboards in dimensioned electrical room shop drawings.

1.3 Operation and Maintenance:

A. Operation and Maintenance Data: Prior to substantial completion, submit operation and maintenance data for panelboards. Submit as indicated in Section 26 00 00 and Division 1.

1.4 Quality Assurance:

A. Qualifications:

1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of panelboards of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of five years.
2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing panelboards similar in type and scope to that required for this Project and shall be approved by the manufacturer.
3. Documentation of qualifications, examples of past projects, and references, shall be provided to Owner and/or Engineer upon request, but are not required as part of the standard submittal procedure.

B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

1. Without limiting the generality of other requirements of this Section, all work specified herein shall conform to or exceed the applicable requirements of the following standards; provided, that wherever the provisions of said publications

are in conflict with the requirements specified herein, the more stringent requirements shall apply:

a. FS W-C-375.
b. FS W-P-115 (Type I, Class 1).
c. NEMA AB 1.
d. NEMA PB 1.
e. NEMA PB 1.1.
f. NEC.
g. UL 50.
h. UL 67.
i. UL 489.
j. UL 924 (for emergency panels).

C. Pre-Installation Conference: Prior to commencing the installation, meet at the Project site to review the material selections, installation procedures, and coordination with other trades. Pre-installation conference shall include, but shall not be limited to, the Contractor, the Installer, manufacturer's representatives, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Architect.

D. Single Source Responsibility: Obtain panelboards and required accessories from a single source with resources to produce products of consistent quality in appearance and physical properties without delaying the work. Any materials which are not produced by the manufacturer shall be acceptable to and approved by the manufacturer.

1.5 Delivery, Storage, and Handling:

A. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.

B. Store materials in their original, undamaged packages and containers, inside a well ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.6 Warranty:

A. General: See closeout procedures in Division 1.

B. Special Warranty: Submit a written warranty executed by the manufacturer, the Installer, and the Contractor, agreeing to repair or replace panelboards that fail in materials or workmanship within the specified warranty period.

1. Warranty Period: Warranty period shall be one year from the date of substantial completion.

PART 2 - PRODUCTS

2.1 Manufacturers:

A. Approved Manufacturers: All panelboard products shall be the produce of one of the following:

1. Square D (Schneider Electric)

B. Basis of Design:

1. Items specified are to establish a standard of quality for design, function, materials, and appearance.
2. Equivalent products by other manufacturers are acceptable.
3. The Design Professional will be the sole judge of the basis of what is equivalent.
4. Any adjustments required to meet equivalency requirements shall be at Contractor's expense.
5. See Drawings for schedules indicating additional Basis of Design information.

2.2 Materials and Components:

A. General:

1. Minimum voltage rating shall be for the voltage indicated and scheduled on the Drawings.
2. Minimum per-phase continuous current ratings shall be as indicated and scheduled on the Drawings.
3. Minimum neutral continuous current ratings shall be as indicated and scheduled on the Drawings.
4. Minimum short circuit current rating shall be as indicated and scheduled on the Drawings, in RMS symmetrical amperes at the AC voltage indicated for the panelboard.
5. Enclosure NEMA rating shall be as indicated and scheduled on the Drawings.
6. Panelboards shall be suitable for use as service equipment when application requirements comply with UL 67 and NEC Article 230.

B. Feeder Connection(s):

1. Interiors shall be field convertible for top or bottom incoming feed.
2. Main circuit breakers shall be vertically mounted.
3. Sub-feed circuit breakers shall be vertically mounted.
4. Main lug interiors up to 400 amperes shall be field convertible to main circuit breaker.

C. Buses:

1. Provide one continuous bus bar per phase.
2. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers.
3. The busing shall be fully rated.
4. Busing shall be plated copper.
5. Bus bar plating shall run the entire length of the bus bar.
6. Solid neutral(s) shall be plated and located in the mains compartment up to 225 amperes so incoming neutral cable may be of the same length.
7. Interior phase bus shall be pre-drilled to accommodate field installable options (i.e., sub-feed lugs, sub-feed circuit breakers, thru-feed lugs, etc.).

D. Circuit Breakers:

1. Circuit breakers shall be UL-listed with amperage ratings, interrupting ratings, and number of poles as indicated and scheduled on the Drawings.
2. Two-pole and three-pole circuit breakers shall have common tripping of all poles. Circuit breaker frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker that shall allow the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.

3. Circuit breakers shall have an overcenter, trip-free, toggle mechanism which shall provide quick-make, quick-break contact action.
4. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole.
5. Main circuit breaker thermal elements shall be true rms sensing and shall be factory calibrated to operate in a 40°C ambient environment.
6. Circuit breaker handle and faceplate shall indicate rated ampacity.
7. Standard construction circuit breakers shall be UL-listed for reverse connection without restrictive line or load markings.
8. Circuit breaker escutcheon shall have international I/O markings, in addition to standard on/off markings.
9. Circuit breaker handle accessories shall provide provisions for locking handle in the on or off position.
10. Circuit breakers shall be UL-listed for use with the following accessories, and shall be provided such accessories as indicated and scheduled on the Drawings:
    a. Shunt trip.
    b. Under voltage trip.
    c. Ground fault shunt trip.
    d. Auxiliary switch.
    e. Alarm switch.
    f. Compression lug kits.
11. The exposed faceplates of branch circuit breakers shall be flush with one another.
12. Molded case branch circuit breakers shall have bolt-on type bus connectors.
13. Breaker shall be UL Listed with the following ratings: (15-125A) Heating, Air Conditioning, and Refrigeration (HACR), (15-30A) High Intensity Discharge (HID), (15-20A) Switch Duty (SWD), (15-50A) Equipment Protection Device (EPD) (480Y/277Vac maximum).

E. Enclosures:

1. Types 3R, 5, and 12:
    a. Enclosures shall be constructed in accordance with UL 50 requirements.
    b. Enclosures shall be painted with grey enamel electrodeposited over cleaned phosphatized steel.
    c. Doors shall be gasketed and equipped with a tumbler type vault lock and two additional quarter turn fasteners on enclosures 59 inches (1499 mm) or more in height.
    d. Lock assemblies shall be keyed alike.
    e. One key shall be provided with each lock.
    f. A clear plastic directory cardholder shall be mounted on the inside of door.

F. Grounding:

1. A solidly bonded copper equipment ground bar shall be provided.

G. Identification:

1. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL-listed label, and short circuit current rating shall be displayed on the interior or in a booklet format.

H. Safety:

1. Current carrying parts shall be insulated from ground and phase-to-phase by high dielectric strength thermoplastic.
2. Interior trim shall be of deadfront construction to shield user from energized parts. Deadfront trim shall have filler plates covering unused mounting spaces.

I. Miscellaneous:

1. Interior leveling provisions shall be provided for flush-mounted applications.
2. The entire panelboard shall be listed as a system, including all breakers, buses, enclosure, cover, etc.
3. Lugs shall be UL-listed to accept solid or stranded copper conductors.
4. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating per NEC Table 310-15(B)(16). Branch circuit breakers rated 30 amperes and below may be UL-listed to accept 60°C rated wire.
5. Lug body shall be bolted in place. Snap-in designs are not acceptable.

2.3 Arc Energy Protection:

A. All circuit breakers set, or capable of being set, to 1200A or higher continuous trip rating shall be provided with arc energy reduction and documentation in accordance with NEC 240.87.
B. Provide documentation to relevant parties with location of all such circuit breakers.
C. Each such circuit breaker shall be LSIG-type unless specifically indicated otherwise.
D. Provide one of the following for each such circuit breaker:

1. Zone-selective interlocking,
2. Differential relaying,
3. Energy-reducing maintenance switching with local status indicated,
4. Energy-reducing active arc flash mitigation system
5. An approved equivalent means, approved in writing by Engineer, Owner, and AHJ.

PART 3 - EXECUTION

3.1 Examination:

A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 Installation:

A. General: Install panelboards and accessories in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, and as indicated on the Drawings.

1. Install panelboards in accordance with manufacturer's written instructions, NEMA PB 1.1, and NEC standards.
2. Install and configure software in accordance with manufacturer's written instructions.

B. Labeling:

1. Provide accurate, printed panelboard directories prior to substantial completion. Directory shall account for all addenda, field orders, and field modifications.
2. Provide engraved laminated melamine label for equipment, in accordance with specification section 260553 Electrical Identification.
3. Permanently label all adjustable trip circuit breakers with the designed trip ratings. Provide engraved laminated melamine label with this information, in accordance with specification section 26 05 53 Electrical Identification.

3.3 Field Quality Control:

A. Inspect complete installation for physical damage, proper alignment, anchorage, and grounding.
B. Measure steady state load currents at each panelboard feeder. Rearrange circuits in the panelboard to balance the phase loads within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.
C. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written specifications.

3.4 Protection:

A. Provide final protection and maintain conditions in a manner acceptable to the Installer, that shall ensure that the panelboards shall be without damage at time of Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.1 Related Documents:

A. Conform to Division 1 and other sections of this division.
B. This Section is a general Division 26 materials and methods section, and applies to all other Division 26 sections involving materials and methods specified herein.

1.2 Description of Work:

A. The extent of wiring device work is indicated by drawings and schedules. Wiring devices are defined as single discrete units of electrical distribution systems which are intended to carry but not utilize electric energy.
B. Types of electrical wiring devices in this Section include the following:

1. Receptacles
2. Ground Fault Circuit Interrupters
3. Switches
4. Wall Plates
5. Timers
6. Time Clocks
7. Photocells

1.3 Codes and Standards:

A. NEC Compliance: Comply with NEC as applicable to installation and wiring of electrical wiring devices.
B. UL Compliance: Comply with applicable requirements of UL 20, 486A, 498, and 943 pertaining to installation of wiring devices. Provide wiring devices which are UL listed and UL-labeled.

1.4 Submittals:

A. Submit in accordance with General, Supplementary, and Special Conditions.
B. Product Data: Submit manufacturer's data on electrical wiring devices.

PART 2 - PRODUCTS

2.1 Acceptable Manufacturers:

A. Manufacturers: Subject to compliance with requirements, manufacturers providing wiring devices which may be incorporated in the work include, but are not limited to, the following (for each type and rating of wiring device):

1. Hubbell, Inc.
2. Leviton Manufacturing Co., Inc.
3. Pass and Seymour, Inc.
4. Eaton, Inc.
5. Intermatic
6. Tork

2.2 Fabricated Wiring Devices:

A. General: Provide factory fabricated wiring devices, in types, colors, and electrical ratings for applications indicated and which comply with NEMA Stds. Pub/No. WD.

1. Normal Power: Provide white color devices except as otherwise indicated.
2. Emergency Power: Provide red color devices except as otherwise indicated.
3. Optional Standby Power: Provide red color devices except as otherwise

indicated.

4. Receptacles:

   a. Receptacles shall be specification grade, with back-fed wiring connections.
   b. All receptacles shall be duplex NEMA 5-20R unless indicated otherwise.
   c. Base receptacle shall be NEMA 5-20R. Leviton 'S' Series (e.g. 5362-SW) is not acceptable. Provide additional features as described below.
   d. Weatherproof: All receptacles marked 'WP' on plans shall be weatherproof-type, and shall be marked 'WP'. Such receptacles shall also be GFCI type unless otherwise indicated.
   e. GFCI: All receptacles marked 'G' or 'WP' on plans shall be GFCI type, self testing, conforming to current UL requirements. "Late model" GFCIs not satisfying current UL requirements are forbidden. "Slim" models are forbidden.

B. Switches:

1. Snap: Provide toggle switches, rated 20 amps at 120/277 volts, quiet type, UL l without derating for tungsten lamp loads or inductive loads. The following catalog numbers are Leviton. "Slim" series (e.g. 1221S) are forbidden.

Type	**Catalog No.**
Single Pole	1221
Two Pole	1222
Three Way	1223
Four Way	1224

C. Time Clocks:

1. Provide 120/277V 365-day digital astronomical time clock. Basis of Design: Intermatic ET2725C (ET2725CR for damp or wet locations).

D. Photocell:

1. Intermatic EK4236S, or equal by Tork.

2.3 Wiring Device Accessories:

A. Wall Plates:

1. Unless otherwise indicated, wall plate material shall be as follows:

   a. Interior finished spaces: Nylon.
   b. Interior unfished spaces: Galvanized.
   c. Exterior: Cover as part of weatherproof assembly.

2. Provide commercial specification grade wall plates for single and combination wiring devices, of types, sizes, and with ganging and cutouts as indicated. Select plates which mate and match wiring devices. Construct with metal screws for securing plates to devices: screw heads to match finish of plates.

PART 3 - EXECUTION

3.1 Installation of Wiring Devices:

A. Install wiring devices as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices to fulfill project requirements.
B. Install wiring devices only in electrical boxes which are clean; free from excess building materials, dirt, and debris.
C. Install wiring devices after wiring work is completed and inspected.
D. Install wall plates after painting work is completed.
E. Rear wire all wiring device connections. Side terminations are forbidden.
F. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B. Use properly scaled torque indicating hand tool.
G. Orient all receptacles with the ground pin up, except:
    1. Where receptacle serves equipment which may have a 90° plug, orient receptacle ground pin down.
    2. Orient horizontally installed receptacles (e.g. receptacles in surface raceway) with the neutral pin up.

3.2 Protection of Wallplates and Receptacles:

A. At time of substantial completion, replace any wall plates and/or receptacles which have been damaged during construction, including those burned and scored by faulty plugs.

3.3 Grounding:

A. Provide equipment grounding connections for all wiring devices, unless otherwise indicated. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounds. Grounding conductor shall be bonded to all boxes with a separate screw. Screws used to support boxes are not to be used for grounding. Bonding screws shall be installed in box during rough-in installation. Bonding screws shall be green hexagonal type.

3.4 Identification:

A. Switches: Each light switch shall be marked by circuit number using a numbered vinyl cloth adhesive marker, 1/4" minimum height. Locate marker behind cover plate so it can be readily identified by removal of the cover plate. Thomas and Betts E-Z Code Markers are acceptable.
B. Receptacles: Each receptacle shall be marked by circuit number using a numbered vinyl cloth adhesive marker, 1/4" minimum height. Locate marker behind cover plate so it can be readily identified by removal of the cover plate. Thomas and Betts E-Z Code Markers are acceptable.

3.5 Testing:

A. Prior to energizing circuitry, test wiring for electrical continuity, and for short circuits. Ensure proper polarity of connections is maintained. Subsequent to energization, test wiring devices to demonstrate compliance with requirements.

END OF SECTION

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PART 1 - GENERAL

1.1 Summary:

A. Scope: Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, erection, and installation for safety switches as required for the complete performance of the work, and as shown on the drawings and as herein specified.
B. Section Includes: the work specified in this section includes, but shall not be limited to, the following:

1. Switches shall be furnished and installed at locations as shown on the drawings. Switches shall be of the type approved, indicated, and specified herein.

1.2 Submittals:

A. General: See submittal procedures in Division 1.
B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the drawings and specifications. Clearly indicate all variations and options proposed for installation.
C. Shop Drawings: Submit scaled shop drawings depicting the intended installation location for each safety switch, relevant clearance requirements, and all other equipment intended for installation nearby. Indicate all relevant dimensions, and document that installation is feasible as proposed.
D. Include safety switches in dimensioned electrical room shop drawings.

1.3 Operation and Maintenance:

A. Operation and Maintenance Data: Prior to substantial completion, submit operation and maintenance data for safety switches. Submit as indicated in Section 26 00 00 and Division 1.

1.4 Quality Assurance:

A. Qualifications:

1. Manufacturer qualifications: Manufacturer shall be a firm engaged in the manufacture of safety switches of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of five years.
2. Installer qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing safety switches similar in type and scope to that required for this project and shall be approved by the manufacturer.
3. Documentation of qualifications, examples of past projects, and references, shall be provided to owner and/or engineer upon request, but are not required as part of the standard submittal procedure.

B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of federal, state, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

1. Without limiting the generality of other requirements of this section, all work specified herein shall conform to or exceed the applicable requirements of the following standards; provided, that wherever the provisions of said publications are in conflict with the requirements specified herein, the more stringent requirements shall apply:

a. Switches shall be manufactured in accordance with the following standards:

1. UL 98 - enclosed and dead front switches
2. NEMA KS 1 - enclosed switches
3. NEMA 250 - enclosures for electrical equipment

1.5 Delivery, Storage, and Handling:

A. Deliver materials to the project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.
B. Store materials in their original, undamaged packages and containers, inside a well ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.6 Warranty:

A. General: See closeout procedures in Division 1.
B. Special Warranty: Submit a written warranty executed by the manufacturer, the installer, and the contractor, agreeing to repair or replace safety switches that fail in materials or workmanship within the specified warranty period.

1. Warranty period: Warranty period shall be one year from the date of substantial completion.

1.7 Operation and Maintenance:

A. Operation and Maintenance Data: Prior to substantial completion, submit operation and maintenance data for light fixtures. Submit as indicated in Section 26 00 00 and Division 1.

PART 2 - PRODUCTS

2.1 Manufacturers:

A. Approved Manufacturers: All safety switch products shall be the produce of one of the following:

1. Square D (Schneider Electric)
2. Bussmann (Eaton)
3. General Electric
4. Siemens

B. Basis of Design:

1. Items specified are to establish a standard of quality for design, function, materials, and appearance.
2. Equivalent products by other manufacturers are acceptable.
3. The design professional will be the sole judge of the basis of what is equivalent.
4. Any adjustments required to meet equivalency requirements shall be at contractor's expense.
5. See drawings for additional basis of design information.

2.2 Materials and Components:

A. General:

1. Minimum voltage rating shall be for the voltage indicated and scheduled on the drawings.

2. Minimum horsepower ratings shall be as indicated and scheduled on the drawings.
3. Minimum per-phase continuous current ratings shall be as indicated and scheduled on the drawings.
4. Fuses shall be provided as indicated on the drawings. Fuse clip current rating shall match equipment rating. Fuse current ratings shall be as indicated and scheduled on the drawings.
5. Provide 10% spare fuses, with a minimum of 3 spare sets. Spare fusing shall be provided within weatherproof containers for long-term storage (such as in ammo cans). Spray paint container with the wording "Spare Fuses" on the side.
6. Minimum neutral continuous current ratings shall be as indicated and scheduled on the drawings.
7. Minimum short circuit current rating shall be as indicated and scheduled on the drawings, in RMS symmetrical amperes at the AC voltage indicated for the safety switch.
8. Enclosure NEMA rating shall be as indicated and scheduled on the drawings.
9. Safety switches shall be suitable for use as service equipment when application requirements comply with UL 67 and NEC articles 230.

B. Switch Interior:

1. All switches shall have switch blades which are visible when the switch is off and the cover is open.
2. Lugs shall be front removable and UL listed for 75°C conductors.
3. All current carrying parts shall be plated to resist corrosion.
4. Switches shall have removable arc suppressors to facilitate easy access to line side lugs.
5. Switches shall have provisions for a field installable electrical interlock.

C. Grounding:

1. A solidly bonded copper equipment ground bar shall be provided.

D. Identification:

1. Nameplates shall contain product information and catalog number or factory order number. UL-listed label, and short circuit current rating shall be displayed on the interior.

E. Switch Mechanism:

1. Switch operating mechanism shall be quick-make, quick-break such that, during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.
2. The operating handle shall be an integral part of the box, not the cover.
3. Provisions for padlocking the switch in the off position with a padlock shall be provided.
4. The handle position shall travel at least 90° between off and on positions to clearly distinguish and indicate handle position.
5. All switches shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is on and prevent turning the switch on when the cover is open. The cover interlock mechanism shall have an externally operated override but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism

shall not be required to enter the enclosure in order to override the interlock.

F. Switch Enclosure:

1. General:

a. All switches shall have provisions to accept up to three 3/8 in hasp padlocks to lock the operating handle in the off position.
b. The enclosure shall have on and off markings stamped into the cover.
c. The operating handle shall be provided with a dual colored, red/black position indication.

2. Type 3R:

a. NEMA 3R switch covers shall be top hinged, attached with removable screws and securable in the open position (type 3R).
b. Type 3R enclosures shall be finished with grey baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated galvannealed steel.
c. Type 3R enclosures for switches rated 30-200A shall be provided with tangential knockouts to facilitate ease of conduit entry.
d. Type 3R enclosures through 200 ampere shall have provisions for interchangeable bolt-on hubs in the top endwall.

3. Type 4X:

a. Type 4X switch covers shall be attached with welded pin-type hinges.
b. Type 4X enclosures shall be finished with a brush finish on type 304 stainless steel.
c. Type 4X stainless steel enclosure shall contain no knockouts. Supply watertight hubs as indicated on the plans.
d. Type 4X cover sealing means for switches rated through 200 amperes shall be quick release trunk latches.
e. Type 4X stainless steel enclosures shall be dual rated as type 3R to facilitate their use in outdoor applications.

PART 3 - EXECUTION

3.1 Examination:

A. Verification of Conditions: examine areas and conditions under which the work is to be installed, and notify the contractor in writing, with a copy to the owner and the architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the installer.

3.2 Installation:

A. General: install safety switches and accessories in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, and as indicated on the drawings.

1. Install safety switches in accordance with manufacturer's written instructions, NEMA PB 1.1, and NEC standards.
2. Install and configure software in accordance with manufacturer's written instructions.

3.3 Field Quality Control:

A. Inspect complete installation for physical damage, proper alignment, anchorage, and grounding.
B. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written specifications.

3.4 Protection:

A. Provide final protection and maintain conditions in a manner acceptable to the installer, that shall ensure that the safety switches shall be without damage at time of substantial completion.

END OF SECTION

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PART 1 - GENERAL

1.1 Summary:

A. This Section specifies the lightning protection system for the building(s) or structure(s). This system provides safety for the building and occupants by preventing damage to the structure caused by lightning. The design of this system is to be in strict accordance with this section of the specification and all contract drawings that apply.
B. The work covered under this section of the specifications consists of furnishing labor, materials, and services required for the completion of a functional and unobtrusive lightning protection system approved by the architect and engineer.
C. The lightning protection system shall be installed by a firm actively engaged in the installation of Underwriters Laboratories Inc. (UL) Master Labeled Lightning Protection Systems and shall be so listed by Underwriters Laboratories, Inc. The completed system shall comply with the latest editions of Underwriters Laboratories, Inc. "Installation Requirements for Lightning Protection Systems, UL96A" and of the National Fire Protection Association's "NFPA® 780, Standard for the Installation of Lightning Protection Systems".

1.2 System Description:

A. The entire lightning protection system shall be designed and installed in accordance with:

1. National Fire Protection Assoc. (NFPA) Document # 780
2. Underwriters' Laboratories, Inc. (UL) Standard # 96A

1.3 Submittals:

A. A complete shop drawing shall be submitted to the architect and engineer for approval prior to commencement of the installation. The shop drawing will show the extent of the system layout designed for the structure along with details of the products to be used in the installation.

1.4 Quality Assurance:

A. The lightning protection system shall be installed by or under the supervision of a UL listed lightning protection installer.
B. The installers shall have completed factory training and be so certified by the manufacturer.

PART 2 - PRODUCTS

2.1 Standard:

A. All materials used in the installation shall be new and shall comply in weight, size, and composition as required by UL 96A and NFPA® 780 and shall be labeled or listed by Underwriters Laboratories, Inc. for use in lightning protection systems. The system furnished under this specification shall be the standard product of a manufacturer regularly engaged in the production of lightning protection equipment. The manufacturer shall be listed by UL as a manufacturer of lightning protection components.

2.2 Acceptable Manufacturers:

A. Advanced Lightning Technology, Ltd.
B. East Coast Lightning Equipment, Inc.
C. ERICO, Inc.

D. Harger, Inc.
E. Heary Brothers Lightning Protection Co., Inc.
F. Independent Protection Company, Inc.
G. Preferred Lightning Protection
H. Robbins Lightning, Inc.
I. Thompson Lightning Protection, Inc.

2.3 Materials:

A. Class I materials shall be used for systems on structures not exceeding 75 feet in height and Class II materials shall be used for systems on structures exceeding 75 feet above grade.
B. Copper shall be of the grade ordinarily required for commercial electrical work, generally designated as being 95 percent conductive when annealed. Aluminum conductors shall be of electrical grade aluminum.
C. Lightning protection materials shall be coordinated with building construction materials to assure compatibility.

1. Aluminum lightning protection materials shall not be:

a. embedded in concrete or masonry,
b. attached to surfaces covered with alkaline-based paint,
c. installed on or below copper surfaces,
d. exposed to runoff from copper surfaces,
e. installed at locations subject to excessive moisture,
f. installed where subject to contact with earth, or
g. within 18" of finished grade.

2. Copper lightning protection materials shall not be:

a. installed on aluminum surfaces,
b. installed on zinc surfaces,
c. installed on galvanized surfaces, or
d. installed within 2 feet of chimney exhausts, unless tin coated to protect against deterioration.

D. Strike termination devices shall be provided to place the entire structure under a zone of protection as defined by the Standards. Air terminals shall project a minimum of 10 inches above protected areas or objects. Air terminals shall be located within 2 feet of exposed corners and roof edges.
E. Metallic bodies having a thickness 3/16" or greater may serve as strike termination devices without the addition of air terminals. These bodies shall be made a part of the lightning protection system by connection(s) according to the Standards using main size conductors and bonding fittings with 3 square inches of surface contact area.
F. Cable conductors shall provide a two-way path from strike termination devices horizontally and downward to connections with the ground system. Cable conductors shall be free of excessive splices and sharp bends. No bend of a conductor shall form a final included angle of less than 90° nor have a radius of bend less than 8 inches. Structural elements and design features shall be used whenever possible to minimize the visual impact of exposed conductors.
G. Cable down conductors may be concealed within the building construction or enclosed within PVC conduit from roof to grade level. Down conductors shall be spaced at intervals averaging not more than 100 feet around the protected perimeter of the structure. In no case shall any structure have fewer than two down conductors.

Where down conductors are exposed to environmental hazards at grade level, guards shall be used to protect the conductor to a point 6 feet above grade.

H. In the case of structural steel frame construction, cable down conductors may be omitted and roof conductors shall be connected to the structural steel frame at intervals averaging not more than 100 feet around the protected perimeter of the structure.

I. Exposed cable conductors shall be secured to the structure at intervals not exceeding 3 feet – 0 inches. Fasteners, nails, screws, or bolts shall be of suitable configuration for the intended application and of the same material as the conductor or of electrolytically compatible materials. Galvanized or plated steels are not acceptable.

J. Connectors and splicers shall be of suitable configuration and type for the intended application and of the same material as the conductors or of electrolytically compatible materials.

K. Ground terminations suitable for the soil conditions shall be provided for each downlead conductor. Where the structural steel framework is utilized as main conductors for the system, perimeter columns shall be connected to the grounding system at intervals averaging 60 feet or less on the protected perimeter. For any structure in excess of 60 ft. in vertical elevation above grade, a ground loop interconnecting all ground terminals and other building grounded systems shall be provided.

L. Common interconnection of all grounded systems within the building shall be accomplished using main size conductors and fittings. Grounded metal bodies located within the calculated bonding distance as determined by the formulas of the Standards shall be bonded to the system using properly sized bonding conductors.

M. Surge suppression shall be provided at every system entrance to the structure to prevent massive lightning over-voltages from entering the structure.

N. Provide theft prevention coverings.

2.4 Ground Electrodes:

A. Each down conductor shall terminate at a ground electrode dedicated to the lightning protection system, or to a building or facility ground electrode system that consists of multiple ground electrodes that are interconnected with a ground ring conductor.

B. Ground rod electrodes shall be copper-clad steel, a minimum 3/4" diameter and 10 feet long. The down conductor shall be connected to the ground electrode using a bronze ground rod clamp having a minimum of 1-1/2" contact between the ground rod electrode and the conductor measured parallel to the axis of the ground rod electrode, or by an exothermically welded connection. Ground rod electrodes shall be located a minimum of 2 feet below grade and shall be installed below the frost line where possible (excluding shallow topsoil conditions).

C. Where it is not possible to drive ground rod electrodes because of bedrock or shallow topsoil conditions, ground plate electrodes, radial electrodes, ground ring electrodes, concrete-encased electrodes, or combinations of these may be used in accordance with NFPA® 780.

D. Where the structural steel framework is utilized as down conductors for the system, ground electrodes shall be connected to columns around the perimeter of the structure at intervals averaging not more than 60 feet apart. Columns shall be grounded using either bonding plates having 8 square inches of surface contact area or by exothermically welded connections.

2.5 Common Bonding of Grounded Systems:

A. Common bonding of all grounded systems within the building shall be ensured by interconnecting them to the lightning protection system using main size conductor and fittings.
B. For structures exceeding 60 feet in height, the interconnection of the lightning protection system ground electrodes and other grounded systems shall be in the form of a ground loop conductor.
C. These grounded systems shall include but are not limited to the electrical service, communication, and antenna system grounds as well as all underground metallic piping systems including water, gas, sewer, underground metallic conduits, etc. Interconnection to a gas line shall be made on the customer's side of the meter.

2.6 Potential Equalization:

A. Grounded metal bodies located within the required bonding distance as determined by the bonding distance formula in NFPA® 780 shall be bonded to the lightning protection system using the required bonding conductors and connections.

PART 3 - EXECUTION

3.1 Standard:

A. The installation of the lightning protection system shall be done in a neat and workmanlike manner.
B. The lightning protection system shall be installed by or under the supervision of a UL listed lightning protection installer.
C. The installers shall have completed factory training and be so certified by the manufacturer.
D. Install the lightning protection system in accordance with the approved coordinated shop drawing and the referenced lightning protection system installation standards. Any deviations shall be brought to the immediate attention of the manufacturer so as not to delay certification.

3.2 Coordination:

A. Coordinate the installation of the lightning protection system with other trades.
B. Coordinate all roof penetrations, fasteners, and adhesive with the roofing contractor prior to installing any materials on the roof.

3.3 Installation:

A. Roof penetrations required for down conductors or for connections to structural steel framework shall be made using through-roof assemblies with solid rods and appropriate roof flashings. The roofing contractor shall furnish the methods and materials required at roofing penetrations of the lightning protection components and any additional roofing materials or preparations required by the roofing manufacturer for lightning conductor runs to assure compatibility with the warranty for the roof.

(Note: The roofing contractor will be responsible for sealing and flashing all lightning protection roof penetrations as per the roof manufacturer's recommendations. The lightning protection roof penetrations and/or method of conductor attachment should be addressed in the roofing section of the specifications.)

3.4 Inspection, Certification, and Maintenance:

A. New Construction: The installing contractor shall apply for inspection of the completed system by UL field representatives. The system is to be inspected by Underwriters

Laboratories Inc, or other ANSI certified testing agency for compliance with NFPA® 780. The system shall be without deviation and the UL field representative will issue a UL Master Label® Certificate of Inspection for Lightning Protection Systems or Letter of Findings at completion of the installation.

B. Existing Structure without Lightning Protection: The contractor shall certify that the system installed complies with the requirements of the Standards, and advise the owner of the lightning protection work required on the existing structure to obtain full certification for the structure.

C. Existing Structure with Existing Lightning Protection: The contractor shall certify that the system installed complies with the requirements of the Standards, and advise the owner of any additional work required on the existing system to bring it into compliance with current Standards and qualify for UL Master Label.

D. If the scope of the lightning protection system is limited by contractual or other reasons, the installer may limit the scope of the UL inspection. In those cases where the entire system is not inspected, a Master Label® Certificate of Inspection will not be issued by UL. They will issue a Letter of Findings of their inspection indicating compliance with the limited scope of the inspection.

E. At project closeout, the contractor shall provide the owner with accurate as-built drawings as well as recommended guidelines for maintenance of the system.

END OF SECTION

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PART 1 - GENERAL

1.1 Summary:

A. Scope: Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, erection, and installation for exterior lighting as required for the complete performance of the work, and as shown on the Drawings and as herein specified.
B. Section Includes: The work specified in this Section includes, but shall not be limited to, the following:

1. Provide exterior lighting fixtures as specified herein and where shown and scheduled on the Drawings.
2. Provide all necessary accessories and appurtenances as required for a functional installation of the exterior lighting system.

1.2 Submittals:

A. General: See submittal procedures in Division 1.
B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Clearly indicate all variations and options proposed for installation.

1.3 Operation and Maintenance:

A. Operation and Maintenance Data: Prior to substantial completion, submit operation and maintenance data for light fixtures. Submit as indicated in Section 26 00 00 and Division 1.

1.4 Quality Control:

A. Qualifications:

1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of light fixtures of types, sizes, and performance required, and whose products have been in satisfactory use in similar service for a minimum of five years.
2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing light fixtures similar in type and scope to that required for this Project and shall be approved by the manufacturer.
3. Documentation of qualifications, examples of past projects, and references, shall be provided to Owner and/or Engineer upon request, but are not required as part of the standard submittal procedure.

B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

1. Without limiting the generality of other requirements of this Section, all work specified herein shall conform to or exceed the applicable requirements of the following standards; provided, that wherever the provisions of said publications are in conflict with the requirements specified herein, the more stringent requirements shall apply:

a. NFPA 70, National Electrical Code
b. ANSI/UL 1598-08 NMX-J-307/1-ANCE/C22.2 NO.250.0-08, Luminaires

c. ANSI/UL 8750-2015 - Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products
d. UL 924 10th Edition - Standard for Emergency Lighting and Power Equipment

C. Pre-Installation Conference: Prior to commencing the installation, meet at the Project site to review the material selections, installation procedures, and coordination with other trades. Pre-installation conference shall include, but shall not be limited to, the Contractor, the Installer, manufacturer's representatives, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Architect.

D. Single Source Responsibility: Obtain each type of light fixture and required accessories from a single source with resources to produce products of consistent quality in appearance and physical properties without delaying the work. Any materials which are not produced by the manufacturer shall be acceptable to and approved by the manufacturer. This is not meant as a requirement that all light fixtures come from a single source. All parts and accessories for each individual light fixture shall meet this requirement.

1.5 Delivery, Storage, and Handling:

A. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.

B. Store materials in their original, undamaged packages and containers, inside a well ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.6 Warranty:

A. General: See closeout procedures in Division 1.

B. Special Warranty: Submit a written warranty executed by the manufacturer, the Installer, and the Contractor, agreeing to repair or replace light fixtures that fail in materials or workmanship within the specified warranty period.

1. Warranty Period: Warranty period shall be one year from the date of substantial completion.

C. Provide additional Manufacturer's warranty information, as applicable.

PART 2 - PRODUCTS

2.1 Manufacturers:

A. Basis of Design:

1. Items specified are to establish a standard of quality for design, function, materials, and appearance.
2. Unless specifically noted otherwise, all Basis of Design light fixtures are open to submission of equivalent products.
3. The Design Professional will be the sole judge of the basis of what is equivalent.
4. Equivalency will be decided on quality, performance, aesthetics, and maintainability.
5. Owner will be given the opportunity to reject specific manufacturers of equivalent materials based on negative past experience.
6. Any adjustments required to meet equivalency requirements shall be at

Contractor's expense.

7. See Drawings for schedules indicating additional Basis of Design information.
8. If proposing any alternate fixtures, contractor shall provide site photometric plans:
    a. Such photometric plans shall include all required calculations, including any local dark skies, light trespass, or other requirements.
    b. Photometric plans shall include calculation zones to match the Basis of Design photometric plans, to allow for easy comparison to the Basis of Design performance.
    c. Statistical photometric report shall be provided, including the following items for each zone: Maximum Illuminance, Minimum Illuminance, Average Illuminance, Maximum/Minimum Ratio, Average/Minimum Ratio.
    d. All results shall be in footcandles, calculated to at least two decimal places.
    e. Calculation point spacing shall match Basis of Design photometric plans. By default, exterior points shall be spaced in a 10'x10' grid, except for pedestrian walking areas, which shall be spaced in a 5'x5' grid.

2.2 Materials and Components:

A. General:

1. Color temperature shall be as indicated on the Light Fixture Schedule.
2. Luminous output shall be as indicated on the Light Fixture Schedule. Alternate fixtures within 5% do not require justification.
3. Fixture or lamp life rating in hours shall be per the Basis of Design. Life rating for LED fixtures shall be to 70% or 90% intensity per the Basis of Design.
4. Minimum rated life shall be comparable to Basis of Design, as determined by the Design Professional.
5. Where not specified elsewhere, minimum rated life shall be 68,000 hours at L70.
6. Materials (steel, aluminum, acrylic, polycarbonate, etc.) shall be per the basis of design.
7. Environmental ratings shall be per the Basis of Design.
8. Additional considerations shall be per notes on the Light Fixture Schedule and on the Drawings.
9. Confirm all finishes with Owner and Architect prior to ordering.

B. Environmental Considerations:

1. All exterior fixtures shall be indicated for use in wet locations, even where installed in damp or dry locations.
2. Exterior fixtures subject to high humidity or moisture shall be suitable for use in wet locations. This includes light fixtures for showers.
3. Exterior light fixtures shall be rated for 0°F to 120°F operation.
4. Complete exterior luminaires shall be listed for wet locations by an NRTL with a minimum rating of IEC 60529/IP65.

C. Construction/Finish:

1. No visible welding, no plane-protruding screws, latches, springs, hooks, rivets or plastic supports viewed from the occupied (room) side are allowed.
2. All housing finishes must be baked-on enamel, anodized, or powder-coated, unless otherwise specified.
3. Luminaire optical enclosures (lens/window) shall be constructed of clear and UV-resistant polycarbonate, or acrylic. Only impact-resistant polycarbonate shall be utilized in fixtures below 10' AFG.

D. Maintainability:

1. Power supplies/drivers/ballasts, LED arrays, boards, or light engines shall be easily field replaceable using common hand tools (e.g., screwdrivers, pliers, etc.) and without uninstalling the luminaire.

E. Maintenance Materials:

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

a. Fixtures: One for every thirty of each type and rating installed. Furnish at least one spare fixture for any type of fixture with at least ten units being installed by this project.
b. Lamps: One for every ten of each type and rating installed, rounded up. Furnish at least one of each type.
c. Track Heads: One for every ten of each type and rating installed, rounded up. Furnish at least one spare head for any type of head with at least ten units being installed by this project.
d. Diffusers and Lenses: One for every twenty of each type and rating installed, rounded up. Furnish at least one of each type.
e. Globes and Guards: One for every thirty of each type and rating installed, rounded up. Furnish at least one of each type.

F. Emergency Egress Application:

1. Exterior lighting that is installed in locations that the local authority has determined to be part of an outdoor path of egress shall meet applicable emergency requirements.
2. Emergency lighting provisions shall be provided at the nearest fixture within 10' of an exit door (as indicated by exit signage on plans), regardless of whether such are indicated as emergency fixtures on lighting plans.

PART 3 - EXECUTION

3.1 Examination:

A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
B. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 Temporary Lighting:

A. If approved by the Architect, use selected permanent luminaires for temporary lighting.
B. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.
C. Contractor is responsible for replacing any light fixtures damaged over the course of construction.

3.3 Installation:

A. Comply with NECA 1.
B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise

indicated.

C. Provide lamps in each luminaire.

D. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Provide support for luminaire without causing deflection of ceiling or wall.
4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.

E. Flush-Mounted Luminaire Support:

1. Secured to outlet box.
2. Trim ring flush with finished surface.
3. Do not use ceiling system as support for pendant luminaires.

F. Wall-Mounted Luminaire Support:

1. Attached to structural members in walls.
2. Utilize back plates and/or other support methods were recommended by the manufacturer.
3. Do not attach luminaires directly to gypsum board.

G. Ceiling-Mounted Luminaire Support:

1. Do not support fixture from soft, pliable, or brittle ceiling materials (e.g. gypsum, light gauge metal).
2. Support fixture from structure, as required by the assembly.
3. Install per manufacturer's recommendations.

H. Pole-Mounted Luminaire Support:

1. Provide poles as indicated on plans and in pole specification.

3.4 Control:

A. Exterior fixtures shall all be controlled by a combination of a photocell and a time clock. See plans for location of photocells and time clocks. See Section 26 27 26 General Wiring Devices for photocell and time clock requirements. Photocell shall not interrupt power to time clock.

B. Where multiple circuits are indicated, provide contactor with Hand-Off-Auto control. See plans for location of contactor and contactor requirements.

3.5 Identification:

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 Electrical Identification.

3.6 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.

3.7 Adjusting:

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

3.8 Protection:

A. Provide final protection and maintain conditions in a manner acceptable to the Installer, that shall ensure that the light fixtures shall be without damage at time of Substantial Completion.

3.9 Cleaning:

A. Clean fixture surfaces of dirt, cement, plaster, and debris. Utilize cleansers compatible with fixture finishes and materials.

3.10 Training:

A. Provide up to four hours of training from a factory authorized-representative, up to two sessions.
B. Schedule training with Owner.
C. Provide DVD recording of all training sessions. Ensure that audio is clear and intelligible.

END OF SECTION

PROPOSED

UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING

FOR

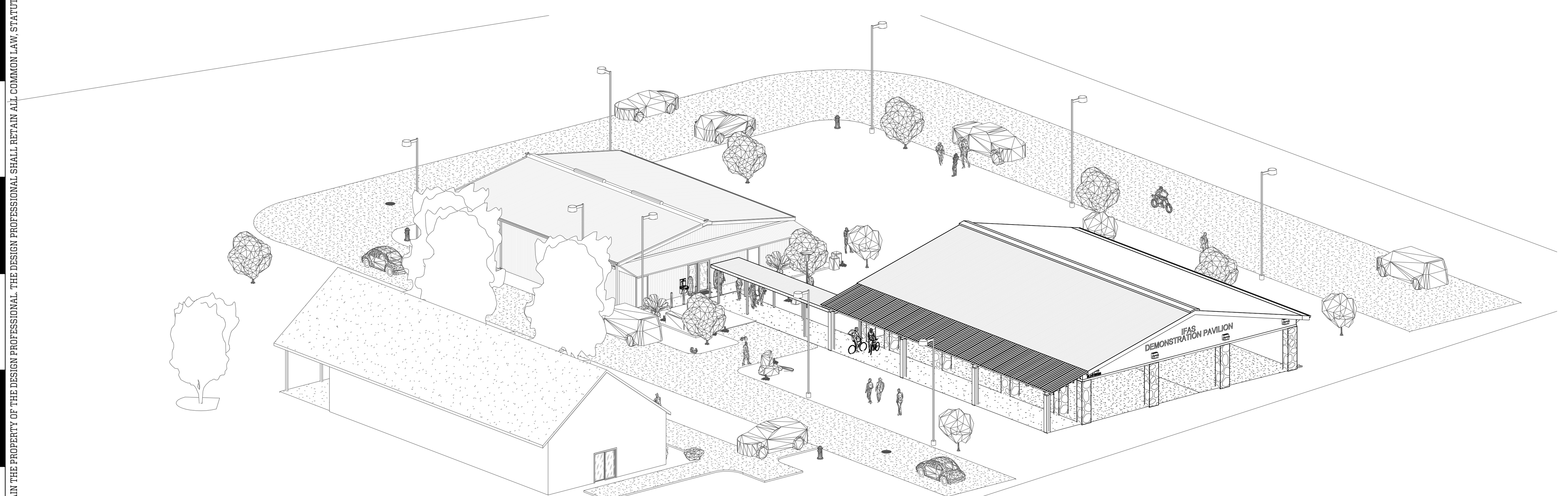
UF PLANNING, DESIGN & CONSTRUCTION

AT

LIVE OAK, FL

UF BLDG # 8325

3D PLAN



SITE VICINITY MAP

PROJECT INFORMATION

SVM JOB NUMBER: 1460-30
PROJECT NAME: UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING

PROJECT/ SITE ADDRESS
LIVE OAK, FL

OCCUPANCY TYPE - FBC: B-BUSINESS
OCCUPANCY TYPE - NFPA: EXISTING BUSINESS
NUMBER OF STORIES: 1 ABOVE GRADE
NUMBER OF BUILDINGS: 1
AUTHORITIES HAVING JURISDICTION: CITY OF GAINESVILLE

PROJECT SCOPE

PROJECT TYPE: PROPOSED
PROJECT SCOPE OF WORK: DEMONSTRATION PAVILION:
ARCHITECTURAL AND ENGINEERING DESIGN SERVICES FOR A 60' X 75' PRE-ENGINEERED, GALVANIZED METAL BUILDING WITH NON-TAPERED COLUMNS ON 25' WIDE BAYS. THE EAVES WILL BE 12' HIGH WITH SIDE PANELS DOWN TO 10' ON ALL FOUR SIDES. THE GALVALUME FINISH ROOF WILL HAVE A 3:12 PITCH WITH A 2' OVERHANG ON ALL 3 SIDES, AND A 10' WIDE SHED ROOF ON THE NORTH SIDE. GUTTERS ON THE NORTH AND SOUTH SIDES WILL BE ROUTED TO AN UNDERGROUND DRAINAGE SYSTEM VIA DOWNSPOUTS ON ALL 8 SIDE COLUMNS.
THE SLAB WILL BE 4" THICK, DESIGNED FOR PEDESTRIAN USE, WITH A SMOOTH TROWEL FINISH, AND BE SLOPED TO DRAIN. COLUMN BASES WILL BE ELEVATED RELATIVE TO THE SLAB. FOUNDATION DESIGN WILL BE BASED UPON BUILDING MANUFACTURER-PROVIDED REACTIONS.
THE SIDE WALLS WILL BE R-PANELS WITH A 20-YEAR PAINTED FINISH OF OYSTER GREY WITH DARK GREEN TRIM. THE COLUMNS WILL BE WRAPPED IN HARDIE PANEL UP TO 10'. THE COLUMNS WILL BE DESIGNED FOR FUTURE INSTALLATION OF ROLL-DOWN CURTAINS EQUIVALENT TO FENETEX.
THE BUILDING WILL HAVE LIGHTING, (1) "BIG ASS" FAN AND QUAD RECEPTACLES AT THE BASE OF EACH COLUMN. ADEQUATE POWER AND JUNCTION BOXES AT EACH COLUMN WILL BE PROVIDED FOR THE FUTURE ROLL-DOWN CURTAINS.
THE BUILDING WILL HAVE A 10' WIDE COVERED CONCRETE WALK ON THE NORTH SIDE. THE WALK WILL CONNECT THE MAIN ASSEMBLY BUILDING TO THE FUTURE PARKING.
COVERED WALKWAY:
ARCHITECTURAL DESIGN FOR A PRE-ENGINEERED ALUMINUM CANOPY OVER THE CONCRETE WALK CONNECTING THE MAIN ASSEMBLY BUILDING WITH THE PAVILION.
RELATED WORK:
PROVIDE A WATER BOTTLE FILLER ON THE WEST EXTERIOR FACE OF THE MAIN ASSEMBLY BUILDING.

DRAWING SHEET INDEX

SHEET #	SHEET NAME	Current Revision	Current Date
TITLE			
T0.0	COVER SHEET		
ARCHITECTURAL PLANS			
A1.0	PROPOSED - PLAN - OVERALL		
A1.2	PROPOSED - ROOF PLAN		
ARCHITECTURAL EXTERIOR ELEVATIONS			
A2.0	PROPOSED - ELEVATIONS - EXTERIOR		
A2.1	PROPOSED - ELEVATIONS - EXTERIOR		
ARCHITECTURAL BUILDING SECTIONS			
A4.0	PROPOSED - SECTIONS - BUILDING		
ARCHITECTUAL DETAILS			
A7.0	PROPOSED - DETAILS		
PLUMBING			
P0.1	PLUMBING LEGEND, NOTES & ABBREVIATIONS		
P1.1	PLUMBING FLOOR PLAN		
ELECTRICAL			
E0.1	ELECTRICAL LEGEND, CODES & ABBREVIATIONS		
E1.1	ELECTRICAL FLOOR PLAN - POWER		
E1.2	ELECTRICAL CEILING PLAN - LIGHTING		
E1.3	ELECTRICAL ROOF PLAN		

CONSULTANTS

MECHANICAL ENGINEERS

MITCHELL GULLEDGE ENGINEERS
CRAIG GULLEDGE
352-745-3991

CGULLEDGE (CGULLEDGE@MITCHELLGULLEDGE.COM)

210 SW 4th Avenue
Gainesville, FL 32601

GENERAL NOTES

1. DRAWINGS ARE DIAGRAMATIC TO CONVEY EXISTING/NEW CONDITIONS. CONTRACTOR SHALL INSPECT AND VERIFY THE SCOPE OF WORK. ANY ADDITIONAL WORK NOT SPECIFICALLY NOTED ON THE DRAWINGS BUT YET ARE APPARENT TO FIELD INSPECTION SHALL BE CONSIDERED AS PART OF THIS CONTRACT. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR VERIFYING ALL EXISTING CONDITIONS.
2. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
3. NO INSTRUCTION, REVISIONS, ADDITIONS, DELETIONS, SPECIFICATIONS OR DETAILS OTHER THAN THE INFORMATION CONTAINED HEREIN BEFORE SHALL GOVERN THE PROJECT UNLESS THEY ARE IN WRITING AND APPROVED BY THE ARCHITECT, OWNER AND CONTRACTOR IN THE FORM OF A CHANGE ORDER.
4. GC, VENDORS & SUB-CONTRACTORS SHALL REFER TO ALL DRAWINGS, PROJECT MANUAL AND PWE SHEETS (WHEN APPLICABLE) OF CONTRACT DOCUMENTS AND COMPLY WITH ALL PROVISIONS THEREIN. IF THERE IS A DESCREPANCY BETWEEN CONTRACT DOCUMENTS, EXISTING CONDITIONS AND VENDOR SUPPLIED WATER TREATMENT DOCUMENTS, GC TO VERIFY AND COORDINATE PRIOR TO INSTALLATION OF ANY SLEAVING.
5. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE W/ MANUFACTURER'S INSTRUCTIONS. IT IS GENERAL CONTRACTOR'S RESPONSIBILITY TO VERIFY AND APPROVE ALL DIMENSIONS OF EQUIPMENT AND MATERIAL WITH SUPPLIERS PRIOR TO ORDERING AND / OR INSTALLATION OF ALL PRODUCTS.
6. RFI'S - SUBMIT ALL QUESTIONS ON RFI DOCUMENT PROVIDED IN BID DOCUMENTS WITH DATE OF REQUEST. ARCHITECT WILL PROVIDE RESPONSE AS QUICKLY AS PRACTICAL.
7. UPON GENERAL CONTRACTOR APPROVAL, ALL SUBMITTALS ARE TO BE SENT FROM THE SUBCONTRACTOR TO THE GENERAL CONTRACTOR FOR REVIEW AND SUBMISSION TO THE ARCHITECT; THE SUBCONTRACTOR IS TO FLAG ANY SUBSTITUTIONS. THE FULL SUBMITTAL PACKAGE IS TO BE SENT ELECTRONICALLY IN PDF FORMAT ON EITHER CD, FTP WEBSITE FOR DOWNLOAD, OR DROP BOX TO THE ARCHITECT WITHIN TWO WEEKS OF AWARD. ALL SUBMITTALS ARE TO BE REVIEWED BY GC PRIOR TO SUBMISSION TO THE ARCHITECT. ALL NON-REVIEWED SUBMITTALS WILL BE REJECTED. THE ARCHITECT WILL SUBMIT TO THE PROJECT MANAGER COPIES OF ALL REJECTED SUBMITTALS AND APPROVED SUBSTITUTIONS. ALL APPROVED SUBMITTALS AND CUT-SHEETS ARE TO BE MADE AVAILABLE PERMANENTLY ON THE JOB SITE FOR FUTURE REFERENCE DURING CONSTRUCTION MEETINGS. TIMELINESS OF SUBMITTALS IS OF EXTREME IMPORTANCE DUE TO PROJECT SCHEDULE. LATE SUBMITTALS WILL BE BACKCHARGED FROM THE SCHEDULE OF VALUES.ANY REVIEWS AFTER THIRD WEEK SHALL BE BORNE BY GENERAL CONTRACTOR @ A RATE OF $200 PER SUBMITTAL.
8. PROJECT MAY INCLUDE MISCELLANIOUS STANDARD DETAILS. GC IS TO REVIEW ALL TO VERIFY ALL ARE APPLICABLE. SOME DETAILS MAY BE MIRRORED FOR THIS PROJECT COORDINATE W/ FLOOR PLAN.
9. SEE PROJECT MANUAL SECTION 01100 FOR ALTERNATES (WHEN APPLICABLE).
10. SEE PROJECT MANUAL SECTION 01021 FOR ALLOWANCES (WHEN APPLICABLE).
11. SEE LS SERIES DRAWINGS FOR CODE DATA & LIFE SAFETY INFORMATION.
12. SEE SHEET A0.0.1 FOR ALL REQUIRED ADA & FIXTURE HEIGHTS.
13. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS TO VISIT THE JOBSITE AND FAMILIARIZE THEMSELVES WITH ALL EXISTING CONDITIONS IN THE FIELD. ANY DISCREPANCIES BETWEEN EXISTING FIELD CONDITIONS AND THE CONSTRUCTION DOCUMENTS ARE TO BE BROUGHT TO ARCHITECT'S ATTENTION IMMEDIATELY PRIOR TO BIDS BEING DUE. OWNER WILL PROVIDE DIRECTION TO GENERAL CONTRACTOR FOR BIDDING PURPOSES TO ASSURE APPROPRIATE SCOPE IS INCLUDED WITHIN BID.
14. CONTRACTOR IS TO COORDINATE WITH TENANTS, LANDLORDS AND/OR SURROUNDING TENANTS/LANDOWNERS WHEN PERFORMING ANY WORK. THERE SHALL NOT BE ANY DISRUPTION OF SERVICES FOR THE SURROUNDING TENANTS/LANDOWNERS DURING THE CONSTRUCTION / RELOCATION AND/OR EXPANSION AND/OR RENOVATION OF THE FACILITY.

SVM | SKINNER VIGNOLA McLEAN, INC.
ARCHITECTS & PLANNERS | FL CERTIFICATE | AA3478
P.352.378.4400 | F.352.377.5378
1628 NW 6TH STREET GAINESVILLE FL 32609
Howard McLean Jr AR0014129

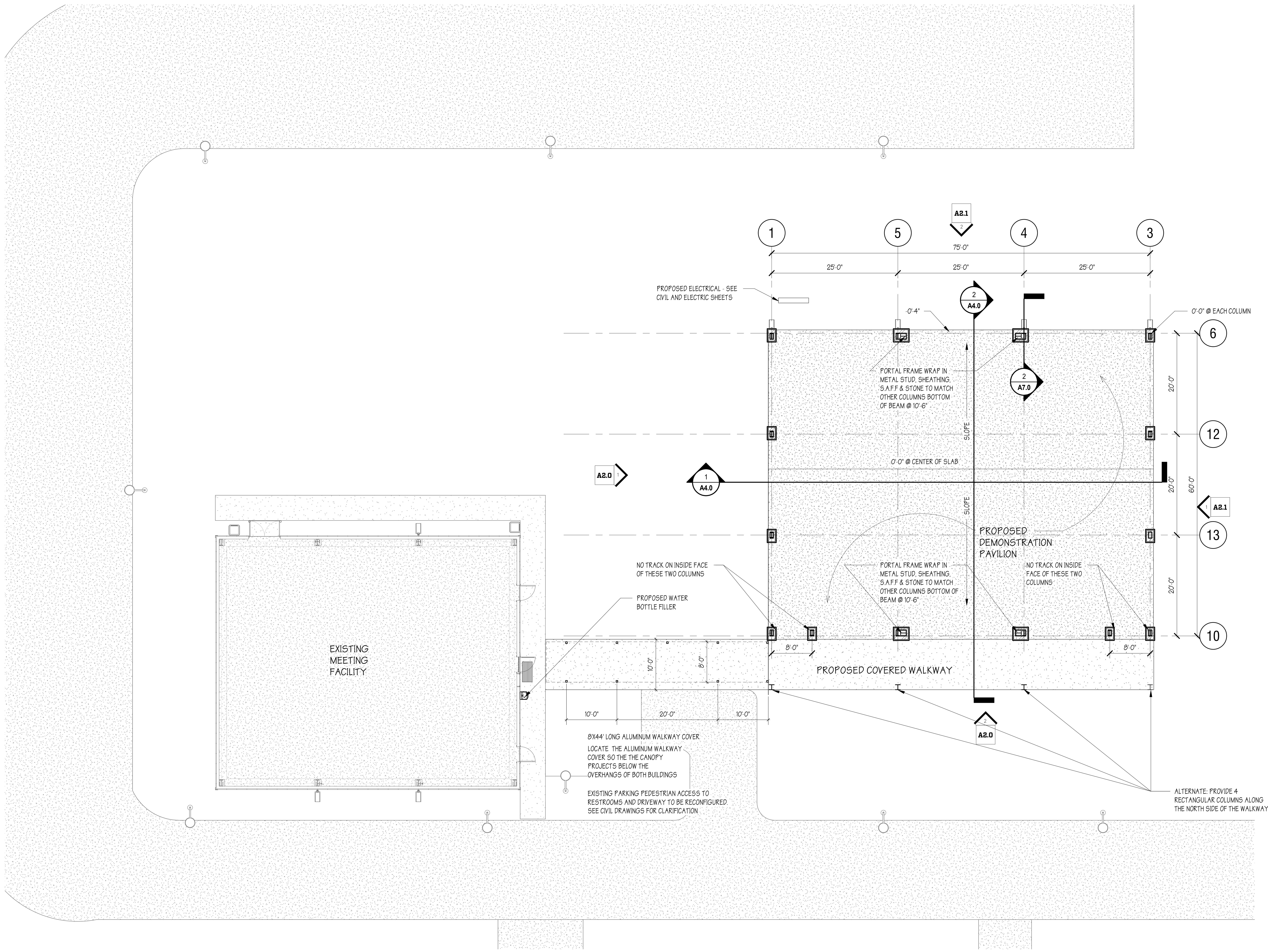
UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING
FOR
UF PLANNING, DESIGN & CONSTRUCTION
LIVE OAK, FL 32060
PROJECT

REVISIONS

DESIGN PHASE: 100% REVIEW

DATE: 1/29/2020
DRAWN BY: JER
CHECKED BY: HJM

SHEET T0.0
COVER SHEET
1460-30



1
A1.0

PROPOSED - PLAN - OVERALL

SCALE: 3/32" = 1'-0"

SVM

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SKINNER VIGNOLA McLEAN, INC.

ARCHITECTS & PLANNERS | FL CERTIFICATE | AA3478

STATE OF FLORIDA REGISTERED ARCHITECT AR0014129

Howard McLean Jr
AR0014129

UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING

FOR

UF PLANNING, DESIGN & CONSTRUCTION

LIVE OAK, FL 32060

PROJECT

REVISIONS

DESIGN PHASE: 100% REVIEW

DATE: 1/29/2020
DRAWN BY: JER
CHECKED BY: HJM

SHEET
A1.0

PROPOSED - PLAN - OVERALL

1460-30

1 A1.2 **PROPOSED - PLAN - ROOF**

SCALE: 1/8" = 1'-0"

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SKINNER VIGNOLA McLEAN, INC.

ARCHITECTS & PLANNERS | FL CERTIFICATE | AA3478

STATE OF FLORIDA HOWARD J. MCLEAN JR. REGISTERED ARCHITECT AR0014129

Howard McLean Jr
AR0014129

UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING FOR UF PLANNING, DESIGN & CONSTRUCTION PROJECT

LIVE OK, FL 32060

REVISIONS

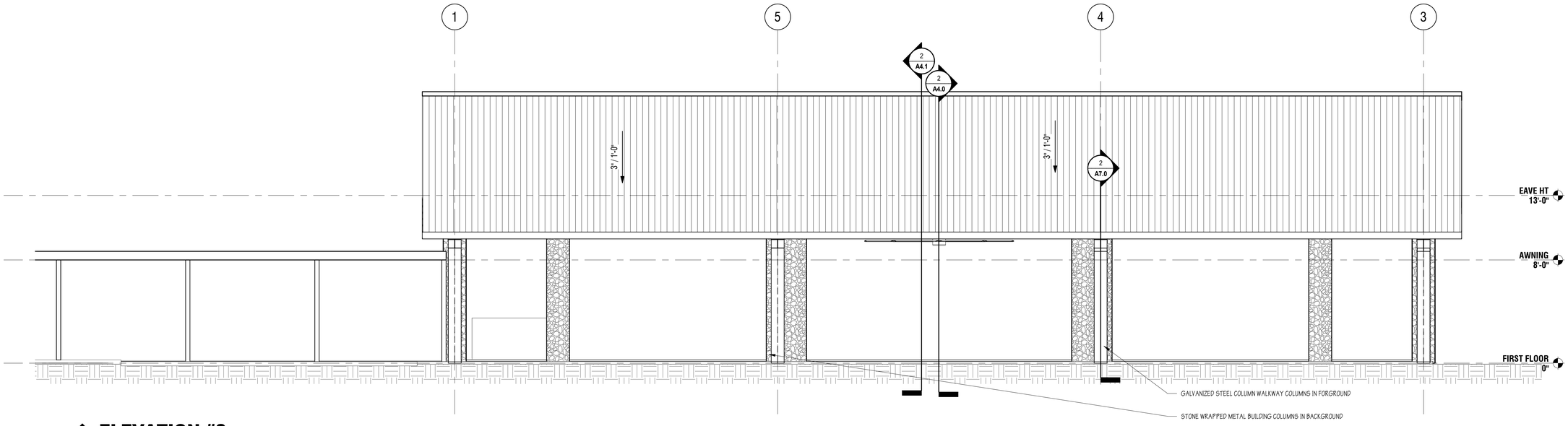
DESIGN PHASE: 100% REVIEW

DATE: 1/29/2020
DRAWN BY: JER
CHECKED BY: HJM

SHEET A1.2

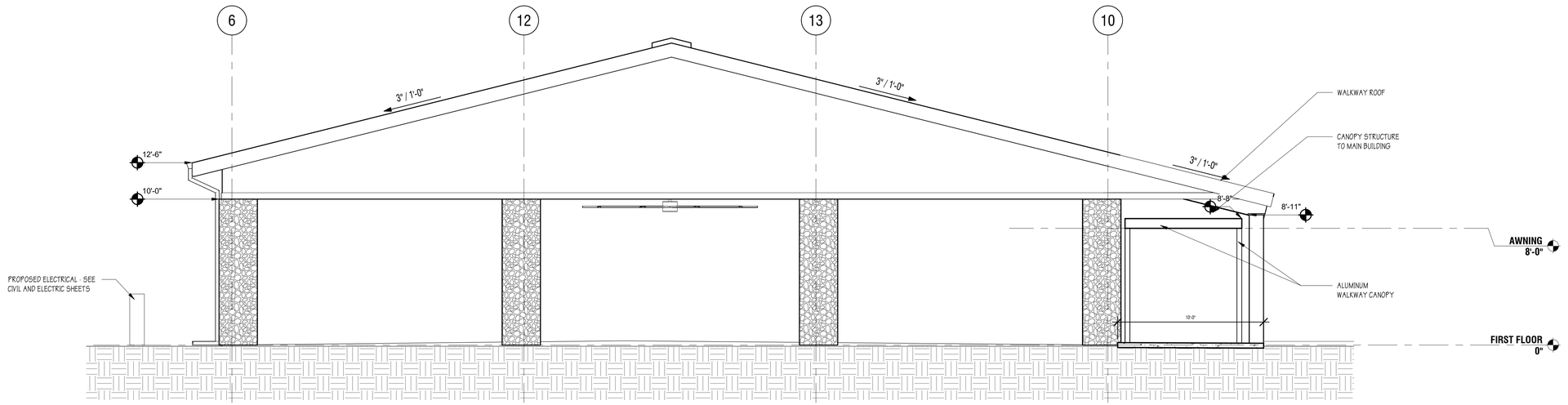
PROPOSED - ROOF PLAN

1460-30



2 A2.0 ELEVATION #2

SCALE: 1/4" = 1'-0"



1 A2.0 ELEVATION #1

SCALE: 1/4" = 1'-0"

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SVM | P.352.378.4400 F.352.377.5378 | 1628 NW 6TH STREET GAINESVILLE FL 32609
SKINNER VIGNOLA McLEAN, INC.
ARCHITECTS & PLANNERS | FL CERTIFICATE | AA3478

STATE OF FLORIDA REGISTERED ARCHITECT Howard McLean Jr AR0014129

Howard McLean Jr
AR0014129

UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING
FOR
UF PLANNING, DESIGN & CONSTRUCTION
LIVE OAK, FL 32060
PROJECT

REVISIONS

DESIGN PHASE: 100% REVIEW

DATE: **1/29/2020**
DRAWN BY: **JER**
CHECKED BY: **HJM**

SHEET
A2.0
PROPOSED - ELEVATIONS - EXTERIOR
1460-30

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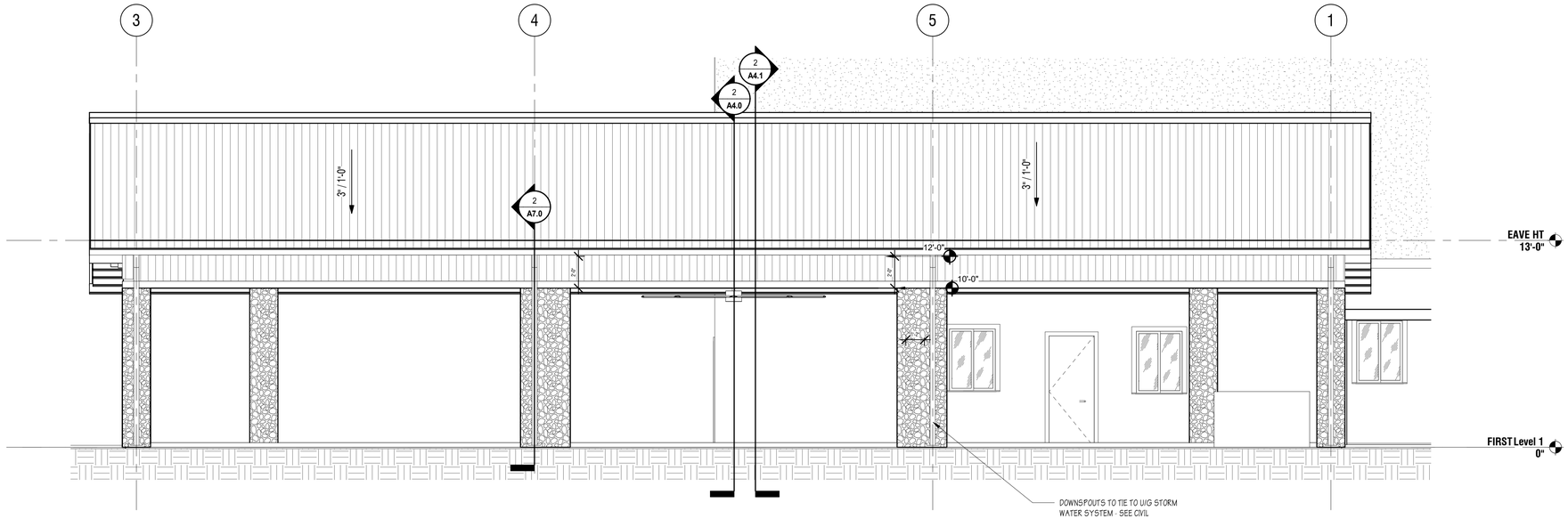
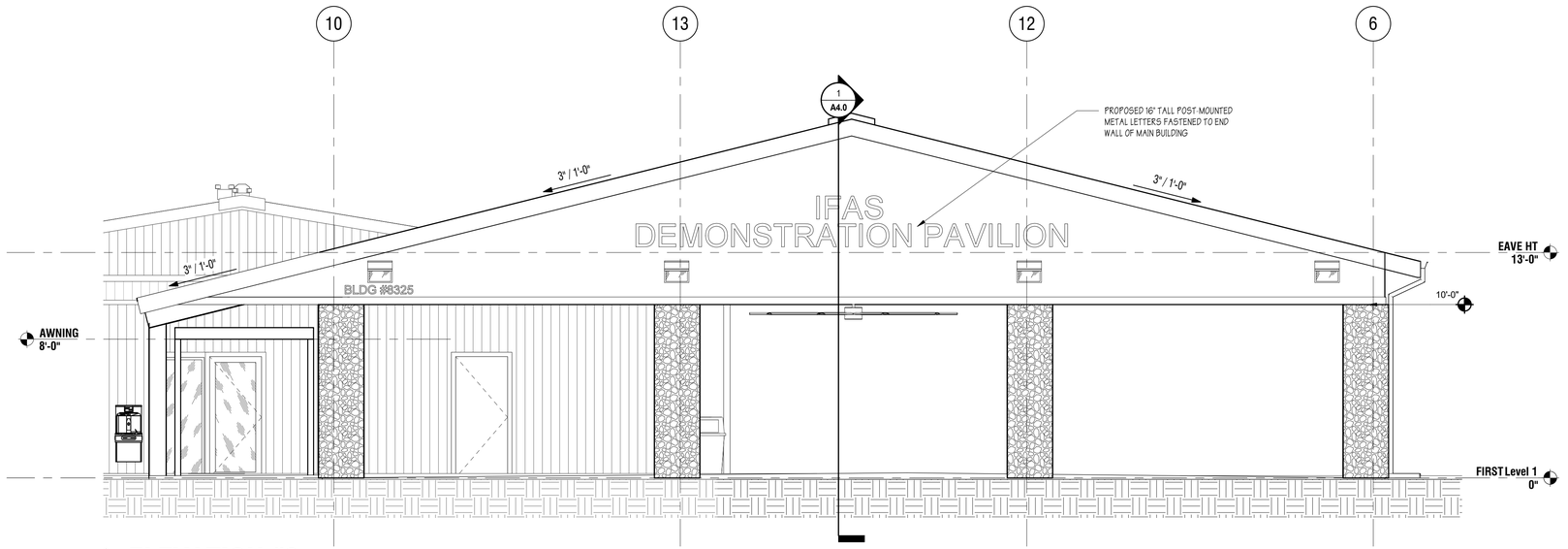


2 A2.1 ELEVATION #4

SCALE: 1/4" = 1'-0"



1 A2.1 ELEVATION #3

SCALE: 1/4" = 1'-0"

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SKINNER VIGNOLA McLEAN, INC.
ARCHITECTS & PLANNERS | FL CERTIFICATE | AA3478

STATE OF FLORIDA HOWARD J. MCLEAN JR. REGISTERED ARCHITECT AR0014129 TEST

Howard McLean Jr
AR0014129

UF/IFAS 20038 NORTH FLORIDA
REC - LIVE OAK AGRICULTURE
DEMONSTRATION BUILDING
FOR
UF PLANNING, DESIGN & CONSTRUCTION
LIVE OAK, FL 32060
PROJECT

REVISIONS

DESIGN PHASE: 100% REVIEW

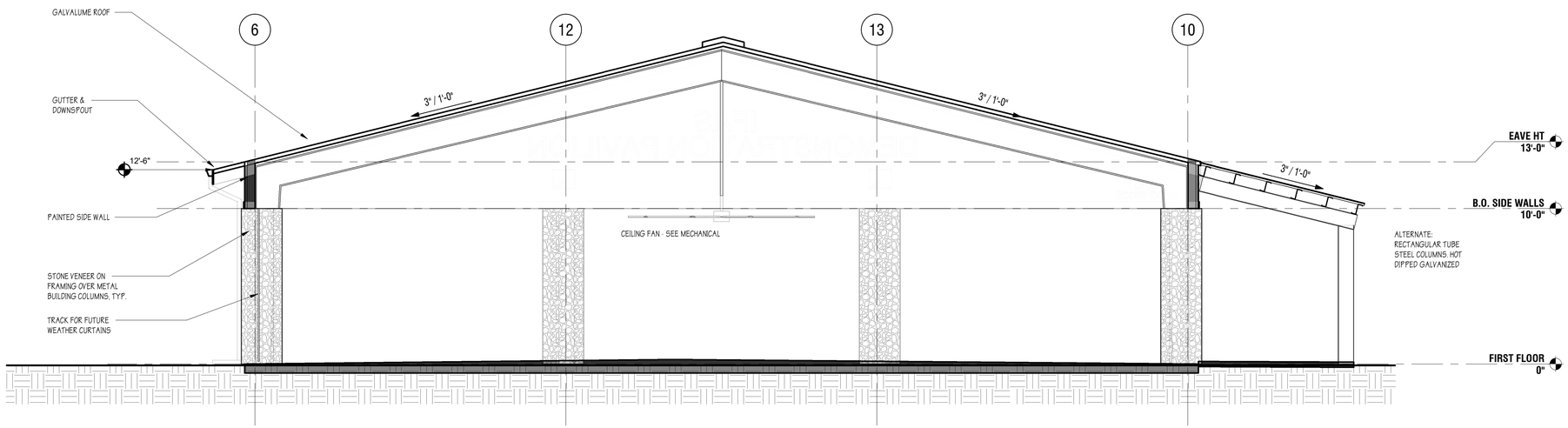
DATE: 1/29/2020
DRAWN BY: JER
CHECKED BY: HJM

SHEET
A2.1

PROPOSED - ELEVATIONS - EXTERIOR

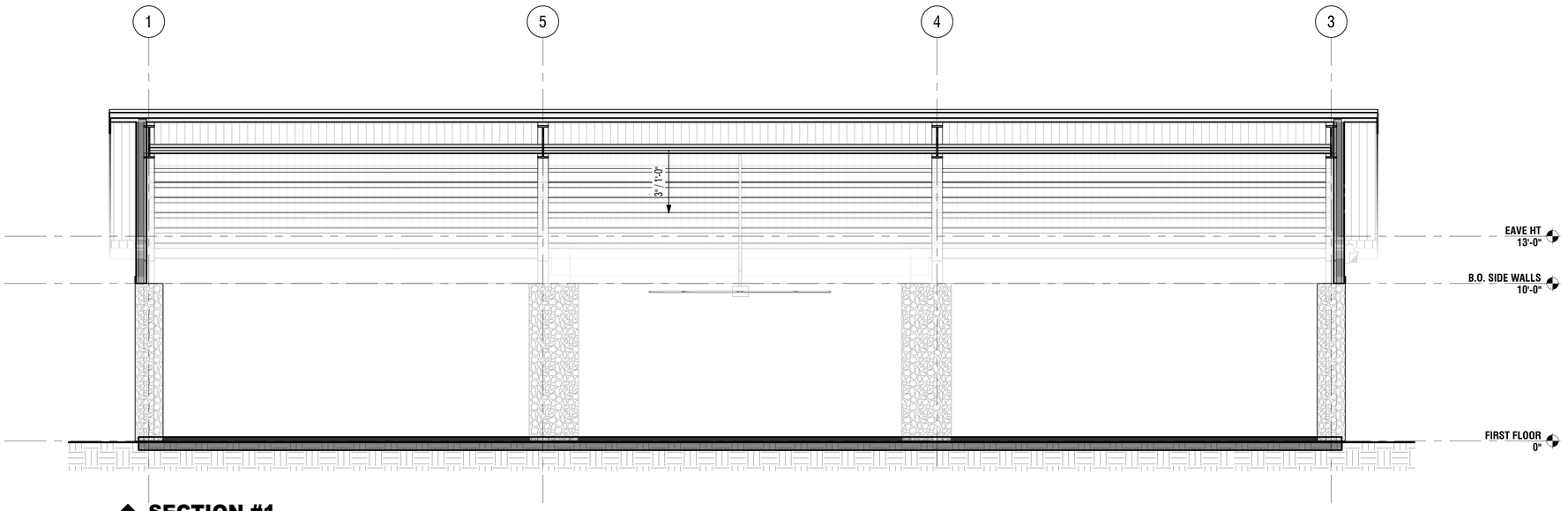
1460-30

GENERAL NOTES - SECTIONS - BUILDING



2 A4.0 **SECTION #2**

SCALE: 1/4" = 1'-0"



1 A4.0 **SECTION #1**

SCALE: 1/4" = 1'-0"

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STATE OF FLORIDA HOWARD JEFFREY MCLEAN LICENSE REGISTERED ARCHITECT AR0014129

Howard McLean Jr AR0014129

UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING
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LIVE OK, FL 32060
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REVISIONS

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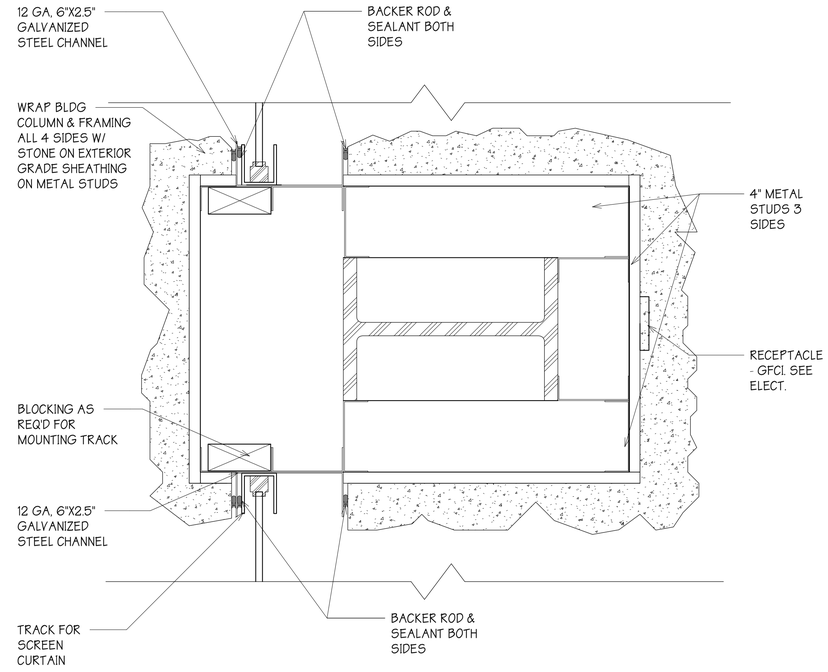
SHEET **A4.0**

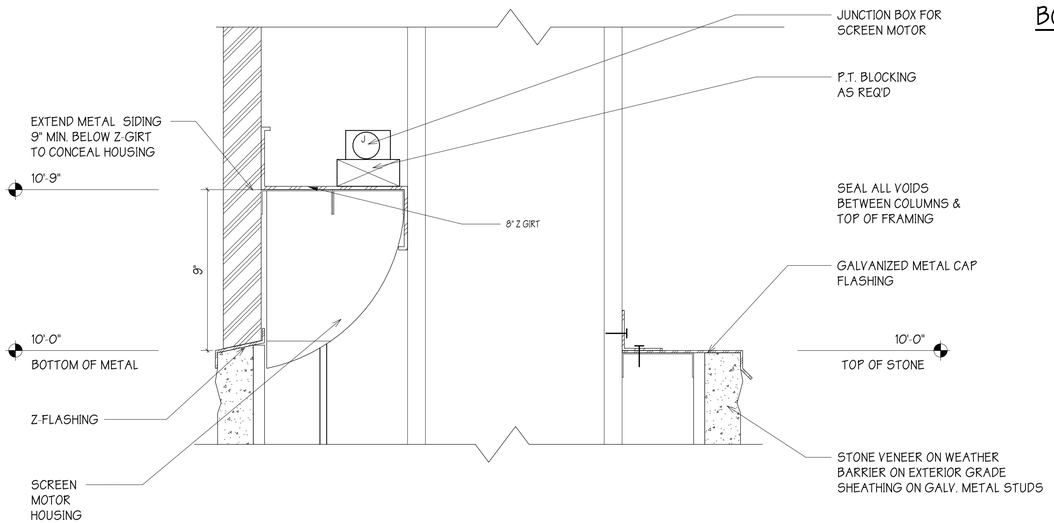
PROPOSED - SECTIONS - BUILDING

1460-30

8/6/2020 8:28:04 AM BIM 360://1460-30 - IFAS PAVILLION LIVE OAK/1460-14 UF-IFAS REDESIGN PAVILLION (10_30_2019)REVIT17.rvt

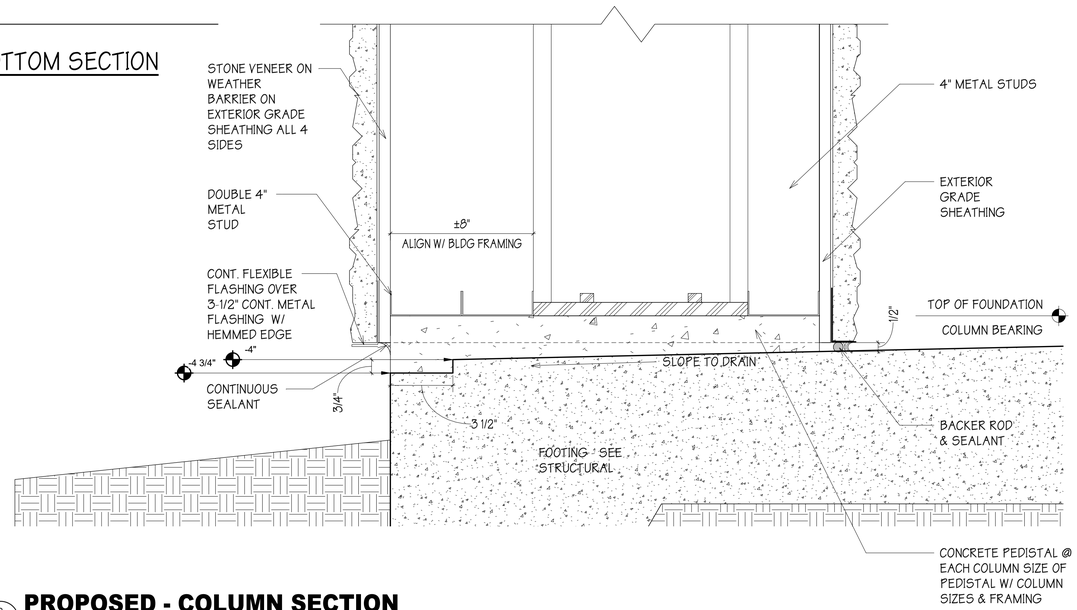
PLAN





1 / A7.0 **SECTION @ TOP OF COLUMNS**
SCALE: 3" = 1'-0"

BOTTOM SECTION



2 / A7.0 **PROPOSED - COLUMN SECTION**
SCALE: 3" = 1'-0"

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STATE OF FLORIDA HOWARD JAMES MCLEAN JR REGISTERED ARCHITECT AR0014129

Howard McLean Jr
AR0014129

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DATE: **1/29/2020**
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DESIGN PHASE: 100% REVIEW

SHEET
A7.0
PROPOSED - DETAILS
1460-30

PLUMBING GENERAL NOTES

1. COORDINATE WORK WITH OTHER TRADES. PROVIDE OFFSETS AND RELOCATE AS REQUIRED TO INSTALL A COMPLETE SYSTEM WITHOUT INTERFERING WITH OTHER TRADES. COORDINATE ANY NECESSARY CHANGES WITH THE GENERAL CONTRACTOR.

2. VERIFY INVERT ELEVATIONS WITH THE CIVIL DRAWINGS AND ON SITE CONDITIONS PRIOR TO INSTALLING ANY SYSTEM. ADJUST SYSTEM INVERT ELEVATIONS AND PROVIDE OFFSETS TO ACCOMMODATE EXISTING CONDITIONS.

3. CONTRACTOR SHALL INSTALL ALL SYSTEMS IN THEIR ENTIRETY ACCORDANCE WITH REFERENCED CODES, STANDARDS, DRAWINGS AND SPECIFICATIONS.

4. CONTRACTOR SHALL VISIT THE PROJECT SITE TO ACQUAINT THEMSELVES WITH THE EXISTING PROJECT CONDITIONS.

5.CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE OWNER AND GENERAL CONTRACTOR PRIOR TO ANY SYSTEM SHUT DOWN. PROVIDE ONE WEEK OF PRIOR NOTICE.

6. DO NOT CUT ANY BUILDING STRUCTURE WITHOUT PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER. PROVIDE OPENINGS IN THE STRUCTURE PER THE STRUCTURAL ENGINEER'S DIRECTIONS PRIOR TO OR DURING STRUCTURE INSTALLATION. (SEE STRUCTURAL DRAWINGS.) REQUEST INFORMATION WHEN REQUIRED TO VERIFY STRUCTURAL REQUIREMENTS WITH THE GENERAL CONTRACTOR.

7. DO NOT HAMMER THROUGH CONCRETE WALLS TO INSTALL ANY ITEM. CORE DRILL, CUT HOLES OR PROVIDE SLEEVES DURING WALL INSTALLATIONS. DAMAGE DONE BY OTHER MEANS TO BLOCK WALLS SHALL BE REPAIRED TO THE SATISFACTION OF THE ARCHITECT.

8. PROVIDE BOTH DEEP SEAL TRAPS AND (TRAP PRIMER VALVES & CONNECTIONS) FOR FLOOR DRAINS IN AREAS OTHER THAN SHOWERS OR AS NOTED FOR KITCHEN FLOOR DRAINS. VERIFY EACH FLOOR DRAIN LOCATION WITH THE GENERAL CONTRACTOR SO THAT PROPER FLOOR SLOPES CAN BE PROVIDED. FLOOR DRAINS THAT DO NOT ACCEPT WATER DUE TO IMPROPER FLOOR SLOPES WILL NOT BE ACCEPTABLE. INSTALL SUCH THAT NO TRIP HAZARD IS PRESENT WHEN COMPLETED, MEANING THE TOP SHALL BE FLUSH WITH FINISHED FLOOR.

9. PROVIDE ACCESS TO ITEMS PLACED IN WALLS OR ABOVE CEILINGS. ABOVE CEILING ITEMS SHALL BE ACCESSIBLE FROM A 6' LADDER.

10. ANY PIPING PASSING THROUGH A FOUNDATION WALL SHALL BE PROVIDED WITH A RELIEVING ARCH OR A PIPE SLEEVE TWO PIPE SIZES LARGER THAN THE PIPE PASSING THROUGH THE FOUNDATION, PER THE FLORIDA PLUMBING CODE. MODIFICATIONS TO STRUCTURE REQUIRE THE STRUCTURAL ENGINEER'S DIRECTION. NOTIFY GENERAL CONTRACTOR OF INTERFERENCES PRIOR TO INSTALLATION. PIPING SHALL NOT PASS THROUGH OR BELOW BUILDING FOOTINGS.

11. PROTECT PIPES FROM CONTACT WITH CONCRETE. USE SLEEVES PER SPECIFICATIONS. ALLOW FOR EXPANSION AND CONTRACTION OF PIPE SYSTEMS.

12. PROVIDE FIRE STOPPING AT EACH RATED FLOOR OR WALL PENETRATION. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FIRE RATINGS AND SYSTEMS.

13. REFER TO THE ARCHITECTURAL DRAWINGS FOR FIXTURE LOCATIONS AND ELEVATIONS.

14. PROVIDE PROPER BRACING FOR ALL FIXTURES TO SUPPORT THE WEIGHT DESCRIBED IN THE FLORIDA BUILDING CODE - ACCESSIBILITY.

15. DO NOT INSTALL PLASTIC PIPING IN AIR PLENUMS OR IN FIRE RATED WALLS. CONVERT TO CAST IRON AND/OR COPPER TUBING AS REQUIRED.

16. MAINTAIN A 15' CLEARANCE BETWEEN OUTDOOR AIR INTAKES AND PLUMBING VENTS. VERIFY LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLING THE VENTS.

17. THE ROOFING CONTRACTOR SHALL PROVIDE THE ROOF FLASHING FOR VENTS THROUGH THE ROOF. PLUMBING CONTRACTOR SHALL COORDINATE WITH THE ROOF CONTRACTOR AND GENERAL CONTRACTOR FOR EACH PENETRATION THROUGH THE ROOF. PROVIDE OFFSETS AS REQUIRED.

18. IN CONCEALED LOCATIONS WHERE PIPING, OTHER THAN CAST-IRON OR GALVANIZED STEEL, IS INSTALLED THROUGH HOLES OR NOTCHES IN STUDS, JOISTS, RAFTERS OR SIMILAR MEMBERS LESS THAN 1-1/2" FROM THE NEAREST EDGE OF THE MEMBER, THE PIPE SHALL BE PROTECTED BY STEEL SHIELD PLATES. SUCH SHIELD PLATES SHALL HAVE A THICKNESS OF NOT LESS THAN 16 GA. SUCH PLATES SHALL COVER THE AREA OF THE PIPE WHERE THE MEMBER IS NOTCHED OR BORED, AND SHALL EXTEND NOT LESS THAN 2" ABOVE SOLE PLATES AND BELOW TOP PLATES. (FBC-P-305.6).

PLUMBING LEGEND

- XX / YY — EQUIPMENT TAG; XX=EQUIP TYPE, YY=EQUIP. NO.
- CONNECT TO EXISTING
- GATE VALVE
- GLOBE VALVE
- CHECK VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CALIBRATED BALANCING VALVE (CIRCUIT SETTER)
- RELIEF VALVE
- TWO WAY CONTROL VALVE
- THREE WAY CONTROL VALVE
- PLUG VALVE
- PRESSURE REDUCING VALVE
- STRAINER
- THERMOMETER
- SENSOR WELL
- UNION
- PRESSURE GAUGE
- ECCENTRIC REDUCER
- CONCENTRIC REDUCER
- VENTURI FLOW METER
- FLEXIBLE PIPE CONNECTION
- TRAP PRIMER
- WATER HAMMER ARRESTOR

PLUMBING ABBREVIATIONS

A	AMPS
AFF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
AV	ACID VENT
AW	ACID WASTE
BFF	BELOW FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CFH	CUBIC FEET PER HOUR
CTG	CLEAN OUT TO GRADE
DEGF	DEGREE FARENHEIT
DIA	DIAMETER
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHR	DOMESTIC HOT WATER RETURN
EA	EACH
EX	EXISTING
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
FBC	FLORIDA BUILDING CODE
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FPM	FEET PER MINUTE
FS	FLOOR SINK
FT	FEET
FT WG	FEET WATER GAUGE
GA	GAUGE
GAL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GWH	GAS WATER HEATER
HB	HOSE BIBB
HP	HORSEPOWER
IN	INCHES
IN WG	INCHES WATER GAUGE
KW	KILOWATTS
KWH	KILOWATT HOUR
LAV	LAVATORY
LB	POUND
LWT	LEAVING WATER TEMPERATURE
MBH	1,000 BTUH
MIN	MINIMUM
MR	MOP RECEPTOR
NC	NORMALLY CLOSED
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PH	PHASE
PSI	POUNDS PER SQUARE INCH
RPM	REVOLUTIONS PER MINUTE
SAN	SANITARY
SF	SQUARE FEET
SH	SHOWER
SK	SINK
SPEC	SPECIFICATION
SS	STAINLESS STEEL; SERVICE SINK
TD	TRENCH DRAIN
TMV	THERMOSTATIC MIXING VALVE
TP	TRAP PRIMER
TYP	TYPICAL
UR	URINAL
V	VOLTS OR VENT
VIYB	VALVE IN YARD BOX
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WH	WALL HYDRANT
WHA	WATER HAMMER ARRESTOR
WPD	WATER PRESSURE DROP

PLUMBING FIXTURE SCHEDULE

MARK	TYPE	ABBREV	DCW (IN)	DHW (IN)	SAN (IN)	VENT (IN)	ELEC	FLOW	ACCESSIBLE	NOTES
EWC-4	ELECTRIC WATER COOLER	EWC	1/2	-	2	2	120-1	-	YES	OFOI DUAL WITH BOTTLE FILLER. PROVIDE WITH INTERAL WHA ON STOP.

NOTE: ALL PIPE SIZES SHOWN ARE FOR SINGLE FIXTURE INSTALLATION. WHERE MULTIPLE FIXTURES ARE SERVED BY A COMMON PIPE, SEE DRAWINGS FOR SIZE.

CODES AND STANDARDS

ALL PROJECT WORK SHALL BE GOVERNED BY AND ADHERE TO THE FOLLOWING CODES AND STANDARDS.

1. FLORIDA BUILDING CODE 6TH EDITION (2017)
2. FLORIDA BUILDING CODE 6TH EDITION (2017) - PLUMBING
3. FLORIDA BUILDING CODE 6TH EDITION (2017) - ENERGY CONSERVATION
4. FLORIDA BUILDING CODE 6TH EDITION (2017) - MECHANICAL
5. FLORIDA BUILDING CODE 6TH EDITION (2017) - ACCESSIBILITY
6. FLORIDA FIRE PREVENTION CODE SIXTH EDITION (2017)
   - A. FIRE CODE (NFPA 1 - 2015 FLORIDA EDITION)
   - B. LIFE SAFETY CODE (NFPA 101 - 2015 FLORIDA EDITION)
7. NATIONAL ELECTRIC CODE (NFPA 70) - 2014 EDITION

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S. Andrew Mitchell PE - 75609

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PROJECT LOCATION: LIVE OK, FL 32060

DESIGN PHASE: 100% REVIEW

REVISIONS

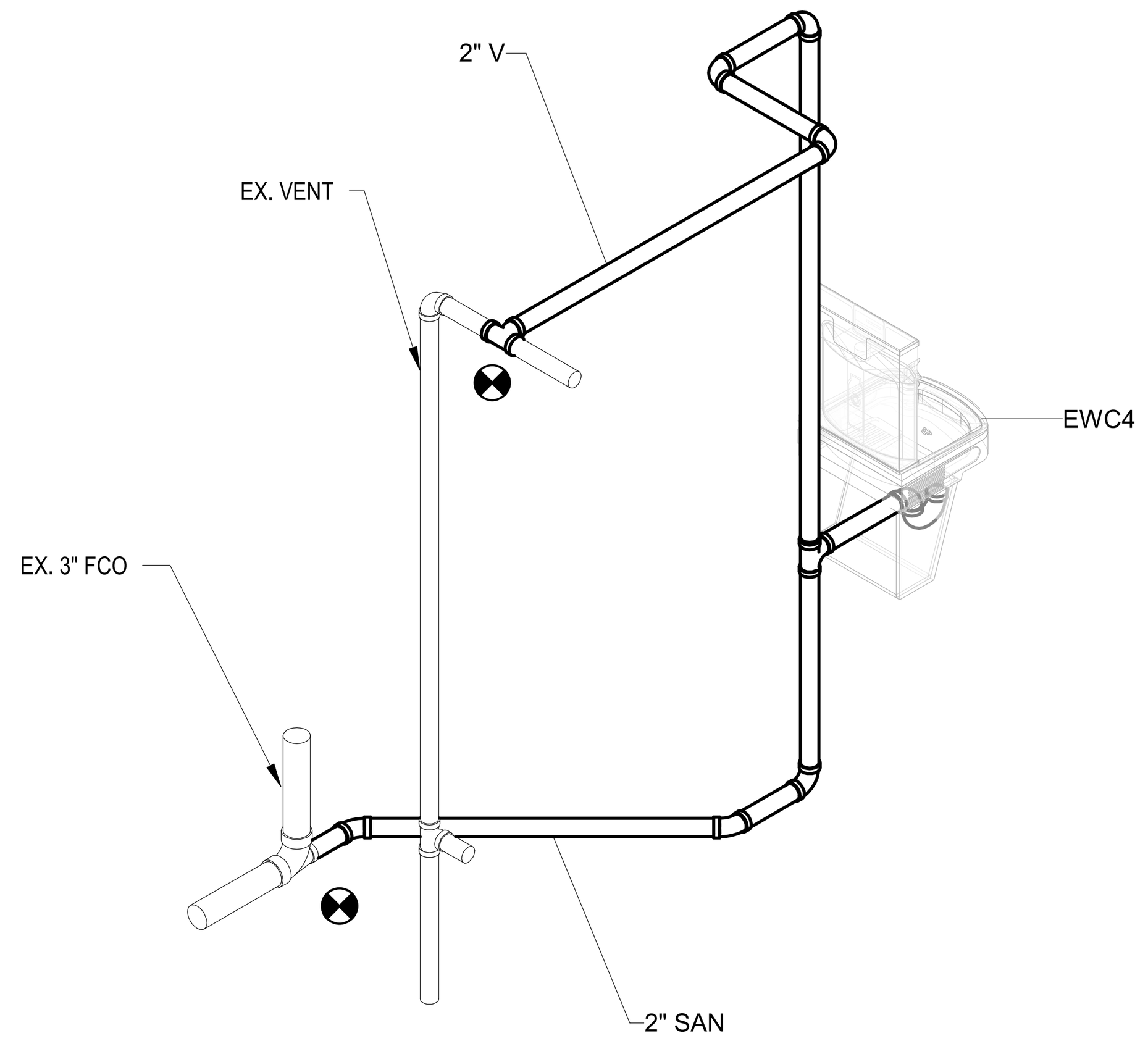
DATE: 2/04/2020
DRAWN BY: LW
CHECKED BY: AM

MG mitchell + gulledge engineering
Mitchell Gulledge Engineering, Inc.
210 SW 4th Avenue
Gainesville, FL 32601
FL License EB-31501 p.352.745.3991
www.mitchellgulledge.com MG#19096

SHEET P0.1

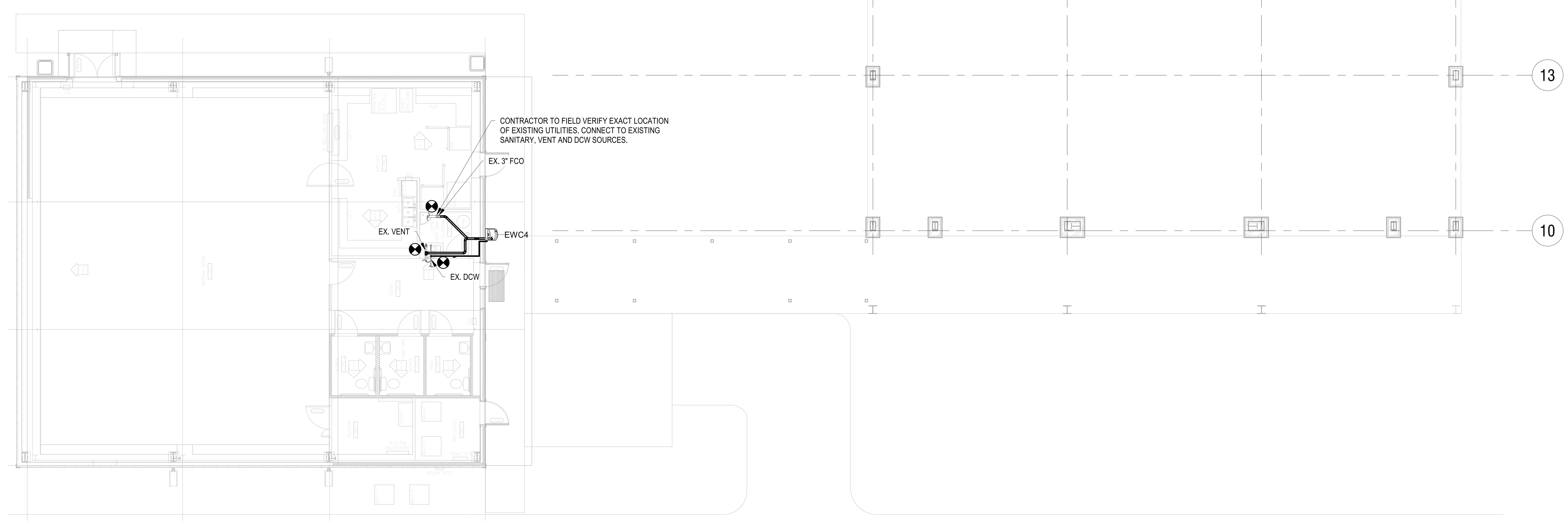
PLUMBING LEGEND, NOTES & ABBREVIATIONS

1460-30



PLUMBING - SANITARY WASTE AND VENT RISER DIAGRAM

NOT TO SCALE



PLUMBING FLOOR PLAN

1/8" = 1'-0"

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P1.1
PLUMBING FLOOR PLAN
1460-30

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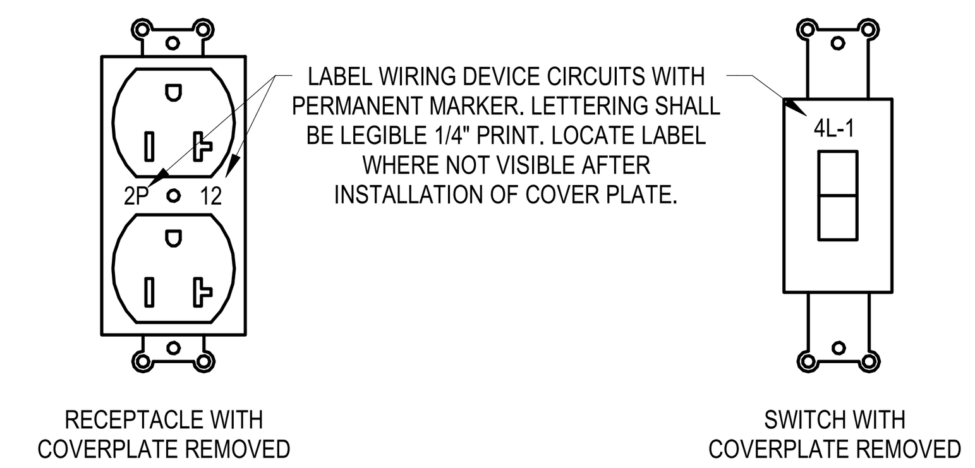
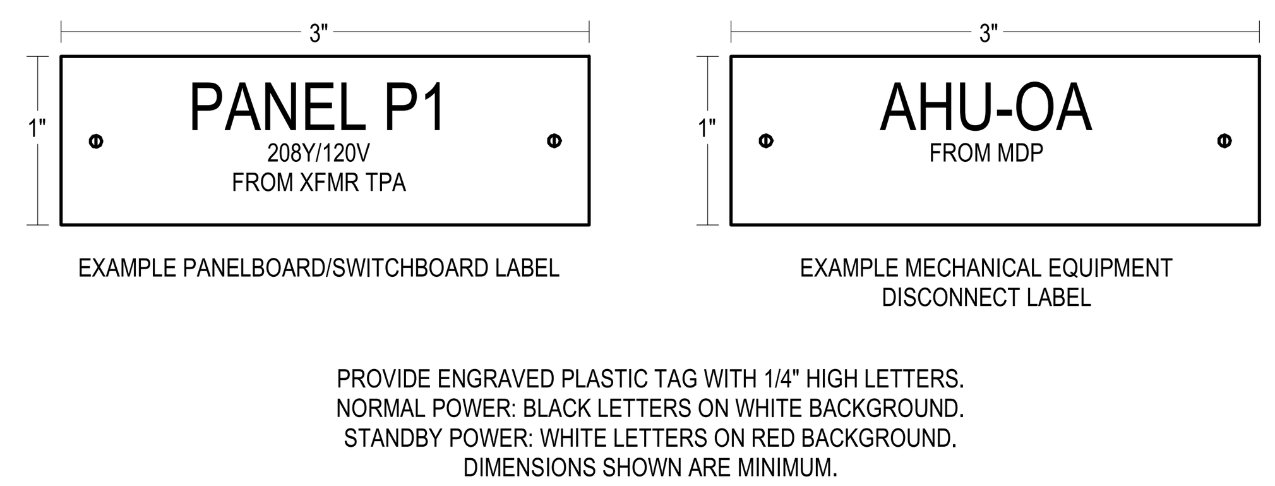
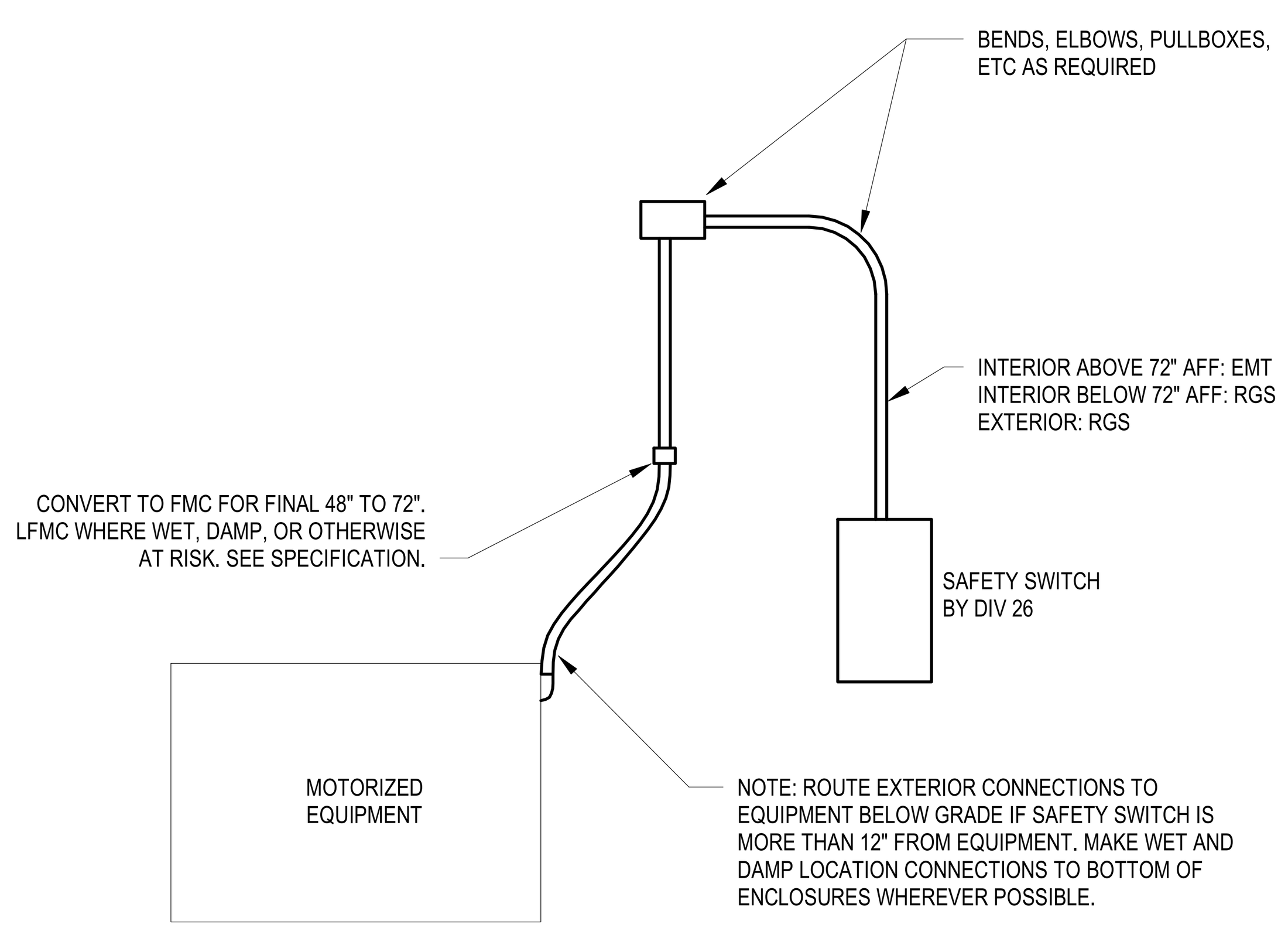


1 ELECTRICAL WIRING DEVICE LABEL DETAIL
NOT TO SCALE

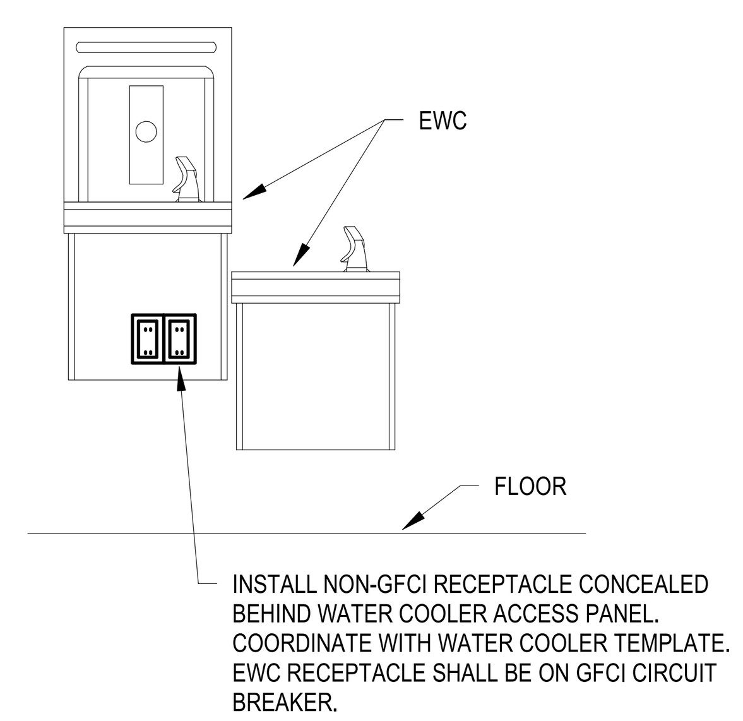


PROVIDE ENGRAVED PLASTIC TAG WITH 1/4" HIGH LETTERS.
NORMAL POWER: BLACK LETTERS ON WHITE BACKGROUND.
STANDBY POWER: WHITE LETTERS ON RED BACKGROUND.
DIMENSIONS SHOWN ARE MINIMUM.

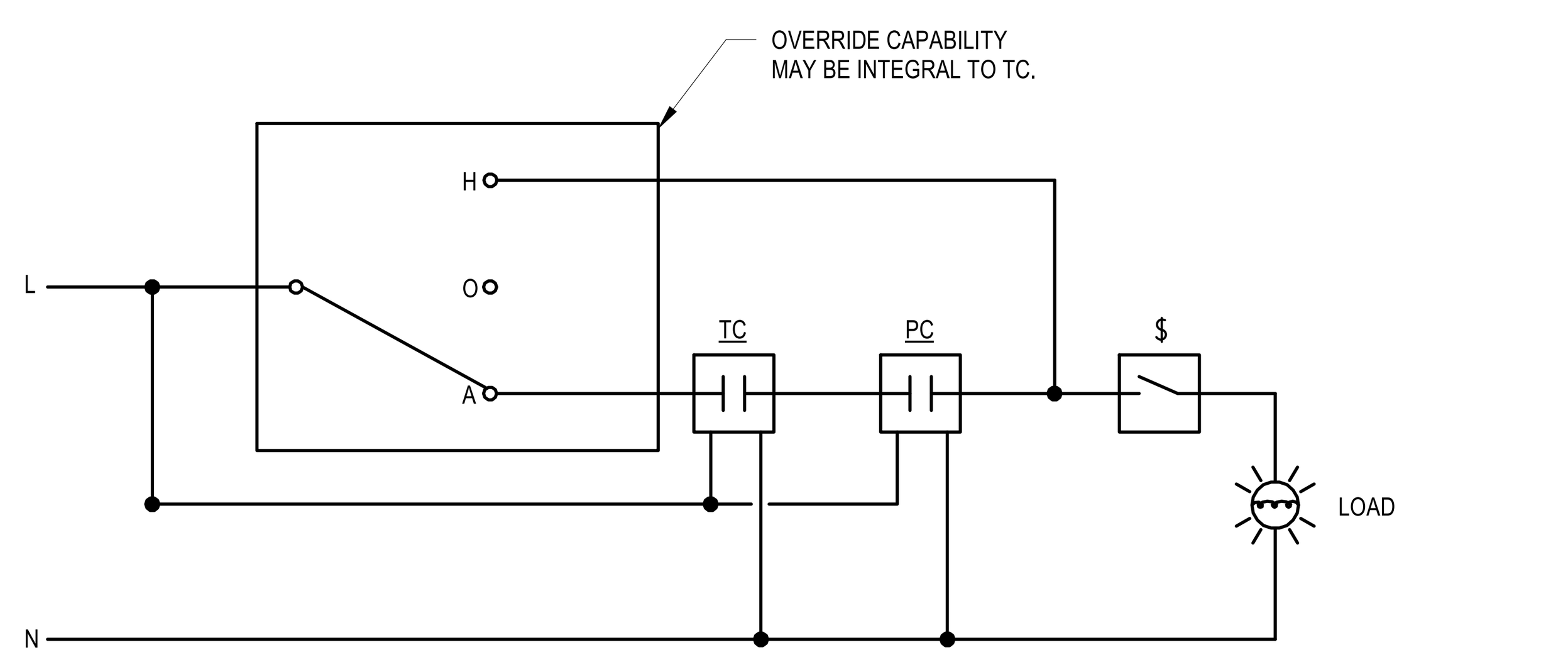
2 ELECTRICAL EQUIPMENT LABELING DETAIL
NOT TO SCALE



4 MOTORIZED EQUIPMENT CONNECTION DETAIL
NOT TO SCALE

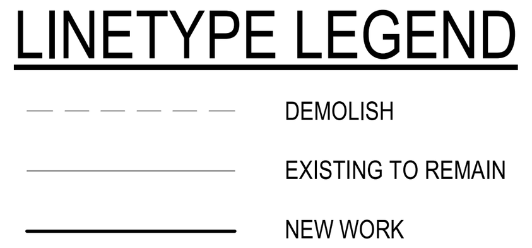


3 EWC RECEPTACLE DETAIL
NOT TO SCALE

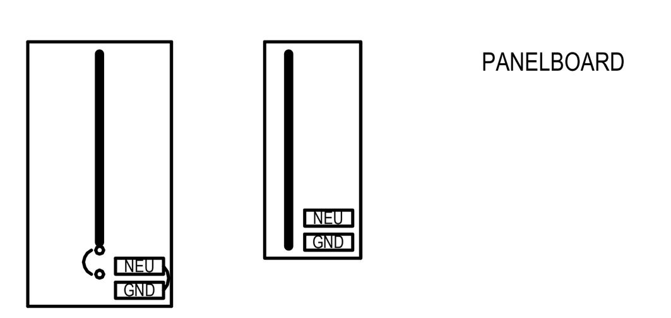


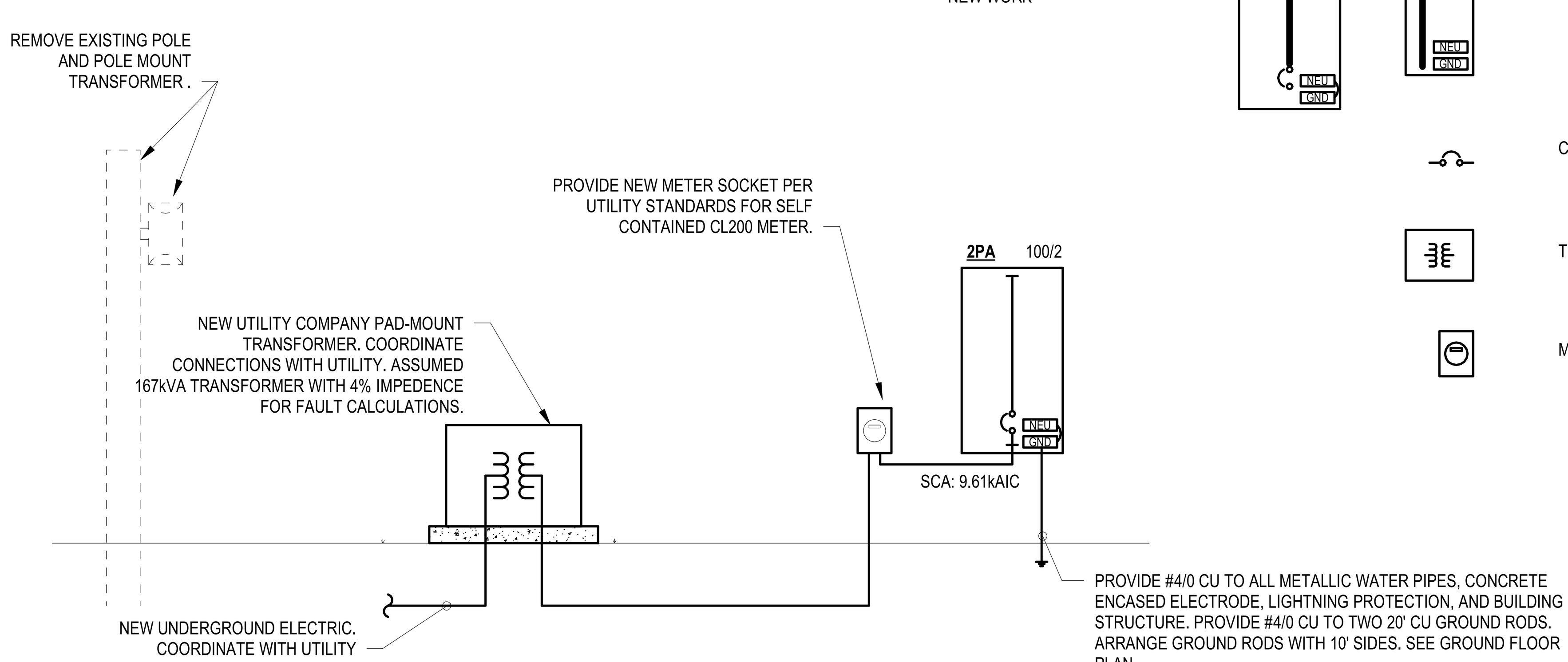
5 SINGLE-CIRCUIT EXTERIOR LIGHTING CONTROL DIAGRAM
NOT TO SCALE

LINETYPE LEGEND



SINGLE LINE DIAGRAM LEGEND





6 ELECTRICAL SINGLE LINE DIAGRAM
NOT TO SCALE

LEGEND

RECEPTACLE:

DUPLEX RECEPTACLE. 18" AFF UNO.
ABOVE COUNTER DUPLEX RECEPTACLE. 46" AFF UNO. COORDINATE WITH COUNTER, BACKSPLASH, ETC.
DUPLEX RECEPTACLE FACE DOWN IN CEILING.
SPECIAL PURPOSE RECEPTACLE. 18" AFF UNO. COORDINATE WITH EQUIPMENT.

RECEPTACLE SUBSCRIPTS:

G GFCI-TYPE RECEPTACLE.
GCB GFCI-TYPE POWER FROM BRANCH CIRCUIT BREAKER.
EWC NON-GFCI RECEPTACLE ON GFCI CIRCUIT BREAKER. COORDINATE HEIGHT WITH EQUIPMENT.
WP WEATHER RESISTANT WIRING DEVICE. WP RECEPTACLES SHALL BE GFCI TYPE WITH IN-USE COVERS.
6-30R NEMA RECEPTACLE TYPE.
PL DUPLEX RECEPTACLE WITH ONE RECEPTACLE ALWAYS-ON AND CONTROLLED BY PLUG LOAD CONTROLLER.
TV TELEVISION RECEPTACLE. COORDINATE HEIGHT AND LOCATION WITH TELEVISION.
DW DISHWASHER RECEPTACLE. COORDINATE HEIGHT AND LOCATION WITH DISHWASHER.
GG GARBAGE GRINDER RECEPTACLE. COORDINATE HEIGHT AND LOCATION WITH GARBAGE GRINDER.
MW MICROWAVE RECEPTACLE. COORDINATE HEIGHT AND LOCATION WITH MICROWAVE.

POWER EQUIPMENT AND CONNECTIONS:

DISTRIBUTION PANELBOARD.
PANELBOARD.
E ELECTRICAL CONNECTION TO EQUIPMENT. SEE ELECTRICAL EQUIPMENT SCHEDULE.
J JUNCTION BOX.
SAFETY SWITCH. MOUNT AS INDICATED. 60" TO TOP UNO.
FUSED SAFETY SWITCH. MOUNT AS INDICATED. 60" TO TOP UNO.
COMBINATION MOTOR STARTER. MOUNT AS INDICATED. 60" TO TOP UNO.

LIGHT FIXTURES:

LIGHT FIXTURES SHALL BE AS INDICATED IN LIGHT FIXTURE SCHEDULE. SEE LIGHT FIXTURE SCHEDULE.

LIGHT FIXTURES SUBSCRIPTS:

a,b LOWERCASE LETTERS INDICATE SWITCHING/DIMMING ZONES.
DL DAYLIGHT SENSOR DIMMED.
24/7 LIGHT NOT SWITCHED BY OCCUPANCY SENSORS OR SWITCHES.
EM PARTIAL SHADING OR 'EM' SUBSCRIPT INDICATES EMERGENCY FIXTURE. SEE LIGHT FIXTURE SCHEDULE.

LIGHTING CONTROLS:

$ TOGGLE SWITCH. 46" AFF UNO.
RC OCCUPANCY SENSOR ROOM CONTROLLER. BOD: WATTSTOPPER DLM. RELAYS & DIMMING AS INDICATED. PROVIDE LMIO INPUT/OUTPUT AS NEEDED FOR FIRE ALARM OR OTHER OVERRIDE.
RT OCCUPANCY SENSOR ROOM TIMER. BOD: WATTSTOPPER DLM. RELAYS AS INDICATED. PROVIDE LMIO INPUT/OUTPUT AS NEEDED FOR FIRE ALARM OR OTHER OVERRIDE.
XC DIMMING OCCUPANCY SENSOR ROOM CONTROLLER. BOD: WATTSTOPPER DLM. RELAYS & DIMMING AS INDICATED. PROVIDE LMIO INPUT/OUTPUT AS NEEDED FOR FIRE ALARM OR OTHER OVERRIDE.
PL OCCUPANCY SENSOR PLUG-LOAD CONTROLLER. BOD: WATTSTOPPER LMPL.
PP OCCUPANCY SENSOR POWER PACK. BOD: WATTSTOPPER BZ-250. RELAY ZONES AS INDICATED.
PC 120/277V 20A PHOTOCELL.
LC 120/277V LIGHTING CONTACTOR. BOD: ENCLOSED SQUARE D CLASS 8903 WITH HOA SWITCH.
TC 120/277V ASTRONOMICAL TIME CLOCK. BOD: PARAGON SUNTRACKER II.

LIGHTING CONTROLS SUBSCRIPTS:

2 2-POLE TOGGLE SWITCH.
3 3-WAY TOGGLE SWITCH.
4 4-WAY TOGGLE SWITCH.
a,b LOWERCASE LETTERS INDICATE SWITCHING/DIMMING ZONES.

TELECOMMUNICATIONS:

ROUGH-IN-ONLY TO. 18" AFF UNO. PROVIDE 1"C TO ABOVE ACCESSIBLE CEILING.
CEILING MOUNT TO ROUGH-IN.

TELECOMMUNICATIONS SUBSCRIPTS:

CAM CAMERA TO.
WAP WIRELESS ACCESS POINT TO.
AC ABOVE COUNTER

ANNOTATIONS:

1 DEMOLITION SHEET NOTE.
1 ELECTRICAL SHEET NOTE.
AH 111 MECHANICAL EQUIPMENT TAG.

GENERAL SUBSCRIPTS (APPLY TO ALL CATEGORIES):

2P1A ELECTRICAL EQUIPMENT TAG.
GCB FED FROM GFCI TYPE CIRCUIT BREAKER.
72" INDICATES HEIGHT OF FIXTURE, RECEPTACLE, BOX, CABINET, ETC. HEIGHT IS TO CENTERLINE UNLESS OTHERWISE INDICATED.
EX EXISTING TO REMAIN
WP WEATHERPROOF INSTALLATION, WITH APPROPRIATELY LISTED OR INDICATED PRODUCTS.
A-1 ELECTRICAL HOME RUN TO PANELBOARD. UNDERLINED LABEL INDICATES PANELBOARD NAME AND CIRCUIT NUMBER. UNLESS INDICATED OTHERWISE, DEFAULT WIRING IS #12 & #12G. PROVIDE CONDUCTORS AS NEEDED FOR INDICATED SWITCHED LEGS, ZONES, ETC. SEE ELECTRICAL EQUIPMENT SCHEDULE FOR SPECIFIC CIRCUIT SIZING.

LIGHTNING PROTECTION:

CLASS I LIGHTNING PROTECTION CONDUCTOR. MATCH MATERIAL TO ROOF TO AVOID CORROSION.
CLASS I DOWN CONDUCTOR TO COMPLIANT LIGHTNING PROTECTION GROUND ROD. WHERE UTILIZING ALUMINUM CONDUCTORS, CONVERT TO COPPER WITH APPROVED COUPLER.
CLASS I AIR TERMINAL WITH ROUNDED TIP.

NEC ELECTRICAL LOAD CALCULATION: PANEL 2PA (240Y/120V 1Ø 3W)

LOAD DESCRIPTION	PER UNIT LOAD	UNITS	CONNECTED LOADS	ADJUSTMENT FACTOR	NEC 220 CALC LOAD	NOTES
HIGH VOLUME LOW VELOCITY FANS	7200.0 VA ea	1	7.2 kVA	1.25	9.0 kVA	
LIGHTING	73 VA ea	16	1.168 kVA	1.25	1.46 kVA	
LIGHTING	29 VA ea	4	0.116 kVA	1.25	0.145 kVA	
LIGHTING	41 VA ea	2	0.082 kVA	1.25	0.103 kVA	
EWC	600 VA ea	1	0.6 kVA	1.00	0.6 kVA	
RECEPTACLES	180 VA ea	12	2.16 kVA	1.00	2.16 kVA	
TOTALS (kVA)			**11.326 kVA**		**13.468 kVA**	
TOTALS (A)			**47.19 A**		**56.11 A**	

ABBREVIATIONS

AC ABOVE COUNTER
ACS (ELECTRONIC) ACCESS CONTROL SYSTEM
AWG AMERICAN WIRE GAUGE
BOD BASIS OF DESIGN
C CONDUIT
CAM CAMERA
CB CIRCUIT BREAKER
CFCI CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFOI CONTRACTOR FURNISHED, OWNER INSTALLED
CKT CIRCUIT
CMS COMBINATION MOTOR STARTER
CO CARBON MONOXIDE
DIV DIVISION
ECB ENCLOSED CIRCUIT BREAKER
EOR ENGINEER OF RECORD
EWC ELECTRIC WATER COOLER
EX EXISTING TO REMAIN
FSS FUSED SAFETY SWITCH
G GROUND, GROUND FAULT CIRCUIT INTERRUPTER
GCB GFCI CIRCUIT BREAKER
LTG LIGHTING
LTS LIGHTS
MCC MOTOR CONTROL CENTER
NAC NOTIFICATION APPLIANCE CIRCUIT
OFCI OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI OWNER FURNISHED, OWNER INSTALLED
PBD PANELBOARD
PQM POWER QUALITY METER
SPD SURGE PROTECTION DEVICE
SLC SIGNALING LINE CIRCUIT
SS SAFETY SWITCH
SWBD SWITCHBOARD
TBD TO BE DETERMINED
TCR TELECOMMUNICATIONS ROOM
TO TELECOMMUNICATIONS OUTLET
TYP TYPICAL
UF UNIVERSITY OF FLORIDA
UFL UNIVERSITY OF FLORIDA
UNO UNLESS NOTED OTHERWISE
VFD VARIABLE FREQUENCY DRIVE
WAO WORK AREA OUTLET
WAP WIRELESS ACCESS POINT
WP WEATHER PROOF / WEATHER RESISTANT
WR WEATHER PROOF / WEATHER RESISTANT
WRT WITH RESPECT TO

CODES AND STANDARDS

ALL PROJECT WORK SHALL BE GOVERNED BY AND ADHERE TO THE FOLLOWING CODES AND STANDARDS.

1. FLORIDA BUILDING CODE - SIXTH EDITION (2017)
2. FLORIDA BUILDING CODE - SIXTH EDITION (2017) - ENERGY CONSERVATION
3. FLORIDA FIRE PREVENTION CODE - SIXTH EDITION (2017)
   A. FIRE CODE (NFPA 1 - 2015 FLORIDA EDITION)
   B. LIFE SAFETY CODE (NFPA 101 - 2015 FLORIDA EDITION)
4. NATIONAL ELECTRIC CODE (2014 NFPA 70).
5. UNDERWRITERS' LABORATORIES (UL)
6. AMERICAN NATIONAL STANDARDS INSTITUTION (ANSI)
7. AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
8. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
9. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
10. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
11. NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)
12. AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)
13. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
14. ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA)
15. TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)
16. ELECTRONICS INDUSTRY ALLIANCE (EIA)

GENERAL DEMOLITION NOTES

1. ALL CIRCUITS AND SYSTEMS OUTSIDE OF THE PROJECT AREA ARE TO REMAIN IN SERVICE AT ALL TIMES THROUGHOUT THE WORK. COORDINATE ANY NECESSARY OUTAGES WITH OWNER PRIOR TO PROCEEDING.
2. DEMOLISH ALL FIXTURES AND CIRCUITS AS INDICATED. DEMOLISH ALL ASSOCIATED WIRES, RACEWAY, AND BOXES. MAINTAIN FUNCTIONALITY OF ALL REMAINING FIXTURES AND EQUIPMENT.
3. DEMOLISH ANY SYSTEMS AND APPURTENANCES DISCOVERED WITHIN WALLS BEING DEMOLISHED. WHERE THESE SYSTEMS SERVE AREAS OUTSIDE OF THE PROJECT AREA, COORDINATE WITH OWNER, ARCHITECT, AND ENGINEER TO MAINTAIN EXISTING FUNCTIONALITY IN A WAY COMPATIBLE WITH THIS PROJECT.

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SKINNER VIGNOLA McLEAN, INC.
ARCHITECTS & PLANNERS | FL CERTIFICATE | AA3478
Andrew P. McCaddin PE - 85318

UF/IFAS 20038 NORTH FLORIDA REC - LIVE OAK AGRICULTURE DEMONSTRATION BUILDING
FOR
UF PLANNING, DESIGN & CONSTRUCTION
PROJECT LOCATION: LIVE OAK, FL 32060

DESIGN PHASE: 100% REVIEW

REVISIONS

DATE: 2/04/2020
DRAWN BY: BNF
CHECKED BY: APM

MG mitchell • gulledge engineering
Mitchell Gulledge Engineering, Inc.
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Gainesville, FL 32601
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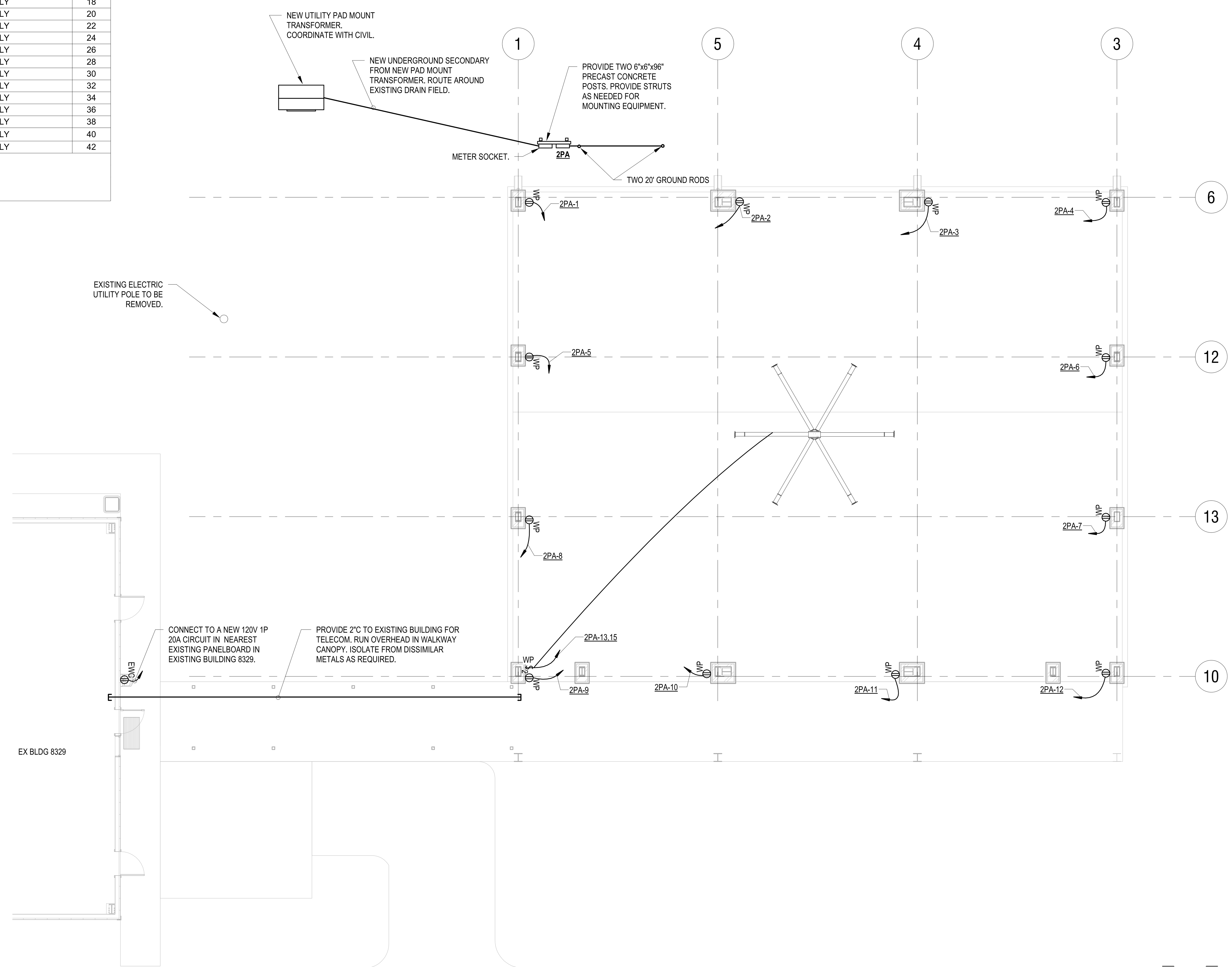
SHEET
E0.1
ELECTRICAL LEGEND, CODES, & ABBREVIATIONS
1460-30

Branch Panel: 2PA

Location:		**Volts:**	120/240 Single	**Phase Bus Rating:**	100 A
Supply From:		**Phases:**	1	**MCB Rating:**	100 A
Mounting:	Surface	**Wires:**	3	**Neutral Rating:**	100%
Enclosure:	N3R	**A.I.C. Rating:**	22,000	**Feeder Ampacity:**	100 A
Basis of Design:	NQ	**SPD:**	YES	**Feeder Phase Conductor:**	2#3
Service Rated:	YES	**PQM:**	NO	**Feeder Neutral Conductor:**	1#3
				Feeder Ground Conductor:	N/A
				Feeder Conduit:	1-1/4"
				Number of Parallel Runs:	1

Notes:

CKT	Circuit Description	Trip	Poles	A	B	A	B	Poles	Trip	Circuit Description	CKT
1	RCPTS	20 A	1	180 VA		180 VA		1	20 A	RCPTS	2
3	RCPTS	20 A	1		180 VA		180 VA	1	20 A	RCPTS	4
5	RCPTS	20 A	1	180 VA		180 VA		1	20 A	RCPTS	6
7	RCPTS	20 A	1		180 VA		180 VA	1	20 A	RCPTS	8
9	RCPTS	20 A	1	180 VA		180 VA		1	20 A	RCPTS	10
11	RCPTS	20 A	1		180 VA		180 VA	1	20 A	RCPTS	12
13	FAN	40 A	2	3600 VA		1358 VA		1	20 A	LIGHTING	14
15					3600 VA		0 VA	--	--	SPACE ONLY	16
17	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	18
19	SPARE	20 A	1		0 VA		0 VA	--	--	SPACE ONLY	20
21	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	22
23	SPARE	20 A	1		0 VA		0 VA	--	--	SPACE ONLY	24
25	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	26
27	SPARE	20 A	1		0 VA		0 VA	--	--	SPACE ONLY	28
29	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	30
31	SPARE	20 A	1		0 VA		0 VA	--	--	SPACE ONLY	32
33	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	34
35	SPARE	20 A	1		0 VA		0 VA	--	--	SPACE ONLY	36
37	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	38
39	SPARE	20 A	1		0 VA		0 VA	--	--	SPACE ONLY	40
41	SPARE	20 A	1	0 VA		0 VA		--	--	SPACE ONLY	42
			Total Load:	6036 VA		4680 VA					
			Total Amps:	50 A		39 A					



ELECTRICAL FLOOR PLAN - POWER

N 1/8" = 1'-0"

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FOR

UF PLANNING, DESIGN & CONSTRUCTION

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REVISIONS

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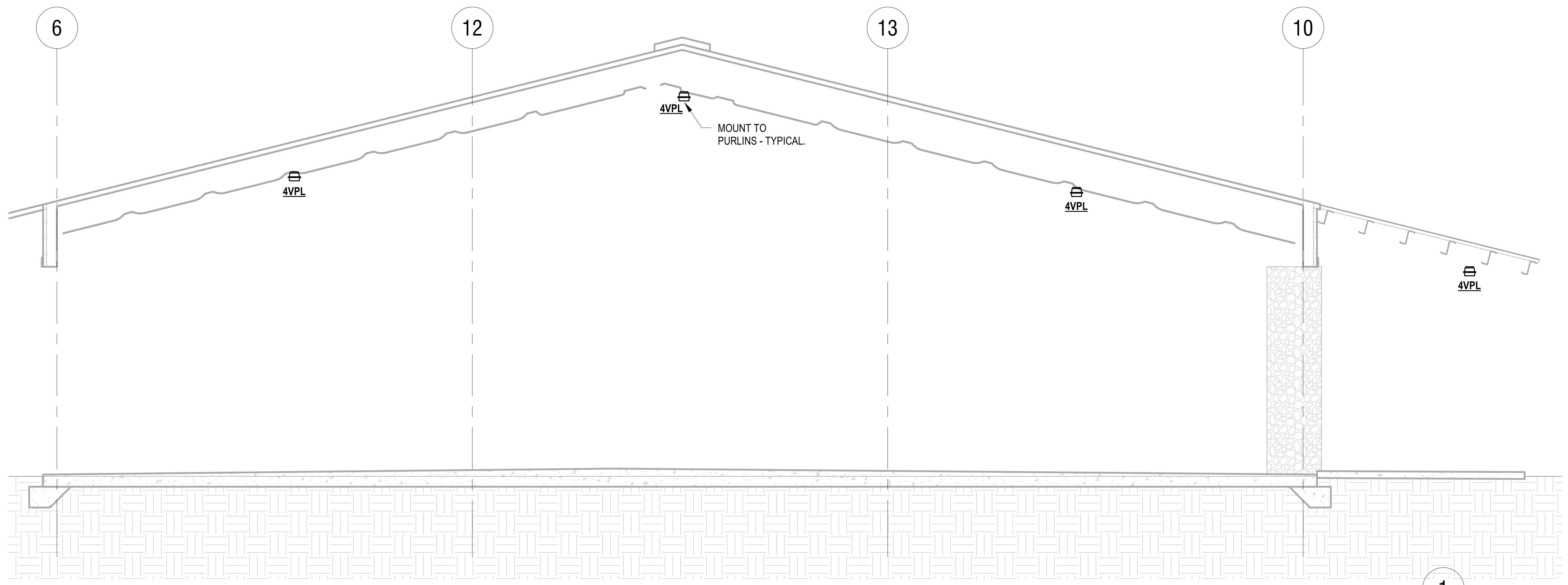
ELECTRICAL FLOOR PLAN - POWER

1460-30

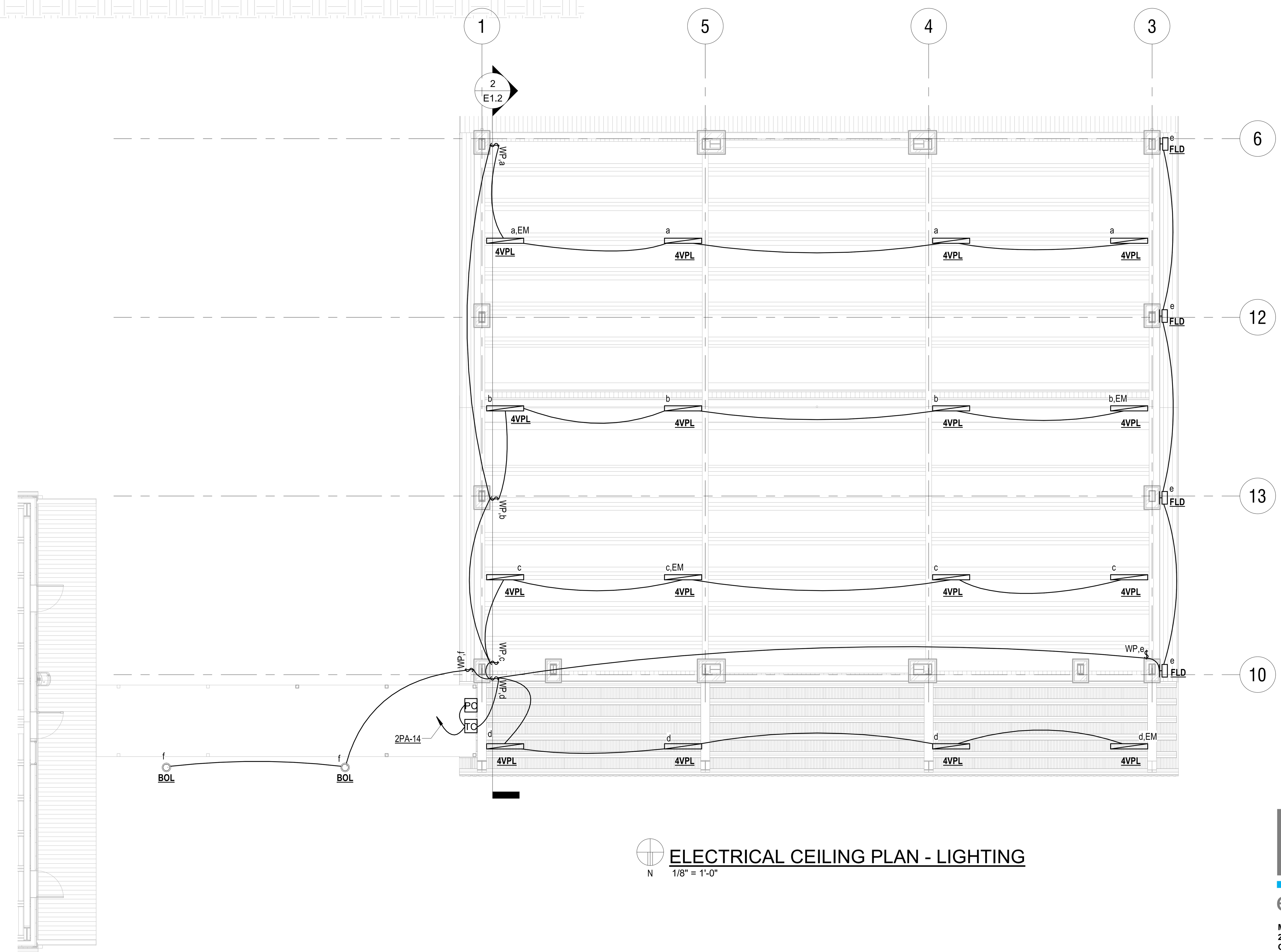
LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	BASIS OF DESIGN	LIGHT SOURCE	INITIAL LUMENS	COLOR TEMPERATURE	WATTAGE	VOLTAGE	MOUNTING	NOTES
4VPL	4' VAPORTIGHT LED WRAP	H.E. WILLIAMS 96-4-L62/840-PCFR-DRV-UNV	LED	6200 lm	4000 K	73 VA	120 V	MOUNT TO PURLINS	MOUNT TO STRUCTURE.
BOL	LED BOLLARD	GARDCO PBL-36-14L-800-NW-G2-3-120-F1-FINISH	LED	3198 lm	4000 K	41 VA	120 V	POLE IN GROUND	COORDINATE FINISH WITH ARCHITECT.
FLD	LED EXTERIOR FLOOD LIGHT WALL MOUNT	PHILLIPS GARDCO CSFS-16-530-NW-G1-YK-A33-120-BK WITH BP-(F)	LED	3025 lm	4000 K	29 VA	120 V	WALL AT 9'	PROVIDE BP-(F) SURFACE MOUNT BASE PLATE.

NOTES:
1. SUBMIT ALTERNATES TO A/E FOR CONSIDERATION A MINIMUM OF 10 BUSINESS DAYS PRIOR TO BID. SUBMIT FIXTURE "CUT SHEET", INDICATING ALL INTENDED RATINGS AND OPTIONS.
2. A/E WILL REVIEW ALTERNATES TO DETERMINE IF THEY ARE FUNCTIONALLY, AESTHETICALLY, AND STRUCTURALLY EQUAL. A/E RESERVE THE RIGHT TO REJECT ANY FIXTURES WHICH ARE NOT DEEMED EQUAL TO THE BASIS OF DESIGN.
3. ALTERNATES REJECTED BY A/E SHALL NOT RESULT IN ADDITIONAL CHARGES TO THE OWNER.
4. FIXTURES HALF SHADED OR MARKED 'EM' ON THE PLANS SHALL BE PROVIDED WITH BODINE BATTERIES PROVIDING AT LEAST 700lm OUTPUT FOR AT LEAST 90 MINUTES.



EAST ELEVATION
1/4" = 1'-0"



ELECTRICAL CEILING PLAN - LIGHTING
1/8" = 1'-0"

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SHEET
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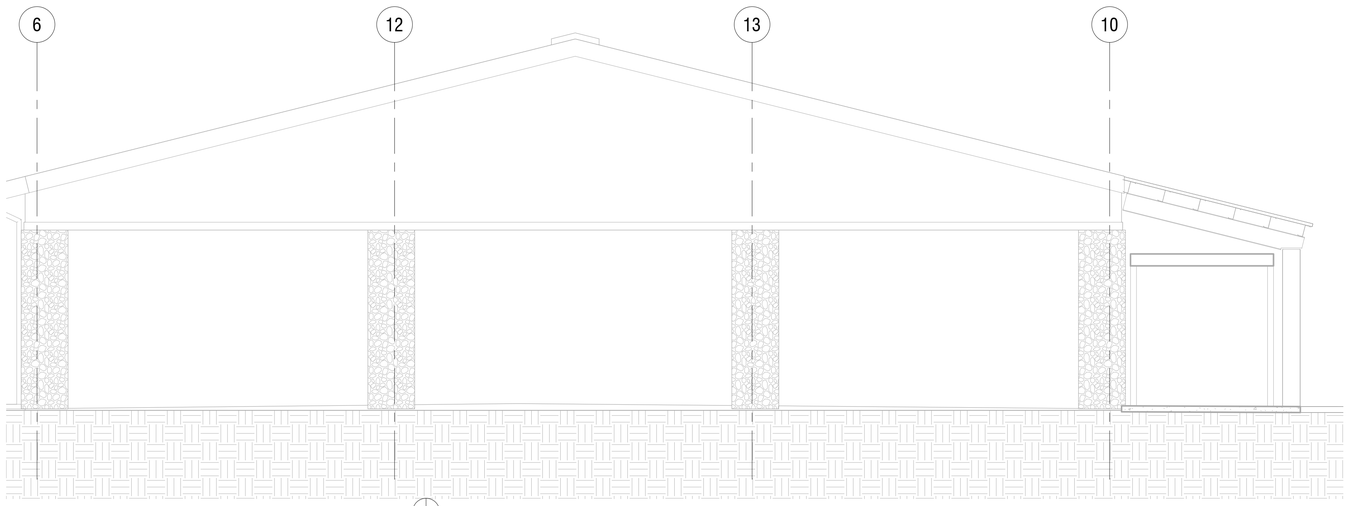
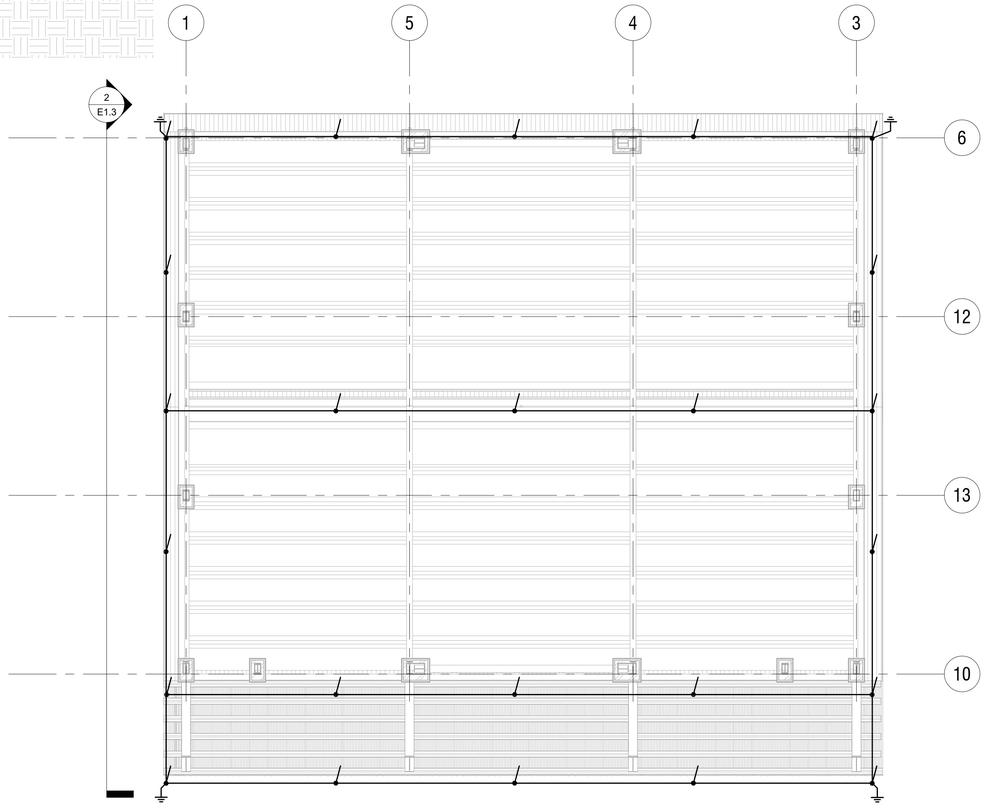
ELECTRICAL CEILING PLAN - LIGHTING
1460-30



LIGHTNING PROTECTION ELEVATION
N 1/4" = 1'-0"



ELECTRICAL ROOF PLAN
N 1/8" = 1'-0"

LIGHTNING PROTECTION UL LABEL

PROVIDE UL MASTER LABEL FOR NEW CLASS II LIGHTNING PROTECTION SYSTEM.

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ELECTRICAL ROOF PLAN
1460-30

2/4/2020 4:03:08 PM BIM 360://01460-30 - IFAS PAVILION LIVE OAK/M0190961_IFAS Live Oak Pavilion_2020.rvt