

Office of the Vice President
and Chief Financial Officer
Procurement Services
<https://procurement.ufl.edu/>

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February 17, 2020

ADDENDUM NUMBER 1 ON INVITATION TO BID ITB20DB-127

TITLE: Air Handling Unit Replacement at Communicore Building

Mandatory pre-bid meeting was held at the site on January 28, 2020 at 10:30 AM. **Bid opening** will be held February 26, 2020 at 3:00 PM in UF Procurement Services, 971 Elmore Drive, Gainesville, FL 32611.

This addendum shall be considered part of the Contract Documents for the above-mentioned project as though it had been issued at the same time and incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original Contract documents, this addendum shall govern and take precedence. Bidders are hereby notified that they shall acknowledge receipt of the addendum.

This addendum consists of:

1. Responses to vendor's questions that were due before 5:00 PM on February 10, 2020.
2. Engineer's Addendum dated February 14, 2020.



Debbie Berrier
Procurement Agent II

PLEASE ACKNOWLEDGE RECEIPT OF THIS ADDENDUM 1 AND RETURN WITH YOUR BID. FAILURE TO ACKNOWLEDGE THIS ADDENDUM COULD CONSTITUTE REJECTION OF YOUR BID.

VENDOR NAME

VENDOR ADDRESS

SIGNATURE

The Foundation for The Gator Nation

An Equal Opportunity Institution

Vendor Questions for ITB20DB-127 - Air Handling Unit Replacement at Communicore Building

Q1) Can Trane Custom be added to the list of acceptable manufacturers?

A1) Please see revised Section 23 73 15 included in the attached Engineer's Addendum.

Q2) Will the asbestos noted in the survey report be abated by UF or should the Contractor include the abatement cost in their bid?

A2) Contractor will include the abatement in the scope of work. Air monitoring is not required.

Q3) In similar AHU projects in the past it was required that the concrete floors be sealed. Will that be a requirement for this project?

A3) Floor sealing is not required for this project.

Q4) There were no fire sprinklers observed in any of the areas currently occupied by AHU's. Can you confirm that there is no requirement for adding fire sprinkler coverage as a part of this project?

A4) Fire protection is not within the scope of the project.

Q5) Is there a prescribed pre-qualification form for mechanical subcontractors that should be submitted as a part of the bid package?

A5) Please see the prequalification form in the original ITB document on page 15.



February 14, 2020

All Plans Holders

Re: Addendum
UF JHMHSC Communicore AHU-5, 7, and 8 Replacement
UF Project Number: MP05285
MG Project Number: 19066

Bidders:

You are hereby notified of the following changes to the contract documents and design intent.

1. SPECIFICATIONS:
 - a. Section 23 05 23 - HVAC VALVES: Replace section in its entirety with the attached section.
 - b. Section 23 33 00 - DUCTWORK ACCESSORIES: Replace section in its entirety with the attached section.
 - c. Section 23 73 15 - CUSTOM AIR HANDLING UNITS: Replace section in its entirety with the attached section

2. DRAWINGS:
 - a. Sheet G0.1 - COVER: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - b. Sheet M001 - MECHANICAL LEGEND, NOTES & SCHEDULE: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - c. Sheet M002 - MECHANICAL DETAILS: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - d. Sheet M100 - MECHANICAL ROOF PLAN: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - e. Sheet M101 - MECHANICAL AHU-5 PENTHOUSE PLANS: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - f. Sheet M102 - MECHANICAL AHU-7 PENTHOUSE PLANS: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - g. Sheet M103 - MECHANICAL AHU-8 PENTHOUSE PLANS: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - h. Sheet M301 - MECHANICAL CONTROLS: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - i. Sheet M302 - MECHANICAL CONTROLS: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - j. Sheet M303 - CONTROL FLOOR PLANS: Add the attached 24"x36" sheet dated February 14, 2020.
 - k. Sheet E001 - ELECTRICAL LEGEND, DETAILS, & SCHEDULES: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - l. Sheet E010 - ELECTRICAL BASEMENT PLAN: Replace sheet in its entirety with the attached 24"x36" sheet dated February 14, 2020.
 - m. Sheet E020 - ELECTRICAL GROUND FLOOR PLAN: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - n. Sheet E050 - ELECTRICAL THIRD FLOOR PLAN: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - o. Sheet E100 - ELECTRICAL ROOF PLAN: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - p. Sheet E101 - ELECTRICAL AHU-5 PENTHOUSE PLANS: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - q. Sheet E102 - ELECTRICAL AHU-7 PENTHOUSE PLANS: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - r. Sheet E103 - ELECTRICAL AHU-8 PENTHOUSE PLANS: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.
 - s. Sheet E201 - ELECTRICAL SCHEDULES: Replace sheet in its entirety with the attached 24"x36" sheet dated December 20, 2019.

Sincerely,

Craig Gullledge, PE, CxA, LEED AP BD+C
Principal
Attachments

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-23 Basic Materials and Methods section, and is part of each Division-23 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-23 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-23 section using the valves, not as a separate submittal. For each valve, identify systems where the valve is intended for use.
 - A. Check Valves: Type CK.
 - B. Ball Valves: Type BA.
 - C. Butterfly Valves: Type BF.
- 1.6 O&M Data Submittals:
 - A. Submit maintenance data and a copy of approval submittals.

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 Check Valves:
 - A. Construction: Construct valves of castings free of any impregnating materials. Construct valves with a bronze regrinding disc with a seating angle of 40° to 45°, unless a composition disc is specified. Provide stop plug as renewable stop for disc hanger, unless otherwise specified. Disc and hanger shall be separate parts with disc free to rotate. Support hanger pins on both ends by removable side plugs.
 - B. Comply with the following standards:
 1. Cast Iron Valves: MSS SP-71. Cast Iron Swing Check Valves, Flanged and Threaded Ends.
 2. Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.
 3. Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.
 - C. Types of check (CK) valves:

1. Threaded Ends 2" and Smaller (CK1): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-319. Nibco T-413-BY. Crane 1707. Milwaukee 509.
2. Soldered Ends 2" and Smaller (CK2): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-309. Nibco S-413-B. Crane 1707S. Milwaukee 1509.
3. Flanged Ends 2-1/2" and Larger (CK3): Class 125, iron body, bronze-mounted, bolted cap, horizontal swing, cast-iron or composition disc. Stockham G-931 or G-932 as applicable. Nibco F918-B. Crane 373. Milwaukee F2974 as applicable.
4. Threaded Ends 2" and Smaller (CK4): 200 WWP, bronze body, screwed cap, horizontal swing, regrinding type bronze disc.
5. Flanged Ends 2-1/2" and Larger (CK5): 175 WWP, iron body, bolted cap, bronze mounted, composition disc, UL listed, with ball drip if required. Stockham G-940. Nibco F-908-W.
6. Threaded Ends 2" and Smaller (CK6): Class 200, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-345. Nibco T-453-B. Crane 36. Milwaukee 518/508.
7. Flanged Ends 2-1/2" and Larger (CK7): Class 250, iron body, bronze mounted, bolted cap, cast-iron disc. Stockham F-947. Nibco F-968-B. Crane 39E. Milwaukee F2970.
8. Threaded Ends 2" and Smaller (CK8): Class 300, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-375. Nibco T-473-B. Crane 76E. Milwaukee 517/507.
9. Flanged Ends 2-1/2" and Larger (CK9): Class 300, cast steel body, bolted cap, horizontal swing, seal welded seat rings, chromium stainless disc. Stockham 30-SF. Crane 159.

2.4 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 150 psi saturated steam and 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, 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:
 1. MSS SP-72. Ball Valves with Flanged or Butt Welding Ends for General Service.
 2. MSS SP-110. Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
- D. 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 and stainless steel ball and trim. 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. Threaded Ends 2" and Smaller (BA4): 175 WWP, bronze two-piece body. Nibco KT-585-70-UL and KT-580-70-UL.
5. Threaded Ends 2" and Smaller (BA5): 400 WWP, bronze two-piece body. Nibco KT-580.
6. Threaded Ends 2-1/2" and Smaller (BA6): 300 WWP, bronze three-piece body, gear operator with handwheel, indicator flag, accepts tamper switch. Nibco T-505-4 and G-505-4.
7. 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.

2.5 Butterfly Valves:

- A. General: Comply with MSS SP-67, Butterfly Valves. Provide butterfly valves designed for tight shut-off. Where used for terminal or equipment removal or repair, select lug type valves. Select wafer type valves for other applications. Provide gear operators on all butterfly valves 6" and larger.
- B. Types of butterfly (BF) valves:
 1. Wafer Type 3" and Larger (BF1): 200 CWP, cast-iron body, lever-operated, **aluminum/bronze** disc, Type 410 stainless steel stem, EPT seat. Stockham LG-512. Nibco WD 2110-3. Crane 42-FXB-TL. Milwaukee MW222E-8416.
 2. Lug Type 3" and Larger (BF2): 200 CWP, cast-iron body, lever-operated, **aluminum/bronze** disc, Type 410 stainless steel stem, EPT seat. Stockham LG-712. Nibco LD 2110-3. Crane 44-FXB-TL. Milwaukee ML132B-8416.
 3. Wafer Type 3" and Larger (BF3): 150/200 CWP, cast-iron body, gear-operated, **aluminum/bronze** disc, Type 410 stainless steel stem, EPT seat. Stockham LG-522 and LG-521. Nibco WD 2110-5. Crane 42-FXB-G. Milwaukee MW 122B-8115.
 4. Lug Type 3" and Larger (BF4): 150/200 CWP, cast-iron body, gear-operated, **aluminum/bronze** disc, Type 410 stainless steel stem, EPT seat. Stockham LG-722 and LG-721. Nibco LD 2110-5. Crane 44-FXB-G. Milwaukee ML 132B-8115.
 5. Wafer Type 4" and Larger (BF5): 175 WWP, cast-iron body, gear-operated, nickel-plated ductile iron disc, Type 410 stainless steel stem, EPT seat, UL listed. Stockham LG-52U. Nibco WD 3510-8.
 6. Lug Type 4" and Larger (BF6): 175 WWP, cast-iron body, gear-operated, nickel-plated ductile iron or aluminum bronze disc, Type 410 stainless steel stem, EPT seat, UL listed. Stockham LG-72U. Nibco LD 3510-8.
 7. Grooved Type 4" and Larger (BF7): 175 WWP, cast-iron body, gear-operated, nickel-plated ductile iron or aluminum bronze disc, Type 410 stainless steel stem, EPT seat, UL listed. Stockham LG-82U. Nibco GD 1765-2.

2.6 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. Bypass: Comply with MSS SP-45, and except as otherwise indicated, provide manufacturer's standard bypass piping and valving. Provide for gate valves 8" and larger.
2. Drain: Comply with MSS SP-45, and provide threaded pipe plugs complying with applicable Division-23 pipe or tube section. Provide for gate valves 8" and larger.
3. Flanged: Provide valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).
4. Threaded: Provide valve ends complying with ANSI B2.1.
5. Solder-Joint: Provide valve ends complying with ANSI B16.18.
6. 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.
7. Non-Metallic Disc: Provide non-metallic material selected for service indicated in accordance with manufacturer's published literature.
8. Renewable Seat: Design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.
9. Extended Stem: Increase stem length by 2" minimum, to accommodate insulation applied over valve.
10. Mechanical Actuator: Provide factory-fabricated gears, gear enclosure, external chain attachment and chain designed to provide mechanical advantage in operating valve for all valves 4" and larger that are mounted more than 7'-0" above the floor, or are otherwise difficult to operate regardless of height.

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.
- 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.

3.5 Installation of Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to center line of pipe. Install for proper direction flow.

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-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of ductwork accessories work is indicated on drawings and in schedules, and by requirements of this section.
- 1.4 Refer to other Division-23 sections for testing, adjusting, and balancing of ductwork accessories; not work of this section.
- 1.5 Codes and Standards:
 - A. SMACNA Compliance: Comply with applicable portions of both SMACNA "HVAC Duct Construction Standards, Metal and Flexible" and "Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems".
 - B. UL Compliance: Construct, test, and label fire dampers in accordance with the latest UL Standard 555 "Fire Dampers and Ceiling Dampers". Construct, test, and label smoke dampers in accordance with UL Standard 555S "Leakage Rated Dampers for use in Smoke Control Systems".
 - C. NFPA Compliance: Comply with applicable provisions of NFPA 90A "Air Conditioning and Ventilating Systems" pertaining to installation of ductwork accessories.
- 1.6 Approval Submittals:
 - A. Product Data: Submit manufacturer's technical product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction; and installation instructions as follows:
 1. Control dampers
 2. Fire dampers
 3. Smoke dampers
 4. Duct access doors
 5. Flexible connections
 - B. O&M Data Submittals: Submit manufacturer's maintenance data including parts lists for fire dampers, smoke dampers. Include this data, product data, and a copy of approval submittals in O&M manual.

PART 2 - PRODUCTS

- 2.1 Fire and Smoke Dampers:
 - A. Fire Dampers: Provide curtain type fire dampers, UL classified and labeled per UL 555, of types and sizes indicated. Construct casings and blades of galvanized steel. Damper shall not restrict duct free area when open. Dampers shall be rated for dynamic closure under flow and pressure. Provide sleeves and mounting angles. Provide fusible link rated at 160 to 165°F unless otherwise indicated. Provide damper with positive lock in closed position. All dampers shall be spring activated. Basis of design:
 1. 1-1/2 HR: Greenheck DFD - Style B for rectangular, Style CR for round, Style CO for oval.
 2. 1-1/2 HR: Greenheck DFD-110 for transfer grilles in narrow partitions.
 3. 3 HR: Greenheck DFD350 - Style B for rectangular, Style CR for round, Style CO for oval.

- B. Smoke Dampers: Provide motorized smoke dampers, UL classified under UL-555S, of types and sizes indicated. Construct frame and blades of galvanized steel. Provide sleeves. Provide damper assembly complete with electric operator that will fail safe if fire interrupts operational power. Provide for remote testing or resetting capability after response to smoke detector operation. Entire assembly shall be rated at least leakage class II (10 CFM/sq. ft. at 1" w.g. at 250°F). Provide memory stop adjustment for utilization by test and balance contractor on all dampers. Provide modulating dampers where indicated on controls drawings. Basis of design:
1. Systems to 1,500 FPM duct velocity or 2.5" w.g.: Class II Greenheck SMD-202.
 2. Systems over 1,500 FPM duct velocity or 2.5" w.g.: Class I, airfoil blades, Greenheck SMD-301.
- C. Fire/Smoke Dampers: Provide motorized combination fire/smoke dampers, UL classified under the latest UL-555 and UL-555S in types and sizes indicated, with casing constructed of galvanized steel, and galvanized steel interlocking blades. Provide factory furnished sleeves and angles. Provide damper assembly complete with electric operator that will fail safe if fire interrupts operational power. For low leakage applications, entire assembly shall be rated at least leakage class I (4 CFM / sq. ft. at 1" w.g. at 250°F. // Entire assembly shall be rated at least leakage class II (10 CFM/sq. ft. at 1" w.g. at 250°F). Provide for remote testing or resetting capability after response to smoke detector operation. Provide fusible link rated at 160 - 165°F unless otherwise indicated that will close the damper under fire conditions and not permit operation by actuator until link is replaced. // Provide firestat rated at 160 - 165°F unless otherwise noted to electrically close the damper under fire conditions with remote testing or resetting capability after response to firestat operation, and with position indicator switches. Provide memory stop adjustment for utilization by test and balance contractor on all dampers. Provide modulating dampers where indicated on controls drawings. Basis of design:
1. Systems to 1,500 FPM duct velocity or 2.5" w.g.: Class I, Greenheck FSD-211M.
 2. Systems over 1,500 FPM duct velocity or 2.5" w.g.: Class I, airfoil blades, Greenheck FSD-311M.
- D. Acceptable Manufacturers: Subject to compliance with requirements, provide fire and smoke dampers by Air Balance, Inc., American Warning & Ventilating, Arrow Louver and Damper, Greenheck or Ruskin Mfg. Co.
- 2.2 Turning Vanes: Provide manufactured or fabricated single wall turning vanes and vane runners, constructed in accordance with SMACNA "HVAC Duct Construction Standards".
- 2.3 Duct Access Doors:
- A. General: Provide duct access doors of size indicated, or as required for duty indicated.
 - B. Construction: Construct of same or greater gauge as ductwork served. Provide insulated doors for insulated ductwork. Provide flush frames for uninsulated ductwork, extended frames for externally insulated duct. Provide one side hinged, other side with one handle-type latch for doors 12" high and smaller, 2 handle-type latches for larger doors.
 - C. Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Air Balance, Inc., Duro Dyne Corp., Ruskin Mfg. Co., or Ventfabrics, Inc.
- 2.4 Flexible Connections:

- A. General: Provide flexible duct connections wherever ductwork connects to vibration isolated equipment. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make airtight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse, and torsional movement, and also capable of absorbing vibrations of connected equipment.
- B. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following: Duro Dyne Corp., Flexaust (The) Co., or Ventfabrics, Inc.

PART 3 - EXECUTION

3.1 Examine areas and conditions under which ductwork accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Installation of Ductwork Accessories:

- A. Install ductwork accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.
- B. Install balancing dampers at all main ducts adjacent to units in return air, outside air and where indicated.
- C. Install control dampers in the outside air duct and return air duct for each air handler. Coordinate damper motor operator signal for UL listed smoke dampers with control contractor. Damper actuators for outside air control dampers are provided by controls contractor.
- D. Install turning vanes in square or rectangular 90° elbows in supply, return, and exhaust air systems, and elsewhere as indicated.
- E. Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter. Install on entering air side of reheat coils. Install at fire dampers and smoke dampers. Opening size shall be per NFPA 90A for servicing fire and smoke dampers. Provide label with 1-1/2" letters to indicate location of fire protection devices.
- F. Install flexible connections in ductwork such that the clear length of the connector is approximately two inches. Provide thrust restraints as required. Flexible material shall not be so slack as to take a definite concave or convex shape during fan operation. Install directly at AHU opening.
- G. Coordinate with other work, including ductwork, as necessary to interface installation of ductwork accessories properly with other work.

Install fire dampers within fire walls and floors at locations shown on the mechanical drawings. Install in strict accordance with the manufacturer's printed instructions, NFPA 90A, and UL 555. Basis of design installation is detailed on the drawings. Provide out of wall dampers where indicated on the drawings. Install ceiling fire dampers to protect openings in rated ceilings at locations shown on the mechanical drawings. Install in strict accordance with the manufacturer's printed instructions, NFPA 90A, and UL 555. Provide diffuser radiation shields where required. Basis of design installation is detailed on the drawings.

3.3 Install smoke dampers on both sides of air handling units (to include filters) in units over 15,000 cfm. // Install at smoke partitions. All locations are shown on the mechanical drawings. Install in strict accordance with the manufacturer's printed instructions, NFPA 90A, and UL 555S. Basis of design installation is detailed on the drawings.

- 3.4 Fire and Smoke Dampers: Notify Engineer at least 24 hours in advance of ceiling installation or chase closure so that complete fire and smoke damper installation can be observed. A copy of the manufacturer's printed installation instructions shall be available at the site.
- 3.5 Operate installed ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories as required to obtain proper operation and leakproof performance.
- 3.6 Adjusting and Cleaning:
- A. Adjusting: Adjust ductwork accessories for proper settings. Install fusible links in fire dampers and adjust for proper action.
 - B. Final positioning of manual dampers is specified in Division-23 section "Testing, Adjusting, and Balancing". However, the system shall be left functional with all dampers open or throttled.
 - C. Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.
 - D. Furnish extra fusible links to Owner, one link for every 10 installed of each temperature range; obtain receipt.

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-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Refer to other Division-23 sections for other devices installed piping system, supports, Testing, Adjusting, and Balancing, Building Automation System.
- 1.4 Refer to Division-23 section "Vibration Isolation" for vibration isolation.
- 1.5 Extent of work required by this section as indicated on drawings and schedules, and by requirements of this section.
- 1.6 Refer to Division 26 sections for power supply wiring from power source to power connection; not work of this Section. All fan power cabling shall be installed in raceway.
- 1.7 Codes and Standards:
 - A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of custom air handling units for the HVAC industry with characteristics, sizes, and capacities required, whose products have been in satisfactory use in similar service for not less than five years.
 - B. Regulatory Requirements: Comply with the codes and standards specified.
 - C. must be manufactured in an ISO 9001 registered facility.
 - D. AMCA 99 - Standards Handbook.
 - E. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.
 - F. AMCA 300 - Test Code for Sound Rating Air Moving Devices.
 - G. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.
 - H. AMCA 500 - Test Methods for Louver, Dampers, and Shutters.
 - I. AHRI 260 - Sound Rating of Ducted Air Moving and Conditioning Equipment
 - J. AHRI 410 - Forced Circulation Air-Cooling and Air-Heating Coils.
 - K. AHRI 430 - Standard for Central Station Air Handling Units
 - L. NFPA 70 - National Electrical Code.
 - M. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems.
 - N. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
 - O. SMACNA - HVAC Duct Construction Standards Metal and Flexible.
 - P. UL 900 - Test Performance of Air Filter Units.
- 1.8 Quality Assurance:
 - A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - B. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of air-handling units and components.
 - C. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning".
 - D. Comply with NFPA 70 for unit and all auxiliary components.
 - E. Performance Ratings: Conform to AHRI Standards; bear AHRI 430 certified rating seal. If unit is not AHRI 430 rated, unit shall be tested in accordance with the standards to establish acceptability.
 - F. Sound Ratings: Test air handling unit in accordance with AMCA 300 (ASHRAE 68) and AHRI 260 Guidelines.

- G. Air Coils: Certify capacities, pressure drops, and selection procedures in accordance with AHRI 410.
- H. Equipment shall fit into the space available with adequate clearances meeting manufacturer's requirements for service and as determined by the Engineer. The Contractor shall not assume that all of the manufacturers listed as acceptable manufacturers will provide a unit that will fit in the space allocated.

1.9 Approval Submittals:

- A. Product Data: Submit manufacturer's product data to include the following:
 - 1. Provide all technical information relevant to the product being provided, including but not limited to all the information shown on the drawing schedules and of this section. It is the responsibility of the supplier to highlight any variances in equipment characteristics.
 - 2. Dimensions, weights, capacities, certifications, shipping splits, component performance, electrical characteristics, casing construction details, wiring interconnections, gauges, and finishes of materials.
 - 3. Provide fan curves with specified operating points clearly plotted.
 - 4. Provide coil selection worksheets at scheduled operating points. Clearly indicate proper consideration for altitude and air density. Indicate coil tube fin and casing construction.
 - 5. Provide filter information, including initial APD, final APD, dust spot efficiency, final dust holding capacity, filter media description, filter frame details, and filter removal details.
 - 6. Submit sound power levels for both air handling unit inlet, outlet, and radiated at rated capacity. If the unit exceeds sound power levels at scheduled conditions, the manufacturer must provide sound attenuators and meet specified brake horsepower requirements without additional connected power requirements.
 - 7. Submit electrical requirements for power supply wiring including wiring diagrams interlocks and control wiring. Clearly indicate factory installed and field installed wiring. Submit load amperage draw, required, maximum overcurrent protection, and short circuit current ratings. Short circuit current rating shall be no less than 65kA.
- B. Coordination Drawings: Floor plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Mechanical-room or space layout and relationships between components and adjacent structural and mechanical elements.
 - 2. Support location, type, and weight.

1.10 Warranty:

- A. The complete unit shall be covered by a parts warranty issued by the manufacturer covering the first year of operation. This warranty period shall start upon receipt of start-up forms for the unit or eighteen months after the date of shipment, whichever occurs first.
- B. The installing contractor shall provide labor warranty during the unit's first year of operation.

PART 2 - PRODUCTS

- 2.1 Manufacturers: Subject to compliance with requirements, provide product indicated on

schedules by one of the following: Temtrol, York **Custom**, Haakon, **Trane Custom (Fort Smith)** or Ingenia.

2.2 Casing Construction and Performance:

- A. Exterior Panel: Provide minimum 16-gauge coated galvanized steel.
- B. Forming: Form walls, roofs, and floors as required for minimal deflection. Maximum deflection at any point on the unit casing shall be limited to 1/200th of the overall panel width or height. The unit casing leakage shall not exceed 0.5 CFM per square foot of cabinet area at the scheduled inches positive or negative static pressure.
- C. Casing Joints: Provide no-through metal construction to preclude fastener condensation and heat transfer. Field joints are only acceptable at shipping splits and shall be installed to match appearance and performance of factory joints.
- D. Sealing: Seal all joints with water-resistant sealant to comply with leakage requirement. Field applied sealant is only acceptable at shipping splits and shall be installed to match appearance and performance of factory applied sealant.
- E. Interior Liner: Provide minimum 20-gauge galvanized steel in all sections.
- F. Casing air leakage shall be field tested to less than 1% at 8" wg positive or negative pressure.

2.3 Casing Insulation and Fastening:

- A. Materials: Provide 2 inch thick, R-12 minimum foam insulation that complies with NFPA 90A and 90B and have a fire hazard classification of 25/50 (per ASTM-84 and ULF 723).
- B. Location and Application: Factory applied in all sections to extend fully inside each casing section to the internal surface of panels. Secure insulation tightly within casing to preclude movement and maximize thermal performance. Insulation shall be installed and sealed between outside and inside casing.
- C. **Units details must be designed the manufacturer with thermal breaks and insulation performance to prevent condensation formation on unit exterior at operating internal temperatures in an unconditioned room with 85/65 db/wb temperatures.**

2.4 Base Construction:

- A. Provide heavy gauge structural steel tubing, C-channel, or I-beam welded perimeter construction with external lifting lugs and internal welded cross members to support internal unit components. Provide no-through metal construction to preclude fastener condensation and heat transfer. Field joints are only acceptable at shipping splits and shall be installed to match appearance and performance of factory joints.
- B. Provide 2" floor cavity closed cell spray foam insulation with embedded drain pans and piping. Insulation shall be UL 94HF1 rated and sealed between the bottom liner and floor liner.
- C. Floor Liner: Provide continuous 0.125 in aluminum checker plate flooring installed on the base framing with attachment and reinforced from below such that no mechanical fastening is required from above.
- D. Provide no-through metal construction to preclude fastener condensation and heat transfer. Field joints are only acceptable at shipping splits and shall be installed to match appearance and performance of factory joints.
- E. Sealing: Seal all joints with water-resistant sealant to comply with leakage requirement. Field applied sealant is only acceptable at shipping splits and shall be installed to match appearance and performance of factory applied sealant.
- F. Bottom Liner: Provide minimum 20-gauge galvanized steel in all sections.

- G. Air leakage rates shall be less than 1% at 8" wc.

2.5 Access Doors:

- A. Door Fabrication: Formed, reinforced, and welded, double-wall and insulated panels with thermal breaks of same materials, thicknesses, and performance as casing.
- B. Hinges: A minimum of two wedge-lever-type latches, operable from inside and outside. Provide Ventlock 310 high pressure latches. Arrange doors to be opened against air-pressure differential.
- C. Gasket: Neoprene, applied around entire perimeters of panel frames.
- D. Fabricate windows in all doors of double-glazed, safety glass with an air space between panes and sealed with interior and exterior rubber seals.
- E. Size: At least 18 inches wide by 5'-10" or full height of unit where the height of the unit does not allow a full height door. Fan access section door must be width of largest motor size.
1. Minimum locations and size (refer to drawings for basis of design):
 - a. Access Section: 2'-0"
 - b. Cooling Coil Section: 2'-4"
 - c. Preheat Coil Section: 1'-0"
 - d. Filter Section: 8"
 - e. Motor: 1'-6"
- F. Service Light: 100-W equivalent LED fixture in each section with single switched junction box located outside fan section door.

2.6 Drains:

- A. Condensate Drain Pans:
1. Fabricated double bottom style 16-gauge stainless steel drain pan with welded corners and two percent slope in three planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) to direct water toward drain connection. Extend drain pan 8" past face of coil to collect any carryover moisture.
 2. Drain Connection: Located at lowest point of pan and sized to prevent overflow or accumulation. Terminate with threaded nipple on one or both ends of pan.
 3. Provide stacked chilled water coils where height of the unit exceeds 36". Provide intermediate drain pan to collect condensate from top coil. Extend upper drain pan outlets to lower pan with stainless steel downspout.
- B. Access Section Drains:
1. Provide floor type drain in all sections and terminate 1" outlet through base rail with cap.

2.7 Fan Array:

- A. Fan arrays shall consist of multiple direct-drive, modular plenum fans selected to provide the scheduled airflow at a minimum value of the sum of the scheduled external static pressure and the internal static pressure. Fans shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and motor horsepower. Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise beyond the peak efficiency to ensure quiet and stable operation. Fans shall have a non-overloading design with self-limiting horsepower characteristics and shall reach a peak in the

- normal selection area. All fans shall be capable of operating over the minimum pressure class limits as specified in AMCA's Standard 2408-69.
- B. Fans shall be tested in accordance with AMCA 210 and AMCA 300 test standards for air moving devices and shall be guaranteed by the manufacturer to deliver rated published performance levels. Fans shall be licensed to bear the AMCA certified ratings seal for fan inlet sound, fan outlet sound, and air performance.
 - C. Airfoil Fan Wheels: Wheels constructed entirely of aluminum to reduce weight and vibration. Airfoil blades shall be extruded aluminum, and continuously welded around all edges. The wheel and fan inlet are matched and have precise running tolerances for maximum performance and operating efficiency. In addition, fans shall be run tested at the specified operating speed prior to shipment. Each fan shall be dynamically balanced as a complete assembly to achieve Balance Quality Grade G6.3 for the rotating assembly. Maximum vibration shall be within the limits ANSI/AMCA 204 Fan Application Category BV-3. Balance readings shall be taken electronically in the axial, vertical, and horizontal directions. Records of each fan balance shall be made available upon request.
 - D. Provide factory mounted flow ring at fan inlet and output signal to building automation system. Coordinate with building automation system signal requirements and provide all necessary hardware to output digital signal as required.
 - E. **All wiring shall be installed in raceway. See Division 26.**
 - F. Internal Vibration Isolation:
 - 1. An integral all welded steel vibration isolation base shall be provided for the fan and motor.
 - 2. Isolators shall be free standing with sound deadening pads and leveling bolts.
 - 3. Spring diameter to compressed operating height ratio shall be 1 to 1.
 - 4. The spring deflection shall be minimum of 2 in.
 - G. Back-Draft Dampers:
 - 1. Each fan shall have an individual industrial grade low leak backdraft damper.
 - 2. Frame shall be minimum 9" deep x 2" (229 x 51) flanged 12 (2.8) gauge galvanized steel channel. The blades shall be maximum 7" (178) wide, minimum .080 (2) thick, 6063T5 extruded aluminum airfoil shaped with integral structural reinforcing tube running full length of each blade.
 - 3. Damper blades shall be equipped with silicone rubber seals mechanically locked into extruded blade slots. Adhesive type seals are not acceptable. Adhesive type seals are not acceptable. Dampers shall be equipped with vinyl jamb seals for low leakage application. Wind stop type seals are not acceptable.
 - 4. Axles shall be minimum 3/4" (19) diameter with machined edge to provide positive locking connection to blades. Full round axles are not acceptable.
 - 5. Bearings shall be ball style pressed into frame.
 - 6. Linkage shall be minimum 3/16" thick 3/4" (5 x 19) bar located on face of blade in airstream. Submittal must include leakage, pressure drop, and maximum pressure data based on AMCA Publication 500 testing.
 - H. Motors:
 - 1. All fan motors shall comply with NEMA and IEEE for temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "HVAC Motors".
 - 2. Enclosure type shall be totally enclosed, fan cooled (TEFC) or open drip proof (ODP).

3. All motors shall be NEMA Premium™ efficient motors as defined in NEMA MG 1.
4. Motors shall be rated for continuous duty at full load at 40°C ambient temperature rise.
5. Motor sizes shall be as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.15.
6. Motors shall be "inverter ready", complying with NEMA STD MG1 PART 31.4.4.2.
7. Motors shall have an insulation Class F.
8. Motors shall include a shaft grounding ring.

2.8 Filters:

- A. Prefilters: Filters shall be 30% efficient, MERV 7 pleated, disposable type. Each filter shall consist of a non-woven cotton and synthetic fabric media, media support grid, and enclosing frame. The filter shall be listed by Underwriters' Laboratories as Class 2.
- B. Prefilters shall be installed in a prefabricated channel rack.
- C. Prefilters shall be lift-out upstream of the filter.

2.9 Final Filters:

- A. Final filters shall be high performance, 2" deep pleated, totally rigid, and disposable type. Each filter shall consist of high density charged fiber media, media supports, and enclosing frame with gasket seal.
- B. Final filter media shall have an average of 90-95% on the ASHRAE Test Standard (52-76) and a MERV 15 rating. Filters shall be Underwriters' Laboratories Standard 900 approved. Basis of Design: Columbus Industries, Inc CI Micro Shield Zero-Bypass.
- C. Holding Frames: Holding frames shall be factory fabricated of 16 gauge galvanized steel and shall be equipped with gaskets on all 4 sides of the filter and 2 heavy duty positive sealing fasteners. Each fastener shall be capable of withstanding 25 lbs pressure without deflection and be attached or removed without the use of tools.
- D. Final filters shall be slide out through access door.

2.10 Water Coils:

- A. All coils shall meet or exceed all capacities specified on the mechanical schedule for the project at full rated conditions and part-load conditions. All coil performance shall be certified by the manufacturer in accordance with ARI Standard 410.
- B. Construct coils of configuration plate fins and seamless tubes. Aluminum fins shall have collars drawn, belled and firmly bonded to tubes by means of mechanical expansion of tubes. Do not use soldering or tinning in bonding process.
- C. Construct coil casings of minimum 16 gauge steel with formed end supports and top and bottom channels. Coils in cooling service shall have stainless steel casings and coils in heating-only service shall have galvanized steel casings.
- D. Coils shall be fully enclosed within casing and cooling coils shall be on mounted 304 stainless steel angle racks manufactured to allow coils to slide out individually. Heating coils shall be mounted on galvanized angle racks manufactured to allow coils to slide out individually.
- E. Removable coil access panels shall be provided for removal of coils through the casing wall. Coils shall be individually removable away from the access side. Coils must be individually racked, removable through the side access panels.
- F. Pipe connections shall be on the same end, extended through the casing for ease of connection, employing a plate over the connection to minimize leakage, and shall be threaded flanged.

- G. Water coils shall be drainable.
- H. Clearly label supply and return headers on outside of units such that direction of coil water-flow is counter to direction of unit air-flow.
- I. Coils shall be proof tested to 300 psig and leak tested to 200 psig air pressure under water.
- J. Coil height shall not exceed 36". Provide multiple stacked coil as required.
- K. Construct headers of round copper pipe.
- L. Construct tubes of 0.625 O.D. minimum 0.025 thick of Copper and construct fins of 0.010 thick of Aluminum.
- M. Provide vent and drain for complete coil drainage.
- N. **Provide "bolt-on" coil construction where required for interior unit coil removal and as shown on the drawings.**

2.11 UVC Light Fixture:

- A. UV-C fixturing shall consist of a power supply, power supply housing, "plenum rated" wiring loom, lamp plug, lamp-plug protector, encapsulated lamp, and lamp support.
- B. Power supply shall be CSA and UL Listed as a variable input type (120-277 Vac $\pm 10\%$), 50-60 Hz with a programmed rapid start. They shall be designed as high power factor, class P, sound rated "A", type 1 outdoor and with inherent thermal protection and no PCBs. They shall be capable of operating in temperatures of from 33-190°F, designed to facilitate plug-and-play wiring and be capable of producing the specified output and organism destruction at no more than 15W of power consumption for each square foot of treated, cross sectional area. The power supply shall be capable of properly powering 1- 145W UV-C lamp or 1- or 2- 75W UV-C lamps while ensuring at least 9000 hours of lamp life, and with greater than 80% of its initial output, at the lamps "end of lamp life" phase. Power supply shall be protected against "end of lamp life" conditions, warranted for 5 years, and be labeled for field wiring. Power supply shall be installed interior or exterior to air handler within a power supply housing.
- C. Power supply housing shall be constructed of 20ga galvanized, powder coated steel. They shall be designed to facilitate NEC regulated power supply installation outside plenums. Each housing shall be capable of properly holding, grounding, and wiring either four or eight ballasts within to protect against electrical shock and moisture, as well as RF and EMI leaks.
- D. Plenum rated wiring looms shall be of sufficient length to facilitate lamp connection to a remotely located power supply. The lamp and loom shall be capable of being mounted anywhere in the system and/or as shown on the drawings. The loom shall be meet UL Subject 13 and UL 1581, and Article 725 of the NEC. The loom jacket shall be constructed of UV-C resistant materials and shall have an internal aluminum/Mylar shield.
- E. Lamp plug shall be of the 4-pin type capable of accommodating a single-ended HO lamp.
- F. Lamp plug protector shall of UV resistant materials and designed to shrink 3-1 over the lamp plug and wiring loom for protection against electrical shock, moisture, and separation.
- G. Lamp supports may be single or dual types, magnetically or permanently affixed within the irradiated cavity to interior surface of air handler or to vertical supports (by others). They shall be constructed of UVC resistant materials and provide for maximum flexibility in quick lamp positioning, removal, and holding power.
- H. Each lamp shall contain less than 8 milligrams of mercury and shall be hermetically laminated with a thin layer of UV-C transmissible Teflon® to provide protection against

lamp breakage and to ensure lamp contents from a broken lamp are contained. Lamp life shall be 9000 hours with no more than a 20% output loss at the end of the lamp's life. Lamps shall be constructed with UV-C proof material bases and shall not produce ozone.

- I. Fixtureless lamps are to be installed in sufficient quantity and in such a manner so as to provide an equal distribution of the available UV-C energy. When installed, the UV-C energy produced shall be of the lowest possible reflected and shadowed losses and shall be distributed in a 360-degree pattern within the cavity to provide the highest UV-C energy absorption by microbial products in the air.
 - J. Intensity – The minimal UV-C energy striking a surface shall be sufficient to continuously destroy a mono-layer of mold and/or bacteria in less than one hour while operating in air temperatures of 1-70°C.
 - K. Installation – The ballast housing shall be capable of installation within the air stream and/or within a power supply housing. Lamps shall be mounted to irradiate the intended surface(s) as well as all of the available line of sight airstream through proper lamp placement and incident angle reflection.
 - L. All doors to any UV-C assembly and/or within view of any UV-C assembly must include mechanical interlock switch to ensure that all UV-C assemblies will be de-energized when any of these accesses are opened.
 - M. Provide auxiliary relay to control the UV-C lights via building automation system.
- 2.12 Variable Frequency Drives:
- A. Comply with applicable requirements in Division 23 Section "Variable Frequency Drives".
 - B. **Provide a single VFD.** All motor circuit protectors can be located in starting device enclosure or, if required by design, in a separate enclosure. Motor circuit protector enclosure must be located and mounted at a minimal distance from motors in the fan array. Provide remote indication and start/stop of individual fans by means of auxiliary contacts.
 - C. Provide cooling provisions and filtration for VFD enclosure.

PART 3 - EXECUTION

- 3.1 Examination:
- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - B. Examine casing insulation materials and filter media before air-handling unit installation. Reject insulation materials and filter media that are wet, moisture damaged, or mold damaged.
 - C. Examine roughing-in for hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.
 - D. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 Installation:
- A. Equipment Mounting:
 - 1. Arrange installation of units to provide access space around air-handling units for service and maintenance.
 - B. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with new, clean filters upon building occupancy.

- C. Install filter-gauge, static-pressure taps upstream and downstream of filters. Mount filter gauges on outside of filter housing or filter plenum in accessible position. Provide filter gauges on filter banks, installed with separate static-pressure taps upstream and downstream of filters.

3.3 Connections:

- A. Comply with requirements for piping specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to air-handling unit to allow service and maintenance.
- C. Connect piping to air-handling units with flexible connectors.
- D. Connect condensate drain pans and extend to nearest floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.
- E. Hot- and Chilled-Water Piping: Comply with applicable requirements in Division 23 Section "Hydronic Piping" and Section "Hydronic Piping Specialties". Install shutoff valve and union or flange at each coil supply connection. Install balancing valve and union or flange at each coil return connection.
- F. Connect duct to air-handling units with flexible connections. Comply with requirements in Division 23 Section "Ductwork Accessories".

3.4 Field Quality Control:

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Tests and Inspections:
 - 1. Hydronic Leak Test: After installation, fill water coils with water, and test coils and connections for leaks.
 - 2. Airside Leak Test: Completely pressurize casing and field pressure test any unit requiring field assembly. Field assembled units shall be tested for 1% or less leakage at design airflow and 8" wg at positive and negative pressure. Test shall be conducted without additional sealant systems required by factory and with only blank-offs at inlet and outlet.
 - 3. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment. Make corrections.
- C. Air-handling unit or components will be considered defective if unit or components do not pass tests and inspections. Make correction at manufacturer's direction and retest for compliance.
- D. Prepare test and inspection reports once units are operational. Include description of corrective actions taken for any failed tests and inspections.

3.5 Adjusting:

- A. Adjust damper linkages for proper damper operation.
- B. Comply with requirements in Division 23 Section "HVAC Testing and Balancing" for air-handling system testing, adjusting, and balancing.

3.6 Cleaning:

- A. After completing system installation and testing, adjusting, and balancing air-handling unit and air-distribution systems and after completing startup service, clean air-handling units internally to remove foreign material and construction dirt and dust.

Clean fan wheels, cabinets, dampers, coils, and filter housings, and install new, clean filters following cleaning.

END OF SECTION

JHMHC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT

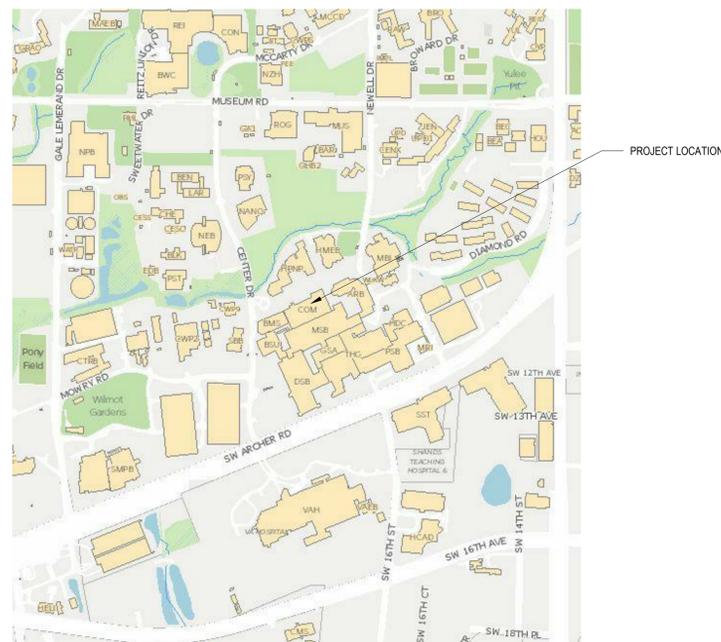
THE UNIVERSITY OF FLORIDA

MP05285

1249 CENTER DRIVE
GAINESVILLE, FL 32610



SITE LOCATION MAP



Sheet List	
Sheet Number	Sheet Name
M001	MECHANICAL LEGEND, NOTES & SCHEDULE
M002	MECHANICAL DETAILS
M100	MECHANICAL ROOF PLAN
M101	MECHANICAL AHU-5 PENTHOUSE PLANS
M102	MECHANICAL AHU-7 PENTHOUSE PLANS
M103	MECHANICAL AHU-8 PENTHOUSE PLANS
M301	MECHANICAL CONTROLS
M302	MECHANICAL CONTROLS
M303	CONTROL FLOOR PLANS
E001	ELECTRICAL LEGEND, DETAILS, & SCHEDULES
E010	ELECTRICAL BASEMENT PLAN
E020	ELECTRICAL GROUND FLOOR PLAN
E050	ELECTRICAL THIRD FLOOR PLAN
E100	ELECTRICAL ROOF PLAN
E101	ELECTRICAL AHU-5 PENTHOUSE PLANS
E102	ELECTRICAL AHU-7 PENTHOUSE PLANS
E103	ELECTRICAL AHU-8 PENTHOUSE PLANS
E201	ELECTRICAL SCHEDULES

PROJECT SUMMARY:

REPLACEMENT OF AHU-5 AND ASSOCIATED ZONE CONTROLS. AHU-5 LOCATED IN MECHANICAL PENTHOUSE NO. 1 AND SERVES SIX ZONES OF THE THIRD FLOOR EAST LIBRARY.

REPLACEMENT OF AHU-7. THE PROJECT DOES NOT INCLUDE ZONE AIR TERMINAL CONTROLS BUT DOES INCLUDE SPACE HUMIDITY, CO2, AND TEMPERATURE INSTRUMENTATION SERVING REPRESENTATIVE SPACES. AHU-7 IS LOCATED IN MECHANICAL PENTHOUSE NO. 3 AND SERVES THE 1ST, 2ND, AND 3RD FLOORS BETWEEN COLUMN LINES 10 & 12.

REPLACEMENT OF AHU-8. THE PROJECT DOES NOT INCLUDE ZONE AIR TERMINAL CONTROLS BUT DOES INCLUDE SPACE HUMIDITY, CO2, AND TEMPERATURE INSTRUMENTATION SERVING REPRESENTATIVE SPACES. AHU-8 IS LOCATED IN MECHANICAL PENTHOUSE NO. 4 AND SERVES THE 2ND AND 3RD FLOORS BETWEEN COLUMN LINES 6 & 10.

ADDITIVE ALTERNATE #1
ALL WORK ASSOCIATED WITH AHU-5 INCLUDING REPLACEMENT OF ALL PENTHOUSE LEVEL FIRE DAMPER.

ADDITIVE ALTERNATE #2
ALL WORK TO REPLACE THE PENTHOUSE LEVEL FIRE DAMPERS FOR AHU-7&8.

UNIT PRICING:
REFER TO FIRE DAMPER SCHEDULE.

ADDENDUM #1 2/14/2020

100% CONSTRUCTION DOCUMENTS
DECEMBER 20, 2019



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MECHANICAL LEGEND

24XXCD YYYYCFM		CEILING DIFFUSER; YYY=AIRFLOW 24= SQUARE SIZE, XX=NECK SIZE
24X2RAG YYYYCFM XX		RETURN AIR GRILLE YYY=AIRFLOW, XX=NECK SIZE
24X24EG YYYYCFM XX		EXHAUST GRILLE YYY=AIRFLOW, XX=NECK SIZE
		DUCT ELBOW (TURNING VANES SHOWN)
		FLEXIBLE DUCT CONNECTION
		FIRE DAMPER
		SMOKE DAMPER
		FIRE SMOKE DAMPER
		MOTORIZED DAMPER
		MANUAL BALANCING DAMPER
	EQUIPMENT TAG XX=EQUIP TYPE, YY=EQUIP. NO.	
	CONNECT TO EXISTING	
	THERMOSTAT	
	HUMIDISTAT	
	SMOKE DETECTOR	
	SPECIFIED AIR BALANCE OFFSET IN CFM	
	HARDWIRE INTERLOCK	
	CONTROL DEVICE (SEE CONTROLS ABBREVIATIONS)	
	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	
	ECCENTRIC REDUCER	
	CONCENTRIC REDUCER	
	VENTURI FLOW METER	
	FLEXIBLE PIPE CONNECTION	

MECHANICAL ABBREVIATIONS

A/C	AIR CONDITIONING
ABS	ABSOLUTE
AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
AMPS	AMPERES
ATM	ATMOSPHERE
AUTO	AUTOMATIC
BD	BALANCING DAMPER
BFC	BELOW FINISHED CEILING
BHP	BRAKE HORSE POWER
BT	BOTTOM THROAT
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CI	CAST IRON
CO	CLEAN OUT
DB	DRY BULB OR DECIBELS
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DN	DOWN
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EP	ELECTRIC PNEUMATIC
EWB	ENTERING WET BULB TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
FA	FREE AREA IN SQUARE FEET
FC	FAIL CLOSED; FLEXIBLE CONNECTION
FLA	FULL LOAD AMPS
FO	FAIL OPEN
FPM	FEET PER MINUTE
FFS	FEET PER SECOND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GPH	GALLON PER HOUR
GPM	GALLON PER MINUTE
HB	HOSE BIG
HP	HORSE POWER
HVAC	HEATING VENTILATING AND AIR-CONDITIONING
HZ	HERTZ
IN	INCHES
IN H2O	INCHES OF WATER
IN WG	INCHES OF WATER GAUGE
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCK ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MER	MECHANICAL EQUIPMENT ROOM
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAP	OPERABLE AIR OPENING
PHASE	PHASE
PRV	PRESSURE REDUCING VALVE
OPD	OPPOSED BLADE DAMPER
PSI	POUNDS PER SQUARE INCH
OZ	OUNCE
PE	PNEUMATIC ELECTRIC
PSIG	POUNDS PER SQUARE INCH GAUGE
RA	RETURN AIR
RPM	REVOLUTIONS PER MINUTE
SS	STAINLESS STEEL
SA	SUPPLY AIR
SD	SPLITTER DAMPER
SEC	SECOND
SP	STATIC PRESSURE
SQ FT	SQUARE FOOT
STD	STANDARD
T	THROAT
TEMP	TEMPERATURE
TG	TRANSFER GRILLE
TSP	TOTAL STATIC PRESSURE
TT	TOP THROAT
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	VOLTAGE
W	WIDTH, WEST, WATER
W/O	WITHOUT
WB	WET BULB
WMS	WIRE MESH SCREEN

MECHANICAL GENERAL NOTES

- IN GENERAL, PLANS AND DIAGRAMMS ARE SCHEMATIC ONLY AND SHOULD NOT BE SCALED.
- THE INTENT OF THE SPECIFICATIONS AND DRAWINGS IS TO CLARIFY THE SCOPE OF WORK AND ALERT CONTRACTOR OF EXISTING CONDITIONS. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL CLEARANCES BEFORE FABRICATION OF DUCTWORK AND PROVIDE ADDITIONAL OFFSET AND/OR CHANGES IN DUCT SIZES TO MEET FIELD CONDITIONS AND COORDINATE WITH ELECTRICAL, PLUMBING AND FIRE PROTECTION SUBCONTRACTOR BEFORE ANY CONSTRUCTION WORK.
- SHOULD ANY CONFLICTS ARISE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE CONFLICT BEFORE ANY CHANGES ARE MADE. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL BEFORE PROCEEDING WITH ANY CHANGES.
- DUCT DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. DUCTWORK, DIFFUSERS, REGISTERS, GRILLES, AND OTHER ITEMS OF THE AIR HANDLING SYSTEM SHALL NOT BE SUPPORTED BY THE CEILING OR CEILING SUSPENSION SYSTEM.
- ALL SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED SHEET METAL CONSTRUCTION IN ACCORDANCE WITH LATEST SMACNA STANDARDS. ALL EXHAUST DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL MATERIAL UNLESS NOTED OTHERWISE. APPLY LOW VOC DUCT MASTIC PER SMACNA AND LEED STANDARDS. PRESSURE TEST ALL DUCTWORK.
- ALL WORK COVERED IN THIS SECTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST PUBLISHED STANDARDS OF ASHRAE. AND NFPA. ALL DUCTWORK MUST BE INSTALLED 6" AWAY FROM ANY FIRE RATED WALL TO ALLOW FOR WALL INSPECTION.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL TRADES INSTALLATION SCHEDULES. FIRED WORK SUCH AS DUCTWORK AND GRAVITY PLUMBING SHALL BE INSTALLED PRIOR TO ANY TRADE WORK THAT CAN BE EASILY RELOCATED OR OFFSET SUCH AS ELECTRICAL CONDUITS, SMALL DIAMETER PLUMBING PRESSURE PIPING, ETC.
- PENETRATIONS THROUGH SMOKE OR FIRE-RATED ASSEMBLIES: PENETRATIONS FOR PIPES, CONDUITS OR OTHER PURPOSES THROUGH ASSEMBLIES (FLOORS, ROOF, WALLS, PARTITIONS, ETC.) WITH A REQUIRED FIRE RESISTANCE RATING SHALL BE SEALED TO THE PENETRATING MEMBER IN AN APPROVED MANNER WHICH MAINTAINS THE REQUIRED FIRE RESISTANCE RATING OF THE ASSEMBLY.
- UNLESS OTHERWISE NOTED, INSTALL DUCTWORK AS HIGH AS POSSIBLE, TIGHT TO BOTTOM OF STRUCTURE. COORDINATE DUCT ELEVATION WITH RAIN LEADERS, WATER PIPING, SANITARY DRAINS AND MAJOR ELECTRICAL CONDUITS.
- IT IS THE RESPONSIBILITY OF THE MECHANICAL INSTALLER TO PATCH AND REPAIR ANY DUCT OPENINGS WHICH RESULT FROM THE RELOCATION OR ELIMINATION OF ANY EXISTING AIR DEVICES. THE PATCH IS TO BE OF A SIMILAR MATERIAL TO THE REPAIRED DUCT AND TO BE SEALED IN ACCORDANCE WITH SMACNA STANDARDS.
- ALL INSULATION SHALL HAVE A MINIMUM FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50.
- SUBMIT EQUIPMENT AND MATERIAL SUBMITTALS.
- AT THE CONCLUSION OF INSTALLATION THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A COMPLETE CERTIFIED TEST AND BALANCE REPORT FROM AN AGENCY HAVING A MINIMUM OF THREE YEARS EXPERIENCE AND REGISTERED WITH THE NEBB OR AABC. REPORT SHALL ITEMIZE THE PERFORMANCE OF EACH AIR DEVICE AND A/C UNIT WITH REGARD TO CFM, STATIC PRESSURE AND TEMPERATURE. TABULATE ALL VALUES AND COMPARE TO EQUIPMENT TOTAL PERFORMANCE. PROVIDE PERCENT DEVIATIONS OF RECORDED VALUES FROM DESIGN VALUES. CONTRACTOR SHALL SUBMIT A CERTIFIED COPY OF THE TEST AND BALANCE REPORT TO THE ENGINEER FOR REVIEW AND APPROVAL.
- CONTRACTOR SHALL ARRANGE TO PAY FOR ALL NECESSARY PERMITS, LICENSES AND INSPECTIONS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
- CONTRACTOR SHALL PROVIDE EQUIPMENT SUBMITTAL DOCUMENTATION TO OWNER'S UTILITY PROVIDER FOR REBATE PURPOSES. REFER TO OWNER'S NON-TECHNICAL SPECIFICATIONS.

TAB PRETEST NOTES

TAB CONTRACTOR SHALL PERFORM THE FOLLOWING MEASUREMENTS AND REPORT TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO START OF DEMOLITION. PROVIDE A COPY TO OWNER FOR REVIEW. NOTIFY ENGINEER AND THE OWNER 24 HOURS IN ADVANCE OF PRETEST TO PROVIDE ENGINEER THE OPPORTUNITY TO PARTICIPATE IN THE PRE-TEST AND/OR CLARIFY ANY SPECIAL REQUIREMENTS.

RECORD VALUES AS FOLLOWS:

- AHU-5
 - INDIVIDUAL ZONE SUPPLY AIRFLOW BY PERFORMING A SUPPLY DUCT TRAVERSE IN MECHANICAL PENTHOUSE.
 - TOTAL SUPPLY AIRFLOW BY SUMMATION OF ALL ZONE SUPPLY AIRFLOWS.
 - SUPPLY FAN TOTAL STATIC PRESSURE
 - EXTERNAL STATIC PRESSURE MEASURED UPSTREAM OF FILTER SECTION AND DOWNSTREAM OF THE HOT/COLD DECK ZONE DAMPERS.
 - TOTAL OUTDOOR AIRFLOW BY DUCT TRAVERSE.
 - CHW FLOW MEASURED VIA EX VETURI FLOW METER WITH EX CHW CONTROL VALVE COMANDED TO 100% OPEN VALVE POSITION.
 - CHW COIL PRESSURE DROP WITH CHW CONTROL VALVE AT 100% OPEN VALVE POSITION.
 - HHW FLOW VIA EX VETURI FLOW METER WITH EX HHW CONTROL VALVE COMANDED TO 100% OPEN VALVE POSITION.
 - HHW COIL PRESSURE DROP WITH HHW CONTROL VALVE AT 100% OPEN VALVE POSITION.
- AHU-7
 - TOTAL SUPPLY AIRFLOW BY SUPPLY DUCT TRAVERSE LOCATED IN THE MECHANICAL PENTHOUSE.
 - SUPPLY FAN TOTAL STATIC PRESSURE.
 - EXTERNAL STATIC PRESSURE MEASURED UPSTREAM OF FILTER SECTION AND DOWNSTREAM OF THE COOLING COIL.
 - TOTAL OUTDOOR AIRFLOW BY DUCT TRAVERSE.
 - CHW FLOW MEASURED VIA EX VETURI FLOW METER WITH EX CHW CONTROL VALVE COMANDED TO 100% OPEN VALVE POSITION.
 - CHW COIL PRESSURE DROP WITH CHW CONTROL VALVE AT 100% OPEN VALVE POSITION.

CUSTOM AIR HANDLING UNIT SCHEDULE

MANUFACTURER	TEMTROL	TEMTROL	TEMTROL
UNIT TYPE	CHILLED WATER	CHILLED WATER	CHILLED WATER
AIR HANDLER MARK	AHU-5	AHU-7	AHU-8
AIR HANDLER MODEL	CUSTOM	CUSTOM	CUSTOM
DESIGN CONDITIONS			
SUMMER OUTDOOR TEMP DB/WB (DEG F)	96/80	96/80	96/80
SUMMER INDOOR DB/WB (DEG F)	75/63	75/63	75/63
WINTER OUTDOOR TEMP (DEG F)	30	30	30
WINTER INDOOR (DEG F)	70	70	70
TOTAL AIR (CFM)	24,000	28,200	28,200
OUTSIDE AIR (CFM)	4,000	7,000	7,000
EXTERNAL STATIC PRESSURE ("WG)	2.5	2.5	2.5
TOTAL STATIC PRESSURE W/DIRTY FILTER ("WG)	6.0	6.0	6.0
COOLING COIL (CHW)			
ENTERING AIR TEMPERATURE (DB/WB DEG F)	73/63.3	80/67.4	80/67.4
LEAVING AIR TEMPERATURE (DB/WB DEG F)	55/54.5	55/54.5	55/54.5
ENTERING WATER TEMPERATURE (DEG F)	45	45	45
LEAVING WATER TEMPERATURE (DEG F)	60	60	60
CHILLED WATER FLOW (GPM)	84	152	152
TOTAL CAPACITY (BTUH)	627,000	1,134,000	1,134,000
SENSIBLE CAPACITY (BTUH)	465,000	705,000	705,000
MINIMUM ROWS & MAXIMUM FINS/INCH	8 & 10	8 & 10	8 & 10
MAX AIR PRESSURE DROP (IN WG)	1.0	1.0	1.0
MAX WATER PRESSURE DROP (FT WG)	3	3	3
CONTROL VALVE TYPE	2-WAY	2-WAY	2-WAY
CONTROL VALVE SIZE (IN)	2-1/2"	3"	3"
MAX CONTROL VALVE PRESSURE DROP (PSI)	5.0	5.0	5.0
HEATING COIL (HWH)			
ENTERING AIR TEMPERATURE (DEG F)	54	N/A	N/A
LEAVING AIR TEMPERATURE (DEG F)	116	N/A	N/A
ENTERING WATER TEMPERATURE (DEG F)	200	N/A	N/A
LEAVING WATER TEMPERATURE (DEG F)	160	N/A	N/A
HEATING HOT WATER FLOW (GPM)	41	N/A	N/A
MINIMUM ROWS & MAXIMUM FINS/INCH	2 & 10	N/A	N/A
CAPACITY (BTUH)	803,600	N/A	N/A
MAX AIR PRESSURE DROP (IN WG)	0.50	N/A	N/A
MAX WATER PRESSURE DROP (FT WG)	5.00	N/A	N/A
CONTROL VALVE TYPE	2-WAY	N/A	N/A
CONTROL VALVE SIZE (IN)	1-1/2"	N/A	N/A
MAX CONTROL VALVE PRESSURE DROP (PSI)	5.0	N/A	N/A
FAN SECTION			
NO OF FANS	6	6	6
FAN AIRFLOW (EACH) (MIN/MAX CFM)	2,000/4,000	2,000/4,700	2,000/4,700
FAN SPEED (EACH) (RPM)	2,250	2,250	2,250
VOLTS-PHASE	460-3	460-3	460-3
FAN POWER (EACH) (HP/BHP)	7.5	7.5	7.5
SINGLE VFD WITH BYPASS (HP)	50	50	50
FILTRATION			
2" PRE-FILTER	MERV 7	MERV 7	MERV 7
2" AFTER FILTER	MERV 15	MERV 15	MERV 15
WEIGHT (LBS)	13,000	12,750	12,750
DISCHARGE SOUND RATING (DB)			
63 Hz	89	91	91
125Hz	84	86	86
250Hz	90	94	94
SCHEDULE NOTES	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)

- PROVIDE FIELD INSTALLED AHU MANUFACTURER UV LIGHTS.
- PROVIDE WINDOW FOR EACH ACCESS DOOR. SEE FLOORPLAN FOR DOOR SWING.
- PROVIDE TWO STACKED CHW COILS WITH INTERMEDIATE DRAIN PAN.
- PROVIDE 6" BASE RAIL.
- EACH FAN SIZED FOR 1/6 OF TOTAL AIRFLOW
- PROVIDE RETURN AND SUPPLY SMOKE DAMPERS
- HEATING COIL LOCATED IN HOT DECK.
- PROVIDE SHIPPING SPLIT FOR FIELD ASSEMBLY.
- PROVIDE KNOCKDOWN CONSTRUCTION
- PROVIDE SERVICE LIGHTS IN EACH ACCESS SECTION
- PROVIDE PITOT FAN INLET AIRFLOW STATION AND PRESSURE TRANSMITTER FOR EACH FAN
- PROVIDE FAN AIRFLOW TOTALIZER PROVIDING ANALOG TOTAL AHU SUPPLY AIRFLOW SIGNAL TO BAS
- PROVIDE COOLING COIL DRAIN PAN FLOAT SENSOR
- PROVIDE OUTDOOR AIR INTAKE CONTROL DAMPER
- PROVIDE ZONE CONTROL DAMPERS

CODES AND STANDARDS

ALL PROJECT WORK SHALL BE GOVERNED BY AND ADHERE TO THE FOLLOWING CODES AND STANDARDS.

- FLORIDA BUILDING CODE - SIXTH EDITION (2017)
 - FLORIDA BUILDING CODE - SIXTH EDITION (2017) - MECHANICAL
 - FLORIDA BUILDING CODE - SIXTH EDITION (2017) - EXISTING BUILDING
 - FLORIDA BUILDING CODE - SIXTH EDITION (2017) - ENERGY CONSERVATION
- FLORIDA FIRE PREVENTION CODE SIXTH EDITION (2017)
 - FIRE CODE (NFPA 1 - 2015 FLORIDA EDITION)
 - LIFE SAFETY CODE (NFPA 101 - 2015 FLORIDA EDITION)
- NATIONAL ELECTRIC CODE (NFPA 70 - 2014)
- FIRE ALARM AND SIGNALING CODE (NFPA 72 - 2013)
- UNDERWRITERS' LABORATORIES (UL)
- AMERICAN NATIONAL STANDARDS INSTITUTION (ANSI)
- AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
- SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
- AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS (ASHRAE)
- AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL (AMCA)
- NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB)
- ASSOCIATED AIR BALANCE COUNCIL (AABC)

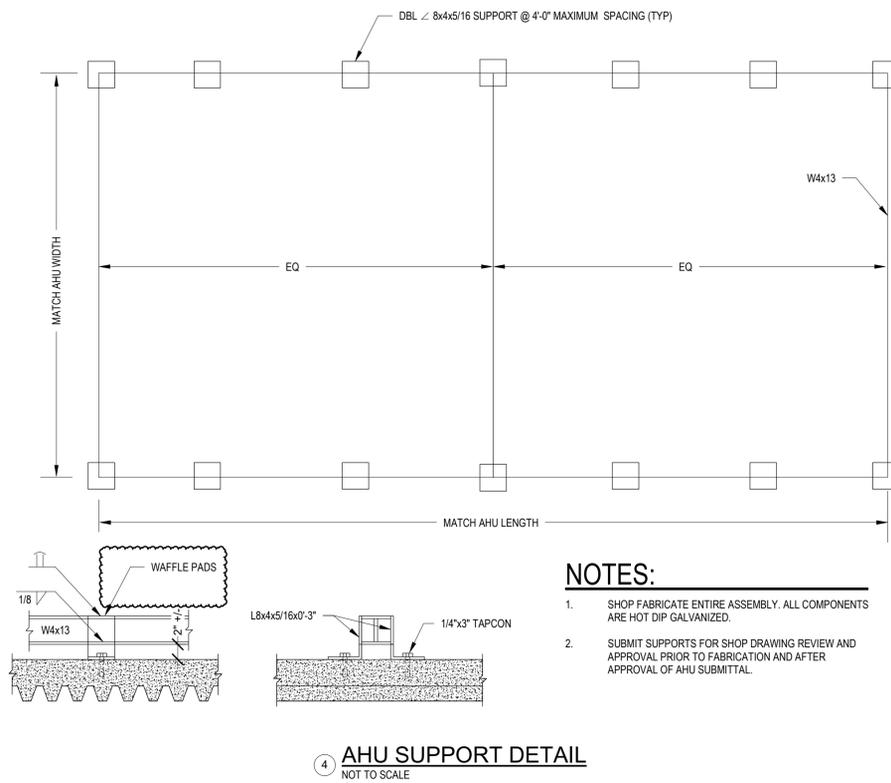
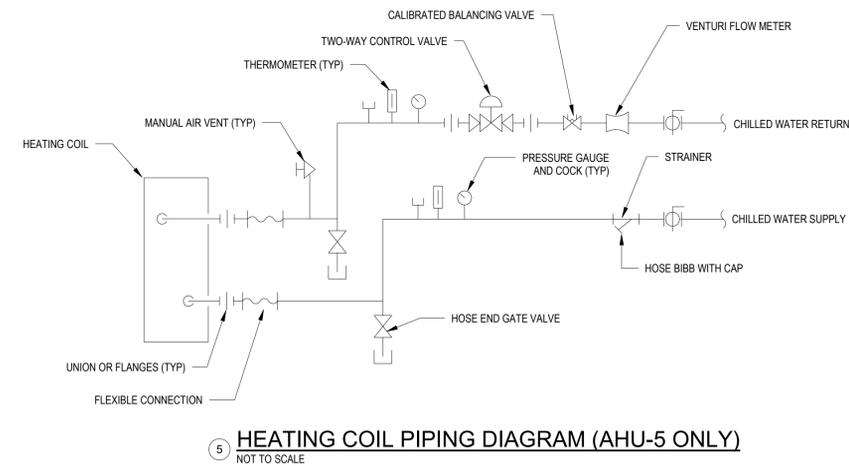
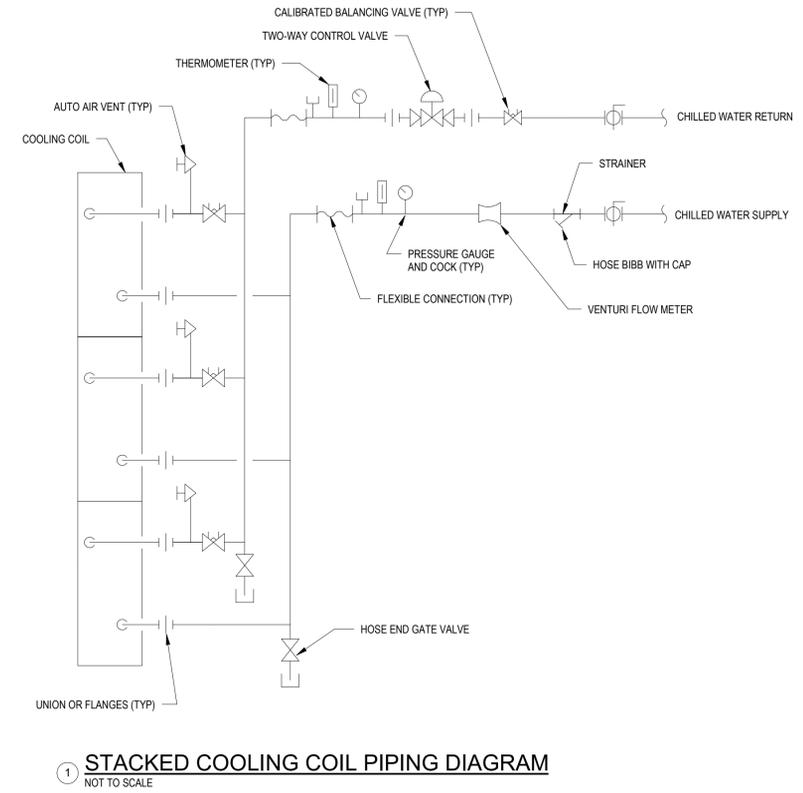
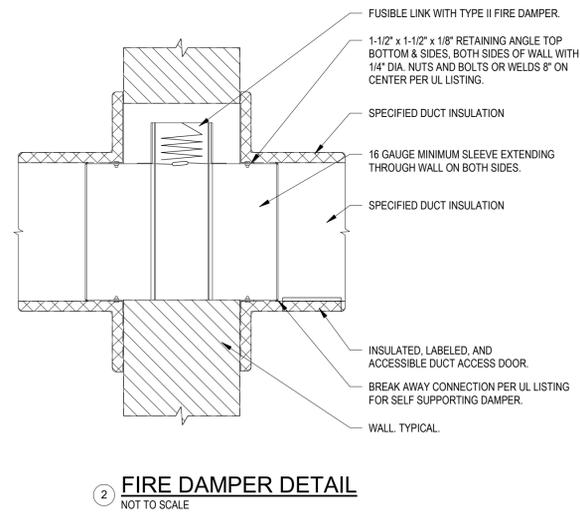
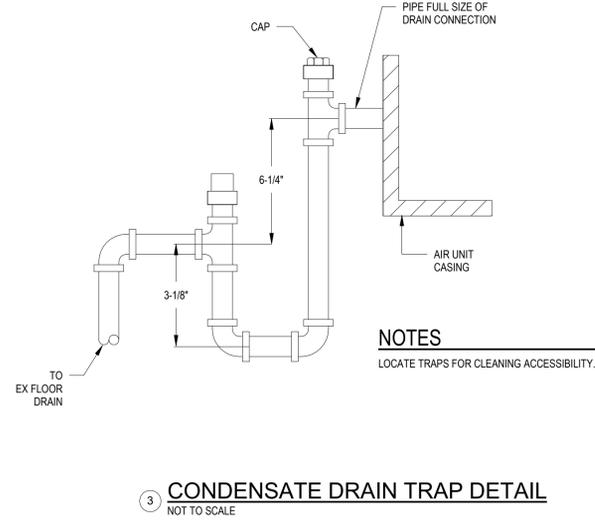
EXISTING CONDITIONS NOTES

- CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL SURVEY THE PROJECT AREA AND BRING TO THE ENGINEER'S ATTENTION, ANY CONCERNS ABOUT PROJECT DESIGN, SCHEDULE OR FACILITY IMPACT.
- COORDINATE ANY UTILITY OR EQUIPMENT OUTAGES WITH OWNER. PROVIDE MINIMUM NOTICE OF SEVEN DAYS PRIOR TO ANY OUTAGE.

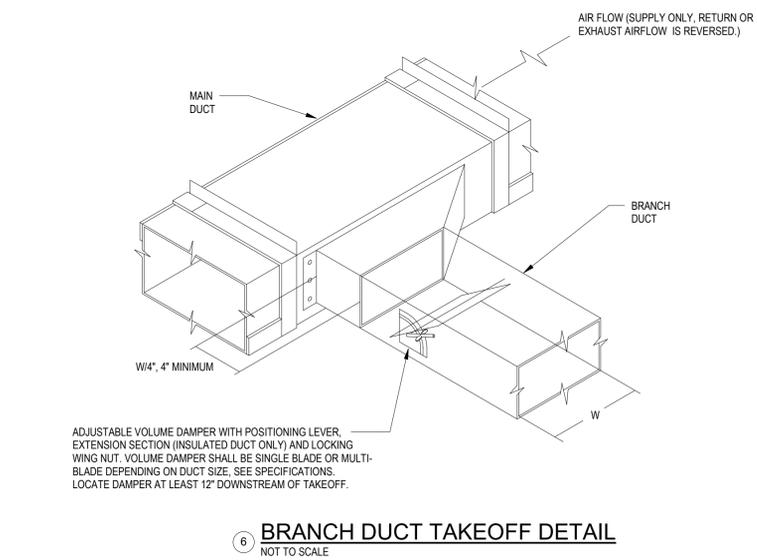
FIRE DAMPER SCHEDULE

MARK	FD-1	FD-2	FD-3	FD-4	FD-5	FD-6	FD-7	FD-8	FD-9	FD-10	FD-11	FD-12	FD-13	FD-14
BASIS OF DESIGN	GREENHECK	GREENHECK	GREENHECK	GREENHECK	RUSKIN	GREENHECK								
MODEL NUMBER	ODFD-150	ODFD-150	ODFD-150	ODFD-150	DFD35/OW	ODFD-150								
APPROXIMATE DIMENSIONS (INCH)	20x34	12x34	40x34	20x34	12x34	74x42	122x18	44x32	36x36	88x18	88x34	88x18	88x18	88x18
SCHEDULE NOTES	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)

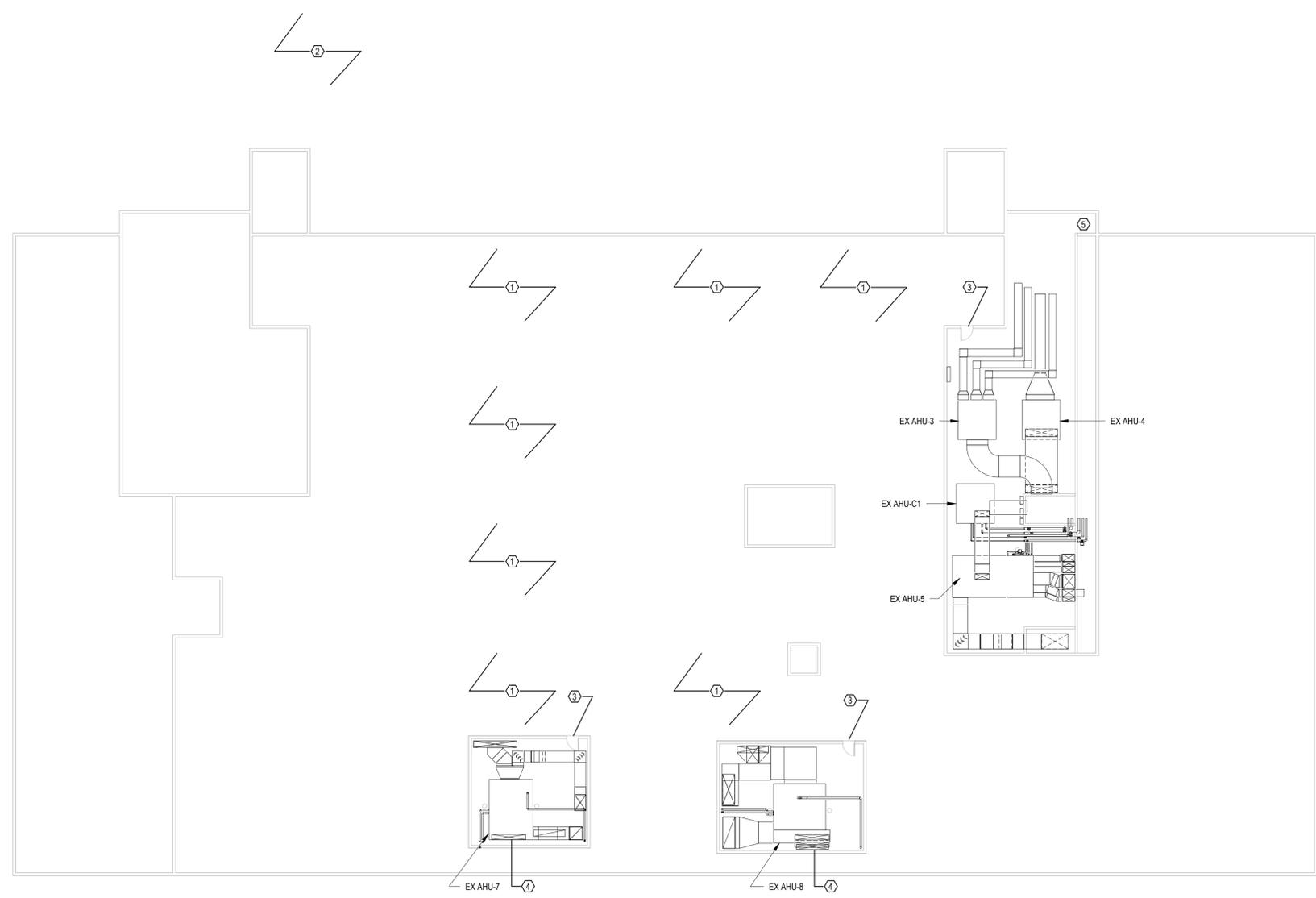
- FIELD VERIFY ALL EXISTING OPENING SIZES
- INSTALL PER LISTING
- PROVIDE DEDUCTIVE UNIT PRICING ON BID FORM INCLUDING COMPLETE INSTALLATION FOR THREE DAMPER RANGES: 8 SQ FT OR LESS, BETWEEN 8 SQ FT AND 12 SQ FT, & 12 SQ FT OR MORE



- NOTES:**
- SHOP FABRICATE ENTIRE ASSEMBLY. ALL COMPONENTS ARE HOT DIP GALVANIZED.
 - SUBMIT SUPPORTS FOR SHOP DRAWING REVIEW AND APPROVAL PRIOR TO FABRICATION AND AFTER APPROVAL OF AHU SUBMITTAL.



ADJUSTABLE VOLUME DAMPER WITH POSITIONING LEVER. EXTENSION SECTION (INSULATED DUCT ONLY) AND LOCKING WING NUT. VOLUME DAMPER SHALL BE SINGLE BLADE OR MULTI-BLADE DEPENDING ON DUCT SIZE. SEE SPECIFICATIONS. LOCATE DAMPER AT LEAST 12" DOWNSTREAM OF TAKEOFF.



MECHANICAL ROOF PLAN
 1/16" = 1'-0"

PHASING NOTES:

1. COORDINATE ANY CHILLED WATER OUTAGE WITH OWNER'S SCHEDULE. PROVIDE 2 WEEK NOTICE.
2. PHASE WORK TO PRIORITIZE AHU-8 REPLACEMENT FIRST AND AHU-7 SECOND.
3. PHASE WORK TO LIMIT OUTAGE OF EXISTING OPERATIONAL AHU's TO A 5 BUSINESS DAYS. PROVIDE PREMIUM TIME WORK AS REQUIRED TO COMPLETE REPLACEMENT WORK WITHIN THIS TIMEFRAME.
4. COORDINATE DRAINAGE AND REFILL OF CHILLED WATER SYSTEM FOR TIE-IN OF NEW INSULATED CHILLED WATER PIPING, VALVES, AND ACCESSORIES. ENSURE THAT PIPING IS PROPERLY FLUSHED PRIOR TO STARTUP.
5. PROVIDE CHEMICAL TREATMENT SERVICES FOR NEW PIPING AND REFILLED SYSTEM BY OWNER'S CHEMICAL TREATMENT COMPANY.

SHEET NOTES:

- ① PROTECT ROOF FROM DAMAGE, WEAR & TEAR, AND STAINING DURING CONSTRUCTION ACTIVITIES. PROVIDE ROOF PROTECTION.
- ② FIELD VERIFY LOCATION OF AVAILABLE STAGING, RIGGING, AND CRANE OPERATION ONSITE PRIOR TO BIDDING. PROTECT ALL EXISTING SITE INFRASTRUCTURE FROM DAMAGE DURING CONSTRUCTION ACTIVITIES. REPAIR ANY AND ALL DAMAGE FROM CONSTRUCTION ACTIVITIES AT NO ADDED COST TO OWNER.
- ③ EXISTING DOOR TO BE UTILIZED FOR ACCESS TO ROOF PENTHOUSES. COORDINATE PHYSICAL SIZE OF NEW EQUIPMENT COMPONENTS WITH AVAILABLE DOOR OPENING.
- ④ EXISTING ROOFTOP GOOSENECK OA INTAKE AND CURB.
- ⑤ FIELD VERIFY LOCATION OF EXISTING CHWS&R AND HHWS&R ISOLATION VALVES SERVING AHU-5, AHU-4, AHU-3 AND AHU-C1 PRIOR TO BIDDING.

PROJECT NAME:
THE UNIVERSITY OF FLORIDA
JHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

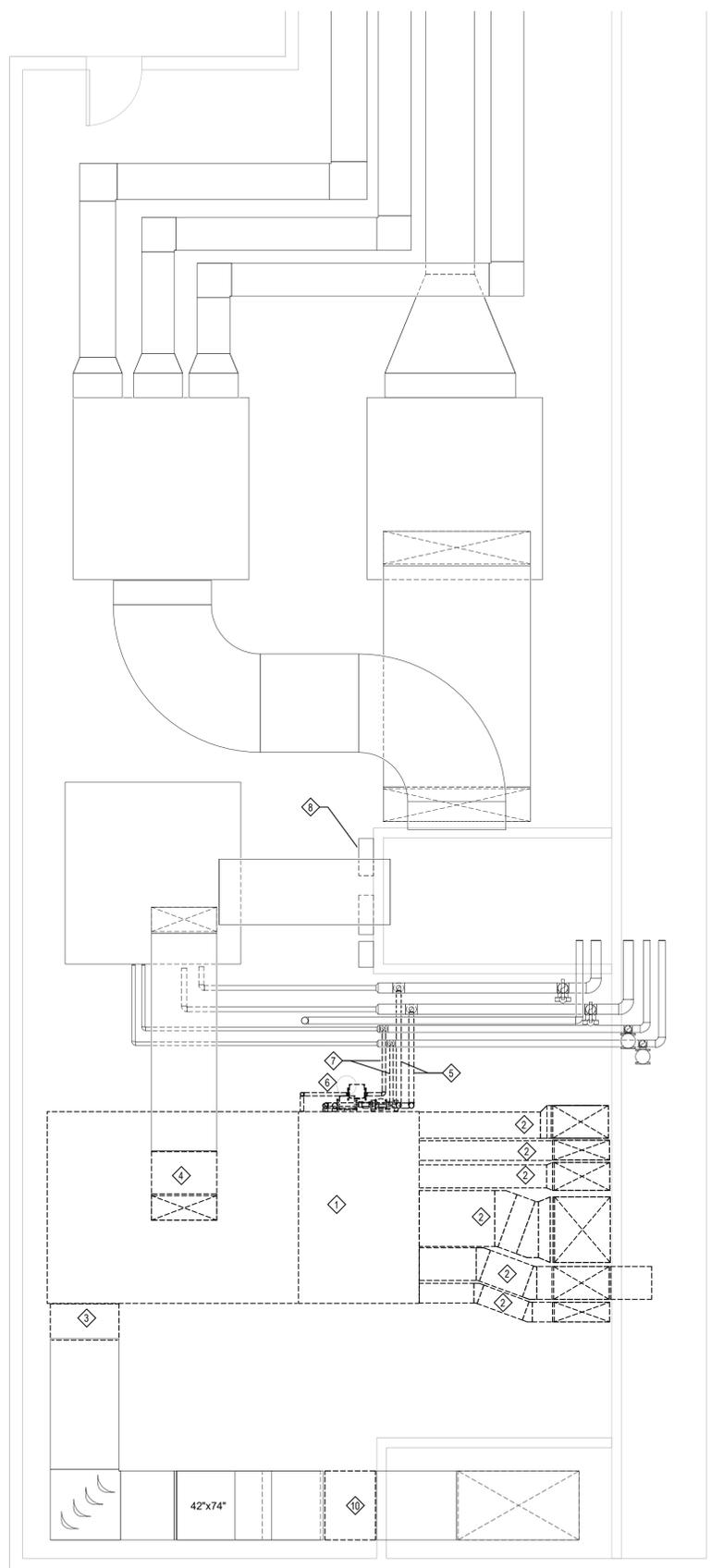
ISSUE:
 100% CONSTRUCTION DOCUMENTS

ISSUE DATE:
 DECEMBER 20, 2019

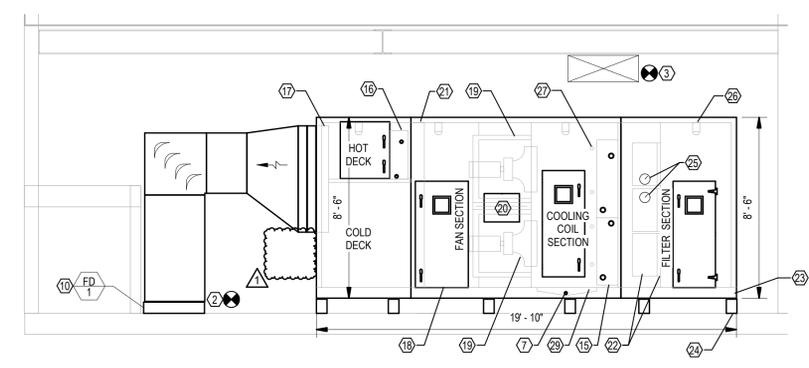
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SHEET TITLE:
MECHANICAL ROOF PLAN

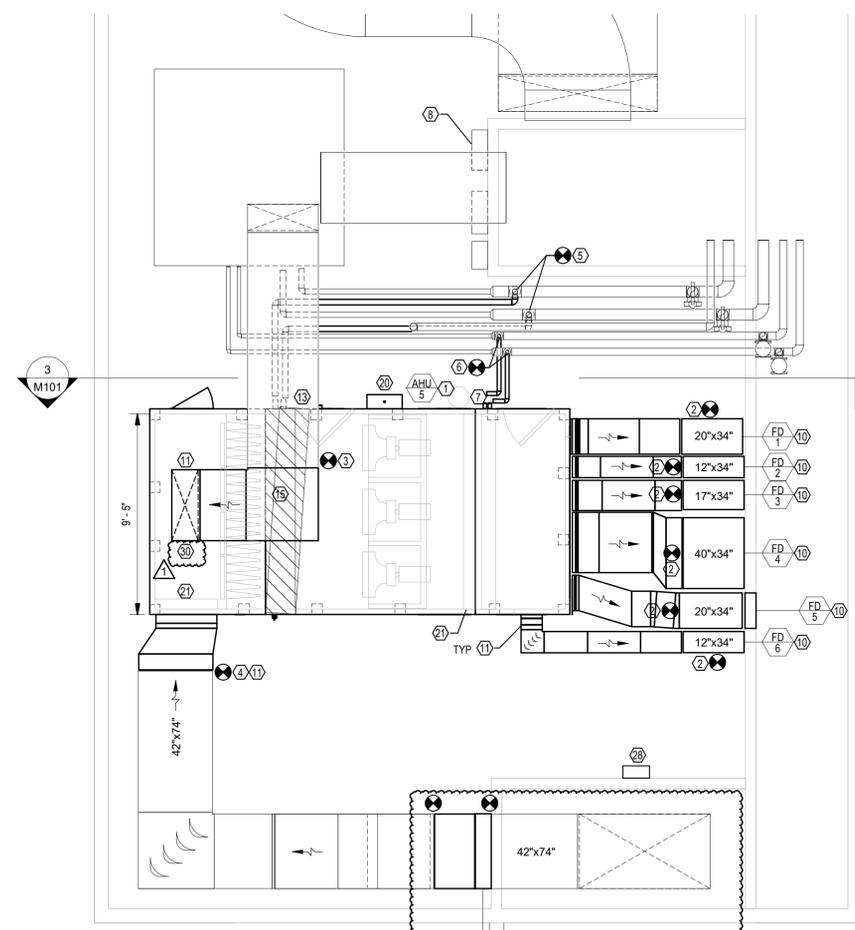
SHEET NUMBER:
M100



MECHANICAL AHU-5 PENTHOUSE - DEMOLITION
 1/4" = 1'-0"



3 AHU-5 SECTION
 1/4" = 1'-0"



MECHANICAL AHU-5 PENTHOUSE
 1/4" = 1'-0"

TAB PRETEST NOTES:

PRIOR TO START OF DEMOLITION TAB CONTRACTOR SHALL PERFORM PRETEST OF EXISTING SYSTEM AS DESCRIBED IN TAB PRETEST NOTES ON SHEET M001.

GENERAL NOTES:

ENSURE THAT ALL HHW AND CHW OUTAGES ARE COORDINATED WITH THE OWNER.

DEMOLITION NOTES:

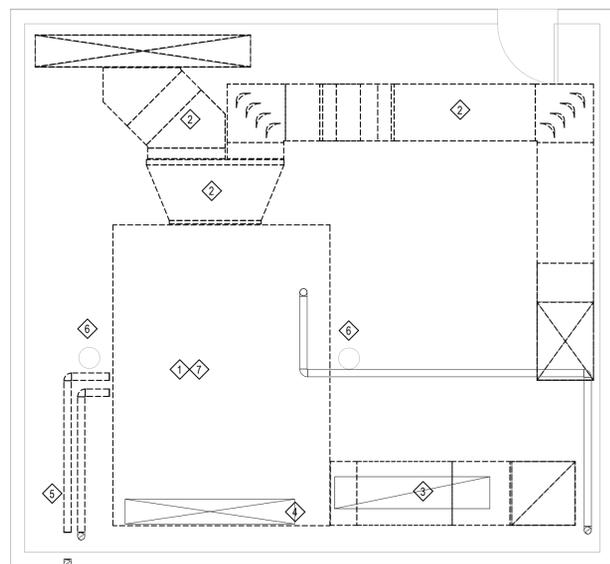
- 1 DEMOLISH EXISTING AIR HANDLER. TURNOVER EX FAN MOTOR TO OWNER.
- 2 DEMOLISH EXISTING SUPPLY DUCT
- 3 DEMOLISH EXISTING RETURN DUCT
- 4 DEMOLISH EXISTING OUTDOOR AIR DUCT. THE PRECONDITIONING UNIT SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. PROVIDE CONSTRUCTION FILTER MEDIA AT DUCT DISCHARGE.
- 5 DEMOLISH EXISTING CHWS&R PIPING AND PIPING ACCESSORIES. UTILIZE ISOLATION VALVES LOCATED IN THE NORTH EAST CORNER OF THE AHU-5 PENTHOUSE.
- 6 DEMOLISH EXISTING CONDENSATE DRAIN PIPING
- 7 DEMOLISH EXISTING HHWS&R PIPING AND PIPING ACCESSORIES. UTILIZE ISOLATION VALVES LOCATED IN THE NORTH EAST CORNER OF THE AHU-5 PENTHOUSE.
- 8 DEMOLISH EXISTING AHU-5 CONTROLS. EX PANEL TO REMAIN.
- 9 DEMOLISH EXISTING THERMOSTATS LOCATED ON THIRD LEVEL.
- 10 DEMOLISH EXISTING RETURN DUCT TO ALLOW NEW FIRE DAMPER INSTALLATION.

ADDITIVE ALTERNATE NOTES:

- 1. ALL WORK ASSOCIATED WITH AHU-5 IS ADDITIVE ALTERNATE #1

SHEET NOTES:

- 1 NEW AHU AND VFD ON STEEL SUPPORTS
- 2 NEW TO EXISTING SUPPLY DUCT CONNECTION AT THE FLOOR
- 3 NEW TO EXISTING OA DUCT CONNECTION ABOVE AHU
- 4 NEW TO EXISTING RA DUCT CONNECTION
- 5 NEW COLD DECK 3" CHWS&R PROVIDE NEW ISOLATION VALVES AND DEVICES. SEE DETAIL
- 6 NEW HOT DECK 2" HHWS&R PROVIDE NEW ISOLATION VALVES AND DEVICES. SEE DETAIL
- 7 NEW 1-1/2" TRAPPED CONDENSATE DRAIN PIPE TO EX FLOOR DRAIN
- 8 NEW AHU CONTROLLER IN EXISTING PANEL.
- 9 PROVIDE BELIMO ACTUATORS AT TAMCO MIXING DAMPERS.
- 10 NEW FIRE DAMPERS AT FLOOR AND WALL
- 11 FLEXIBLE DUCT CONNECTION. TYPICAL.
- 12 REPLACE EXISTING THERMOSTATS IN THEIR EXISTING LOCATION ON THIRD FLOOR.
- 13 COOLING COIL PULL CLEARANCE WITH DEMOUNTABLE COIL AND REMOVABLE AHU SIDE PANEL
- 14 NEW DUCT INSIDE OF CHASE.
- 15 STACKED COOLING COIL
- 16 HEATING COIL
- 17 ZONE CONTROL DAMPER BY AHU MANUFACTURER
- 18 ACCESS DOOR
- 19 SUPPLY FAN ARRAY
- 20 SUPPLY FAN CONTROL PANEL BY AHU MANUF.
- 21 SMOKE DAMPER BY AHU MANUFACTURER
- 22 PRE-FILTER AND FINAL FILTER
- 23 BASERAIL
- 24 SUPPORT WITH VIBRATION ISOLATION PADS
- 25 FILTER AIR DIFFERENTIAL PRESSURE GAUGE
- 26 SERVICE LIGHT IN EACH SECTION
- 27 UV LIGHTS WITH CONTACTOR FOR BAS CONTROL
- 28 SINGLE VFD WITH BYPASS
- 29 DRAIN PAN FLOAT SWITCH
- 30 OUTDOOR AIR CONTROL DAMPER BY AHU MANUFACTURER



MECHANICAL AHU-7 PENTHOUSE - DEMOLITION
1/4" = 1'-0"

TAB PRETEST NOTES:

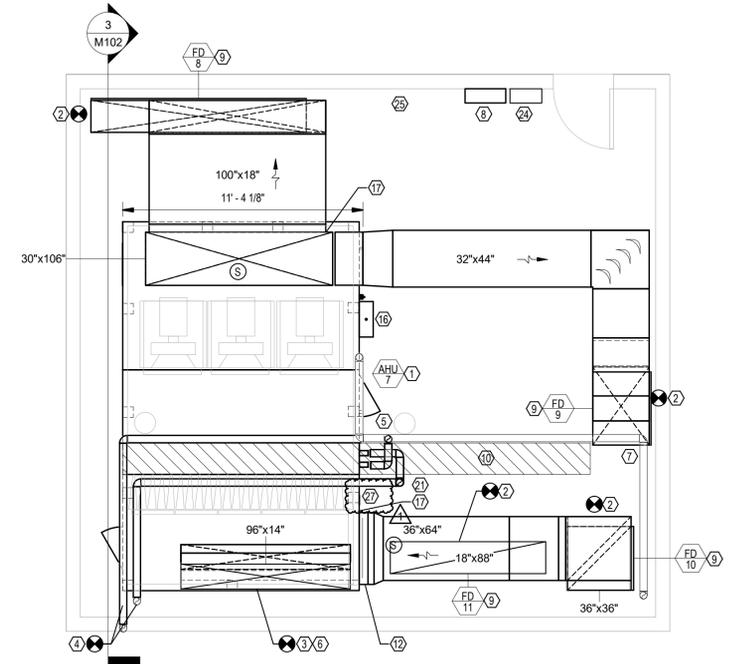
PRIOR TO START OF DEMOLITION TAB CONTRACTOR SHALL PERFORM PRETEST OF EXISTING SYSTEM AS DESCRIBED IN TAB PRETEST NOTES ON SHEET M001.

GENERAL NOTES:

ENSURE CHW OUTAGES ARE COORDINATED WITH THE OWNER.

DEMOLITION NOTES:

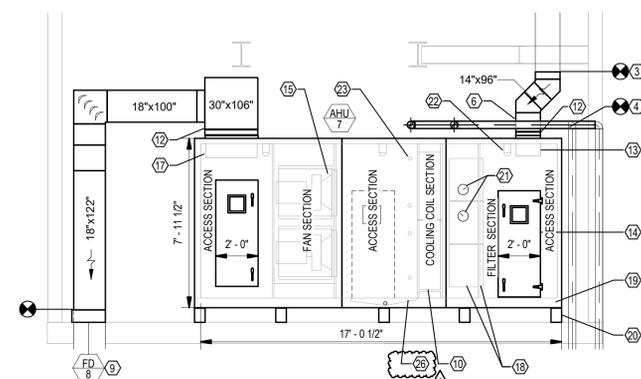
- 1 DEMOLISH EXISTING AIR HANDLER
- 2 DEMOLISH EXISTING SUPPLY DUCT
- 3 DEMOLISH EXISTING RETURN DUCT
- 4 DEMOLISH EXISTING OUTDOOR AIR DUCT
- 5 DEMOLISH EXISTING CHWS&R PIPING AND PIPING ACCESSORIES. UTILIZE CHWS&R ISOLATION VALVES LOCATED ABOVE CEILING ON 3RD FLOOR.
- 6 DEMOLISH EXISTING CONDENSATE DRAIN PIPING
- 7 DEMOLISH EXISTING AHU-7 CONTROLS



MECHANICAL AHU-7 PENTHOUSE
1/4" = 1'-0"

SHEET NOTES:

- 1 NEW AHU AND VFD ON STEEL SUPPORTS
- 2 NEW TO EXISTING DUCT CONNECTION AT THE FLOOR
- 3 NEW TO EXISTING DUCT CONNECTION ABOVE AHU
- 4 NEW TO EXISTING CHWS&R PIPE CONNECTION. PROVIDE NEW ISOLATION VALVES AND DEVICES. SEE DETAIL.
- 5 NEW 2" TRAPPED CONDENSATE DRAIN PIPE TO EX FLOOR DRAIN.
- 6 OUTDOOR AIRFLOW STATION IN VERTICAL
- 7 EX STORM PIPE ABOVE NEW DUCT
- 8 NEW CONTROL PANEL
- 9 NEW OUT OF FLOOR FIRE DAMPER
- 10 COOLING COIL PULL CLEARANCE. PROVIDE DEMOUNTABLE COIL AND REMOVABLE AHU SIDE PANEL.
- 11 STACKED COOLING COIL
- 12 FLEXIBLE DUCT CONNECTION
- 13 OUTDOOR AIR CONTROL DAMPER BY AHU MANUFACTURER
- 14 ACCESS DOOR
- 15 SUPPLY FAN ARRAY
- 16 SUPPLY FAN CONTROL PANEL BY AHU MANUFACTURER
- 17 SMOKE DAMPER BY AHU MANUFACTURER
- 18 PRE-FILTER AND FINAL FILTER
- 19 BASERAIL
- 20 SUPPORT WITH VIBRATION ISOLATION PADS
- 21 FILTER AIR DIFFERENTIAL PRESSURE GAUGE
- 22 SERVICE LIGHT IN EACH SECTION
- 23 UV LIGHTS WITH CONTACTOR CONTROLLED BY BAS
- 24 SINGLE VFD WITH BYPASS
- 25 MAINTAIN EXISTING PNEUMATIC CONTROL TO THE REMAINDER OF THE BUILDING SERVICES.
- 26 DRAIN PAN FLOAT SENSOR
- 27 SIDE LOAD FILTER DOORS



AHU-7 SECTION
1/4" = 1'-0"

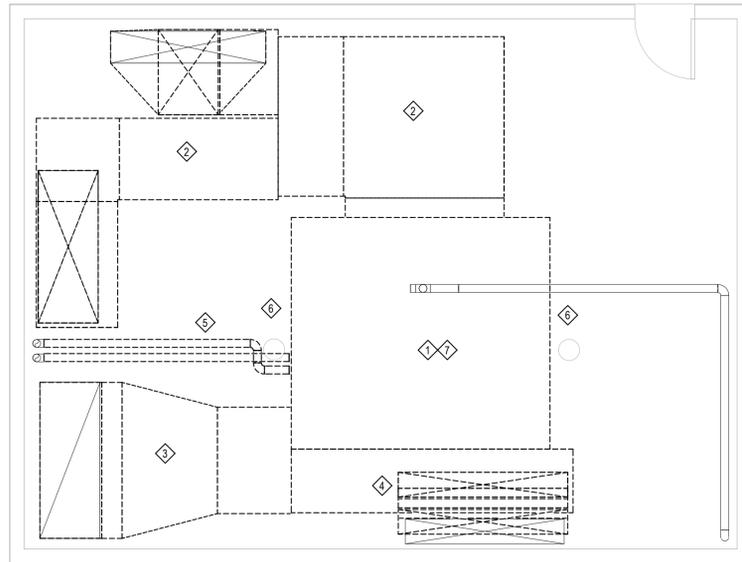


GENERAL NOTES:

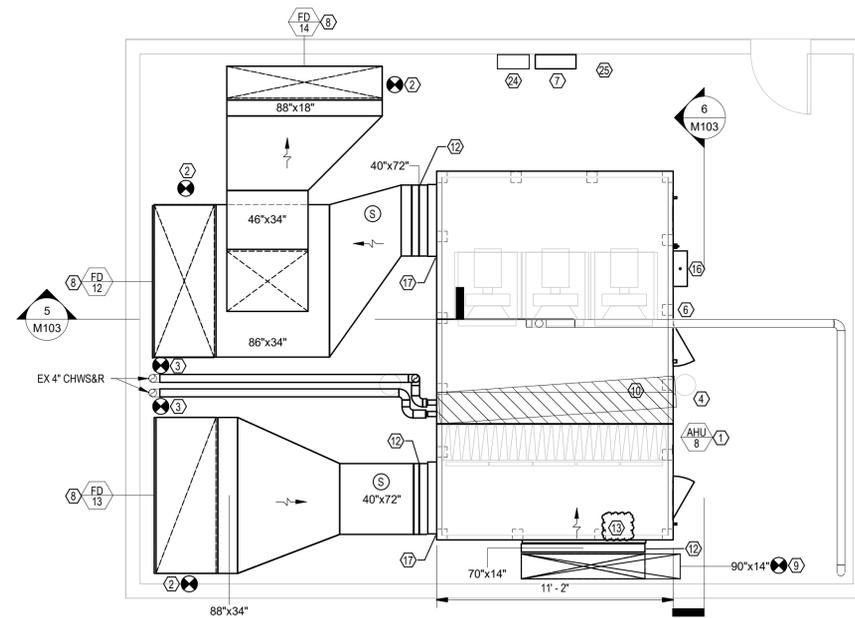
ENSURE CHW OUTAGES ARE COORDINATED WITH THE OWNER.

DEMOLITION NOTES:

- 1 DEMOLISH EXISTING AIR HANDLER. TURN OVER EX FAN MOTOR TO OWNER.
- 2 DEMOLISH EXISTING SUPPLY DUCT
- 3 DEMOLISH EXISTING RETURN DUCT
- 4 DEMOLISH EXISTING OUTDOOR AIR DUCT
- 5 DEMOLISH EXISTING CHWS&R PIPING AND PIPING ACCESSORIES. UTILIZE CHWS&R ISOLATION VALVES LOCATED IN CHASE ADJACENT TO RESTROOMS ON 3RD FLOOR.
- 6 DEMOLISH EXISTING CONDENSATE DRAIN PIPING
- 7 DEMOLISH EXISTING AHU-8 CONTROLS



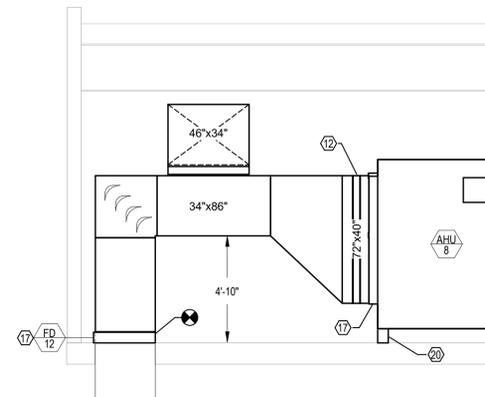
MECHANICAL AHU-8 PENTHOUSE - DEMOLITION
 1/4" = 1'-0"



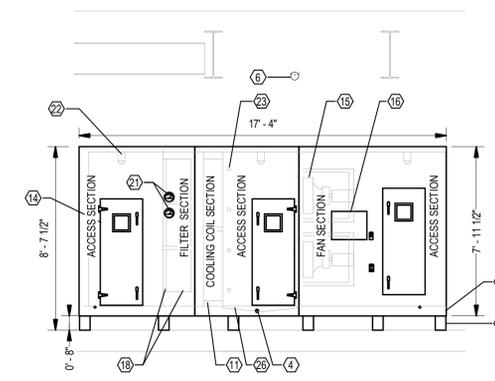
MECHANICAL AHU-8 PENTHOUSE
 1/4" = 1'-0"

SHEET NOTES:

- 1 NEW AHU AND VFD ON STEEL SUPPORTS
- 2 NEW TO EXISTING DUCT CONNECTION AT THE FLOOR
- 3 NEW TO EXISTING 4" CHWS&R PIPE CONNECTION. PROVIDE NEW ISOLATION VALVES AND DEVICES. SEE DETAIL.
- 4 NEW 2" TRAPPED CONDENSATE DRAIN PIPE TO EX FLOOR DRAIN
- 5 OUTDOOR AIR CONTROL DAMPER IN VERTICAL
- 6 EX STORM PIPE ABOVE AHU
- 7 NEW CONTROL PANEL
- 8 PROVIDE NEW OUT OF FLOOR FIRE DAMPER.
- 9 NEW TO EXISTING OA DUCT CONNECTION AT ABOVE AHU
- 10 COOLING COIL PULL CLEARANCE WITH DEMOUNTABLE COIL AND REMOVABLE AHU SIDE PANEL
- 11 STACKED COOLING COIL
- 12 FLEXIBLE DUCT CONNECTION
- 13 OUTDOOR CONTROL DAMPER
- 14 ACCESS DOOR
- 15 SUPPLY FAN ARRAY
- 16 SUPPLY FAN CONTROL PANEL BY AHU MANUF.
- 17 SMOKE DAMPER
- 18 PRE-FILTER AND FINAL FILTER
- 19 BASERAIL
- 20 SUPPORT WITH VIBRATION ISOLATION PADS
- 21 FILTER AIR DIFFERENTIAL PRESSURE GAUGE
- 22 SERVICE LIGHT IN EACH SECTION
- 23 UV LIGHTS WITH CONTACTOR FOR BAS CONTROL
- 24 SINGLE VFD WITH BYPASS
- 25 MAINTAIN EXISTING PNEUMATIC SYSTEM FOR THE REMAINDER OF THE BUILDING SERVICE.
- 26 DRAIN PAN FLOAT SENSOR



AHU-8 ELEVATION
 1/4" = 1'-0"



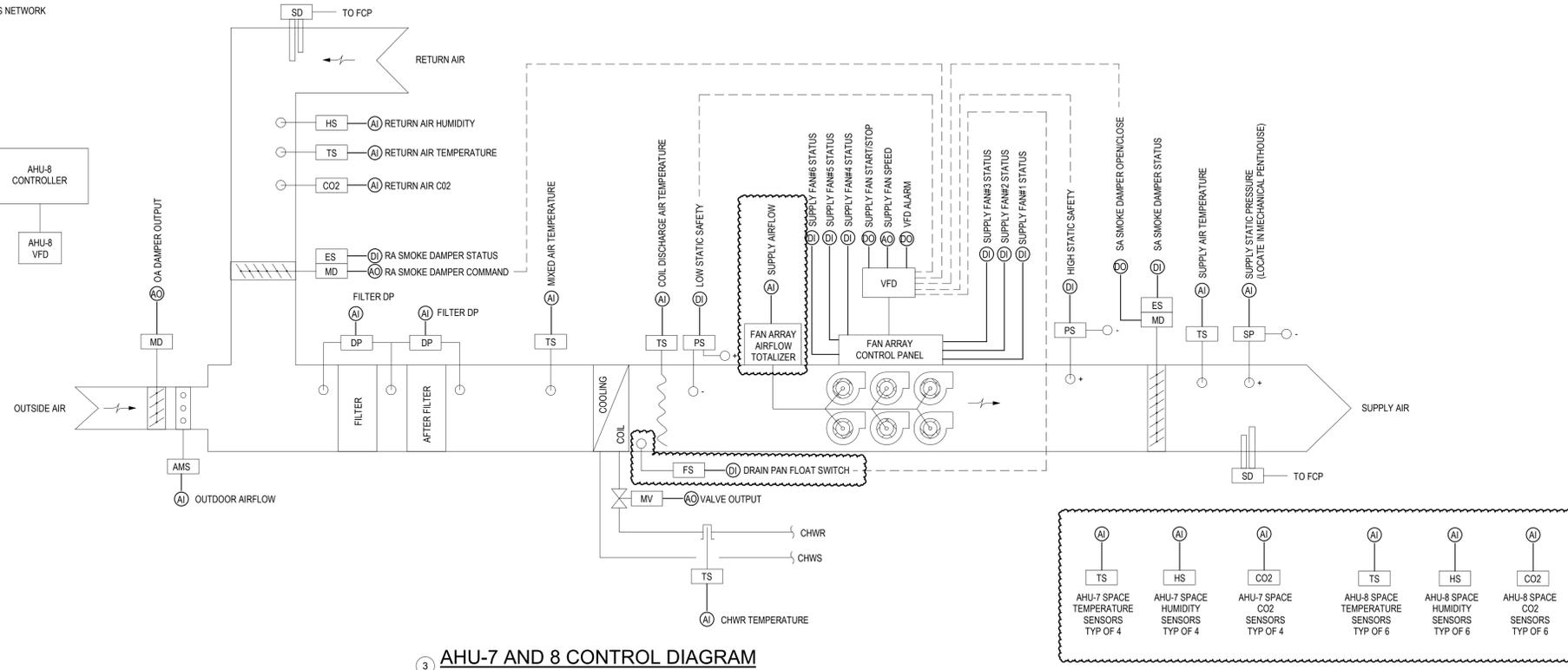
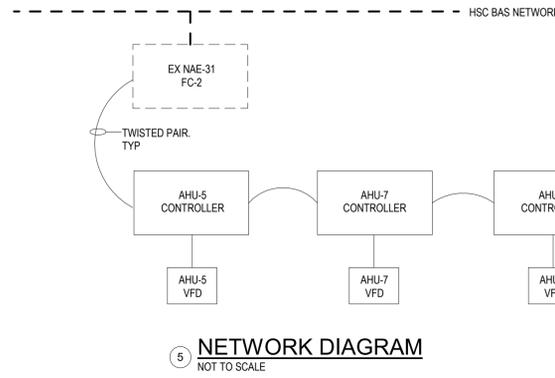
AHU-8 SECTION
 1/4" = 1'-0"

CONTROLS LEGEND

- DUCT ELBOW (TURNING VANES SHOWN)
- FLEXIBLE DUCT CONNECTION
- MANUAL BALANCING DAMPER
- EQUIPMENT TAG
- INTEGRATION OF EQUIPMENT SPECIFIC POINTS TO BUILDING AUTOMATION SYSTEM VIA BACnet
- CONTROL DEVICE (SEE CONTROLS ABBREVIATIONS)
- DUCT BREAK
- AIRFLOW DIRECTION
- AVERAGING ELEMENT (SERPENTINE)
- POINT SENSOR
- PARALLEL BLADE DAMPER
- OPPOSED BLADE DAMPER
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- AIRFLOW STATION (DUCT MOUNTED)

CONTROLS ABBREVIATIONS

- AMS AIR MEASURING STATION
- AI ANALOG INPUT
- AO ANALOG OUTPUT
- CC COOLING COIL
- CO2 CARBON DIOXIDE SENSOR
- CSR CURRENT RELAY
- CT CURRENT TRANSDUCER
- DI DIGITAL INPUT
- DO DIGITAL OUTPUT
- DP DIFFERENTIAL PRESSURE SENSOR
- ES END SWITCH
- FC FAIL CLOSED
- FM FLOW METER
- FO FAIL OPEN
- FTL FAIL TO LAST
- FS FLOW SWITCH
- FZ FREEZE STAT
- HS HUMIDITY SENSOR
- M MOTOR
- MD MOTORIZED DAMPER
- MV MOTORIZED VALVE
- PS PRESSURE SWITCH
- SCR SILICONE CONTROLLED RECTIFIER
- SD SMOKE DETECTOR
- TH THERMISTAT
- TS COMBINATION THERMOSTAT AND HUMIDITY SENSOR
- TS TEMPERATURE SENSOR



AHU-7 AND AHU-8 POINTS LIST

SYSTEM POINT DESCRIPTION	POINT TYPE		ALARMS		
	GRAPHICS	HARDWIRED INPUT HARDWIRED OUTPUT SOFTWARE POINT	ALARM DESCRIPTION	ALARM SETTING	TIME DELAY
OUTDOOR AIR DAMPER OUTPUT	X	AO			
OUTDOOR AIRFLOW	X	AI			
RETURN AIR HUMIDITY	X	AI			
RETURN AIR TEMPERATURE	X	AI			
RETURN AIR CO2	X	AI			
RETURN AIR SMOKE DAMPER STATUS	X	DI	SMOKE DAMPER ALARM	STATUS DOES NOT MATCH COMMAND	1 MIN
RETURN AIR SMOKE DAMPER OUTPUT	X	AO			
PRE-FILTER PRESSURE DROP	X	AI	DIRTY PRE-FILTER ALARM	DP ABOVE DIRTY SETTING	15 MIN
AFTER FILTER PRESSURE DROP	X	AI	DIRTY AFTER FILTER ALARM	DP ABOVE DIRTY SETTING	15 MIN
MIXED AIR TEMPERATURE	X	AI			
FREEZSTAT STATUS	X	DI	FREEZSTAT ALARM	FREEZTAT ACTIVATED	0 MIN
COOLING COIL DISCHARGE TEMPERATURE	X	AI			
LOW STATIC PRESSURE SAFETY SWITCH STATUS	X	DI	LOW DP SAFETY ALARM	SWITCH ACTIVATED	1 MIN
COOLING COIL CONTROL VALVE OUTPUT	X	AO			
CHILLED WATER RETURN TEMPERATURE	X	AI			
SUPPLY FAN#1 STATUS	X	DI	FAN FAILURE	STATUS DOES NOT MATCH COMMAND	1 MIN
SUPPLY FAN#2 STATUS	X	DI	FAN FAILURE	STATUS DOES NOT MATCH COMMAND	2 MIN
SUPPLY FAN#3 STATUS	X	DI	FAN FAILURE	STATUS DOES NOT MATCH COMMAND	3 MIN
SUPPLY FAN#4 STATUS	X	DI	FAN FAILURE	STATUS DOES NOT MATCH COMMAND	4 MIN
SUPPLY FAN#5 STATUS	X	DI	FAN FAILURE	STATUS DOES NOT MATCH COMMAND	5 MIN
SUPPLY FAN#6 STATUS	X	DI	FAN FAILURE	STATUS DOES NOT MATCH COMMAND	6 MIN
SUPPLY FAN START/STOP	X	DI			
SUPPLY FAN SPEED COMMAND	X	AO			
VRF ALARM	X	DI	VFD ALARM	ALARM ISSUED	0 MON
HIGH STATIC PRESSURE SAFETY SWITCH STATUS	X	DI	HIGH DP SAFETY ALARM	SWITCH ACTIVATED	1 MIN
SUPPLY SMOKE DAMPER COMMAND	X	DO			
SUPPLY SMOKE DAMPER STATUS	X	DI	SMOKE DAMPER ALARM	STATUS DOES NOT MATCH COMMAND	1 MIN
SUPPLY AIR TEMPERATURE	X	AI	HIGH DAT ALARM	DAT + 3 DEGF	15 MIN
SUPPLY STATIC PRESSURE	X	AI			
DRAIN PAN FLOAT SWITCH	X	DI	DRAIN PAN ALARM	SWITCH ACTIVATED	0 MIN
SPACE HUMIDITY SENSOR (2)	X	AI			
SPACE CO2 SENSOR (2)	X	AI			
SPACE TEMPERATURE SENSOR (2)	X	AI			
SUPPLY AIRFLOW	X	AI			

NOTE:
 (1) PROVIDE VFD INTEGRATION
 (2) FOR COUNT AND LOCATION REFER TO SHEET M303

AHU-7 & 8 CONTROL SEQUENCE

OCCUPIED/UNOCCUPIED CONTROL:
THE AHU CONTROLLER SHALL ACTIVATE THE OCCUPIED AND UNOCCUPIED MODE BASED ON TIME OF DAY SCHEDULE.

SAFETIES:

- SMOKE DETECTORS:** SMOKE DETECTORS SHALL BE INSTALLED IN DUCTWORK WHERE SHOWN ON PLANS. WHEN SMOKE DETECTOR ACTIVATES IT SHALL SEND A SIGNAL TO FACP. THE FIRE ALARM RELAY SHALL SHUT DOWN AHU ON SIGNAL FROM FACP.
- LOW STATIC SAFETY:** PROVIDE STATIC PRESSURE SWITCH (ADJUSTABLE) WHERE SHOWN ON CONTROL DIAGRAM. SET STATIC PRESSURE SWITCH TO -4.0 IN WG. UPON ACTIVATION OF THE STATIC PRESSURE SWITCH THE SUPPLY FAN SHALL SHUT OFF AND THE BAS SHALL COMMAND THE COOLING COIL CONTROL VALVE TO CLOSE. MANUAL RESET REQUIRED.
- HIGH STATIC SAFETY:** PROVIDE STATIC PRESSURE SWITCH (ADJUSTABLE) WHERE SHOWN ON CONTROL DIAGRAM. SET STATIC PRESSURE SWITCH TO 2.0 IN WG ABOVE SUPPLY STATIC PRESSURE SET-POINT. UPON ACTIVATION OF THE STATIC PRESSURE SWITCH THE SUPPLY FAN SHALL SHUT OFF AND THE BAS SHALL COMMAND THE COOLING COIL CONTROL VALVE TO CLOSE. MANUAL RESET REQUIRED.
- DRAIN PAN FLOAT SWITCH:** UPON ACTIVATION OF FLOAT SWITCH THE SUPPLY FAN SHALL SHUT OFF AND THE BAS SHALL COMMAND THE COOLING COIL CONTROL VALVE TO CLOSE.

UNOCCUPIED MODE:

WHEN UNOCCUPIED MODE IS ACTIVATED THE BAS SHALL DISABLE FAN CONTROL, CLOSE OUTDOOR AIR DAMPER, AND DISABLE COOLING COIL CONTROL.

OCCUPIED MODE:

WHEN OCCUPIED MODE IS ACTIVATED BASED ON THE TIME OF DAY SCHEDULE. BAS SHALL ENABLE FAN CONTROL, ENABLE OUTDOOR AIR DAMPER CONTROL, AND ENABLE COOLING COIL CONTROL.

SMOKE DAMPER CONTROL: PROVIDE SMOKE DAMPERS WHERE SHOWN ON PLANS. INTERLOCK ASSOCIATED SUPPLY AND RETURN SMOKE DAMPERS TO OPERATE WHEN THE SUPPLY FAN STARTS AND STOPS. PROVIDE END SWITCH WITH VISUAL INDICATOR ON SMOKE DAMPER TO PREVENT FAN START UNTIL DAMPERS ARE PROVEN OPEN.

FAN SPEED CONTROL:

MODULATE FAN SPEED AND MAINTAIN A STATIC PRESSURE SETPOINT (ADJ) AS SENSED BY STATIC PRESSURE SENSOR MOUNTED IN THE SUPPLY DUCT.

OUTSIDE AIR DAMPER CONTROL:

OPEN DAMPER AND ENABLE OUTDOOR AIR CONTROL SEQUENCE ON FAN START. CLOSE DAMPER AND DISABLE OUTDOOR AND DISABLE OUTDOOR AIR CONTROL ON FAN STOP. MODULATE THE OUTDOOR AIR DAMPER AND RETURN AIR DAMPER IN SEQUENCE TO MAINTAIN OUTDOOR AIRFLOW SET-POINT (ADJUSTABLE) AS LISTED IN THE AIR HANDLING UNIT SCHEDULE.

OUTDOOR AIRFLOW RESET:

BAS SHALL MONITOR THE SPACE CO2 SENSORS. IF ALL SENSORS REPORT CO2 LEVELS BELOW 750 PPM THE BAS SHALL RESET THE OUTDOOR AIRFLOW SET-POINT AT A RATE OF 100 CFM/15MIN. TAB CONTRACTOR SHALL DETERMINE THE MINIMUM OUTDOOR AIR SET-POINT TO ENSURE BUILDING PRESSURIZATION IS MAINTAINED. IF ANY CO2 SENSOR REPORTS CO2 LEVEL ABOVE 1,000PPM THE BAS SHALL RESET THE OUTDOOR AIRFLOW SET-POINT TO THAT LISTED IN THE AIR HANDLING UNIT SCHEDULE.

SUPPLY AIR TEMPERATURE CONTROL:

ENABLE THE SUPPLY CONTROL ROUTINE ON PROOF OF FAN START. CLOSE VALVE TO COIL ON FAN STOP. MODULATE CHILLED WATER VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 55 DEG F.

SUPPLY AIR TEMPERATURE RESET CONTROL:

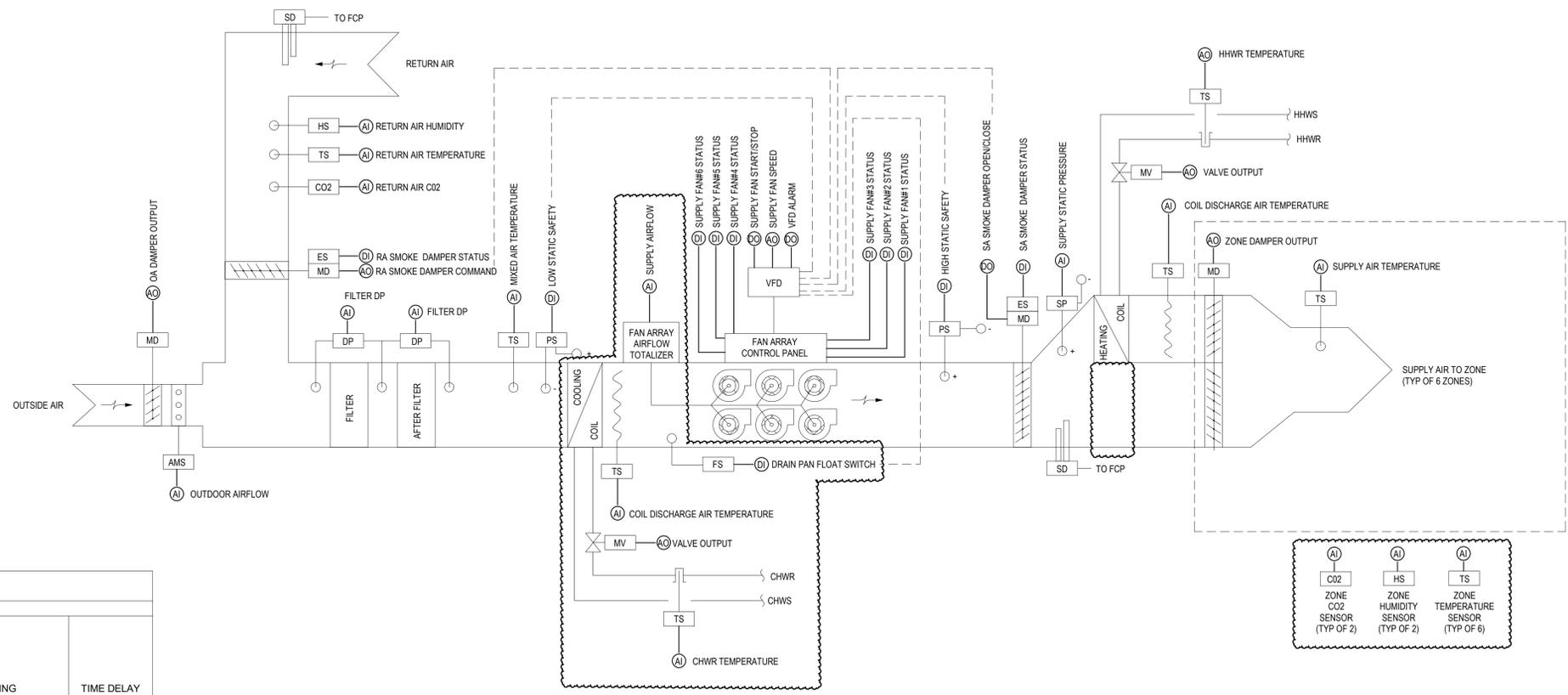
BAS SHALL MONITOR SPACE HUMIDITY SENSORS. IF ALL SENSORS REPORT RH BELOW 55% THE BAS SHALL RESET THE SUPPLY AIR TEMPERATURE SET-POINT FROM 55 DEG F TO 60DEGF AT A RATE OF 0.1 DEG/FMIN. IF ANY HUMIDITY SENSOR REPORTS RH% THE BAS SHALL RESET THE SUPPLY AIR TEMPERATURE SET-POINT TO 55 DEG F.

ALARMS:

BAS SHALL ISSUE THE ALARMS INDICATED ON THE POINTS LIST.

INDICATION:

SHOW ALL POINTS LISTED ON BAS GRAPHICS SHOWN ON CONTROL DIAGRAM AND ON POINTS LIST.



1 AHU-5 CONTROL DIAGRAM
NOT TO SCALE

AHU-5 POINTS LIST

SYSTEM POINT DESCRIPTION	POINT TYPE			ALARMS			
	GRAPHICS	HARDWIRED INPUT	HARDWIRED OUTPUT	SOFTWARE POINT	ALARM DESCRIPTION	ALARM SETTING	TIME DELAY
OUTDOOR AIR DAMPER OUTPUT	X		AO				
OUTDOOR AIRFLOW	X	AI					
RETURN AIR HUMIDITY	X	AI					
RETURN AIR TEMPERATURE	X	AI					
RETURN AIR CO2	X	AI					
RETURN AIR SMOKE DAMPER STATUS	X	DI			SMOKE DAMPER ALARM	STATUS DOES NOT MATCH COMMAND	1 MIN
RETURN AIR SMOKE DAMPER OUTPUT	X		AO				
PRE-FILTER PRESSURE DROP	X	AI			DIRTY PRE-FILTER ALARM	DP ABOVE DIRTY SETTING	15 MIN
AFTER FILTER PRESSURE DROP	X	AI			DIRTY AFTER FILTER ALARM	DP ABOVE DIRTY SETTING	15 MIN
MIXED AIR TEMPERATURE	X	AI					
LOW STATIC PRESSURE SAFETY SWITCH STATUS	X	DI			LOW DP SAFETY ALARM	SWITCH ACTIVATED	1 MIN
SUPPLY FAN#1 STATUS	X	DI			FAN FAILURE	STATUS DOES NOT MATCH COMMAND	1 MIN
SUPPLY FAN#2 STATUS	X	DI			FAN FAILURE	STATUS DOES NOT MATCH COMMAND	2 MIN
SUPPLY FAN#3 STATUS	X	DI			FAN FAILURE	STATUS DOES NOT MATCH COMMAND	3 MIN
SUPPLY FAN#4 STATUS	X	DI			FAN FAILURE	STATUS DOES NOT MATCH COMMAND	4 MIN
SUPPLY FAN#5 STATUS	X	DI			FAN FAILURE	STATUS DOES NOT MATCH COMMAND	5 MIN
SUPPLY FAN#6 STATUS	X	DI			FAN FAILURE	STATUS DOES NOT MATCH COMMAND	6 MIN
SUPPLY FAN START/STOP	X		DI				
SUPPLY FAN SPEED COMMAND	X		AO				
VRF ALARM	X	DI			VFD ALARM	ALARM ISSUED	0 MON
HIGH STATIC PRESSURE SAFETY SWITCH STATUS	X	DI			HIGH DP SAFETY ALARM	SWITCH ACTIVATED	1 MIN
SUPPLY SMOKE DAMPER COMMAND	X		DO				
SUPPLY SMOKE DAMPER STATUS	X	DI			SMOKE DAMPER ALARM	STATUS DOES NOT MATCH COMMAND	1 MIN
COOLING COIL DISCHARGE TEMPERATURE	X	AI					
COOLING COIL CONTROL VALVE OUTPUT	X		AO				
CHILLED WATER RETURN TEMPERATURE	X	AI					
HEATING COIL DISCHARGE TEMPERATURE	X	AI					
HEATING COIL CONTROL VALVE OUTPUT	X		AO				
HEATING HOT WATER RETURN TEMPERATURE	X	AI					
SUPPLY STATIC PRESSURE	X	AI					
ZONE 1 DAMPER OUTPUT	X		AO				
ZONE 1 SUPPLY AIR TEMPERATURE	X	AI					
ZONE 1 TEMPERATURE	X	AI			ZONE TEMPERATURE ALARM	TEMP +/- 3 DEG FROM SET-POINT	30 MIN
ZONE 2 DAMPER OUTPUT	X		AO				
ZONE 2 SUPPLY AIR TEMPERATURE	X	AI					
ZONE 2 TEMPERATURE	X	AI			ZONE TEMPERATURE ALARM	TEMP +/- 3 DEG FROM SET-POINT	30 MIN
ZONE 3 DAMPER OUTPUT	X		AO				
ZONE 3 SUPPLY AIR TEMPERATURE	X	AI					
ZONE 3 TEMPERATURE	X	AI			ZONE TEMPERATURE ALARM	TEMP +/- 3 DEG FROM SET-POINT	30 MIN
ZONE 4 DAMPER OUTPUT	X		AO				
ZONE 4 SUPPLY AIR TEMPERATURE	X	AI					
ZONE 4 TEMPERATURE	X	AI			ZONE TEMPERATURE ALARM	TEMP +/- 3 DEG FROM SET-POINT	30 MIN
ZONE 5 DAMPER OUTPUT	X		AO				
ZONE 5 SUPPLY AIR TEMPERATURE	X	AI					
ZONE 5 TEMPERATURE	X	AI			ZONE TEMPERATURE ALARM	TEMP +/- 3 DEG FROM SET-POINT	30 MIN
ZONE 6 DAMPER OUTPUT	X		AO				
ZONE 6 SUPPLY AIR TEMPERATURE	X	AI					
ZONE 6 TEMPERATURE	X	AI			ZONE TEMPERATURE ALARM	TEMP +/- 3 DEG FROM SET-POINT	30 MIN
DRAIN PAN FLOAT SWITCH	X	DI			DRAIN PAN ALARM	SWITCH ACTIVATED	0 MIN
SPACE HUMIDITY SENSOR (2)	X	AI					
SPACE CO2 SENSOR (2)	X	AI					
SPACE TEMPERATURE SENSOR (2)	X	AI					
SUPPLY AIRFLOW	X	AI					

NOTE:
(1) PROVIDE VFD INTEGRATION
(2) FOR COUNT AND LOCATION REFER TO SHEET M303

AHU-5 CONTROL SEQUENCE

OCCUPIED/UNOCCUPIED CONTROL:
THE AHU CONTROLLER SHALL ACTIVATE THE OCCUPIED AND UNOCCUPIED MODE BASED ON TIME OF DAY SCHEDULE. THE OCCUPIED SCHEDULE SHALL BE M-F 6AM TO 9PM. AN OVERRIDE SWITCH LOCATED AT THE THERMOSTAT IN ANY ASSOCIATED ZONE, WHEN ACTIVATED WILL FORCE THE SYSTEM INTO TEMPORARY OCCUPIED MODE FOR A TIME PERIOD OF 2 HOURS.

- SAFETIES:**
- SMOKE DETECTORS:** SMOKE DETECTORS SHALL BE INSTALLED IN DUCTWORK WHERE SHOWN ON PLANS. WHEN SMOKE DETECTOR ACTIVATES IT SHALL SEND A SIGNAL TO FACP. THE FIRE ALARM RELAY SHALL SHUT DOWN AHU ON SIGNAL FROM FACP.
 - LOW STATIC SAFETY:** PROVIDE STATIC PRESSURE SWITCH (ADJUSTABLE) WHERE SHOWN ON CONTROL DIAGRAM. SET STATIC PRESSURE SWITCH TO 4.0 IN WG. UPON ACTIVATION OF THE STATIC PRESSURE SWITCH THE SUPPLY FAN SHALL SHUT OFF AND THE BAS SHALL COMMAND THE COOLING COIL CONTROL VALVE TO CLOSE. MANUAL RESET REQUIRED.
 - HIGH STATIC SAFETY:** PROVIDE STATIC PRESSURE SWITCH (ADJUSTABLE) WHERE SHOWN ON CONTROL DIAGRAM. SET STATIC PRESSURE SWITCH TO 2.0 IN WG ABOVE SUPPLY STATIC PRESSURE SET-POINT. UPON ACTIVATION OF THE STATIC PRESSURE SWITCH THE SUPPLY FAN SHALL SHUT OFF AND THE BAS SHALL COMMAND THE COOLING COIL CONTROL VALVE TO CLOSE. MANUAL RESET REQUIRED.
 - DRAIN PAN FLOAT SWITCH:** UPON ACTIVATION OF FLOAT SWITCH THE SUPPLY FAN SHALL SHUT OFF AND THE BAS SHALL COMMAND THE COOLING COIL CONTROL VALVE TO CLOSE.

UNOCCUPIED MODE:
WHEN UNOCCUPIED MODE IS ACTIVATED THE BAS SHALL DISABLE FAN CONTROL, CLOSE OUTDOOR AIR DAMPER, AND DISABLE COOLING COIL CONTROL.

UNOCCUPIED WARM UP MODE:
WHEN ANY ASSOCIATED ZONE TEMPERATURE FALLS BELOW UNOCCUPIED HEATING SET-POINT THE BAS SHALL ENABLE FAN CONTROL, DISABLE OUTDOOR AIR DAMPER CONTROL, AND DISABLE COOLING COIL CONTROL.

UNOCCUPIED COOL DOWN MODE:
WHEN ANY ASSOCIATED ZONE TEMPERATURE RISES ABOVE UNOCCUPIED COOLING SET-POINT THE BAS SHALL ENABLE FAN CONTROL, DISABLE OUTDOOR AIR DAMPER CONTROL, AND ENABLE COOLING COIL AND HEATING COIL CONTROL.

OCCUPIED MODE:
WHEN OCCUPIED MODE IS ACTIVATED BASED ON THE TIME OF DAY SCHEDULE OR LOCAL OVERRIDE AT ANY UNIT THERMOSTAT, BAS SHALL ENABLE FAN CONTROL, ENABLE OUTDOOR AIR DAMPER CONTROL, ENABLE COOLING COIL CONTROL, AND HEATING COIL CONTROL.

SMOKE DAMPER CONTROL: PROVIDE SMOKE DAMPERS WHERE SHOWN ON PLANS. INTERLOCK ASSOCIATED SUPPLY AND RETURN SMOKE DAMPERS TO OPERATE WHEN THE SUPPLY FAN STARTS AND STOPS. PROVIDE END SWITCH WITH VISUAL INDICATOR ON SMOKE DAMPER TO PREVENT FAN START UNTIL DAMPERS ARE PROVEN OPEN.

FAN SPEED CONTROL:
STATIC PRESSURE CONTROL: MODULATE FAN SPEED TO MAINTAIN A STATIC PRESSURE SETPOINT (ADJ) AS SENSED BY STATIC PRESSURE SENSOR MOUNTED IN UNIT CASING DOWNSTREAM OF SMOKE DAMPER.

OUTSIDE AIR DAMPER CONTROL:
OPEN DAMPER AND ENABLE OUTDOOR AIR CONTROL SEQUENCE ON FAN START. CLOSE DAMPER AND DISABLE OUTDOOR AIR CONTROL ON FAN STOP. MODULATE THE OUTDOOR AIR DAMPER AND RETURN AIR DAMPER IN SEQUENCE TO MAINTAIN OUTDOOR AIRFLOW SET-POINT (ADJUSTABLE) AS LISTED IN THE AIR HANDLING UNIT SCHEDULE.

OUTDOOR AIRFLOW RESET:
BAS SHALL MONITOR THE SPACE CO2 SENSORS. IF ALL SENSORS REPORT CO2 LEVELS BELOW 750 PPM THE BAS SHALL RESET THE OUTDOOR AIRFLOW SET-POINT AT A RATE OF 100 CFM/15MIN. TAB CONTRACTOR SHALL DETERMINE THE MINIMUM OUTDOOR AIR SET-POINT TO ENSURE BUILDING PRESSURIZATION IS MAINTAINED. IF ANY CO2 SENSOR REPORTS CO2 LEVEL ABOVE 1,000PPM THE BAS SHALL RESET THE OUTDOOR AIRFLOW SET-POINT TO THAT LISTED IN THE AIR HANDLING UNIT SCHEDULE.

COLD DECK SUPPLY AIR TEMPERATURE CONTROL:
ENABLE COLD DECK SUPPLY CONTROL ROUTINE ON PROOF OF FAN START. CLOSE VALVE TO COIL ON FAN STOP. MODULATE CHILLED WATER VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE SET-POINT OF 55 DEG F (ADJ).

COLD DECK SUPPLY AIR TEMPERATURE RESET CONTROL:
BAS SHALL MONITOR SPACE HUMIDITY SENSORS. IF BOTH HUMIDITY SENSORS REPORT RH BELOW 55% THE BAS SHALL RESET THE COLD DECK DISCHARGE TEMPERATURE SET-POINT FROM 55 DEG F TO 60DEG F AT A RATE OF 0.1 DEG/FMIN. IF ANY HUMIDITY SENSOR REPORTS RH% THE BAS SHALL RESET THE COLD DECK SUPPLY TEMPERATURE SET-POINT TO 55 DEG F.

HOT DECK SUPPLY AIR TEMPERATURE CONTROL:
ENABLE HOT DECK SUPPLY CONTROL ROUTINE ON PROOF OF FAN START. CLOSE VALVE TO COIL ON FAN STOP. MODULATE HEATING HOT WATER VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE SET-POINT OF 92 DEG F (ADJ).

ZONE AIR TEMPERATURE CONTROL:
ENABLE ZONE AIR TEMPERATURE CONTROL ROUTINE ON PROOF OF FAN START. WHEN ZONE AIR TEMPERATURE FALLS BELOW ZONE TEMPERATURE SET-POINT MODULATE THE COLD DECK DAMPER CLOSED WHILE HOT DECK DAMPER OPENS. WHEN ZONE AIR TEMPERATURE RISES ABOVE THE ZONE AIR TEMPERATURE SET-POINT OPEN THE COLD DECK DAMPER WHILE HOT DECK DAMPER CLOSES.

ALARMS:
BAS SHALL ISSUE THE ALARMS INDICATED ON THE POINTS LIST.

INDICATION:
SHOW ALL POINTS LISTED ON BAS GRAPHICS SHOWN ON CONTROL DIAGRAM AND ON POINTS LIST.

R. Craig Gullledge II
 PE - 69158

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

REV	DESCRIPTION	DATE
1	Addendum 1	02/14/2020

ISSUE:
 100% CONSTRUCTION DOCUMENTS

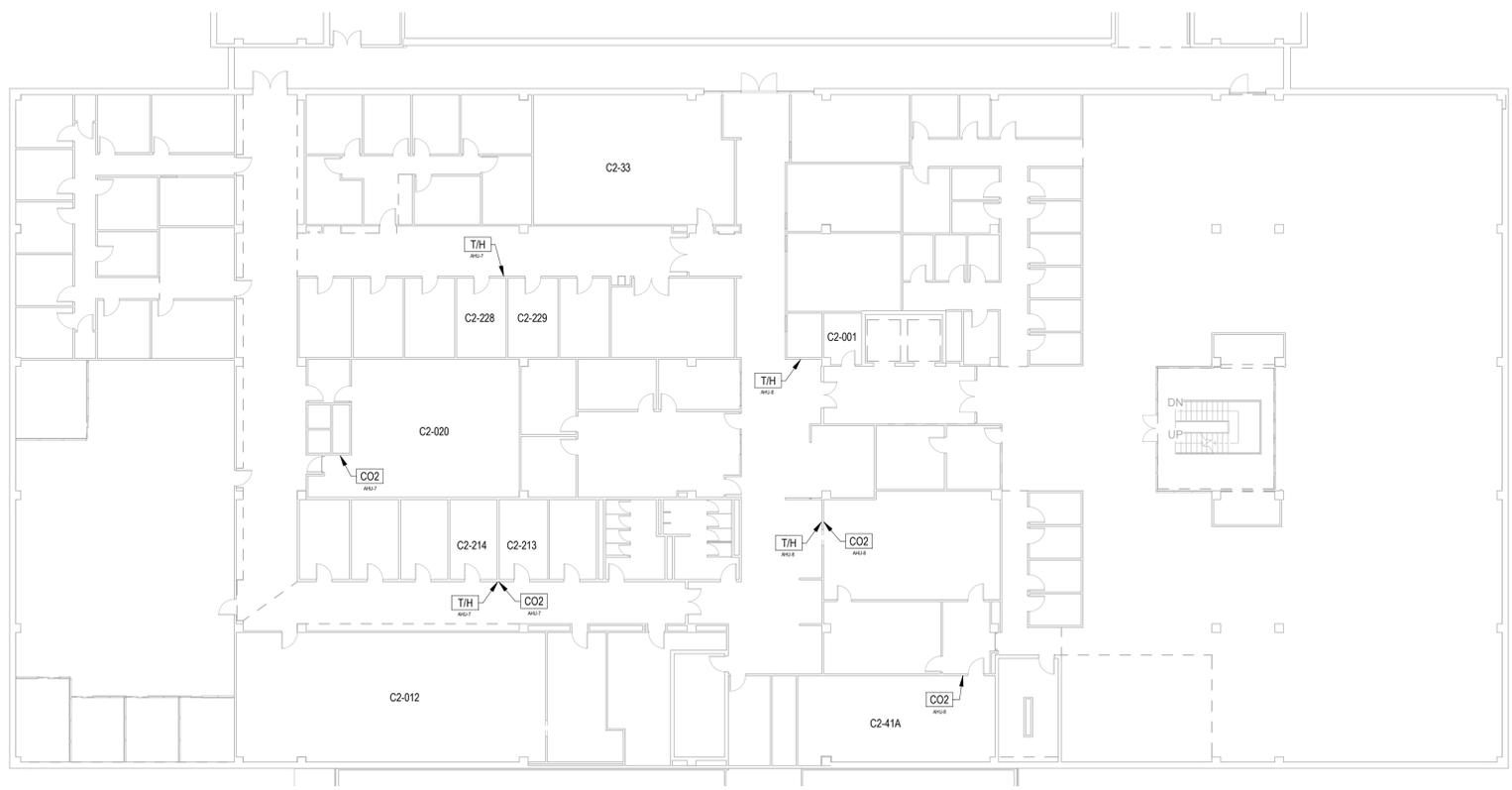
ISSUE DATE:
 DECEMBER 20, 2019

CHECKED BY:
 RCG

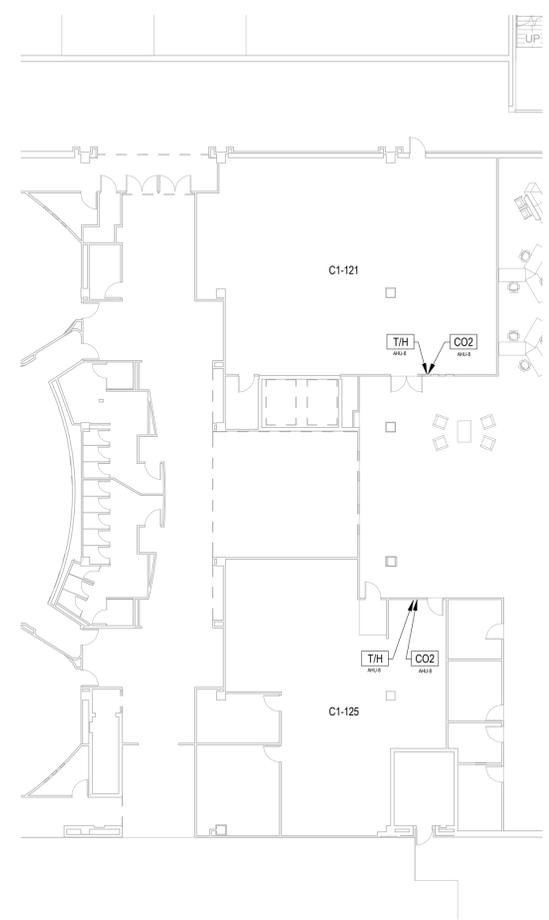
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CONTROL FLOOR PLANS

SHEET NUMBER:

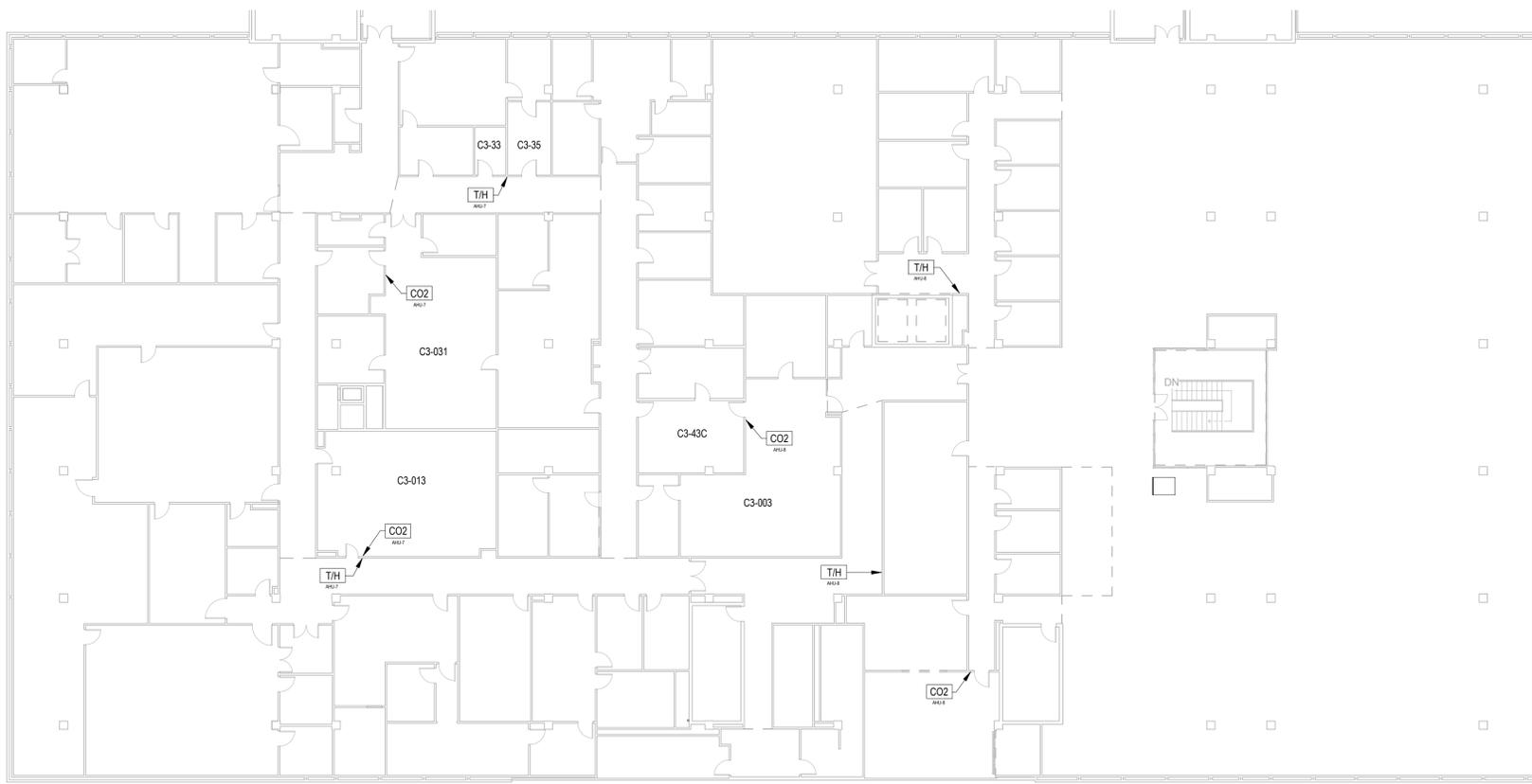
M303



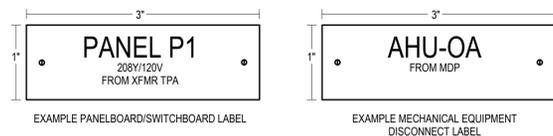
MECHANICAL SECOND FLOOR PLAN
 1/16" = 1'-0"



MECHANICAL PARTIAL FIRST FLOOR PLAN
 1/16" = 1'-0"

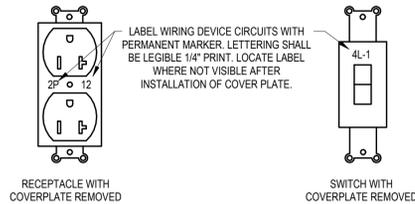


MECHANICAL THIRD FLOOR PLAN
 1/16" = 1'-0"



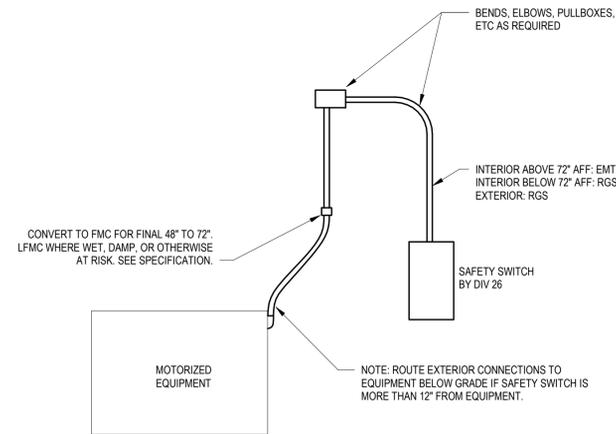
2 ELECTRICAL EQUIPMENT LABELING DETAIL

NOT TO SCALE



3 ELECTRICAL WIRING DEVICE LABEL DETAIL

NOT TO SCALE



4 MOTORIZED EQUIPMENT CONNECTION DETAIL

NOT TO SCALE

LEGEND

RECEPTACLE:

- Ⓛ DUPLEX RECEPTACLE. 18" AFF UNO.
- Ⓜ SPECIAL PURPOSE RECEPTACLE. 18" AFF UNO. COORDINATE WITH EQUIPMENT.

RECEPTACLE SUBSCRIPTS:

- G GFCI-TYPE RECEPTACLE
- GCB GFCI-TYPE POWER FROM BRANCH CIRCUIT BREAKER
- WP WEATHER RESISTANT WIRING DEVICE. WP RECEPTACLES SHALL BE GFCI TYPE WITH IN-USE COVERS.
- 6-30R NEMA RECEPTACLE TYPE.

POWER EQUIPMENT AND CONNECTIONS:

- ▭ DISTRIBUTION PANELBOARD.
- ▭ PANELBOARD.
- Ⓜ ELECTRICAL CONNECTION TO EQUIPMENT. SEE ELECTRICAL EQUIPMENT SCHEDULE.
- Ⓛ 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.

FIRE ALARM:

- FACP FIRE ALARM CONTROL PANEL.
 - NAC NAC EXTENDER PANEL.
 - Ⓛ FIRE ALARM AUDIBLE NOTIFICATION DEVICE. CEILING MOUNT.
 - Ⓛ FIRE ALARM COMBINATION AUDIBLE/VISIBLE NOTIFICATION DEVICE. CEILING MOUNT. 75cd UNO.
 - Ⓛ FIRE ALARM VISIBLE NOTIFICATION DEVICE. CEILING MOUNT. 75cd UNO.
 - Ⓛ SMOKE DETECTOR. SYSTEM DETECTOR, UNLESS MARKED '120V'.
 - Ⓛ CO DETECTOR. SYSTEM DETECTOR, UNLESS MARKED '120V'.
 - Ⓛ ELEVATOR FIRE-ALARM INTERFACE.
 - Ⓛ SMOKE DETECTOR. SYSTEM DETECTOR, UNLESS MARKED '120V'.
 - Ⓛ DUCT MOUNTED SMOKE DETECTOR. COORDINATE MOUNTING AND SAMPLING TUBE WITH MECHANICAL.
 - Ⓛ FIRE PROTECTION TAMPER SWITCH. COORDINATE WITH FIRE PROTECTION.
 - Ⓛ FIRE PROTECTION FLOW SWITCH. COORDINATE WITH FIRE PROTECTION.
 - Ⓛ FIRE PROTECTION PRESSURE SWITCH. COORDINATE WITH FIRE PROTECTION.
 - Ⓛ ADDRESSABLE INTERFACE MODULE, WITH INPUT/OUTPUT CAPABILITIES.
 - Ⓛ MANUAL PULL STATION.
- FIRE ALARM SUBSCRIPTS:**
- 15cd CANDELA RATING OF VISIBLE NOTIFICATION APPLIANCE.
 - 120V SENSORS: 120V-POWERED SINGLE- OR MULTIPLE-STATION DEVICE.
 - 120V RELAYS: 120V RELAY.
 - LTG RELAY FOR OCCUPANCY SENSOR OVERRIDE. COORDINATE WITH LIGHTING CONTROLS.
 - AHU AIR HANDLING UNIT SHUTDOWN RELAY. COORDINATE WITH MECHANICAL.

TELECOMMUNICATIONS:

- ▽ ROUGH-IN-ONLY TO. 18" AFF UNO. PROVIDE 1" TO ABOVE ACCESSIBLE CEILING.

TELECOMMUNICATIONS SUBSCRIPTS:

- AC ABOVE COUNTER

ANNOTATIONS:

- Ⓛ DEMOLITION SHEET NOTE.
- Ⓛ ELECTRICAL SHEET NOTE.
- Ⓛ MECHANICAL EQUIPMENT TAG.

GENERAL SUBSCRIPTS (APPLY TO ALL CATEGORIES):

- ZPA 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.

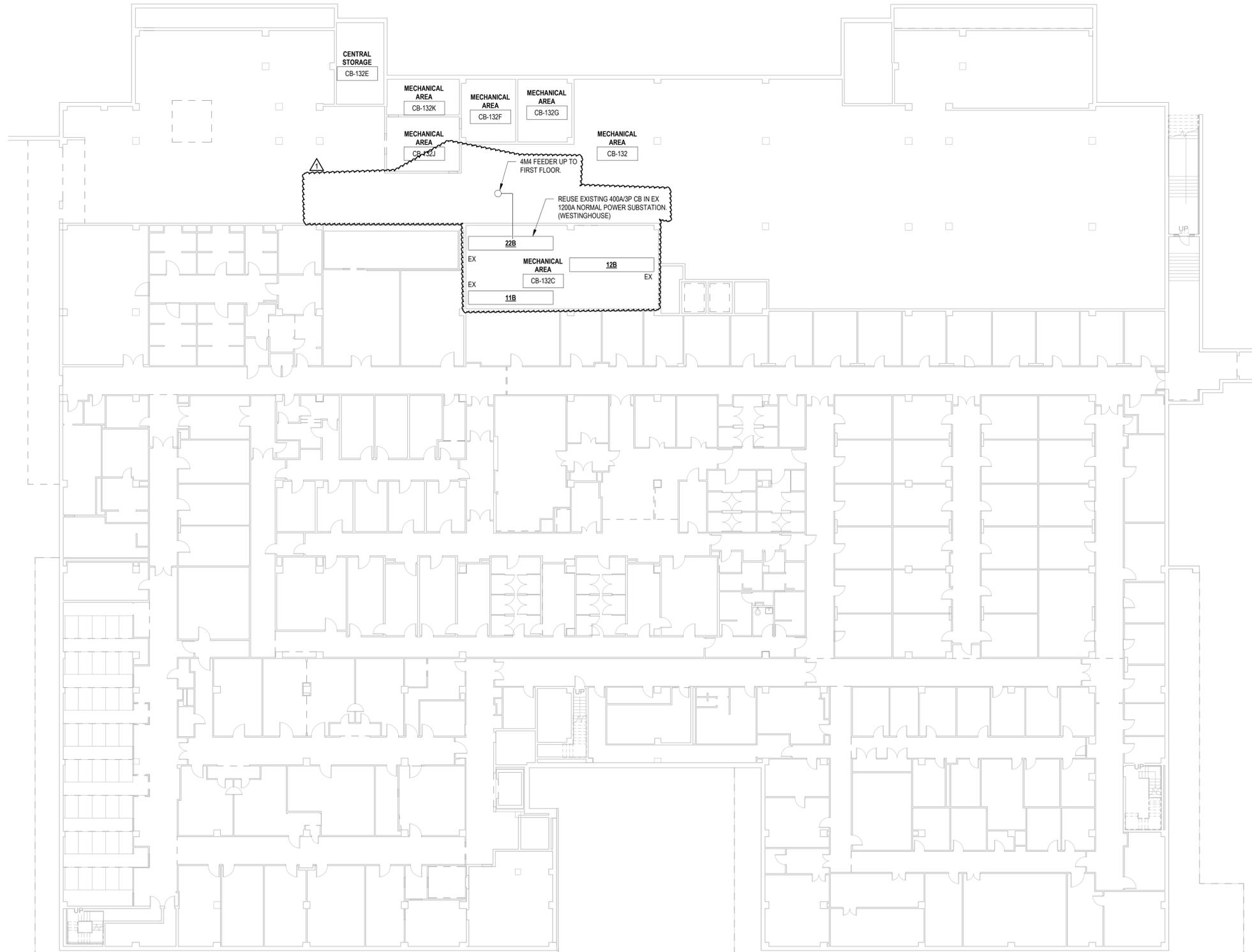
ABBREVIATIONS

AC	ABOVE COUNTER
AWG	AMERICAN WIRE GAUGE
BOD	BASIS OF DESIGN
C	CONDUIT
CB	CIRCUIT BREAKER
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED, OWNER INSTALLED
CKT	CIRCUIT
CMS	COMBINATION MOTOR STARTER
DIV	DIVISION
ECB	ENCLOSED CIRCUIT BREAKER
EOR	ENGINEER OF RECORD
EX	EXISTING TO REMAIN
FSS	FUSED SAFETY SWITCH
G	GROUND, GROUND FAULT CIRCUIT INTERRUPTER
GCB	GFCI CIRCUIT BREAKER
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
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. FIRE ALARM AND SIGNALING CODE (2013 NFPA 72)
6. UNDERWRITERS LABORATORIES (UL)
7. AMERICAN NATIONAL STANDARDS INSTITUTION (ANSI)
8. AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
9. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
10. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
11. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
12. NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)
13. AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)
14. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
15. ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA)
16. TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)
17. ELECTRONICS INDUSTRY ALLIANCE (EIA)



ELECTRICAL BASEMENT PLAN
 1/16" = 1'-0"

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JMHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

REV	DESCRIPTION	DATE
1	Addendum 1	02/14/2020

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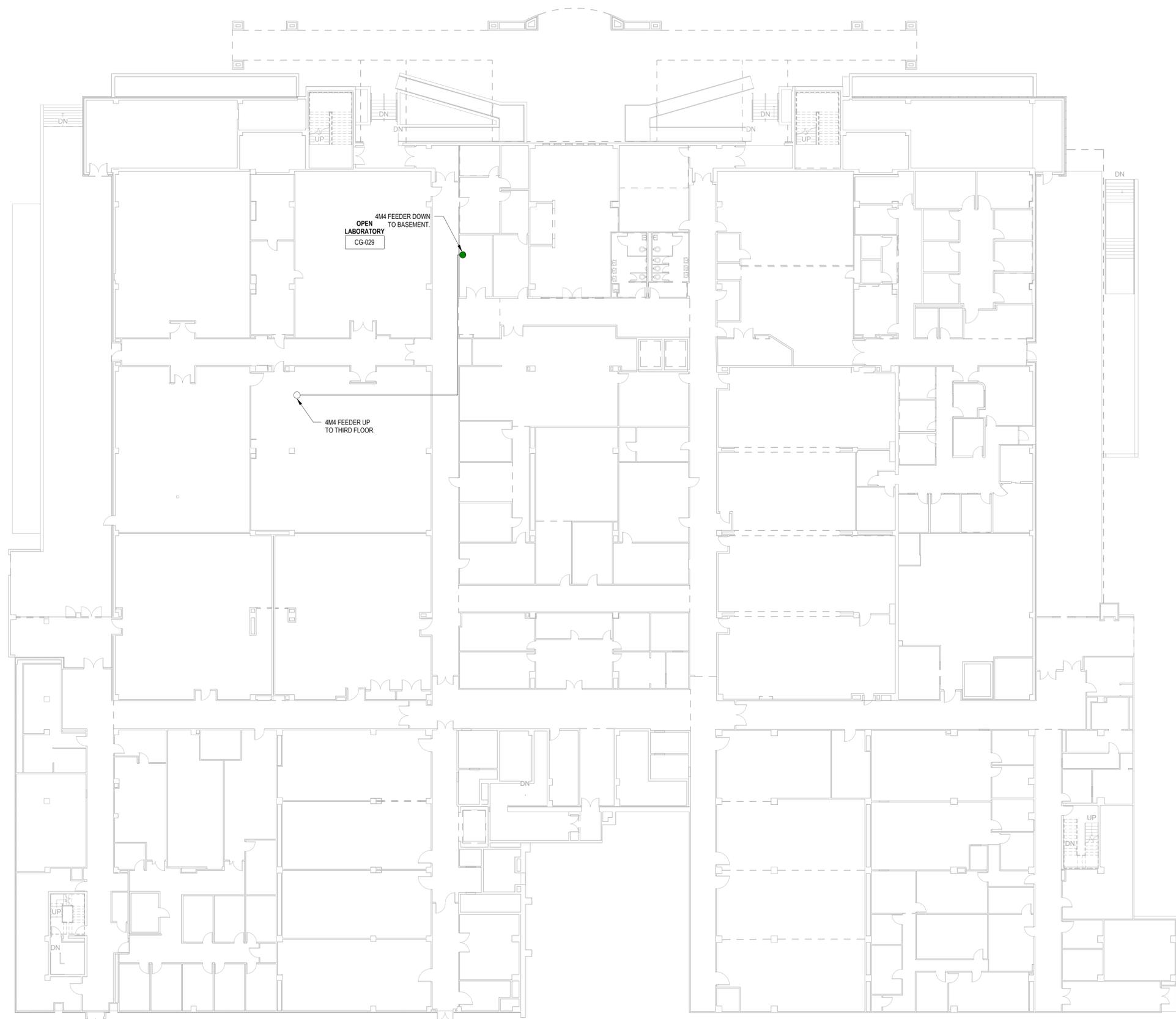
ISSUE DATE:
 DECEMBER 20, 2019

CHECKED BY:
 APM

SHEET TITLE:
**ELECTRICAL
 BASEMENT PLAN**

SHEET NUMBER:
E010

Andrew P. McCaddin
 PE - 83318



 **ELECTRICAL GROUND FLOOR PLAN**
 1/16" = 1'-0"

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JMHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

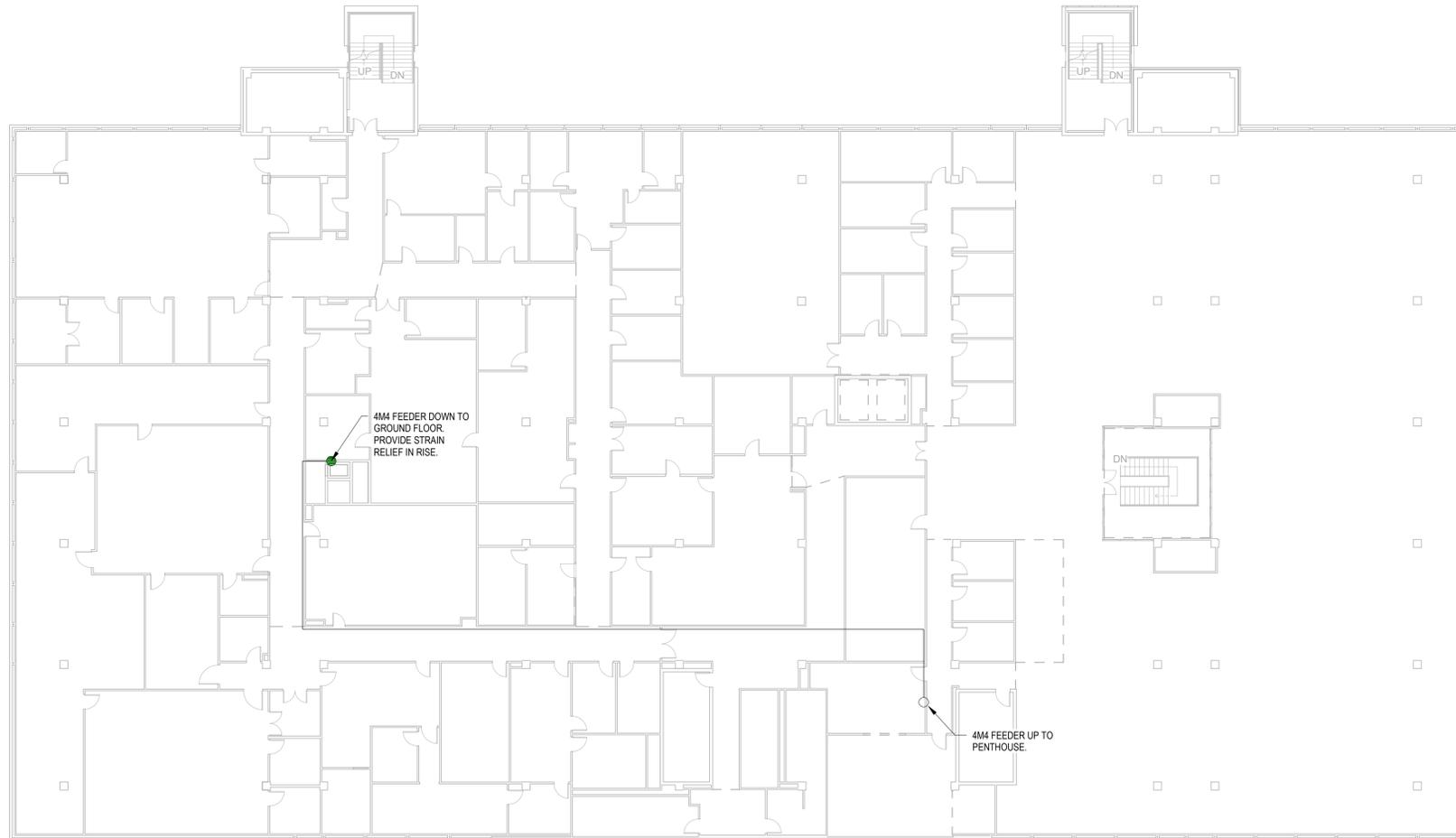
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ISSUE DATE:
 DECEMBER 20, 2019

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SHEET TITLE:
**ELECTRICAL
 GROUND FLOOR
 PLAN**
 SHEET NUMBER:

E020



 **ELECTRICAL THIRD FLOOR PLAN**
 1/16" = 1'-0"

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JMHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:

REV	DESCRIPTION	DATE

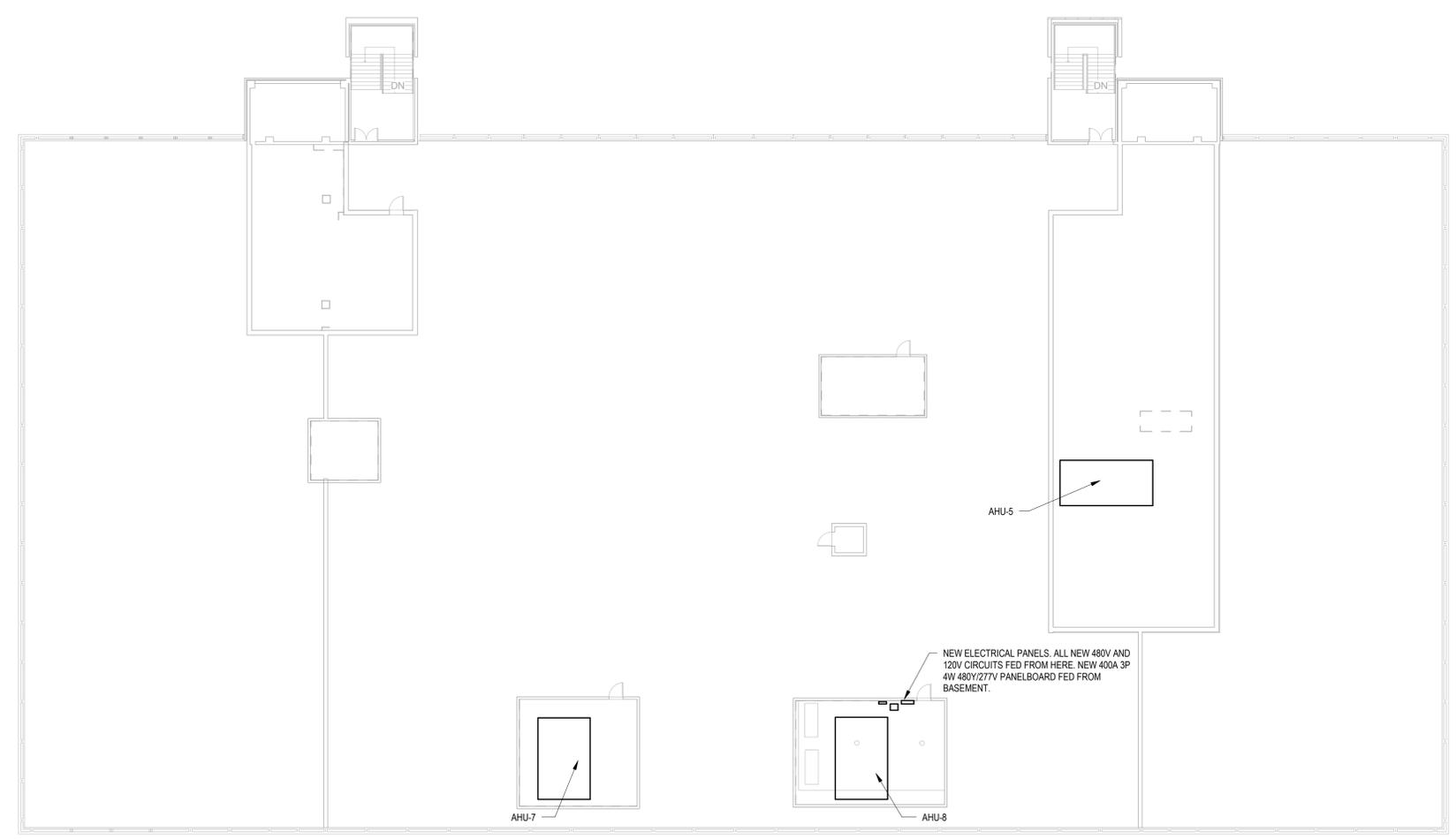
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ISSUE DATE:
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SHEET TITLE:
ELECTRICAL THIRD FLOOR PLAN

SHEET NUMBER:
E050



 **ELECTRICAL ROOF PLAN**
 1/16" = 1'-0"

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

 PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

ISSUE:
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ISSUE DATE:
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CHECKED BY:
 APM

SHEET TITLE:
ELECTRICAL ROOF PLAN

SHEET NUMBER:
E100

Andrew P. McCaddin
 PE - 83318

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

ISSUE:
 100% CONSTRUCTION DOCUMENTS

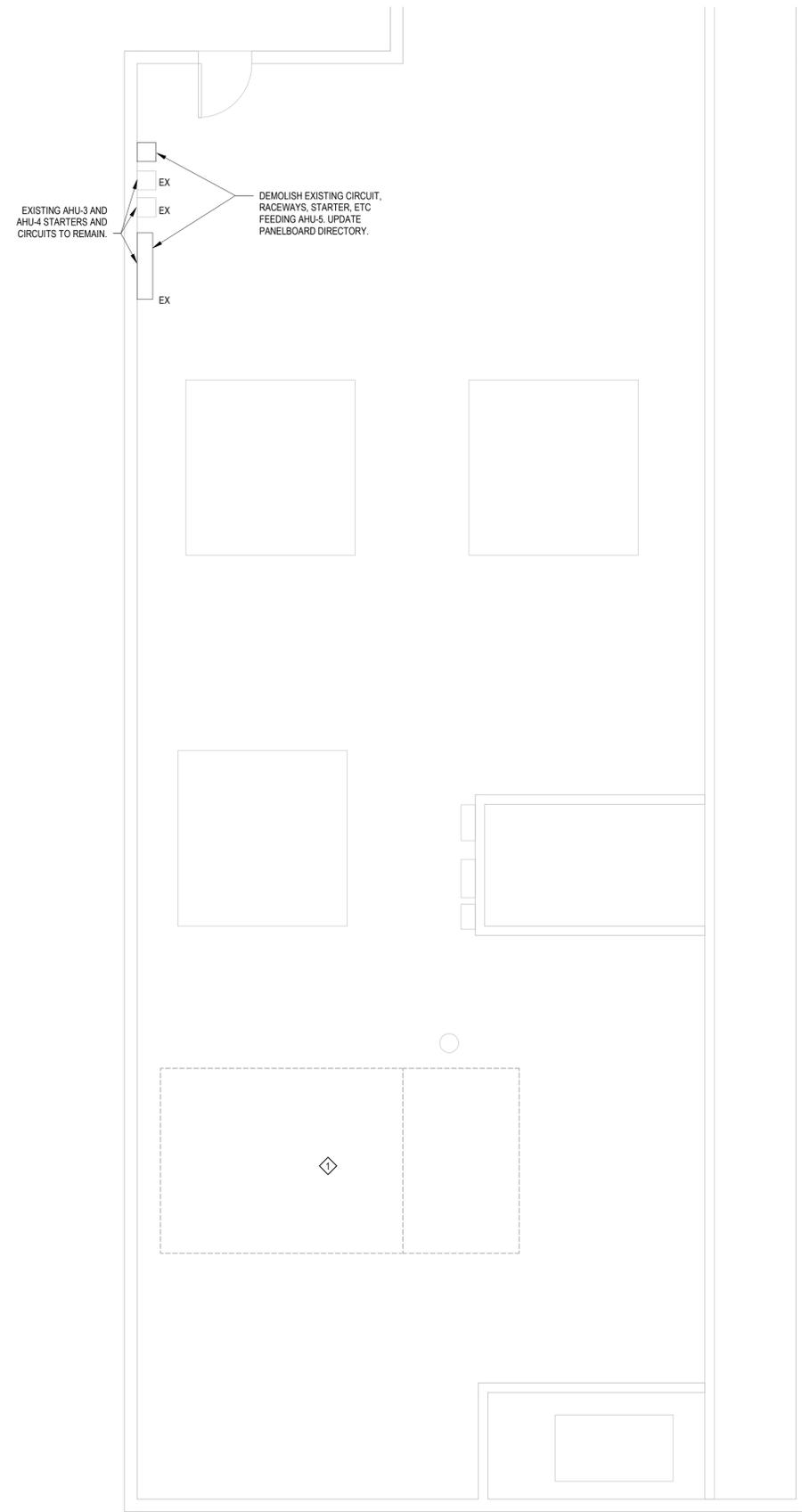
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SHEET TITLE:
ELECTRICAL AHU-5 PENTHOUSE PLANS

SHEET NUMBER:

E101



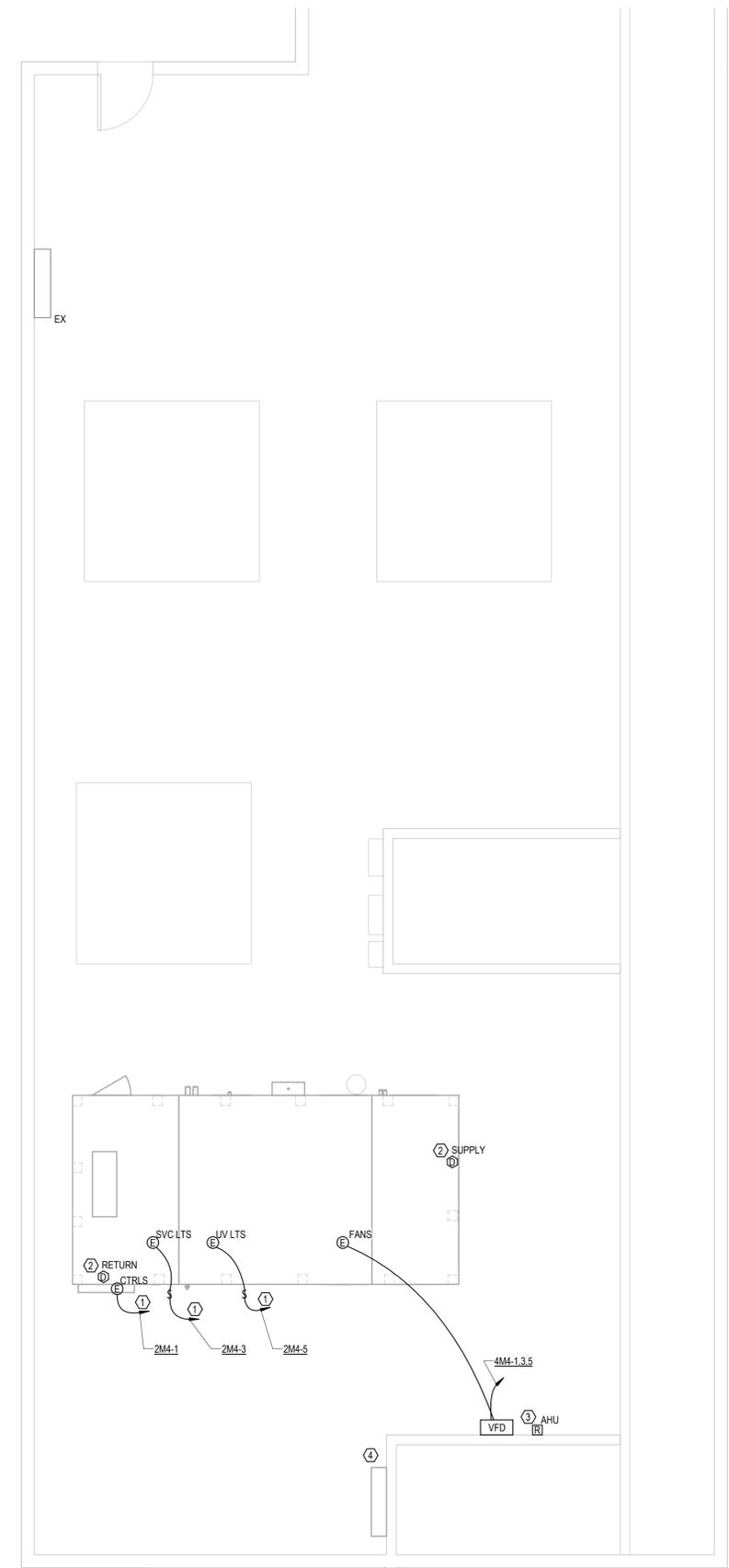
ELECTRICAL AHU-5 PENTHOUSE - DEMOLITION
 1/4" = 1'-0"

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.

DEMOLITION NOTES:

- ◆ DEMOLISH ELECTRICAL AND FIRE ALARM CONNECTIONS TO AIR HANDLER. DEMOLISH ALL WIRING, CONDUIT, BOXES, AND OTHER APPURTENANCES EXCEPT WHERE REMAINING IN SERVICE FOR ANOTHER PURPOSE. REPROGRAM FIRE ALARM SYSTEM AS NEEDED.



ELECTRICAL AHU-5 PENTHOUSE
 1/4" = 1'-0"

GENERAL NOTE

1. AHU-5 RELATED WORK IS AN ALTERNATE. SEE DESCRIPTION OF ALTERNATE ON MECHANICAL SHEETS FOR MORE INFORMATION.

SHEET NOTES:

1. CONNECT AHU LINE VOLTAGE LOADS AS REQUIRED. AHUS WILL BE FIELD ASSEMBLED AND WILL REQUIRE ELECTRICAL CONNECTIONS TO LIGHTS, SWITCHES, ETC. COORDINATE WITH MECHANICAL.
2. PROVIDE NEW DUCT SMOKE DETECTORS ON ADDRESSABLE SIMPLEX FIRE ALARM SYSTEM. PROGRAM PER EXISTING FIRE ALARM SEQUENCE.
3. PROVIDE NEW FIRE ALARM RELAY ON ADDRESSABLE SIMPLEX FIRE ALARM SYSTEM. CONFIGURE RELAY TO SHUT DOWN UNIT UPON ACTIVATION OF ALL DUCT SMOKE DETECTORS CORRESPONDING TO THIS AIR HANDLING UNIT.
4. PROVIDE 120V POWER FROM CIRCUIT IN PANEL 2M4 TO FIRE/SMOKE DAMPER.

Andrew P. McCaddin
 PE - 83318

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JHMHC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

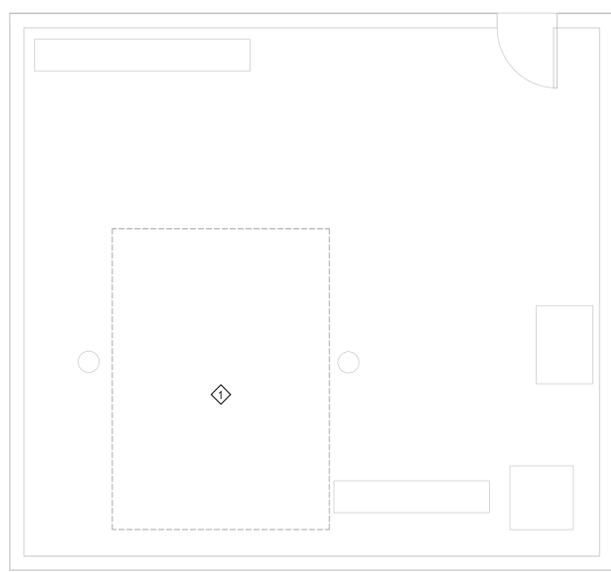
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 ISSUE DATE:
 DECEMBER 20, 2019

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SHEET TITLE:
ELECTRICAL AHU-7 PENTHOUSE PLANS

SHEET NUMBER:

E102



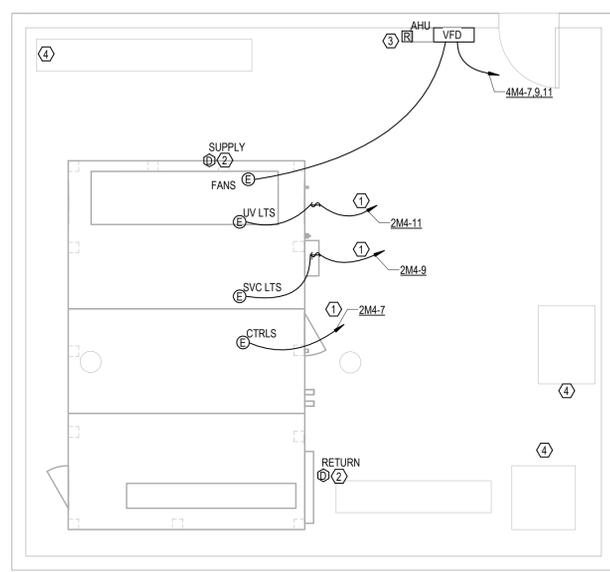
ELECTRICAL AHU-7 PENTHOUSE - DEMOLITION
 1/4" = 1'-0"

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.

DEMOLITION NOTES:

- ④ DEMOLISH ELECTRICAL AND FIRE ALARM CONNECTIONS TO AIR HANDLER. DEMOLISH ALL WIRING, CONDUIT, BOXES, AND OTHER APPURTENANCES EXCEPT WHERE REMAINING IN SERVICE FOR ANOTHER PURPOSE. REPROGRAM FIRE ALARM SYSTEM AS NEEDED.



ELECTRICAL AHU-7 PENTHOUSE
 1/4" = 1'-0"

SHEET NOTES:

- ① CONNECT AHU LINE VOLTAGE LOADS AS REQUIRED. AHUS WILL BE FIELD ASSEMBLED AND WILL REQUIRE ELECTRICAL CONNECTIONS TO LIGHTS, SWITCHES, ETC. COORDINATE WITH MECHANICAL.
- ② PROVIDE NEW DUCT SMOKE DETECTORS ON ADDRESSABLE SIMPLEX FIRE ALARM SYSTEM. PROGRAM PER EXISTING FIRE ALARM SEQUENCE.
- ③ PROVIDE NEW FIRE ALARM RELAY ON ADDRESSABLE SIMPLEX FIRE ALARM SYSTEM. CONFIGURE RELAY TO SHUT DOWN UNIT UPON ACTIVATION OF ALL DUCT SMOKE DETECTORS CORRESPONDING TO THIS AIR HALDING UNIT.
- ④ PROVIDE 120V POWER FROM CIRCUIT IN PANEL 2M4 TO FIRE/SMOKE DAMPER.

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

ISSUE:
 100% CONSTRUCTION DOCUMENTS

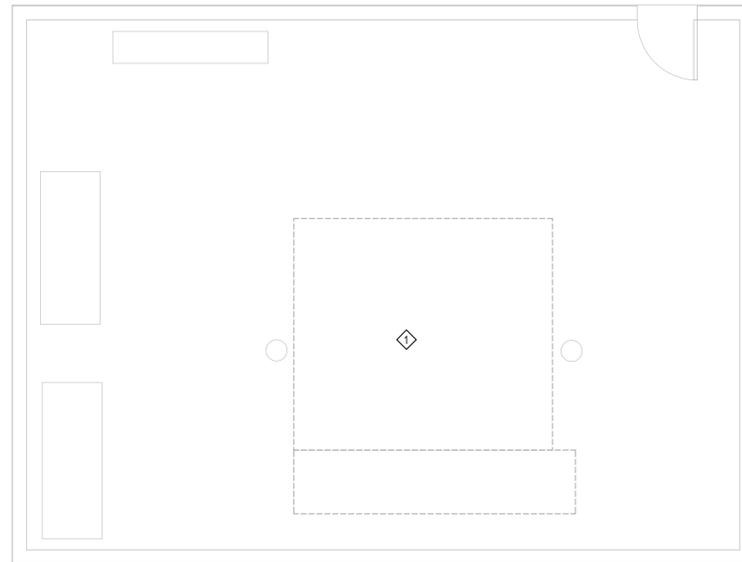
ISSUE DATE:
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SHEET TITLE:
ELECTRICAL AHU-8 PENTHOUSE PLANS

SHEET NUMBER:

E103



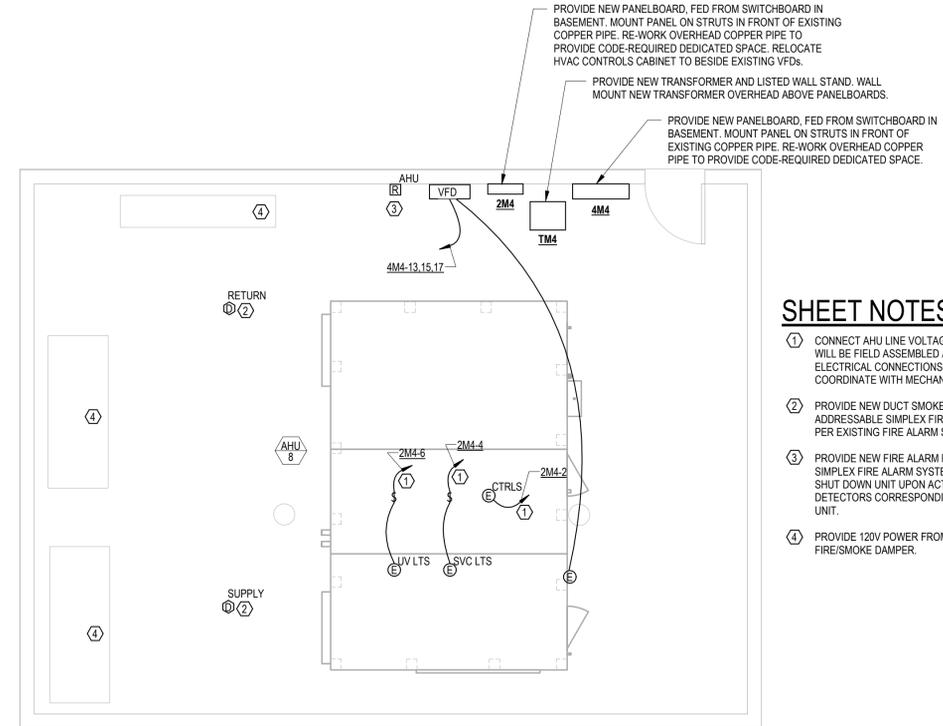
GENERAL DEMOLITION NOTES

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.

DEMOLITION NOTES:

- ◇ DEMOLISH ELECTRICAL AND FIRE ALARM CONNECTIONS TO AIR HANDLER. DEMOLISH ALL WIRING, CONDUIT, BOXES, AND OTHER APPURTENANCES EXCEPT WHERE REMAINING IN SERVICE FOR ANOTHER PURPOSE. REPROGRAM FIRE ALARM SYSTEM AS NEEDED.

ELECTRICAL AHU-8 PENTHOUSE - DEMOLITION
 1/4" = 1'-0"



SHEET NOTES:

- ① CONNECT AHU LINE VOLTAGE LOADS AS REQUIRED. AHUS WILL BE FIELD ASSEMBLED AND WILL REQUIRE ELECTRICAL CONNECTIONS TO LIGHTS, SWITCHES, ETC. COORDINATE WITH MECHANICAL.
- ② PROVIDE NEW DUCT SMOKE DETECTORS ON ADDRESSABLE SIMPLEX FIRE ALARM SYSTEM. PROGRAM PER EXISTING FIRE ALARM SEQUENCE.
- ③ PROVIDE NEW FIRE ALARM RELAY ON ADDRESSABLE SIMPLEX FIRE ALARM SYSTEM. CONFIGURE RELAY TO SHUT DOWN UNIT UPON ACTIVATION OF ALL DUCT SMOKE DETECTORS CORRESPONDING TO THIS AIR HALDING UNIT.
- ④ PROVIDE 120V POWER FROM CIRCUIT IN PANEL 2M4 TO FIRE/SMOKE DAMPER.

ELECTRICAL AHU-8 PENTHOUSE
 1/4" = 1'-0"

Andrew P. McCaddin
 PE - 83318

PROJECT NAME:
**THE UNIVERSITY OF FLORIDA
 JMHMC COMMUNICORE AHU-5, 7, & 8 REPLACEMENT**

OWNER:
 THE UNIVERSITY OF FLORIDA
 1249 CENTER DRIVE
 GAINESVILLE, FL 32610

OWNER'S PROJECT NUMBER:
 MP05285

MG PROJECT NUMBER: 19066
 REVISIONS:
 REV DESCRIPTION DATE

ISSUE:
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 DECEMBER 20, 2019

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SHEET TITLE:
ELECTRICAL SCHEDULES

SHEET NUMBER:

E201

Branch Panel: 4M4

Location:
 Supply From:
 Mounting: Surface
 Enclosure: Type 1
 Basis of Design: I-LINE
 Service Rated: NO

Volts: 480/277 Wye
 Phases: 3
 Wires: 4
 A.I.C. Rating: 18,000
 SPD: NO
 PQM: NO

Phase Bus Rating: 400 A
 MCB Rating: MLO
 Neutral Rating: 100%
 Feeder Ampacity: 400 A
 Feeder Phase Conductor: 3#4/0
 Feeder Neutral Conductor: 1#4/0
 Feeder Ground Conductor: 1#2
 Feeder Conduit: 2-1/2"
 Number of Parallel Runs: 2

Notes:
 PROVIDE NEW FEEDER FROM BASEMENT SWITCHBOARD.

CKT	Circuit Description	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Circuit Description	CKT
1				11085...			18013...						2
3	AHU-5	80 A	3		11085...		18013...	18013...	18013...	3	100 A	SPACE ONLY (FUTURE AHU-3)	4
5						11085...	18013...		18013...				6
7				18013...	18013...		18013...						8
9	AHU-7	100 A	3				18013...	18013...	18013...	3	100 A	SPACE ONLY (FUTURE AHU-4)	10
11						18013...	18013...						12
13				18013...			2500 VA		18013...				14
15	AHU-8	100 A	3		18013...		2500 VA	2500 VA		3	50 A	PANEL 2M4 VIA XFMR TM4	16
17						18013...		2500 VA					18
19	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	20
21	SPACE ONLY	--	--	0 VA	0 VA		0 VA	0 VA		--	--	SPACE ONLY	22
23	SPACE ONLY	--	--		0 VA	0 VA		0 VA	0 VA	--	--	SPACE ONLY	24
25	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	26
27	SPACE ONLY	--	--		0 VA		0 VA	0 VA		--	--	SPACE ONLY	28
29	SPACE ONLY	--	--		0 VA	0 VA		0 VA	0 VA	--	--	SPACE ONLY	30
31	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	32
33	SPACE ONLY	--	--		0 VA		0 VA	0 VA		--	--	SPACE ONLY	34
35	SPACE ONLY	--	--		0 VA	0 VA		0 VA	0 VA	--	--	SPACE ONLY	36
37	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	38
39	SPACE ONLY	--	--		0 VA		0 VA	0 VA		--	--	SPACE ONLY	40
41	SPACE ONLY	--	--		0 VA		0 VA	0 VA		--	--	SPACE ONLY	42
				Total Load:	85638 VA		85638 VA		85638 VA				
				Total Amps:	309 A		309 A		309 A				

Branch Panel: 2M4

Location:
 Supply From: TM4
 Mounting: Recessed
 Enclosure: Type 1
 Basis of Design: NQ
 Service Rated: YES

Volts: 120/208 Wye
 Phases: 3
 Wires: 4
 A.I.C. Rating: 10,000
 SPD: NO
 PQM: NO

Phase Bus Rating: 100 A
 MCB Rating: 100 A
 Neutral Rating: 100%
 Feeder Ampacity: 100 A
 Feeder Phase Conductor: 3#3
 Feeder Neutral Conductor: 1#3
 Feeder SSBJ: #8
 Feeder Conduit: 1-1/4"
 Number of Parallel Runs: 1

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Circuit Description	CKT
1	AHU-5 CONTROLS	20 A	1	500 VA			500 VA			1	20 A	AHU-5 CONTROLS	2
3	AHU-5 SVC LTS	20 A	1		500 VA			500 VA		1	20 A	AHU-5 SVC LTS	4
5	AHU-5 UV LTS	20 A	1			500 VA			500 VA	1	20 A	AHU-5 UV LTS	6
7	AHU-7 CONTROLS	20 A	1	500 VA			500 VA			1	20 A	SPARE (FUTURE AHU-3 CONTROLS)	8
9	AHU-7 SVC LTS	20 A	1		500 VA			500 VA		1	20 A	SPARE (FUTURE AHU-3 SVC LTS)	10
11	AHU-7 UV LTS	20 A	1			500 VA			500 VA	1	20 A	SPARE (FUTURE AHU-3 UV LTS)	12
13	SPARE	20 A	1	0 VA			500 VA			1	20 A	SPARE (FUTURE AHU-4 CONTROLS)	14
15	SPARE	20 A	1		0 VA			500 VA		1	20 A	SPARE (FUTURE AHU-4 SVC LTS)	16
17	SPARE	20 A	1			0 VA			500 VA	1	20 A	SPARE (FUTURE AHU-4 UV LTS)	18
19	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	20
21	SPACE ONLY	--	--		0 VA			0 VA		--	--	SPACE ONLY	22
23	SPACE ONLY	--	--			0 VA			0 VA	--	--	SPACE ONLY	24
25	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	26
27	SPACE ONLY	--	--		0 VA			0 VA		--	--	SPACE ONLY	28
29	SPACE ONLY	--	--			0 VA			0 VA	--	--	SPACE ONLY	30
31	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	32
33	SPACE ONLY	--	--		0 VA			0 VA		--	--	SPACE ONLY	34
35	SPACE ONLY	--	--			0 VA			0 VA	--	--	SPACE ONLY	36
37	SPACE ONLY	--	--	0 VA			0 VA			--	--	SPACE ONLY	38
39	SPACE ONLY	--	--		0 VA			0 VA		--	--	SPACE ONLY	40
41	SPACE ONLY	--	--			0 VA			0 VA	--	--	SPACE ONLY	42
				Total Load:	2500 VA		2500 VA		2500 VA				
				Total Amps:	21 A		21 A		21 A				

ELECTRICAL EQUIPMENT SCHEDULE

MARK	EQUIPMENT DESCRIPTION	VOLTAGE (V)	PHASES	WIRES	LOAD	MEANS OF DISCONNECT	FED FROM	OCP (A)	MCA (A)	CIRCUIT INFORMATION							NOTES
										# RUNS	PHASE	NEUTRAL	GROUND	CONDUIT	RATING	AMPACITY	
AHU-5	AIR HANDLING UNIT 5	480	3	4	30hp	VFD	4M4	80	50	1	6	6	8	3/4"	60°C	55	
	UV LIGHTS	120	1	2	500VA	N1 TS 20/1	2M4	20	20	1	12	12	12	1/2"	60°C	20	
	SERVICE LIGHTS	120	1	2	500VA	N1 TS 20/1	2M4	20	20	1	12	12	12	1/2"	60°C	20	
	CONTROLS	120	1	2	500VA	INTEGRAL	2M4	20	20	1	12	12	12	1/2"	60°C	20	
AHU-7	AIR HANDLING UNIT 7	480	3	4	50hp	VFD	4M4	100	81	1	3	3	8	1-1/4"	60°C	85	
	UV LIGHTS	120	1	2	500VA	N1 TS 20/1	2M4	20	20	1	12	12	12	1/2"	60°C	20	
	SERVICE LIGHTS	120	1	2	500VA	N1 TS 20/1	2M4	20	20	1	12	12	12	1/2"	60°C	20	
	CONTROLS	120	1	2	500VA	INTEGRAL	2M4	20	20	1	12	12	12	1/2"	60°C	20	
AHU-8	AIR HANDLING UNIT 8	480	3	4	50hp	VFD	4M4	100	81	1	3	3	8	1-1/4"	60°C	85	
	UV LIGHTS	120	1	2	500VA	N1 TS 20/1	2M4	20	20	1	12	12	12	1/2"	60°C	20	
	SERVICE LIGHTS	120	1	2	500VA	N1 TS 20/1	2M4	20	20	1	12	12	12	1/2"	60°C	20	
	CONTROLS	120	1	2	500VA	INTEGRAL	2M4	20	20	1	12	12	12	1/2"	60°C	20	

TRANSFORMER SCHEDULE

MARK	PRIMARY CONFIGURATION	SECONDARY CONFIGURATION	RATING (kVA)	WINDING MATERIAL	ENCLOSURE TYPE	INSULATION CLASS (C)	TEMPERATURE RISE (C)	PRIMARY OCPD (AMPS)	PRIMARY FEEDER CIRCUIT INFORMATION							SECONDARY OCPD (AMPS)	SECONDARY FEEDER CIRCUIT INFORMATION							NOTES
									# RUNS	PHASE	GROUND	CONDUIT	RATING	AMPACITY	# RUNS		PHASE	NEUTRAL	SSBJ	CONDUIT	RATING	AMPACITY		
T1	480V DELTA	120/208 GROUNDED WYE	30	Cu	NEMA 2	220	150	50	1	8	10	1"	75°C	50	100	1	3	3	8	1-1/4"	75°C	100		