COLUMBUS COUNTY
BUILDING B HVAC REPAIRS
WHITEVILLE, NORTH CAROLINA

DRAWING LIST

Coastal Architecture

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COLUMBUS COUNTY
BUILDING B HVAC REPAIRS
WHITEVILLE, NORTH CAROLINA

COASTAL ARCHITECTURE PLLC CERT. NO. C-2792 NORTH CAROLINA REGISTERED

LEE D. DIXON, JR. REGISTERED ARCHITECT 6419 NORTH CAROLINA MOREHEAD CITY

COVER SHEET

23031

ISSUED:	01/22/24
DWG BY:	MSG
CKD BY:	LDD

REVISIONS

SHEET NO.
CS-1
OF

DIVISION 15 B – HEATING, VENTILATING AND AIR CONDITIONING

1.1 DESCRIPTION OF THE WORK

A. Work under this section includes, but is not necessarily limited to, furnishing and installing the following:

1. Heating, ventilation, and air conditioning equipment.
2. Ductwork.
3. Controls and control wiring.

B. All work under this contract shall be installed in compliance with the latest edition of the following codes and standards insofar as they apply:

1. ASHRAE Guide
2. National Electric Code.
3. 2018 NC State Building Code: Mech Code.
4. SMACNA HVAC Duct Construction Standards.
5. All local codes and ordinances.
6. ARI rating.
7. 2018 NC State Building Code: Energy Conservation Code.

C. These codes are minimum standards. If codes require a more stringent method of construction than the specifications require, the codes shall govern.

D. The HVAC Contractor shall be licensed in North Carolina and have all local licenses required for the work.

1.2 INTENT

A. The intent of these specification and the accompanying drawing is to convey as reasonably as possible the requirements for a complete job ready for the building to operate. The HVAC Contractor shall take this into consideration and include in his bid allowance for contingencies as will allow him to provide minor pieces of equipment and labor not specifically indicated but required for the job to operate properly, at no additional cost to the Owner.

1.3 COORDINATION

A. Coordinate work with other contractors. Notify Owner of apparent conflicts early to expedite construction. If structural damage appears imminent, stop work and notify Owner for a decision before resuming operations.

B. Locations shown are approximate. The HVAC Contractor shall verify with owner, the placement of equipment, fixtures, outlets, etc. The drawings do not give exact details as to elevations and locations of various pipes, fittings, ducts, conduit, etc., and do not show all offsets and other installation details which may be required.

C. Changes in duct or piping design caused by obstructions shall be submitted to Engineer in sketch form for study and comment prior to execution. Additional cost will not be allowed for this type of work.

1.4 SHOP DRAWINGS

A. Shop drawings shall be submitted for all major items of equipment, These may consist of the manufacturer's standard catalog or tear sheets and shall have the exact items being offered clearly identified. Shop drawings shall include but are not limited to the following:

1. All equipment and accessories.
2. Unit sizes and requirements.

PART 2 –PRODUCTS

2.1 EQUIPMENT

A. All air handling devices must have the manufacturer's recommended filter rack, for 1" thick filters.

2.2 DUCTWORK

A. Ductwork shall be built in accordance with SMACNA HVAC Duct construction standards. Furnish and install all supply, return, and ventilation ductwork shown, together with splitters, deflectors, dampers, etc. This work shall be constructed of new galvanized prime grade steel sheets. The gauges of metal to be used and the construction and bracing of joints shall be in accordance with the SMACNA recommendations.

B. Seal all sheet metal joints with fiber impregnated mastic.

C. Support from building structure on strap hangers not over 8 feet apart.

D. Use manufactured turning vanes in each elbow where required or where indicated on drawings.

E. Flexible connectors shall be 3 inches wide, of fireproof material and used to isolate noise between equipment and ductwork on supply and return side of all units.

F. Round runouts, where used, shall be built in accordance with the above standards, and each runout shall also have manufactured side take off, adjustable quadrant damper at all accessible locations and shall be of Owens Corning INL–25 flexible duct with UL label. Flex duct lengths allowed up to 14 feet. Duct must be supported with sufficient hangers in order to prevent sags. Serpentine routing will not be permitted. Quadrant damper to be 22 gauge easily adjustable manually with exterior handle (similar to H&C Kwik–set) and is not to be mounted in side take–off.

2.3 DUCT INSULATION (LOW PRESSURE)

A. All insulation, linings, coverings and adhesives shall have a flame spread classification of 25 or less and a smoke developed rating of not more than 50, exposed exterior piping.

B. All duct insulation shall comply with Section 604, of the N. C. Building Code: Mechanical Code

C. All supply and return ductwork shall be completely insulated, either internally or externally.

D. Rectangular ductwork shall be lined with two–inch thick, 1.5 lb. per cubic foot density, duct liner, Armstrong, CSG Ultraliner, Johns Manville or approved equal.

E. As an alternative to duct liner rectangular duct may be wrapped with Class I – 2", 3/4 lb. density (R–6.5) thick reinforced foil back fiberglass insulation, Owens–corning Series ED or equal. Tape shall be Kraft reinforced foil tape or equal.

G. Insulation shall be held inplace with adhesive and welding pins 16" on center.

H. Duct dimensions shown on the drawings are Net Inside Dimensions

2.4 TEMPERATURE SENSORS

A. See controls specifications for temperature sensors.

2.5 DUCT SMOKE DETECTORS

A. Duct detectors are existing to remain.

PART 3 – EXECUTION

3.1 ELECTRICAL WORK

A. The electrical contractor shall provide all switches, starters, wire conduit for the air conditioning, heating and ventilation equipment. Control wiring shall be by the heating and air conditioning contractor.

B. HVAC Contractor is responsible for verifying that power terminals have been properly grounded prior to operating equipment and must find connections to all equipment including control wiring.

C. All materials and workmanship shall be in accordance with the electrical specifications for the project. All wiring shall be color coded, and as–built wiring diagram prepared showing all connections and colors of wiring and delivered to the Owner.

D. Furnish certification for acceptance of control wiring from local electrical inspector prior to acceptance.

3.2 CLEAN UP

A. During construction, keep the site clean of debris. Upon completion, and before final inspection, clean up the premises to remove all evidence of work. In addition upon completion of construction leave equipment clean.

B. Furnish one box of clean filters, for each size required, at the time of final inspection to the owner.

3.3 OPERATOR'S MANUAL AND DIAGRAM

A. The HVAC Contractor shall prepare in one copy a manual describing the proper maintenance and operation of the systems. This manual shall not consist of standard factory instructions (although these may be included) but shall be prepared to describe this particular job.

B. The manual shall be bound, indexed, dated and signed by the HVAC Contractor.

C. Qualified representative of the HVAC contractor shall meet with the designated representatives of the Owner and the Owner's representative shall be instructed in the proper operation and maintenance of the control system and other systems.

3.4 GUARANTEE

A. Guarantee all materials and labor included in the HVAC work for a period of one year from date of final acceptance by the owner. In addition, motor compressors shall be a nonprorated five year warranty. Any part or parts of the work or equipment which prove to be defective during the guarantee period shall be replaced at no additional cost to the owner or tenant.

B. All air flows must be measured and balanced to within 10% of design airflows. All equipment used must have a current certification. Provide two copies of the balance report to the owner at closeout. The HVAC contractor shall return and re–balance to occupant comfort after 90 days from close–out Provide all balance dampers needed for satisfactory operation regardless if shown on the drawings or not, and shift location of thermostats themostats if required for occupancy comfort.

GENERAL NOTES – MECHANICAL

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE CODE AND ALL LOCAL AND OTHER APPLICABLE CODES.
2. ANY PERMITS AND INSPECTION FEES SHALL BE SECURED AND PAID FOR BY THE MECHANICAL CONTRACTOR (MC).
3. ALL WORK SHALL BE PERFORMED BY EXPERIENCED AND SKILLED CRAFTSMEN. THE MC SHALL COORDINATE ALL OF HIS WORK WITH THE GENERAL CONTRACTOR (GC) AND OTHER TRADES.
4. THE LOCATION OF ALL DUCT, PIPING AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES.
5. THESE PLANS ARE DIAGRAMMATIC AND MAY NOT SHOW MINOR DETAILS AND LOCATIONS. FOR DIMENSIONS REFER TO THE ARCHITECTURAL PLANS.
6. THE MC SHALL BE RESPONSIBLE FOR ALL ELECTRICAL STARTERS INTERLOCKS, CONTROL WIRING CONDUIT AND POWER WIRING FROM DISCONNECTS TO HIS EQUIPMENT, USING A LICENSED ELECTRICIAN.
7. THE MC SHALL USE FIRE DAMPERS FOR PROTECTION OF THE OPENING IN ACCORDANCE WITH STATE AND LOCAL CODES IN ALL LOCATIONS WHERE PENETRATIONS OF RATED WALLS AND FLOORS OCCUR. SEE ARCHITECTURAL PLANS FOR RATED WALL AND FLOOR LOCATIONS. PROVIDE ACCESS DOORS AT ALL DAMPER LOCATIONS. LOCATE DOORS FOR EASY ACCESS.
8. INSTALL FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCTWORK AHU. ALL MECHANICAL EQUIPMENT SHALL OPERATE FREE OF OBJECTIONAL NOISE AND VIBRATION.
9. INSTALL TURNING VANES IN SUPPLY DUCTS AT ALL ELBOWS AND SPLITTER DAMPERS. PROVIDE BALANCING DAMPERS IN ALL DUCTS WHERE SHOWN OR REQUIRED FOR SYSTEM BALANCING.
10. DUCT DIMENSIONS ARE SHOWN INSIDE CLEAR.
11. THE MC SHALL KEEP THE PREMISES CLEAR OF DEBRIS FROM HIS WORK DURING CONSTRUCTION AND LEAVE THE AREA AND BUILDING CLEAN AT THE COMPLETION OF HIS WORK. HE SHALL ALSO LEAVE CLEAN ALL EXPOSED EQUIPMENT IN HIS CONTRACT.
12. PROVIDE ALL REQUIRED ROOF PENETRATIONS FOR THE INSTALLATION OF THE NEW EQUIPMENT. ALL FLASHINGS ARE BY THE MECHANICAL CONTRACTOR. ALL ROOFING WORK SHALL BE DONE BY A LICENSED ROOFING CONTRACTOR SO AS TO MAINTAIN ORIGINAL WARRANTY.
13. THE M.C. SHALL COORDINATE WITH AND PROVIDE EQUIPMENT SPEC. SHEETS TO THE GENERAL AND ELECTRICAL CONTRACTORS FOR REVIEW PRIOR TO ORDERING EQUIPMENT.
14. PROPERLY SUPPORT ALL DUCT WORK, AND EQUIP FROM STRUCTURE. PROVIDE ALL STRUCTURAL SUPPORTS FOR THE LOADS AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

PROJECT SCOPE OF WORK:

REMOVE ALL EXISTING VAV BOXES (EXCEPT BOXES #301 & #302). REMOVE EXISTING BUILDING CONTROLS SYSTEM COMPLETELY. REPLACE ALL EXISTING VAV BOXES (EXCEPT BOXES #301 & #302) WITH SPECIFIED UNITS.
INSTALL NEW BUILDING CONTROLS SYSTEM AS SPECIFIED. TIE IN ALL BOXES.
RECONNECT ALL NEW VAV BOXES TO EXISTING DUCT SYSTEM.
PROVIDE DUCT TRANSITIONS AS REQUIRED TO CONNECT NEW BOXES TO EXISTING DUCTS. RECONNECT POWER WIRING FOR THE EXISTING REMOVED VAV BOXES TO NEW VAV BOXES.

LEGEND – MECHANICAL

12 X 8	RECTANGULAR DUCTWORK. INSIDE CLEAR DIMENSION INDICATED (WIDTH X HEIGHT)
12" DIA.	ROUND GALVANIZED STEEL DUCT INSIDE CLEAR DIMENSION INDICATED.
101	VAV UNIT, TAG NUMBER INDICATED
	EXISTING LINEAR SUPPLY DIFFUSER
	EXISTING RETURN GRILLE
T 101	NEW WALL MOUNTED TEMPERATURE SENSOR IN PLACE OF EXISTING REMOVED SENSOR (VAV UNIT SERVED IS INDICATED)

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COLUMBUS COUNTY BLD B
HVAC REPLACEMENT
WHITEVILLE, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — BENJAMIN E. BURKE
FOR BIDDING PURPOSES ONLY

HVAC SCHEDs, NOTES, LEGENDS

23031

ISSUED:	1–24–2024
DWG BY:	CLS
CKD BY:	BEB
REVISIONS	

SHEET NO.
M-1

VAV Fan Powered Terminal Units

			Schedule										
					Airflow						Electric Heating		
Unit Tags	Quantity	Model Number	Unit model	Primary inlet	Design cooling airflow	Min cooling airflow	Valve heating airflow	Unit heating airflow	Fan airflow	Coil heating capacity	Electric heater kilowatt	Electric heater voltage	Electric heater stages
					cfm	cfm	cfm	cfm	cfm	MBh			
101	1	VSEF1000QN0SY74BD2100L*WWF10027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	900	200	200	900	900	34.15	10	480/3	2
102	1	VSEF0600PN0SY74BD2100L*WWF04027W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	350	175	175	350	350	13.66	4	480/3	2
103	1	VSEF0600PN0SY74BD2100L*WWF02517W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	250	200	200	250	250	8.54	2.5	480/3	1
104	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	200	200	450	450	17.08	5	480/3	2
105	1	VSEF1000QN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	460	460	800	800	27.32	8	480/3	2
106	1	VSEF0600PN0SY74BD2100L*WWF04027W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	350	175	175	350	350	13.66	4	480/3	2
107	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	200	200	450	450	17.08	5	480/3	2
108	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	200	200	450	450	17.08	5	480/3	2
109	1	VSEF1000RN0SY74BD2100L*WWF09027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	850	460	460	850	850	30.74	9	480/3	2
110	1	VSEF0600PN0SY74BD2100L*WWF02517W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	250	200	200	250	250	8.54	2.5	480/3	1
111	1	VSEF1000QN0SY74BD2100L*WWF10027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	460	460	800	800	34.15	10	480/3	2
112	1	VSEF0800RN0SY74BD2100L*WWF09027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	800	460	460	800	800	30.74	9	480/3	2
113	1	VSEF0800PN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	200	200	450	450	20.49	6	480/3	2
114	1	VSEF0800PN0SY74BD2100L*WWF04027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	400	200	200	400	400	13.66	4	480/3	2
115	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	600	200	200	600	600	20.49	6	480/3	2

VAV Fan Powered Terminal Units

			Schedule										
					Airflow						Electric Heating		
Unit Tags	Quantity	Model Number	Unit model	Primary inlet	Design cooling airflow	Min cooling airflow	Valve heating airflow	Unit heating airflow	Fan airflow	Coil heating capacity	Electric heater kilowatt	Electric heater voltage	Electric heater stages
					cfm	cfm	cfm	cfm	cfm	MBh			
201	1	VSEF1200RN0SY74BD2100L*WWF13027W*0010000	VSEF (Series Fan Electric Heat)	12" (305mm)	1200	300	300	1200	1200	44.4	13	480/3	2
202	1	VSEF1000QN0SY74BD2100L*WWF10027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	900	300	300	900	900	34.15	10	480/3	2
203	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	200	200	450	450	17.08	5	480/3	2
204	1	VSEF1000QN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	200	200	800	800	27.32	8	480/3	2
205	1	VSEF1200TN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	12" (305mm)	1600	400	400	1600	1600	27.32	8	480/3	2
206	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
207	1	VSEF1000QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	250	250	800	800	20.49	6	480/3	2
208	1	VSEF1000QN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	250	250	800	800	27.32	8	480/3	2
209	1	VSEF1000RN0SY74BD2100L*WWF09027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	850	250	250	850	850	30.74	9	480/3	2
210	1	VSEF1000RN0SY74BD2100L*WWF09027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	850	250	250	850	850	30.74	9	480/3	2
211	1	VSEF1000RN0SY74BD2100L*WWF12027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	1150	250	250	1150	1150	40.98	12	480/3	2
212	1	VSEF1000RN0SY74BD2100L*WWF12027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	1100	250	250	1100	1100	40.98	12	480/3	2
213	1	VSEF0800PN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	250	250	450	450	20.49	6	480/3	2
214	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2

VAV Fan Powered Terminal Units

			Schedule										
					Airflow						Electric Heating		
Unit Tags	Quantity	Model Number	Unit model	Primary inlet	Design cooling airflow	Min cooling airflow	Valve heating airflow	Unit heating airflow	Fan airflow	Coil heating capacity	Electric heater kilowatt	Electric heater voltage	Electric heater stages
					cfm	cfm	cfm	cfm	cfm	MBh			
301	1	VSEF1400TN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	14" (356mm)	1800	500	500	1800	1800	20.49	6	480/3	2
302	1	VSEF1000QN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	250	250	800	800	27.32	8	480/3	2
303	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	600	250	250	600	600	20.49	6	480/3	2
304	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
305	1	VSEF1000QN0SY74BD2100L*WWF10027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	950	250	250	950	950	34.15	10	480/3	2
306	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
307	1	VSEF1000RN0SY74BD2100L*WWF11027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	1100	400	400	1100	1100	37.56	11	480/3	2
308	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
309	1	VSEF0600PN0SY74BD2100L*WWF03017W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	300	200	200	300	300	10.24	3	480/3	1
310	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
311	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	250	250	450	450	17.08	5	480/3	2
312	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	250	250	450	450	17.08	5	480/3	2
313	1	VSEF0600PN0SY74BD2100L*WWF03017W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	300	200	200	300	300	10.24	3	480/3	1
314	1	VSEF0600PN0SY74BD2100L*WWF03017W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	300	200	200	300	300	10.24	3	480/3	1
315	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	600	250	250	600	600	20.49	6	480/3	2
316	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	250	250	450	450	17.08	5	480/3	2
317	1	VSEF1000QN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	800	250	250	800	800	27.32	8	480/3	2
318	1	VSEF0800PN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	450	250	250	450	450	17.08	5	480/3	2
319	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
320	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	550	250	250	550	550	20.49	6	480/3	2
321	1	VSEF0800QN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	600	250	250	600	600	27.32	8	480/3	2

VAV Fan Powered Terminal Units

			Schedule										
					Airflow						Electric Heating		
Unit Tags	Quantity	Model Number	Unit model	Primary inlet	Design cooling airflow	Min cooling airflow	Valve heating airflow	Unit heating airflow	Fan airflow	Coil heating capacity	Electric heater kilowatt	Electric heater voltage	Electric heater stages
					cfm	cfm	cfm	cfm	cfm	MBh			
401	1	VSEF0800QN0SY74BD2100L*WWF05027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	700	250	250	700	700	17.08	5	480/3	2
402	1	VSEF0600PN0SY74BD2100L*WWF02517W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	300	250	250	300	300	8.54	2.5	480/3	1
403	1	VSEF0800QN0SY74BD2100L*WWF04027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	525	250	250	525	525	13.66	4	480/3	2
404	1	VSEF0600RN0SY74BD2100L*WWF02527W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	350	250	250	350	350	8.54	2.5	480/3	2
405	1	VSEF0600PN0SY74BD2100L*WWF02517W*0010000	VSEF (Series Fan Electric Heat)	6" (152mm)	300	250	250	300	300	8.54	2.5	480/3	1
406	1	VSEF1200SN0SY74BD2100L*WWF10027W*0010000	VSEF (Series Fan Electric Heat)	12" (305mm)	1400	250	250	1400	1400	34.15	10	480/3	2
407	1	VSEF1200QN0SY74BD2100L*WWF07027W*0010000	VSEF (Series Fan Electric Heat)	12" (305mm)	1000	250	250	1000	1000	23.9	7	480/3	2
408	1	VSEF0800RN0SY74BD2100L*WWF04527W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	600	250	250	600	600	15.37	4.5	480/3	2
409	1	VSEF0800QN0SY74BD2100L*WWF06027W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	800	250	250	800	800	20.49	6	480/3	2
410	1	VSEF0800RN0SY74BD2100L*WWF05527W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	750	250	250	750	750	18.78	5.5	480/3	2
411	1	VSEF1200RN0SY74BD2100L*WWF09027W*0010000	VSEF (Series Fan Electric Heat)	12" (305mm)	1200	250	250	1200	1200	30.74	9	480/3	2
412	1	VSEF1200SN0SY74BD2100L*WWF10027W*0010000	VSEF (Series Fan Electric Heat)	12" (305mm)	1400	250	250	1400	1400	34.15	10	480/3	2
413	1	VSEF0800RN0SY74BD2100L*WWF04527W*0010000	VSEF (Series Fan Electric Heat)	8" (203mm)	600	250	250	600	600	15.37	4.5	480/3	2
414	1	VSEF1000RN0SY74BD2100L*WWF08027W*0010000	VSEF (Series Fan Electric Heat)	10" (254mm)	1100	250	250	1100	1100	27.32	8	480/3	2

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COLUMBUS COUNTY BLD B
HVAC REPLACEMENT
WHITEVILLE, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER BENJAMIN E. BURKE
FOR BIDDING PURPOSES ONLY

HVAC SCHED

23031

ISSUED: 1-24-2024
DWG BY: CLS
CKD BY: BEB
REVISIONS

SHEET NO.
M-2

Sequence of Operation: PACKAGED RTU [QTY: 2]

Building Automation System Interface:
The Building Automation System (BAS) shall send the controller Occupied Bypass, Pre–Cool, Occupied/Unoccupied and Heat/Cool modes. The BAS shall also send the discharge air temperature setpoint and the duct static pressure setpoint. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied:
During occupied periods, the supply fan shall run continuously and the mixed air dampers shall open to maintain minimum ventilation requirements. The unit controller shall control the supply fan speed to maintain the current supply duct static pressure setpoint (adj.). Upon a call for DX cooling, the unit controller shall enable the first fixed speed compressor. If the fixed speed compressor cannot satisfy the load conditions, the unit controller shall start the next fixed speed compressor in sequence to add to the total unit cooling load percentage. This process shall repeat until all of the fixed speed compressors have been started or until the active discharge air temperature setpoint is satisfied. If economizing is enabled, the outdoor air or mixed air dampers shall modulate to maintain the discharge air temperature setpoint and the relief air damper shall track the mixed air dampers. If the discharge air temperature sensor fails, the DX cooling shall be disabled and an alarm shall annunciate at the BAS.

Unoccupied:
When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall be commanded on, the outside air damper shall open if economizing is enabled and remain closed if economizing is disabled and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the Unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop, the DX cooling shall be disabled and the outside air damper shall close.

Optimal Start:
The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Optimal Stop:
The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Pre–Cool Mode:
During optimal start, if the average space temperature is above the occupied cooling setpoint, pre–cool mode shall be activated. When pre–cool is initiated the unit shall enable the fan and cooling or economizer. The outside air damper shall remain closed, unless economizing. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Occupied Bypass:
The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensors. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Heat/Cool Mode:
COOLING: The unit controller shall use the discharge air temperature sensor and discharge air temperature cooling setpoint to determine when to initiate requests for cooling. Discharge air setpoint shall be maintained by controlling the cooling as required.

Discharge Air Temperature Reset Control:
The discharge air temperature setpoint shall be reset to the optimal setpoint communicated by the BAS. The BAS shall reset the discharge air temperature setpoint based on the current outside air temperature, but shall override this reset function and return the discharge air temperature setpoint to 55.0 deg. F (adj.) if more than two (adj.) zones begin to overheat. Also, the BAS shall override this reset function whenever outdoor dew point is higher than 60.0 deg. F (adj.) or indoor humidity is higher than 60% RH (adj.). If the discharge air temperature drops below the minimum limit, a low temperature alarm shall annunciate and the unit shall shut down. If the discharge air temperature rises above the maximum limit, a high temperature alarm shall annunciate.

Economizer:
ENABLE (Comparative Enthalpy): Outside air (OA) enthalpy shall be compared with Return air (RA) enthalpy point. The economizer shall enable when OA enthalpy is less than RA enthalpy – 2.0 BTU/LB. The economizer shall disable when OA enthalpy is greater than RA enthalpy.
OPERATION: The supply air sensor shall measure the dry bulb temperature of the air leaving the evaporator coil while economizing. When economizing is enabled and the unit is operating in the cooling mode, the economizer damper shall be modulated between its minimum position and 100% to maintain the discharge air temperature setpoint. The economizer damper shall modulate toward minimum position in the event the discharge air temperature falls below the discharge low limit temperature setpoint. Compressors shall be delayed from operating until the economizer has opened to 100%.

Ventilation Control:
When in the occupied mode, the flow–measuring outdoor–air and damper shall modulate to maintain the current ventilation airflow setpoint. The ventilation airflow setpoint shall be reset to the optimal ventilation setpoint communicated by the BAS. The BAS shall reset the ventilation setpoint based on the current ventilation needs of the VAV terminals.

Supply Fan:
The supply fan shall be enabled while in the occupied mode and cycled on during the unoccupied mode.

Supply Duct Static Pressure Control:
During the occupied mode the unit controller shall modulate the output to the variable speed drive as required to maintain the supply duct static pressure setpoint of 1.5 inches of W.C. (adj.). If the supply duct static pressure falls below 1.3 inches of W.C. (adj.) the unit controller shall increase the output to the variable speed drive to maintain setpoint. If the supply duct static pressure rises above 1.7 inches of W.C. (adj.) the unit controller shall decrease the output to the variable speed drive to maintain setpoint. Upon a call for heating or cooling in the unoccupied mode the unit controller shall modulate the speed of the variable speed drive to 100%.

Static Pressure High Limit:
If for any reason the supply air pressure exceeds the supply air pressure high limit, the supply fan shall shut down. The unit shall be allowed to restart three times after a 15 minute off period. If the overpressurization condition occurs on the fourth restart, the unit shall shut down and a manual reset diagnostic is displayed at the remote panel and/or the BAS system.

Relief Air and Building Pressure Control:
The relief air fan shall enable when the economizer damper position is equal to or greater than the relief air fan setpoint (adj.). The relief air damper shall proportionally track or follow the fresh air (economizer) damper position. The offset between the fresh air and relief damper shall be adjustable.
A differential pressure switch shall monitor the differential pressure across the relief air fan. If the switch is detected to be open for 40 consecutive seconds after a request for relief fan operation a fan failure alarm shall annunciate at the BAS and the relief fan shall stop. A manual reset shall be required.

Filter Timer:
The fan–run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter–maintenance timer is reset to zero, and the timer begins accumulating fan–run time again.

Smoke Detector Shutdown:
The unit shall shut down in response to a signal from the smoke detector indicating the presence of smoke. The smoke detector shall be interlocked to the unit through the dry contacts of the smoke detector. A manual reset of the smoke detector shall be required to restart the unit.

Condensate Overflow Shutdown:
The unit shall shut down in response to a signal from the condensate overflow sensor. The sensor shall be interlocked to the unit cooling controller for immediate shutdown of cooling.

Sequence of Operation: VARIABLE AIR VOLUME SYSTEM

Rooftop Unit VAV Air System:
Note:
This sequence of operations describes the system–level control functions of a rooftop unit (RTU) with VAV terminal units that are part of the air system, which includes coordinating the operation of the RTU and the zone–level VAV units during the various operating modes. The equipment–level control functions of the RTU and the terminal units are contained in their respective sequence of operations documents.

System Operating Modes:
The Building Automation System (BAS) controller shall include a user–adjustable time–of–day schedule to define when the various areas of the facility are expected to be occupied versus unoccupied. Then, based on current zone conditions, the BAS determines the current system operating mode. The BAS controller shall send the following operating modes to the unit level controllers that are a member of the air system: Occupied Heat/Cool, Unoccupied Heat/Cool and Morning Warmup/Pre–cool.

Occupied Heat/Cool:
During the Occupied Mode, each VAV terminal unit shall be activated to maintain zone temperature at the occupied setpoint (cooling or heating). Meanwhile, the rooftop unit (RTU) modulates the supply fan to deliver the required airflow to the zones, positions the outdoor–air damper to bring in required amount of ventilation, and increases/decreases the source of cooling or heating to maintain discharge air at the desired setpoint.

Unoccupied Heat/Cool:
During the Unoccupied Mode, each VAV terminal unit shall be activated to maintain zone temperature at the unoccupied setpoint (cooling or heating). Meanwhile, the RTU shuts off, unless a zone requires unoccupied cooling or heating. If needed to operate, the RTU modulates the supply fan to deliver the required airflow to the zones, closes the outdoor–air damper and increases/decreases the source of cooling or heating to maintain discharge air at the desired setpoint.

Morning Warm–Up/Pre–Cool:
During the Morning Warm–up/Pre–cool Mode, each VAV terminal shall be activated to raise or lower the zone temperature to the occupied setpoint (heating or cooling) and then closes. Meanwhile, the RTU modulates the supply fan to deliver the required airflow to the zones, closes the outdoor–air damper and increases/decreases the source of cooling or heating to maintain discharge air at the desired setpoint.

Optimized System–Level Control Sequences:
The BAS controller shall perform the following optimized system–level control strategies:

Optimal Start:
The BAS shall initiate Optimal Start mode such that the RTU is started and VAV boxes are enabled to allow the zone temperature to reach the occupied heating or cooling setpoint prior to scheduled occupancy. The system shall wait as long as possible before starting, so that the temperature in each zone reaches the occupied setpoint just in time for scheduled occupancy.

Optimal Stop:
The BAS shall initiate Optimal Stop mode such that cooling or heating is disabled so that the zone temperature does not drift beyond the occupied standby setpoint by the end of the scheduled occupancy period. The RTU supply fan shall continue operating, and ventilation control shall continue, through the end of the scheduled occupancy period.

Unoccupied Economizing (Night Purge):
Between 4:00 AM (adj.) and 6:00 AM (adj), the system controller shall initiate Unoccupied Economizing mode if the current zone temperature is at least 1F warmer than the occupied cooling setpoint and the outdoor dry–bulb temperature is more than 15F (adj) cooler than the current zone temperature. When initiated, the RTU is started (OA damper fully open, cooling source is off) and VAV boxes are enabled to allow the zone temperature to cool to the occupied cooling setpoint.

Optimized Control of Supply Duct Static Pressure (Fan–Pressure Optimization):
At a frequency of once every 10 minutes, the system controller shall monitor the damper position of all VAV terminal units. The system controller shall calculate a new supply fan duct static pressure setpoint based on the position of the furthest–open VAV damper, and send this newly–calculated setpoint to the RTU controller. When any VAV damper is more than 75% (adj) open, the supply fan duct static pressure setpoint shall be reset upward by 5% until no damper is more than 75% (adj) open or the static pressure setpoint has reset to the maximum setting. When all VAV dampers are less than 65% (adj) open, the supply fan duct static pressure setpoint shall be reset downward by 5% until at least one damper is more than 65% (adj) open or the static pressure setpoint has reset to the minimum setting.

Optimized Control of Discharge Air Temperature (DAT Reset):
At a frequency of once every 10 minutes, the system controller shall monitor the outdoor dry–bulb temperature, as well as the zone temperature and damper position of all VAV terminal units. The BAS shall calculate a new DAT setpoint based on current outdoor air (OA) temperature, and send this newly–calculated DAT setpoint to the RTU controller. When the OA temperature is warmer than 65F (adj), the DAT setpoint shall be 55F (adj). When the OA temperature is colder than 55F (adj), the DAT setpoint shall be 60F (adj). When the OA temperature is between 55F (adj) and 65F (adj), the DAT setpoint shall be reset proportionally between 55F (adj) and 60F (adj). If at least two (adj) zones have both 1) a VAV damper that is more than 75% open, and 2) a current zone temperature that is higher than the current cooling setpoint, then the DAT setpoint shall return to 55F (adj). If the outdoor dew point is higher than 60F (adj), this DAT Reset sequence shall be suspended and the DAT setpoint shall be reset to 55F (adj) until outdoor dew point drops below 57F (adj).

Optimized Control of Ventilation (Ventilation Optimization) with OA Flow Measurement:
The actual outdoor airflow shall be sensed at the outdoor air intake of the RTU, and controlled to an airflow setpoint determined according to ASHRAE Standard 62.1. When the BAS time–of–day schedule indicates that a zone is unoccupied, the required outdoor airflow for that zone shall be zero. When the schedule indicates that a zone is occupied, the required outdoor airflow for that zone shall equal the design outdoor airflow, unless the zone is equipped with occupancy sensor and/or a carbon dioxide (CO_2) sensor, or uses a time–of–day ventilation schedule, to reduce the required outdoor airflow during periods of partial occupancy. The required outdoor–air fraction (current required outdoor airflow divided by the current primary airflow) shall be continuously calculated for each zone (VAV terminal unit). At a frequency of once every 10 minutes, the BAS shall gather this data from all VAV terminal units, calculate the minimum required outdoor airflow for the system according to ASHRAE 62.1, and send this newly–calculated outdoor airflow setpoint to the RTU controller.

Sequence of Operation: VAV TERMINAL UNIT [QTY: 64]

Building Automation System Interface:
The Building Automation System (BAS) shall send the controller Occupied, and Unoccupied commands. The BAS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If communication is lost with the BAS, the controller shall operate using its local setpoints.

Occupied:
Normal operating mode for occupied spaces or daytime operation. When the unit is in the occupied mode the VAV shall maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints shall be enforced. The occupied mode shall be the default mode of the VAV.

Occupied Standby:
The occupancy sensor shall be used to indicate that the space is unoccupied, even though the BAS has scheduled the space as occupied. In the occupied standby mode, the active cooling and heating setpoints shall be relaxed (see cooling and heating mode) and both the ventilation airflow and minimum airflow setpoints shall be lowered (see VAV schedule).

Unoccupied:
Normal operating mode for unoccupied spaces or nighttime operation. When the unit is in unoccupied mode the VAV controller shall maintain the space temperature at the stored unoccupied heating or cooling setpoint regardless of the presence of a hardwired or communicated setpoint. When the space temperature exceeds the active unoccupied setpoint the VAV shall modulate fully closed.

Occupied Bypass:
Mode used to temporarily place the unit into the occupied operation. Tenants shall be able to override the unoccupied mode from the space sensor. The override shall last for a maximum of 4 hours (adj.). The tenants shall be able to cancel the override from the space sensor at any time. During the override the unit shall operate in occupied mode.

Heat/Cool Mode:
The Heat/Cool mode shall be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV shall compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot"" or ""cold"". Heating mode implies the primary air temperature is hot. Cooling mode implies the primary air temperature is cold."

Heat/Cool Setpoint:
The space temperature setpoint shall be determined either by a local (e.g., thumbwheel) setpoint, the VAV default setpoint or a communicated value. The VAV shall use the locally stored default setpoints when neither a local setpoint nor communicated setpoint is present. If both a local setpoint and communicated setpoint exist, the VAV shall use the communicated value.

Cooling Mode:
When the unit is in cooling mode, the VAV controller shall maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. The VAV shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity. When in the Occupied Mode, the controller shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs shall be controlled based on the unit configuration and the requested cooling capacity.

Heating Mode:
When the unit is in heating mode, the VAV controller shall maintain the space temperature at the active heating setpoint by modulating the airflow between the active heating minimum airflow setpoint to the maximum heating airflow setpoint. The VAV controller shall use the measured space temperature and the active heating setpoint to determine the requested heating capacity of the unit. The outputs will be controlled based on the unit configuration and the requested heating capacity.

Continuous Fan Control:
The VAV fan shall operate continuously in all occupied modes. During the unoccupied mode, the primary air valve shall modulate fully closed. The terminal fan and heat shall cycle as needed to maintain a reduced space temperature.

Local Reheat Control:
Reheat will only be allowed when the primary air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.). The reheat shall be enabled when the space temperature drops below the active heating setpoint and the minimum airflow requirements are met. During reheat the VAV shall operate at its minimum heating airflow setpoint and energize the heat as follows:

Electric Staged Reheat:
Stage 1 is energized when the space temperature falls below the active heating setpoint and minimum airflow requirements are met. When the zone temperature rises above the active heating setpoint by 5.0 deg. F, stage 1 is de–energized. Stage 2 energizes when the space temperature is 1.0 deg. F or more below the active heating setpoint, and is de–energized when the space temperature is 5.0 deg. F below the active heating setpoint.

Demand Control Ventilation:
When the unit is in unoccupied mode, the ventilation airflow setpoint will be zero. When the unit is in occupied mode, the ventilation airflow setpoint shall be equal the design outdoor airflow and reset based on occupancy.
OCCUPANCY SENSOR: When the unit is in occupied mode, and the occupancy sensor indicates that the space is currently unoccupied, the ventilation airflow setpoint shall be the "occupied standby" outdoor airflow (see VAV schedule).
The current ventilation airflow setpoint shall be communicated to the BAS for control of the system outdoor–air intake.

Space Sensor Failure:
If there is a fault with the operation of the zone sensor an alarm shall be annunciated at the BAS. Space sensor failure shall cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode. The series fan shall be enabled and the reheat will be disabled.

Sequence of Operation: FAN [QTY: 6]

Building Automation System Interface:
The Building Automation System (BAS) shall send the controller an Occupied or Unoccupied command. If a BAS is not present, or communication is lost with the BAS, the controller shall operate in the Occupied mode.

Occupied:
During occupied periods, the exhaust fan shall run continuously.

Unoccupied:
During unoccupied periods the exhaust fan shall be disabled.

Operation:
The occupancy sensor shall be used to indicate that the space is occupied/unoccupied.

Fan Status:
The fan status shall be monitored by a current sensing switch. If the fan is signaled to start, and status is not proven within 20 seconds (adj.), an alarm shall annunciate at the BAS.

Points List - VAV TERMINAL UNIT [QTY: 64]

System Point Description	POINTS									ALARMS					
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
AIR VALVE MODULATION COMMAND **AIR VLV**	X			X											
DISCHARGE AIR TEMPERATURE **DAT**	X	X								X	X			X	
FAN OUTPUT **FAN**	X				X										
LOCAL HEAT ELECTRIC STAGE 1 OUTPUT **EH1**	X				X										
LOCAL HEAT ELECTRIC STAGE 2 OUTPUT **EH2**	X				X										
SPACE TEMPERATURE LOCAL **SPT**	X							X							
SPACE TEMPERATURE SETPOINT LOCAL **SPT SP**	X							X							
SUPPLY AIRFLOW **DA FLW**	X	X								X	X				
BAS COMMUNICATION STATE **BAS COM**						X									X
DESIGN HEAT DISCHARGE AIR TEMP SETPOINT **DSNG HT DAT SP**						X									
MAXIMUM COOLING AIRFLOW SETPOINT **MAX CLG FLW SP**						X									
MINIMUM COOLING AIRFLOW SETPOINT **MIN CLG FLW SP**						X									
MAXIMUM HEATING AIRFLOW SETPOINT **MAX HTG FLW SP**						X									
MINIMUM HEATING AIRFLOW SETPOINT **MIN HTG FLW SP**						X									
OCCUPIED BYPASS TIMER **OCC TMR**	X					X									
OCCUPIED COOLING SETPOINT **OCC CLG SP**	X					X									
OCCUPIED HEATING SETPOINT **OCC HTG SP**	X					X									
UNOCCUPIED COOLING SETPOINT **UNOCC CLG SP**	X					X									
UNOCCUPIED HEATING SETPOINT **UNOCC HTG SP**	X					X									
SUPPLY FAN COMMAND **SF CMD**	X				X										

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COLUMBUS COUNTY BLD B
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SEQUENCE OF OPERATION

23031	
ISSUED:	1-24-2024
DWG BY:	CLS
CKD BY:	BEB
REVISIONS	
SHEET NO.	M-3

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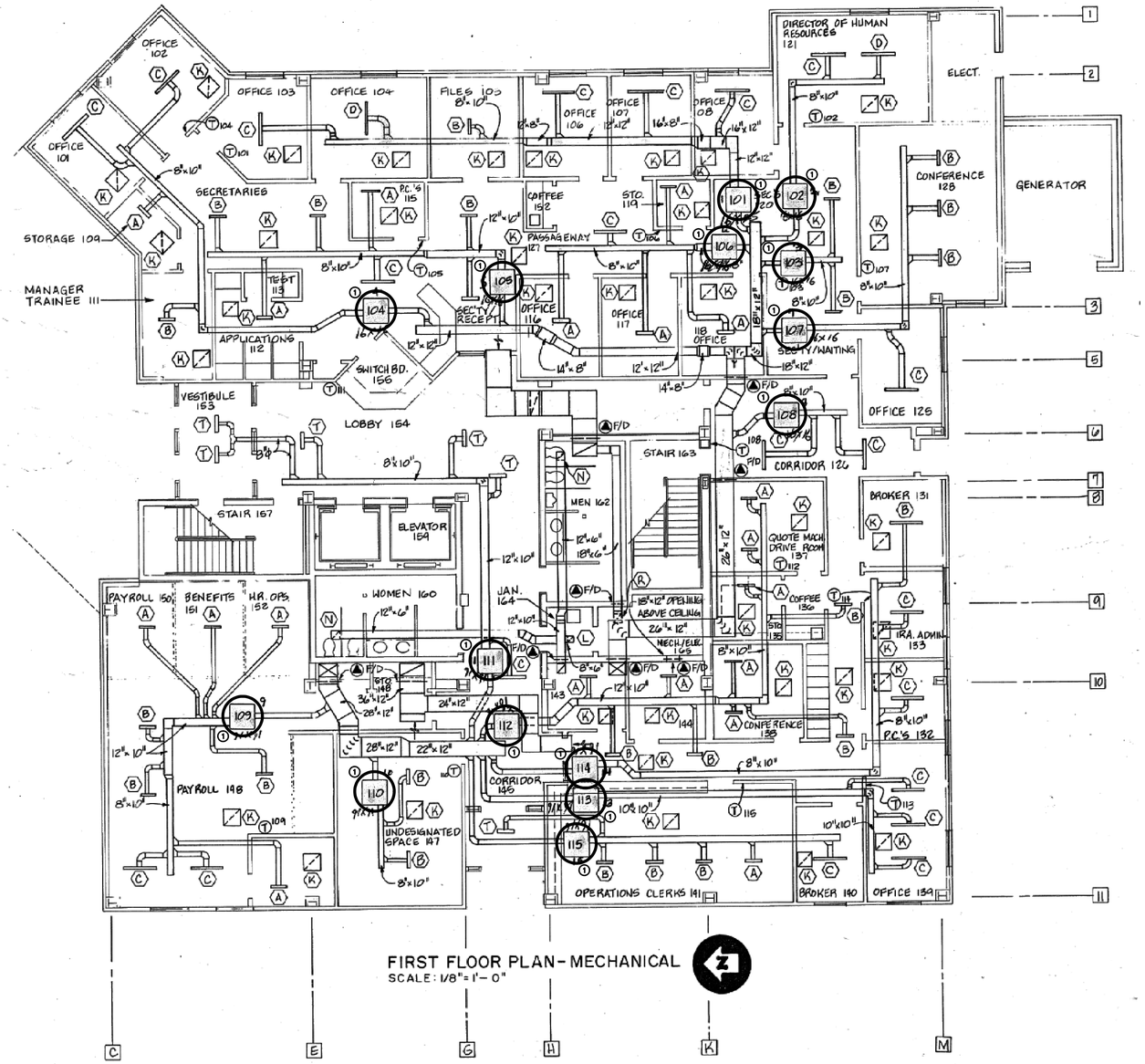
THE SUBMISSION OF A BID INDICATES ACCEPTANCE OF EXISTING CONDITIONS. NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED.

KEY NOTES FOR M-4

(1) EXISTING VAV UNIT WITH ELECTRICAL HEAT. REPLACE WITH NEW. SEE SCHEDULE ON M2 SHEET. TRANASITION DUCTS AS REQUIRED.



FIRST FLOOR PLAN - MECHANICAL
SCALE: 1/8"= 1'- 0"

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER BENJAMIN E. BURKE
FOR BIDDING PURPOSES ONLY

1st FLOOR HVAC

23031

ISSUED: 1-24-2024
DWG BY: CLS
CKD BY: BEB
REVISIONS

SHEET NO.
M-4

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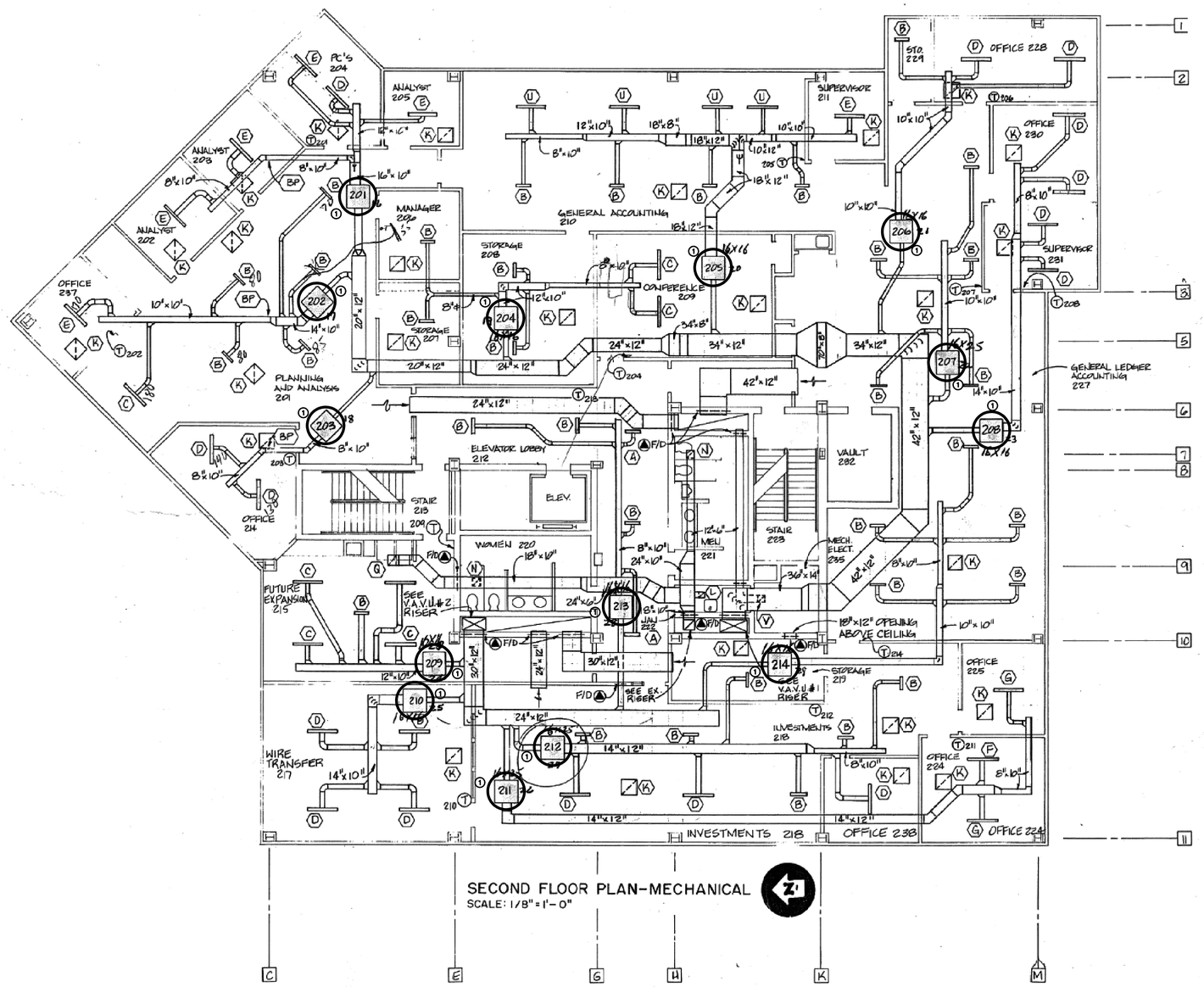
OF ANY DISCREPANCIES NOTED.

KEY NOTES FOR M-5

(1) EXISTING VAV UNIT WITH ELECTRICAL HEAT. REPLACE WITH NEW. SEE SCHEDULE ON M2 SHEET. TRANASITION DUCTS AS REQUIRED.



SECOND FLOOR PLAN-MECHANICAL
SCALE: 1/8" = 1'-0"

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FOR BIDDING PURPOSES ONLY

2nd FLOOR HVAC

23031

ISSUED:	1-24-2024
DWG BY:	CLS
CKD BY:	BEB

REVISIONS

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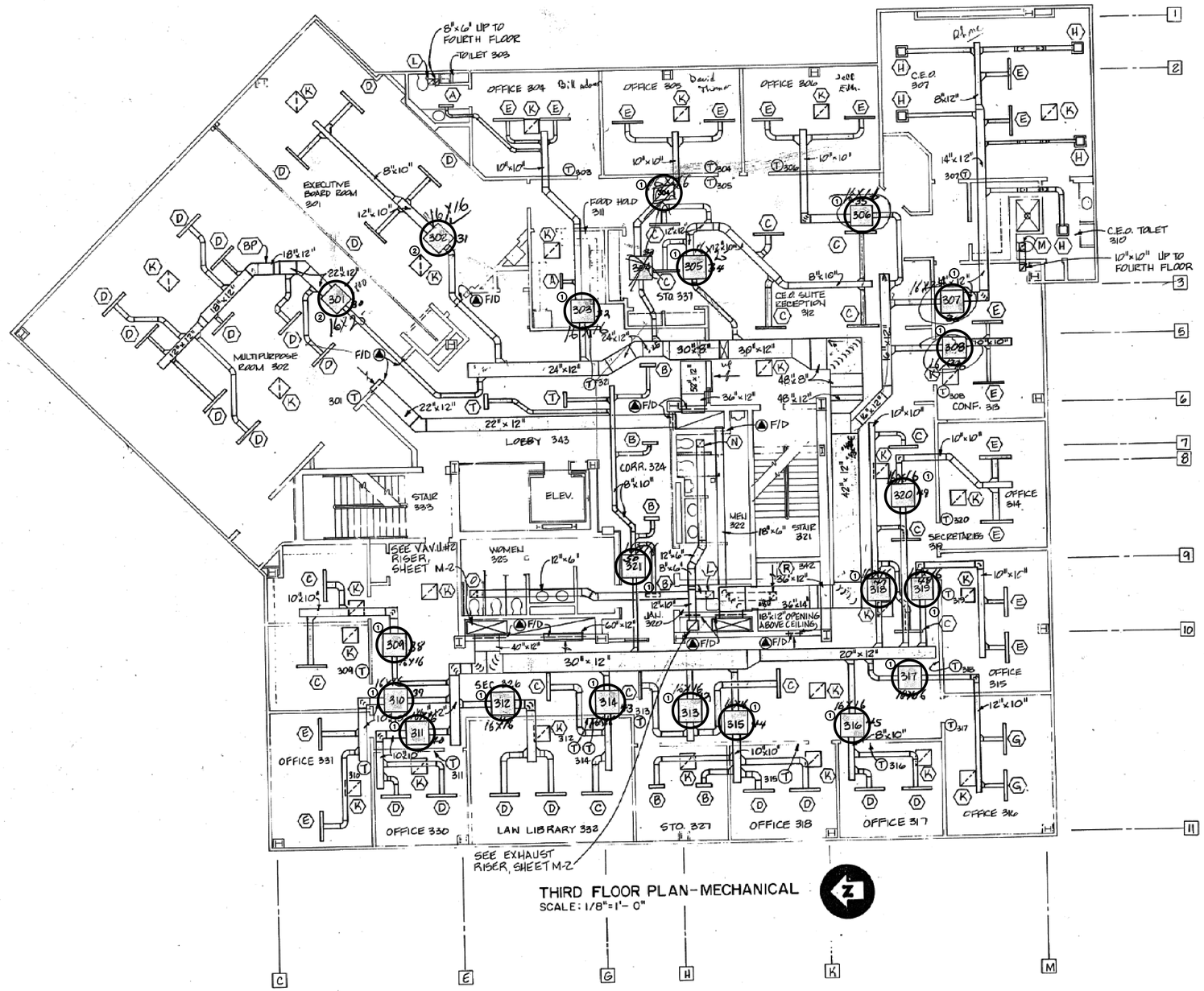
KEY NOTES FOR M-6

1. EXISTING VAV UNIT WITH ELECTRICAL HEAT. REPLACE WITH NEW. SEE SCHEDULE ON M2 SHEET. TRANASITION DUCTS AS REQUIRED.
2. EXISTING VAV UNIT TO REMAIN. THIS UNIT HAS BEEN PREVIOUSLY REPLACED.



THIRD FLOOR PLAN-MECHANICAL
SCALE: 1/8"=1'-0"

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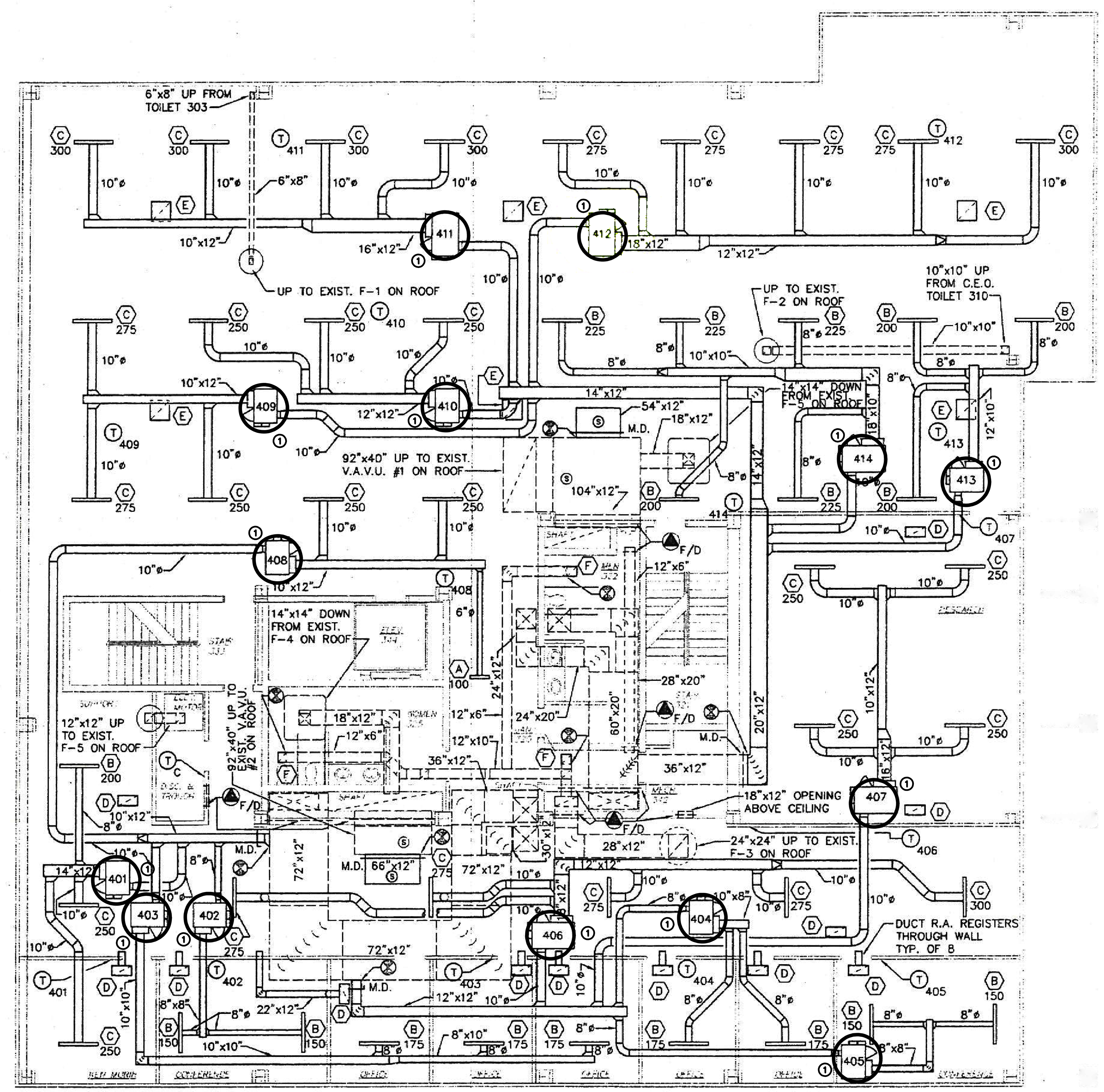
SHEET NO.
M-6



NOTE:
THE INFORMATION SHOWN ON THIS DRAWING IS FROM PREVIOUS PERMIT DRAWINGS.
THE CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE AND FIELD VERIFYING ALL RELEVANT INFORMATION.
THE SUBMISSION OF A BID INDICATES ACCEPTANCE OF EXISTING CONDITIONS. NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED.

KEY NOTES FOR M-7

(1) EXISTING VAV UNIT WITH ELECTRICAL HEAT. REPLACE WITH NEW. SEE SCHEDULE ON M2 SHEET. TRANASITION DUCTS AS REQUIRED.

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COLUMBUS COUNTY BLD B HVAC REPLACEMENT
WHITEVILLE, NORTH CAROLINA

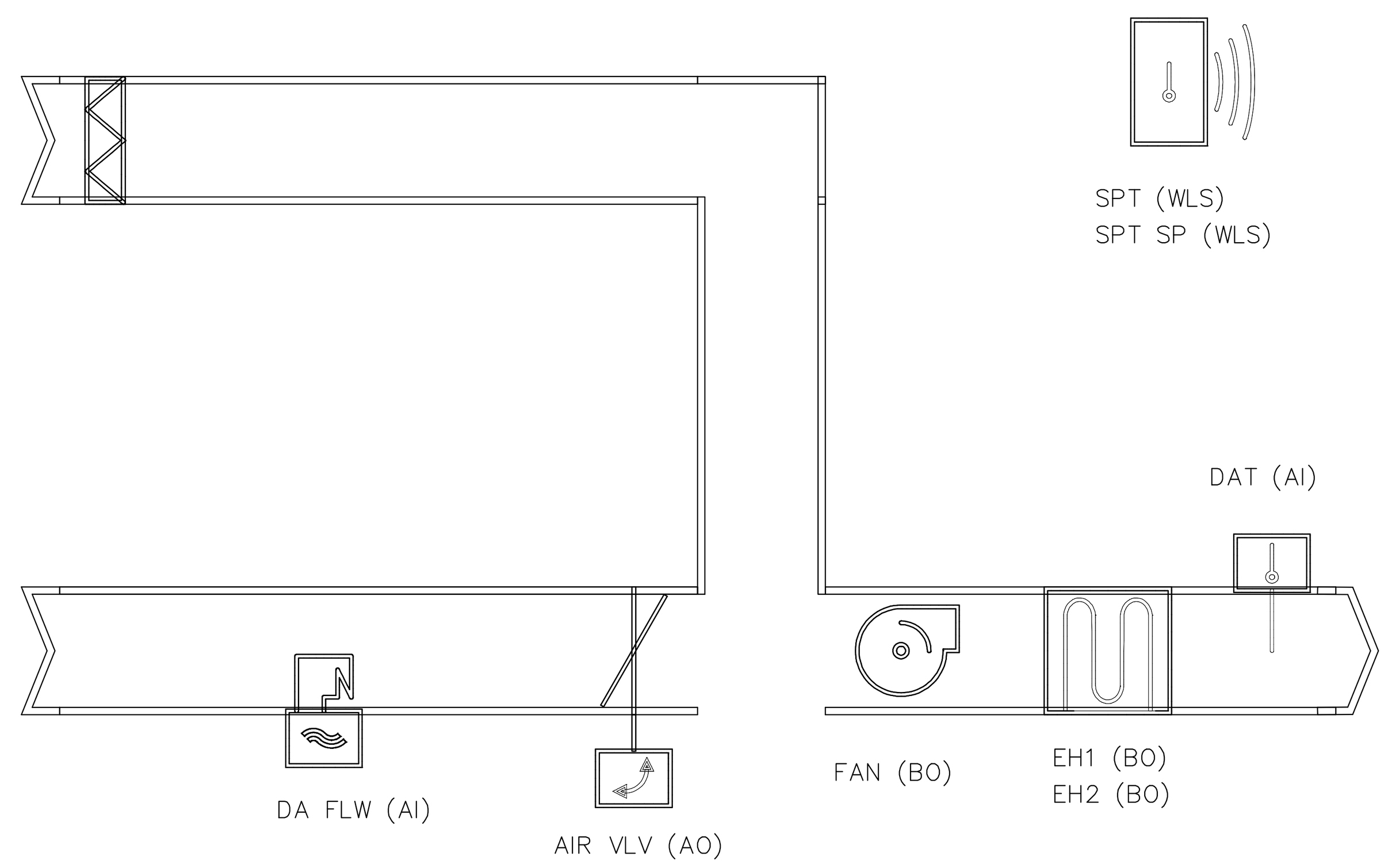
FOR BIDDING PURPOSES ONLY

4th FLOOR HVAC

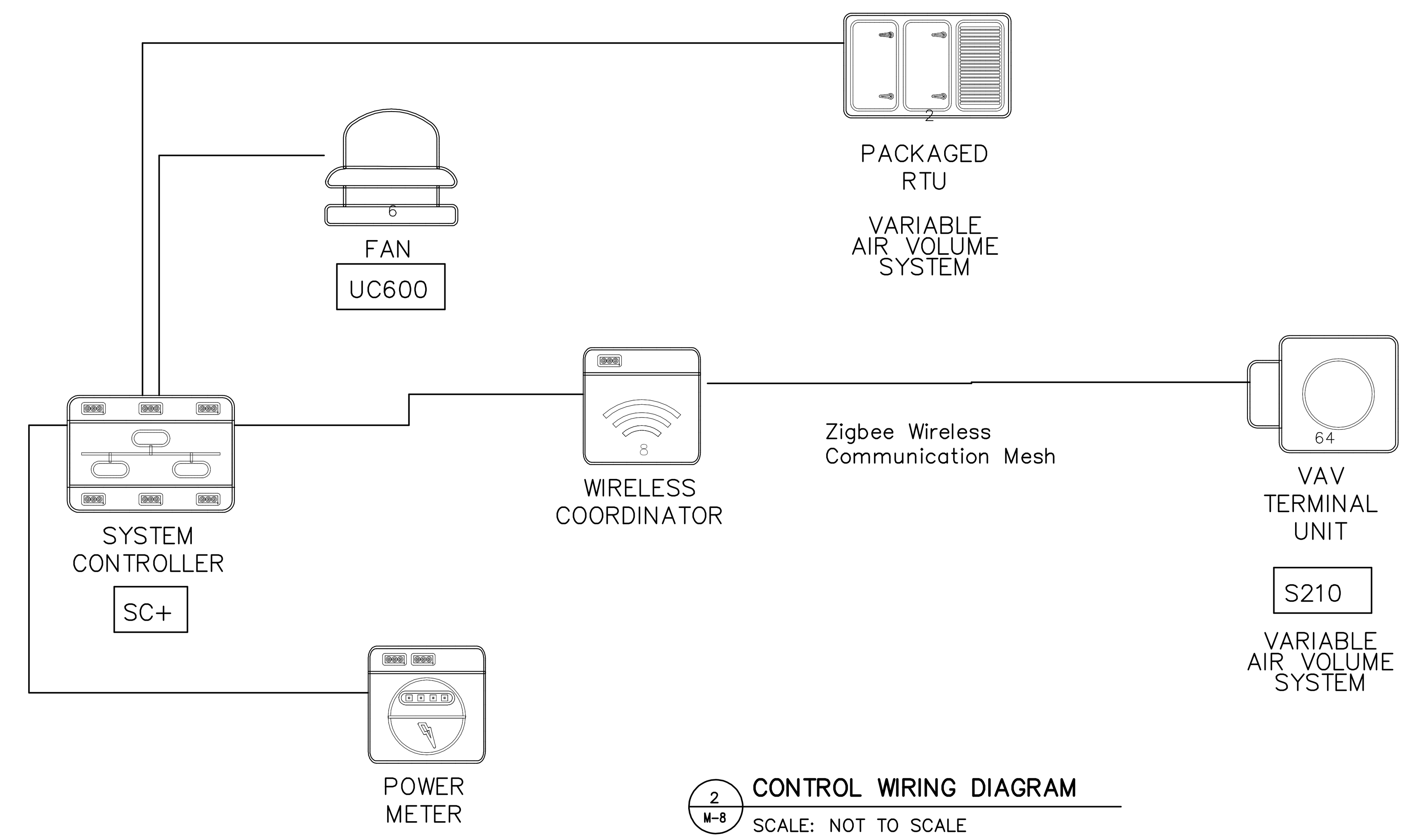
23031

ISSUED:	1-24-2024
DWG BY:	CLS
CKD BY:	BEB
REVISIONS	

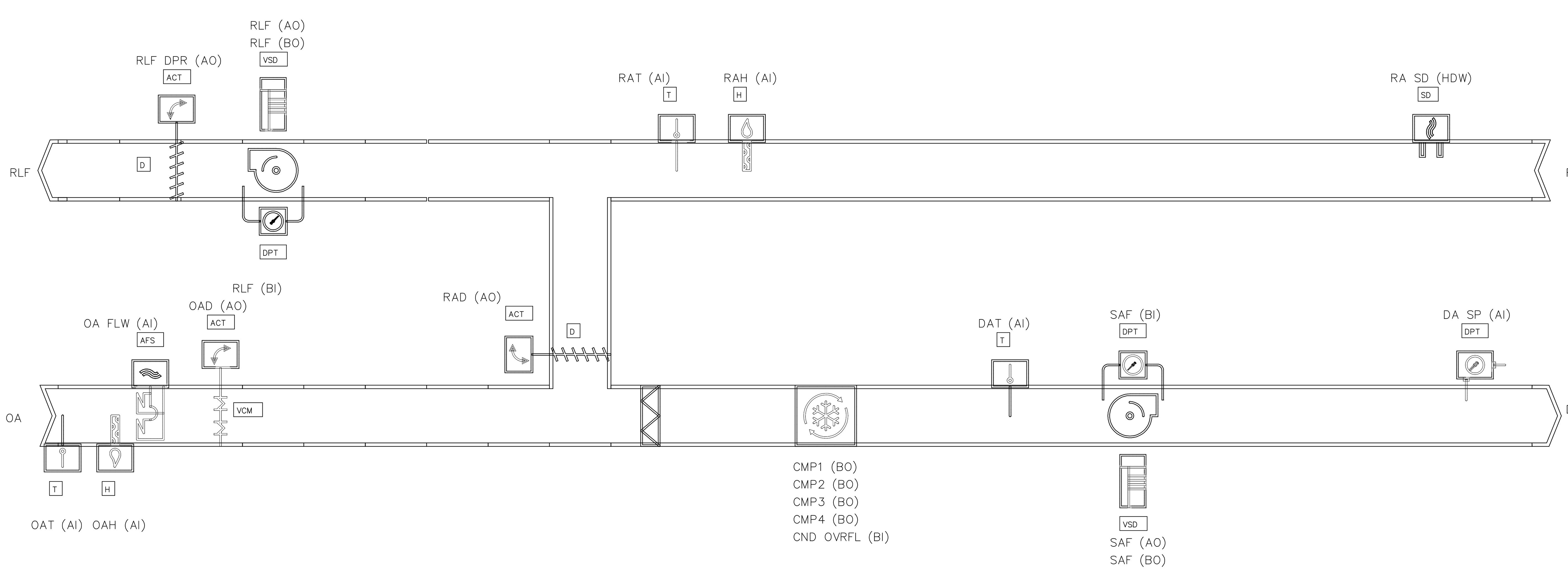
SHEET NO.
M-7



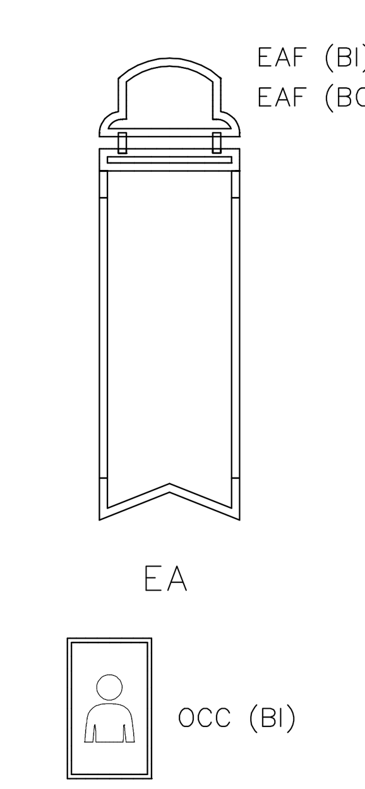
1 M-8 VAV FLOW DIAGRAM
SCALE: NOT TO SCALE



2 M-8 CONTROL WIRING DIAGRAM
SCALE: NOT TO SCALE



3 M-8 AIR HANDLER FLOW DIAGRAM
SCALE: NOT TO SCALE



4 M-8 FAN DIAGRAM
SCALE: NOT TO SCALE

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CONTROLS DIAGRAMS

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SHEET NO.
M-8