

# TOMMY SMITH ELEMENTARY SCHOOL RENOVATIONS VOLUME 2



PROJECT  
**VOLUME 2**

TOMMY SMITH  
ELEMENTARY SCHOOL  
RENOVATIONS

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**

ARCHITECT'S SEAL



H. MILLER CALDWELL, JR.  
AR 7462

PROJECT TEAM

ARCHITECTURAL  
Caldwell Associates

PLUMBING  
Watford Engineering

MECHANICAL  
Watford Engineering

ELECTRICAL  
HG Engineers

PROJECT NUMBERS

Architect No: 22045D

DELIVERABLES

Schematic Design: None  
Design Development: 20 July 2023  
CD Owner Review Set: 18 January 2024  
Bid Documents: 03 June 2024

**Architect Issued  
to CM for Bidding 03 June 2024**

SHEET TITLE

TITLE

SHEET NUMBER

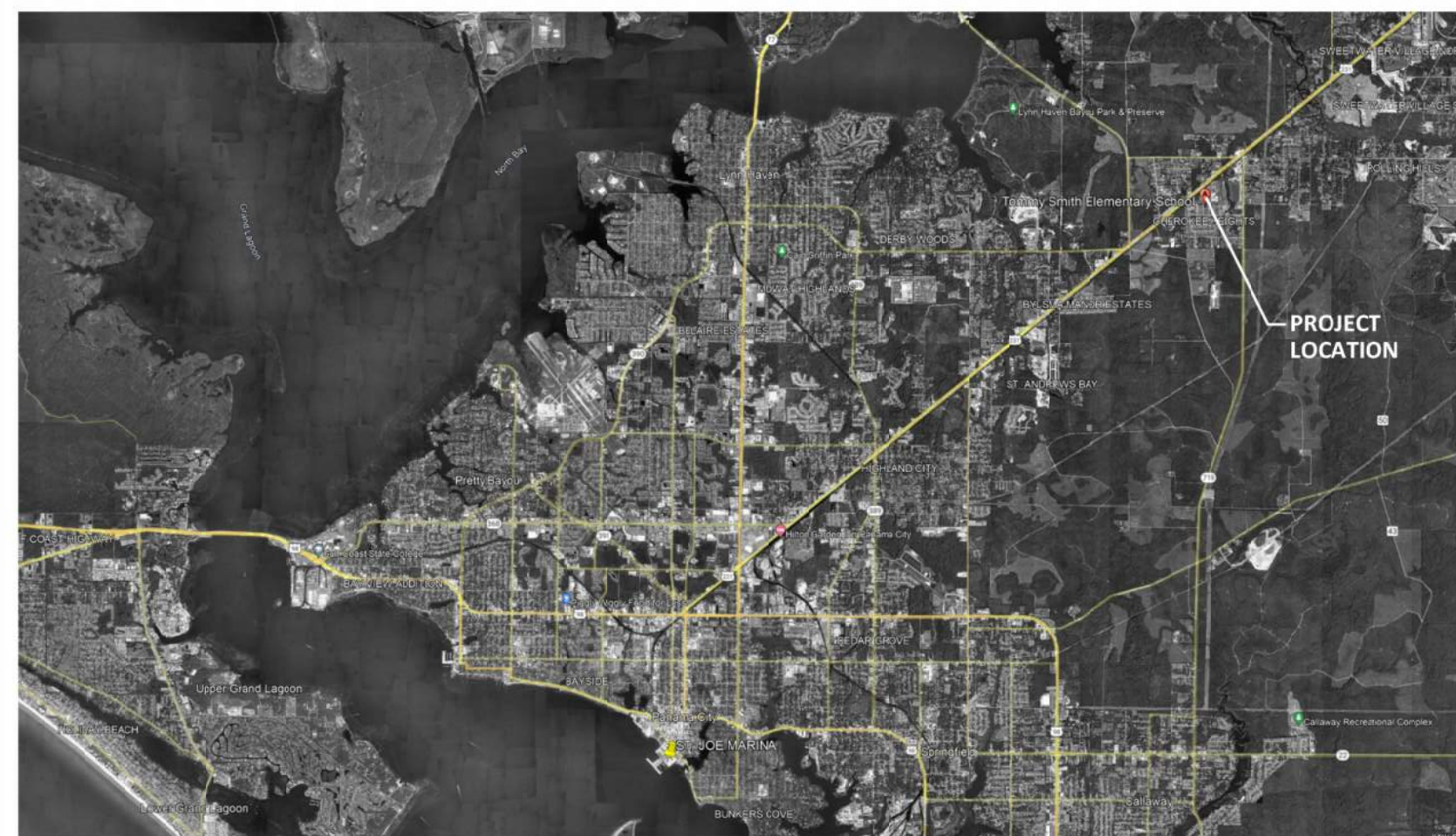
**G001B**

### PROJECT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF THE BUILDING CODE AND FIRE CODE ADOPTED BY STATE AND/OR LOCAL AUTHORITIES HAVING JURISDICTION.
2. ALL MATERIALS AND EQUIPMENT REFERRED TO IN NOTES AND KEYNOTE LEGENDS SHALL BE NEW AND FURNISHED AND INSTALLED UNDER THE WORK OF THESE CONTRACT DOCUMENTS UNLESS NOTED OTHERWISE TO BE FURNISHED AND INSTALLED BY OWNER.
3. CONTRACTOR AND SUBCONTRACTORS SHALL EMPLOY SKILLED EMPLOYEES TO PERFORM ALL WORK IN ACCORDANCE WITH THE BEST STANDARDS OF WORK FOR ALL CATEGORIES OF WORK IN THE PROJECT.
4. CONTRACTOR AND SUBCONTRACTORS SHALL COORDINATE THEIR WORK WITH ALL OTHER SUBCONTRACTORS AND TRADE CONTRACTORS TO FACILITATE A SMOOTH WORK PROGRESSION. COORDINATION SHALL BE PERFORMED PRIOR TO ORDERING AND INSTALLATION OF MATERIALS.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO COORDINATE WITH ALL PARTIES INVOLVED WITH THE PROJECT SUCH AS, BUT NOT LIMITED TO, PARTIES ASSOCIATED WITH THE CONSTRUCTION CONTRACT AND PARTIES SEPARATE FROM THE CONSTRUCTION CONTRACT.
6. CONTRACTOR AND SUBCONTRACTORS SHALL SECURE THE OWNER'S APPROVAL OF ANY SUBSTITUTIONS PRIOR TO BIDDING, PURCHASING, AND INSTALLING. OWNER SHALL SUPPLY TO CONTRACTOR ANY SUBSTITUTIONS IN PROMPT ATTENTIVENESS TO THE PROGRESSION OF WORK.
7. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND APPROVALS AND SHALL NOTIFY AND SCHEDULE ALL REQUIRED INSPECTIONS AND APPROVALS WITH THE VARIOUS AUTHORITIES HAVING JURISDICTION.
8. CONTRACTOR SHALL PROVIDE AND MAINTAIN SUITABLE PROTECTION FOR ALL EMPLOYEES AND THE PUBLIC AND OCCUPANTS DURING THE COURSE OF THE WORK, COMPLYING WITH ALL APPLICABLE JOB SAFETY REGULATIONS.
9. CONTRACTORS AND SUBCONTRACTORS SHALL REMOVE FROM THE SITE ALL DEBRIS, RUBBISH, AND OTHER MATERIALS RESULTING FROM THEIR OPERATIONS. ALL SUCH MATERIAL MUST BE DISPOSED OF LEGALLY AND CONTRACTOR WILL BE RESPONSIBLE FOR ALL FEES ASSOCIATED WITH SAID REMOVALS AND DISPOSALS. SUBCONTRACTOR SHALL MAINTAIN THE PROJECT SITE IN A NEAT AND SAFE CONDITION AT ALL TIMES.
10. CONTRACTOR SHALL SUBMIT ALL SAMPLES AND COLOR SELECTIONS TO ARCHITECT FOR APPROVAL.
11. THE CONTRACTOR AND SUBCONTRACTORS SHALL UNDERSTAND THAT ANY ITEMS OBVIOUSLY ASSOCIATED WITH THE ITEMS TO BE DEMOLISHED (IN ORDER TO PERFORM THE CONSTRUCTION OR NEW WORK TO FOLLOW) SHALL ALSO BE CONSIDERED AS PART OF THE REQUIRED DEMOLITION WORK.
12. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ANY AND ALL STRUCTURAL SYSTEMS SUCH AS LOAD BEARING WALLS. NO STRUCTURAL SYSTEMS SHALL BE REMOVED WITHOUT PRIOR WRITTEN NOTICE TO THE ARCHITECT AND STRUCTURAL ENGINEER.

### SCOPE OF WORK & EXISTING CONDITIONS GENERAL NOTES

1. PRIOR TO SUBMITTING A GMP, THE CONSTRUCTION MANAGER AND SUBCONTRACTORS SHALL CAREFULLY EXAMINE THE BIDDING DOCUMENTS AND THE CONSTRUCTION SITE (EXISTING CONDITIONS).
2. THE CM AND SUBCONTRACTORS SHALL FULLY INFORM THEMSELVES PRIOR TO PROVIDING A GMP AS TO ALL EXISTING CONDITIONS AND LIMITATIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND SHALL INCLUDE IN THEIR BID A SUM TO COVER THE COSTS OF ALL ITEMS NECESSARY TO PERFORM THE WORK AS SET FORTH IN THE CONTRACT DOCUMENTS.
3. THE CM/BIDDER SHALL CAREFULLY EXAMINE AND COMPARE THE BIDDING DOCUMENTS, PROJECT SITE AND LOCAL CONDITIONS WITH EACH OTHER.
4. ANY ITEM, MATERIAL, CONDITION, SERVICE, ETC. THAT MAY BE REFERENCED TO IN THE DRAWINGS OR SPECIFICATIONS, AND THAT IS NOT CLEARLY UNDERSTOOD BY THE BIDDER AS TO THE ARCHITECT'S INTENT, SHALL BE CLARIFIED BY THE BIDDER PRIOR TO THE BID. FAILURE TO CLARIFY ANY AMBIGUITY SHALL NOT RELIEVE THE BIDDER FROM SUPPLYING THE INTENT OF THE ARCHITECT AS PART OF THE BASE CONTRACT.
5. THE BIDDER SHALL BE FAMILIAR WITH ALL FEDERAL, STATE AND LOCAL LAWS, ORDINANCES, RULES AND REGULATIONS AFFECTING THE WORK. IGNORANCE OF THEM ON THE PART OF BIDDER SHALL IN NO WAY RELIEVE THE BIDDER FROM RESPONSIBILITY.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO VISIT THE PROPERTY AND FIELD VERIFY ALL EXISTING CONDITIONS SUCH AS, BUT NOT LIMITED TO, FIELD VERIFYING THE DIMENSIONAL SIZES OF ROOMS AND BUILDING SYSTEMS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO SUBMITTING A BID.
7. ARCHITECTURAL AND ENGINEERING SPECIFICATIONS AND DRAWINGS ARE PROVIDED TO DESCRIBE AND ILLUSTRATE THE INTENT OF THE PROPOSED RENOVATION WORK TO BE PERFORMED IN THE CONSTRUCTION CONTRACT.
8. THE ARCHITECTURAL AND ENGINEERING SPECIFICATIONS AND DRAWINGS DO NOT REPRESENT A PRECISE DESCRIPTION AND ILLUSTRATION OF THE EXISTING CONDITIONS.
9. ALL DIMENSIONAL INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS ARE FOR REFERENCE ONLY FOR THE CONTRACTOR'S AND SUBCONTRACTORS' USE IN FIELD VERIFYING EXISTING CONDITIONS.
10. THE CONTRACTOR AND SUBCONTRACTORS SHALL VERIFY THE EXISTING CONDITIONS PRIOR TO COMMENCING ANY CONSTRUCTION WORK AND SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT.
11. THE CONTRACTOR (GC OR CM) AND SUBCONTRACTORS SHALL PROVIDE A BID PRICE PER THE SCOPE OF THE WORK AS IT RELATES TO THE EXISTING CONDITIONS.



**2** LOCATION MAP  
G001 NOT TO SCALE

PERMITTING AUTHORITY USE ONLY



**1** VICINITY MAP  
G001 NOT TO SCALE

**Project Scope of Work:** The entire project scope of work consists of the following two volumes of documents:

1. Tommy Smith Elementary School Equipment Package
  - a. Architect Project Number 22045B
  - b. Bid Documents dated June 13, 2024
2. Tommy Smith Elementary School Renovations
  - a. Architect Project Number 22045D
  - b. Bid Documents dated XXXX XX, 2024

VOLUME 1  
TOMMY SMITH ELEMENTARY  
SCHOOL RENOVATIONS  
22045D

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VOLUME 2  
TOMMY SMITH ELEMENTARY  
SCHOOL RENOVATIONS  
22045D

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TOMMY SMITH ELEMENTARY  
SCHOOL RENOVATIONS  
22045D

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PROJECT

VOLUME 2

ELEMENTARY SCHOOL

TOMMY SMITH  
RENOVATIONS

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER

BAY  
DISTRICT  
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ARCHITECT'S SEAL



H. MILLER CALDWELL, JR.  
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Schematic Design: None  
Design Development: 20 July 2023  
CD Owner Review Set: 18 January 2024  
Bid Documents: 03 June 2024

Architect Issued  
to CM for Bidding 03 June 2024

SHEET TITLE

SHEET INDEX AND  
NOTES

SHEET NUMBER

G002B

GENERAL NOTES

- 1. ALL DUCT DIMENSIONS ARE NET INSIDE. 2. VERIFY COLLAR SIZES ON ALL AIR TERMINALS... 3. FIELD VERIFY CLEAR SPACE AVAILABLE... 4. CONTRACTOR SHALL INSTALL ALL EQUIPMENT... 5. PROVIDE DUCT FLEX CONNECTIONS & VIBRATION ISOLATION... 6. WASTE VENT STACKS, EXHAUST FANS, ETC. SHALL BE A MINIMUM OF 10 FT. FROM OUTSIDE AIR INTAKES... 7. ALL SUPPLY, RETURN, EXHAUST AND OUTSIDE AIR INTAKE DUCTWORK SHALL BE GALVANIZED SHEET METAL... 8. ALL AHU FILTERS SHALL BE OF A READILY AVAILABLE SIZE... 9. PROVIDE ACCESS PANELS IN HARD CEILINGS... 10. ALL BIRD AND INSECT SCREENS SHALL BE ANODIZED ALUMINUM... 11. BECAUSE OF THE SMALL SCALE OF CONTRACT DOCUMENTS... 12. THIS PROJECT SHALL INCLUDE COMMISSIONING... 13. ALL WORK SHALL COMPLY WITH 8TH EDITION (2023) FLORIDA BUILDING CODE... 14. SEAL AND PROTECT ALL WORK IN PROGRESS...

DUCTWORK AND INSULATION GENERAL NOTES

- 1. ALL ROUND FLEXIBLE DUCT SHALL BE FLEXMASTER TYPE... 2. SEAL ALL DUCT PENETRATIONS OF WALLS AND FLOORS... 3. UNLESS OTHERWISE INDICATED, ALL SUPPLY AIR DUCTWORK... 4. ALL SUPPLY AIR DUCTWORK DOWNSTREAM OF TERMINAL UNITS... 5. ALL RETURN AIR DUCTWORK SHALL BE LOW PRESSURE... 6. ALL OUTSIDE AIR INTAKE DUCTWORK SHALL BE LOW PRESSURE... 7. STANDARD EXHAUST AIR DUCTWORK SHALL BE LOW PRESSURE... 8. AVOID ROUTING DUCTWORK AND TUS WITHIN 6" OF TOP OF LIGHT FIXTURES... 9. PROVIDE MVD'S AT ALL TAKEOFFS FROM MAIN DUCTS.

PUMP SCHEDULE

Table with 3 columns: DESIGNATION, CHP-1, CHP-2. Rows include USE, MANUFACTURER - MODEL, TYPE, SUCTION SIZE (IN.), DISCHARGE SIZE (IN.), PUMP TYPE, CAPACITY (GPM), TOTAL HEAD (FT. H2O), RPM, MINIMUM EFFICIENCY (%), MOTOR HP (MAX), VOLTAGE/PHASE.

- NOTES: 1. ALL PUMPS SHALL BE BRONZE FITTED. 2. ALL PUMPS SHALL HAVE ENERGY EFFICIENT INVERTER READY MOTORS.

AIR DEVICE SCHEDULE

Table with 5 columns: MARK, MAX AIRFLOW CFM, AIR DEVICE SIZE, DUCT CONNECTION SIZE, TITUS MODEL. Rows include CD-1 CFM, CD-2 CFM, CD-3 CFM, SS-1 CFM, SS-2 CFM.

- NOTES: 1. MAX NC=20. 2. PROVIDE 2x2 LAY IN PANEL FOR AIR DEVICES IN LAY IN CEILINGS. 3. PROVIDE BEVELED MOUNTING FRAME FOR CEILING DIFFUSERS IN HARD CEILINGS. 4. PROVIDE FLAT MOUNTING FRAME FOR GRILLES LOCATED IN HARD CEILINGS. 5. PROVIDE ALUMINUM BIRD SCREEN FOR SOFFIT GRILLES.

DUCT AIR LEAKAGE TESTING NOTE: AFTER DEMOLITION AND NEW WORK IS COMPLETE, CONTRACTOR SHALL TEST ALL MEDIUM PRESSURE DUCT UPSTREAM OF TERMINAL UNITS FOR AIR LEAKAGE... CONTRACTOR SHALL THEN DOCUMENT ALL AIR LEAKS DISCOVERED IN A REPORT DELIVERED TO THE ENGINEER AND SCHOOL DISTRICT PERSONNEL...

AIR VOLUME TERMINAL UNIT SCHEDULE

Table with columns: MARK, TOTAL CFM, COOL CFM MIN, HEATING CFM MAX, EAT (DB), LAT (F), KW, VOLTS/PHASE, MCA, MOP, SOUND POWER AT 0.5' (REF. CFM, DISCHARGE, RADIATED), INLET SIZE (IN.), MANUFACTURER, MODEL NUMBER.

- TERMINAL UNIT SCHEDULE NOTES: 1. ALL VAV TERMINAL UNITS SHALL BE PRESSURE INDEPENDENT. 2. PROVIDE ALL VAV TERMINAL UNITS WITH ACCESS PANEL TO ALLOW SERVICING OF AIR VALVE WITHOUT DISCONNECTING DUCT WORK. 3. PROVIDE ALL VAV TERMINAL UNITS WITH FOIL FACED INSULATION. 4. SOUND DATA FOR DISCHARGE NC BASED ON 10 dB ROOM ABSORPTION... FOOT ROOM VOLUME, DISTANCE OF 8', AND MAX 500 CFM PER DIFFUSER. 5. SOUND DATA FOR RADIATED NC BASED ON 10 dB ROOM ABSORPTION... 6. PROVIDE VAV TERMINAL UNITS WITH FACTORY MULTIPOINT FLOW SENSOR. 7. PROVIDE FACTORY MOUNTED CONTROLS TRANSFORMER AT VOLTAGE SHOWN IN SCHEDULE TO SUPPLY 24 VOLT POWER TO DAMPER ACTUATOR AND CONTROLS. 8. PROVIDE INTERLOCK TYPE DOOR DISCONNECT SWITCH.

LEGEND

Legend section containing symbols and descriptions for equipment tags (RTU-1, M3, M3), duct types (rectangular, flat oval, round, externally insulated), valves (gate, two-way, three-way), and other components like dampers, fans, and sensors.

100% OUTSIDE AIR UNIT SCHEDULE - ALREADY ORDERED (SEE HVAC BID PACKAGE)

Table with columns: UNIT OAU, BASIS OF DESIGN, OAU MODEL, CONFIGURATION, OA (CFM), ESP (IN. WC), FAN (HP), COOLING (EAT, LAT, TOTAL, SENSIBLE, ISMRE), HEATING (EAT, LAT), STAGES, KW, OAU ELECTRICAL (VOLTS/PHASE, MCA, MOP), NOTES.

- 1. DIRECT DRIVE FAN WITH ECM MOTOR. 2. REFER TO CONDENSING UNIT SCHEDULE FOR EFFICIENCIES. 3. ESP DOES NOT INCLUDE FILTER, CASING, ETC. 4. PROVIDE 100% OUTSIDE AIR DEHUMIDIFICATION UNIT WITH HOT GAS REHEAT UNIT LEAVING AIR TEMPERATURE SHALL BE 70°F DB BUILD ADJUSTABLE. 5. PROVIDE MOTORIZED OA DAMPER. 6. PROVIDE DIGITAL CONTROLLER WITH BACNET MSTP CARD. 7. PROVIDE COATED INDOOR COILS, NON FUSED DISCONNECT, PHASE FAILURE MONITOR, DIRTY FILTER SWITCH, OUTSIDE AIR TEMPERATURE SENSOR, DISCHARGE AIR TEMPERATURE SENSOR AND LEAVING COIL TEMPERATURE SENSOR. 8. PROVIDE FULLY MODULATING INVERTER COMPRESSORS WITH AUTO CHANGEOVER FUNCTIONS. 9. ISMRE IS INTEGRATED SEASONAL MOISTURE REMOVAL EFFICIENCY.

CUSTOM AIR HANDLING UNIT SCHEDULE- ALREADY ORDERED (SEE HVAC BID PACKAGE)

Table with columns: UNIT DESIGNATION, TYPE, FAN TYPE, AIR VOLUME CONTROL, MAX. AIR FLOW (CFM), MIN. AIR FLOW (CFM), MIN. OA DAMPER (CFM), APPROX. ESP (IN. W.G.), TOTAL SP (IN. W.G.), MAXIMUM FAN MOTOR HORSEPOWER, NOM MOTOR RPM, MAX. FACE VELOCITY (FPM), UNIT TOTAL CAPACITY (MBH), UNIT SENSIBLE CAPACITY (MBH), AIR SIDE (EAT, LAT, FLOW, EWT, LWT), WATER SIDE (MAX. W/P, CONTROL VALVE), FILTER SECTION (TYPE, EFF, THICKNESS), NOTES.

- SCHEDULE LEGEND: HDT - HORIZONTAL DRAW THRU, SDU - STACKED DEHUMIDIFICATION UNIT, FC - FORWARD CURVED, DDPF - DIRECT DRIVE PLENUM FAN, BC - BACKWARD CURVED. SZVAV - VARIABLE AIR VOLUME, SINGLE ZONE, VAV - VARIABLE AIR VOLUME, MULTIPLE ZONES, CV - CONSTANT VOLUME. SCHEDULE NOTES: 1. ESP DOES NOT INCLUDE PRESSURE DROP THROUGH AHU CASING OR COILS. 2. TOTAL SP INCLUDES PRESSURE DROP THROUGH CASING, COILS, AND MID LIFE FILTER PRESSURE. 3. DROP AVERAGE ATMOSPHERIC DUST SPOT EFFICIENCY BASED ON ASHRAE 52-76. 4. BASIS OF DESIGN: DRAIN CAH CUSTOM AIR HANDLING UNIT. 5. 2" THICKNESS MERV 8 PRE FILTERS AND SPECIFIED FINAL FILTERS. 6. VARIABLE FREQUENCY DRIVE WITH BUILT IN DISCONNECT FOR FAN MOTOR PROVIDED BY DDC CONTRACTOR. 7. 200V 3 PHASE. 8. MAX FACE VELOCITY FOR CHILLED WATER COIL IN REFERENCE TO MAX AIRFLOW.

- ALREADY ORDERED (SEE HVAC BID PACKAGE)

SPLIT SYSTEM HEAT PUMP SCHEDULE

UNIT AHU/HP	BASIS OF DESIGN	MODEL HP/AHU	SA (CFM)	OA (CFM)	ESP (IN. H2O)	FAN (HP)	COOLING			HEATING			SUPPL. HEAT	AHU ELECTRICAL			HP ELECTRICAL			NOTES			
							MAT* (DB/WB)	OAT* (DB/WB)	TOTAL (BTU/H)	SEER	MAT* (DB)	OAT* (DB)		TOTAL (BTU/H)	HSPE2	VOLTS/PHASE	MCA	MOP	VOLTS/PHASE		MCA	MOP	
1.1	IRANE	TWA12044D/TWE12044BAA	4140	170	0.4	1.5	72.5/63.7	95/77	111900	98500	11.4 EER	68.7	25	53700	-	24.92kW	460/3	42	45	460/3	21	25	1,2,3,4,5,7,8
1.2	IRANE	4TWR4024N1/TEM6A0B24H21	795	150	0.25	1/3	72.3/61.5	95/77	17900	15200	14.6	71.3	25	6200	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
1.3	IRANE	4TWR4024N1/TEM6A0B24H21	870	150	0.25	1/3	72.1/61.3	95/77	19200	16500	14.6	71.3	25	8300	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
1.4	IRANE	4TWR4024N1/TEM6A0B24H21	915	150	0.25	1/3	72.3/61.4	95/77	20500	17800	14.6	71.3	25	6800	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
1.5	IRANE	4TWR4030N1/TEM6A0B30H21	855	170	0.25	1/2	72.0/61.5	95/77	19100	16100	14.6	71.4	25	7000	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
1.6	IRANE	4TWR4036N1/TEM6A0C36H31	1120	135	0.25	1/2	72.1/61.7	95/77	23200	20100	14.3	71.0	25	8300	7.5	3.60kW	208/1	27	30	208/1	18	30	1,2,3,4,5,7,8
1.7	IRANE	4TWR4036N1/TEM6A0C36H31	1135	150	0.25	1/2	72.2/61.4	95/77	25100	21700	14.3	71.3	25	8500	7.5	2.88kW	208/1	23	25	208/1	18	30	1,2,3,4,5,7,8
1.8	IRANE	4TWR4036N1/TEM6A0C36H31	1020	125	0.25	1/2	72.1/61.3	95/77	21100	18700	14.3	71.6	25	9600	7.5	3.60kW	208/1	27	30	208/1	18	30	1,2,3,4,5,7,8
2.1	IRANE	4TWR4036N1/TEM6A0C36H31	1230	150	0.25	1/2	72.1/62.5	95/77	25100	20900	14.3	71.3	25	12500	7.5	3.60kW	208/1	27	30	208/1	18	30	1,2,3,4,5,7,8
2.2	IRANE	4TWR4030N1/TEM6A0B30H21	885	155	0.25	1/2	72.2/61.7	95/77	20900	16900	14.6	71.3	25	6900	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
2.3	IRANE	4TWR4030N1/TEM6A0B30H21	1095	155	0.25	1/2	72.1/61.4	95/77	24200	20700	14.6	71.3	25	10400	7.8	3.60kW	208/1	27	30	208/1	15	20	1,2,3,4,5,7,8
2.4	IRANE	4TWR4030N1/TEM6A0B30H21	1010	170	0.25	1/2	72.2/62.6	95/77	21000	17500	14.6	71.3	25	10100	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
2.5	IRANE	4TWR4030N1/TEM6A0B30H21	840	150	0.25	1/2	72.1/61.6	95/77	19200	15900	14.6	71.3	25	8900	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
2.6	IRANE	4TWR4030N1/TEM6A0B30H21	935	150	0.25	1/2	72.1/61.4	95/77	20700	17700	14.6	71.4	25	8900	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
2.7	IRANE	4TWR4030N1/TEM6A0B30H21	1015	170	0.25	1/2	72.1/61.5	95/77	22800	19200	14.6	71.1	25	6600	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
2.8	IRANE	4TWR4024N1/TEM6A0B24H21	795	150	0.25	1/3	71.9/61.5	95/77	18400	15200	14.6	71.3	25	6800	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
2.9	IRANE	4TWR4030N1/TEM6A0B30H21	980	150	0.25	1/2	72.0/61.9	95/77	20700	17500	14.6	71.4	25	11800	7.8	3.60kW	208/1	27	30	208/1	15	20	1,2,3,4,5,7,8
2.10	IRANE	4TWR4036N1/TEM6A0C36H31	1265	150	0.25	1/2	72.1/62.9	95/77	23700	19900	14.3	71.3	25	12000	7.5	3.60kW	208/1	27	30	208/1	18	30	1,2,3,4,5,7,8
2.11	IRANE	4TWR4030N1/TEM6A0B30H21	1065	170	0.25	1/2	72.0/61.5	95/77	23200	19700	14.6	71.5	25	10200	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.1	IRANE	4TWR4030N1/TEM6A0B30H21	905	160	0.25	1/2	72.0/61.3	95/77	20900	17200	14.6	71.3	25	7400	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.2	IRANE	4TWR4030N1/TEM6A0B30H21	990	150	0.25	1/2	72.0/62.9	95/77	19600	16100	14.6	71.3	25	9400	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.3	IRANE	4TWR4024N1/TEM6A0B24H21	870	150	0.25	1/3	72.0/61.2	95/77	19600	16700	14.6	71.3	25	6800	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
3.4	IRANE	4TWR4030N1/TEM6A0B30H21	960	150	0.25	1/2	72.2/61.4	95/77	20900	18300	14.6	71.3	25	7800	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.5	IRANE	4TWR4030N1/TEM6A0B30H21	995	170	0.25	1/2	72.2/61.4	95/77	22000	18900	14.6	71.4	25	7900	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.6	IRANE	4TWR4024N1/TEM6A0B24H21	900	150	0.25	1/3	72.0/61.2	95/77	20000	17000	14.6	71.4	25	7300	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
3.7	IRANE	4TWR4030N1/TEM6A0B30H21	870	150	0.25	1/2	72.2/61.5	95/77	19400	16500	14.6	71.3	25	5700	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.8	IRANE	4TWR4024N1/TEM6A0B24H21	730	150	0.25	1/3	72.0/61.2	95/77	16800	14100	14.6	71.2	25	6100	7.8	2.88kW	208/1	20	20	208/1	15	25	1,2,3,4,5,7,8
3.9	IRANE	4TWR4030N1/TEM6A0B30H21	900	170	0.25	1/2	72.1/61.6	95/77	20200	17100	14.6	71.3	25	7400	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.10	IRANE	4TWR4036N1/TEM6A0C36H31	1110	150	0.25	1/2	72.1/61.3	95/77	22900	19300	14.3	71.1	25	10200	7.5	2.88kW	208/1	23	25	208/1	18	30	1,2,3,4,5,7,8
3.11	IRANE	4TWR4030N1/TEM6A0B30H21	945	150	0.25	1/2	72.2/61.3	95/77	20900	17900	14.6	71.3	25	7400	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.12	IRANE	4TWR4030N1/TEM6A0B30H21	1135	170	0.25	1/2	72.0/62.3	95/77	23900	19600	14.6	71.4	25	11300	7.8	3.60kW	208/1	27	30	208/1	15	20	1,2,3,4,5,7,8
3.13	IRANE	4TWR4030N1/TEM6A0B30H21	915	150	0.25	1/2	72.0/61.5	95/77	19400	16900	14.6	71.2	25	10200	7.8	3.60kW	208/1	27	30	208/1	15	20	1,2,3,4,5,7,8
3.14	IRANE	4TWR4030N1/TEM6A0B30H21	900	150	0.25	1/2	72.3/62.3	95/77	20100	17200	14.6	71.4	25	7000	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8
3.15	IRANE	4TWR4030N1/TEM6A0B30H21	1070	150	0.25	1/2	72.1/61.4	95/77	20600	18000	14.6	71.4	25	11000	7.8	2.88kW	208/1	23	25	208/1	15	20	1,2,3,4,5,7,8

1. PROVIDE 2" ± 30% FILTERS AND FILTER HOUSING SHOWN IN DETAILS.
2. EFFICIENCIES IN ACCORDANCE WITH ARI STANDARD 210/240.
3. ESP DOES NOT INCLUDE FILTER, CASING, ETC.
4. PROVIDE CONTROL KIT TO INCLUDE BLOWER CONTACTOR OR STARTER, TRANSFORMER, ELECTRIC HEATER INTERLOCKS.
5. ELECTRICAL SERVICE SHALL BE A SINGLE POINT OF CONNECTION. PROVIDE THERMAL EXPANSION VALVES.
6. DIRECT DRIVE AHU FAN.
7. COOLING CAPACITY IS NET AND DOES NOT INCLUDE FAN HEAT.
8. PROVIDE UNIT MOUNTED CIRCUIT BREAKER FOR INDOOR AIR HANDLERS.

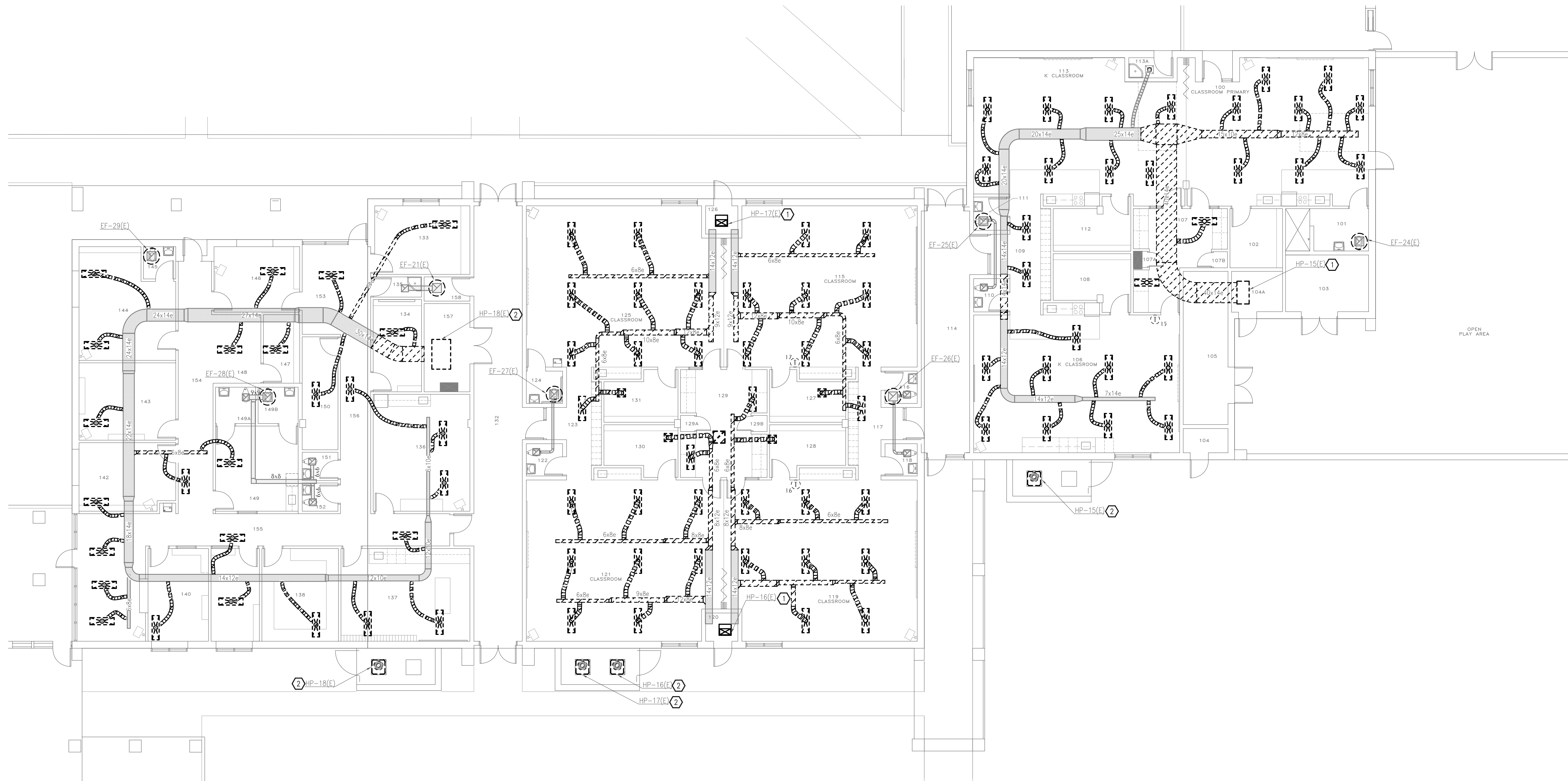
- ALREADY ORDERED (SEE HVAC BID PACKAGE)

AIR PURIFICATION EQUIPMENT SCHEDULE

ZONE AHU	SUPPLY CFM	OA CFM	PRESS. IN. W.C.	BASIS OF DESIGN	MODEL	QUANTITY	ELECTRICAL		NOTES
							VOLTS/PHASE	WATTS	
1.1	4140	170	<0.01	GPS	DMH8	1	24 VAC/1	12	1,2,3,4
1.2	795	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
1.3	870	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
1.4	915	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
1.5	855	170	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
1.6	1120	135	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
1.7	1135	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
1.8	1020	125	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.1	1230	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.2	885	155	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.3	1095	155	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.4	1010	170	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.5	840	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.6	935	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.7	1015	170	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.8	795	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.9	980	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.10	1265	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
2.11	1065	170	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
3.1	905	160	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
3.2	990	150	<0.01	GPS	DM2	1	24 VAC/1	11	1,2,3,4
3.3									

**SHEET NOTES**

- ① HEAT PUMP TO BE REMOVED. REMOVE ASSOCIATED REFRIGERANT PIPING.
- ② AIR HANDLING UNIT TO BE REMOVED. REMOVE ALL ASSOCIATED DUCTWORK FROM INSIDE MECHANICAL ROOM.



**1 HVAC DEMOLITION PLAN - BUILDING 1**  
 M101 SCALE: 1/8" = 1'-0"

**PROJECT VOLUME 2**

**TOMMY SMITH ELEMENTARY SCHOOL RENOVATIONS**

5044 TOMMY SMITH DR.  
 PANAMA CITY, FL 32404

**OWNER**  
 BAY DISTRICT SCHOOLS

ARCHITECT'S SEAL

**NOT FOR CONSTRUCTION**

**PROJECT TEAM**  
 ARCHITECTURAL  
 Caldwell Associates  
 PLUMBING  
 Watford Engineering  
 MECHANICAL  
 Watford Engineering  
 ELECTRICAL  
 HG Engineers

**PROJECT NUMBERS**  
 Architect No: 22045B

**DELIVERABLES**  
 Schematic Design: None  
 Design Development: 20 JULY 2023  
 Bid Documents: TBD  
 Architect Issued to CM for Bidding 03 June 2024

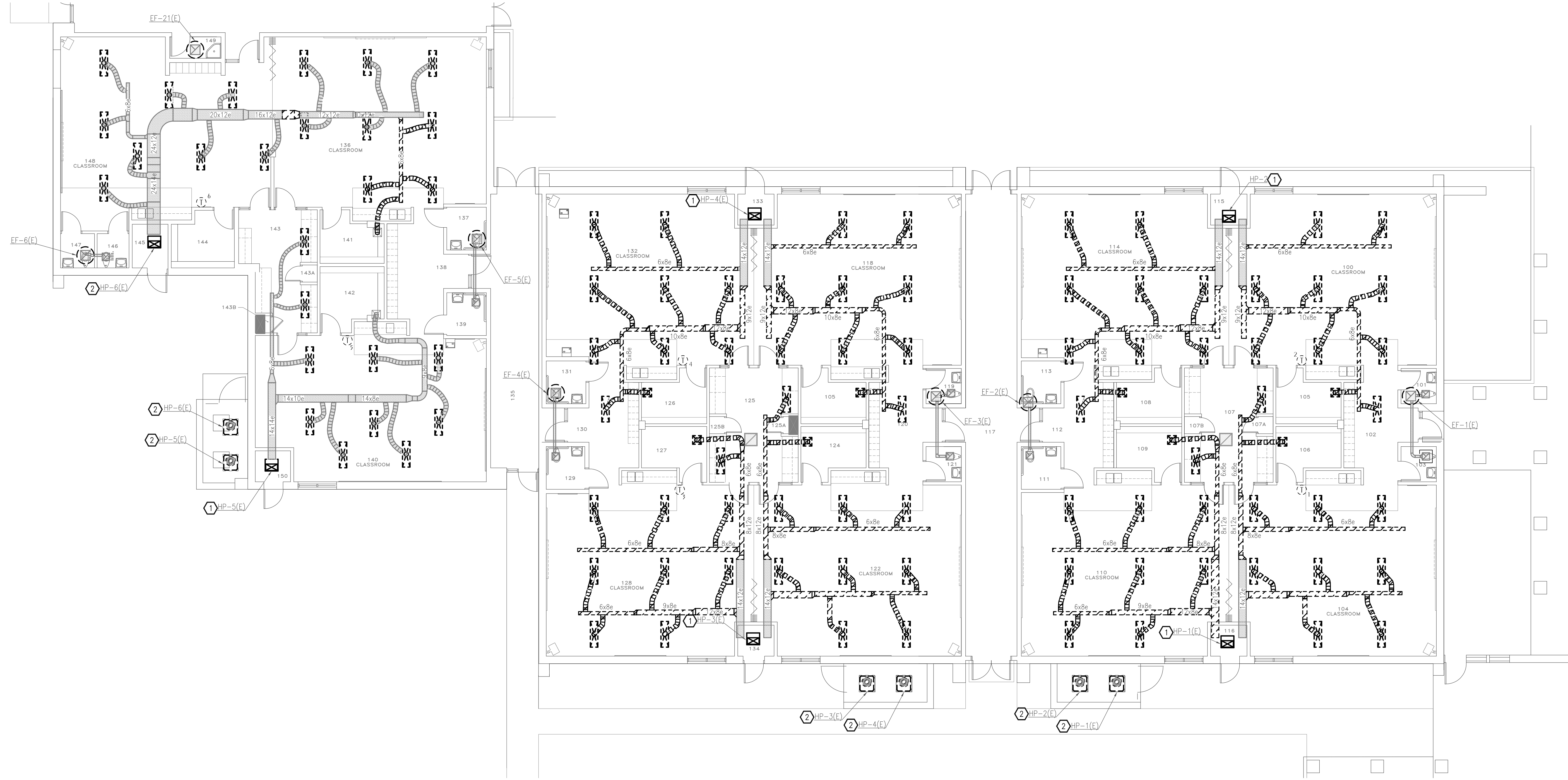
**SHEET TITLE**  
 HVAC DEMOLITION PLAN - BLDG. 1

**SHEET NUMBER**  
**M101**

**WATFORD ENGINEERING**  
 Florida CA Number: 27125  
 Keith A. Johnson, PE  
 Florida License Number: 95457  
 800.526.3647  
 Project Number: 2025018  
 Created By: JAG  
 Drawn By: JVB

**SHEET NOTES**

- ① HEAT PUMP TO BE REMOVED. REMOVE ASSOCIATED REFRIGERANT PIPING.
- ② AIR HANDLING UNIT TO BE REMOVED. REMOVE ALL ASSOCIATED DUCTWORK FROM INSIDE MECHANICAL ROOM.



**1** HVAC DEMOLITION PLAN - BUILDING 2  
 M102 SCALE: 1/8" = 1'-0"

PROJECT  
**VOLUME 2**

TOMMY SMITH ELEMENTARY SCHOOL  
**TOMMY SMITH RENOVATIONS**  
 5044 TOMMY SMITH DR.  
 PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**  
 ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

PROJECT TEAM  
**ARCHITECTURAL**  
 Caldwell Associates  
**PLUMBING**  
 Watford Engineering  
**MECHANICAL**  
 Watford Engineering  
**ELECTRICAL**  
 HG Engineers

PROJECT NUMBERS  
 Architect No: 22045B

DELIVERABLES  
 Schematic Design: None  
 Design Development: 20 JULY 2023  
 Bid Documents: TBD  
**Architect Issued**  
 to CM for Bidding 03 June 2024

SHEET TITLE  
 HVAC DEMOLITION  
 PLAN - BLDG. 2

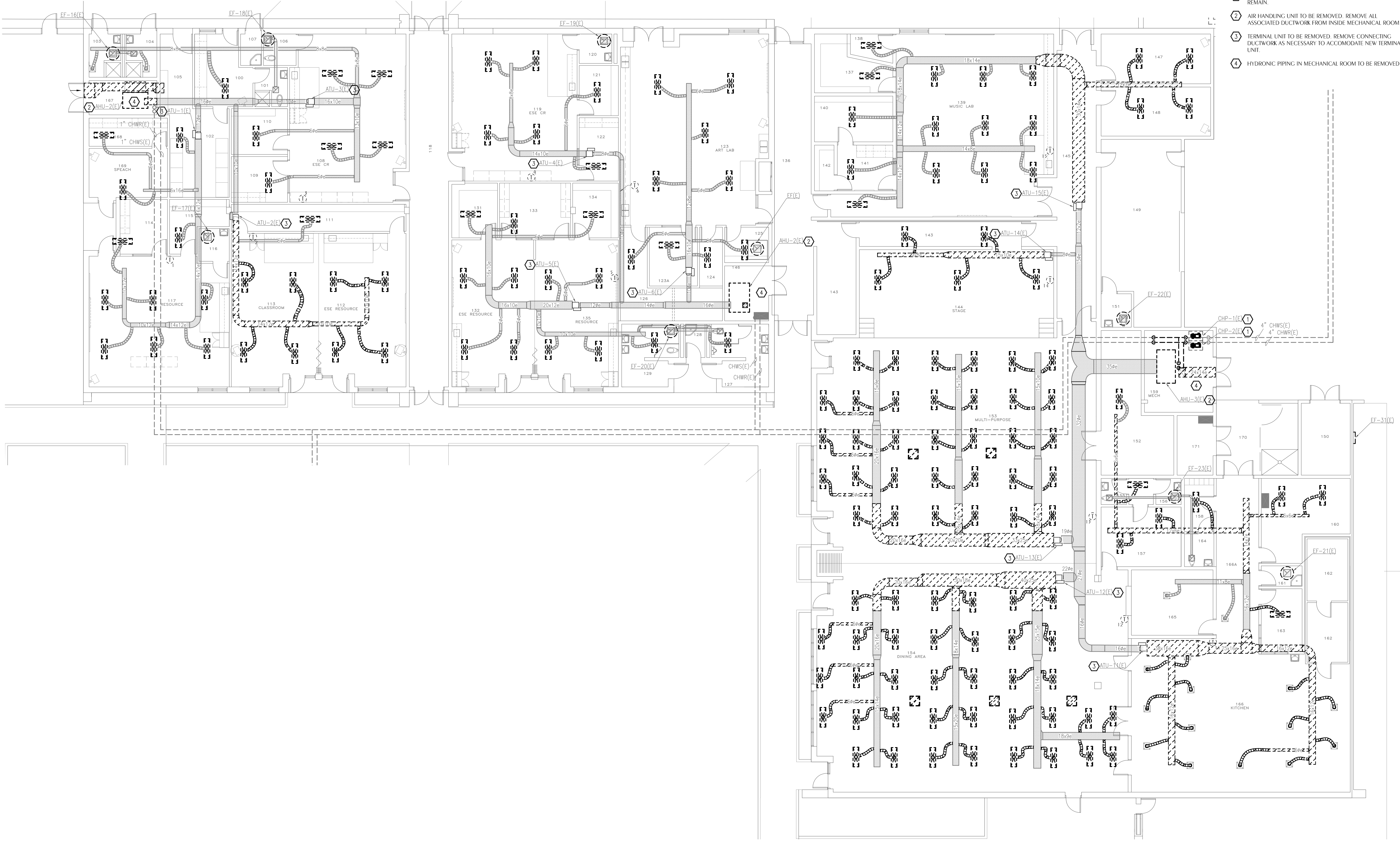
SHEET NUMBER  
**M102**

**WATFORD ENGINEERING**  
 4452 Clinton Street Marietta, Florida 32448  
 311 N. College St. Office 1018 Auburn, AL 36801  
 Florida CA Number: 27125  
 Keith A. Johnson PE  
 Florida License Number: 95457  
 800.526.3447  
 Project Number: 2025018  
 Created By: JAW  
 Drawn By: JVB



**SHEET NOTES**

- ① CHILLER PUMP TO BE REMOVED. HOUSEKEEPING PAD TO REMAIN.
- ② AIR HANDLING UNIT TO BE REMOVED. REMOVE ALL ASSOCIATED DUCTWORK FROM INSIDE MECHANICAL ROOM.
- ③ TERMINAL UNIT TO BE REMOVED. REMOVE CONNECTING DUCTWORK AS NECESSARY TO ACCOMMODATE NEW TERMINAL UNIT.
- ④ HYDRONIC PIPING IN MECHANICAL ROOM TO BE REMOVED.



**HVAC DEMOLITION PLAN - BUILDING 4**  
 SCALE: 1/8" = 1'-0"

PROJECT  
**VOLUME 2**

**TOMMY SMITH ELEMENTARY SCHOOL RENOVATIONS**

5044 TOMMY SMITH DR.  
 PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**  
 ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

PROJECT TEAM  
 ARCHITECTURAL  
 Caldwell Associates  
 PLUMBING  
 Watford Engineering  
 MECHANICAL  
 Watford Engineering  
 ELECTRICAL  
 HG Engineers

PROJECT NUMBERS  
 Architect No: 22045B

DELIVERABLES  
 Schematic Design: None  
 Design Development: 20 JULY 2023  
 Bid Documents: TBD  
 Architect Issued to CM for Bidding: 03 June 2024

SHEET TITLE  
 HVAC DEMOLITION PLAN - BLDG. 4

SHEET NUMBER  
**M104**

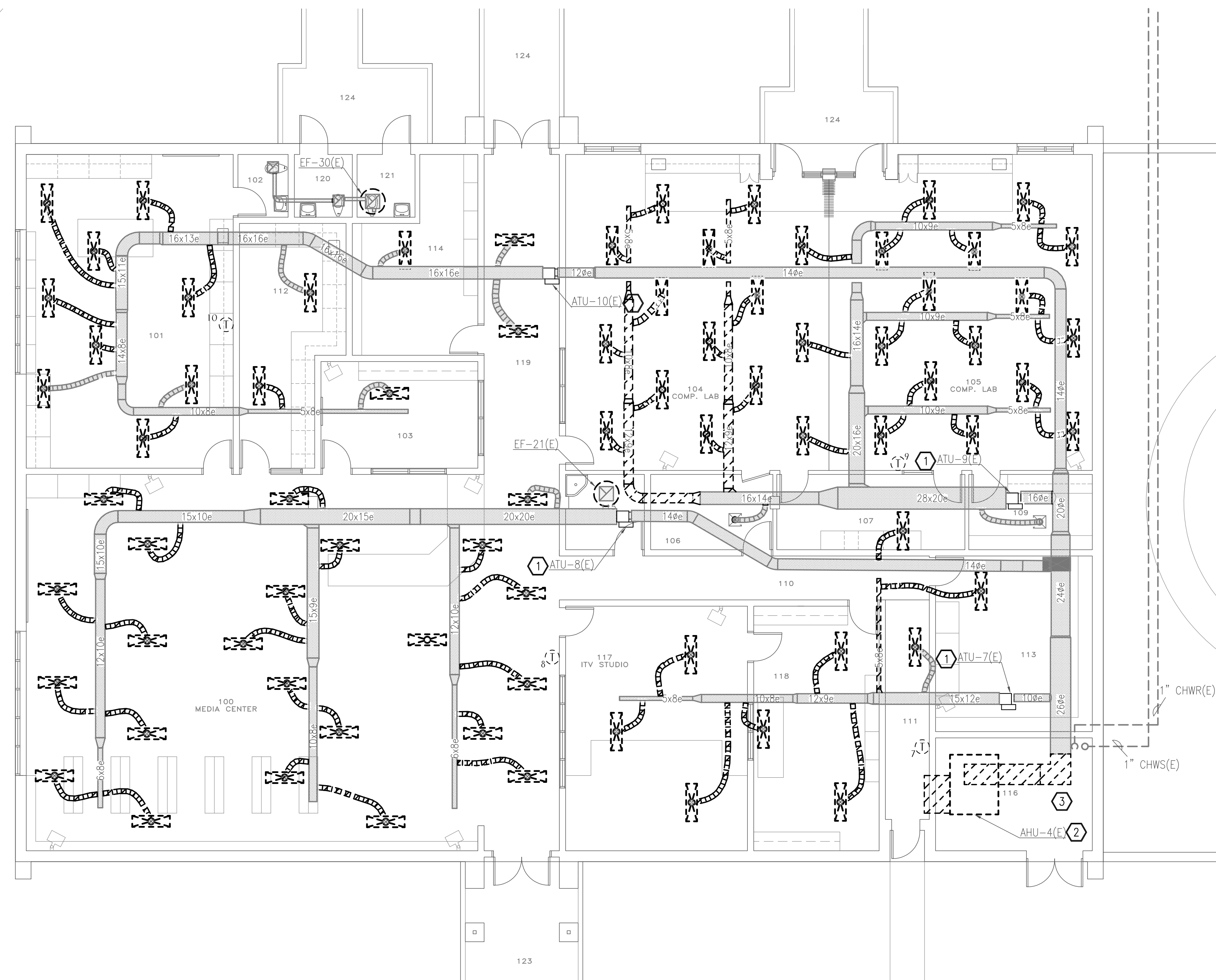
**WATFORD ENGINEERING**  
 4452 Clinton Street Marietta, Florida 32448  
 311 N. College St. Office 1010 Auburn, AL 36830

Florida CA Number: 27125  
 Keith A. Johnson PE  
 Florida License Number: 95457  
 800.526.3447  
 Project Number: 2025418  
 Created By: JAW  
 Drawn By: JVB



**SHEET NOTES**

- ① TERMINAL UNIT TO BE REMOVED. REMOVE CONNECTING DUCTWORK AS NECESSARY TO ACCOMMODATE NEW TERMINAL UNIT.
- ② AIR HANDLING UNIT TO BE REMOVED. REMOVE ALL ASSOCIATED DUCTWORK FROM INSIDE MECHANICAL ROOM.
- ③ HYDRONIC PIPING IN MECHANICAL ROOM TO BE REMOVED.



**1 HVAC DEMOLITION PLAN - BUILDING 5**  
M105 SCALE: 1/8" = 1'-0"

PROJECT  
**VOLUME 2**

ELEMENTARY SCHOOL

**TOMMY SMITH RENOVATIONS**

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**

ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

**PROJECT TEAM**

- ARCHITECTURAL**  
Caldwell Associates
- PLUMBING**  
Watford Engineering
- MECHANICAL**  
Watford Engineering
- ELECTRICAL**  
HG Engineers

**PROJECT NUMBERS**

Architect No: 22045B

**DELIVERABLES**

Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
**Architect Issued to CM for Bidding 03 June 2024**

**SHEET TITLE**

HVAC DEMOLITION  
PLAN - BLDG. 5

**SHEET NUMBER**

**M105**



**SHEET NOTES**

- 1 ROUTE NEW REFRIGERANT PIPING FROM AHU ABOVE CEILING TO EXTERIOR WALL, DOWN EXTERIOR WALL AND OVER TO APPROPRIATE HEAT PUMP UNIT. INSULATE ENTIRE LENGTH OF SUCTION PIPE WITH MINIMUM 3/4" FLEXIBLE UNICELLULAR INSULATION. PROVIDE INSULATION EXPOSED TO WEATHER WITH AN ALUMINUM JACKET.
- 2 PROVIDE MANUAL VOLUME DAMPER (MVD) IN VERTICAL OUTSIDE AIR DUCT.
- 3 PROVIDE NEW 3" TALL CONCRETE HOUSEKEEPING PAD MINIMUM 3" LARGER THAN NEW EQUIPMENT ON ALL SIDES.
- 4 PROVIDE HANGERS AND SUPPORTS AS NECESSARY AND INSTALL EXHAUST FAN IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. TRANSITION DUCTWORK AS NECESSARY TO CONNECT TO EXISTING.

PROJECT  
**VOLUME 2**

**TOMMY SMITH ELEMENTARY SCHOOL RENOVATIONS**

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**

ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

PROJECT TEAM

- ARCHITECTURAL  
Caldwell Associates
- PLUMBING  
Watford Engineering
- MECHANICAL  
Watford Engineering
- ELECTRICAL  
HG Engineers

PROJECT NUMBERS

Architect No: 220458

DELIVERABLES

Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
**Architect Issued to CM for Bidding 03 June 2024**

SHEET TITLE

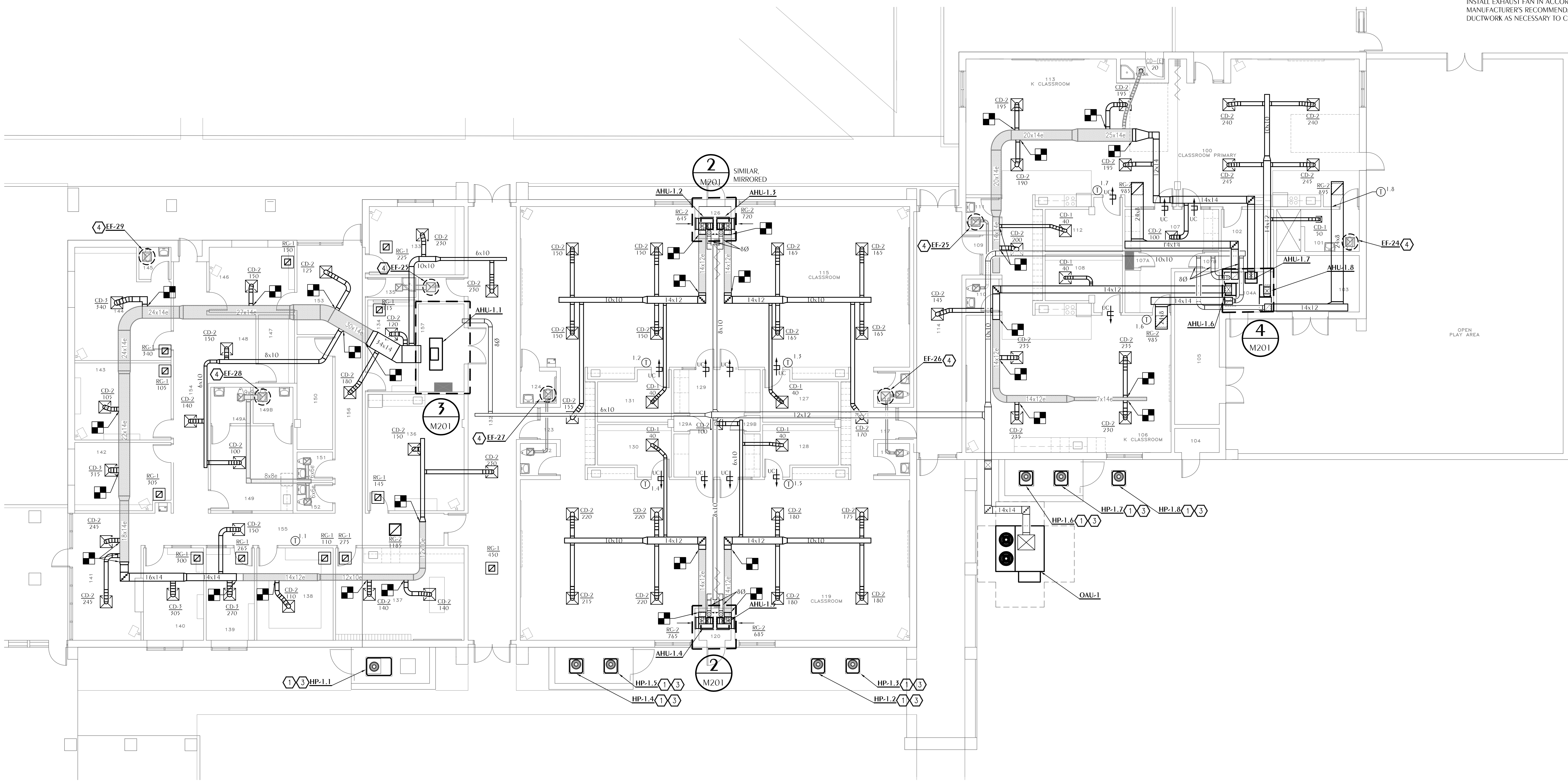
HVAC NEW WORK PLAN - BLDG. 1

SHEET NUMBER

**M201**

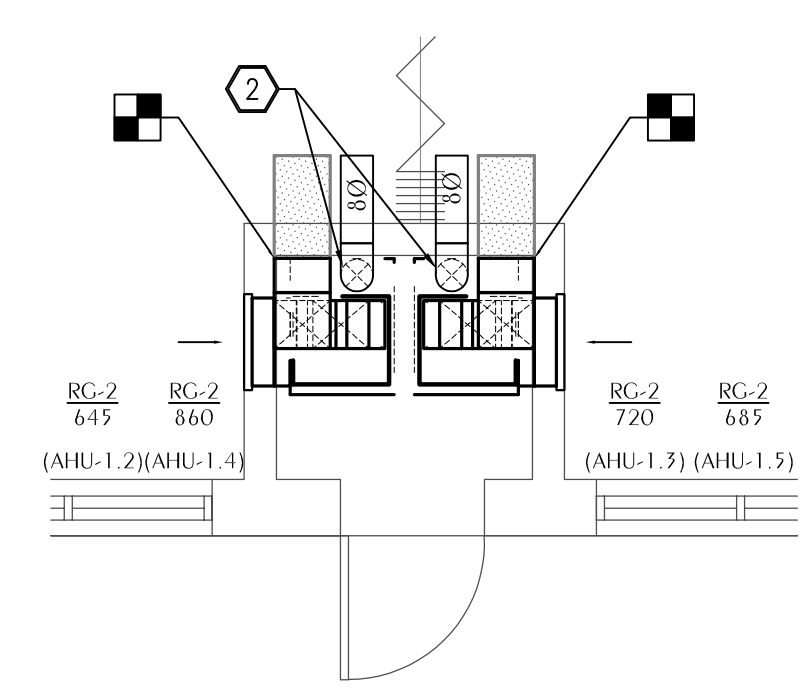
**WATFORD ENGINEERING**  
4452 Clinton Street Marietta, Florida 32448  
311 N. College St. Office 1010 Auburn, AL 36801

Florida CA Number: 27125  
Keith A. Johnson PE  
Florida License Number: 95457  
800.526.3447  
Project Number: 2025018  
Created By: JAW  
Drawn By: JVB

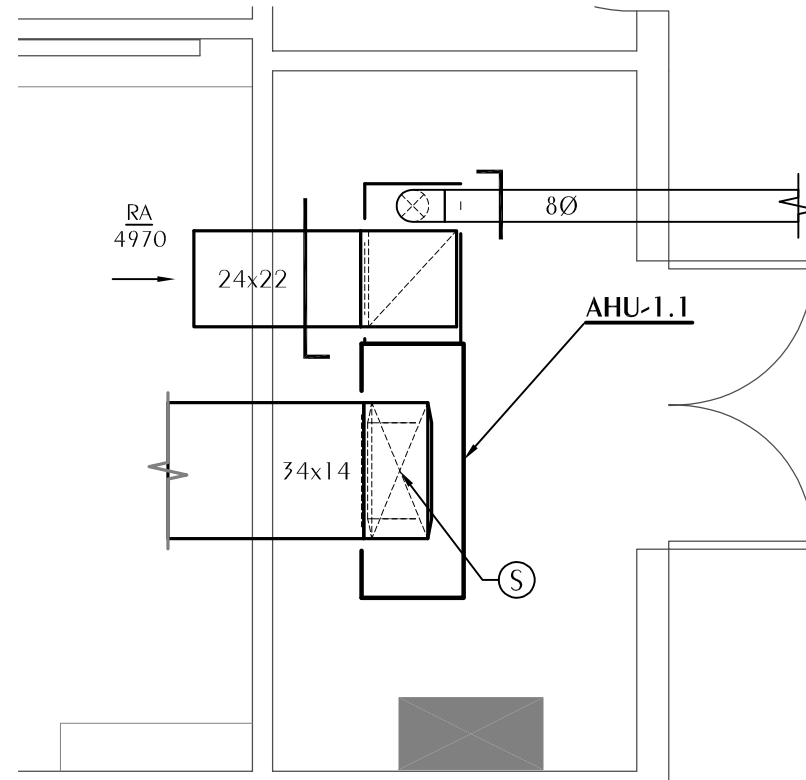


**1** HVAC NEW WORK PLAN - BUILDING 1  
SCALE: 1/8" = 1'-0"

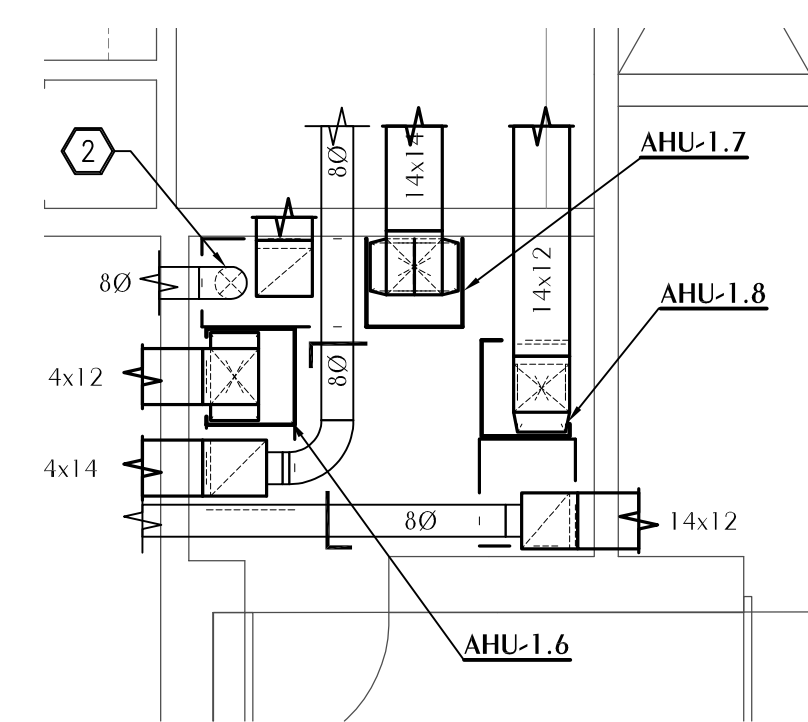
**2** HVAC ENLARGED NEW WORK PLAN  
SCALE: 1/4" = 1'-0"



**3** HVAC ENLARGED NEW WORK PLAN  
SCALE: 1/4" = 1'-0"



**4** HVAC ENLARGED NEW WORK PLAN  
SCALE: 1/4" = 1'-0"



**SHEET NOTES**

- 1 ROUTE NEW REFRIGERANT PIPING FROM AHU ABOVE CEILING TO EXTERIOR WALL, DOWN EXTERIOR WALL AND OVER TO APPROPRIATE HEAT PUMP UNIT. INSULATE ENTIRE LENGTH OF SUCTION PIPE WITH MINIMUM 3/4" FLEXIBLE UNICELLULAR INSULATION. PROVIDE INSULATION EXPOSED TO WEATHER WITH AN ALUMINUM JACKET.
- 2 PROVIDE MANUAL VOLUME DAMPER (MVD) IN VERTICAL OUTSIDE AIR DUCT.
- 3 PROVIDE NEW 3" TALL CONCRETE HOUSEKEEPING PAD MINIMUM 3" LARGER THAN NEW EQUIPMENT ON ALL SIDES.
- 4 PROVIDE HANGERS AND SUPPORTS AS NECESSARY AND INSTALL EXHAUST FAN IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. TRANSITION DUCTWORK AS NECESSARY TO CONNECT TO EXISTING.

PROJECT  
**VOLUME 2**

**TOMMY SMITH ELEMENTARY SCHOOL RENOVATIONS**

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**

ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

PROJECT TEAM

ARCHITECTURAL  
Caldwell Associates

PLUMBING  
Watford Engineering

MECHANICAL  
Watford Engineering

ELECTRICAL  
HG Engineers

PROJECT NUMBERS

Architect No: 22045B

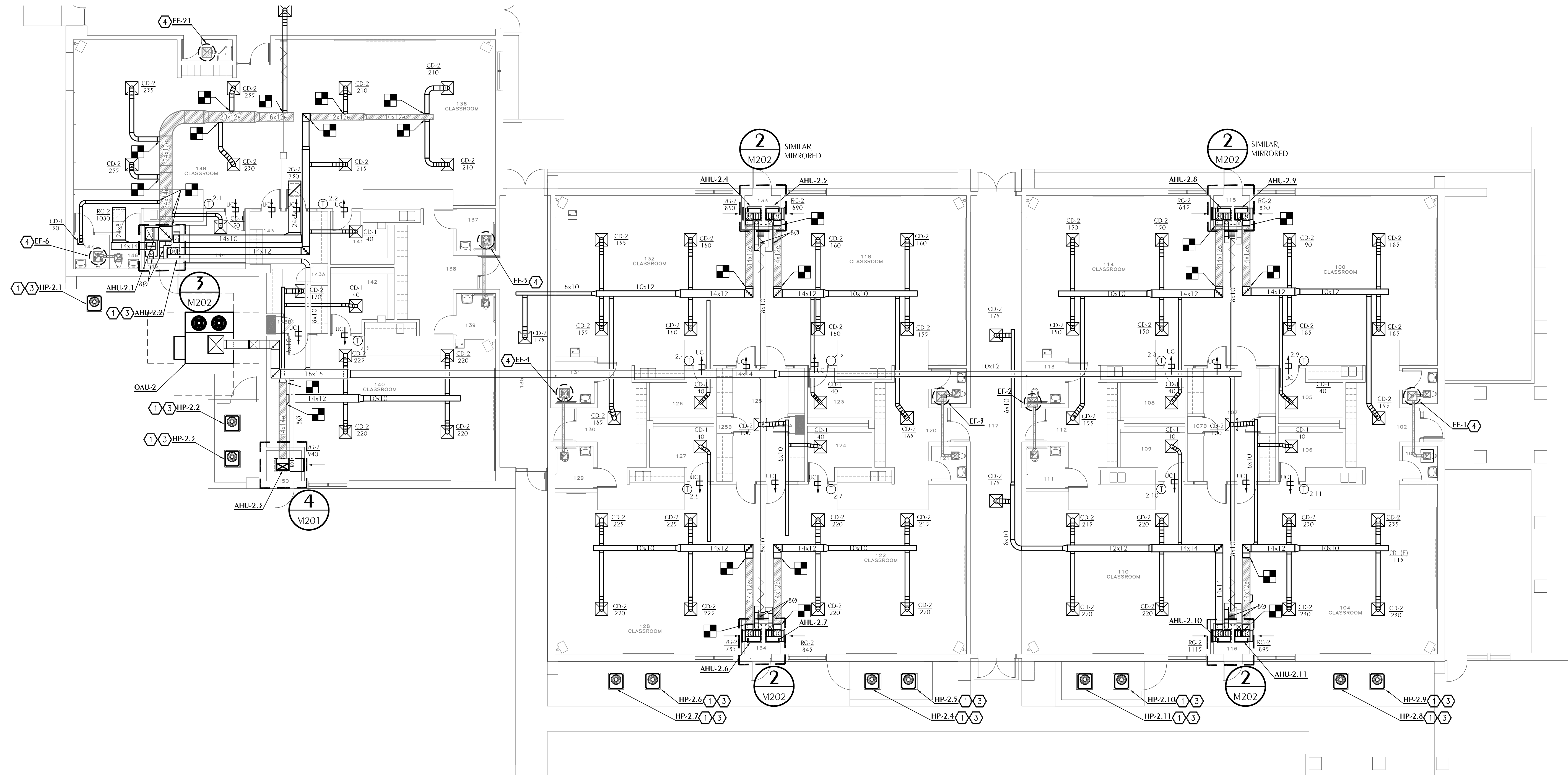
DELIVERABLES

Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
Architect Issued to CM for Bidding: 03 June 2024

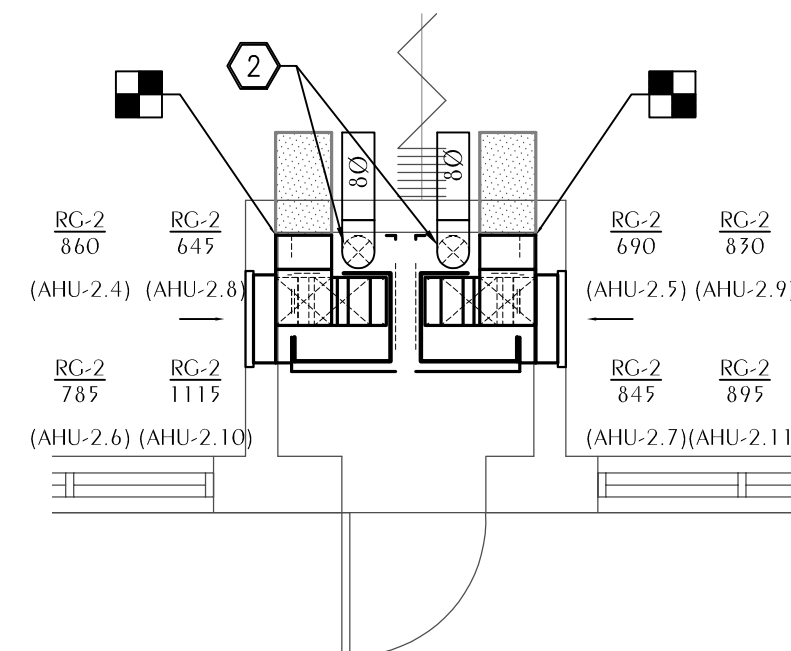
SHEET TITLE  
HVAC NEW WORK PLAN - BLDG. 2

SHEET NUMBER  
**M202**

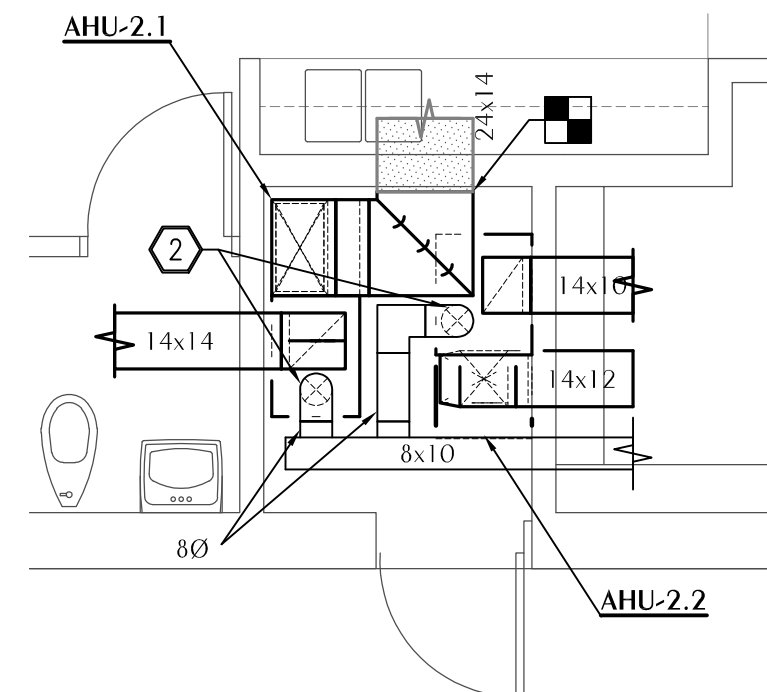
**WATFORD ENGINEERING**  
4452 Clinton Street Marianna, Florida 32446  
311 N. College St. Office 1018 Auburn, AL 36830  
Florida CA Number: 27135  
Keith A. Johnson, PE  
Florida License Number: 66467  
800.526.8447  
Project Number: 2025018  
Created By: JAW  
Drawn By: JVB



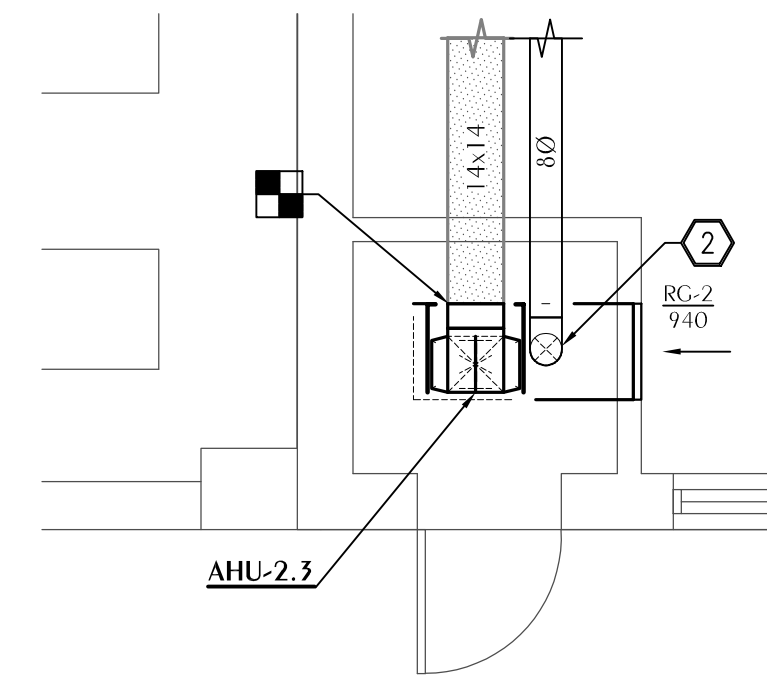
**1** HVAC NEW WORK PLAN - BUILDING 2  
SCALE: 1/8" = 1'-0"



**2** HVAC ENLARGED NEW WORK PLAN  
SCALE: 1/4" = 1'-0"



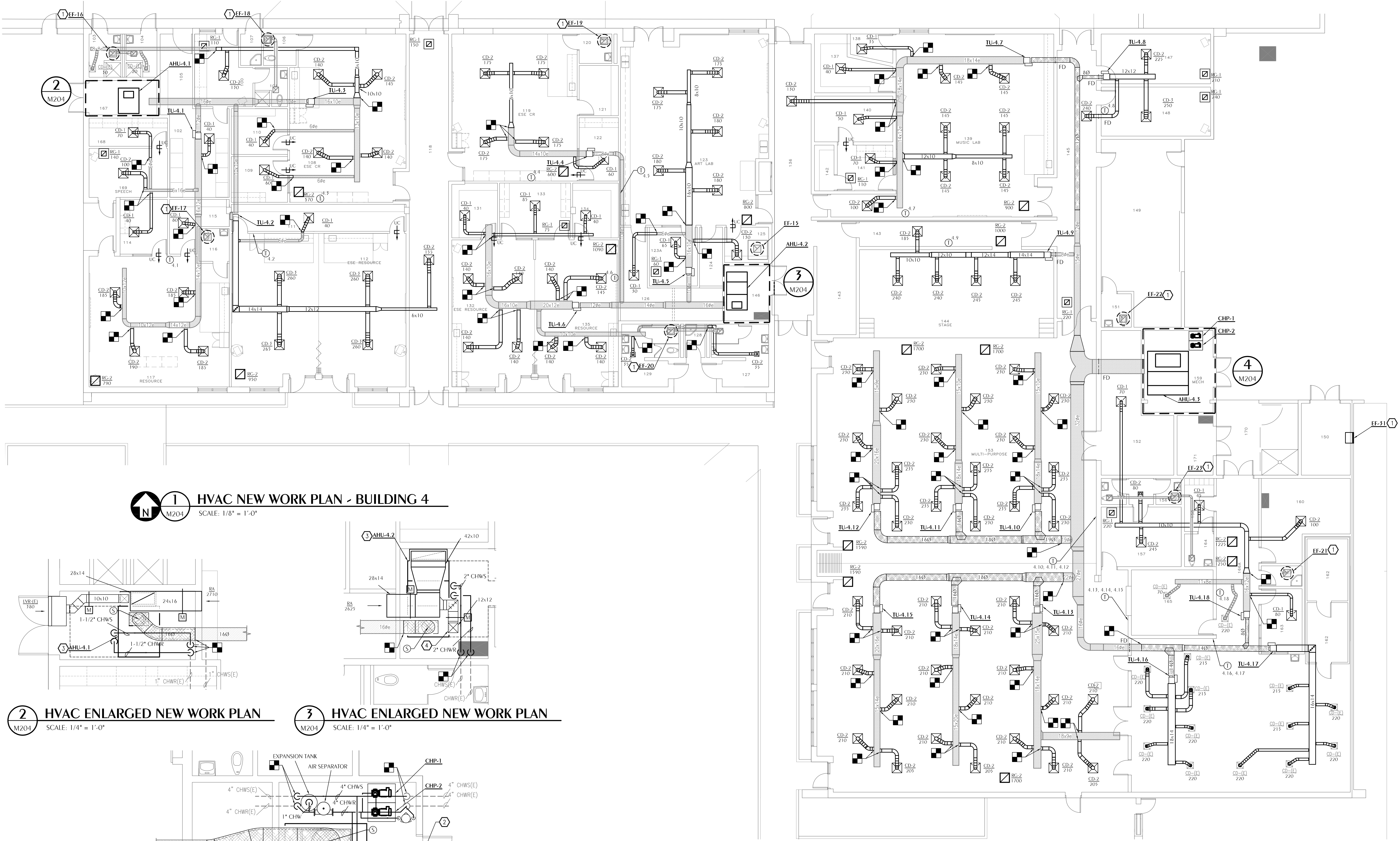
**3** HVAC ENLARGED NEW WORK PLAN  
SCALE: 1/4" = 1'-0"



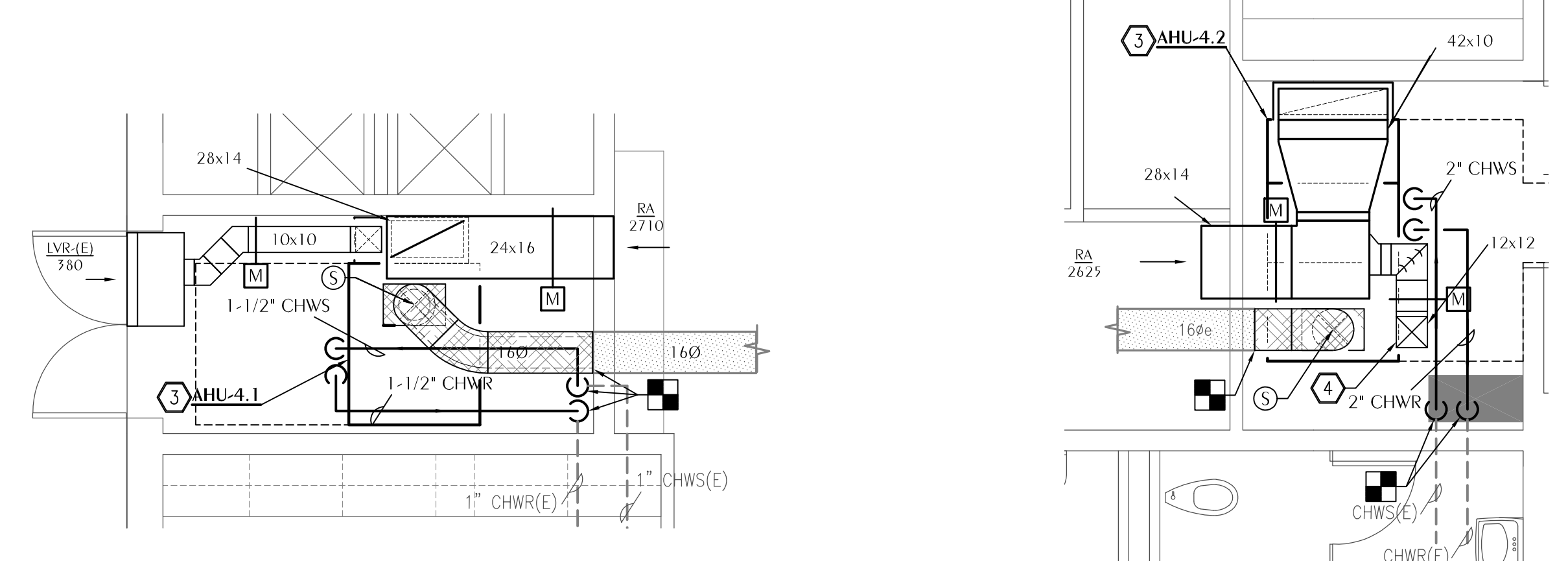
**4** HVAC ENLARGED NEW WORK PLAN  
SCALE: 1/4" = 1'-0"



NOT FOR CONSTRUCTION

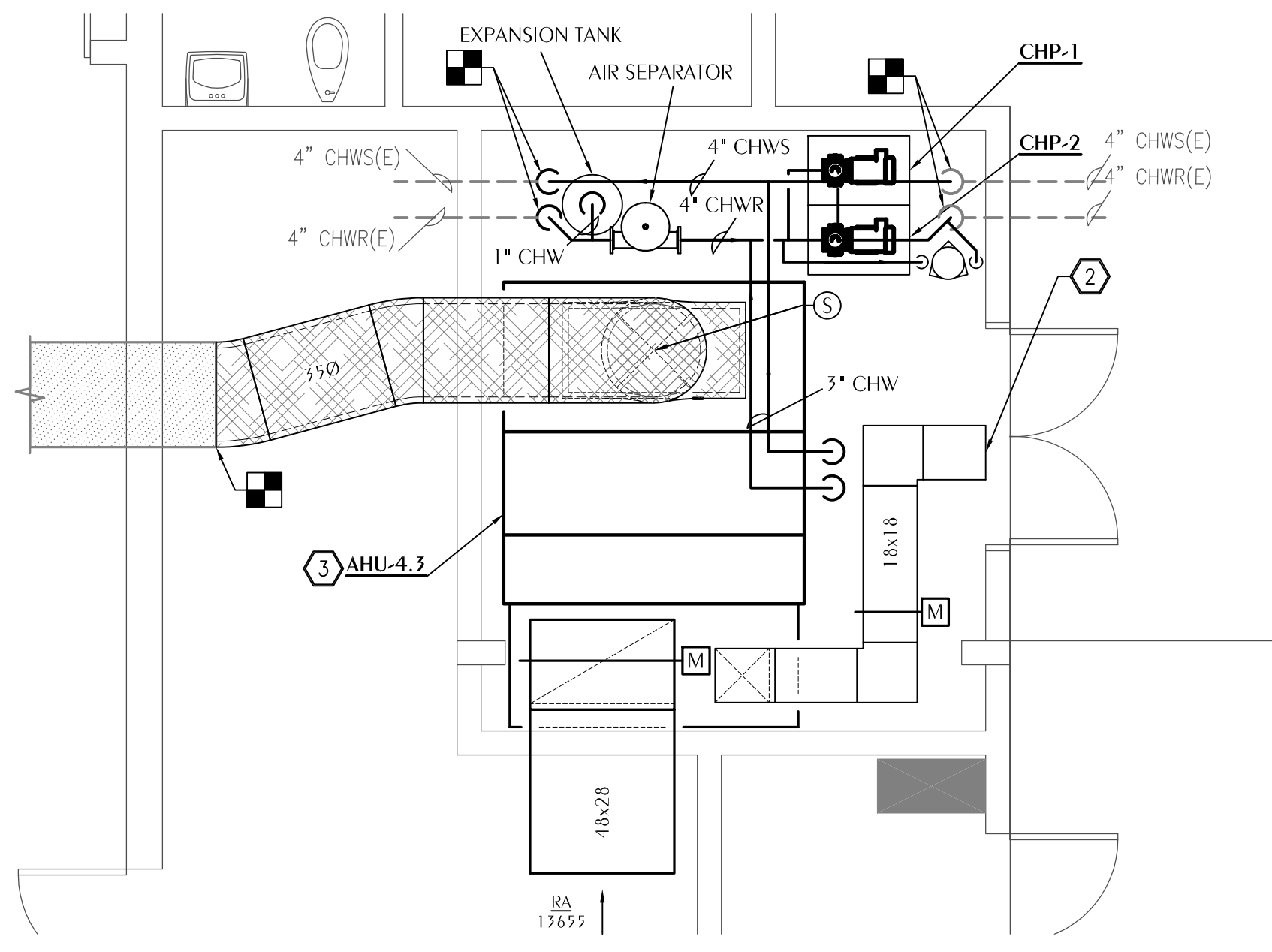


**1 HVAC NEW WORK PLAN - BUILDING 4**  
SCALE: 1/8" = 1'-0"



**2 HVAC ENLARGED NEW WORK PLAN**  
SCALE: 1/4" = 1'-0"

**3 HVAC ENLARGED NEW WORK PLAN**  
SCALE: 1/4" = 1'-0"



**4 HVAC ENLARGED NEW WORK PLAN**  
SCALE: 1/4" = 1'-0"

**SHEET NOTES**

- 1 PROVIDE HANGERS AND SUPPORTS AS NECESSARY AND INSTALL EXHAUST FAN IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. TRANSITION DUCTWORK AS NECESSARY TO CONNECT TO EXISTING.
- 2 CONNECT OUTSIDE AIR DUCT TO EXISTING EXTERIOR SOFFIT.
- 3 PROVIDE 3" TALL HOUSEKEEPING PAD MINIMUM 3" LARGER THAN NEW EQUIPMENT ON ALL SIDES.
- 4 CONNECT TO EXISTING OUTSIDE AIR DUCT. SMOOTHLY TRANSITION AS NECESSARY.



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Keith A. Johnson, PE  
Florida License Number: 95407  
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Project Number: 2025018  
Created By: JAW  
Drawn By: JVB

**SHEET NOTES**

- 1 PROVIDE HANGERS AND SUPPORTS AS NECESSARY AND INSTALL EXHAUST FAN IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. TRANSITION DUCTWORK AS NECESSARY TO CONNECT TO EXISTING.
- 2 CONNECT OUTSIDE AIR DUCT TO EXTERIOR SOFFIT.
- 3 PROVIDE 3" TALL HOUSEKEEPING PAD MINIMUM 3" LARGER THAN NEW EQUIPMENT ON ALL SIDES.

**NOT FOR CONSTRUCTION**

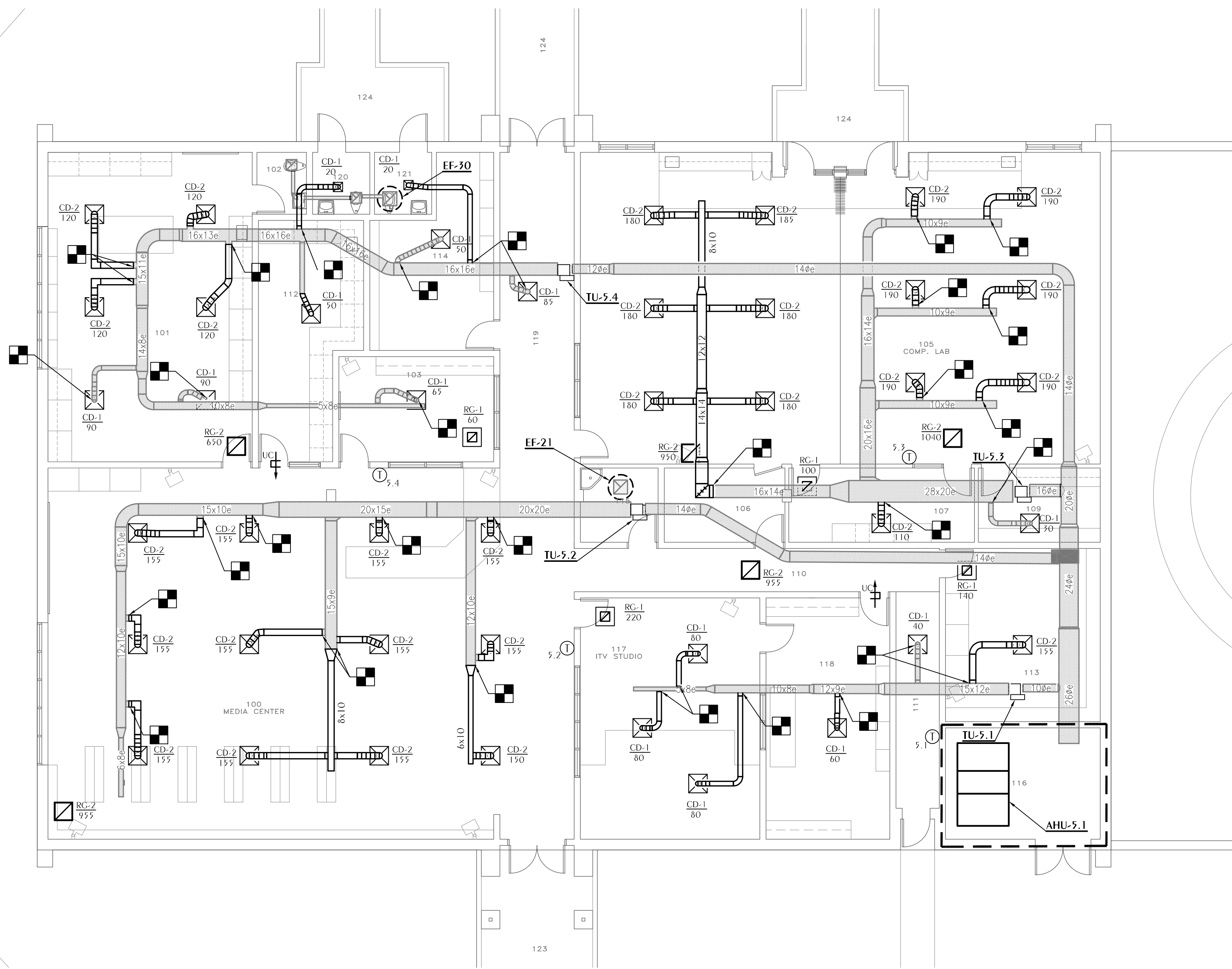
**PROJECT TEAM**  
ARCHITECTURAL  
Caldwell Associates  
PLUMBING  
Watford Engineering  
MECHANICAL  
Watford Engineering  
ELECTRICAL  
HG Engineers

**PROJECT NUMBERS**  
Architect No: 22045B

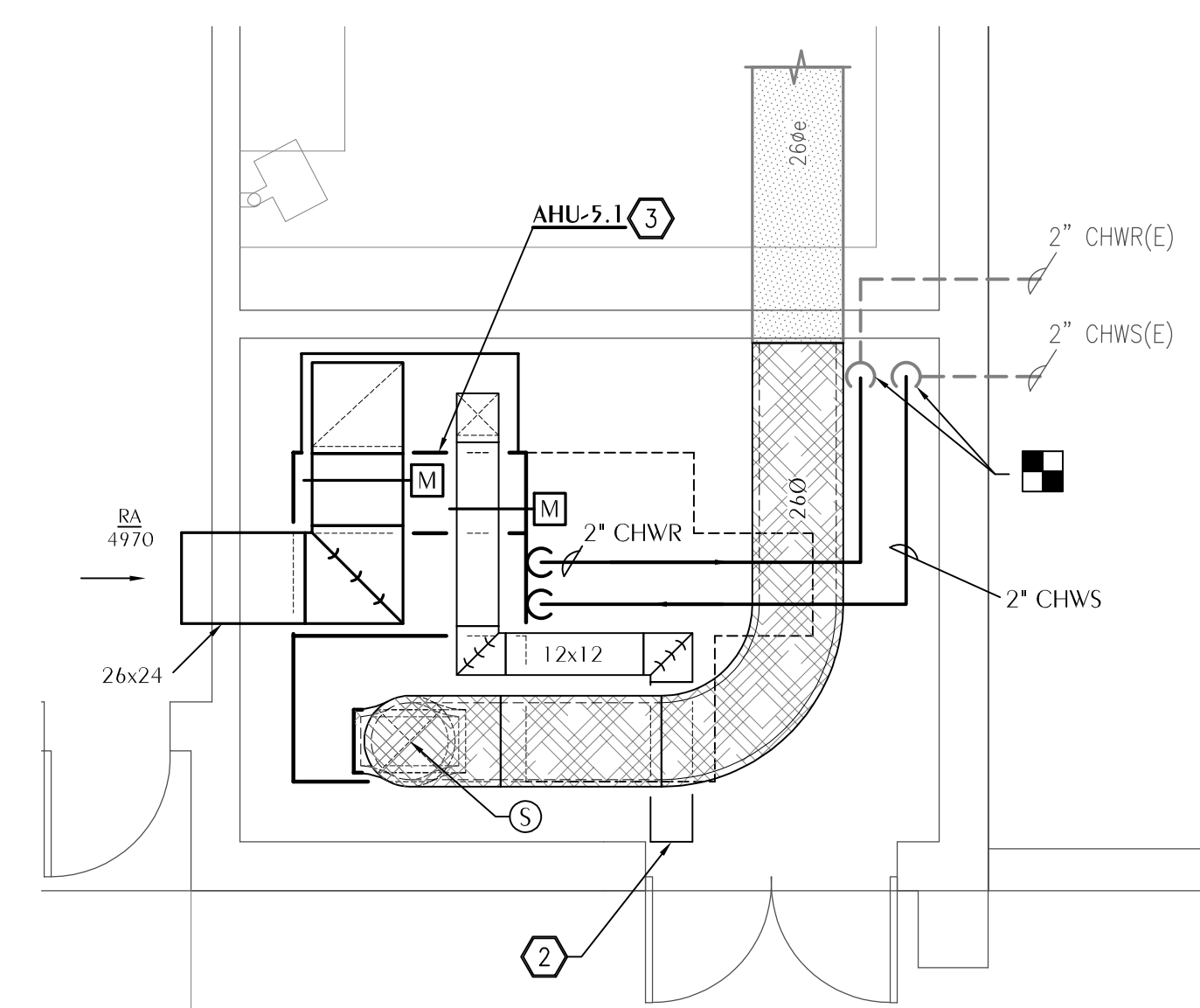
**DELIVERABLES**  
Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
**Architect Issued to CM for Bidding 03 June 2024**

**SHEET TITLE**  
HVAC NEW WORK  
PLAN - BLDG. 5

**SHEET NUMBER**  
**M205**

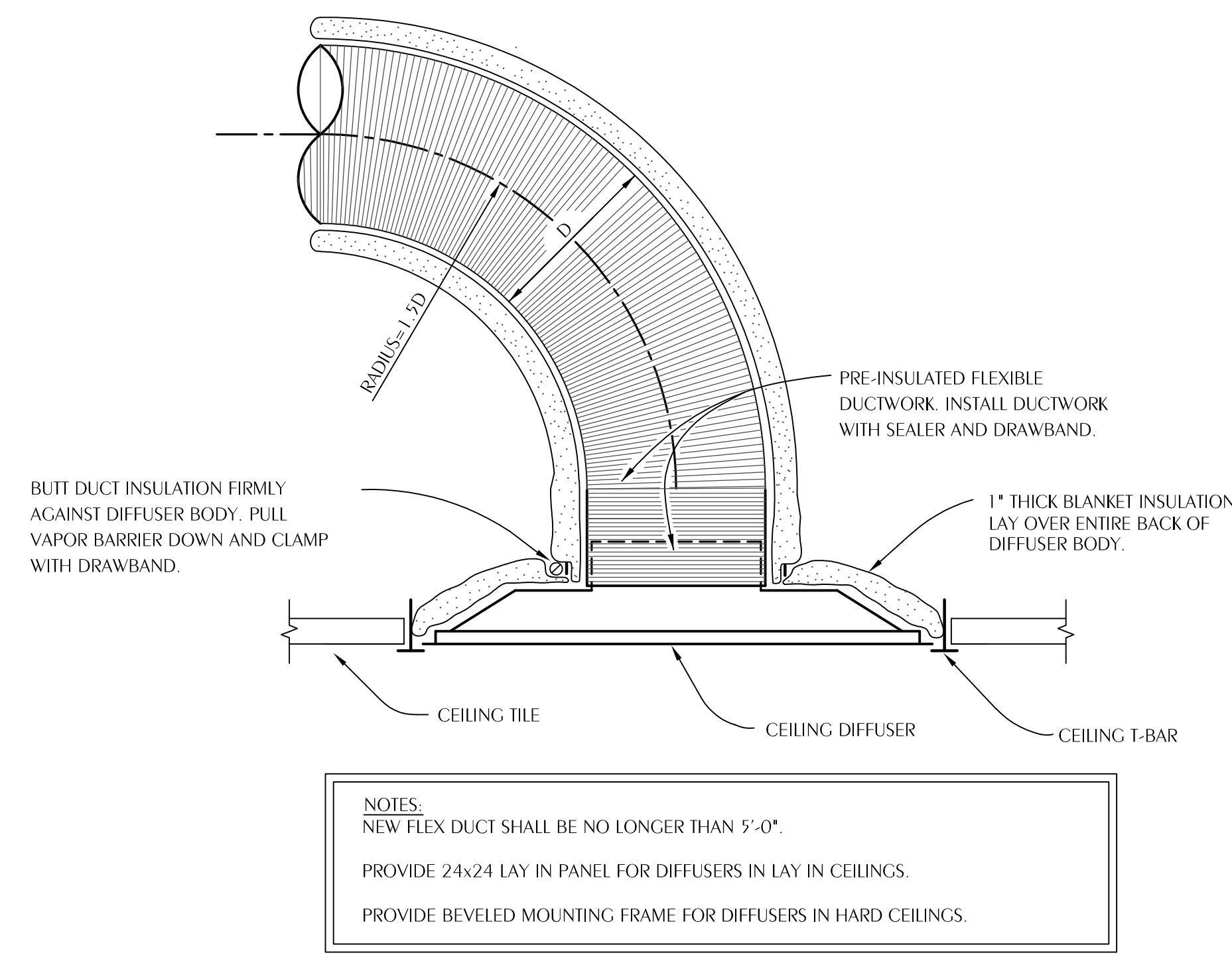


**1 HVAC NEW WORK PLAN - BUILDING 5**  
SCALE: 1/8" = 1'-0"

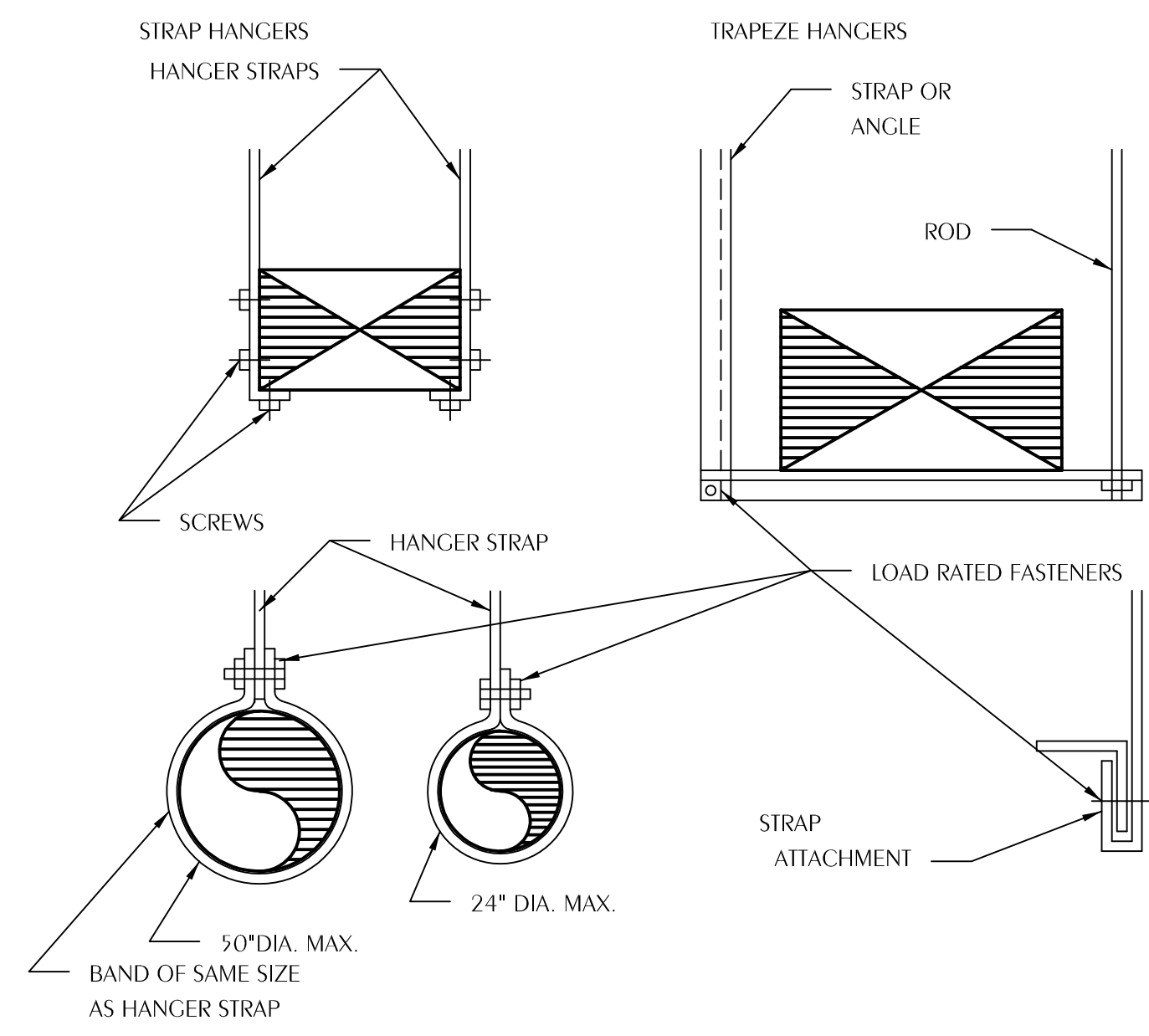


**3 HVAC ENLARGED NEW WORK PLAN**  
SCALE: 1/4" = 1'-0"

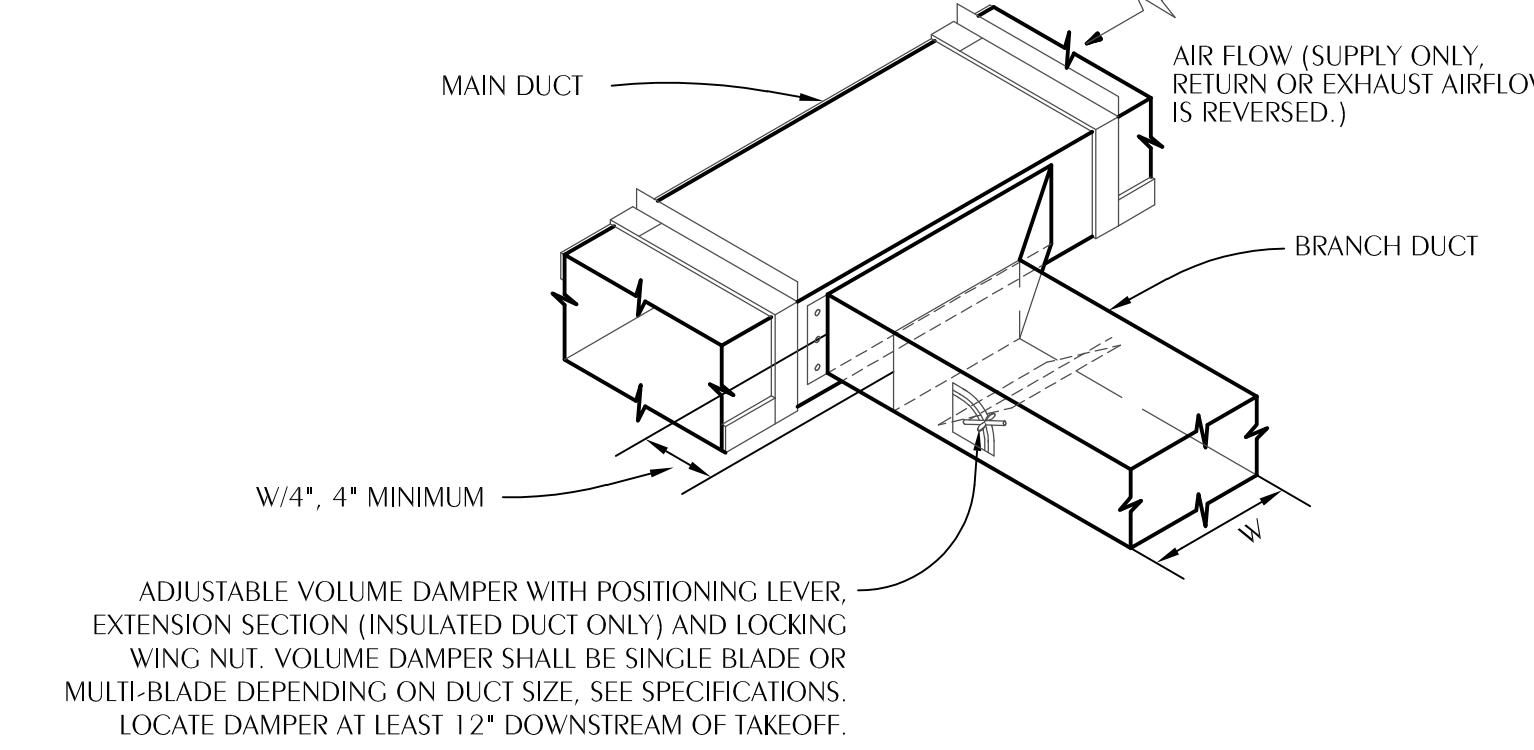
**WATFORD ENGINEERING**  
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Project Number: 2025418  
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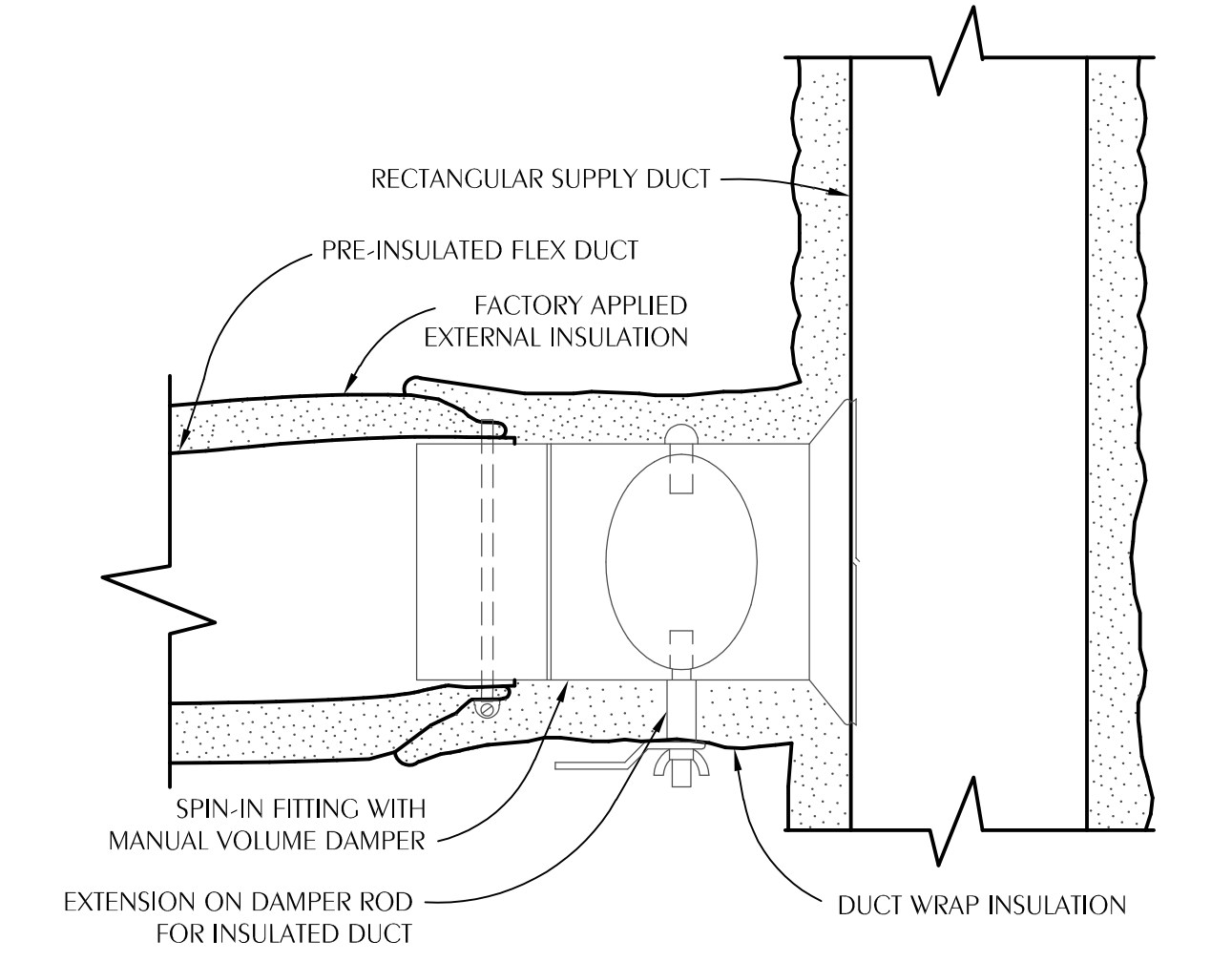
**1 TYPICAL CEILING DIFFUSER DETAILS**  
M301 SCALE: NONE



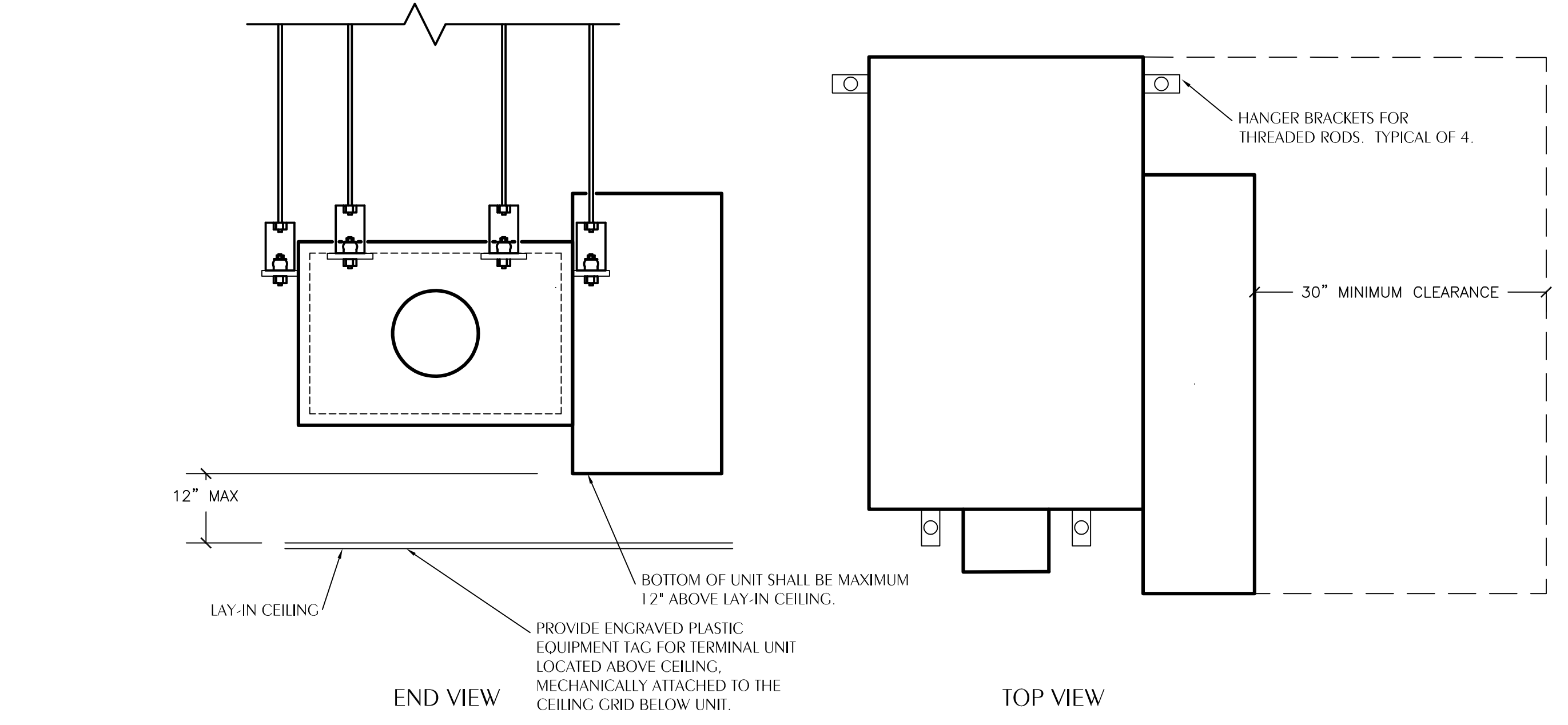
**2 TYPICAL DUCT HANGER DETAILS**  
M301 SCALE: NONE



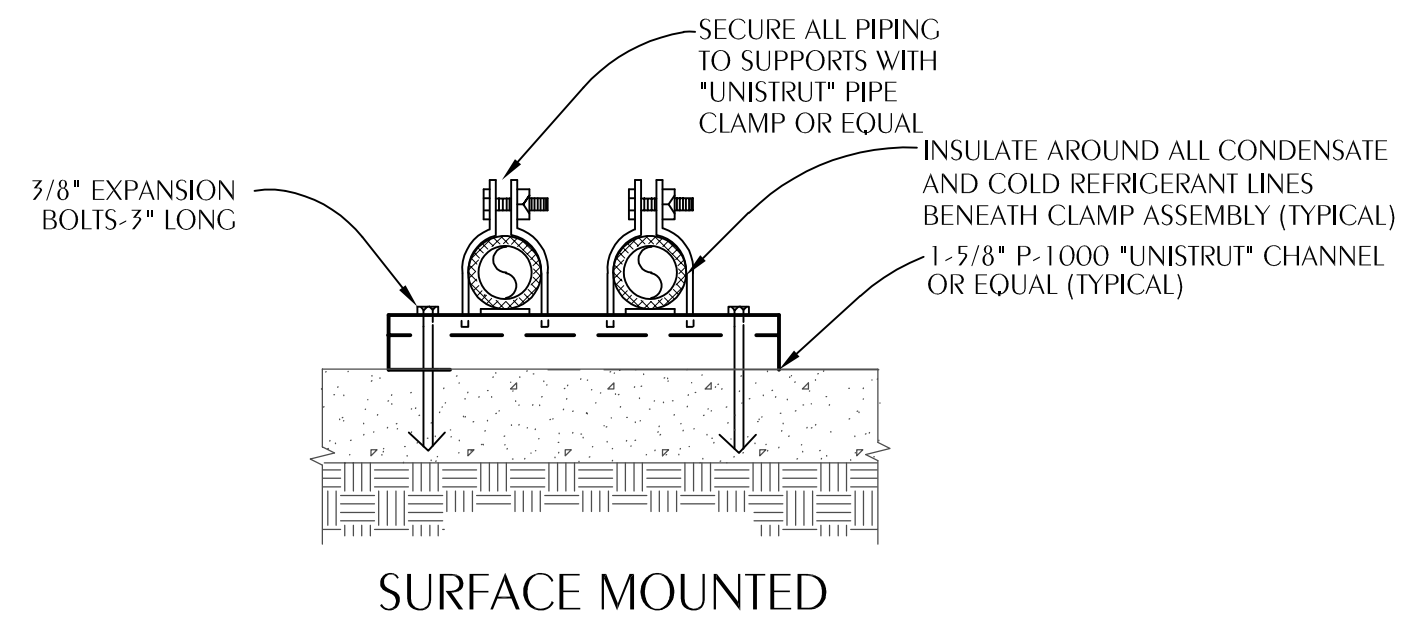
**3 TYPICAL BRANCH DUCT TAKEOFF**  
M301 SCALE: NONE



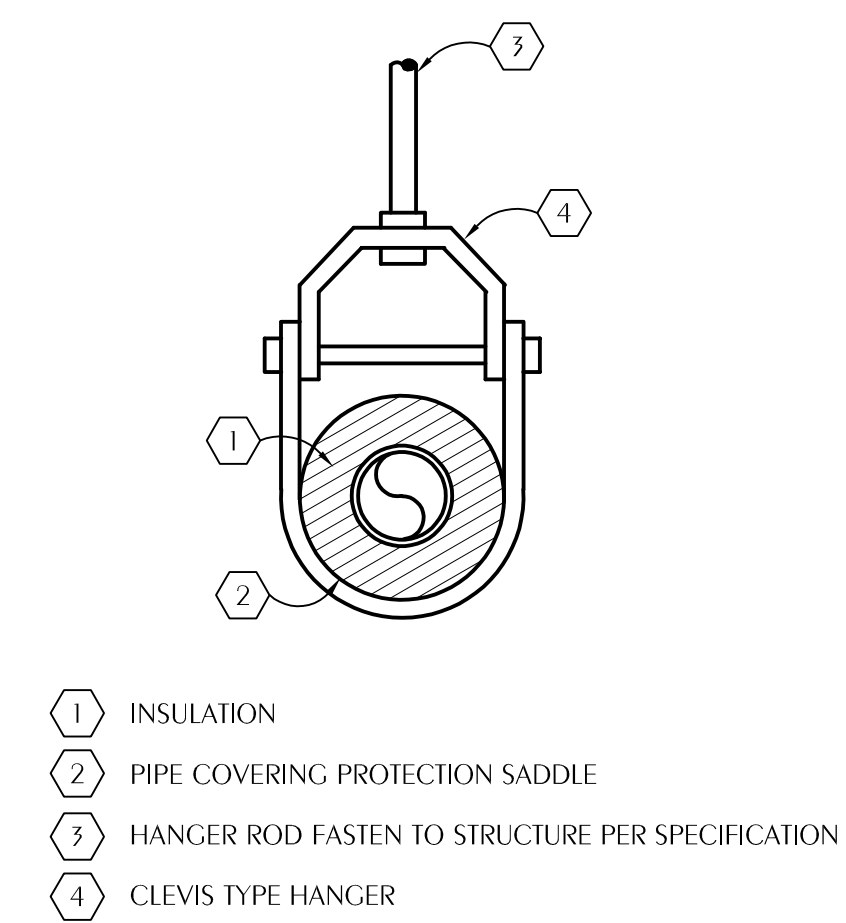
**4 TYPICAL FLEX DUCT TAKEOFF DETAIL**  
M301 SCALE: NONE



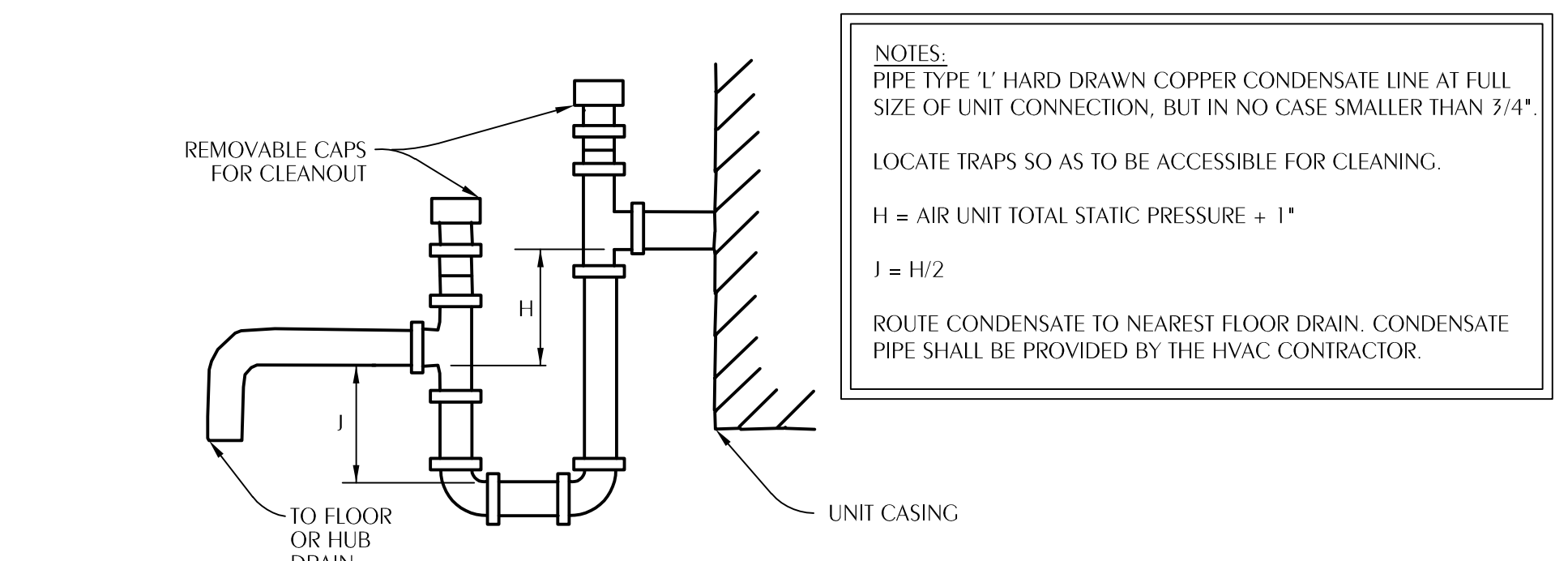
**5 TERMINAL UNIT MOUNTING DETAIL**  
M301 SCALE: NONE



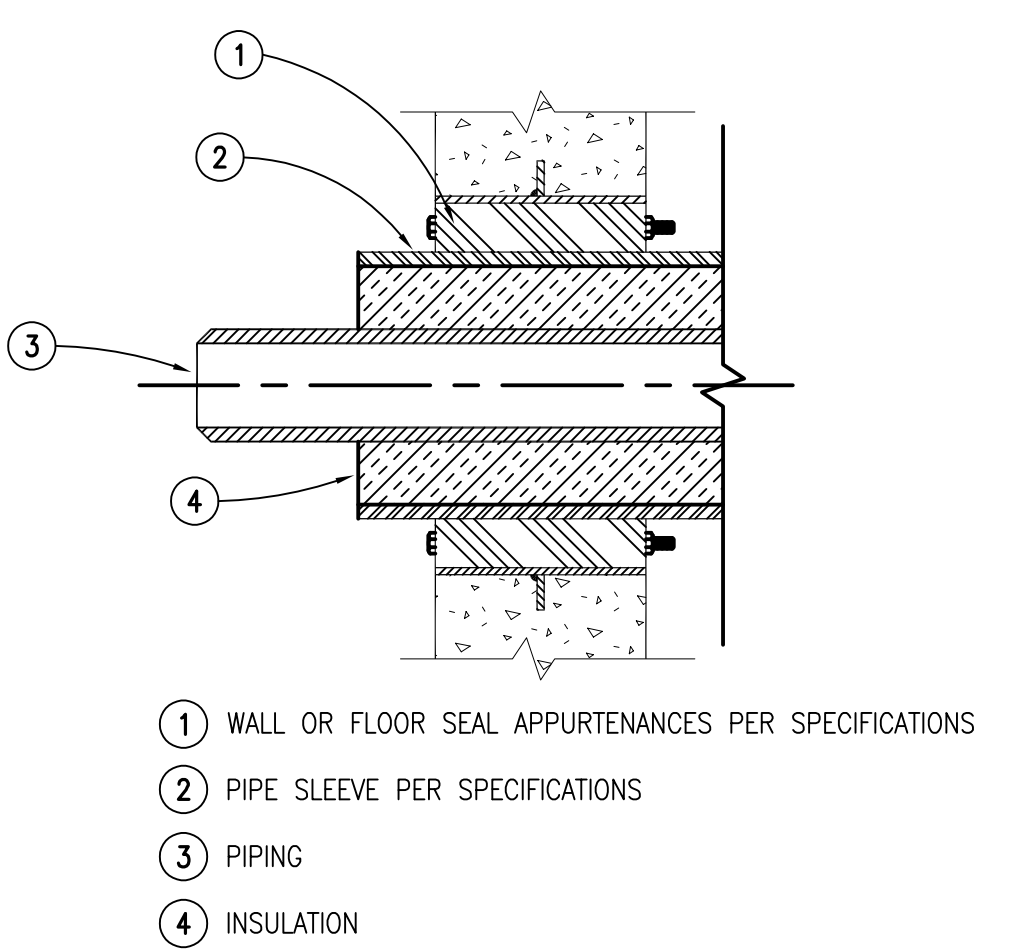
**6 TYPICAL EXTERIOR PIPING SUPPORT DETAIL**  
M301 SCALE: NONE



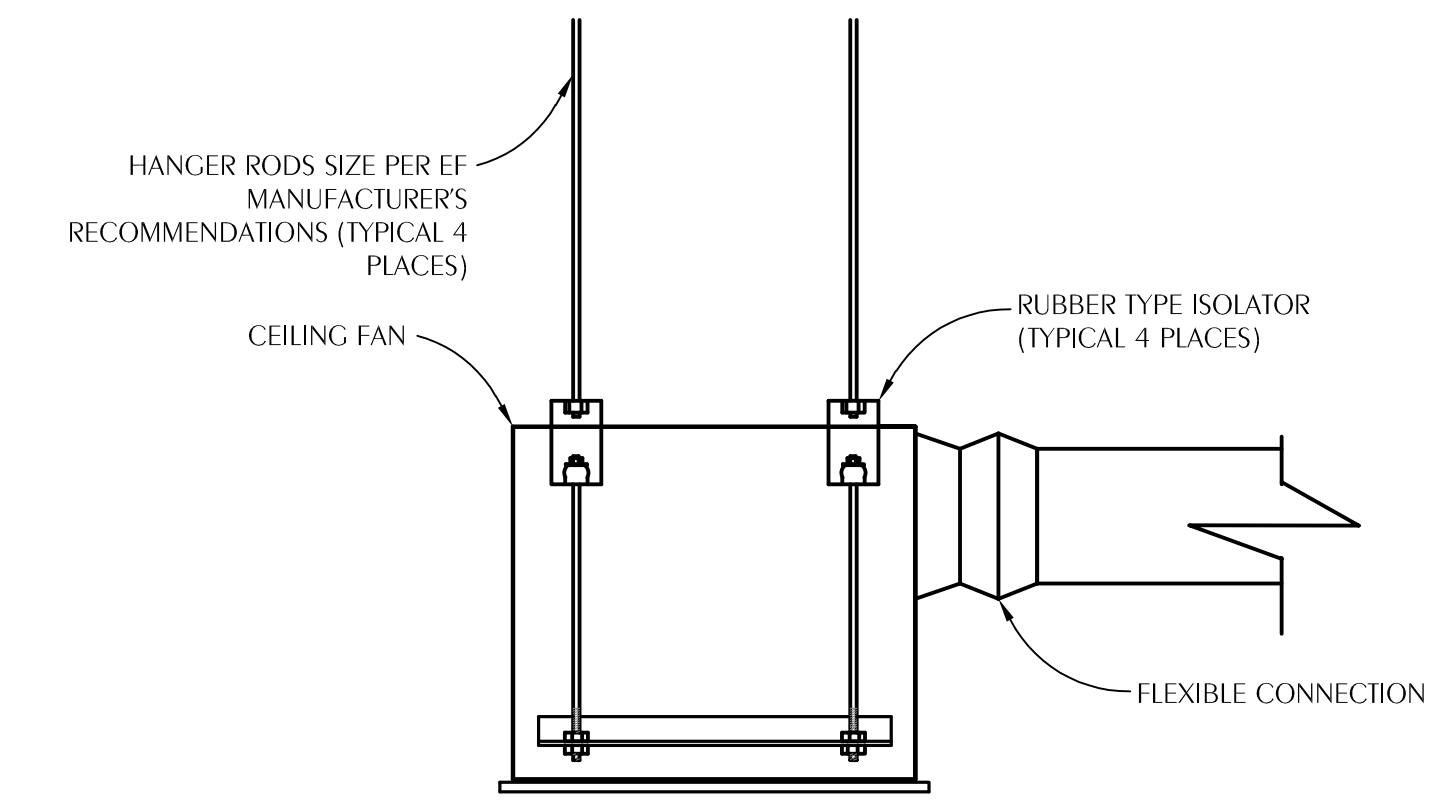
**7 OVERHEAD PIPE SUPPORT**  
M301 SCALE: NONE



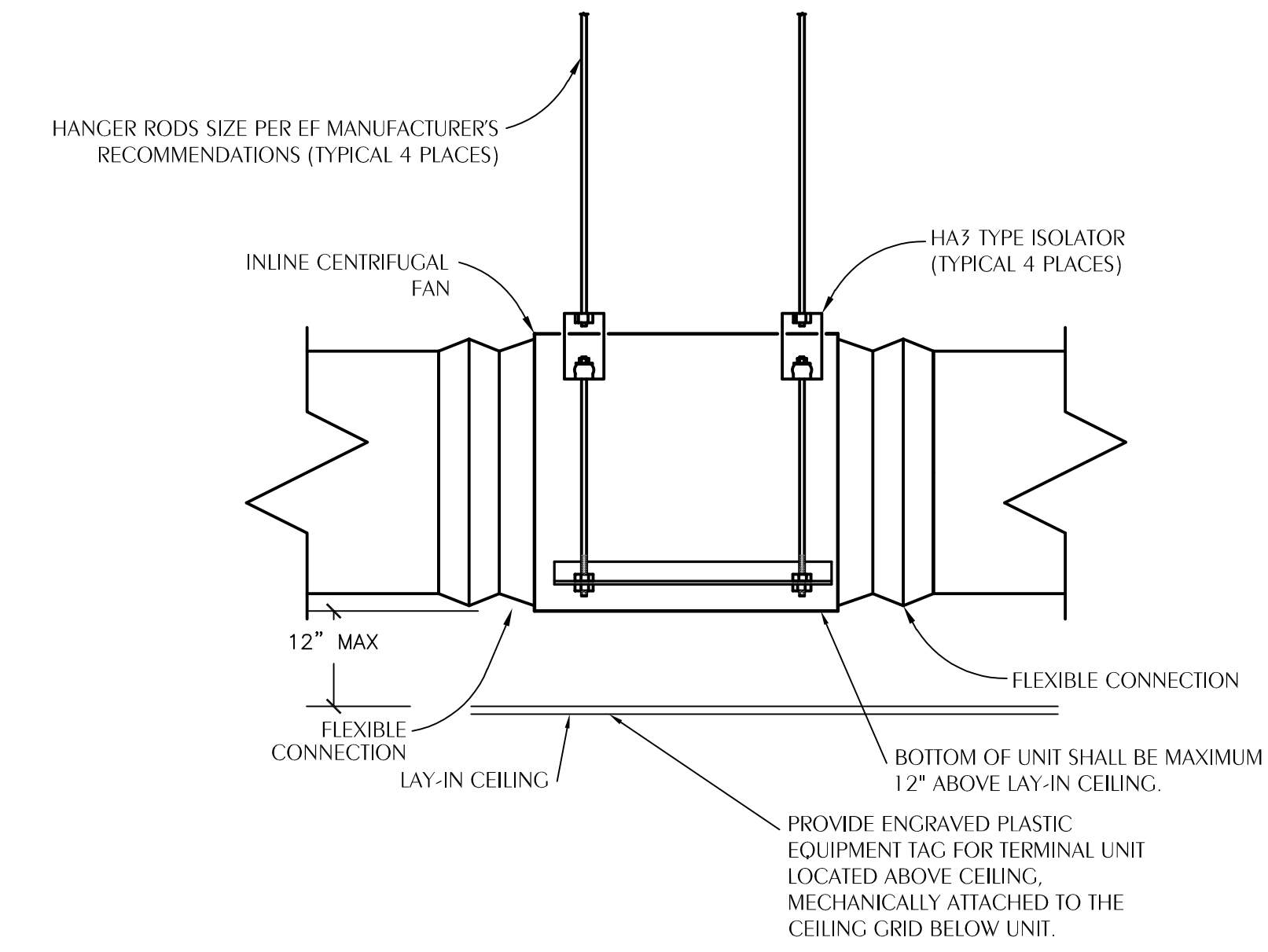
**8 NEGATIVE PRESSURE CONDENSATE DRAIN TRAP**  
M301 SCALE: NONE



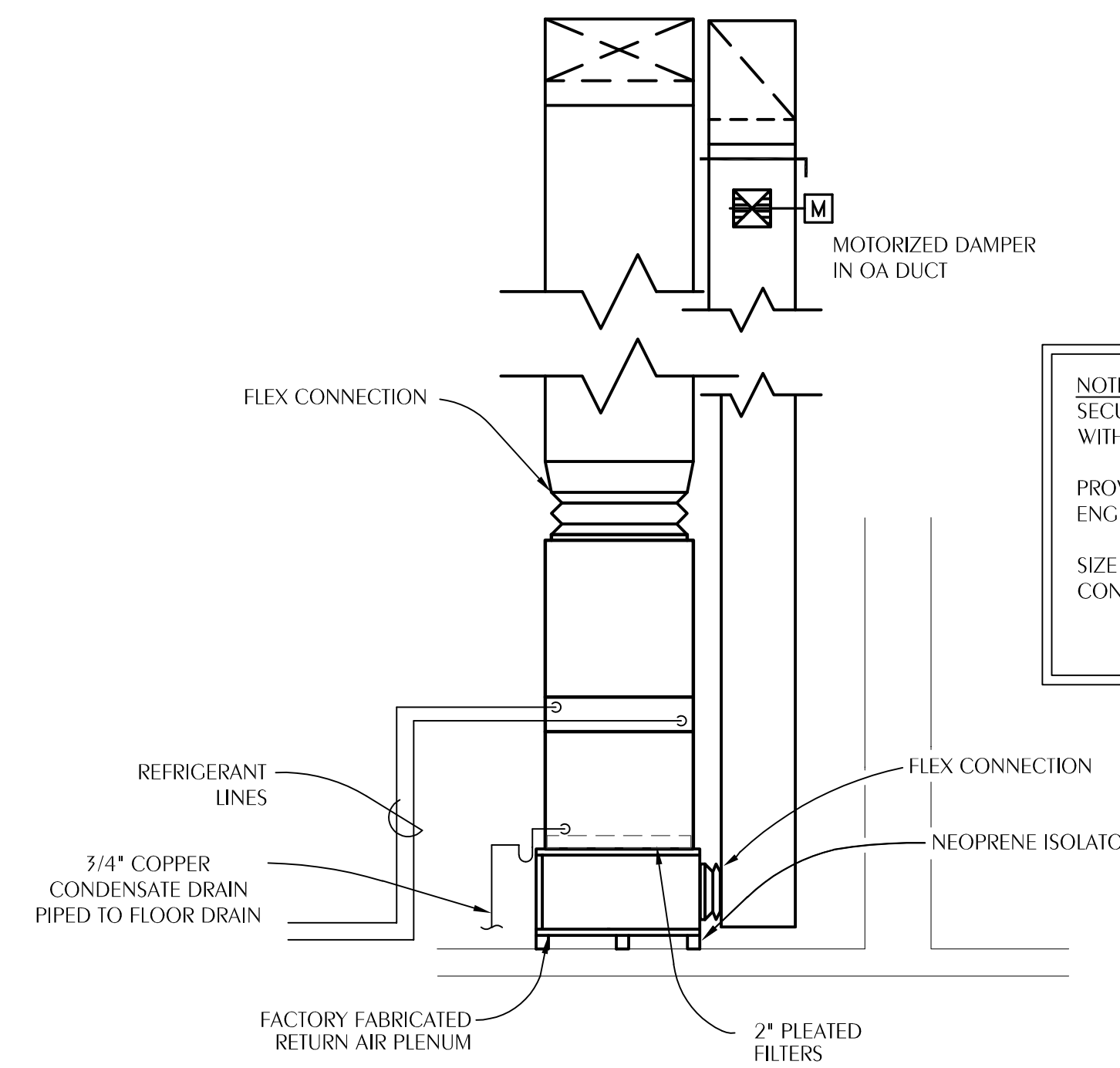
**9 TYPICAL WALL PIPE PENETRATION**  
M301 SCALE: NONE



**10 CEILING FAN DETAIL**  
M301 SCALE: NONE

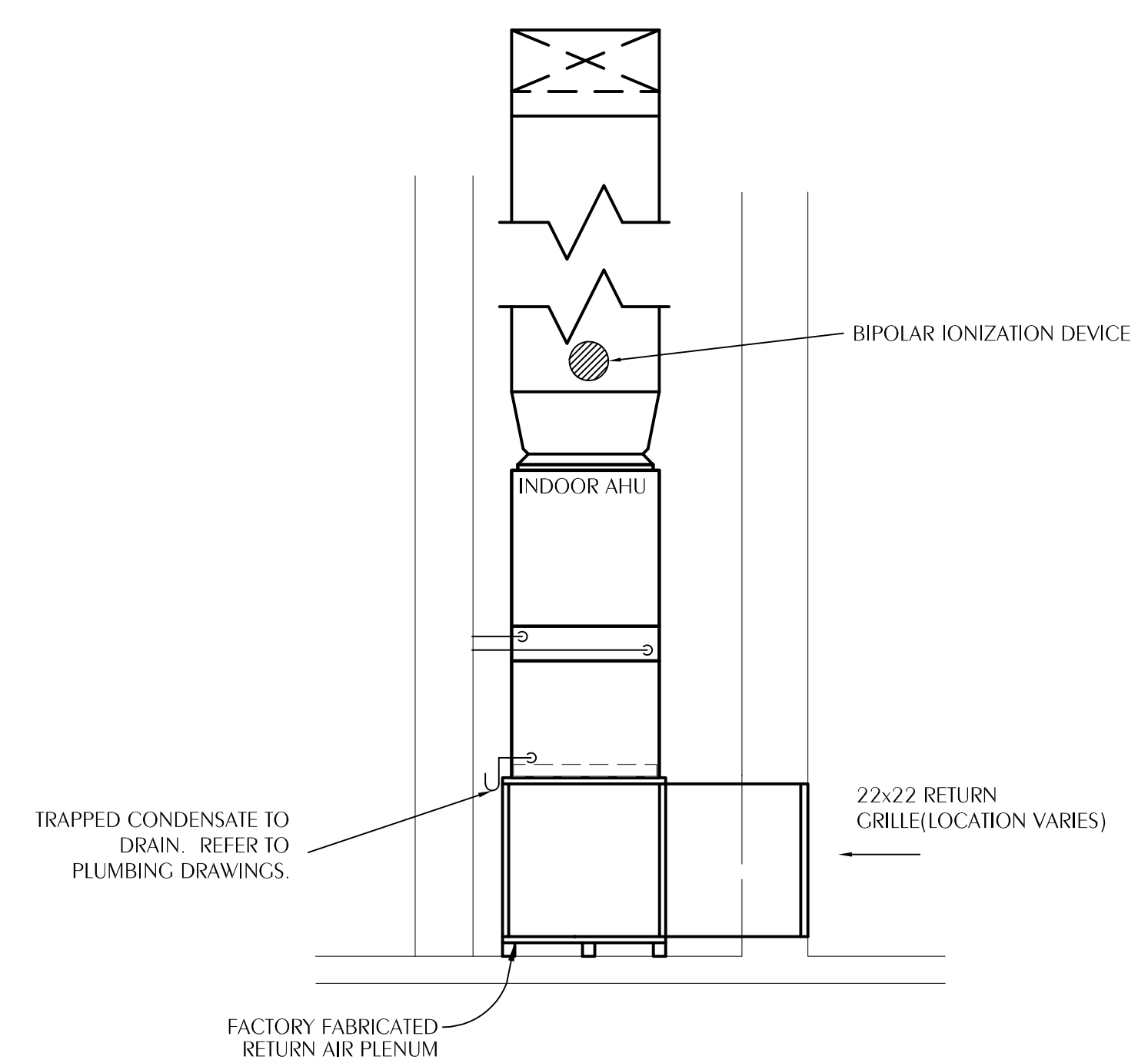


**11 INLINE FAN DETAIL**  
M301 SCALE: NONE

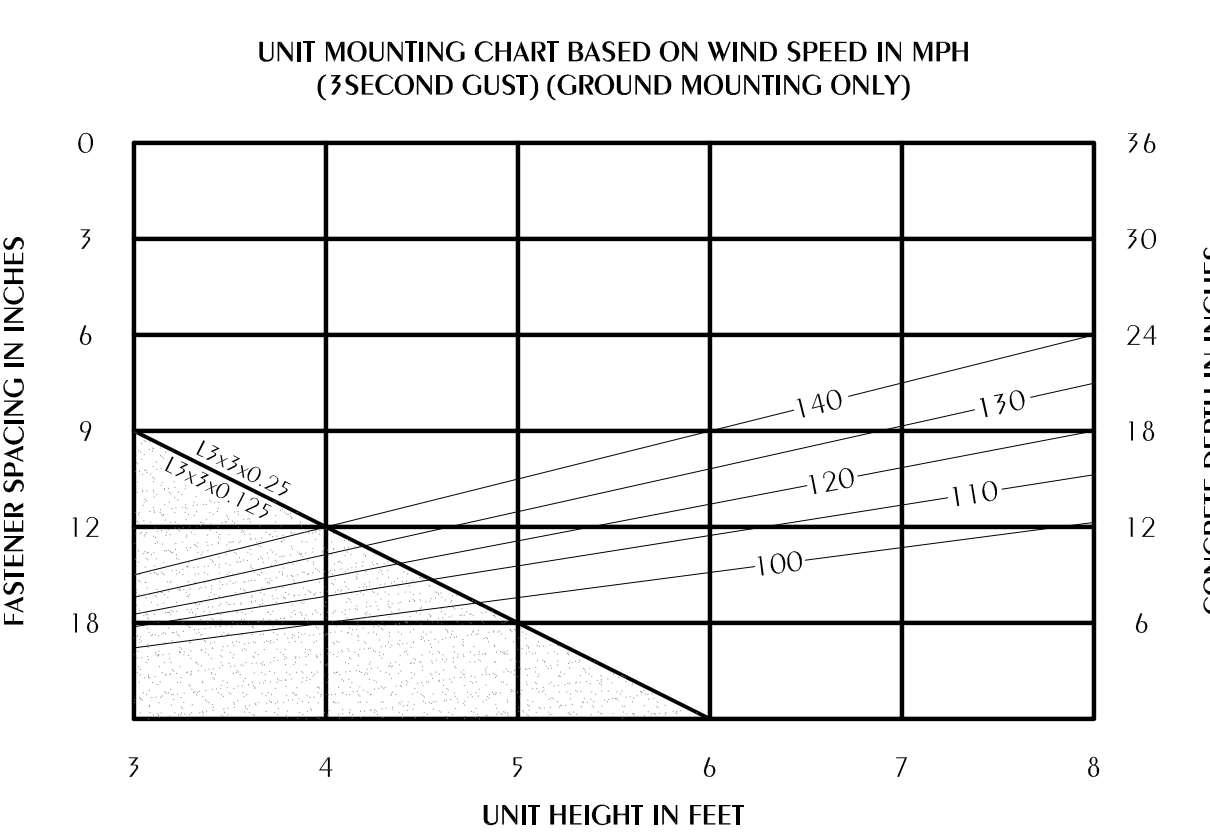
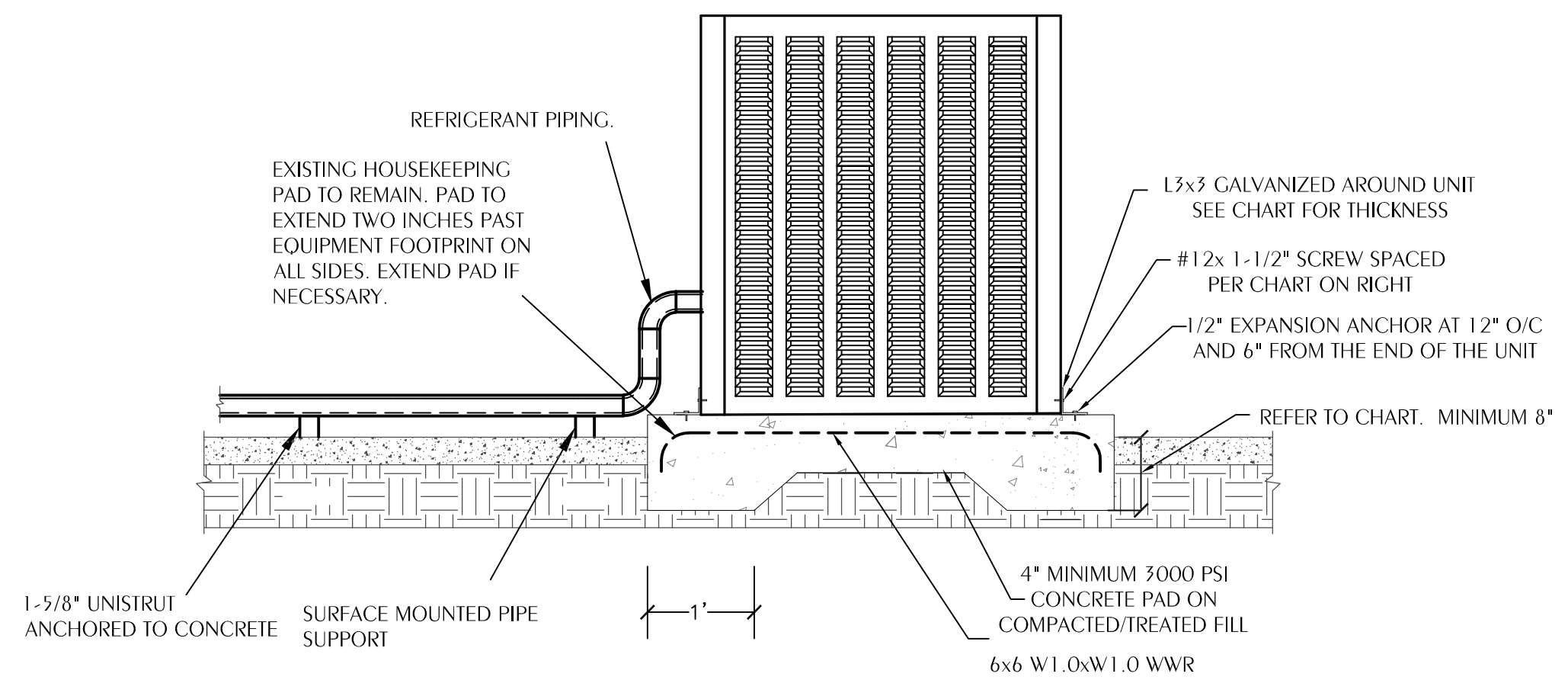


**NOTES:**  
SECURE REFRIGERANT LINES AND CONDENSATE PIPING WITH UNISTRUT.  
PROVIDE FACTORY FABRICATED RETURN AIR PLENUM OR ENGINEER APPROVED EQUAL WITH 2" FILTER FRAME.  
SIZE COPPER CONDENSATE LINE AT FULL SIZE OF UNIT CONNECTION, BUT IN NO CASE SMALLER THAN 3/4".

**1 VERTICAL UPFLOW AHU DETAIL**  
SCALE: NONE



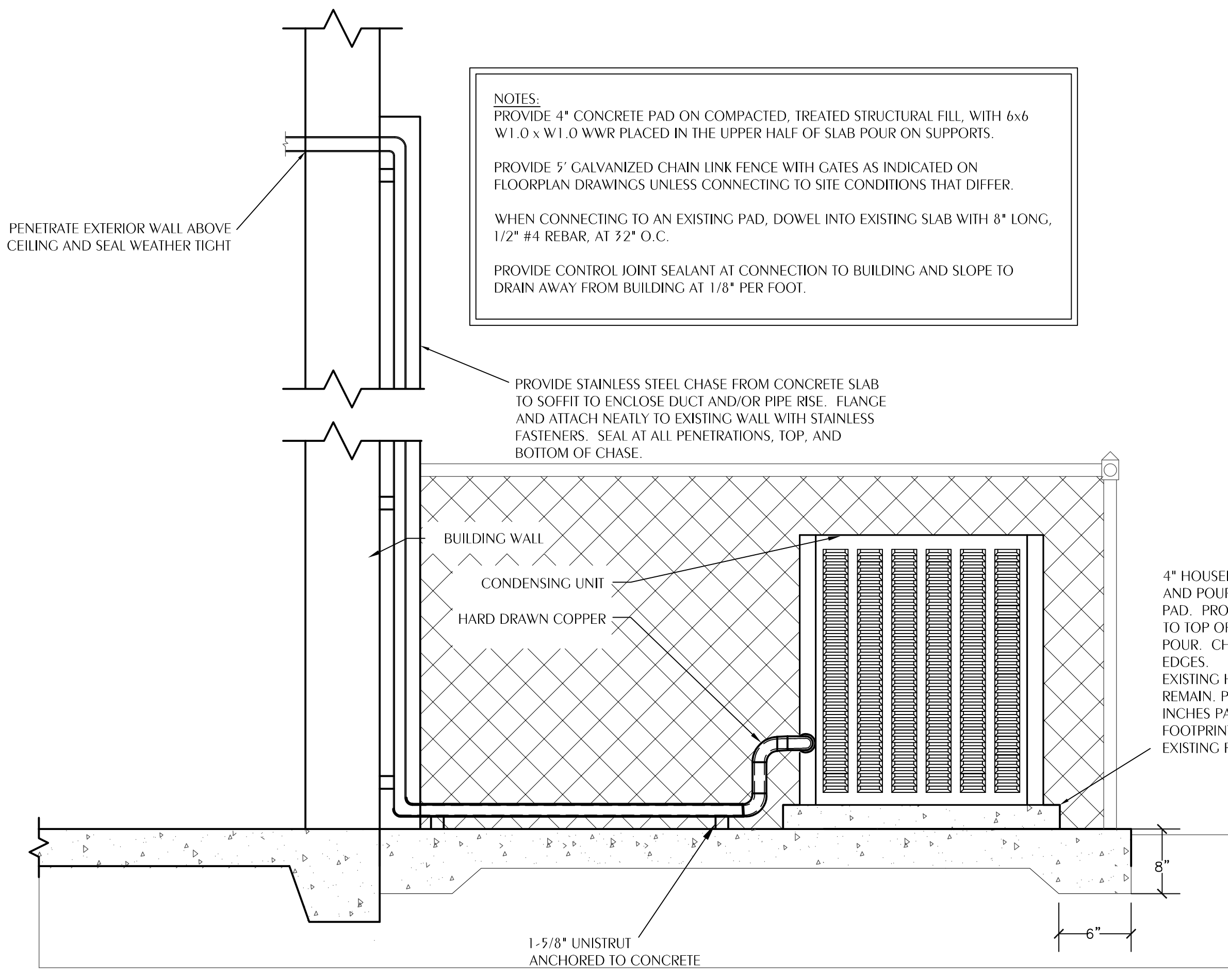
**2 TYPICAL AIR HANDLER DETAIL**  
SCALE: NONE



DESIGN CRITERIA:

CODE:	ASCE 7-05
VELOCITY:	SEE BELOW
Kz:	0.70
Kzt:	1.00
Kd:	0.85
IMPORTANCE:	1.15
EXPOSURE:	B
CF:	1.3
CF:	0.85
W:	100 mph: 17.52 psf
	110 mph: 21.20 psf
	120 mph: 25.22 psf
	130 mph: 29.60 psf
	140 mph: 34.33 psf
Pd:stps:	100 mph: 19.36 psf
	110 mph: 23.42 psf
	120 mph: 27.87 psf
	130 mph: 32.71 psf
	140 mph: 37.94 psf

**3 TYPICAL OUTDOOR MECHANICAL UNIT MOUNTING DETAIL**  
SCALE: NONE



**NOTES:**  
PROVIDE 4" CONCRETE PAD ON COMPACTED, TREATED STRUCTURAL FILL WITH 6x6 W1.0 x W1.0 WWR PLACED IN THE UPPER HALF OF SLAB POUR ON SUPPORTS.  
PROVIDE 5' GALVANIZED CHAIN LINK FENCE WITH GATES AS INDICATED ON FLOORPLAN DRAWINGS UNLESS CONNECTING TO SITE CONDITIONS THAT DIFFER.  
WHEN CONNECTING TO AN EXISTING PAD, DOWEL INTO EXISTING SLAB WITH 8" LONG, 1/2" #4 REBAR, AT 32" O.C.  
PROVIDE CONTROL JOINT SEALANT AT CONNECTION TO BUILDING AND SLOPE TO DRAIN AWAY FROM BUILDING AT 1/8" PER FOOT.

**CHAINLINK FENCE NOTES**

- EXISTING SCREEN WALLS TO REMAIN.
- REFER TO SHEET A620 DETAIL 2 FOR NEW GATE DETAIL.
- REFER TO SHEET A101B FOR LOCATIONS.

**4 TYPICAL OUTDOOR EQUIPMENT YARD DETAIL**  
SCALE: NONE

PROJECT  
**VOLUME 2**

TOMMY SMITH ELEMENTARY SCHOOL  
**RENOVATIONS**

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER  
**BAY DISTRICT SCHOOLS**

ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

- PROJECT TEAM**
- ARCHITECTURAL: Caldwell Associates
  - PLUMBING: Watford Engineering
  - MECHANICAL: Watford Engineering
  - ELECTRICAL: HG Engineers

**PROJECT NUMBERS**  
Architect No: 22045B

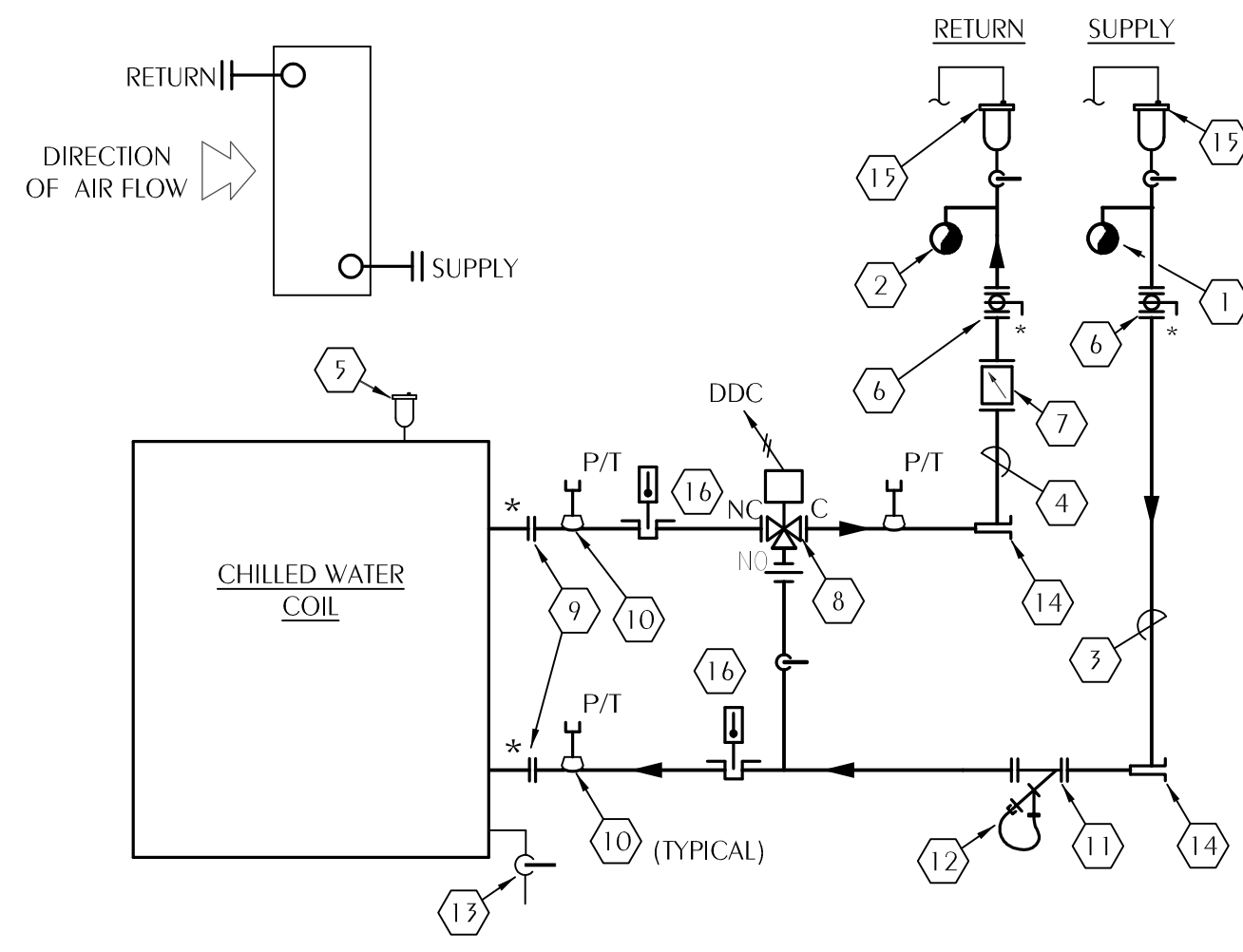
**DELIVERABLES**  
Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
Architect Issued to CM for Bidding: 03 June 2024

SHEET TITLE  
HVAC DETAILS

SHEET NUMBER  
**M302**



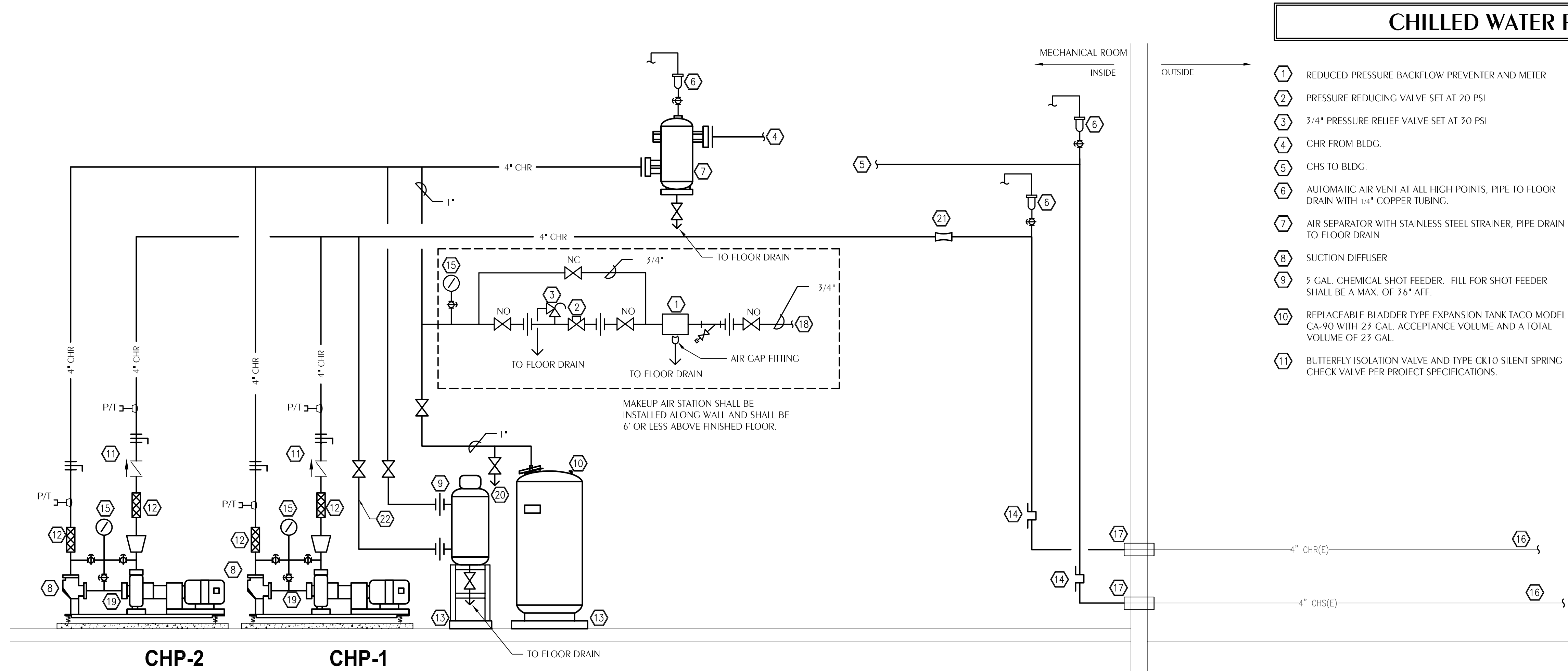




- KEY NOTES:**
- 1 SUPPLY MAIN
  - 2 RETURN MAIN
  - 3 SUPPLY RUNOUT
  - 4 RETURN RUNOUT
  - 5 1/4" AUTOMATIC AIR VENT IN COIL HEADER, FLOW DESIGN MODEL AAO25.
  - 6 BUTTERFLY SERVICE VALVE, FLANGED
  - 7 AUTOMATIC FLOW CONTROL VALVE, FLANGED
  - 8 3-WAY CONTROL VALVE, CAST IRON FLANGED BODY, MIXING PATTERN, LINEAR FLOW PLUG.
  - 9 SERVICE FLANGE
  - 10 PRESSURE/TEMPERATURE PORT WITH EXTENDED NECK
  - 11 CAST IRON STRAINER, FLANGED.
  - 12 STRAINER BLOWDOWN/HOSE END DRAIN VALVE WITH BRASS CAP AND CHAIN, FLOW DESIGN MODEL HE.
  - 13 3/8" COPPER DRAIN W/BALL VALVE
  - 14 STAINLESS STEEL WELL FOR DDC TEMPERATURE TRANSMITTER IN TEE, COORDINATE WITH DDC CONTRACTOR.
  - 15 3/4" AUTOMATIC AIR VENT. SEE MOUNTING DETAIL THIS SHEET.
  - 16 THERMOMETER

- GENERAL NOTES:**
- 1) AUTOMATIC FLOW CONTROL VALVES SHALL BE FLOW DESIGN AUTO FLOW SERIES WS, WAFER STYLE, LINE SIZE, WITH TWO FACTORY P/T PORTS. RANGE 2-32 PSID.
  - 2) INSTALL P/T PORTS IN FORGED STEEL THRODLETS OR REDUCING TEE. HALF COUPLINGS ARE NOT ALLOWABLE.
  - 3) ARRANGE PIPING SUCH THAT THE ENTIRE COIL CONNECTION ASSEMBLY CAN BE REMOVED BY DISCONNECTING AT POINTS MARKED WITH AN ASTERISK (\*) FOR COIL SERVICING. PIPING SHALL NOT INTERFERE WITH ACCESS TO ANY COMPONENT OF THE AIR HANDLING UNIT THAT REQUIRES SERVICE.

**1 TYPICAL AHU COIL CONNECTION SCHEMATIC**  
SCALE: NONE



**CHILLED WATER PIPING DIAGRAM NOTES**

- 1 REDUCED PRESSURE BACKFLOW PREVENTER AND METER
- 2 PRESSURE REDUCING VALVE SET AT 20 PSI
- 3 3/4" PRESSURE RELIEF VALVE SET AT 30 PSI
- 4 CHR FROM BLDG.
- 5 CHS TO BLDG.
- 6 AUTOMATIC AIR VENT AT ALL HIGH POINTS, PIPE TO FLOOR DRAIN WITH 1/4" COPPER TUBING.
- 7 AIR SEPARATOR WITH STAINLESS STEEL STRAINER, PIPE DRAIN TO FLOOR DRAIN
- 8 SUCTION DIFFUSER
- 9 5 GAL. CHEMICAL SHOT FEEDER. FILL FOR SHOT FEEDER SHALL BE A MAX. OF 3/8" AFF.
- 10 REPLACEABLE BLADDER TYPE EXPANSION TANK TACO MODEL CA-90 WITH 23 GAL. ACCEPTANCE VOLUME AND A TOTAL VOLUME OF 23 GAL.
- 11 BUTTERFLY ISOLATION VALVE AND TYPE CK10 SILENT SPRING CHECK VALVE PER PROJECT SPECIFICATIONS.
- 12 FLEXIBLE CONNECTOR
- 13 CONCRETE HOUSEKEEPING PAD 6" LARGER THAN EQUIPMENT FOOTPRINT AND 4" THICK
- 14 STAINLESS STEEL WELL FOR EMCS SENSOR
- 15 PRESSURE GAUGE WITH SNUBBER.
- 16 TO EXISTING CHILLER.
- 17 PIPE SLEEVE AND CALKING
- 18 CONNECT TO DOMESTIC COLD WATER SUPPLY
- 19 PUMP SUPPORT AND VIBRATION ISOLATION PER SPECIFICATIONS.
- 20 PROVIDE TEE WITH DRAIN VALVE AND HOSE END CONNECTION.
- 21 MANUAL SHUTOFF VENTURI VALVE.
- 22 PROVIDE SIGHT GLASS/FLOW INDICATOR WHEEL

**2 CHILLED WATER PIPING DIAGRAM**  
SCALE: NONE

NOT FOR CONSTRUCTION

**PROJECT TEAM**  
ARCHITECTURAL  
Caldwell Associates  
PLUMBING  
Watford Engineering  
MECHANICAL  
Watford Engineering  
ELECTRICAL  
HG Engineers

**PROJECT NUMBERS**  
Architect No: 22045B

**DELIVERABLES**  
Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
Architect Issued to CM for Bidding: 03 June 2024

**SHEET TITLE**  
HVAC DETAILS

**SHEET NUMBER**  
**M303**

**WATFORD ENGINEERING**  
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800.526.3447  
Project Number: 2025018  
Created By: JAW  
Drawn By: JVB

NOT FOR CONSTRUCTION

**VERTICAL INSTALLATION**

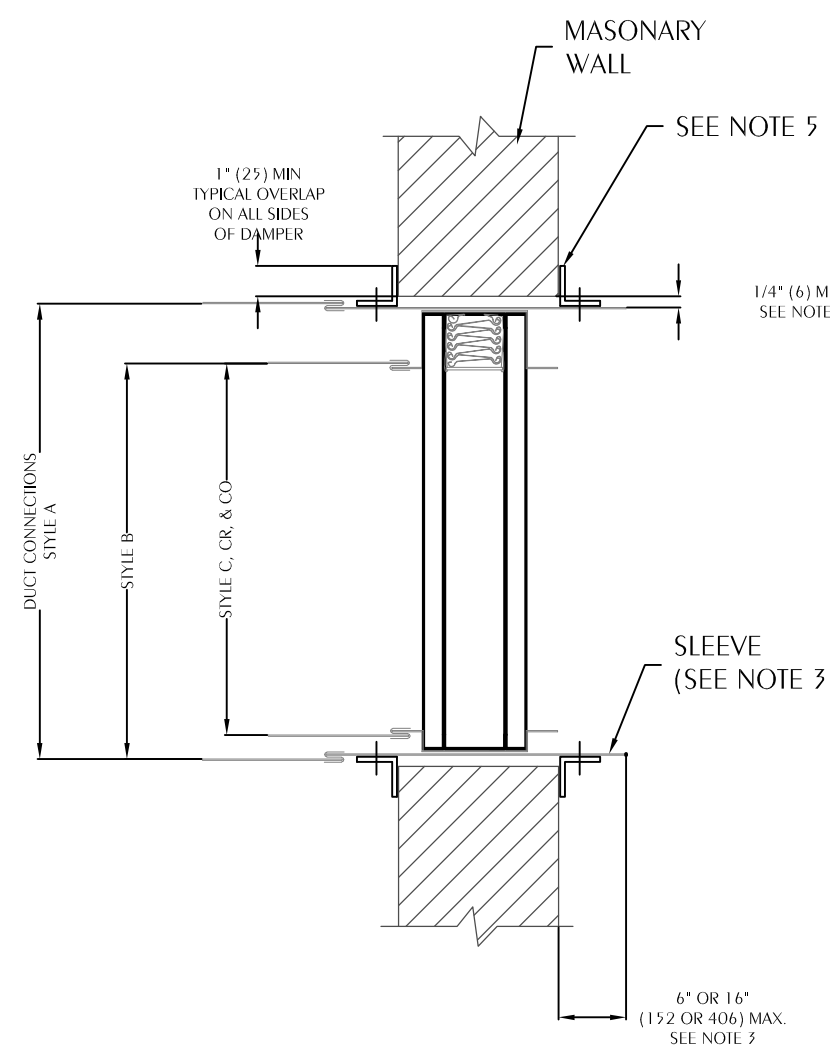
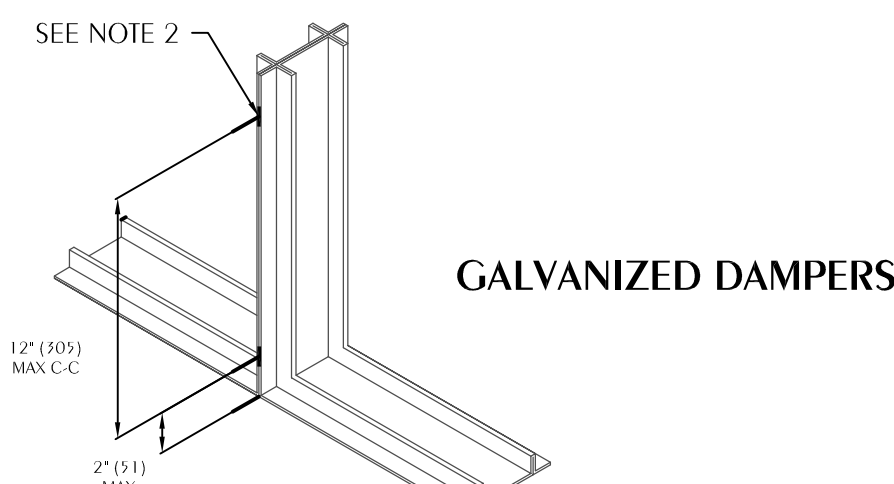
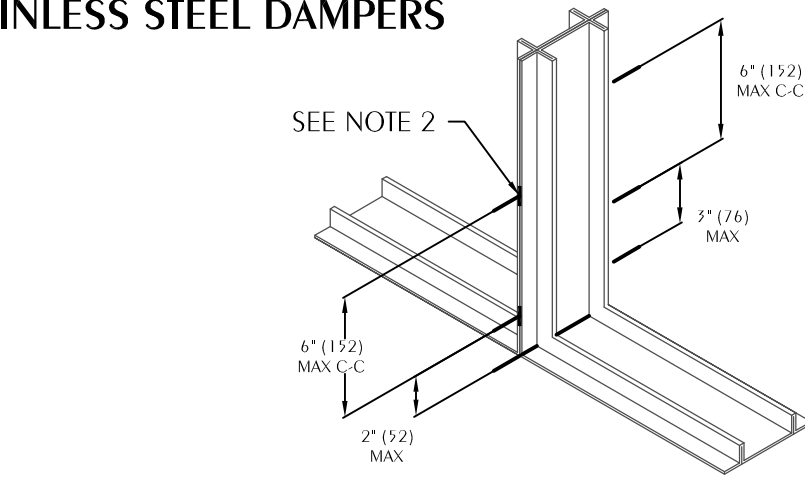


FIGURE 1

**STAINLESS STEEL DAMPERS**



**GALVANIZED DAMPERS**

FIGURE 2

1 1/2 HOUR

**HORIZONTAL INSTALLATION**

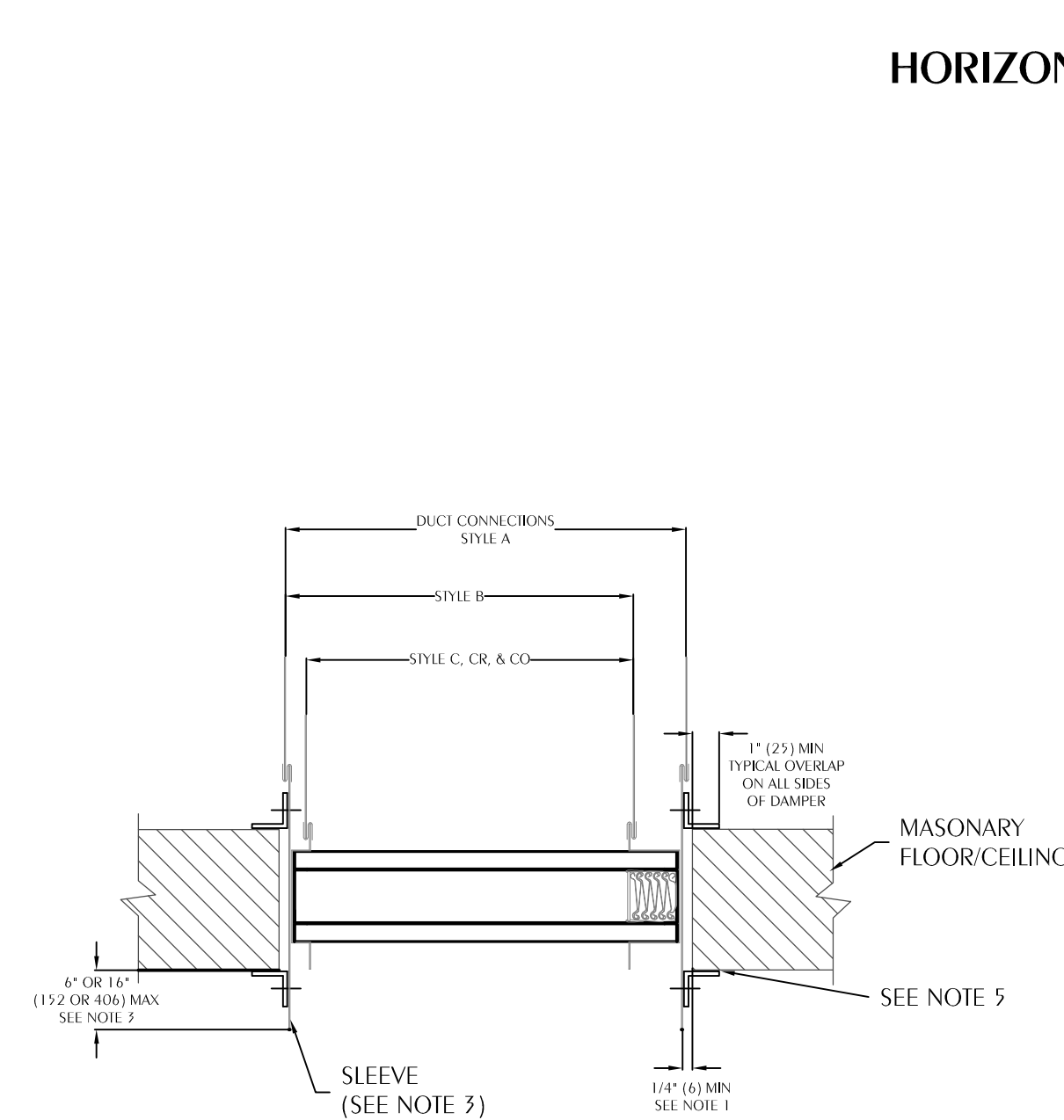


FIGURE 3

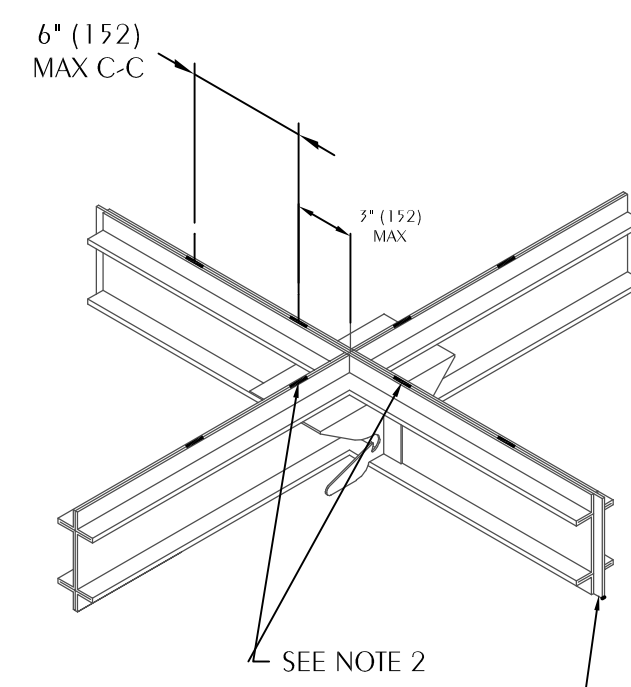


FIGURE 4

1 1/2 HOUR

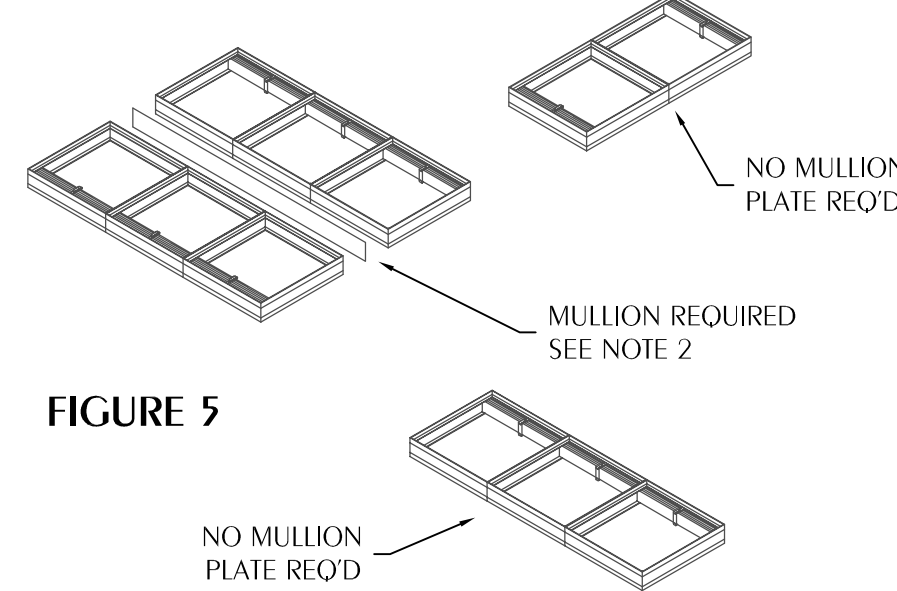


FIGURE 5

- Opening Clearance**  
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. For two angle installations the opening shall be a minimum of 1/8" per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 1/8" per foot (3 per 305) plus 2" (51), nor shall the opening be less than 1/4" (6) larger than the damper/sleeve assembly. For one angle installations, the opening shall be a minimum of 1/4" (6) to a maximum of 1" (25) larger than the overall size of the damper/sleeve assembly. The opening may be as small as 2" (51) larger than the damper/sleeve assembly if a 1/8" (1.6) mounting angles is utilized.
- Fasteners and Multiple Section Assembly**  
Use No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:  
Vertical Mount (In wall)  
Galvanized steel dampers 12" (305) spacing  
Stainless steel dampers 6" (152) spacing  
Horizontal Mount (In floor)  
All dampers 6" (152) spacing  
Multiple section horizontal mount dampers require a 1/4" (6.4) thick x 4 1/2" (114) wide steel reinforcing plate sandwiched between the damper leaves with 1/2" (12.7) long welds staggered transversely and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.
- Damper Sleeve**  
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gap requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA90A. If a breakaway style duct/sleeve connection is not used, the sleeve shall be a minimum of 1/6" (4.1) for dampers up to 36" (914) wide by 24" (610) high and 1/4" (6.4) for dampers exceeding 36" (914) wide by 24" (610) high. Damper sleeve shall not extend more than 6" (152) beyond the fire wall or partition unless damper is equipped with a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.
- Damper Orientation**  
Use "Age Firm" and "Mount with Arrow Up" labels on Dynamic DBD and DBXD models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation.
- Mounting Angles**  
Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls or concrete/masonry walls and floors of sizes 90° x 49° or 49° x 90° (2286 x 1245 or 1245 x 2286) and less mounting angles are only required on one side of the wall or top side of the floor and must be attached to both the sleeve and the wall or floor. Mounting angles may be installed directly to the metal stud under the wall board or metal stud wall installations only. Larger openings require mounting angles on both sides of the partition and must be attached only to the sleeve. Mounting angles must overlap the partition a minimum of 1" (25). Do not weld or fasten angles together at corners of dampers. Riskis fire dampers may be installed using Riskis FAST angle for one angle installation or Riskis PFMA for two angle installations.
- Mounting Angle Fasteners**  
Sleeve: #10 bolts or screws, 3/16" (5) steel rivets or 1/2" (13) long welds.  
Masonry/Wall or Floor: #10 self-tapping, concrete screws.  
Wood/Steel Stud Wall: #10 screws.  
**Mounting Angle Fastener Spacing**  
For one angle installations the sleeve fasteners shall be spaced at 6" (152) o.c. and the wall or floor fasteners shall be spaced at 12" (305) o.c. with a minimum of 2 fasteners on each side, top and bottom. Screw fasteners used in metal stud must engage the metal stud a minimum of 1/2" (13). Screw fasteners used in wood stud must engage the wood stud a minimum of 3/4" (19). Screw fasteners used in masonry walls or floors must engage the wall a minimum of 1 1/2" (38). For two angle installations the fasteners shall be spaced at 6" (203) o.c.
- Duct/Sleeve Connections**  
**Break-away Duct/Sleeve Connections**  
Rectangular ducts must use one or more of the connections: plain "S" slip, beamed "S" slip, double "S" slip, inside slip joint, standing, S, standing, S (angle reinforced), standing, standing, S (bar reinforced), standing, S (angle reinforced), or dove slip joint.  
A maximum of two #10 sheet metal screws on each side and the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used. Connections using these slip joints on the top and bottom with flat duct slips up to 20" (508) long on the sides may also be used.  
**Round and Oval Break-away Connections**  
Round and flat oval break-away connections must use either a 4" (102) wide dowelrod or #10 sheet metal screws spaced equally around the circumference of the duct as follows:  
• Duct diameters 22" (559) and smaller – Maximum 3 screws.  
• Duct diameters over 22" (559) and including 36" (914) – Maximum 5 screws.  
• Duct diameters over 36" (914) and up to and including 48" (1219) – Maximum 8 screws.  
For flat oval ducts, the diameter is considered the largest (major) dimension of the duct.  
Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer's instructions:  
Harsco, Inc. – Iron Gap 601 Precision-PA200-4T  
Eco Duct Seal 44-52 Duxey Polymers – DP 1010  
**Flanged Break-away Style Duct Sleeve Connections**  
Flanged connection systems manufactured by Ductmat, Nexus or Ward are approved break-away connections when installed as shown on the Flanged System Breakaway Connections Supplement.  
**Non-Break-away Duct/Sleeve Connections**  
If other duct/sleeve connections are used, the sleeve shall be a minimum of 1/6" (4.1) for dampers up to 36" (914) wide x 24" (610) high and 1/4" (6.4) for dampers exceeding 36" (914) wide x 24" (610) high.

NOTE: ALL SYSTEMS DETAILED ON MECHANICAL PENETRATIONS SHEETS ARE BASED ON THE MANUFACTURERS SPECIFIED AS BASIS OF DESIGN AND APPLY TO MECHANICAL, FIRE PROTECTION, AND PLUMBING. THE CONTRACTOR SHALL SUBMIT A PENETRATIONS PACKAGE DETAILING EACH PENETRATION AND PRODUCTS TO BE USED TO THE PERMITTING AUTHORITY FOR THE ACTUAL SYSTEMS TO BE USED.

1 TYPICAL HORIZONTAL AND VERTICAL FIRE DAMPER DETAIL  
M304 SCALE: NONE



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Florida License Number: 95457  
800.526.3447  
Project Number: 2025-018  
Created By: JAW  
Drawn By: JVB

DDC SYSTEM LEGEND

- DI DIGITAL INPUT
- DO DIGITAL OUTPUT
- AI ANALOG INPUT
- AO ANALOG OUTPUT
- DV DIGITAL VALUE
- AV ANALOG VALUE

DDC SYSTEM GENERAL NOTES

1. NEW DDC SYSTEM SHALL TIE INTO THE EXISTING NIAGARA FRONT END.
2. THE DDC CONTRACTOR SHALL PROVIDE A NEW DDC SYSTEM TO PERFORM THE INDICATED SEQUENCES, ALL OTHER FUNCTIONS REQUIRED BY THE CONTRACT DOCUMENTS, AND ALL OTHER FUNCTIONS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM.
3. THE CONTROLS CONTRACTOR SHALL PROVIDE A DDC SYSTEM FOR THE NEW EQUIPMENT THAT MEETS ALL REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS, THIS SHALL INCLUDE ALL GRAPHICS, AREA CONTROL MEMBERS, TIME SCHEDULING, ETC. ALL WORK SHALL BE THE RESPONSIBILITY OF THIS CONTROLS CONTRACTOR.
4. ALL SEQUENCES ARE SUBJECT TO SAFETIES. DDC CONTRACTOR SHALL PROVIDE ALL NECESSARY AND CUSTOMARY SAFETIES.
5. ALL WIRING SHALL BE IN CONDUIT. ALL CONDUIT SHALL BE IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS, REQUIREMENTS FOR 120 VAC CIRCUITS.
6. ALL CONTROL TUBING SHALL BE RUN IN CONDUIT. ALL CONDUIT SHALL BE IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS, REQUIREMENTS FOR 120 VAC CIRCUITS.
7. CONDUIT SHALL BE RUN PERPENDICULAR AND PARALLEL TO BUILDING LINES IN A FIRST CLASS WORKMANSHIP LIKE MANNER.
8. ALL WELLS SHALL BE 3/16 STAINLESS STEEL AND SHALL BE INSTALLED IN NEW THREDOLETS WHETHER INSTALLED IN NEW OR EXISTING PIPING. IN CHILLED WATER PIPING PROVIDE NEW WELLS WITH EXTENDED NECK TO SUIT INSULATION THICKNESS.
9. ALL EXISTING CONTROLS CONDUIT, WIRING, ENCLOSURES, AND DEVICES NOT TO BE REUSED SHALL BE REMOVED INCLUDING STRAPS, HANGERS, ETC.
10. NO EXPOSED CONDUIT SHALL BE USED IN FINISHED SPACES.
11. WHERE EXISTING CONTROLS DEVICES ARE REMOVED AND THE EXISTING LOCATION IS NOT TO BE REUSED, THE CONTRACTOR SHALL PROVIDE A BLANK COVER PLATE TO MATCH EXISTING ROOM DEVICES.
12. WHERE NEW DEVICES REPLACING EXISTING DEVICES DO NOT FULLY COVER THE FOOTPRINT OF THE EXISTING DEVICE, THE CONTRACTOR SHALL PROVIDE AN ESCUTCHEON OR TRIM PIECE TO COVER THE UNFINISHED SURFACE.
13. PROVIDE TWO LAPTOP COMPUTERS FOR MAINTENANCE AND SERVICE STAFF WITH ALL SERVICE SOFTWARE FOR THE SYSTEM INSTALLED. CONTROLS SYSTEM TRAINING SHALL INCLUDE TRAINING ON HOW TO USE THE TOOL FOR DIAGNOSTICS, TO MAKE SIMPLE SEQUENCE MODIFICATIONS, AND TO CONFIGURE NEW SENSORS AND CONTROLLERS.

SEQUENCE OF OPERATION  
HEAT PUMP-PRETREATED OA

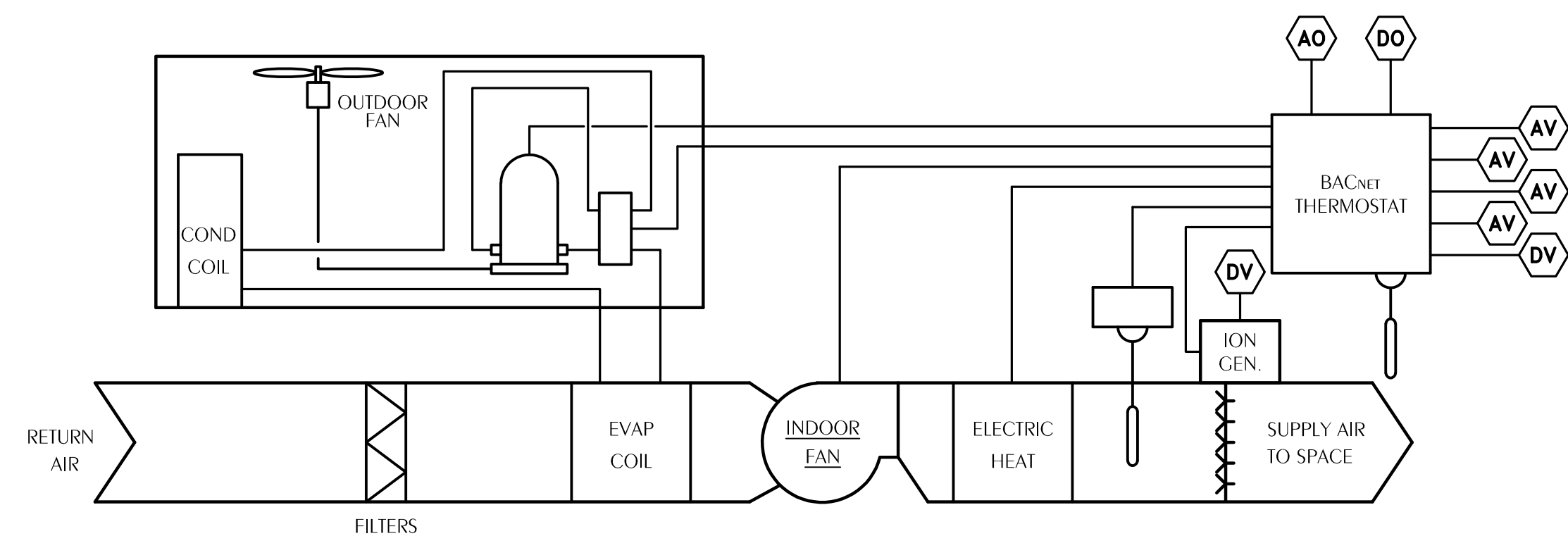
**GENERAL:** THE UNIT SHALL BE STARTED AUTOMATICALLY BY THE BACnet THERMOSTAT. ALL CONTROLS ACTIVATED SUBJECT TO THE FIRE ALARM RELAY, SAFETIES AND OVERLOADS. THE DDC SYSTEM SHALL INCLUDE A GRAPHIC FOR EACH UNIT AND COMMUNICATE THE INDICATED VALUES AND SETPOINTS ON THE GRAPHIC. THE DDC SHALL POST AN ALARM WHEN THE RELATIVE HUMIDITY EXCEEDS 65% (ADJUSTABLE) AND TEMPERATURE EXCEEDS SETPOINT ± 2°F FOR SPACE TEMPERATURE MORE THAN 1 HOUR AFTER OCCUPIED MODE BEGINS.

**OCCUPIED MODE:** THE INDOOR FAN SHALL RUN CONTINUALLY AND THE HEAT PUMP SHALL CYCLE WITH A CALL FOR HEATING AND COOLING. THE SET POINT FOR COOLING SHALL BE 75°F ADJUSTABLE. THE SET POINT FOR HEATING SHALL BE 70°F ADJUSTABLE. THE SUPPLEMENTAL ELECTRIC HEAT SHALL OPERATE AS A SECOND STAGE OF HEATING ENABLED ONLY DURING DEEROST OR WHEN THE OUTDOOR TEMPERATURE IS BELOW 55°F AND THE HEAT PUMP CAN NOT SATISFY THE CALL FOR HEATING AFTER 20 MINUTES OF RUN TIME.

**UNOCCUPIED MODE:** THE INDOOR FAN AND HP SHALL CYCLE TO MAINTAIN SET POINT TEMPERATURE. THE SET POINT FOR COOLING SHALL BE 80°F ADJUSTABLE. THE SET POINT FOR HEATING SHALL BE 65°F ADJUSTABLE.

**VERRIDE MODE:** THE OVERRIDE MODE SHALL PLACE THE SYSTEM IN OCCUPIED MODE FOR 1 HR AND THE OUTSIDE AIR UNIT FOR THE UNIT IN OVERRIDE SHALL BE PLACED IN OCCUPIED MODE FOR 1 HR.

**BIPOLAR IONIZATION:** THE BACnet THERMOSTAT SHALL MONITOR A DIGITAL ALARM OUTPUT ON THE IONIZATION DEVICE AND THE DDC SHALL MONITOR THIS POINT AND POST AN ALARM IF THERE IS A FAILURE.



HEAT PUMP-PRETREATED OA POINTS LIST

POINT NAME	HARDWARE POINTS					SOFTWARE POINTS				
	AI	AO	DI	DO	AV	DV	SCHED	TREND	ALARM	GRAPHIC
OCCUPIED/UNOCCUPIED SCHED				X						X
BMS TEMPERATURE SETPOINT		X								X
ZONE TEMP SETPOINT					X					X
ZONE TEMP					X				X	X
ZONE RELATIVE HUMIDITY					X				X	X
SUPPLY AIR TEMP					X					X
IONIZATION DEVICE						X			X	X

1 HEAT PUMP-PRETREATED OA CONTROL DIAGRAM

M401 SCALE: NONE

SEQUENCE OF OPERATION  
100% OUTSIDE AIR UNIT

**GENERAL:** THE DDC CONTRACTOR SHALL INSTALL FIELD MOUNTED SENSORS PROVIDED BY THE UNIT MANUFACTURER. THE DDC SYSTEM SHALL CONNECT TO THE UNITS BACNET INTERFACE TO READ THE POINTS INDICATED. THE DDC SYSTEM SHALL PROVIDE OCCUPIED/UNOCCUPIED SIGNAL TO THE FACTORY MOUNTED UNIT CONTROLLER. MONITOR ALARM STATUS, AND MONITOR VALUES INDICATED. THE DDC SHALL MONITOR BUILDING RELATIVE HUMIDITY (BACnet POINTS FROM ROOM THERMOSTATS) AND OUTSIDE AIR SUPPLY AIR DEWPOINT TEMPERATURE. WHEN THE OA DEWPOINT SUPPLY AIR TEMPERATURE RISES ABOVE 60°F FOR MORE THAN 10 MINUTES (ADJUSTABLE), THE DDC SHALL POST AN ALARM AND SHUT DOWN THE OUTSIDE AIR UNIT.

**THE FOLLOWING SEQUENCE OF OPERATIONS SHALL BE PROVIDED BY THE UNIT MANUFACTURER:**

**GENERAL:** STARTING AND STOPPING OF EQUIPMENT SHALL BE BY A UNIT MOUNTED DIGITAL CONTROLLER. WITH THE DIGITAL CONTROLLER IN THE AUTO POSITION, THE UNIT SHALL BE STARTED AUTOMATICALLY BY THE ELECTRONIC CONTROL SYSTEM AND ALL CONTROLS ACTIVATED SUBJECT TO THE FIRE ALARM RELAY, SAFETIES AND OVERLOADS.

**OCCUPIED MODE DEHUMIDIFICATION:** THE MOTORIZED OA DAMPER SHALL OPEN TO THE BALANCED POSITION AND THE INDOOR FAN SHALL RUN CONTINUOUSLY. THE UNIT SHALL DEHUMIDIFY SUPPLY TO A SET POINT OF 50°F DEWPOINT AIR ANYTIME THE OUTDOOR AIR DEWPOINT IS ABOVE 55°F. THE UNIT SHALL REHEAT SUPPLY AIR TO SPACE CONDITIONS WITH VARIABLE HOT GAS, MAINTAINING LEAVING AIR TEMPERATURE OF 72°F.

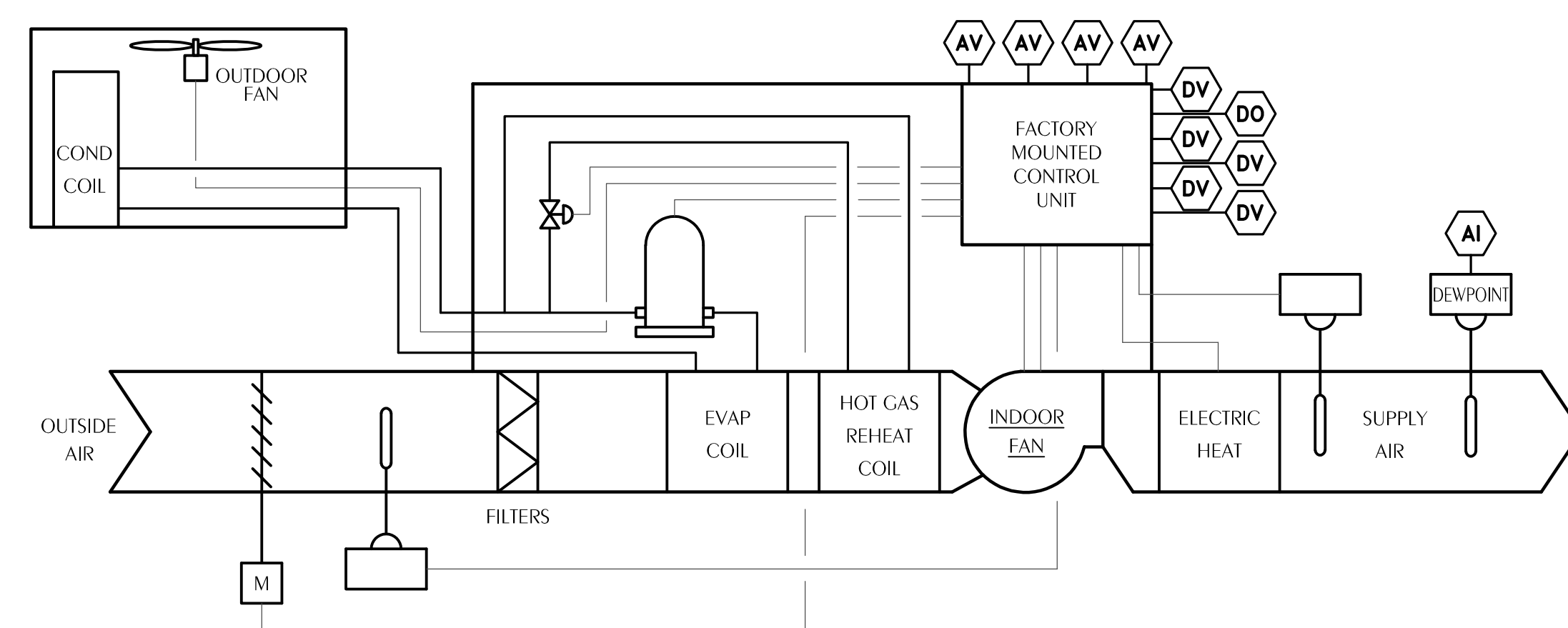
**OCCUPIED MODE HEATING:** WHEN THE OUTDOOR AIR TEMPERATURE FALLS BELOW 50°F, THE ELECTRIC HEAT SHALL OPERATE AS REQUIRED TO MAINTAIN 70°F LEAVING AIR TEMPERATURE. THE ELECTRIC HEAT SHALL BE LOCKED OUT DURING COOLING.

**UNOCCUPIED MODE:** THE MOTORIZED OA DAMPER SHALL CLOSE AND THE UNIT SHALL BE NOT OPERATE.

**VERRIDE MODE:** THE OVERRIDE MODE SHALL PLACE THE SYSTEM IN OCCUPIED MODE AND THE OUTSIDE AIR DAMPER FOR THE UNIT IN OVERRIDE SHALL OPEN TO THE BALANCED POSITION.

**SUPPLY AIR RESET-TEMPERATURE BASED:** AT THE START OF EACH PERIOD OF OCCUPANCY, THE DDC SHALL SET SUPPLY AIR TEMPERATURE TO 60°F. THE DDC SYSTEM SHALL MONITOR THE ASSOCIATED AHUS IN THE AREAS SERVED BY EACH OAU. UPON A CALL FOR HEATING FROM MORE THAN 10% OF THE UNITS SERVED BY THE OAU, THE DDC SHALL RESET OAU DISCHARGE AIR TEMPERATURE UP IN 5°F INCREMENTS UNTIL THERE ARE FEWER THAN 10% OF THE UNITS SERVED WITH HEATING DEMAND OR A MAXIMUM SUPPLY AIR TEMPERATURE OF 75°F HAS BEEN REACHED. THE INCREASE IN TEMPERATURE SHALL BE ACCOMPLISHED BY THE ELECTRIC REHEAT COIL.

**SUPPLY AIR RESET-HUMIDITY BASED:** THE DDC SYSTEM SHALL MONITOR THE ASSOCIATED AHUS IN THE AREAS SERVED BY EACH OAU. UPON A RISE IN AVERAGE RELATIVE HUMIDITY ABOVE 65% (ADJUSTABLE), THE DDC SHALL RESET OAU DISCHARGE AIR TEMPERATURE UP IN 5°F INCREMENTS UNTIL THE CALL FOR DEHUMIDIFICATION HAS BEEN SATISFIED OR A MAXIMUM SUPPLY AIR TEMPERATURE OF 75°F HAS BEEN REACHED. THE INCREASE IN TEMPERATURE SHALL BE ACCOMPLISHED BY THE ELECTRIC REHEAT COIL.



2 100% OUTSIDE AIR UNIT CONTROL DIAGRAM

M401 SCALE: NONE

100% OUTSIDE AIR UNIT POINTS LIST

POINT NAME	HARDWARE POINTS					SOFTWARE POINTS				
	AI	AO	DI	DO	AV	DV	SCHED	TREND	ALARM	GRAPHIC
SCHEDULE				X						X
FAULT						X			X	X
OUTSIDE AIR SUPPLY DEW POINT	X								X	X
OUTDOOR AIR TEMP					X					X
OUTSIDE AIR DEW POINT					X					X
SUPPLY AIR TEMP					X					X
ELECTRIC HEAT					X					X
OA DAMPER						X				X
COMPRESSOR						X				X
FAN START/STOP						X				X
FAN STATUS						X			X	X

NOT FOR CONSTRUCTION

PROJECT TEAM

ARCHITECTURAL  
Caldwell Associates

PLUMBING  
Watford Engineering

MECHANICAL  
Watford Engineering

ELECTRICAL  
HG Engineers

PROJECT NUMBERS

Architect No: 22045B

DELIVERABLES

Schematic Design: None

Design Development: 20 JULY 2023

Bid Documents: TBD

Architect Issued to CM for Bidding 03 June 2024

SHEET TITLE

HVAC CONTROLS

SHEET NUMBER

M401



Florida CA Number: 27125  
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Project Number: 2025018  
Created By: JAW  
Drawn By: JVB

### SEQUENCE OF OPERATION VARIABLE VOLUME AHU

STARTING AND STOPPING OF EQUIPMENT SHALL BE ACCOMPLISHED THROUGH A "HAND-OFF-AUTO" SWITCH LOCATED ON FACE OF DDC CONTROL PANEL. AN ALARM SHALL BE POSTED TO THE DDC SYSTEM ANYTIME THE HOA SWITCH IS INDEXED TO THE "HAND" OR "OFF" POSITIONS. WITH THE HOA SWITCH IN THE "AUTO" POSITION, THE UNIT SHALL BE STARTED AUTOMATICALLY BY THE DDC SYSTEM AND ALL CONTROLS ACTIVATED SUBJECT TO FIRE ALARM RELAY, SAFETIES AND OVERLOADS.

**OCCUPIED MODE:**

**BIPOLAR IONIZATION:** THE DDC SHALL MONITOR A DIGITAL ALARM OUTPUT ON THE IONIZATION DEVICE AND POST AN ALARM IF THERE IS A FAILURE.

OPEN OUTSIDE AIR DAMPER AND START EXHAUST FANS INDICATED WHENEVER THE BUILDING IS IN OCCUPIED MODE.

**COOLING COIL FREEZE PROTECTION:** THE DDC SYSTEM SHALL CLOSE THE OUTSIDE AIR DAMPER ANYTIME THE COOLING COIL ENTERING AIR TEMPERATURE FALLS BELOW 40°F LONGER THAN 5 MINUTES. THE LOW LIMIT FREEZE STAT SHALL STOP THE AHU FAN MOTOR ANYTIME THE COOLING COIL ENTERING AIR TEMPERATURE FALLS BELOW 33°F.

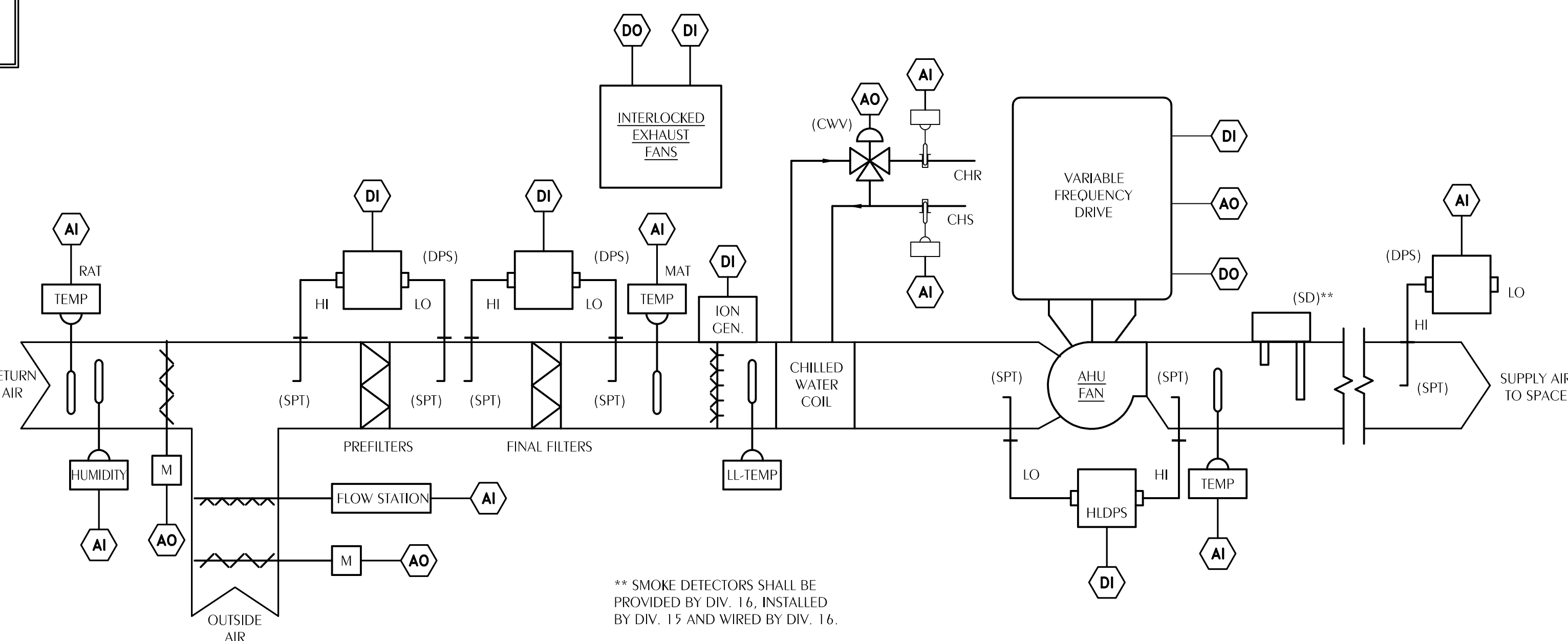
**DISCHARGE TEMPERATURE CONTROL:** THE DDC SYSTEM SHALL MODULATE THE CHILLED WATER VALVE AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SET POINT (REFER TO AHU SCHEDULE). WHEN MINIMUM SPEED IS REACHED AND THERE IS A CALL FOR HEATING FROM ANY ZONE, THE DDC SHALL RESET SUPPLY AIR TEMPERATURE UP IN 2°F INCREMENTS EVERY FIVE MINUTES TO A MAXIMUM OF 65°F. THE DDC SHALL REVERSE SUPPLY AIR RESET UPON A CALL FOR COOLING OR WHEN RETURN AIR RH RISES ABOVE 60%.

**FAN SPEED CONTROL:** SUBJECT TO THE UNIT MOUNTED HIGH LIMIT STATIC PRESSURE AND LOW LIMIT TEMPERATURE SENSORS, THE DDC SHALL VARY AHI WITH THE VARIABLE FREQUENCY DRIVE (VFD) AS REQUIRED TO MAINTAIN A CONSTANT STATIC PRESSURE AT THE DUCT MOUNTED STATIC PRESSURE SENSOR. THE DUCT STATIC PRESSURE SET POINT SHALL BE SET AT THE MINIMUM REQUIRED FOR TEST AND BALANCE. WHEN NONE OF THE TUS ASSOCIATED WITH THE AHU HAVE BEEN IN FULL COOLING MODE FOR FIVE MINUTES, THE DDC SHALL RESET THE DUCT STATIC PRESSURE DOWN 0.1". AHU AIRFLOW SHALL BE LIMITED TO SCHEDULED MAXIMUM AND MINIMUM VALUES. AHU FAN SHALL RUN CONTINUOUSLY.

**OUTSIDE AIR CONTROL:** THE DDC SYSTEM, WITH OA DUCT MOUNTED FLOW MEASURING STATION, SHALL MODULATE OA DAMPER AS REQUIRED TO MAINTAIN OUTSIDE AIR QUANTITY AT SET POINT REGARDLESS OF THE TOTAL AIR FLOW OF THE AIR HANDLING UNIT AT ANYTIME. READOUT OF OUTSIDE AIR QUANTITY SHALL BE IN CFM. OUTSIDE AIR DAMPER SHALL BE OPENED TO ITS BALANCED POSITION DURING OCCUPIED CYCLES. UPON FAILURE THE OA DAMPER SHALL BE NORMALLY CLOSED. WHENEVER THE AHU OPERATES DURING UNOCCUPIED MODE, THE OA DAMPER SHALL REMAIN CLOSED.

**UNOCCUPIED MODE:** THE OA DAMPER SHALL SHUT AND THE FAN SHALL CYCLE UPON A CALL FOR COOLING OR HEATING FROM ANY SPACE.

**INTERLOCKED EXHAUST FANS:** INTERLOCKED EXHAUST FANS SHALL OPERATE ONLY DURING OCCUPIED TIMES.



**1 VARIABLE VOLUME AHU CONTROL DIAGRAM**  
SCALE: NONE

### VARIABLE VOLUME AHU POINTS LIST

SYSTEM POINT DESCRIPTION	ANALOG		DIGITAL		SYSTEMS FEATURES	
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS
CONTROL PANEL						
FAN CONTROL			X	X		
RETURN AIR	X	X			X	X
MIXED AIR	X				X	X
CHWC DISCHARGE AIR	X				X	X
COOLING VALVE (CWV)		X				
CHS	X				X	X
CHR	X				X	X
FILTERS			X		X	X
OUTSIDE AIR	X				X	X
RETURN AIR DAMPER		X			X	X
DUCT STATIC PRESSURE	X				X	X
OUTSIDE AIR DAMPER		X			X	X
HLDPS					X	X
EXHAUST FANS			X	X		
ION GENERATOR			X			

### SEQUENCE OF OPERATION SINGLE DUCT TERMINAL UNIT

EACH TERMINAL UNIT SHALL BE PROVIDED WITH A UNIT CONTROL MODULE (UCM). THE UCM SHALL BE FIELD OR FACTORY MOUNTED. THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER TO EACH TERMINAL UNIT. 24V CONTROL TRANSFORMER FOR EACH TU FURNISHED WITH EACH TU. THE ZONE TEMPERATURE SENSOR WITH SET POINT ADJUSTMENT SHALL BE PROVIDED WITH NIGHT SETBACK OVERRIDE. AND A COMMUNICATIONS JACK. UPPER AND LOWER ZONE TEMPERATURE SET POINTS SHALL BE SET BY THE DDC.

UNIT AIRFLOW SHALL BE MONITORED BY AN INTEGRAL, MULTIPLE POINT, AVERAGING FLOW SENSING DEVICE AND A TRANSDUCER TO MAINTAIN AIRFLOW WITHIN 5% OF RATED CFM DOWN TO A MINIMUM CFM AS SCHEDULED, INDEPENDENT OF CHANGES IN SYSTEM STATIC PRESSURE.

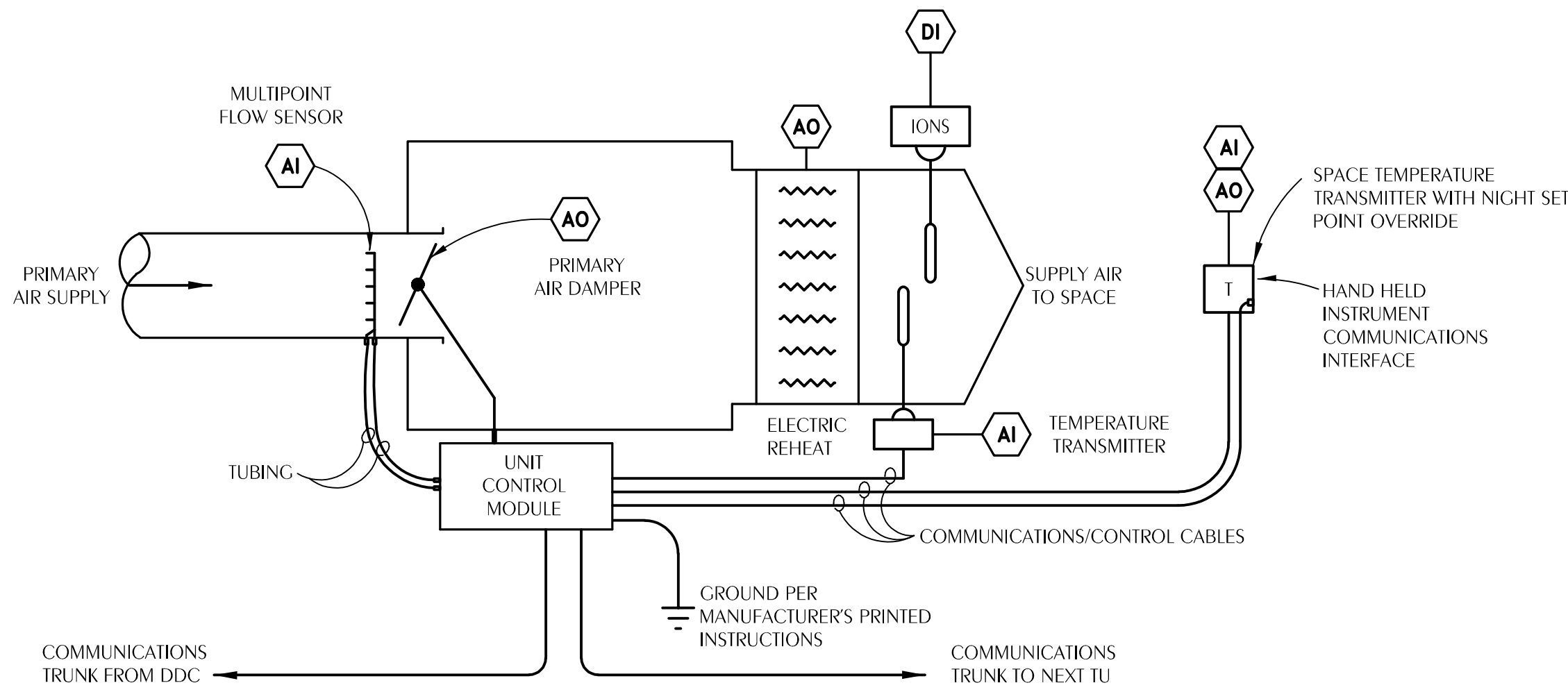
**COOLING MODE:** THE UCM SHALL MONITOR THE ZONE TEMPERATURE AGAINST ITS SET POINT (74°F ADJUSTABLE) AND MODULATE THE DAMPER TO MEET THE ZONE SETPOINT. IF THE TU CALLS FOR FULL COOLING AND CANNOT REACH MAXIMUM AIRFLOW FOR FIVE MINUTES, THE DDC SHALL RESET THE AHU STATIC PRESSURE UP 0.1". AS THE COOLING SETPOINT IS REACHED, THE UCM SHALL MODULATE THE ZONE DAMPER TO THE MINIMUM SCHEDULED COOLING CAPACITY.

**HEATING MODE:** IF THE ZONE REACHES MINIMUM COOLING AIRFLOW AND THERE IS A CALL FOR HEAT (COOLING SET POINT MINUS 3°F), THE UCM SHALL MODULATE THE UNIT MOUNTED ELECTRIC REHEAT SCR CONTROLLER TO INCREASE SUPPLY AIR TEMPERATURE AS REQUIRED TO MAINTAIN ROOM TEMPERATURE AT SETPOINT UP TO THE MAXIMUM SUPPLY AIR TEMPERATURE INDICATED IN THE TERMINAL UNIT SCHEDULE. IF THERE IS A CONTINUED CALL FOR HEAT UPON REACHING THE MAXIMUM HEATING SUPPLY AIR TEMPERATURE, THE UCM SHALL MAINTAIN THE SUPPLY AIR TEMPERATURE AT SETPOINT AND MODULATE AIRFLOW UNTIL THE MAXIMUM HEATING AIRFLOW IS REACHED.

**OCCUPIED/UNOCCUPIED MODE:** CONTROLS CONTRACTOR SHALL CONSULT WITH OWNER FOR SPACE TEMPERATURE SETPOINTS.

**OVERRIDE MODE:** THE OVERRIDE TIMER SHALL PLACE THE TU AND AHU IN OCCUPIED MODE FOR ONE HOUR (ADJUSTABLE).

**ION SENSOR:** TU-4, 2, 4, 4, 4, 7, AND 5, 4 SHALL BE EQUIPPED WITH A SUPPLY AIR MOUNTED ION SENSOR WITH ADJUSTABLE SETPOINT AND DIGITAL OUTPUT. THE DDC SHALL POST AN ALARM WHEN THE ION COUNT FALLS BELOW THE SETPOINT. INITIAL SETPOINT MINIMUM SHALL BE 5000 IONS/CC/SEC. DUCT SETPOINT SHALL BE CONFIRMED BY SPACE ION MEASUREMENTS AT A MINIMUM OF 2000 IONS/CC/SEC IN THE SPACE SERVED.



**2 SINGLE DUCT TU CONTROL DIAGRAM**  
SCALE: NONE

### SINGLE DUCT TU POINTS LIST

SYSTEM POINT DESCRIPTION	ANALOG		DIGITAL		SYSTEMS FEATURES	
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS
CONTROL PANEL	X					
SUPPLY AIR TO SPACE	X			X	X	X
ZONE TEMPERATURE	X	X			X	X
ELECTRIC REHEAT		X				
DAMPER		X				
FLOW SENSOR	X				X	

### CHILLED WATER SYSTEM POINTS LIST

SYSTEM POINT DESCRIPTION	ANALOG		DIGITAL		SYSTEMS FEATURES	
	INPUT	OUTPUT	INPUT	OUTPUT	ALARMS	PROGRAMS
CHILLER						
CHILLER PLANT	X					
CH-1			X	X	X	X
CHP-1			X	X	X	X
CHS	X				X	X
CHR	X				X	X
OA TEMP	X				X	
CHW		X	X			

### SEQUENCE OF OPERATION CHILLED WATER PLANT

STARTING AND STOPPING OF EQUIPMENT SHALL BE ACCOMPLISHED THRU A "HAND-OFF-AUTO" SWITCH LOCATED ON FACE OF THE CHILLER PLANT MANAGER. AN ALARM SHALL BE POSTED TO THE DDC SYSTEM ANYTIME THE CW SYSTEM HOA SWITCH IS INDEXED TO THE "HAND" OR "OFF" POSITIONS. WITH THE CW SYSTEM HOA SWITCH IN THE "AUTO" POSITION, THE CHILLED WATER SYSTEM SHALL BE ENABLED BY THE DDC SYSTEM AND STARTED UNDER ITS OWN SEQUENCE SUBJECT TO SAFETIES AND OVERLOADS.

**CHILLER CONTROL:**

**GENERAL:** THE DDC PROGRAM SHALL BE FULLY EDITABLE AND SET-UP VIA POINT AND CLICK ON A STANDARD WINDOWS SCREEN. IT SHALL NOT REQUIRE SPECIAL SOFTWARE TOOLS OR A BAS TECHNICIAN TO OPERATE AND MODIFY CHILLER PLANT CONTROL.

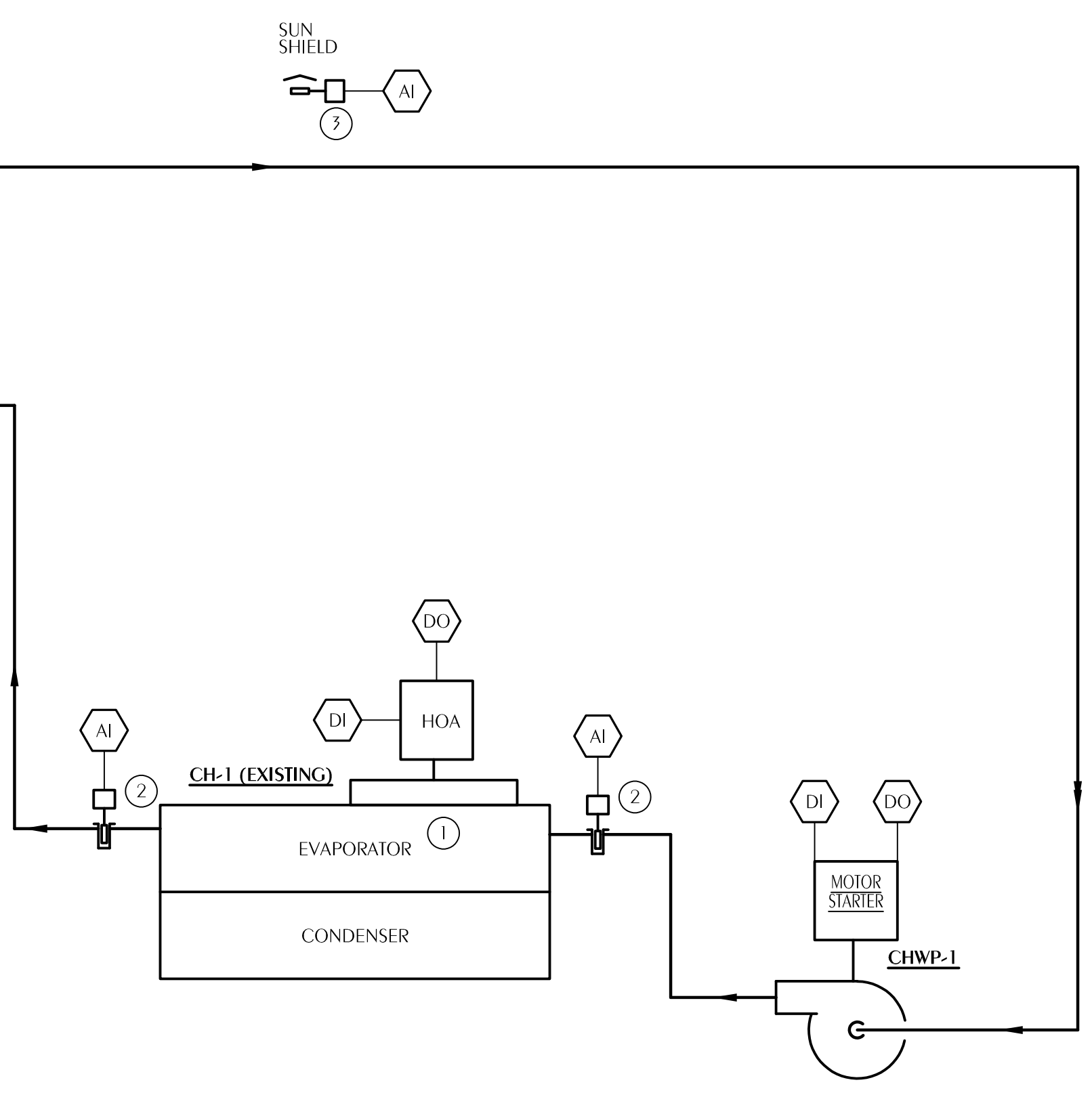
THE DDC SHALL PERFORM THE FOLLOWING CONTROL STRATEGIES:

- CHILLER PLANT SYSTEM SCHEDULING
  - COLOR GRAPHIC BASED CHILLER PLANT STATUS SCREENS
  - COLOR GRAPHIC BASED CHILLER STATUS SCREENS
  - SYSTEM AND CHILLER DIAGNOSTIC MESSAGES
  - SYSTEM AND CHILLER REPORTS
- CHILLER SYSTEM OPERATOR INTERFACE:** DDC APPLICATION OPERATIONAL STATUS SCREEN TO INCLUDE:
- CHILLER SYSTEM STATUS (OFF/NOT START/NORMAL/AMBIENT/LOCKOUT/SHUTDOWN IN PROGRESS)
  - CHILLER PLANT SUPPLY WATER SETPOINT
  - CHILLED WATER SYSTEM SUPPLY WATER TEMPERATURE
  - CHILLED WATER SYSTEM RETURN WATER TEMPERATURE
  - INDIVIDUAL CHILLER FAILURE RESET
  - ALL CHILLER FAILURE RESET
  - SYSTEM PUMP FAILURE RESET

THE CHILLED WATER SYSTEM SHALL BE ENABLED BASED ON CHILLED WATER VALVE POSITION, THIS INDICATING DEMAND FROM THE CONNECTED SYSTEMS. WHEN MAXIMUM VALVE POSITION IS GREATER THAN 25% OPEN, THE DDC WILL ENABLE THE PLANT AND WHEN MAXIMUM VALVE POSITION IS LESS THAN 15% OPEN, THE DDC SYSTEM SHALL DISABLE THE PLANT.

**PUMP CONTROL:** UPON CHW SYSTEM STARTUP, THE DDC SYSTEM SHALL START CHP-1.

**CHILLER CONTROL SUMMARY:** THE DDC SYSTEM SHALL ENABLE THE CHILLER BASED ON BUILDING LOAD AND EACH CHILLER SHALL OPERATE THROUGH ITS INTERNAL CONTROLS TO MAINTAIN CHILLED WATER SUPPLY TEMPERATURE AT SETPOINT OF 44°F. UPON PROOF OF FLOW, THE CHILLER SHALL OPERATE TO MAINTAIN LEAVING WATER AT SETPOINT. THE DDC SYSTEM SHALL MONITOR ALARM STATUS OF THE CHILLER AND POST AN ALARM IN THE EVENT A CHILLER IS ENABLED AND NOT OPERATING. THE DDC SHALL MONITOR ALL POINTS AVAILABLE THROUGH THE MANUFACTURER'S FACTORY MOUNTED CHILLER MICROPROCESSOR CONTROL THROUGH EXISTING LONTAK/TRACEX SUMMIT INTERFACE.



**CHILLED WATER SYSTEM KEY NOTES**

- CHILLER CONTROLS.
- TEMPERATURE SENSOR WITH STAINLESS STEEL RIGID IMMERSION PROBE.
- OUTSIDE AIR TEMPERATURE SENSOR.

**3 CHILLED WATER PLANT CONTROL DIAGRAM**  
SCALE: NONE

PROJECT  
**VOLUME 2**

TOMMY SMITH  
ELEMENTARY SCHOOL  
RENOVATIONS

5044 TOMMY SMITH DR.  
PANAMA CITY, FL 32404

OWNER  
BAY DISTRICT SCHOOLS

ARCHITECT'S SEAL

NOT FOR CONSTRUCTION

PROJECT TEAM  
ARCHITECTURAL  
Caldwell Associates

PLUMBING  
Watford Engineering

MECHANICAL  
Watford Engineering

ELECTRICAL  
HG Engineers

PROJECT NUMBERS  
Achitect No: 22045B

DELIVERABLES  
Schematic Design: None  
Design Development: 20 JULY 2023  
Bid Documents: TBD  
Architect Issued to CM for Bidding: 03 June 2024

SHEET TITLE  
HVAC CONTROLS

SHEET NUMBER  
**M402**

