LEGEND

RTU-1	EQUIPMENT TAG
1 / M3	DETAIL TAG("1" INDICATES IDENTIFICATION NUMBER; "M3" INDICATES SHEET NUMBER DRAWN ON)
1	SHEET NOTE
	SUPPLY DUCT SECTION POSITIVE PRESSURE
	RETURN OR EXHAUST DUCT NEGATIVE PRESSURE
AxB	RECTANGULAR DUCT SIZE ("A" INDICTES SIDE SHOWN; "B" INDICATES SIDE NOT SHOWN)
A/B	FLAT OVAL DUCT SIZE ("A" INDICATES SIDE SHOWN;"B" INDICATES SIDE NOT SHOWN)
AØ	ROUND DUCT SIZE
	EXTERNALLY INSULATED DUCTWORK
	DUCT ELBOW WITH TURNING VANES
	RADIUSED DUCT ELBOW
	FLEXIBLE DUCT CONNECTION
	MANUAL VOLUME BALANCING DAMPER
	HIGH PRESSURE DUCTWORK
	DOUBLE WALL HIGH PRESSURE DUCTWORK
	DUCTWORK TO BE DEMOLISHED
	EXISTING DUCTWORK TO REMAIN
	DOUBLE WALL SPIRAL DUCTWORK
	INTERNALLY INSULATED DUCTWORK
	GATE VALVE
	BUTTERFLY VALVE
	TWO-WAY CONTROL VALVE
	THREE-WAY CONTROL VALVE
	STRAINER WITH BLOW DOWN VALVE AND CAP
	THERMOMETER
	THERMOMETER WELL OR PRESSURE TEMPERATURE PORT AS INDICATED
VFD	VARIABLE FREQUENCY DRIVE
DDC	DIGITAL CONTROLS ENCLOSURE
	BUTTERFLY VALVE- VALVE HANDLE OPENS IN DIRECTION OF FLOW HANDLE
	BALL VALVE- VALVE HANDLE OPENS IN DIRECTION OF FLOW

	MOTORIZED DAMPER
FD	FIRE DAMPER WITH ACCESS DOOR
SD	SMOKE DAMPER WITH ACCESS DOOR
FSD	FIRE/SMOKE DAMPER WITH ACCESS DOOR
BD	BACKDRAFT DAMPER
	TEE WITH TURNING VANES AND BALANCING DAMPERS IN EACH LEG
	FLEX DUCT TAKEOFF WITH MVD. RUNOUT SIZE EQUALS DIFFUSER NECK SIZE UNLESS OTHERWISE INDICATED
	BRANCH DUCT TAKEOFF WITH MVD
	AUTOMATIC AIR VENT
	PRESSURE GAUGE AND 1/4" BALL VALVE
AFM	AIRFLOW MEASURING STATION
SR-1 / 100	AIR DEVICE TAG. TOP LINE INDICATES TYPE OF DEVICE. BOTTOM LINE INDICATES AIRFLOW IN CFM.
(2)SR-1 / 100	AIR DEVICE TAG. TOP LINE INDICATES TYPE OF DEVICE. BOTTOM LINE INDICATES AIRFLOW IN CFM. (2) INDICATES TYPICAL OF TWO DEVICES
SR-E / 100	EXISTING AIR DEVICE TAG. TOP LINE INDICATES TYPE OF DEVICE. BOTTOM LINE INDICATES AIRFLOW IN CFM.
	UNION
LPS	LOW PRESSURE SUPPLY
HPS	HIGH PRESSURE SUPPLY
XFR	TRANSFER
EH	ELETRIC HEATER
TF	TRANSFER FAN
APD	AIR PRESSURE DROP
	POINT OF CONNECTION TO EXISTING

TYP	TYPICAL
TEMP	TEMPERATURE
SA	SUPPLY AIR
RA	RETURN AIR
EA	EXHAUST AIR
OA	OUTDOOR AIR
TA	TRANSFER AIR
EF	EXHAUST FAN
CD	CEILING DIFFUSER
RG	RETURN GRILLE
EG	EXHAUST GRILLE
SWG	SIDEWALL SUPPLY GRILLE
LVR	LOUVER
CEF	CEILING EXHAUST FAN
AHU	INDOOR AIR HANDLING UNIT
CHWP	CHILLED WATER PUMP
HWP	HEATING HOT WATER PUMP
T	THERMOSTAT, "1" INDICATES UNIT CONTROLLED. MOUNT WITH TOP AT 48" AFF.
S	DUCT MOUNTED SMOKE DETECTOR
UC	UNDERCUT DOOR 3/4"
	16x16 DOOR GRILL
N.I.C	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR
FD	FLOOR DRAIN
TG	TRANSFER GRILLE
SG	SOFFIT GRILLE
SWS	SIDEWALL SUPPLY GRILLE
SWR	SIDEWALL RETURN GRILLE
DDC	DIRECT DIGITAL CONTROL
CHW	CHILLED WATER
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HW	HOT WATER
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
VFM	VENTURI FLOW METER
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
TAB	TESTING, ADJUSTING AND BALANCING
TU	TERMINAL UNIT
NOM	NOMINAL
VFD	VARIABLE FREQUENCY DRIVE
E	EXISTING
FCU	FAN COIL UNIT
FD	HORIZONTAL FIRE DAMPER
BCU	BLOWER COIL UNIT
MVD	MANUAL VOLUME DAMPER
UH	UNIT HEATER
H	HUMIDITY SENSOR

DUCTWORK AND INSULATION GENERAL NOTES

1. ALL ROUND FLEXIBLE DUCT SHALL BE FLEXMASTER TYPE 8M OR ENGINEER APPROVED EQUAL. MAXIMUM LENGTH OF ANY FLEXIBLE DUCT RUNOUT SHALL BE 5'-0". WHERE LENGTH REQUIRED EXCEEDS 5'-0", INSTALL EXTERNALLY INSULATED ROUND SNAPLOCK DUCT FOR BALANCE OF DISTANCE TO SPIN-IN TAP AT MAIN DUCT TRUNK.
2. SEAL ALL DUCT PENETRATIONS OF WALLS AND FLOORS AIRTIGHT, REGARDLESS OF WHETHER WALLS AND FLOORS ARE FIRE RATED OR NOT.
3. UNLESS OTHERWISE INDICATED, ALL SUPPLY AIR DUCTWORK UPSTREAM OF TERMINAL UNITS SHALL BE OVAL OR ROUND, SMACNA STATIC PRESSURE CLASS 3" W.G., SEAL CLASS A. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS.
4. ALL SUPPLY AIR DUCTWORK UPSTREAM OF TERMINAL UNITS WITHIN 40' OF AHU DISCHARGE SHALL BE DOUBLE WALL SPIRAL WITH PERFORATED INNER LINER.
5. ALL SUPPLY AIR DUCTWORK DOWNSTREAM OF TERMINAL UNITS (EXCEPT TAKEOFFS TO SUPPLY AIR DIFFUSERS) SHALL BE LOW PRESSURE RECTANGULAR, SMACNA STATIC PRESSURE CLASS 2" W.G., SEAL CLASS A, EXTERNALLY INSULATED. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS.
6. ALL RETURN AIR DUCTWORK SHALL BE LOW PRESSURE RECTANGULAR, SMACNA STATIC PRESSURE CLASS 2" W.G., SEAL CLASS A, EXTERNALLY INSULATED. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS.
7. ALL AHU RETURN DUCT WITHIN 40' OF AHU RETURN PLENUM SHALL BE LINED WITH 2" DUCT LINER PER PROJECT SPECIFICATIONS.
8. ALL AHU RETURN PLENUMS SHALL BE LINED WITH 2" DUCT LINER PER PROJECT SPECIFICATIONS.
9. ALL OUTSIDE AIR INTAKE DUCTWORK SHALL BE LOW PRESSURE RECTANGULAR, SMACNA STATIC PRESSURE CLASS 2" W.G., SEAL CLASS A, EXTERNALLY INSULATED. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS.
10. STANDARD EXHAUST AIR DUCTWORK SHALL BE LOW PRESSURE RECTANGULAR, SMACNA STATIC PRESSURE CLASS 1/2" W.G., SEAL CLASS A, INSULATION NOT REQUIRED.
11. AVOID ROUTING DUCTWORK AND TU'S WITHIN 6" OF TOP OF LIGHT FIXTURES WHEREVER POSSIBLE. MAINTAIN CLEARANCE BETWEEN TU'S AND DUCT INSULATION TO TOP OF LIGHTS. PROVIDE CLEARANCE ALL AROUND AIR TERMINAL UNITS AS REQUIRED FOR ROUTINE MAINTENANCE.
12. PROVIDE MVD'S AT ALL TAKEOFFS FROM MAIN DUCTS.
13. CONTRACTOR SHALL SUBMIT COORDINATED DUCTWORK SHOP DRAWINGS INDICATING COORDINATION WITH ELECTRICAL AND PLUMBING PRIOR TO BEGINNING WORK. SHOP DRAWINGS SHALL INCLUDE LOCATIONS OF THERMOSTATS, ACCESS PANELS, AIR DEVICES, DUCTWORK, ETC.
14. PROVIDE DUCT ACCESS DOORS AT ALL CONTROL DAMPERS, SMOKE DETECTORS, FIRE DAMPERS, AND SMOKE DAMPERS. MINIMUM SIZE OF ACCESS DOOR SERVING FIRE DAMPERS IS 12X12.
15. PROVIDE REMOVABLE DUCT SECTIONS IN DUCTWORK CONTAINING FIRE DAMPERS IF FULL 12X12 ACCESS DOOR CANNOT BE PROVIDED.

PIPING GENERAL NOTES

1. BUTTERFLY VALVES INDICATED FOR FLOW BALANCING AND SHUT OFF SERVICE SHALL BE PROVIDED WITH INFINITE POSITION THROTTLING HANDLE AND MEMORY STOP. AFTER HYDRONIC TEST AND BALANCE HAS BEEN COMPLETED, THE CONTRACTOR SHALL POSITION THE MEMORY STOP AT THE FINAL BALANCE POINT OF EACH VALVE. PROVIDE STAMPED ALUMINUM TAG FOR EACH VALVE INDICATING "BALANCING VALVE - DO NOT REMOVE MEMORY STOP - RETURN TO BALANCE SETTING."
2. PROVIDE AIR CHAMBER AND AUTOMATIC AIR VENTS AT ALL HIGH POINTS IN SYSTEM, PIPE TO FLOOR DRAIN WITH COPPER TUBING. SEE "TYPICAL AIR CHAMBER DETAIL."
3. BUTTERFLY VALVES FOR SHUT OFF SERVICE SHALL BE PROVIDED WITH STAMPED ALUMINUM TAG INDICATING "SERVICE VALVE."
4. ALL CONNECTIONS TO AIR VENTS AND PRESSURE GAGES SHALL BE MADE WITH BRASS PIPING.
5. INSTALL PIPE HANGERS NEXT TO AND ON BOTH SIDES OF ALL EQUIPMENT.
6. SEAL ALL PIPE PENETRATIONS OF WALLS AND FLOORS AIR TIGHT REGARDLESS OF WHETHER WALLS OR FLOORS ARE FIRE RATED OR NOT.

GENERAL NOTES

1. ALL DUCT DIMENSIONS ARE NET INSIDE.
2. VERIFY COLLAR SIZES ON ALL AIR TERMINALS, EQUIPMENT OUTLETS AND INLETS. TRANSITION DUCTWORK AS NECESSARY. EXTERNALLY INSULATE TRANSITIONS AT EQUIPMENT CONNECTIONS.
3. FIELD VERIFY CLEAR SPACE AVAILABLE, ROUTING PATH, AND CONFLICTS WITH STRUCTURE AND THE WORK OF OTHER TRADES PRIOR TO FABRICATING DUCTWORK. PROVIDE OFFSETS IN DUCTWORK AS REQUIRED, WHETHER SPECIFICALLY INDICATED ON DRAWINGS OR NOT. SUBMIT SHOP DRAWINGS ON DUCTWORK LAYOUT PRIOR TO COMMENCING WORK. MAINTAIN CLEARANCE AROUND ALL LIGHT FIXTURES AS REQUIRED TO REMOVE AND SERVICE FIXTURES. COORDINATE WITH ROOF TRUSSES/STRUCTURE. PRESSURE TEST ALL DUCTWORK FOR LEAKS. SEE SPECIFICATIONS.
4. CONTRACTOR SHALL INSTALL ALL EQUIPMENT, PIPING, AND DUCTWORK SUCH THAT MANUFACTURERS' RECOMMENDED CLEARANCES ARE MET FOR ALL ACCESS PANELS, MOTORS, FANS, BELTS, FILTERS AND AIR INTAKES. CONDENSATE LINES SHALL BE CLEAR OF FILTER RACK ACCESS.
5. PROVIDE DUCT FLEX CONNECTIONS & VIBRATION ISOLATION FOR ALL UNITS NOT INTERNALLY ISOLATED.
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, OF DISPOSABLE TYPE, AND BE ACCESSIBLE WITHOUT THE USE OF SCREWS OR OTHER MECHANICAL DEVICES REQUIRING TOOLS.
9. PROVIDE ACCESS PANELS IN HARD CEILINGS AS REQUIRED FOR MAINTENANCE AND ADJUSTMENT OF EQUIPMENT LOCATED ABOVE CEILING.
10. ALL BIRD AND INSECT SCREENS SHALL BE ANODIZED ALUMINUM.
11. BECAUSE OF THE SMALL SCALE OF CONTRACT DOCUMENTS IT IS NOT POSSIBLE TO SHOW ALL OFFSETS, TRANSITIONS, ETC. THE CONTRACT DOCUMENTS ARE ESSENTIALLY DIAGRAMATIC. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS COORDINATED WITH THE STRUCTURE AND ARCHITECTURAL WORK FOR REVIEW PRIOR TO COMMENCING WORK
12. ALL WORK SHALL COMPLY WITH 2023 FLORIDA BUILDING CODE.
13. THIS PROJECT SHALL INCLUDE COMMISSIONING OF THE HVAC, CONTROLS, AND RELATED ELECTRICAL SYSTEMS. THE SERVICES OF THE COMMISSIONING AGENT ARE PROVIDED UNDER SEPARATE CONTRACT. UNDER THIS CONTRACT, THE PRIME CONTRACTOR, SUBCONTRACTORS, AND EQUIPMENT MANUFACTURERS SHALL PROVIDE LABOR AND MATERIALS AS REQUIRED TO ASSIST AND PARTICIPATE IN THE COMMISSIONING PROCESS FOR THE SCOPE OF WORK AS DESCRIBED IN SECTION 23 08 00 OF THE PROJECT SPECIFICATIONS.

AIR DEVICE SCHEDULE

MARK	MAX AIRFLOW CFM	AIR DEVICE SIZE	DUCT CONNECTION SIZE	TITUS MODEL
CD-1 / CFM	80	9x9	6Ø	TDC
CD-2 / CFM	230	12x12	8Ø	TDC
CD-3 / CFM	350	12x12	10Ø	TDC
CD-4 / CFM	590	20Ø	10Ø	R-OMNI
SWG-1 / CFM	60	6x6	6x6	272RL
LD-1 / CFM	255	6" LENGTH, 1" SLOT	8Ø	FL-10
RG,EG,SG,TG,RR,ER				
xx-1 / CFM	530	12x12	12x12	350FL
xx-2 / CFM	1800	22x22	22x22	350FL
xx-3 / CFM	3500	42x36	42x36	33RL
xx-4 / CFM	4315	36x36	36x36	350FL

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. PAINT ALL DUCT VISIBLE THROUGH GRILLES FLAT BLACK.
6. PROVIDE LD-1 WITH INSULATED PLENUM.

VENTILATION SCHEDULE

SPACE TYPE	VENTILATION CFM/S.F.	VENTILATION CFM/PERSON	EXHAUST CFM
CORRIDOR	0	5	0
CLASSROOM	0	5	0
RESTROOM	0	5	60/FIXTURE
STORAGE	0	5	0
JANITORS CLOSET	0	5	1/SF

NOTE:

VENTILATION RATES IN COMPLIANCE WITH ASHRAE STANDARD 62.1-2019. BIPOLAR IONIZATION IS UTILIZED TO CLEAN INDOOR AIR AND MAINTAIN ACCEPTABLE INDOOR AIR QUALITY WITH A REDUCTION IN OUTDOOR AIRFLOW.

AIR PURIFICATION EQUIPMENT SCHEDULE

ZONE AHU	SA (CFM)	OA (CFM)	PRESS (IN W.C.)	BASIS OF DESIGN	MODEL	QUANTITY	ELECTRICAL VOLTS/PHASE	ELECTRICAL WATTS	NOTES
A3	10955	1190	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
A4	9625	970	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
A5	6980	1155	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
A6	8690	1155	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
B1	7890	950	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
B2	10065	1175	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
B3	9460	1005	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
B5	3795	385	<0.01	GPS	FC48-AC	1	24/1	10	1,2,3,4
B6	5160	655	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
C1	3930	445	<0.01	GPS	FC48-AC	1	24/1	10	1,2,3,4
C2	7720	905	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
C3	5980	690	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
C4	9615	1020	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5
C5	8195	875	<0.01	GPS	IMOD	1	120/1	12	1,2,4,5

1. BI-POLAR IONIZATION SYSTEMS REQUIRING PERISHABLE GLASS TUBES ARE NOT ACCEPTABLE.
2. MANUFACTURER MUST PASS UL-867-2007 OZONE CHAMBER TESTING BY EITHER UL OR ETL.
3. UNIT SHALL BE MOUNTED IN SUPPLY AIR DUCT.
4. PROVIDE 12V DC POWER SUPPLY FOR CONTROL PANEL.
5. UNIT SHALL BE MOUNTED IN AHU COOLING COIL.

LOUVER SCHEDULE

MARK	AIRFLOW CFM (MAX)	LOUVER SIZE (WxH) INCHES	FREE AREA FT (MIN)
LVR-1 / CFM	120	12x12	0.2
LVR-2 / CFM	230	12x18	0.4
LVR-3 / CFM	345	12x24	0.6
LVR-4 / CFM	905	24x24	1.7
LVR-5 / CFM	1465	40x24	3.0
LVR-6 / CFM	2470	48x28	4.6
LVR-7 / CFM	3065	64x28	5.7
LVR-8 / CFM	1255	30x24	2.9
LVR-9 / CFM	1180	40x24	2.2

1. FOR LVR-1 THROUGH LVR-7: PROVIDE GREENHECK MODEL 'EHV-901D' (OR EQUAL) EXTRUDED ALUMINUM, WIND-DRIVEN RAIN RESISTANT, STATIONARY LOUVER WITH BIRDSCREEN AND FLORIDA PRODUCT APPROVAL.
2. FOR LVR-8 AND LVR-9: ROVIDE GREENHECK MODEL 'EHV-901D' (OR EQUAL) IN FRONT OF GREENHECK MODEL 'AFL-501' (OR EQUAL) EXTRUDED ALUMINUM TORNADO LOUVER IN ACCORDANCE WITH ICC 500-20 AND FEMA P-361. LOUVERS SHALL BE INSTALLED IN COMMON 10 GAUGE SLEEVE.

   Base price EHV-901D.
   Alternate add AFL-501 in series.
3. FINISH TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD COLORS.
4. COORDINATE ELEVATIONS WITH ARCHITECT.
5. MAXIMUM PRESSURE DROP SHALL BE 0.10".
6. REFER TO SPECIFICATION 089119 FOR LOUVER SPECIFICATIONS.

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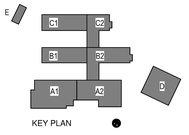
KEITH A. JOHNSON LICENSE NO. 86457 STATE OF FLORIDA PROFESSIONAL ENGINEER

PERMIT DOCUMENTS

GADSDEN COUNTY SCHOOL BOARD
New Quincy K-8 School

GADSDEN COUNTY SCHOOL DISTRICT — FL —

1400 W. KING STREET
QUINCY, FL 32351



REVISIONS

NO.	DESCRIPTION	DATE

RECEIVED
ALLSTATE CONSTRUCTION
09-18-2025

Project Number	22023
Dated	09-18-2025

WATFORD ENGINEERING
4452 Clinton Street Marianna, Florida 32446

Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: BJB

HVAC LEGEND, SCHEDULES, AND NOTES

M-001

CUSTOM AIR HANDLING UNIT SCHEDULE

UNIT DESIG-NATION	FAN DATA: TYPE	FAN TYPE	AIR VOLUME CONTROL	MAX AIRFLOW (CFM)	MIN. AIRFLOW (CFM)	MIN. OA DAMPER (CFM)	APPROX. ESP (IN. W.G.)	TOTAL SP (IN. W.G.)	MAXIMUM FAN MOTOR HORSEPOWER	NOM. MOTOR RPM	CHILLED WATER COIL DATA: MAX FACE VELOCITY (FPM)	UNIT TOTAL CAPACITY (MBH)	UNIT SENSIBLE CAPACITY (MBH)	AIR SIDE: EAT (°F) DB	EAT (°F) WB	LAT (°F) DB	LAT (°F) WB	WATER SIDE: FLOW (GPM)	EWT (°F)	LWT (°F)	MAX. WPD (FT H2O)	CONTROL VALVE (BY DDC CONTRACTOR)	CONTROL VALVE PRESSURE DROP	HEATING COIL DATA: COIL POSITION	TOTAL CAPACITY (MBH)	AIR SIDE: EAT (°F)	WATER SIDE: FLOW (GPM)	EWT (°F)	LWT (°F)	MAX. WPD (FT H2O)	CONTROL VALVE (BY DDC CONT.)	CONTROL VALVE PRESSURE DROP	FILTER SECTION: TYPE	FILTER EFF. (%)	THICK-NESS (IN)	NOTES
AHU-A1	HDT	PF	VAV	5800	1905	1905	2.00	4.30	7.5	1800	490	238.6	161.1	79.4	66.5	53.5	52.4	28.9	42	57	3.5	2-WAY	11.5 FT	PREHEAT	30.8	37.9	3.1	160	140	4.0	2-WAY	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-A2	HDT	PF	SZVAV	1280	385	150	0.60	2.20	1	1800	345	51.9	26.7	74.7	62.1	53.4	52.3	4.2	42	57	0.4	2-WAY	11.5 FT	REHEAT	30.5	62.0	3.1	160	140	0.1	2-WAY	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-A3	HDT	PF	VAV	10955	3285	1190	1.80	3.95	15	1800	455	312.9	247.0	74.6	62.6	53.5	52.4	41.6	42	57	0.5	2-WAY	11.5 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-A4	HDT	PF	VAV	9625	2885	970	2.45	4.85	15	1800	485	264.8	214.8	74.4	62.3	53.5	52.4	35.2	42	57	1.4	2-WAY	11.5 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-A5	HDT	PF	SZVAV/CV	6980/13530	2095	1155	2.00	5.05	20	1800	265	247.4	169.8	75.6	64.4	52.9	51.9	32.8	42	57	2.1	2-WAY	11.5 FT	REHEAT	160.9	44.2	16.4	160	140	3.8	2-WAY	11.5 FT	CARTRIDGE	95	12	1,2,3,5,6,7,8,9,10
AHU-A6	HDT	PF	SZVAV/CV	8690/17560	2605	1155	2.00	4.60	25	1800	235	278.3	200.6	75.1	63.8	53.5	52.5	35.9	42	57	2.4	2-WAY	11.5 FT	REHEAT	283.5	49.0	28.9	160	140	2.4	2-WAY	11.5 FT	CARTRIDGE	95	12	1,2,3,5,6,7,8,9,11
AHU-B1	HDT	PF	VAV	7890	2565	950	2.00	4.25	10	1800	495	234.9	178.7	74.6	63.0	53.5	52.4	30.8	42	57	3.2	2-WAY	11.5 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-B2	HDT	PF	VAV	10065	3020	1175	2.05	4.55	15	1800	490	297.6	227.2	74.6	62.9	53.5	52.4	38.5	42	57	1.7	3-WAY	25.0 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-B3	HDT	PF	VAV	9460	2840	1005	2.20	4.55	15	1800	470	272.2	213.0	74.5	62.7	53.5	52.4	35.6	42	57	1.5	3-WAY	25.0 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-B4	HDT	PF	VAV	10105	3115	3115	2.15	4.35	15	1800	420	410.2	277.0	78.9	66.3	53.5	52.4	54.4	42	57	2.5	3-WAY	25.0 FT	PREHEAT	50.4	39.6	5.0	160	140	4.0	2-WAY	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-B5	HDT	PF	VAV	3795	1140	385	1.80	3.90	5	1800	415	108.9	85.0	74.4	62.7	53.5	52.4	14.5	42	57	1.1	2-WAY	11.5 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-B6	HDT	PF	VAV	5160	1550	655	2.05	4.50	7.5	1800	435	214.9	140.9	75.0	63.8	49.2	48.3	28.5	42	57	4.3	2-WAY	11.5 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-C1	HDT	PF	SZVAV	3930	1180	445	0.50	3.05	5	1800	430	166.4	108.6	74.5	63.5	48.6	47.8	22.1	42	57	0.8	3-WAY	25.0 FT	REHEAT	151.3	51.7	15.4	160	140	0.8	2-WAY	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-C2	HDT	PF	VAV	7720	2315	905	2.05	4.20	10	1800	480	228.9	174.3	74.6	63.0	53.5	52.4	29.7	42	57	3.0	3-WAY	25.0 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-C3	HDT	PF	VAV	5980	1795	690	1.85	4.10	7.5	1800	470	177.0	135.0	74.7	63.0	53.5	52.4	22.2	42	57	2.3	3-WAY	25.0 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-C4	HDT	PF	VAV	9615	2885	1020	1.85	3.95	10	1800	445	275.6	216.4	74.5	62.6	53.5	52.4	34.4	42	57	2.6	3-WAY	25.0 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7
AHU-C5	HDT	PF	VAV	8195	2460	875	1.95	4.10	10	1800	480	233.3	184.4	74.5	62.7	53.5	52.4	29.0	42	57	2.9	3-WAY	25.0 FT	-	-	-	-	-	-	-	-	11.5 FT	CARTRIDGE	95	12	1,2,3,4,5,6,7

SCHEDULE LEGEND:

HDT - HORIZONTAL DRAW THRU
SDU - STACKED DEHUMIDIFICATION UNIT
FC - FORWARD CURVED
PF - 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 AND COILS.
3. AVERAGE ATMOSPHERIC DUST SPOT EFFICIENCY BASED ON ASHRAE 52-76.
4. BASIS OF DESIGN: TRANE CSAA.
5. 30% PRE FILTERS AND MERV 13 FINAL FILTERS.
6. VARIABLE FREQUENCY DRIVE WITH 3 CONTACT BYPASS AND BUILT IN DISCONNECT FOR FAN MOTOR PROVIDED BY DDC CONTRACTOR
7. 480V/3 PHASE
8. BASIS OF DESIGN: TRANE PSCA
9. UNIT SHALL OPERATE AS SZVAV WITH THE LOWER SCHEDULED AIRFLOW DURING NORMAL CONDITIONS. DURING WEATHER EVENT, UNIT SHALL OPERATE AS CV WITH THE GREATER SCHEDULED AIRFLOW.
10. PROVIDE AUXILARY DX COIL WITH 310800 BTU CAPACITY. CONNECT TO HP-A5.1 AND HP-A5.2
11. PROVIDE AUXILARY DX COIL WITH 380900 BTU CAPACITY. CONNECT TO HP-A6.1, HP-A6.2, HP-A6.3, AND HP-A6.4

Alternate

Alternate

CUSTOM AIR HANDLER CONDENSING UNIT SCHEDULE

UNIT HP	BASIS OF DESIGN	MODEL HP	NOMINAL COOL CAPACITY (BTUH)	DESIGN COOLING OUTDOOR DB	NOMINAL HEAT CAPACITY	DESIGN HEATING OUTDOOR DB	COP	EER	ELECTRICAL: MCA	MOP	VOLTS/PHASE	NOTES
5.1	TRANE	TUHYE2405BN41AN	240000	95.0	270000	25.0	3.7	10	55	90	208/3	1,2,3
5.2	TRANE	TUHYE2405BN41AN	240000	95.0	270000	25.0	3.7	10	55	90	208/3	1,2,3
6.1	TRANE	TUHYE1205AN41AN	120000	95.0	135000	20.5	3.8	10.7	55	90	208/3	1,2
6.2	TRANE	TUHYE1205AN41AN	120000	95.0	135000	20.5	3.8	10.7	55	90	208/3	1,2
6.3	TRANE	TUHYE1205AN41AN	120000	95.0	135000	20.5	3.8	10.7	55	90	208/3	1,2
6.4	TRANE	TUHYE1205AN41AN	120000	95.0	135000	20.5	3.8	10.7	55	90	208/3	1,2

1. NOMINAL COOLING CAPACITIES ARE ABSED ON INDOOR COIL EAT OF 80/67F (DB/WB), OUTDOOR OF 95F (DB)
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70F (DB), OUTDOOR OF 43F(WB)
3. UNIT CONSISTS OF TWO MODULES, EACH WITH THE ELECTRICAL REQUIREMENTS LISTED.

BOILER SCHEDULE

MARK	GB-1	GB-2
MANUFACTUERER	FULTON	FULTON
MODEL NUMBER	EDR-1500	EDR-1500
TYPE/FLUID	INDOOR/WATER	INDOOR/WATER
GAS INPUT (MBH)	1500	1500
GAS OUTPUT (MBH)	1402	1402
WORKING PRESSURE (PSI)	160	160
FUEL	NATURAL GAS	NATURAL GAS
PRESSURE DROP (FT. H20)	1.8	1.8
ELECTRICAL CIRCUIT (VOLTS/PHASE)	120/1	120/1
WATER SUPPLY TEMP (°F)	160	160
WATER RETURN TEMP (°F)	140	140
WATER FLOW (GPM)	130	130

NOTES:
1. PROVIDE FULL MODULATION WITH 5-1 TURNDOWN
2. MINIMUM EFFICIENCY AT DESIGN CONDTIONS = 88%
3. PROVIDE BOILER PLANT MANAGER WITH BACNET INTERFACE TO CAMPUS SYSTEM.
4. PROVIDE STAINLESS STEEL GAS VENT AND PVC INTAKE DUCT.
5. PROVIDE CONDENSATE DRAIN PH NEUTRALIZING KIT.

PUMP SCHEDULE

DESIGNATION	CHP-1	CHP-2	HWP-1	HWP-2
USE	CHILLED WATER DISTRIBUTION	CHILLED WATER DISTRIBUTION	HOT WATER DISTRIBUTION	HOT WATER DISTRIBUTION
MANUFACTURER - MODEL	TACO - FI3007D	TACO - FI3007D	TACO - FI2510C	TACO - FI2510C
TYPE	FRAME MOUNTED	FRAME MOUNTED	FRAME MOUNTED	FRAME MOUNTED
SUCTION SIZE (IN.)	4.0	4.0	3.0	3.0
DISCHARGE SIZE (IN.)	3.0	3.0	2.5	2.5
PUMP TYPE	END SUCTION	END SUCTION	END SUCTION	END SUCTION
CAPACITY (GPM)	656.4	656.4	260.0	260.0
TOTAL HEAD (FT. H2O)	123	123	58.1	58.1
RPM	3500	3500	1760	1760
MINIMUM EFFICIENCY (%)	91	91	94	94
MOTOR HP (MAX)	25	25	5	5
VOLTAGE/PHASE	460/3	460/3	460/3	460/3

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

CHILLER SCHEDULE

MARK	CH-1	CH-2
MANUFACTURER	TRANE	TRANE
MODEL	ASCA230	ASCA230
COMPRESSOR TYPE	SCROLL	SCROLL
CONDENSER TYPE	AIR COOLED	AIR COOLED
MINIMUM CAPACITY (TONS)	206	206
MAXIMUM POWER (TOTAL UNIT KW)	244.3	244.3
FULL LOAD EFFICIENCY (EER)	10.4	10.4
PART LOAD EFFICIENCY (IPLV)	17.3	17.3
VOLTAGE/PHASE	460/3	460/3
MCA/MOP (AMPS)	466/500	466/500
ENTERING WATER TEMP. (°F)	57	57
LEAVING WATER TEMP. (°F)	42	42
CHILLED WATER FLOW (GPM)	328.2	328.2
EVAPORATOR WPD FT. (MAX)	6.42	6.42
EVAPORATOR FOULING FACTOR (HR-SQ FT-F/BTU)	0.000100	0.000100
CONDENSER ENTERING AIR TEMP. (°F)	85	85
CONDENSER FOULING FACTOR (HR-SQFT-F/BTU)	0.000250	0.000250
NUMBER OF REFRIGERANT CIRCUITS	2	2
MINIMUM PART LOAD CAPACITY WITH ARI RELIEF (TONS)	212	212
REFRIGERANT	R-454B	R-454B
MINIMUM FLOW (GPM)	296.3	296.3

NOTES:
1. PROVIDE FACTORY INSULATION PACKAGE FOR EVAPORATOR, WATER BOXES, AND MOTOR HOUSING.
2. PROVIDE FACTORY SOUND REDUCTION PACKAGE AND INSULATION.
3. PROVIDE FACTORY WIRED AND MOUNTED DISCONNECT AND SINGLE POINT ELECTRICAL CONNECTION.
4. PROVIDE CHILLER WITH MAXIMUM A-WEIGHTED SOUND PRESSURE 66dBA MAXIMUM. SOUND RATINGS IN ACCORDANCE WITH ARI STANDARD 575-2008.
5. PROVIDE ELECTRONIC CONTROLS FOR VARIABLE PRIMARY FLOW.
6. IPLV AT AHRI 550/590 CONDENSOR RELIEF.

FAN SCHEDULE

UNIT	TYPE	CFM	MAX. FAN RPM	ESP (IN. H20)	MAX. MOTOR POWER	SONES (MAX)	BASIS OF DESIGN	MODEL	CONTROL	ELECRICAL: VOLTS/PHASE	NOTES
EF-A1	INLINE	135	970	0.25	19W	2.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A2	INLINE	185	1670	0.30	28W	3.0	COOK	GNVF-340	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A3	INLINE	1125	1100	0.35	0.152HP	7.8	COOK	135SQN10D	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A4	INLINE	150	1050	0.25	24W	3.0	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A5	INLINE	135	1000	0.30	21W	3.0	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A6	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A7	INLINE	450	1050	0.25	49W	2.5	COOK	GNVF-700	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A8	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-A9	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B1	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B2	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B3	INLINE	260	1760	0.30	59W	3.5	COOK	GNVF-500	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B4	INLINE	150	1050	0.30	26W	3.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B5	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B6	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B7	INLINE	240	1760	0.35	36W	3.0	COOK	GNVF-500	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B8	INLINE	1145	1100	0.35	0.152HP	7.8	COOK	135SQN10D	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B9	INLINE	210	1200	0.35	28W	2.5	COOK	GNVF-500	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B10	INLINE	140	1050	0.30	26W	3.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B11	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B12	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B13	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B14	INLINE	260	1760	0.30	59W	3.5	COOK	GNVF-500	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B15	INLINE	150	1050	0.30	26W	3.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B16	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B17	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B18	INLINE	150	1050	0.30	26W	3.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B19	INLINE	1550	950	0.25	0.175HP	8.0	COOK	150SQN10D	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B20	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B21	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B22	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B23	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B24	INLINE	1160	1100	0.25	0.151HP	8.6	COOK	135SQN10D	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-B25	INLINE	85	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C1	INLINE	195	1660	0.25	29W	3.0	COOK	GNVF-340	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C2	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C3	INLINE	260	1760	0.30	59W	3.5	COOK	GNVF-500	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C4	INLINE	150	1050	0.30	26W	3.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C5	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C6	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C7	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C8	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C9	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C10	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C11	INLINE	260	1760	0.30	59W	3.5	COOK	GNVF-500	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C12	INLINE	150	1050	0.30	26W	3.5	COOK	GNVF-180	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C13	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C14	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C15	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C16	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C17	INLINE	100	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C18	INLINE	570	650	0.25	0.044HP	3.0	COOK	GN-940	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
EF-C19	INLINE	85	950	0.25	11W	2.0	COOK	GNVF-100	INTERLOCK WITH AHU OA DAMPER	115/1	1,2,3,4,5,6
KEF-1	ROOF	5500	645	0.75	1.5 HP	10.8	COOK	270C8B	HOOD CONTROL PANEL	115/1	1,2,3,4,6,7
KEF-2	ROOF	5500	645	0.75	1.5 HP	10.8	COOK	270C8B	HOOD CONTROL PANEL	115/1	1,2,3,4,6,7
KSF-1	ROOF	4400	860	0.25	0.5 HP	19.4	COOK	30HER420D	HOOD CONTROL PANEL	115/1	1,2,3,4,5,6,8
KSF-2	ROOF	4400	860	0.25	0.5 HP	19.4	COOK	30HER420D	HOOD CONTROL PANEL	115/1	1,2,3,4,5,6,8

Alternate

1. PROVIDE DISCONNECT
2. PROVIDE SOLID STATE SPEED CONTROLLER
3. PROVIDE BACKDRAFT DAMPER
4. PROVIDE THERMAL OVERLOAD
5. PROVIDE DIRECT DRIVE FAN WITH EC MOTOR.
6. PROVIDE RUBBER IN SHEAR VIBRATION ISOLATION.
7. PROVIDE HINGED BASE AND GREASE TROUGH.
8. PROVIDE MERV 8 FILTER.

WATFORD ENGINEERING
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Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: BJB

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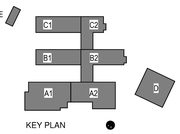
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PERMIT DOCUMENTS

GADSDEN COUNTY SCHOOL BOARD
New Quincy K-8 School

1400 W. KING STREET
QUINCY, FL 32351



REVISIONS

NO.	DESCRIPTION	DATE

RECEIVED
ALLSTATE CONSTRUCTION
09-18-2025

Project Number	22023
Dated	09-18-2025

HVAC SCHEDULES

M-002

VARIABLE VOLUME TERMINAL UNIT SCHEDULE - AREA A

TU MARK	TOTAL CFM	COOL CFM MIN.	HEATING CFM MAX.	HEATING COIL										SOUND POWER AT 1.0'			INLET SIZE	MANUFACTURER	DESV NUMBER
				EAT (°F)	LAT (°F)	MBH (MIN.)	EWT (°F)	LWT (°F)	GPM	MAX UNIT APD (IN.)	MAX WPD (FT)	CONTROL VALVE TYPE & RUNOUT SIZE	CONTROL VALVE PRESSURE DROP	REF. CFM	DISCHARGE NC	RADIATED NC	(IN.)		
A1.1	255	130	230	42.6	84	10.3	160	140	1.0	0.09	0.08	2-WAY, 0.5"	11.5 FT	255	20	16	6	TITUS	06
A1.2	2085	1555	1555	42.6	84	55.1	160	140	5.5	0.23	0.11	2-WAY, 1.0"	11.5 FT	2085	20	17	16	TITUS	16
A1.3	1625	485	485	42.6	84	18.0	160	140	1.8	0.08	0.07	2-WAY, 0.5"	11.5 FT	1625	19	16	16	TITUS	16
A1.4	1835	550	550	42.6	84	26.0	160	140	2.6	0.09	0.80	2-WAY, 0.75"	11.5 FT	1835	20	17	16	TITUS	16
A3.1	265	90	90	61.7	84	3.9	160	140	0.4	0.05	0.08	2-WAY, 0.5"	11.5 FT	265	20	17	6	TITUS	06
A3.2	500	190	190	61.7	84	3.7	160	140	0.4	0.03	0.08	2-WAY, 0.5"	11.5 FT	185	27	20	8	TITUS	08
A3.3	450	155	280	61.7	84	10.1	160	140	1.0	0.06	0.39	2-WAY, 0.5"	11.5 FT	410	24	20	7	TITUS	07
A3.4	415	205	300	61.7	84	8.8	160	140	0.9	0.06	0.21	2-WAY, 0.5"	11.5 FT	400	24	20	7	TITUS	07
A3.5	110	35	35	61.7	84	2.4	160	140	0.3	0.01	0.07	2-WAY, 0.5"	11.5 FT	110	24	16	4	TITUS	04
A3.6	420	190	335	61.7	84	8.1	160	140	0.8	0.07	0.16	2-WAY, 0.5"	11.5 FT	420	24	20	7	TITUS	07
A3.7	1260	375	495	61.7	84	16.6	160	140	1.7	0.07	0.07	2-WAY, 0.5"	11.5 FT	1260	22	20	14	TITUS	14
A3.8	1195	485	865	61.7	84	20.8	160	140	2.1	0.12	0.25	2-WAY, 0.5"	11.5 FT	1195	28	23	12	TITUS	12
A3.9	1195	485	865	61.7	84	20.8	160	140	2.1	0.12	0.23	2-WAY, 0.5"	11.5 FT	1195	28	23	12	TITUS	12
A3.10	1195	485	865	61.7	84	20.8	160	140	2.1	0.12	0.23	2-WAY, 0.5"	11.5 FT	1195	28	23	12	TITUS	12
A3.11	2035	610	1045	61.7	84	25.2	160	140	2.5	0.11	0.10	2-WAY, 0.5"	11.5 FT	2035	22	18	16	TITUS	16
A3.12	1195	485	865	61.7	84	20.8	160	140	2.1	0.12	0.23	2-WAY, 0.5"	11.5 FT	1195	28	23	12	TITUS	12
A3.13	1195	485	865	61.7	84	20.8	160	140	2.1	0.12	0.23	2-WAY, 0.5"	11.5 FT	1195	28	23	12	TITUS	12
A4.1	1675	665	1185	61.7	84	28.5	160	140	2.9	0.08	0.13	2-WAY, 0.5"	11.5 FT	1675	19	16	16	TITUS	16
A4.2	465	140	165	61.7	84	5.6	160	140	0.6	0.08	0.10	2-WAY, 0.5"	11.5 FT	465	27	19	8	TITUS	08
A4.3	1310	590	1050	61.7	84	25.3	160	140	2.5	0.07	0.13	2-WAY, 0.5"	11.5 FT	1310	22	20	14	TITUS	14
A4.4	200	30	95	61.7	84	3.9	160	140	0.4	0.03	0.08	2-WAY, 0.5"	11.5 FT	200	25	18	5	TITUS	05
A4.5	990	350	620	61.7	84	15.0	160	140	1.5	0.09	0.11	2-WAY, 0.5"	11.5 FT	990	27	20	12	TITUS	12
A4.6	550	165	240	61.7	84	6.3	160	140	0.6	0.10	0.10	2-WAY, 0.5"	11.5 FT	550	28	20	8	TITUS	08
A4.7	1310	640	1140	61.7	84	27.4	160	140	2.7	0.07	0.15	2-WAY, 0.5"	11.5 FT	1310	22	20	14	TITUS	14
A4.8	820	430	760	61.7	84	18.3	160	140	1.8	0.11	0.39	2-WAY, 0.5"	11.5 FT	820	28	20	9	TITUS	09
A4.9	95	30	40	61.7	84	2.6	160	140	0.3	0.01	0.07	2-WAY, 0.5"	11.5 FT	95	23	12	4	TITUS	04
A4.10	125	40	60	61.7	84	3.2	160	140	0.3	0.02	0.08	2-WAY, 0.5"	11.5 FT	125	25	18	4	TITUS	04
A4.11	720	215	215	61.7	84	8.2	160	140	0.8	0.09	0.07	2-WAY, 0.5"	11.5 FT	720	25	19	9	TITUS	09
A4.12	365	270	365	61.7	84	11.4	160	140	1.1	0.05	1.27	2-WAY, 0.5"	11.5 FT	365	24	19	7	TITUS	07
A4.13	760	345	615	61.7	84	14.8	160	140	1.5	0.09	0.14	2-WAY, 0.5"	11.5 FT	760	27	19	9	TITUS	09
A4.14	510	295	510	61.7	84	12.7	160	140	1.3	0.09	0.90	2-WAY, 0.5"	11.5 FT	510	27	20	8	TITUS	08

VARIABLE VOLUME TERMINAL UNIT SCHEDULE - AREA B

TU MARK	TOTAL CFM	COOL CFM MIN.	HEATING CFM MAX.	HEATING COIL										SOUND POWER AT 1.0'			INLET SIZE	MANUFACTURER	DESV NUMBER	
				EAT (°F)	LAT (°F)	MBH (MIN.)	EWT (°F)	LWT (°F)	GPM	MAX UNIT APD (IN.)	MAX WPD (FT)	CONTROL VALVE TYPE & RUNOUT SIZE	CONTROL VALVE PRESSURE DROP	REF. CFM	DISCHARGE NC	RADIATED NC	(IN.)			
B1.1	610	195	345	58.7	84	9.8	160	140	1.0	0.07	0.07	2-WAY, 0.5"	11.5 FT	610	23	17	9	TITUS	09	
B1.2	720	220	390	58.7	84	10.7	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	720	25	19	9	TITUS	09	
B1.3	890	265	345	58.7	84	11.4	160	140	1.1	0.07	0.08	2-WAY, 0.5"	11.5 FT	890	25	19	12	TITUS	12	
B1.4	720	215	300	58.7	84	9.3	160	140	0.9	0.09	0.07	2-WAY, 0.5"	11.5 FT	720	25	19	9	TITUS	09	
B1.5	810	245	405	58.7	84	11.0	160	140	1.1	0.10	0.08	2-WAY, 0.5"	11.5 FT	810	28	20	9	TITUS	09	
B1.6	745	225	405	58.7	84	11.0	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	745	27	19	9	TITUS	09	
B1.7	755	225	405	58.7	84	11.0	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	755	27	19	9	TITUS	09	
B1.8	720	215	300	58.7	84	9.3	160	140	0.9	0.09	0.07	2-WAY, 0.5"	11.5 FT	720	25	19	9	TITUS	09	
B1.9	800	240	300	58.7	84	9.3	160	140	0.9	0.10	0.07	2-WAY, 0.5"	11.5 FT	800	27	20	9	TITUS	09	
B1.10	745	225	405	58.7	84	11.0	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	745	27	19	9	TITUS	09	
B1.11	825	245	325	58.7	84	9.6	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	825	28	20	9	TITUS	09	
B2.1	820	245	375	60.2	84	10.0	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	820	28	20	9	TITUS	09	
B2.2	700	210	375	60.2	84	10.0	160	140	1.0	0.08	0.07	2-WAY, 0.5"	11.5 FT	700	25	18	9	TITUS	09	
B2.3	850	295	320	60.2	84	13.4	160	140	1.3	0.11	1.04	2-WAY, 0.5"	11.5 FT	850	28	20	9	TITUS	09	
B2.4	725	295	520	60.2	84	13.4	160	140	1.3	0.09	0.12	2-WAY, 0.5"	11.5 FT	725	25	19	9	TITUS	09	
B2.5	235	100	180	60.2	84	5.0	160	140	0.5	0.04	0.08	2-WAY, 0.5"	11.5 FT	235	19	16	6	TITUS	06	
B2.6	920	275	300	60.2	84	10.8	160	140	1.1	0.08	0.08	2-WAY, 0.5"	11.5 FT	920	25	19	12	TITUS	12	
B2.7	235	100	180	60.2	84	5.0	160	140	0.5	0.04	0.08	2-WAY, 0.5"	11.5 FT	235	19	16	6	TITUS	06	
B2.8	755	235	415	60.2	84	10.7	160	140	1.1	0.09	0.07	2-WAY, 0.5"	11.5 FT	755	27	19	9	TITUS	09	
B2.9	800	240	300	60.2	84	9.3	160	140	0.9	0.10	0.07	2-WAY, 0.5"	11.5 FT	800	27	20	9	TITUS	09	
B2.10	735	220	300	60.2	84	9.3	160	140	0.9	0.09	0.07	2-WAY, 0.5"	11.5 FT	735	27	19	9	TITUS	09	
B2.11	810	245	415	60.2	84	10.7	160	140	1.1	0.10	0.07	2-WAY, 0.5"	11.5 FT	810	28	20	9	TITUS	09	
B2.12	755	235	415	60.2	84	10.7	160	140	1.1	0.09	0.07	2-WAY, 0.5"	11.5 FT	755	27	19	9	TITUS	09	
B2.13	755	225	200	60.2	84	8.0	160	140	0.8	0.09	0.07	2-WAY, 0.5"	11.5 FT	755	27	19	9	TITUS	09	
B2.14	780	280	495	60.2	84	12.7	160	140	1.3	0.10	0.11	2-WAY, 0.5"	11.5 FT	780	27	19	9	TITUS	09	
B2.15	830	300	535	60.2	84	13.8	160	140	1.4	0.11	0.13	2-WAY, 0.5"	11.5 FT	830	28	20	9	TITUS	09	
B3.1	280	85	85	59.9	84	3.8	160	140	0.4	0.06	0.08	2-WAY, 0.5"	11.5 FT	280	22	18	6	TITUS	06	
B3.2	1175	350	530	59.9	84	17.0	160	140	1.7	0.06	0.07	2-WAY, 0.5"	11.5 FT	1175	22	19	14	TITUS	14	
B3.3	980	295	445	59.9	84	12.4	160	140	0.2	0.08	0.08	2-WAY, 0.5"	11.5 FT	980	27	20	12	TITUS	12	
B3.4	840	250	355	59.9	84	9.8	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	840	28	20	9	TITUS	09	
B3.5	880	265	455	59.9	84	12.5	160	140	1.3	0.07	0.08	2-WAY, 0.5"	11.5 FT	880	25	19	12	TITUS	12	
B3.6	900	270	455	59.9	84	12.5	160	140	1.3	0.07	0.08	2-WAY, 0.5"	11.5 FT	900	25	19	12	TITUS	12	
B3.7	1025	310	555	59.9	84	14.4	160	140	1.4	0.09	0.11	2-WAY, 0.5"	11.5 FT	1025	27	20	12	TITUS	12	
B3.8	840	250	355	59.9	84	9.8	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	840	28	20	9	TITUS	09	
B3.9	820	245	355	59.9	84	9.8	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	820	28	20	9	TITUS	09	
B3.10	925	275	490	59.9	84	12.8	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	925	25	20	12	TITUS	12	
B3.11	1040	315	560	59.9	84	17.3	160	140	1.7	0.05	0.07	2-WAY, 0.5"	11.5 FT	1040	20	18	14	TITUS	14	
B4.1	380	150	265	49.6	84	9.8	160	140	1.0	0.06	1.12	2-WAY, 0.75"	11.5 FT	380	24	19	7	TITUS	07	
B4.2	1520	455	710	49.6	84	26.3	160	140	2.6	0.07	0.21	2-WAY, 0.5"	11.5 FT	1520	18	15	16	TITUS	16	
B4.3A	1115	1115	1115	49.6	84	31.9	160	140	3.2	0.21	0.15	2-WAY, 0.5"	11.5 FT	1115	27	20	12	TITUS	12	
B4.3B	1110	1110	1110	49.6	84	31.9	160	140	3.2	0.21	0.15	2-WAY, 0.5"	11.5 FT	1110	27	20	12	TITUS	12	
B4.4	1225	365	600	49.6	84	22.4	160	140	2.2	0.07	0.18	2-WAY, 0.5"	11.5 FT	1225	22	19	14	TITUS	14	
B4.5	1110	335	580	49.6	84	21.6	160	140	2.2	0.06	0.15	2-WAY, 0.5"	11.5 FT	1110	22	18	14	TITUS	14	
B4.6	965	290	490	49.6	84	18.2	160	140	1.8	0.08	0.55	2-WAY, 0.5"	11.5 FT	965	27	20	12	TITUS	12	
B4.7	980	295	490	49.6	84	18.2	160	140	1.8	0.09	0.55	2-WAY, 0.75"	11.5 FT	980	27	20	12	TITUS	12	
B4.8	945	290	515	49.6	84	19.2	160	140	1.9	0.08	0.87	2-WAY, 0.5"	11.5 FT	945	27	20	12	TITUS	12	
B4.9	1070	320	550	49.6	84	20.4	160	140	2.0	0.05	0.14	2-WAY, 0.5"	11.5 FT	1070	22	18	14	TITUS	14	
B5.1	920	285	510	60.9	84	12.9	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	920	25	19	12	TITUS	12	
B5.2	1065	325	580	60.9	84	17.5	160	140	1.8	0.05	0.07	2-WAY, 0.5"	11.5 FT	1065	20	18	14	TITUS	14	
B5.3	860	260	445	60.9	84	10.6	160	140	1.1	0.11	0.07	2-WAY, 0.5"	11.5 FT	860	28	20	9	TITUS	09	
B5.4	1020	305	515	60.9	84	12.9	160	140	1.3	0.09	0.08	2-WAY, 0.5"	11.5 FT	1020	27	20	12	TITUS	12	
B6.1	1220	365	575	60.8	84	17.5	160	140	1.8	0.07	0.07	2-WAY, 0.5"	11.5 FT	1220	22	19	14	TITUS	14	Alternate
B6.2	845	485	845	60.8	84	21.5	160	140	2.2	0.11	2.39	2-WAY, 0.5"	11.5 FT	845	28	20	9	TITUS	09	
B6.3	315	255	315	60.8	84	11.5	160	140	1.2	0.13	0.08	2-WAY, 0.5"	11.5 FT	315	22	20	6	TITUS	06	
B6.4	450	290	450	60.8	84	12.9	160	140	1.3	0.07	2.34	2-WAY, 0.5"	11.5 FT	450	27	19	8	TITUS	08	Alternate
B6.5A	1360	405	570	60.8	84	14.3	160	140	1.4	0.07	0.07	2-WAY, 0.5"	11.5 FT	1225	22	19	14	TITUS	14	
B6.5B	1220	370	160	60.8	84	11.5	160	140	1.2	0.07	0.07	2-WAY, 0.5"	11.5 FT	1220	22	19	14	TITUS	14	

VARIABLE VOLUME TERMINAL UNIT SCHEDULE - AREA C

TU MARK	TOTAL CFM	COOL CFM MIN.	HEATING CFM MAX.	HEATING COIL										SOUND POWER AT 1.0'			INLET SIZE	MANUFACTURER	DESV NUMBER
				EAT (°F)	LAT (°F)	MBH (MIN.)	EWT (°F)	LWT (°F)	GPM	MAX UNIT APD (IN.)	MAX WPD (FT)	CONTROL VALVE TYPE & RUNOUT SIZE	CONTROL VALVE PRESSURE DROP	REF. CFM	DISCHARGE NC	RADIATED NC	(IN.)		
C2.1	445	135	180	58.8	84	5.8	160	140	0.6	0.07	0.10	2-WAY, 0.5"	11.5 FT	445	27	19	8	TITUS	08
C2.2	885	265	390	58.8	84	11.9	160	140	1.2	0.07	0.08	2-WAY, 0.5"	11.5 FT	885	25	19	12	TITUS	12
C2.3	720	215	345	58.8	84	9.8	160	140	1.0	0.09	0.07	2-WAY, 0.5"	11.5 FT	720	25	19	9	TITUS	09
C2.4	720	215	300	58.8	84	10.8	160	140	1.1	0.05	0.08	2-WAY, 0.5"	11.5 FT	720	24	18	12	TITUS	12
C2.5	805	240	405	58.8	84	11.0	160	140	1.1	0.10	0.08	2-WAY, 0.5"	11.5 FT	805	28	20	9	TITUS	09
C2.6	755	225	405	58.8	84	11.0	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	755	27	19	9	TITUS	09
C2.7	745	225	405	58.8	84	11.0	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	745	27	19	9	TITUS	09
C2.8	720	215	300	58.8	84	9.3	160	140	0.9	0.09	0.07	2-WAY, 0.5"	11.5 FT	720	25	19	9	TITUS	09
C2.9	790	235	300	58.8	84	9.3	160	140	0.9	0.10	0.07	2-WAY, 0.5"	11.5 FT	790	27	20	9	TITUS	09
C2.10	745	225	405	58.8	84	11.0	160	140	1.1	0.09	0.08	2-WAY, 0.5"	11.5 FT	745	27	19	9	TITUS	09
C2.11	820	245	325	58.8	84	9.6	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	820	28	20	9	TITUS	09
C3.1	875	260	265	61.1	84	8.9	160	140	0.9	0.12	0.07	2-WAY, 0.5"	11.5 FT	875	28	20	9	TITUS	09
C3.2	780	235	325	61.1	84	9.6	160	140	1.0	0.10	0.07	2-WAY, 0.5"	11.5 FT	780	27	19	9	TITUS	09
C3.3	770	295	520	61.1	84	12.9	160	140	1.3	0.10	0.11	2-WAY, 0.5"	11.5 FT	770	27	19	9	TITUS	09
C3.4	805	375	670	61.1	84	16.5	160	140	1.7	0.10	0.22	2-WAY, 0.5"	11.5 FT	805	28	20	9	TITUS	09
C3.5	735	220	375	61.1	84	10.0	160	140	1.0	0.09	0.07	2-WAY, 0.5"	11.5 FT	735	27	19	9	TITUS	09
C3.6	780	235	375	61.1	84	10.0	160	140	1.0	0.10	0.07	2-WAY, 0.5"	11.5 FT	780	27	19	9	TITUS	09
C3.7	765	295	520	61.1	84	12.9	160	140	1.3	0.09	0.11	2-WAY, 0.5"	11.5 FT	765	27	19	9	TITUS	09
C3.8	810	295	520	61.1	84	12.9	160	140	1.3	0.10	0.11	2-WAY, 0.5"	11.5 FT	810	28	20	9	TITUS	09
C4.1	280	85	85	60.3	84	3.8	160	140	0.4	0.06	0.08	2-WAY, 0.5"	11.5 FT	280	22	18	6	TITUS	06
C4.2	965	290	465	60.3	84	12.6	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	965	27	20	12	TITUS	12
C4.3	1075	320	425	60.3	84	15.7	160	140	1.6	0.05	0.07	2-WAY, 0.5"	11.5 FT	1075	22	18	14	TITUS	14
C4.4	880	265	455	60.3	84	12.5	160	140	0.3	0.07	0.08	2-WAY, 0.5"	11.5 FT	880	25	19	12	TITUS	12
C4.5	900	270	455	60.3	84	12.5	160	140	1.3	0.07	0.08	2-WAY, 0.5"	11.5 FT	900	25	19	12	TITUS	12
C4.6	1025	315	560	60.3	84	14.4	160	140	1.4	0.09	0.11	2-WAY, 0.5"	11.5 FT	1025	27	20	12	TITUS	12
C4.7	900	270	455	60.3	84	12.5	160	140	1.3	0.07	0.08	2-WAY, 0.5"	11.5 FT	900	25	19	12	TITUS	12
C4.8	820	245	355	60.3	84	9.8	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	820	28	20	9	TITUS	09
C4.9	840	250	355	60.3	84	9.8	160	140	1.0	0.11	0.07	2-WAY, 0.5"	11.5 FT	840	28	20	9	TITUS	09
C4.10	1245	440	785	60.3	84	20.1	160	140	2.0	0.07	0.08	2-WAY, 0.5"	11.5 FT	1245	22	19	14	TITUS	14
C4.11	925	275	490	60.3	84	12.8	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	925	25	20	12	TITUS	12
C5.1	555	260	470	61.3	84	11.5	160	140	1.2	0.10	0.45	2-WAY, 0.5"	11.5 FT	555	28	20	8	TITUS	08
C5.2	930	310	555	61.3	84	13.6	160	140	1.4	0.08	0.09	2-WAY, 0.5"	11.5 FT	930	25	20	12	TITUS	12
C5.3	1030	320	570	61.3	84	14.0	160	140	1.4	0.09	0.10	2-WAY, 0.5"	11.5 FT	1030	27	20	12	TITUS	12
C5.4	935	280	455	61.3	84	12.5	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	935	27	20	12	TITUS	12
C5.5	875	295	530	61.3	84	13.0	160	140	1.3	0.12	0.11	2-WAY, 0.5"	11.5 FT	875	28	20	9	TITUS	09
C5.6	1040	325	580	61.3	84	17.5	160	140	1.8	0.05	0.07	2-WAY, 0.5"	11.5 FT	1040	20	18	14	TITUS	14
C5.7	965	290	510	61.3	84	12.9	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	965	27	20	12	TITUS	12
C5.8	980	295	515	61.3	84	12.9	160	140	1.3	0.08	0.08	2-WAY, 0.5"	11.5 FT	980	27	20	12	TITUS	12
C5.9	1100	330	530	61.3	84	17.0	160	140	1.7	0.06	0.07	2-WAY, 0.5"	11.5 FT	1100	22	18	14	TITUS	14

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 1.5 PCF CLOSED CELL FOAM INSULATION.
4. SOUND DATA FOR DISCHARGE NC BASED ON 10 dB ROOM ABSORPTION, 5' LINED DUCT (12"x12") WITH 1" THICK FIBERGLASS INSULATION, 6' LINED FLEX DUCT (8") TO DIFFUSER, AND MAX 300 CFM PER DIFFUSER. CALCULATED PER AHRI 880-2011.
5. SOUND DATA FOR RADIATED NC BASED ON 10 dB ROOM ABSORPTION, 3' DEEP CEILING CAVITY, AND 5/8" THICK, 3.5 LB/CU. FT. FIBER CEILING TILE.
6. PROVIDE VAV TERMINAL UNITS WITH FACTORY MULTIPOINT FLOW SENSOR.
7. PROVIDE FACTORY MOUNTED 120V CONTROLS TRANSFORMER TO SUPPLY 24 VOLT POWER TO DAMPER ACTUATOR AND CONTROLS.

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MINI SPLIT SYSTEM CONDENSING UNIT SCHEDULE

UNIT MHP	BASIS OF DESIGN	MODEL	NOMINAL COOL CAPACITY (BTUH)	DESIGN COOLING OUTDOOR TEMP DB	SEER2	NOMINAL HEAT CAPACITY (BTUH)	DESIGN HEATING OUTDOOR TEMP DB	HSPF	VOLTS/PHASE	MCA (AMPS)	MFA (AMPS)	NOTES
A1	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
A2	MITSUBISHI	PUZ-AH24NL	24000	95	22.6	29000	47	9.2	208/1	22	37	1,2,3
A3	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
A4	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
A5	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
A6	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
A7	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
B1	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
B2	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
B3	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
B4	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
B5	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
B6	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
C1	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
C2	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
C3	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
C4	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
C5	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
C6	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
1	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3
2	MITSUBISHI	PUZ-AK18NL	18000	95	19.5	23600	47	8.9	208/1	16	27	1,2,3

1. NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB/WB), OUTDOOR OF 95°F (DB).
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70°F (DB), OUTDOOR OF 43°F (WB).
3. EFFICIENCY VALUES FOR EER, IEER, AND COP ARE BASED ON AHRI 1230 TEST METHOD FOR MIXTURE OF DUCTED AND NON-DUCTED INDOOR UNITS.

MINI SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE

UNIT	BASIS OF DESIGN	MODEL	TYPE	NOMINAL COOL CAPACITY (BTUH)	DESIGN COOLING EAT °F DB/WB	DESIGN COOLING CAPACITY (BTUH)		NOMINAL HEAT CAPACITY (BTUH)	DESIGN HEATING TOTAL CAPACITY (BTUH)	DESIGN HEATING EAT °F DB	AIRFLOW (CFM)	VOLTS/PHASE	MCA (AMPS)	MOP (AMPS)	NOTES
						COOLING TOTAL	COOLING SENSIBLE								
WM-A1.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-A2.1	MITSUBISHI	PKA-AK24NL	WALL-MOUNTED	24000	95	25100	16900	26000	25700	70.0	450	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-A3.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-A4.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-A5.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-A6.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-A7.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-B1.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-B2.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-B3.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-B4.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-B5.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-B6.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-C1.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-C2.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-C3.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-C4.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-C5.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8
WM-C6.1	MITSUBISHI	PKA-A18NL	WALL-MOUNTED	18000	95	17300	10900	23600	21400	70.0	300	208/1	N/A	N/A	1,2,3,4,5,6,7,8

1. NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB/WB), OUTDOOR OF 95°F (DB).
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70°F (DB), OUTDOOR OF 43°F (WB).
3. DESIGN COOLING CONDITIONS ARE AT 95°F AMBIENT, DESIGN HEATING CONDITIONS ARE AT 25°F AMBIENT.
4. DESIGN CAPACITY IS NET CAPACITY FOR INSTALLATION ACCOUNTING FOR 65 FT PIPE RUN LEGNTHS, ETC.
5. CALCULATE REFRIGERANT LINE SIZES BASED UPON FINAL FIELD PIPING LAYOUT.
6. EXPOSED (INDOOR OR OUTDOOR) REF PIPING SHALL BE HARD DRAWN COPPER.
7. PROVIDE BAC-NET MODULE.
8. POWERED BY OUTDOOR UNIT.

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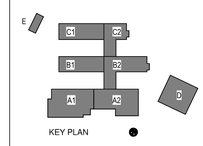
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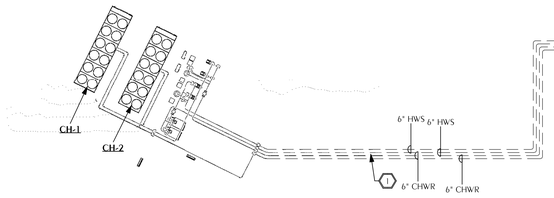
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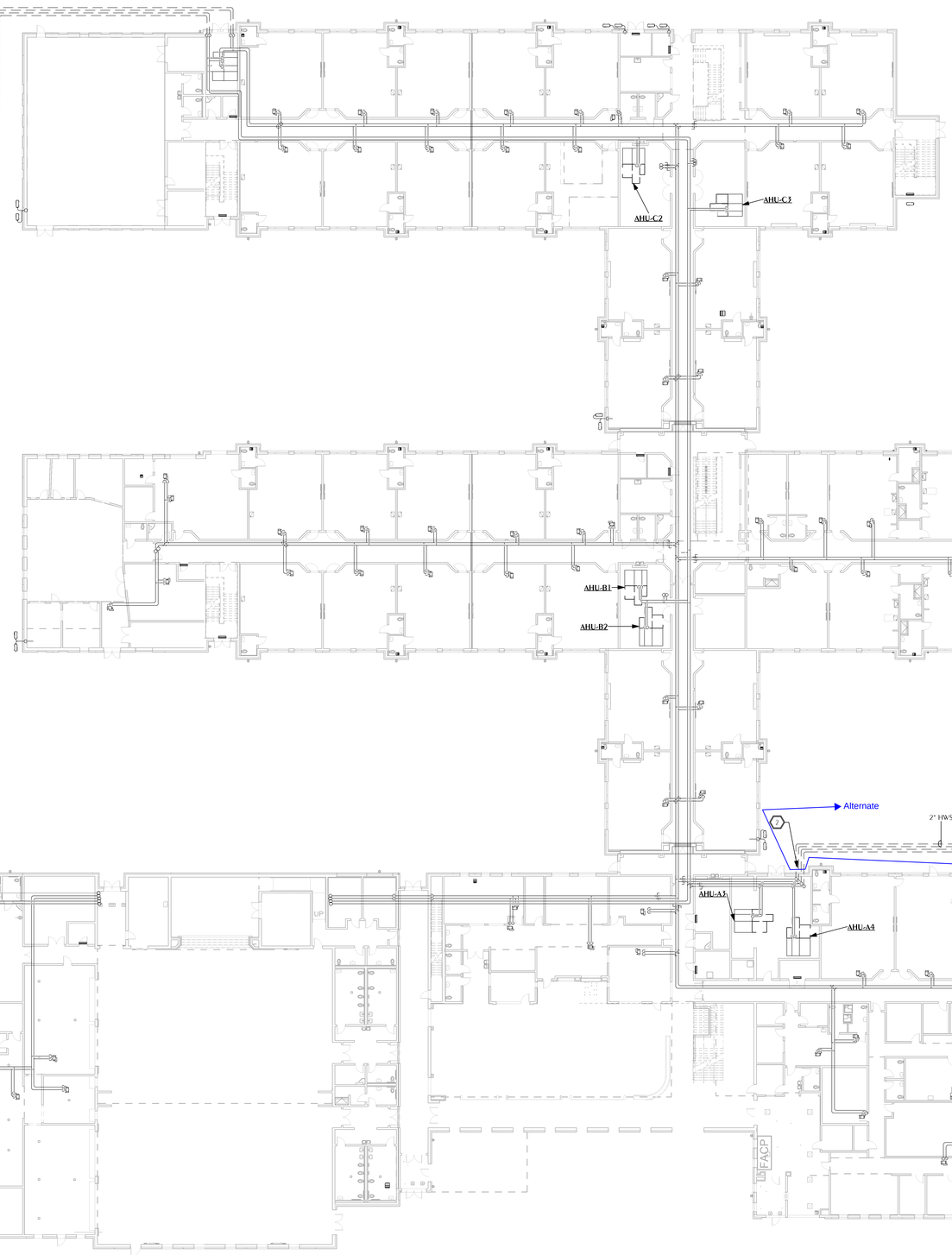
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Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.326.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: IVB

HVAC SCHEDULES
M-004



SHEET NOTES

1. ROUTE PREINSULATED CHILLED WATER AND HEATING HOT WATER PIPING UNDERGROUND BETWEEN CENTRAL PLANT AND MAIN BUILDING.
2. ROUTE PREINSULATED CHILLED WATER AND HEATING HOT WATER PIPING UNDERGROUND BETWEEN AS SHOWN BETWEEN CLASSROOM BUILDING AND GYM. PROVIDE VALVE BOX AT GYM. REFER TO GYM CONSTRUCTION DOCUMENTS FOR CONTINUATION.





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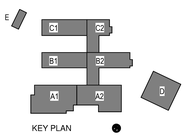
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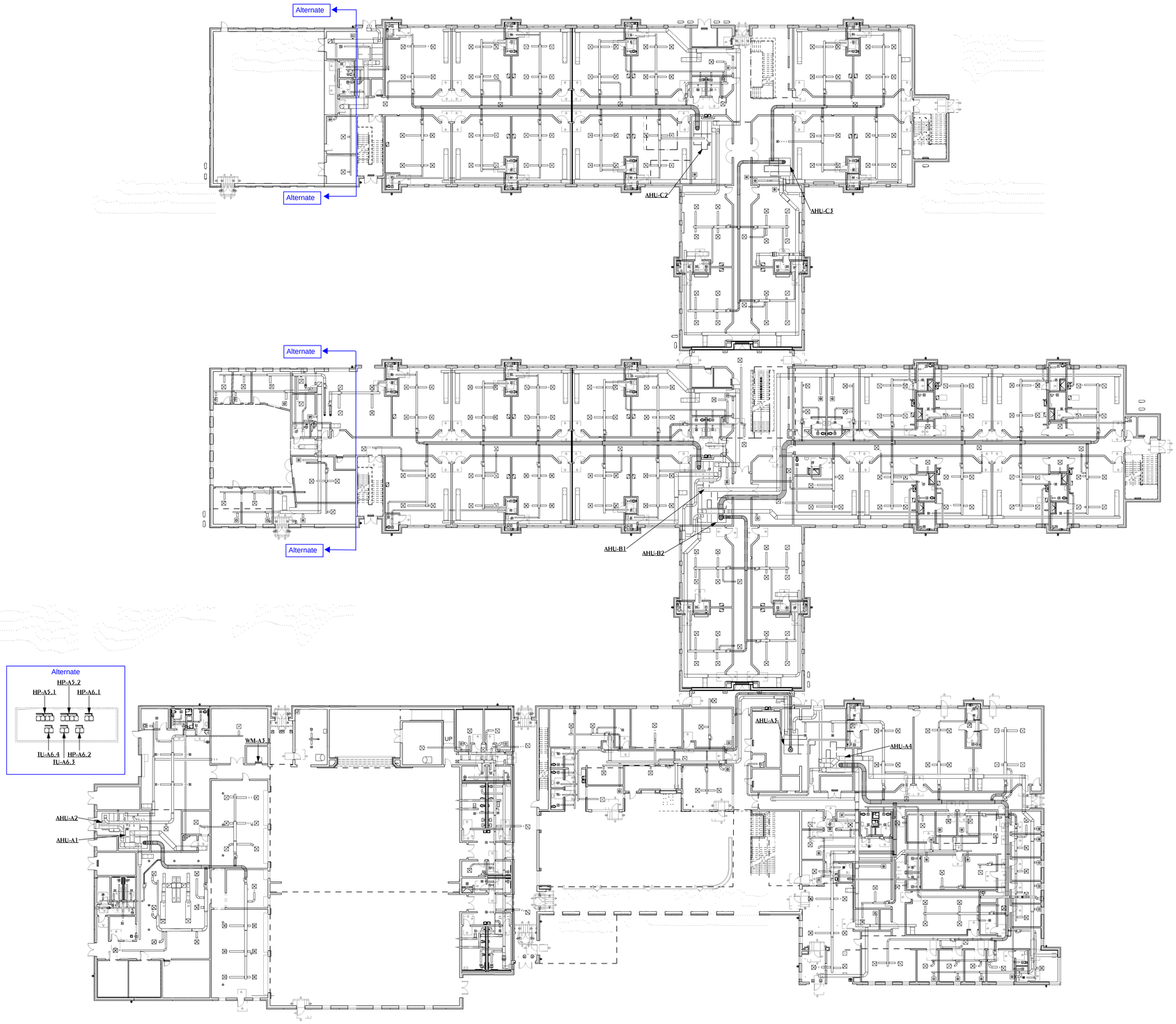
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LEVEL 1 HVAC PIPING PLAN-OVERALL

M-101.1



1 LEVEL 1 HVAC PLAN-OVERALL
M-101 SCALE: 1" = 20'-0"

PROJECT NORTH TRUE NORTH

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KEY PLAN

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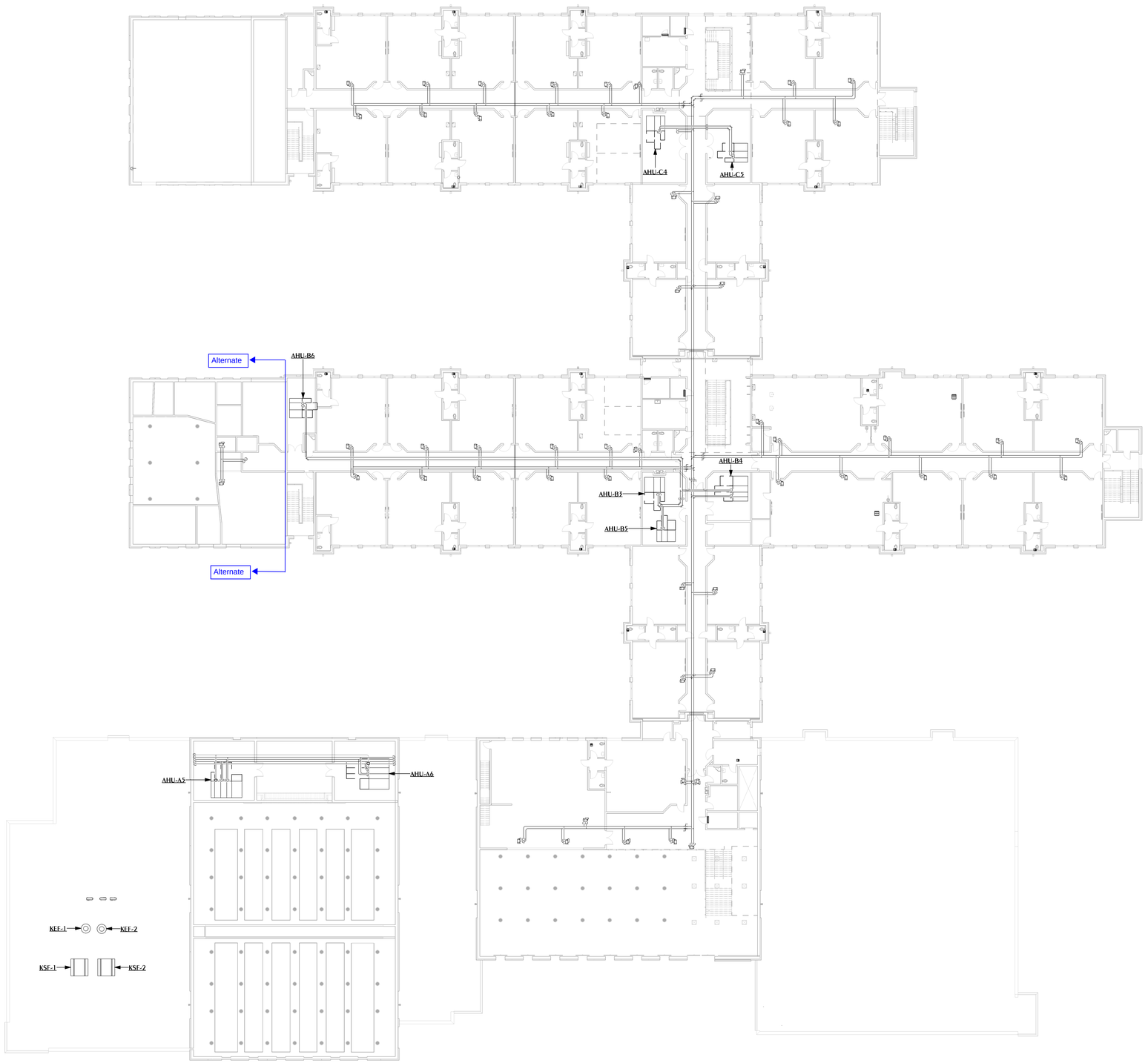
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Florida License Number: 86457
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Project Number: 2022-041
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Drawn By: IVB

LEVEL 1 HVAC
PLAN-OVERALL

M-101



1 LEVEL 2 HVAC PIPING PLAN-OVERALL

M-102.1 SCALE: 1" = 20'-0"

PROJECT NORTH / TRUE NORTH

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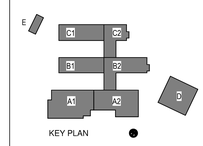
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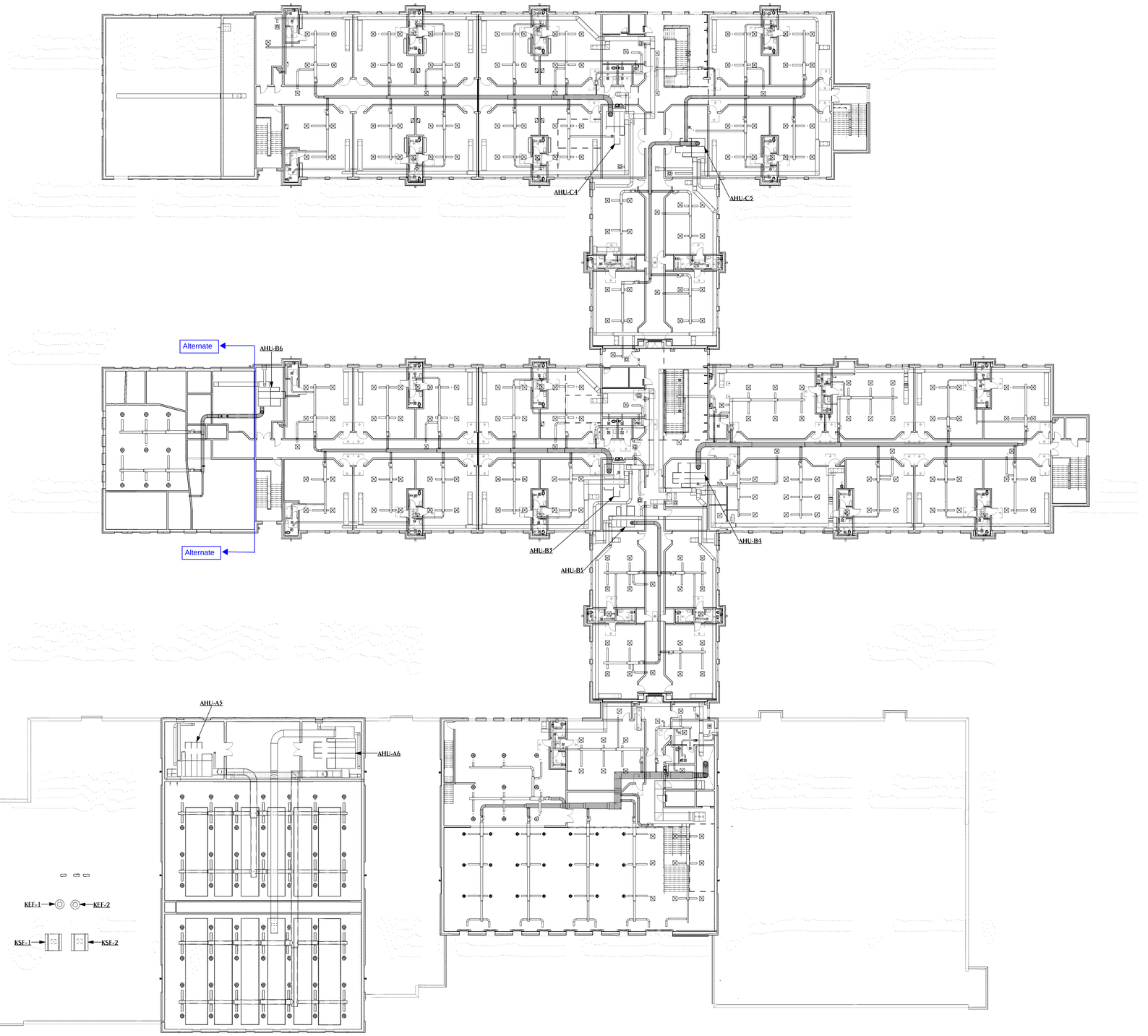
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LEVEL 2 HVAC PIPING PLAN-OVERALL

M-102.1

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Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
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LEVEL 2 HVAC PLAN-OVERALL

1 M-102 SCALE: 1" = 20'-0"

PROJECT NORTH / TRUE NORTH

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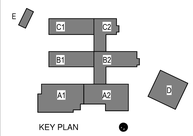
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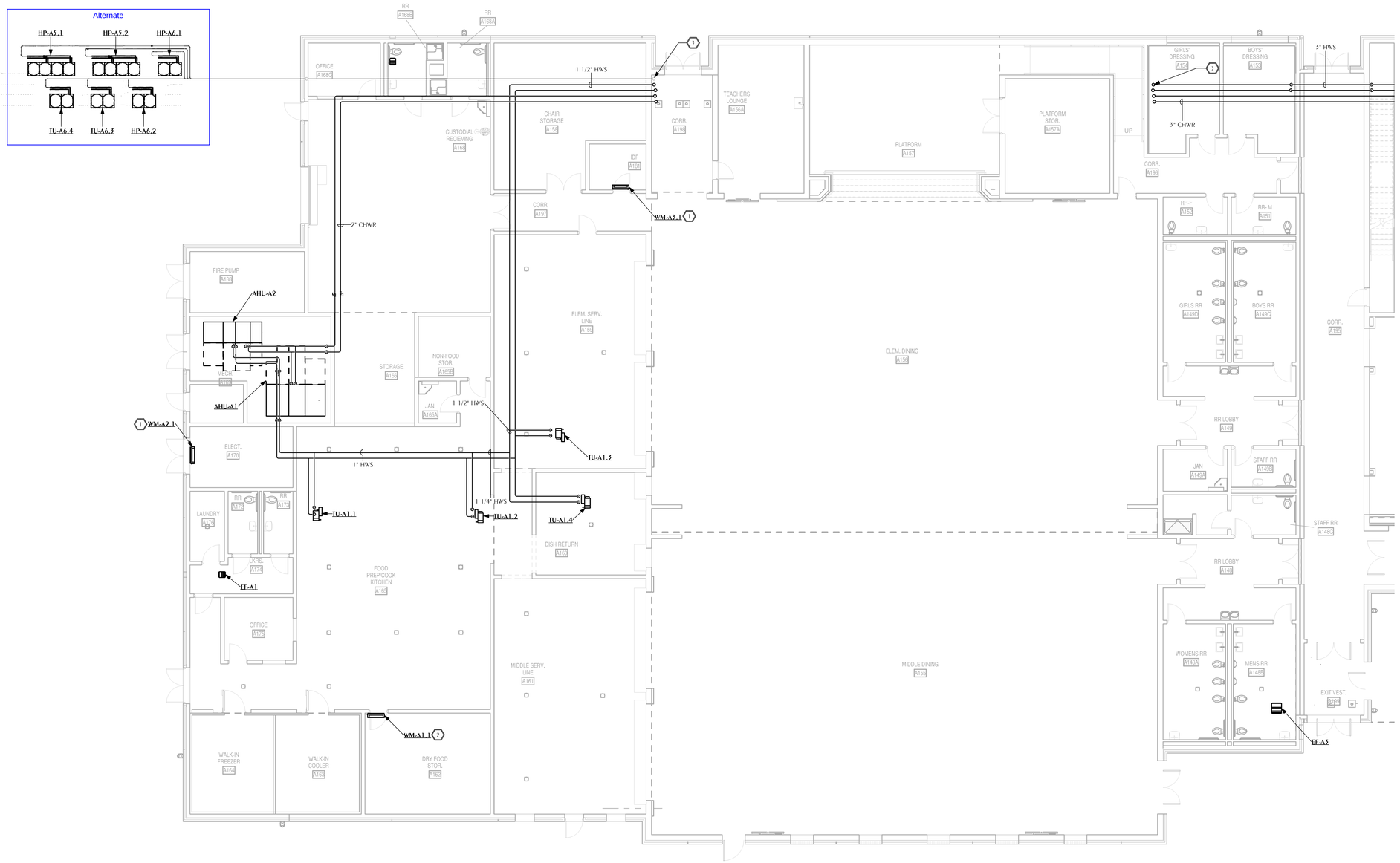
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Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
Project Number: 2022-041
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LEVEL 2 HVAC
PLAN-OVERALL

M-102

SHEET NOTES

1. ROUTE CONDENSATE TO UTILITY BOX. REFER TO PLUMBING DRAWINGS.
2. ROUTE CONDENSATE TO NEARBY KITCHEN FLOOR DRAIN. REFER TO PLUMBING DRAWINGS.
3. UP TO SECOND LEVEL. REFER TO M-121.1 FOR CONTINUATION



N PROJECT NORTH / N TRUE NORTH

1 LEVEL 1 HVAC PIPING PLAN-AREA A1

M-111.1 SCALE: 1/8" = 1'-0"

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C1 C2
B1 B2
A1 A2
D
KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE

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ALLSTATE CONSTRUCTION
09-18-2025

Project Number	22023
Dated	09-18-2025

WATFORD ENGINEERING
4452 Clinton Street Marianna, Florida 32446
Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: AJB

LEVEL 1 HVAC PIPING PLAN-AREA A1

M-111.1

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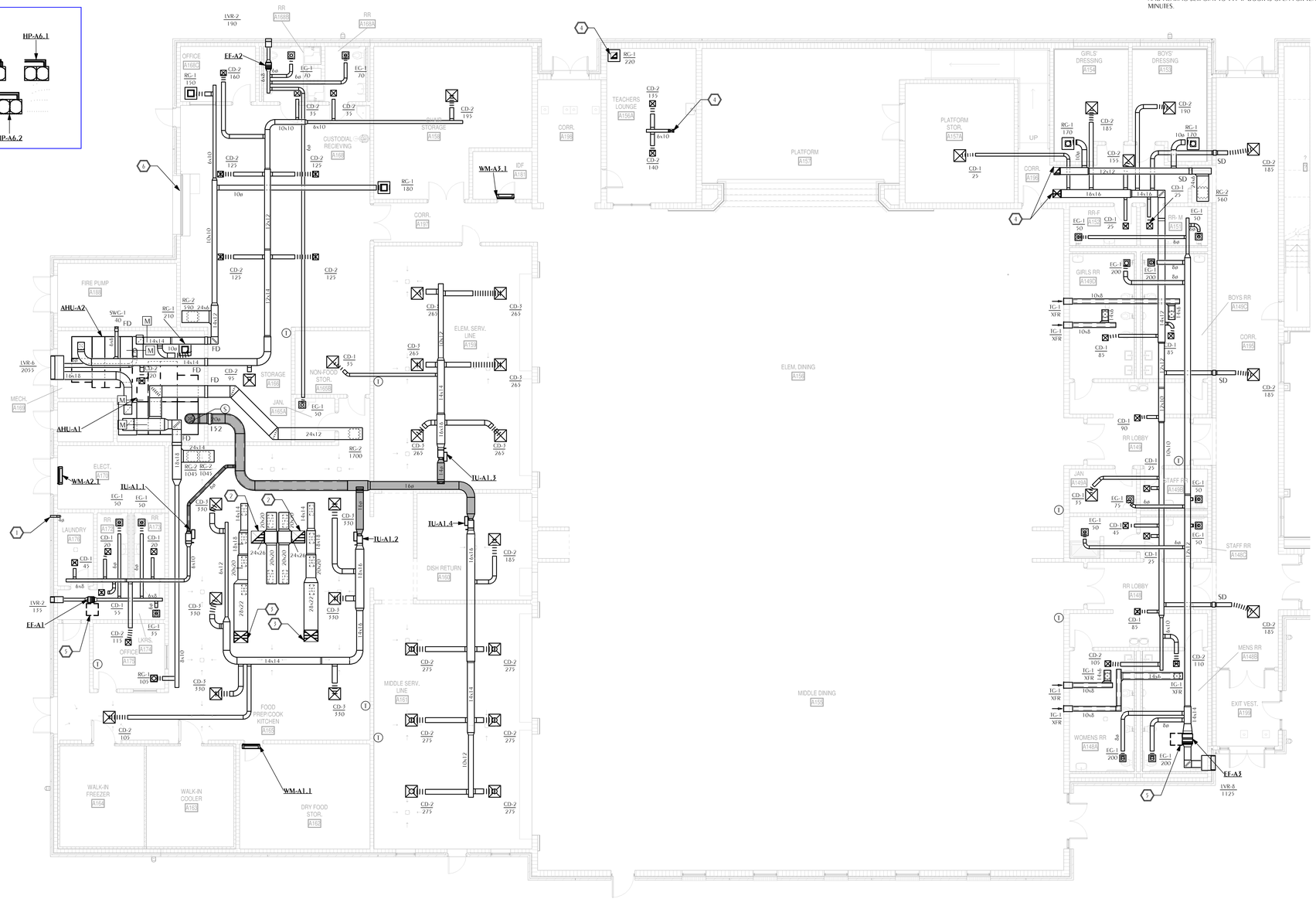
SHEET NOTES

1. PROVIDE VENT CAP FOR DRYER EXHAUST.
2. UP TO KEF. REFER TO M-121 FOR FAN LOCATION.
3. UP TO KSF. REFER TO M-121 FOR FAN LOCATION.
4. UP TO SECOND LEVEL. REFER TO M-121 FOR CONTINUATION.
5. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.
6. PROVIDE DELAY-ON BREAK TIMING RELAY, KELE KRDB (LOW VOLTAGE OPTION) OR APPROVED EQUAL WITH TEN MINUTE TIME DELAY AND DOOR SWITCH TO INTERLOCK WITH AHU-2 AND SET COOLING SETPOINT TO 90F AND HEATING SETPOINT TO 55F IF DOOR IS OPEN FOR TEN CONSECUTIVE MINUTES.

Alternate

HP-A5.1 HP-A5.2 HP-A6.1

TU-A6.4 TU-A6.3 HP-A6.2



1 LEVEL 1 HVAC PLAN-AREA A1

M-111 SCALE: 1/8" = 1'-0"

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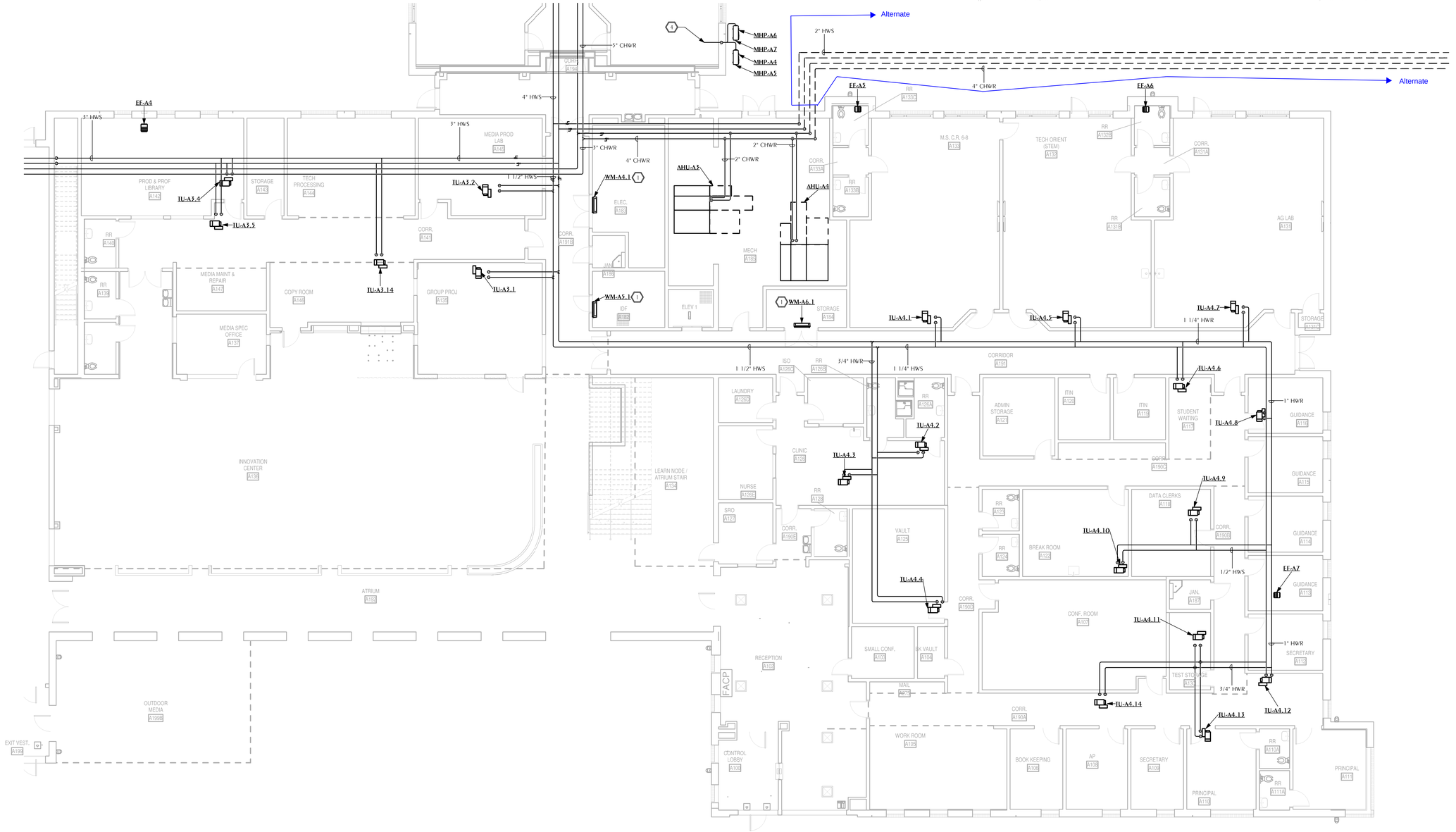
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LEVEL 1 HVAC PLAN-AREA A1

M-111

SHEET NOTES

1. ROUTE CONDENSATE TO UTILITY BOX.
2. UNDERGROUND PIPING TO GYM.
3. ROUTE REFRIGERANT TO RESPECTIVE WM.



LEVEL 1 HVAC PIPING PLAN-AREA A2

M-112.1 SCALE: 1/8" = 1'-0"

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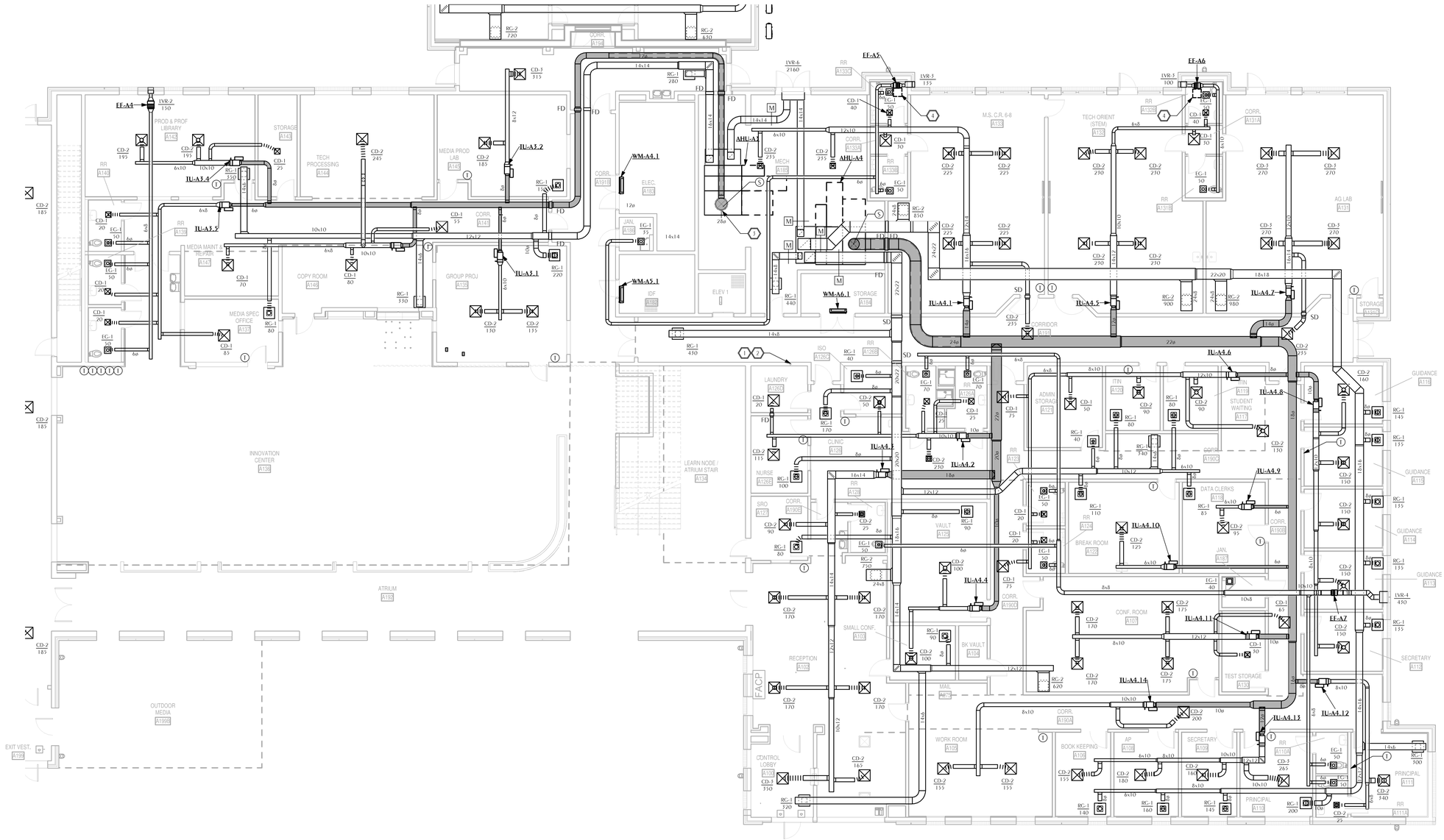
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LEVEL 1 HVAC PIPING PLAN-AREA A2

M-112.1

SHEET NOTES

1. PROVIDE GOOSENECK ROOFTOP VENT CAP FOR DRYER EXHAUST.
2. PROVIDE UTILITY BOX IN WALL TO ALLOW DRYER EXHAUST TO RISE UP IN WALL CAVITY. BOX SHALL HAVE CONNECTION FOR 4" ROUND DUCT. BOX SHALL BE 22 GAUGE ALUMINIZED STEEL. DRYERBOX 425 OR APPROVED EQUAL.
3. 28" ROUND DUCT UP THROUGH CHASE TO SECOND LEVEL. REFER TO M-122 FOR CONTINUATION.
4. PROVIDE 18X18 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



N N
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1 LEVEL 1 HVAC PLAN-AREA A2

M-112 SCALE: 1/8" = 1'-0"

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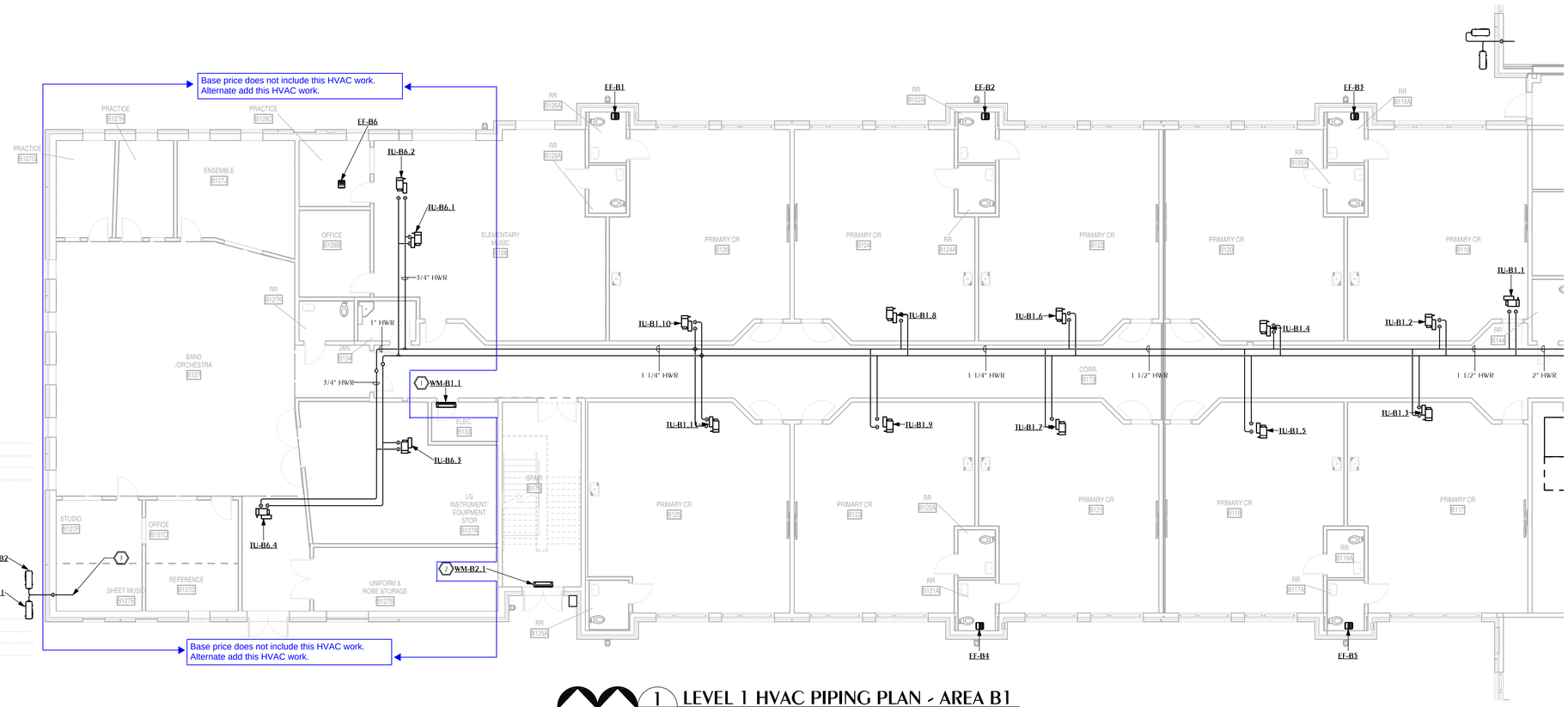
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LEVEL 1 HVAC PLAN-AREA A2

M-112



1 LEVEL 1 HVAC PIPING PLAN - AREA B1

M-113.1 SCALE: 1/8" = 1'-0"

PROJECT NORTH TRUE NORTH

SHEET NOTES

1. ROUTE CONDENSATE TO IAN B134 TO DISCHARGE TO FLOOR DRAIN.
2. ROUTE CONDENSATE TO BUILDING EXTERIOR TO DISCHARGE OVER ARCHITECTURAL SPLASH BLOCK.
3. ROUTE REFRIGERANT TO RESPECTIVE WM.

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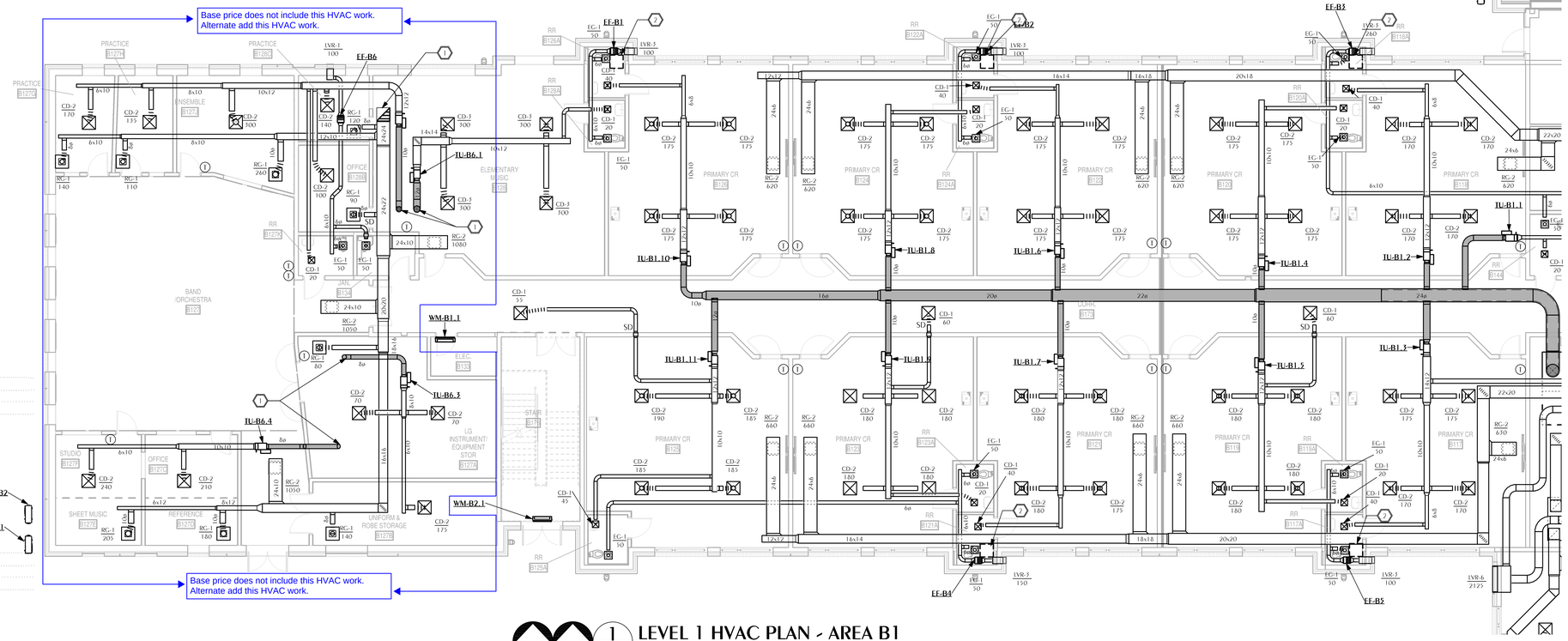
LEVEL 1 HVAC PIPING PLAN-AREA B1

M-113.1

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SHEET NOTES

1. DUCT UP TO SECOND LEVEL. REFER TO M-123 FOR CONTINUATION.
2. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



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1 M-113 **LEVEL 1 HVAC PLAN - AREA B1**

SCALE: 1/8" = 1'-0"

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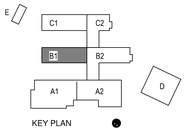
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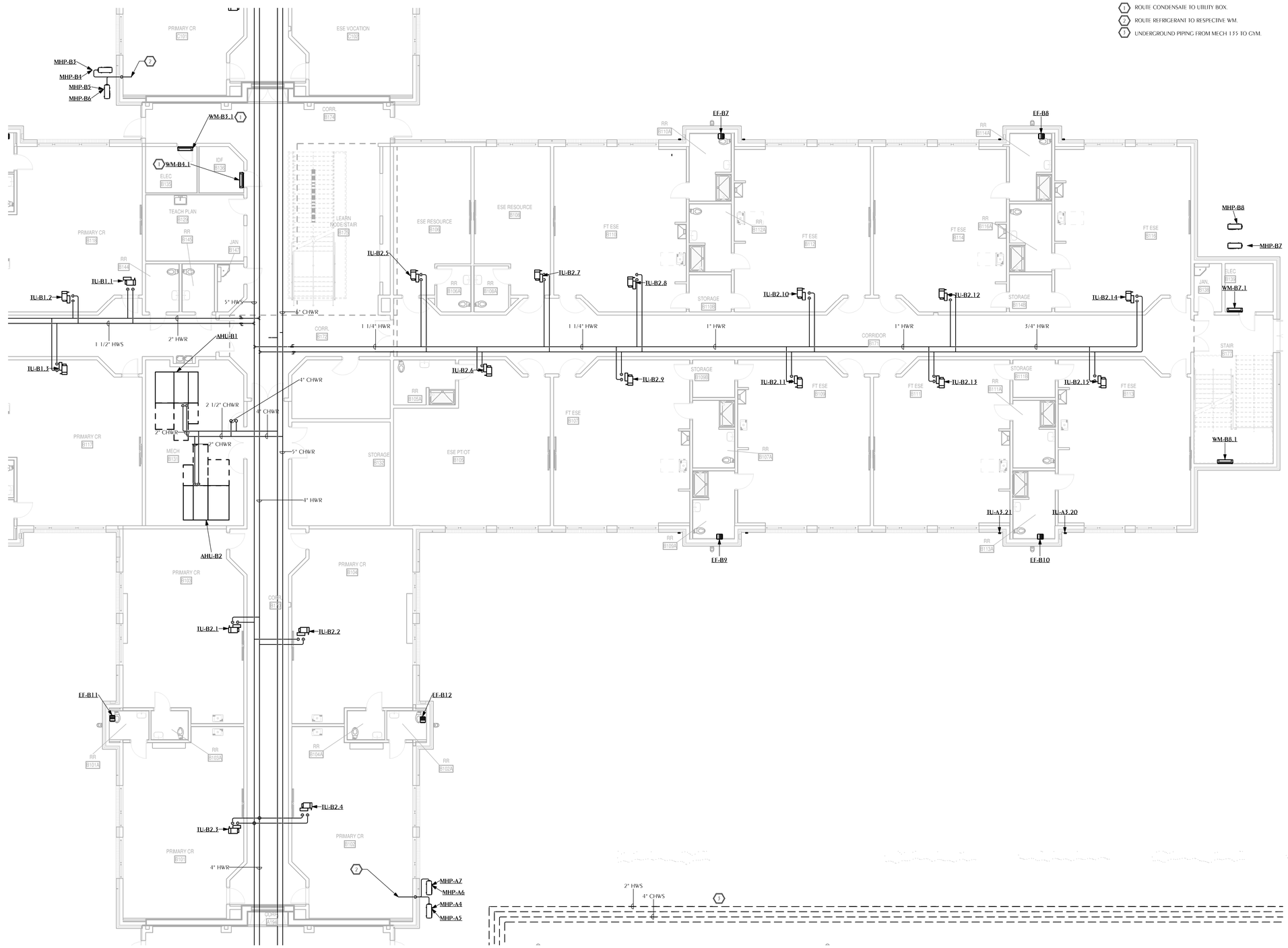
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Florida CA Number: 27525
Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: BJB

LEVEL 1 HVAC PLAN-AREA B1

M-113

SHEET NOTES

1. ROUTE CONDENSATE TO UTILITY BOX.
2. ROUTE REFRIGERANT TO RESPECTIVE WM.
3. UNDERGROUND PIPING FROM MECH 133 TO GYM.



1 LEVEL 1 HVAC PIPING PLAN - AREA B2

M-114.1 SCALE: 1/8" = 1'-0"

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Keith A. Johnson, PE
Florida License Number: 86457
850.326.3447
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Drawn By: MB

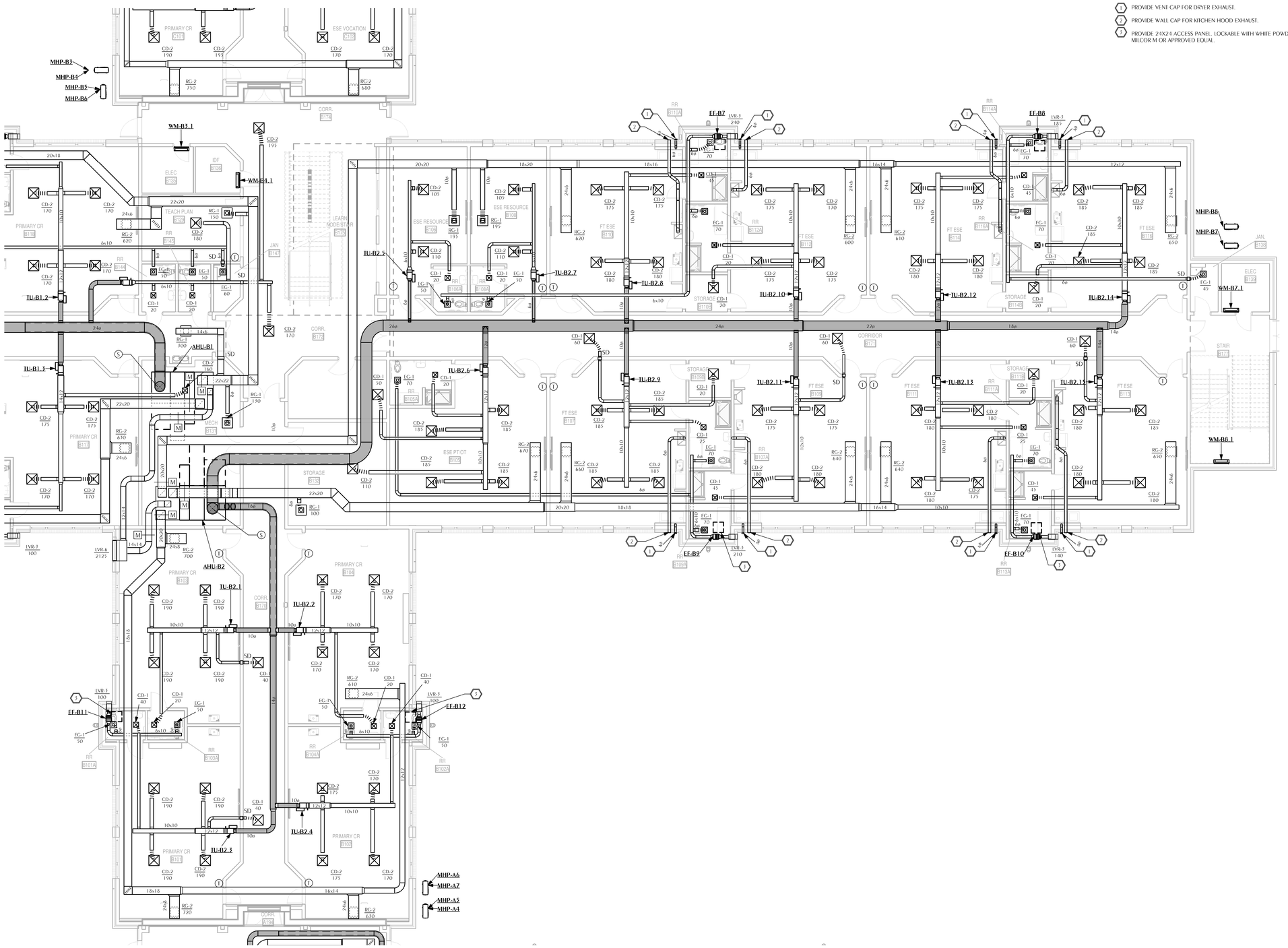
LEVEL 1 HVAC PIPING PLAN-AREA B2

M-114.1

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SHEET NOTES

1. PROVIDE VENT CAP FOR DRYER EXHAUST.
2. PROVIDE WALL CAP FOR KITCHEN HOOD EXHAUST.
3. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



N N 1 M-114 LEVEL 1 HVAC PLAN - AREA B2
SCALE: 1/8" = 1'-0"
PROJECT NORTH TRUE NORTH

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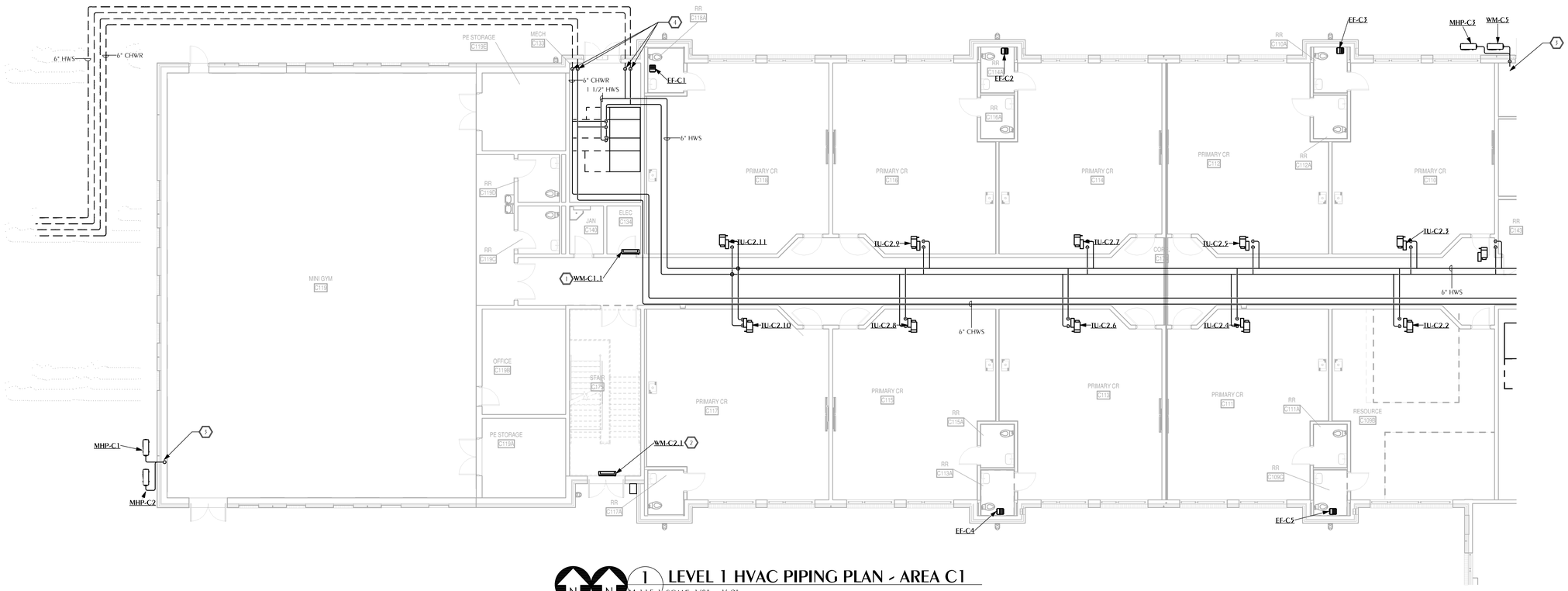
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LEVEL 1 HVAC PLAN-AREA B2

M-114

SHEET NOTES

1. ROUTE CONDENSATE TO JAN C140 TO DISCHARGE TO FLOOR DRAIN.
2. ROUTE CONDENSATE TO BUILDING EXTERIOR TO DISCHARGE OVER ARCHITECTURAL SPLASH BLOCK.
3. ROUTE REFRIGERANT TO RESPECTIVE WM.
4. PROVIDE BUTTERFLY VALVE IN VERTICAL SECTION OF PIPE.



N PROJECT NORTH N TRUE NORTH

1 LEVEL 1 HVAC PIPING PLAN - AREA C1
M-115.1 SCALE: 1/8" = 1'-0"

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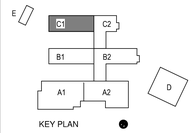
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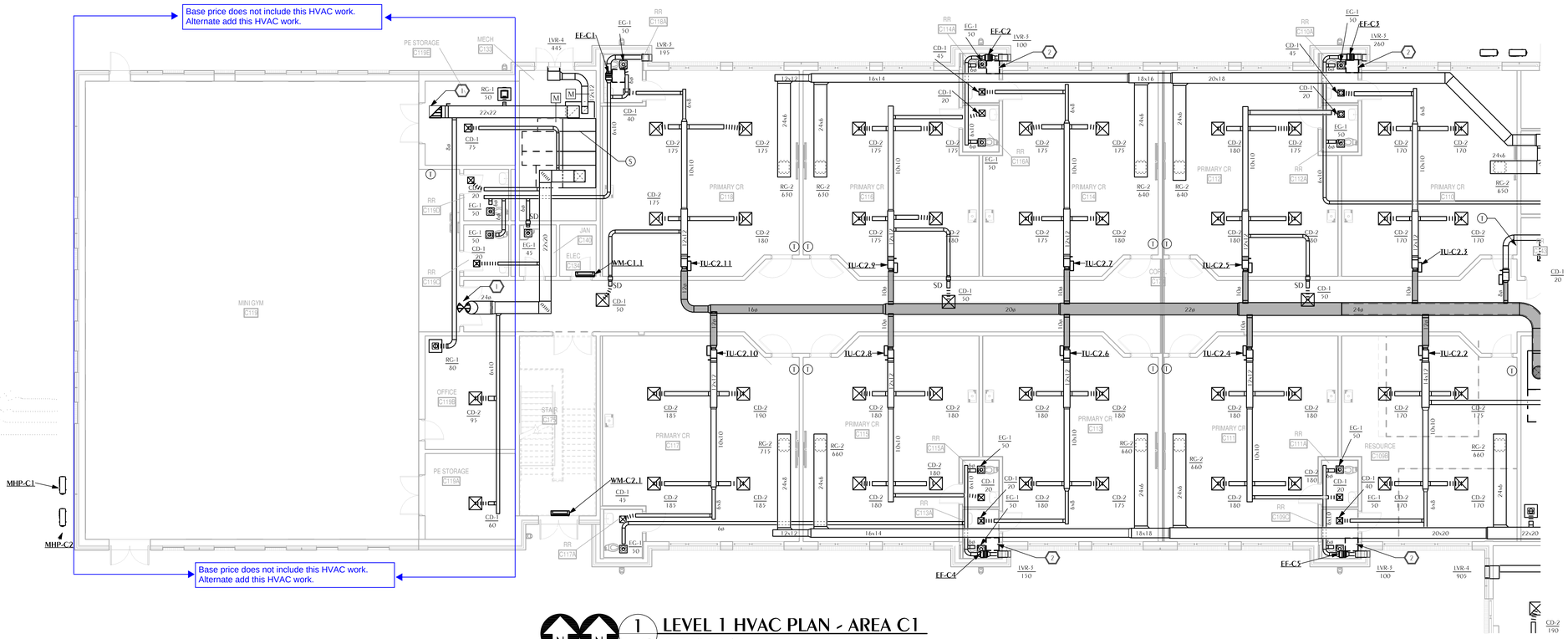
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LEVEL 1 HVAC PIPING PLAN-AREA C1

M-115.1

SHEET NOTES

1. DUCT UP TO SECOND LEVEL. REFER TO M-125 FOR CONTINUATION.
2. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



1 LEVEL 1 HVAC PLAN - AREA C1

M-115 SCALE: 1/8" = 1'-0"

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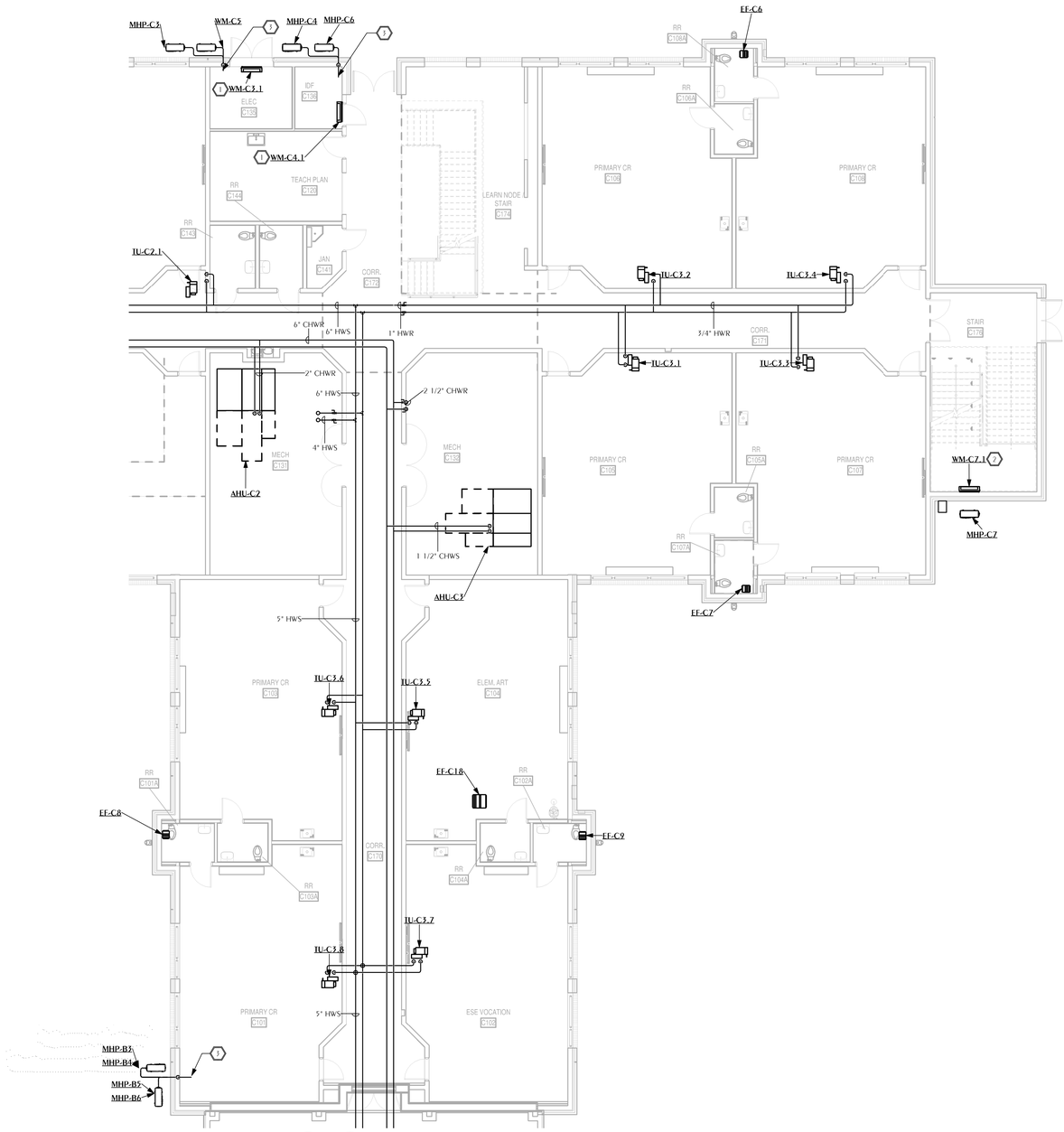
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M-115

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SHEET NOTES

1. ROUTE CONDENSATE TO UTILITY BOX.
2. ROUTE CONDENSATE TO BUILDING EXTERIOR TO DISCHARGE OVER ARCHITECTURAL SPLASH BLOCK.
3. ROUTE REFRIGERANT TO RESPECTIVE WM.



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1 LEVEL 1 HVAC PIPING PLAN - AREA C2
M-116.1 SCALE: 1/8" = 1'-0"

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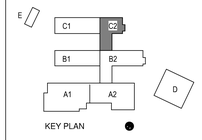
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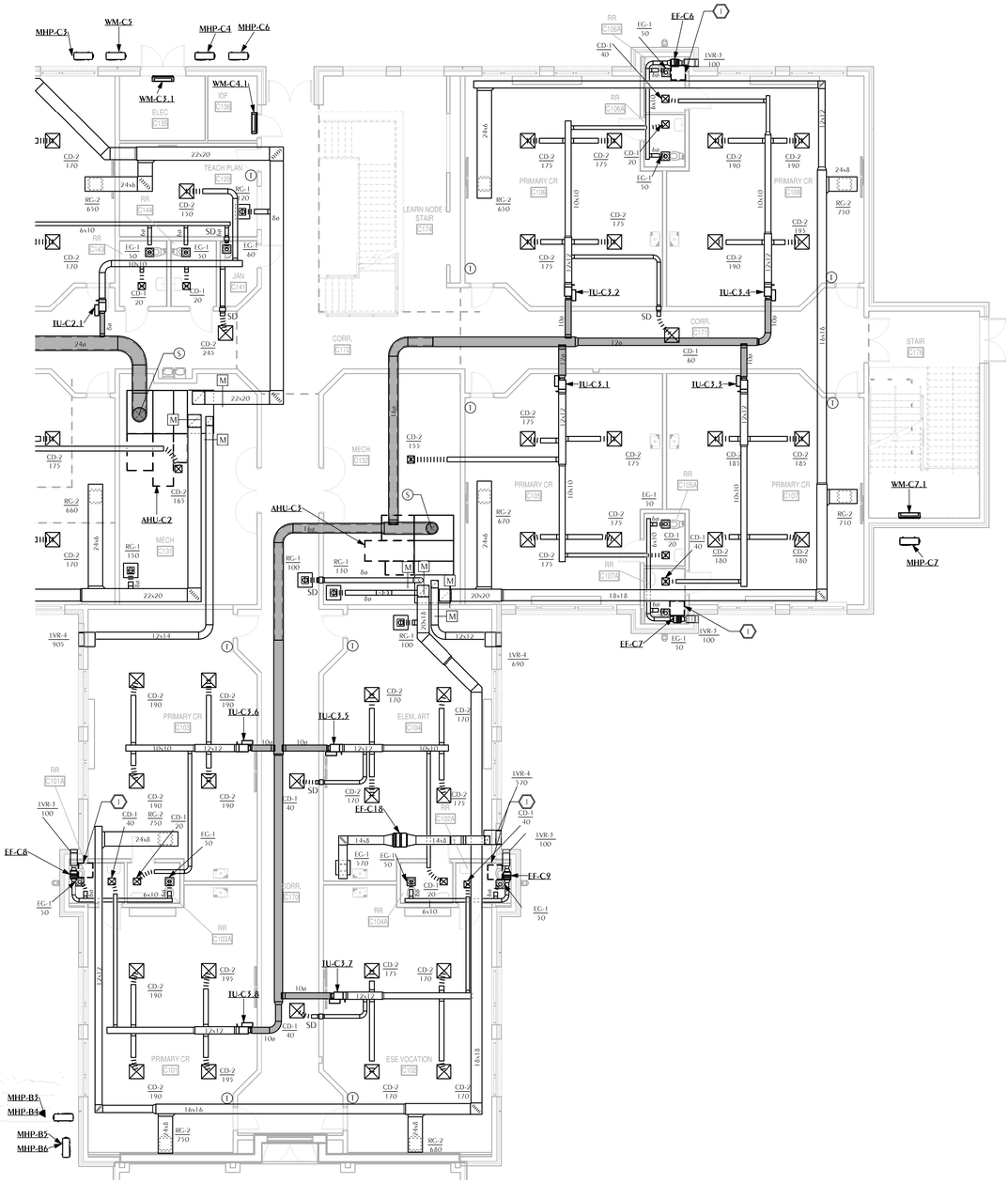
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M-116.1

SHEET NOTES

1. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL



1 LEVEL 1 HVAC PLAN - AREA C2

M-116 SCALE: 1/8" = 1'-0"

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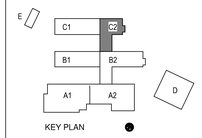
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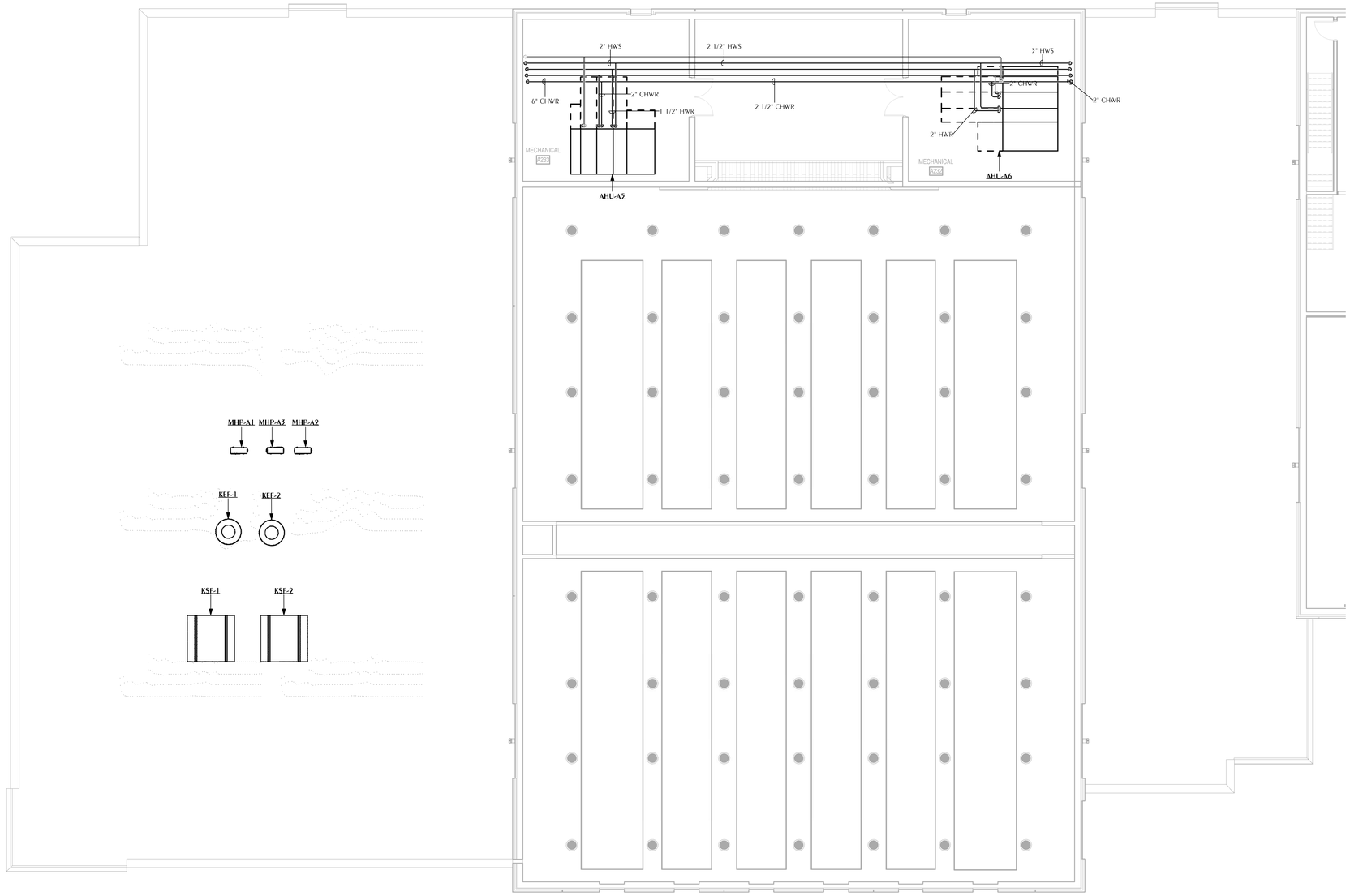
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LEVEL 1 HVAC PLAN-AREA C2

M-116

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1 LEVEL 2 HVAC PIPING PLAN - AREA A1
M-121_1 SCALE: 1/8" = 1'-0"

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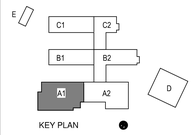
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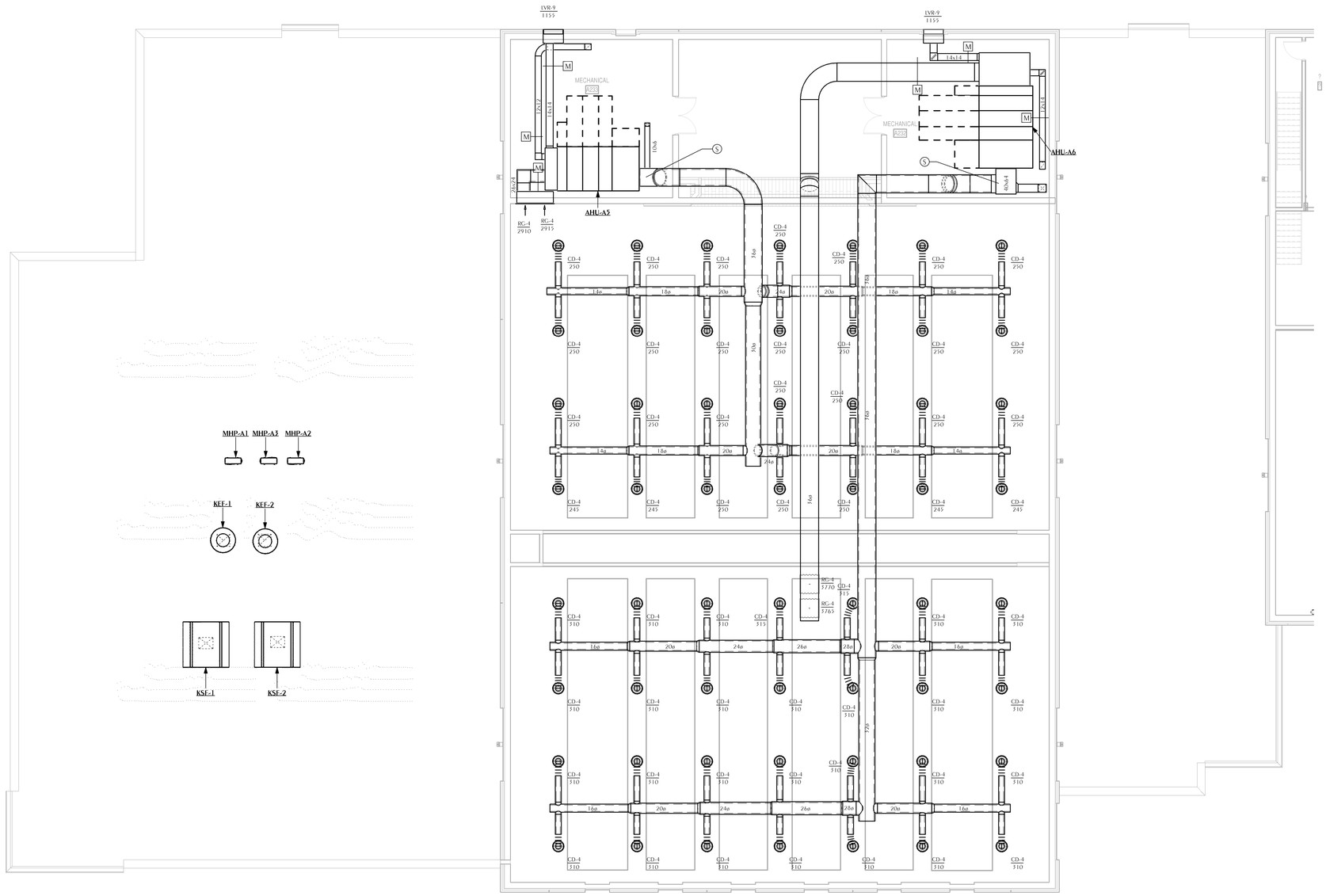
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LEVEL 2 HVAC
PIPING
PLAN-AREA A1

M-121.1



LEVEL 2 HVAC PLAN - AREA A1

SCALE: 1/8" = 1'-0"

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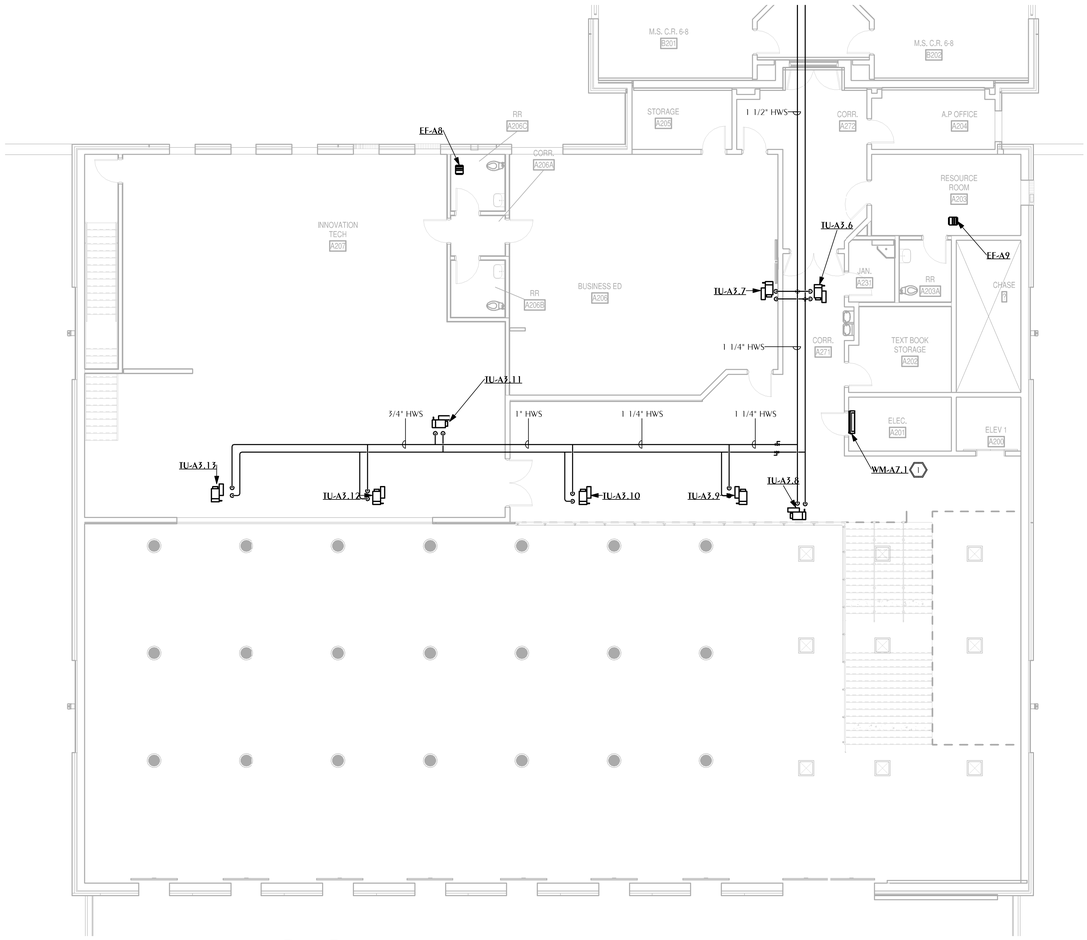
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LEVEL 2 HVAC PLAN-AREA A1

M-121

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1 LEVEL 2 HVAC PIPING PLAN - AREA A2
M-122.1 SCALE: 1/8" = 1'-0"

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N TRUE NORTH

SHEET NOTES

1 ROUTE CONDENSATE TO IAN A231 TO DISCHARGE TO FLOOR DRAIN.

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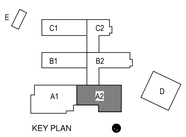
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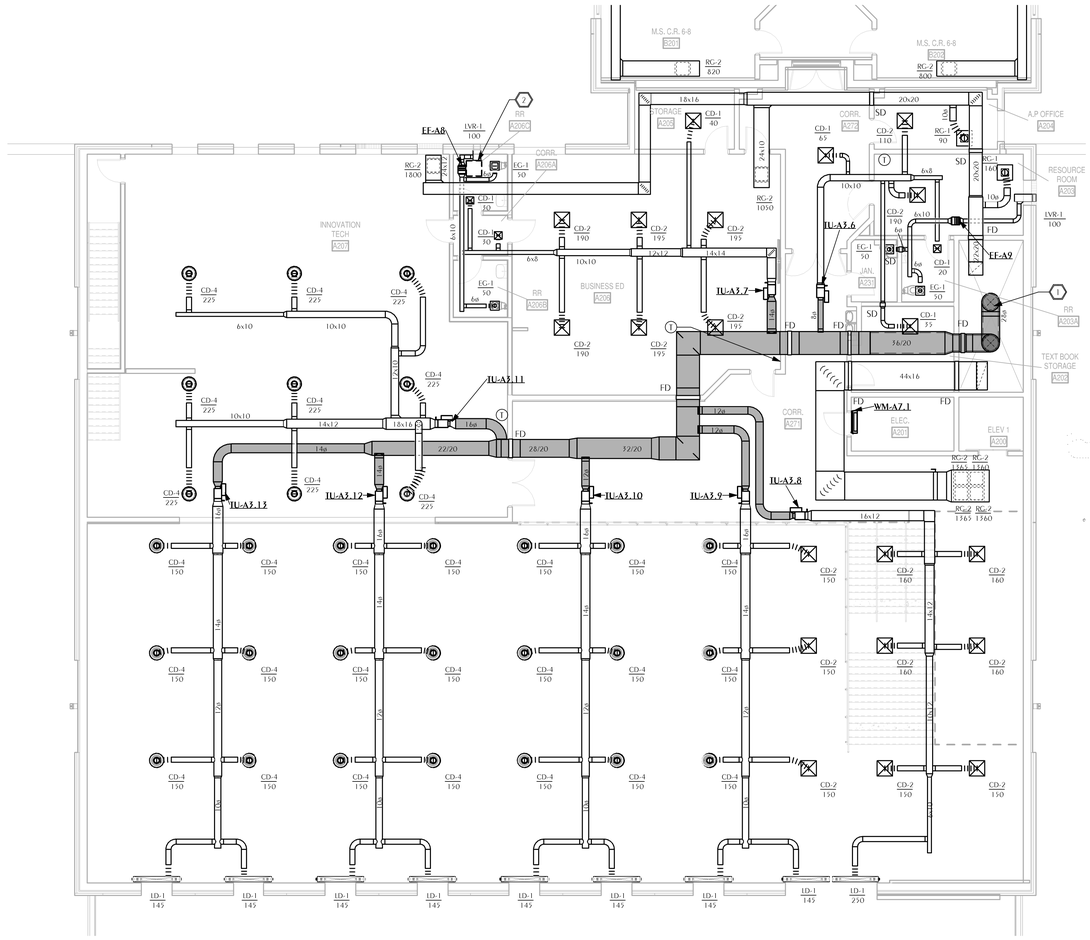
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LEVEL 2 HVAC PIPING PLAN-AREA A2

M-122.1

SHEET NOTES

1. DUCT UP FROM MECH A185. OFFSET DUCT IN VERTICAL SECTION.
2. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



1 LEVEL 2 HVAC PLAN - AREA A2

M-122 SCALE: 1/8" = 1'-0"

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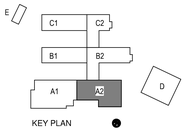
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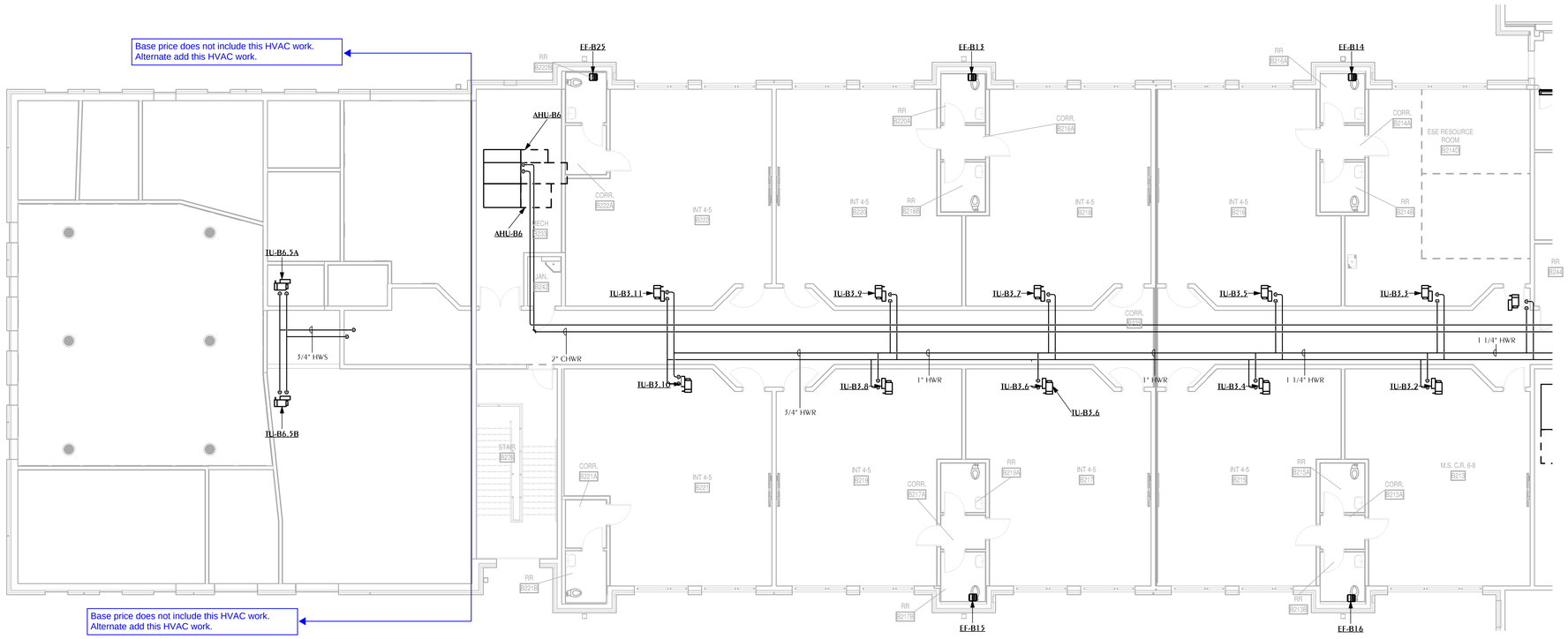
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LEVEL 2 HVAC PLAN-AREA A2

M-122



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1 LEVEL 2 HVAC PIPING PLAN - AREA B1

M-123.1 SCALE: 1/8" = 1'-0"

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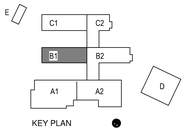
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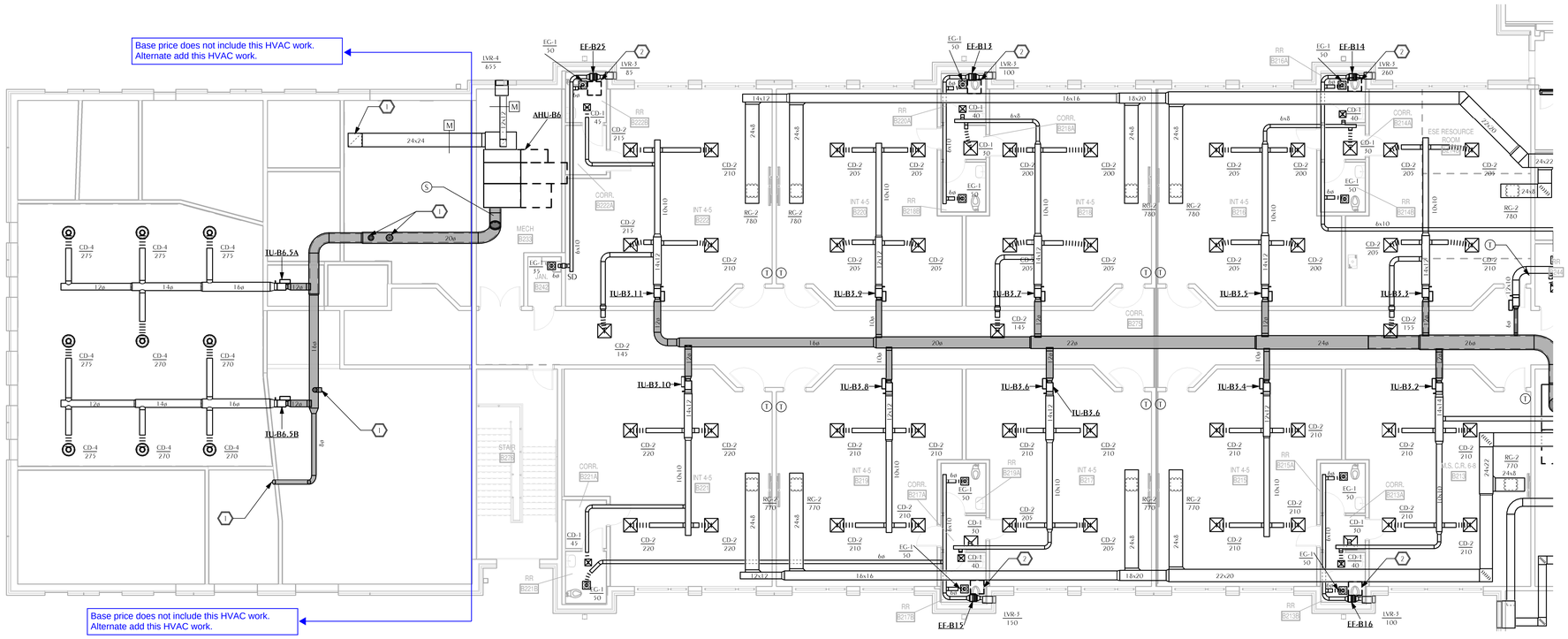
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Drawn By: JVB

LEVEL 2 HVAC PIPING PLAN-AREA B1

M-123.1

SHEET NOTES

1. DUCT DOWN TO FIRST LEVEL. REFER TO M-113 FOR CONTINUATION.
2. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



1 LEVEL 2 HVAC PLAN - AREA B1

M-123 SCALE: 1/8" = 1'-0"

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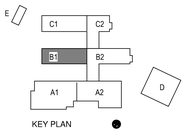
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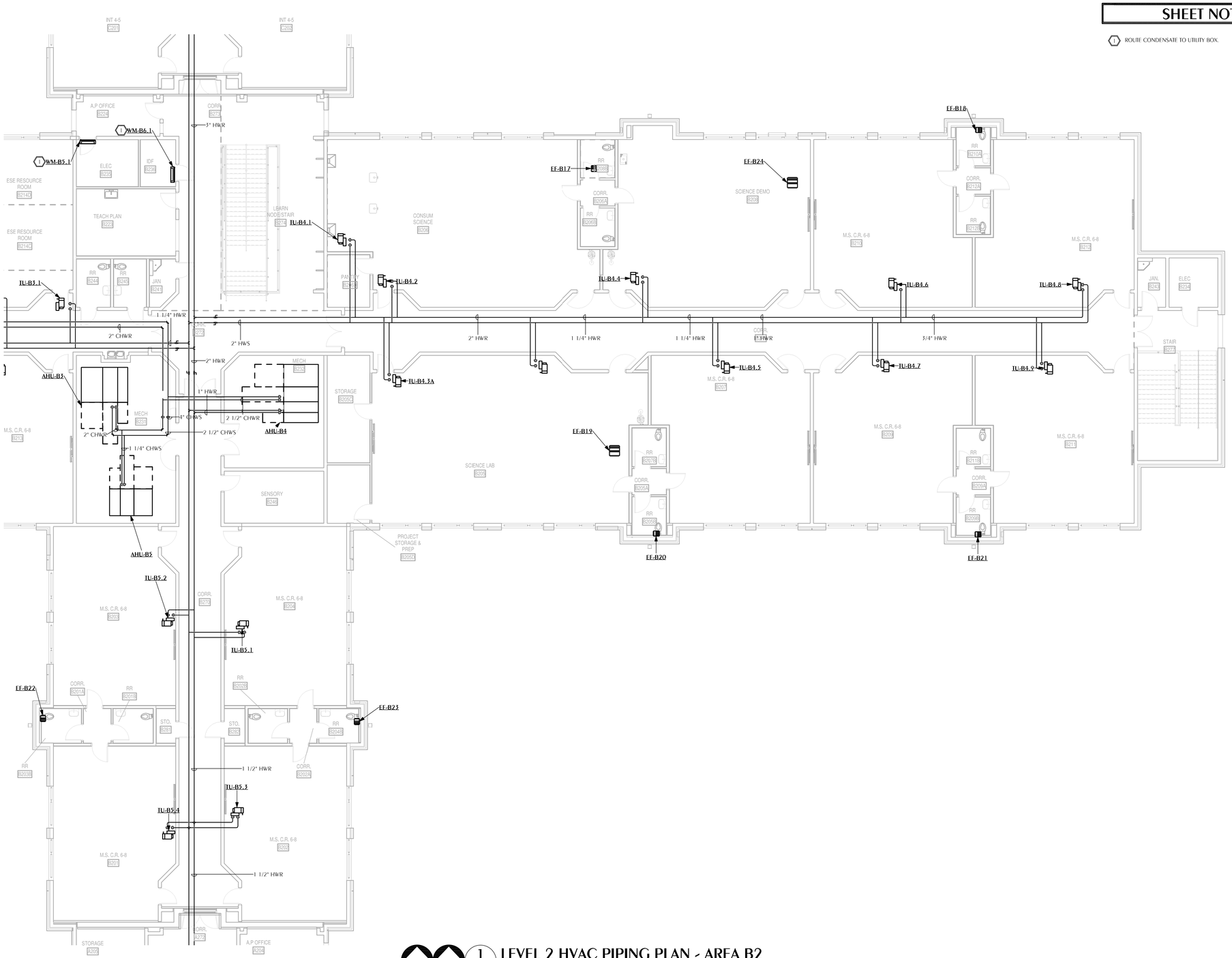
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LEVEL 2 HVAC PLAN-AREA B1

M-123

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SHEET NOTES

1. ROUTE CONDENSATE TO UTILITY BOX.

1 LEVEL 2 HVAC PIPING PLAN - AREA B2

M-124.1 SCALE: 1/8" = 1'-0"

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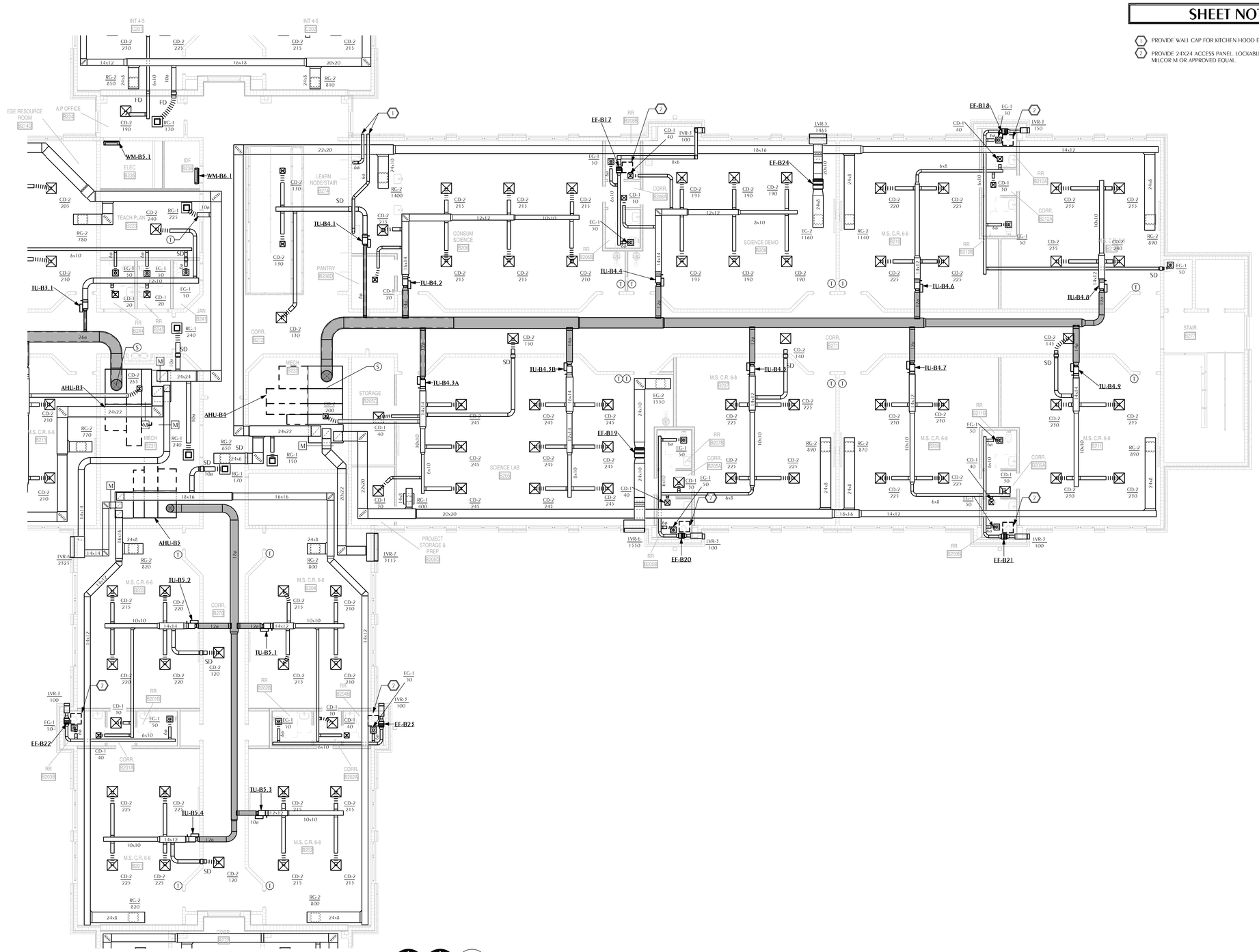
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LEVEL 2 HVAC PIPING PLAN-AREA B2

M-124.1



SHEET NOTES

1. PROVIDE WALL CAP FOR KITCHEN HOOD EXHAUST.
2. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.

N PROJECT NORTH N TRUE NORTH

1 LEVEL 2 HVAC PLAN - AREA B2
M-124 SCALE: 1/8" = 1'-0"

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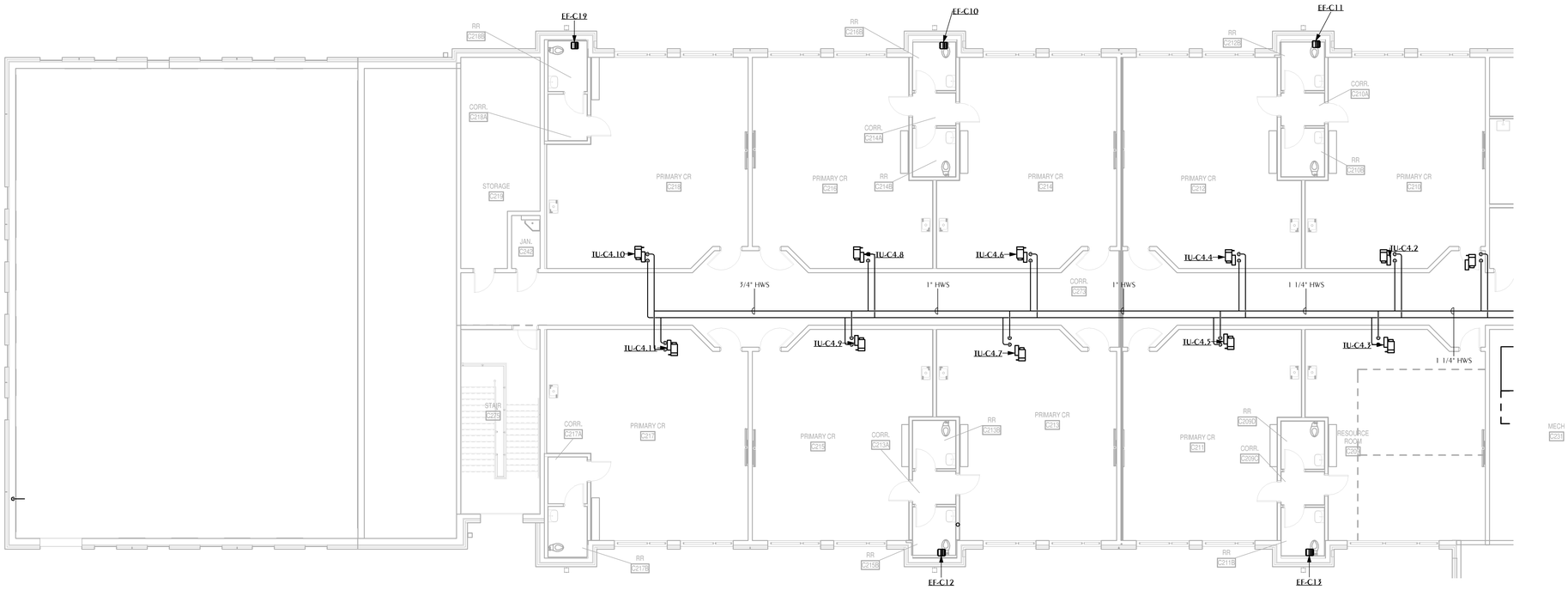
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LEVEL 2 HVAC PLAN-AREA B2

M-124



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1 LEVEL 2 HVAC PIPING PLAN - AREA C1
M-125.1 SCALE: 1/8" = 1'-0"

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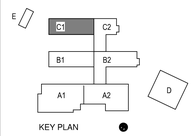
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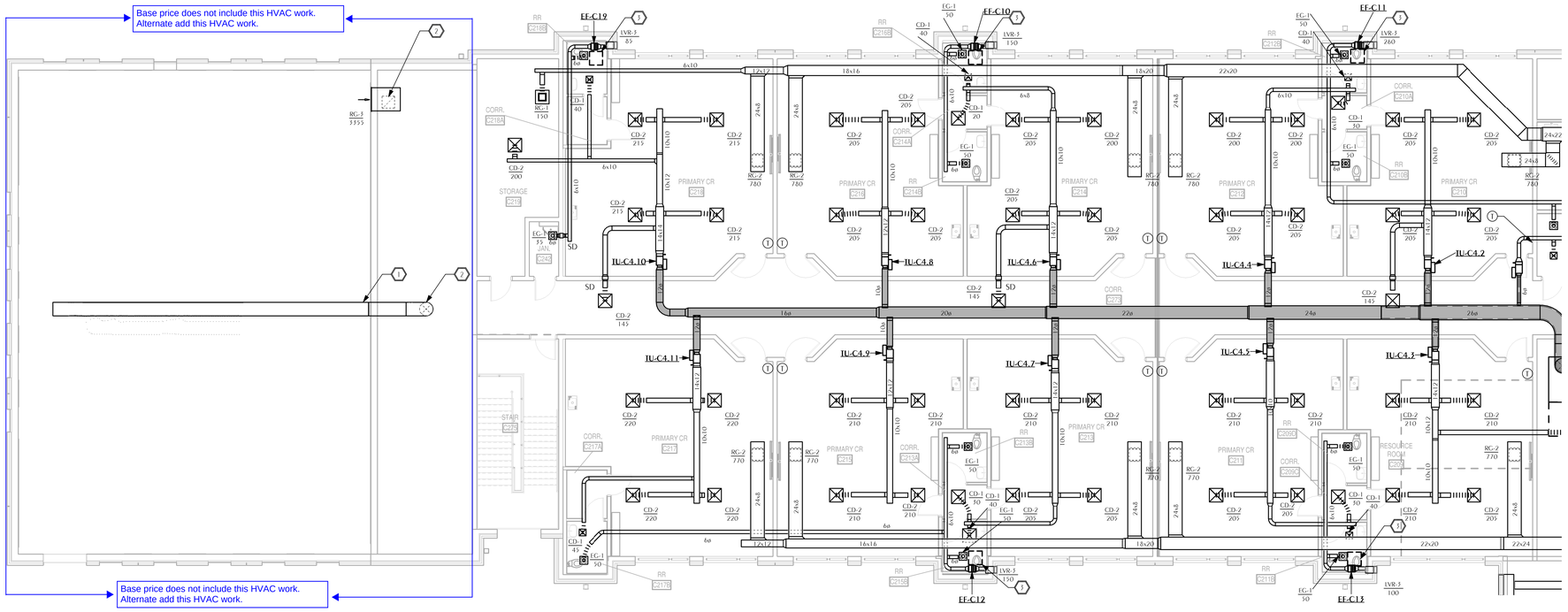
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LEVEL 2 HVAC PIPING PLAN-AREA C1

M-125.1

SHEET NOTES

1. FABRIC DUCT TO DISPERSE 3580 CFM OF AIR.
2. DUCTWORK UP FROM FIRST LEVEL. REFER TO M-115 FOR CONTINUATION.
3. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



1 LEVEL 2 HVAC PLAN - AREA C1

M-125 SCALE: 1/8" = 1'-0"

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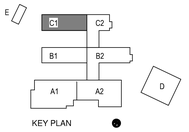
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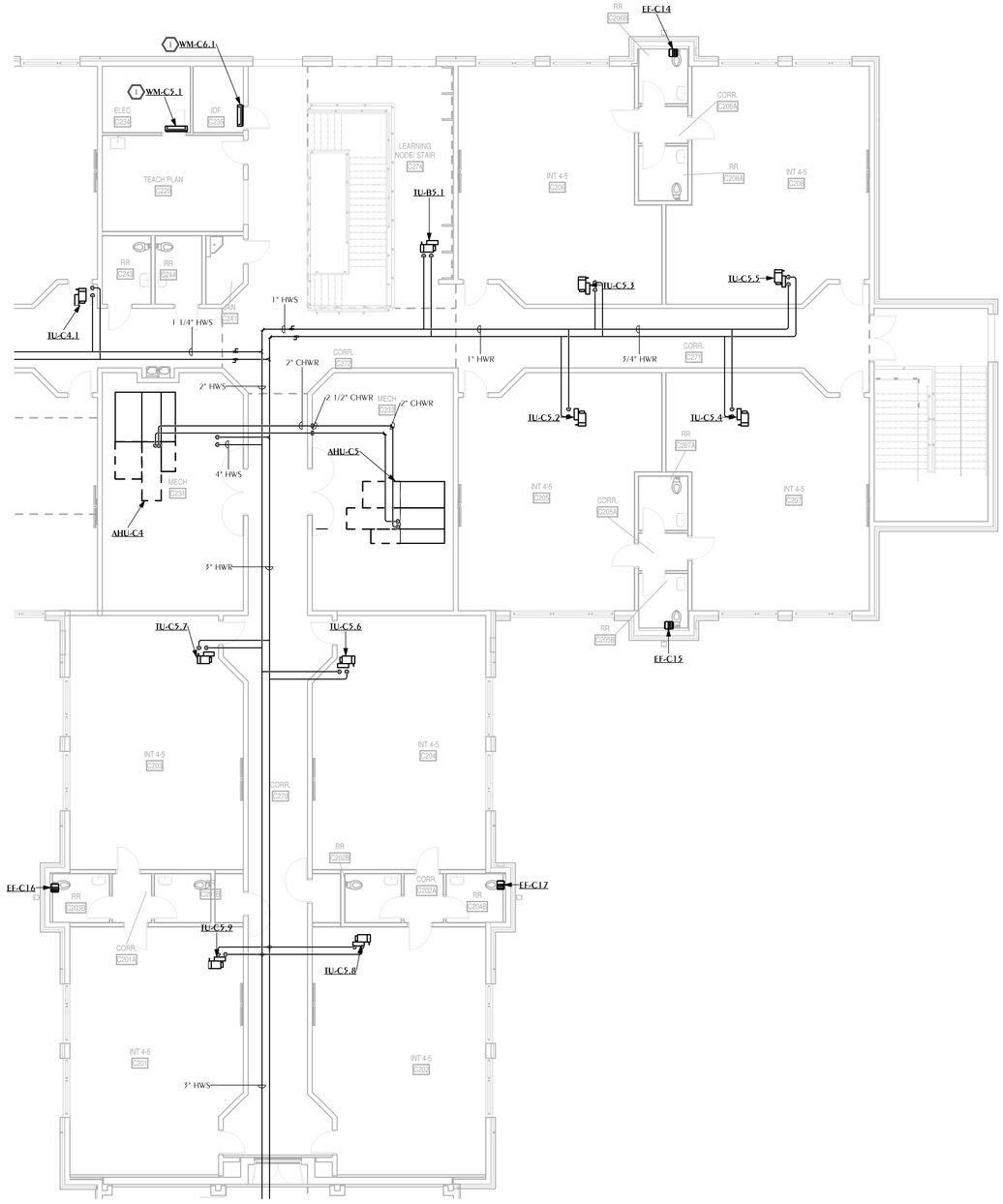
LEVEL 2 HVAC PLAN-AREA C1

M-125

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SHEET NOTES

1. ROUTE CONDENSATE TO UTILITY BOX.



N PROJECT NORTH / N TRUE NORTH

1 LEVEL 2 HVAC PIPING PLAN - AREA C2
M-126.1 SCALE: 1/8" = 1'-0"

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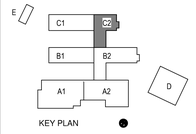
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GADSDEN COUNTY SCHOOL BOARD
New Quincy K-8 School

1400 W. KING STREET
QUINCY, FL 32351



REVISIONS

NO.	DESCRIPTION	DATE

RECEIVED
ALLSTATE CONSTRUCTION
09-18-2025

Project Number	22023
Dated	09-18-2025

WATFORD ENGINEERING
4452 Clinton Street Marianna, Florida 32448

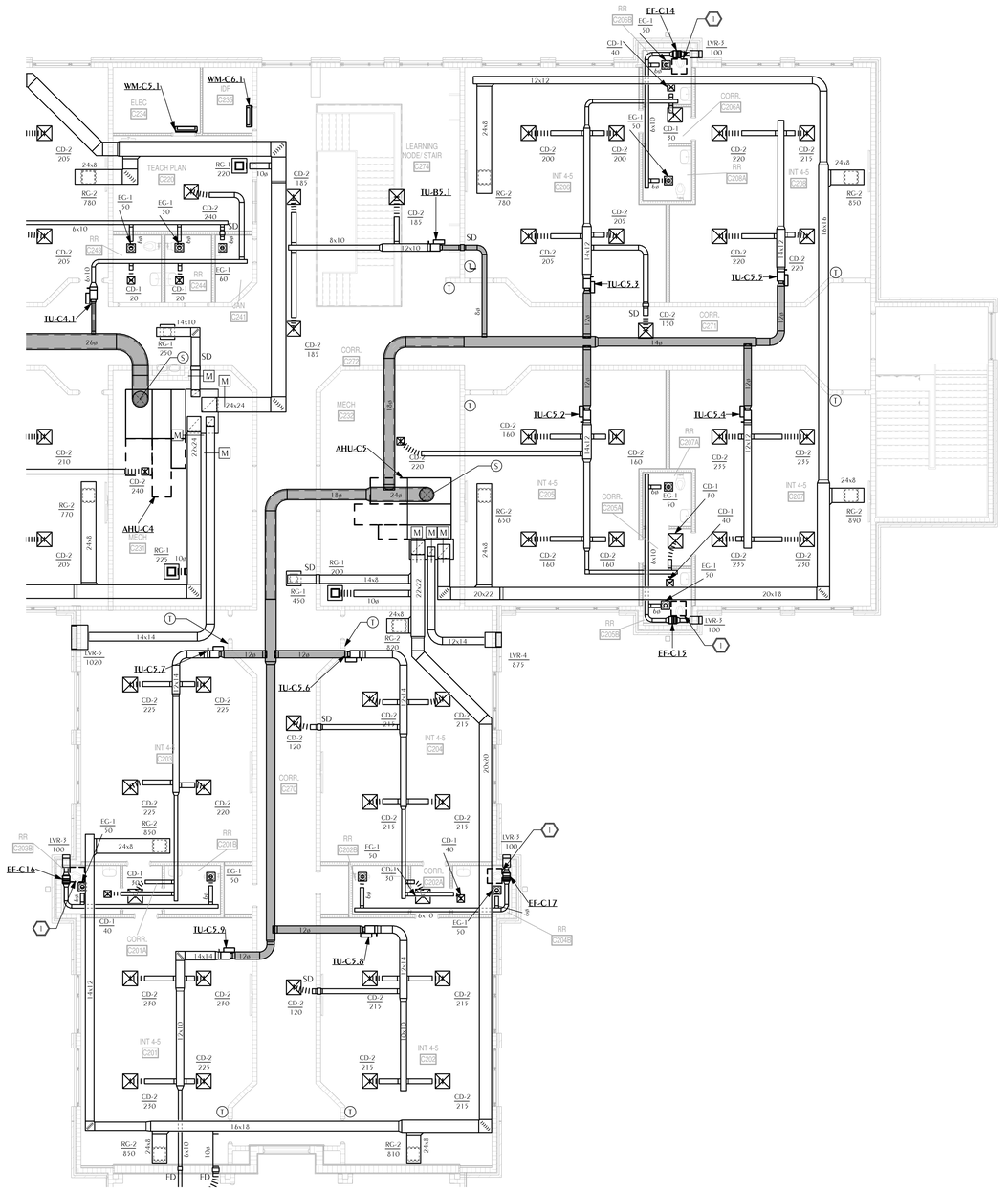
Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.526.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: BJB

LEVEL 2 HVAC PIPING PLAN-AREA C2

M-126.1

SHEET NOTES

1. PROVIDE 24X24 ACCESS PANEL. LOCKABLE WITH WHITE POWDER COAT. MILCOR M OR APPROVED EQUAL.



N N 1 LEVEL 2 HVAC PLAN - AREA C2
PROJECT NORTH TRUE NORTH M-126 SCALE: 1/8" = 1'-0"

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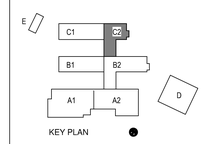
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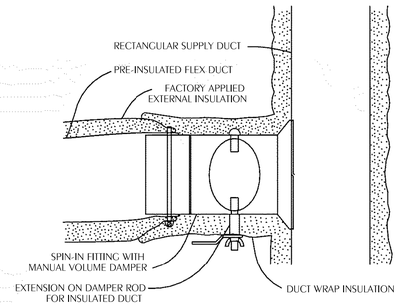
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Dated	09-18-2025

WATFORD ENGINEERING
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Drawn By: BJB

LEVEL 2 HVAC PLAN-AREA C2

M-126

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NOTES:

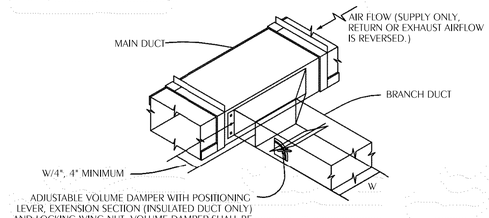
CONNECT FLEXIBLE DUCT TO FITTING WITH DRAWBAND AND SEALER.

ROUND HARD DUCT RUNOUTS SHOULD START WITH SPIN-IN FITTINGS SIMILART TO THIS DETAIL.

PROVIDE REMOTE CABLE ACTUATOR FOR AIR DEVICE IN HARD CEILINGS WITHOUT ACCESS. MOUNT ACTUATOR IN FACE OF AIR DEVICE.

FLEXIBLE INSULATION SHALL BE 2" THICK, ASTM C553, TYPE 1, CLASS B-3 WITH 1 PCF DENSITY AND UL RATED ALUMINUM FOIL VAPOR BARRIER (FSK)

1 TYPICAL FLEX DUCT TAKEOFF DETAIL
M-201 SCALE: NONE

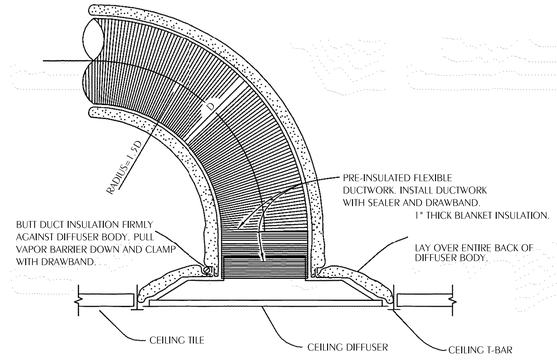


NOTES:

PROVIDE REMOTE CABLE ACTUATOR FOR AIR DEVICE IN HARD CEILINGS WITHOUT ACCESS. MOUNT ACTUATOR IN FACE OF AIR DEVICE.

FLEXIBLE INSULATION SHALL BE 2" THICK, ASTM C553, TYPE 1, CLASS B-3 WITH 1 PCF DENSITY AND UL RATED ALUMINUM FOIL VAPOR BARRIER (FSK)

2 TYPICAL BRANCH DUCT TAKEOFF
M-201 SCALE: NONE



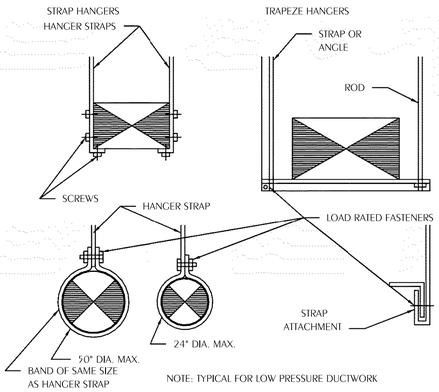
NOTES:

FLEX DUCT SHALL BE NO LONGER THAN 5'-0". FLEXIBLE DUCT SHALL HAVE REINFORCED, METALIZED POLYESTER JACKET WITH NO FIBERGLASS EROSION IN THE AIRSTREAM AND AN ENCAPUSLATED WIRE HELIX. FLEX DUCT SHALL HAVE OPERATING PRESSURE OF 6" W.G. AND NEGATIVE OPERATING PRESSURE OF 0.75" W.G. FLEX DUCT SHALL HAVE R-VALUE OF R-6 AND MEET REQUIREMENTS OF UL-181, 2020 FLORIDA ENERGY CODE, NFPA 90A AND NFPA 90B. AICO 36 OR APPROVED EQUAL.

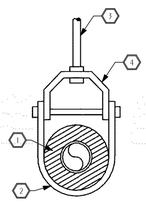
PROVIDE 24X24 LAY IN PANEL FOR DIFFUSERS IN LAY IN CEILINGS.

PROVIDE BEVELED MOUNTING FRAME FOR DIFFUSERS IN HARD CEILINGS.

3 TYPICAL CEILING DIFFUSER DETAIL
M-201 SCALE: NONE

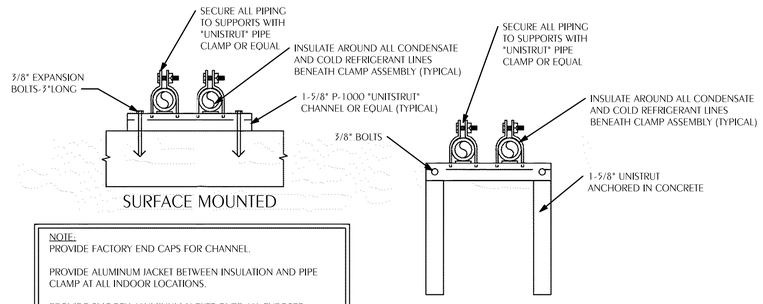


4 TYPICAL DUCT HANGER DETAILS
M-201 SCALE: NONE



1. INSULATION
2. PIPE COVERING PROTECTION SADDLE
3. HANGER ROD FASTEN TO STRUCTURE PER SPECIFICATIONS
4. CLEVIS TYPE HANGER

5 OVERHEAD PIPE SUPPORT DETAIL
M-201 SCALE: NONE



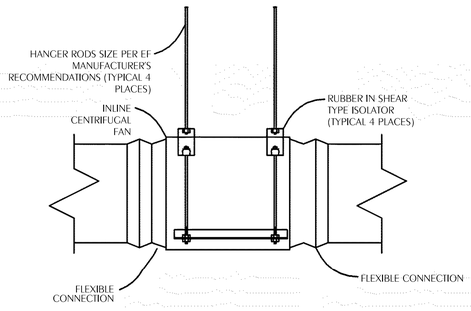
NOTE:
PROVIDE FACTORY END CAPS FOR CHANNEL.

PROVIDE ALUMINUM JACKET BETWEEN INSULATION AND PIPE CLAMP AT ALL INDOOR LOCATIONS.

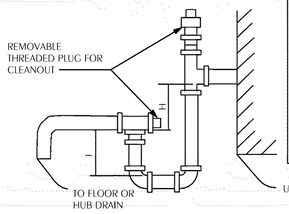
PROVIDE SMOOTH ALUMINUM JACKET OVER ALL EXPOSED OUTDOOR INSULATION.

PROVIDE SUPPORT AT INTERVALS REQUIRED BY THE FLORIDA BUILDING CODE.

6 TYPICAL EXTERIOR PIPING SUPPORT DETAIL
M-201 SCALE: NONE



7 INLINE FAN DETAIL
M-201 SCALE: NONE



NOTES:

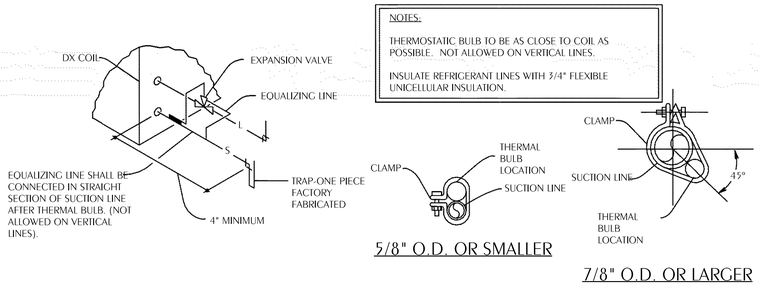
PIPE TYPE 'L' HARD DRAWN COPPER CONDENSATE LINE AT FULL SIZE OF UNIT CONNECTION, BUT IN NO CASE SMALLER THAN 3/4". CONDENSATE LINES SHALL BE INSULATED WITH 1/2" FLEXIBLE UNICELLULAR INSULATION.

LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.

H=AIR UNIT TOTAL STATIC PRESSURE +1"

J=H/2

8 NEGATIVE PRESSURE CONDENSATE DRAIN TRAP DETAIL
M-201 SCALE: NONE



NOTES:

THERMOSTATIC BULB TO BE AS CLOSE TO COIL AS POSSIBLE. NOT ALLOWED ON VERTICAL LINES.

INSULATE REFRIGERANT LINES WITH 3/4" FLEXIBLE UNICELLULAR INSULATION.

9 REFRIGERANT COIL CONNECTION DETAIL
M-201 SCALE: NONE

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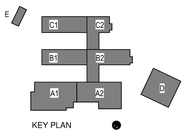
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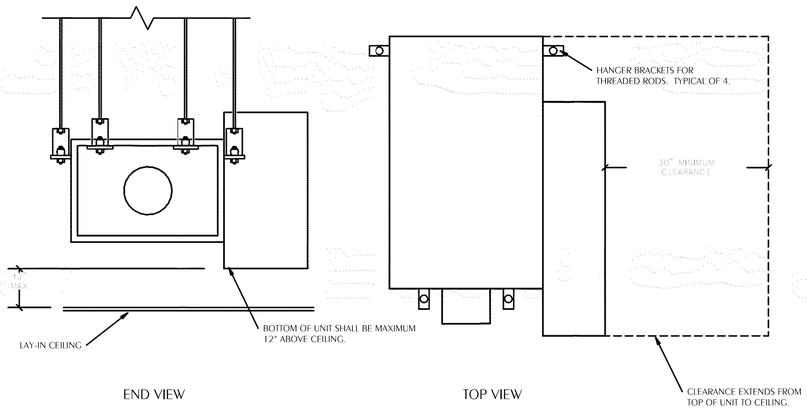
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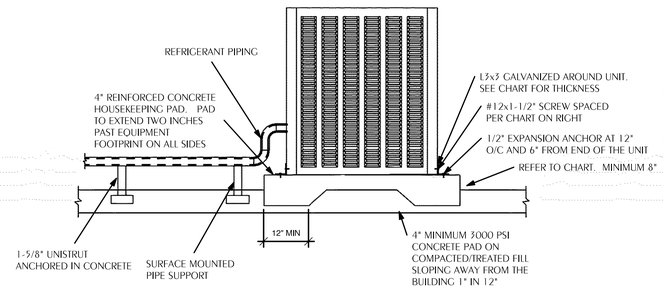
HVAC DETAILS
M-201

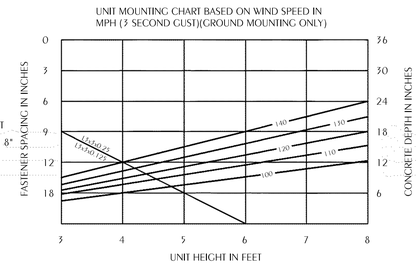


END VIEW TOP VIEW

1 TERMINAL UNIT MOUNTING DETAIL

M-202 SCALE: NONE





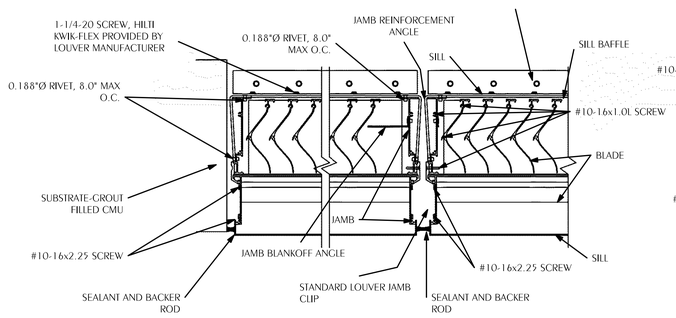
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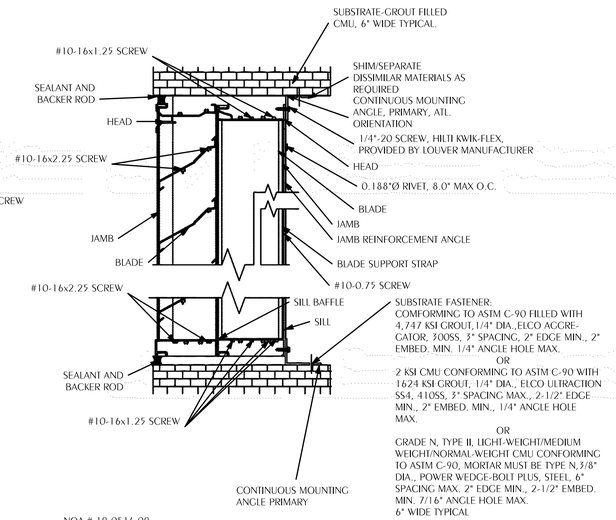
CODE:	ASCE 7-10
VELOCITY:	SEE BELOW
Kz:	0.70
Kzt:	1.00
Kd:	0.85
IMPORTANCE:	1.15
EXPOSURE:	B
Gf:	1.3
Gf:	0.85
qz:	
100 mph	17.52 psf
110 mph	21.20 psf
120 mph	25.22 psf
130 mph	29.60 psf
140 mph	34.33 psf
Pdesign:	
100 mph	19.36 psf
110 mph	23.42 psf
120 mph	27.87 psf
130 mph	32.71 psf
140 mph	37.94 psf

2 TYPICAL OUTDOOR MECHANICAL UNIT MOUNTING DETAIL

M-202 SCALE: NONE

SUBSTRATE FASTENER:
COMFORMING TO ASTM C-90 FILLED WITH 4,747 KSI GROUT, 1/4" DIA.,ELCO AGGRE-GATOR, 3OOSS, 3" SPACING, 2" EDGE MIN., 2" EMBED. MIN. 1/4" ANGLE HOLE MAX.
OR
2 KSI CMU CONFORMING TO ASTM C-90 WITH 1624 KSI GROUT, 1/4" DIA., ELCO ULTRACTION SS4, 410SS, 3" SPACING MAX., 2-1/2" EDGE MIN., 2" EMBED. MIN., 1/4" ANGLE HOLE MAX.
OR
GRADE N, TYPE II, LIGHT-WEIGHT/MEDIUM WEIGHT/NORMAL-WEIGHT CMU CONFORMING TO ASTM C-90, MORTAR MUST BE TYPE N, 3/8" DIA., POWER WEDGE-BOLT PLUS, STEEL, 6" SPACING MAX. 2" EDGE MIN., 2-1/2" EMBED. MIN. 7/16" ANGLE HOLE MAX.
6" WIDE TYPICAL





NOTES:

1. THE INSTALLATION SHOWN HEREIN MUST BE FOLLOWED STRICTLY TO ENSURE COMPLIANCE WITH FLORIDA BUILDING CODE PRODUCT APPROVAL.
2. CONTINUOUS INSTALLATION ANGLES AND FASTENERS ARE SHIPPED LOOSE AND REQUIRE INSTALLATION IN THE FIELD.
3. SHIMS MAY BE REQUIRED TO ACHIEVE CONSISTENT CLEARANCE BETWEEN LOUVER AND OPENING ON ALL SIDES.
4. INSTALLATION DETAIL IS BASED UPON GREENHECK MODEL "EHV-901D", IF AN ALTERNATE MANUFACTURER'S LOUVER IS USED, IT MUST BE INSTALLED WITH ITS FLORIDA PRODUCT APPROVAL.

NOA # 19-0516.09

3 WALL LOUVER DETAIL

M-202 SCALE: NONE

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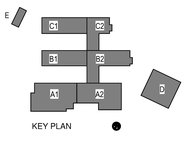
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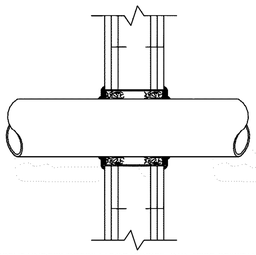
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HVAC DETAILS
M-202



CONSULT CURRENT UNDERWRITERS LABORATORIES, INC. "FIRE RESISTANCE DIRECTORY" FOR DETAILS.
UL SYSTEM WL1003

1. **WALL ASSEMBLY**—THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. **STUDS**—WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC WITH NOM 2 BY 4 IN. LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-1/2 IN. WIDE BY 1-3/8 IN. DEEP CHANNELS SPACED MAX 24 IN. OC.
   B. **WALLBOARD, GYPSUM***—NOM 5/8 IN. THICK, 4 FT. WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 15 IN.

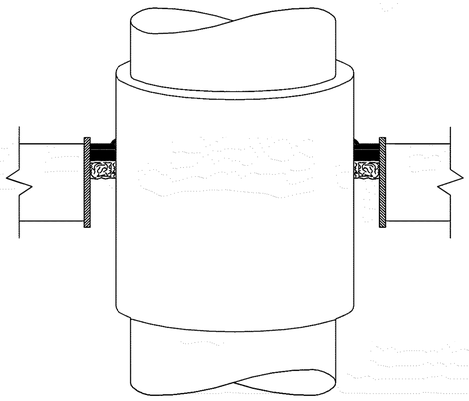
   THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. **THROUGH-PENETRANT**—ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE SPACE BETWEEN PIPES, CONDUITS OR TUBING AND THE STEEL SLEEVE (ITEM 3A) SHALL BE MIN OF 0 IN. (POINT CONTACT) TO MAX 2-3/8 IN. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. **STEEL PIPE**—NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. **IRON PIPE**—NOM 12 IN. DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.
   C. **CONDUIT**—NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.
   D. **COPPER TUBING**—NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   E. **COPPER PIPE**—NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. **FIRESTOP SYSTEM—**INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS.
   A. **STEEL SLEEVE**—CYLINDRICAL SLEEVE FABRICATED FROM MIN 0.019 IN. THICK (NO. 28 GAUGE) GALV SHEET STEEL AND HAVING A MIN 2 IN. LAP ALONG THE LONGITUDINAL SEAM. LENGTH OF STEEL SLEEVE TO BE EQUAL TO THICKNESS OF WALL PLUS 1 TO 4 IN. SUCH THAT, WHEN INSTALLED, THE ENDS OF THE SLEEVE WILL PROJECT APPROXIMATELY 1/2 TO 2 IN. BEYOND THE SURFACE OF THE WALL ON BOTH SIDES OF THE WALL ASSEMBLY. SLEEVE INSTALLED BY COILING THE SHEET STEEL TO A DIAM SMALLER THAN THE THROUGH OPENING, INSERTING THE COIL THROUGH THE OPENINGS AND RELEASING THE COIL TO LET IT UNCOIL AGAINST THE CIRCULAR CUTOUTS IN THE GYPSUM WALLBOARD LAYERS.
   B. **PACKING MATERIAL**—MIN 1 IN. THICKNESS OF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO STEEL SLEEVE ON BOTH SIDES OF THE WALL ASSEMBLY AS PERMANENT FORMS. PACKING MATERIAL TO BE RECESSED MIN 1/2 IN. FROM END OF STEEL SLEEVE (FLUSH WITH OR RECESSED INTO GYPSUM WALLBOARD SURFACE) ON BOTH SIDES OF WALL ASSEMBLY.
   B1. **PACKING MATERIAL**—(NOT SHOWN)—AS AN ALTERNATE TO ITEM B, NOM 1 IN. THICK POLYETHYLENE BACKER ROD MAY BE USED. THE BACKER ROD IS TO BE RECESSED WITHIN THE STEEL SLEEVE A MIN OF 1 IN. FROM EACH SURFACE OF WALL.
   C. **FILL, VOID OR CAVITY MATERIALS*—CAULK**—WHEN MINERAL WOOL BATT INSULATION IS USED, APPLIED TO FILL THE STEEL SLEEVE TO A MIN DEPTH OF 1/2 IN. ON BOTH SIDES OF WALL ASSEMBLY. WHEN BACKER ROD IS USED, A MIN THICKNESS OF 1 IN. OF CP-25WB+ CAULK IS REQUIRED FLUSH WITH SURFACE OF WALL. A NOM 1/4 IN. DIAM CONTINUOUS BEAD OF CAULK SHALL BE APPLIED AROUND THE CIRCUMFERENCE OF THE STEEL SLEEVE AT ITS EGRESS FROM THE GYPSUM WALLBOARD LAYERS ON BOTH SIDES OF THE WALL ASSEMBLY.
   MINNESOTA MINING & MFG. CO.—CP 25WB+

*BEARING THE UL CLASSIFICATION MARKING

1 TYPICAL FIRE RATED WALL PENETRATION
M-301 SCALE: NONE



CONSULT CURRENT UNDERWRITERS LABORATORIES, INC. "FIRE RESISTANCE DIRECTORY" FOR DETAILS.
UL SYSTEM CAJ5060

1. **FLOOR OR WALL ASSEMBLY**—MIN 2-1/2 IN. THICK LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED **CONCRETE BLOCKS***. F RATINGS AND T RATINGS ARE DEPENDENT ON THE MIN THICKNESS OF FLOOR OR WALL, AS WELL AS THE MAX SIZE OF THE PIPE AND THE NOM THICKNESS OF THE CELLULAR GLASS INSULATION, AS NOTED IN ITEM 3. MAX DIAM OF THROUGH OPENING IS 28-1/2 IN.
   SEE **CONCRETE BLOCKS** (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAME OF MANUFACTURERS.

   1A. **STEEL SLEEVE**—MAX 15 IN. ID (OR SMALLER), MIN 0.25 IN. WALL THICKNESS (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. SLEEVE MAY EXTEND A MAX OF 2 IN. ABOVE TOP OF FLOOR OR BEYOND EITHER SURFACE OF WALL. T RATING IS 0 HR WHEN SLEEVE IS USED.

2. **THROUGH PENETRANTS**—ONE METALLIC PIPE OR TUBING TO BE POSITIONED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
   A. **STEEL PIPE**—NOM 20 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. **COPPER TUBING**—NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   C. **COPPER PIPE**—NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. **PIPE COVERING MATERIALS*—CELLULAR GLASS INSULATION—**NOM 1-1/2 TO 3 IN. THICK CELLULAR GLASS UNITS SIZED TO THE OUTSIDE DIAM OF THE STEEL PIPE AND SUPPLIED IN NOM 24 IN. LONG HALF SECTIONS OR NOM 18 IN. LONG SEGMENTS. PIPE INSULATION INSTALLED ON PIPE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. F RATINGS AND T RATINGS ARE DEPENDENT ON THE ITEMS NOTED IN THE FOLLOWING TABLE:

MIN FLOOR OR WALL THKNS IN.	MAX PIPE DIAM IN.	NOM CLASS INSUL THKNS IN.	F RATING HR	T RATING HR
2-1/2	6	1-1/2 AND 3	2	3/4
4-1/2	6	1-1/2	3	1
4-1/2	6	3	3	1-1/2
4-1/2	20	1-1/2	2	1/2
4-1/2	20	3	2	1

PITTSBURGH CORNING CORP.—FOAMGLAS

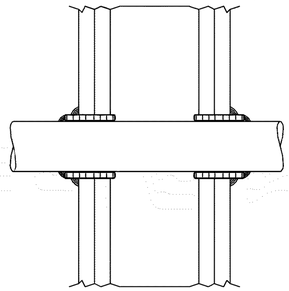
4. **PACKING MATERIAL**—MIN 1 IN. THICKNESS OF TIGHTLY-PACKED MINERAL WOOL BATT INSULATION MATERIAL USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED MIN 1 IN. FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL TO ACCOMMODATE THE CAULK FILL MATERIAL (ITEM 5).

5. **FILL, VOID OR CAVITY MATERIALS*—CAULK**—INSTALLED TO FILL ANNULAR SPACE TO A MIN DEPTH OF 1 IN., FLUSH WITH TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL. A MIN 1/2 IN. DIAM BEAD OF CAULK SHALL BE APPLIED TO THE PIPE INSULATION/CONCRETE INTERFACE AT THE POINT CONTACT LOCATION ON THE TOP SURFACE OF THE FLOOR AND ON BOTH SIDES OF WALLS.
   MINNESOTA MINING & MFG. CO.—CP 25WB+

6. **METAL JACKET**—MIN 12 IN. LONG JACKET FORMED OF MIN 0.010 IN. THICK STEEL OR ALUMINUM SHEET CUT TO WRAP TIGHTLY AROUND THE PIPE INSULATION WITH A MIN 2 IN. LAP AND SECURED USING BANDS AND SEALS OF SIMILAR MATERIAL. BANDS TO BE LOCATED WITHIN 2 IN. OF EACH END OF THE JACKET AND SPACED MAX 10 IN. OC. JACKET TO BE INSTALLED WITH EDGE ABUTTING SURFACE OF CAULK FILL MATERIAL (ITEM 5) ON TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL. METAL JACKET TO BE USED IN ADDITION TO ANY OTHER JACKETING MATERIAL WHICH MAY BE REQUIRED OR DESIRED ON THE PIPE INSULATION.

*BEARING THE UL CLASSIFICATION MARKING

3 TYPICAL FIRE RATED WALL/FLOOR PENETRATION
M-301 SCALE: NONE



CONSULT CURRENT UNDERWRITERS LABORATORIES, INC. "FIRE RESISTANCE DIRECTORY" FOR DETAILS.
UL SYSTEM WL2003

1. **WALL ASSEMBLY**—THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. **STUDS—**WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC WITH NOM 2 BY 4 IN. LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. WIDE BY 1-3/8 IN. DEEP CHANNELS SPACED MAX 24 IN. OC.
   B. **WALLBOARD, CYPSUM***—5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE CYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 3-1/8 IN.

2. **THROUGH PENETRANTS—**ONE NONMETALLIC PIPE OR CONDUIT TO BE CENTERED INTHE THROUGH OPENING. THE ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 1/4 IN. AND MAX 3/8 IN. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR-CEILING ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES OR CONDUITS MAY BE USED:
   A. **POLYVINYL CHLORIDE (PVC) PIPE**—NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 SOLID CORE PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEM.
   B. **RICID NONMETALLIC CONDUIT++**—NOM 4 IN. DIAM (OR SMALLER)(SCHEDULE 40 OR 80) PVC CONDUIT INSTALLED IN ACCORDANCE WITH ARTICLE 347 OF THE NATIONAL ELECTRIC CODE (NFPA NO. 70).
   C. **CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE**—NOM 2 IN. DIAM (OR SMALLER) SDR17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEMS.
   D. **CELLULAR CORE POLYVINYL CHLORIDE (CCPVC) PIPE**—NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 CELLULAR CORE PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEM.
   E. **ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE**—NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 SOLID CORE ABS PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEMS.
   F. **CELLULAR CORE ACRYLONITRILE BUTADIENE STYRENE (CCABS) PIPE**—NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 CELLULAR CORE ABS PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEMS.

3. **FIRESTOP SYSTEM—**INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE HOURLY F AND T RATINGS FOR THE FIRESTOP SYSTEM ARE EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED. THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS.
   A. **FILL, VOID OR CAVITY MATERIALS*—WRAP STRIP**—NOM 1/4 IN. THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. WIDE STRIPS. NOM 2 IN. WIDE STRIP TIGHTLY WRAPPED AROUND NONMETALLIC PIPE (FOIL SIDE OUT) WITH SEAM BUTTED. WRAP STRIP LAYER SECURELY BOUND WITH STEEL WIRE OR ALUMINUM FOIL TAPE AND SLID INTO ANNULAR SPACE APPROX 1-1/4 IN. SUCH THAT APPROX 3/4 IN. OF THE WRAP STRIP PROTRUDES FROM THE WALL SURFACE.
   MINNESOTA MINING & MFG, CO.—FS-195+
   B. **FILL, VOID OR CAVITY MATERIALS*—CAULK OR PUTTY**—MIN 5/8 IN. THICKNESS OF CAULK OR PUTTY APPLIED INTO ANNULAR SPACE BETWEEN WRAP STRIP AND PERIPHERY OF OPENING. A NOM 1/4 IN. DIAM BEAD OF CAULK OR PUTTY TO BE APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED EDGE OF THE WRAP STRIP LAYERS APPROX 3/4 IN. FROM THE WALL SURFACE. MINNESOTA MINING & MFG CO.—CP 25WB+ CAULK OR MPS-2 + PUTTY. (NOTE: L RATINGS APPLY ONLY WHEN TYPE CP-25 WB+ CAULK IS USED.)
   C. **FOIL TAPE**—(NOT SHOWN)—NOM 4 IN. WIDE, 3 MIL THICK ALUMINUM TAPE WRAPPED AROUND PIPE PRIOR TO THE INSTALLATION OF THE WRAP STRIP (ITEM 3A). MIN OF ONE WRAP, FLUSH WITH BOTH SIDES OF WALL AND PROCEEDING OUTWARD. TAPE IS NOT REQUIRED FOR PIPES SHOWN IN ITEMS 2A, 2B AND 2C.

*BEARING THE UL CLASSIFICATION MARKING

2 TYPICAL FIRE RATED WALL PENETRATION
M-301 SCALE: NONE

1. **FLOOR OR WALL ASSEMBLY**—MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150) PCF CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED **CONCRETE BLOCKS***. MAX DIAM OF OPENING IS 18 IN. SEE **CONCRETE BLOCKS** (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

   1A. **STEEL SLEEVE**—NOM 10 IN. (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. SLEEVE MAY EXTEND A MAX OF 2 IN. ABOVE TOP OF FLOOR OR BEYOND EITHER SURFACE OF WALL. **T RATING IS 0 HR WHEN SLEEVE IS USED.**

2. **THROUGH PENETRANT**—NOM 4 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE, NOM 12 IN. DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. DIAM (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE OR NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE CENTERED IN THE OPENING AND RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY.

3. **PIPE COVERING***—NOM 1/2 TO 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN. 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT. SEE PIPE AND EQUIPMENT COVERING—MATERIALS*(BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

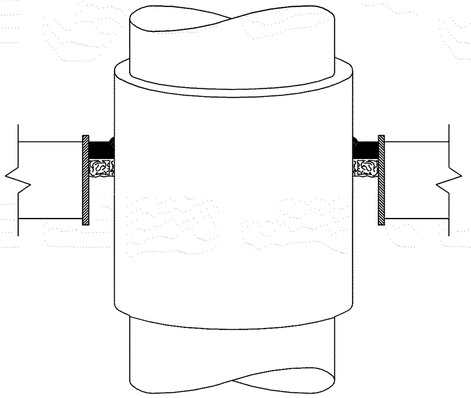
4. **FIRESTOP SYSTEM—**THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

   A. **PACKING MATERIAL**—MIN 1 IN. THICKNESS OF FIRMLY PACKED MINERAL WOOL BATT INSULATION USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR SLEEVE OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM B).
   B. **FILL, VOID OR CAVITY MATERIAL***—CAULK—APPLIED TO FILL THE ANNULAR SPACE FLUSH WITH THE TOP SURFACE OF THE FLOOR OR SLEEVE OR FLUSH WITH BOTH SURFACES OF WALL. WHEN NOM PIPE COVERING THICKNESS IS 2 IN., MIN THICKNESS OF CAULK FILL MATERIAL IS 2 IN. WHEN NOM PIPE COVERING THICKNESS IS 1-1/2 IN. OR LESS, MIN THICKNESS OF CAULK FILL MATERIAL IS 1 IN. THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE DEPENDENT UPON THE THICKNESS OF THE FLOOR OR WALL, THE SIZE OF PIPE, THE THICKNESS OF PIPE COVERING MATERIAL AND THE SIZE OF THE ANNULAR SPACE (BETWEEN THE PIPE COVERING MATERIAL AND THE EDGE OF THE CIRCULAR THROUGH OPENING), AS SHOWN IN THE FOLLOWING TABLE:

MIN FLOOR OR WALL THKNS IN.	MAX PIPE DIAM IN.	NOM PIPE COVERING THKNS IN.	ANNULAR SPACE IN.	F RATING HR	T RATING HR
2-1/2	4	1 OR 1-1/2	1/2 TO 2-3/8	2	1
4-1/2	4	2	1/4 TO 2-3/8	2	1-1/2
2-1/2	12	1	1/2 TO 1-1/2	2	1/2
4-1/2	12	1	1/2 TO 2-3/8	3	1
2-1/2	12	1/2	1/2 TO 2-3/8	2	0

MINNESOTA MINING & MFG. CO.—CP 25WB+.

*BEARING THE UL CLASSIFICATION MARKING



CONSULT CURRENT UNDERWRITERS LABORATORIES, INC. "FIRE RESISTANCE DIRECTORY" FOR DETAILS.
UL SYSTEM CAJ5001

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.

4 TYPICAL FIRE RATED WALL/FLOOR PENETRATION
M-301 SCALE: NONE

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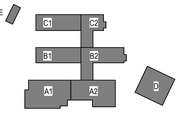
Digital Signature

PERMIT DOCUMENTS

GADSDEN COUNTY SCHOOL BOARD
New Quincy K-8 School

GADSDEN COUNTY SCHOOL DISTRICT — FL —

1400 W. KING STREET
QUINCY, FL 32351



REVISIONS

NO.	DESCRIPTION	DATE

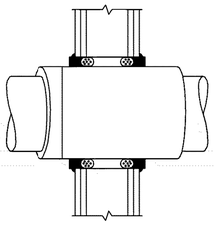
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ALLSTATE CONSTRUCTION
09-18-2025

Project Number	22023
Dated	09-18-2025

HVAC FIRE PENETRATION DETAILS

M-301

WATFORD ENGINEERING
4452 Clinton Street Marianna, Florida 32446
Florida CA Number: 27825
Keith A. Johnson, PE
Florida License Number: 86457
850.326.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: MB



CONSULT CURRENT UNDERWRITERS LABORATORIES, INC. "FIRE RESISTANCE DIRECTORY" FOR DETAILS.
UL SYSTEM WL5011

1. **WALL ASSEMBLY**—THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALLASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. **STUDS**—WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC WITH NOM 2 BY 4 IN. LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. WIDE BY 1-3/8 DEEP CHANNELS SPACED MAX 24 IN. OC.
   B. **WALLBOARD, GYPSUM***—NOM 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 14-1/2 IN. FOR WOOD STUD WALLS AND 17 IN. FOR STEEL STUD WALLS.

   THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS 1 HR WHEN INSTALLED IN A 1 HR FIRE RATED WALL AND 2 HR WHEN INSTALLED IN A 2 HR FIRE RATED WALL.

2. **THROUGH PENETRANTS**—ONE METALLIC PIPE, CONDUIT OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. **STEEL PIPE**—NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE. WHEN STEEL PIPE IS USED, T RATING IS 1 HR.
   B. **CONDUIT**—NOM 5 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT. WHEN STEEL CONDUIT IS USED, T RATING IS 1/4 HR.
   C. **COPPER TUBING**—NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING. WHEN COPPER TUBING IS USED, T RATING IS 1/2 AND 1 HR WHEN INSTALLED IN 1 AND 2 HR RATED WALLS, RESPECTIVELY.
   D. **COPPER PIPE**—NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE. WHEN COPPER PIPE IS USED, T RATING IS 1/2 AND 1 HR WHEN INSTALLED IN 1 AND 2 HR RATED WALLS, RESPECTIVELY.

3. **PIPE COVERING***—NOM 1 OR 1-1/2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORYAPPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SEALED WITH METAL FASTENER STRIP TAPE SUPPLIED WITH THE PRODUCT.
   SEE **PIPE AND EQUIPMENT COVERINGS—MATERIALS**—(BRCGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. **STEEL SLEEVE**—CYLINDRICAL SLEEVE FABRICATED FROM MIN 0.019 IN. THICK (NO. 28 GAUGE) GALV SHEET STEEL AND HAVING A MIN 2 IN. LAP ALONG THE LONGITUDINAL SEAM. LENGTH OF STEEL SLEEVE TO BE EQUAL TO THICKNESS OF WALL PLUS 1 IN. SUCH THAT, WHEN INSTALLED, THE ENDS OF THE SLEEVE WILL PROJECT APPROX 1/2 IN. BEYOND THE SURFACE OF THE WALL ON BOTH SIDES OF THE WALL ASSEMBLY. THE DIAM OF THE OPENINGS CUT IN THE GYPSUM WALLBOARD LAYERS ON EACH SIDE OF THE WALL ASSEMBLY (CONCENTRIC WITH PIPE) TO BE 2 TO 2-1/2 IN. LARGER THAN OUTSIDE DIAM OF PIPE INSULATION SUCH THAT, WHEN THE STEEL SLEEVE IS INSTALLED, A 1 TO 1-1/4 IN. ANNULAR SPACE WILL BE PRESENT BETWEEN THE STEEL SLEEVE AND THE PIPE INSULATION AROUND THE ENTIRE CIRCUMFERENCE OF THE PIPE. SLEEVE INSTALLED BY COILING THE SHEET STEEL TO A DIAM SMALLER THAN THE THROUGH OPENING, INSERTING THE COIL THROUGH THE OPENINGS AND RELEASING THE COIL TO LET IT UNCOIL AGAINST THE CIRCULAR CUTOUTS IN THE GYPSUM WALLBOARD LAYERS.

5. **PACKING MATERIAL**—POLYETHYLENE BACKER ROD OR MIN 1 IN. THICKNESS OF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO STEEL SLEEVE ON BOTH SIDES OF THE WALL ASSEMBLY AS PERMANENT FORMS. PACKING MATERIAL TO BE RECESSED MIN 1 IN. FROM END OF STEEL SLEEVE (RECESSED MIN 1/2 IN. INTO GYPSUM WALLBOARD SURFACE) ON BOTH SIDES OF WALL ASSEMBLY.

6. **FILL, VOID OR CAVITY MATERIALS*—CAULK**—MIN 1 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS ON BOTH SIDES OF WALL ASSEMBLY. THICKNESS FOR FILL MATERIAL FOR NOM 3 IN. DIAM (OR SMALLER) STEEL PIPES OR CONDUITS MAY BE REDUCED TO A MIN 1/2 IN. A NOM 1/4 IN. DIAM CONTINUOUS BEAD OF CAULK SHALL BE APPLIED AROUND THE CIRCUMFERENCE OF THE STEEL SLEEVE AT ITS EGRESS FROM THE GYPSUM WALLBOARD LAYERS ON BOTH SIDES OF THE WALL ASSEMBLY.

MINNESOTA MINING & MFG. CO.—CP 25WB+
*BEARING THE UL CLASSIFICATION MARKING

1 TYPICAL FIRE RATED WALL PENETRATION
M-302 SCALE: NONE

VERTICAL INSTALLATION

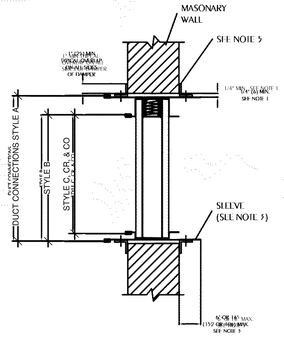


FIGURE 1

STAINLESS STEEL DAMPERS

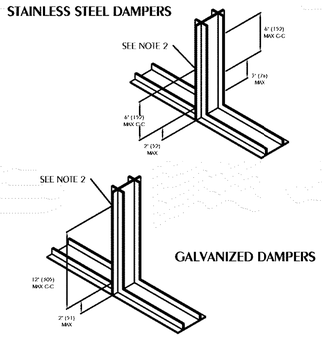


FIGURE 2
1 1/2 HOUR

HORIZONTAL INSTALLATION

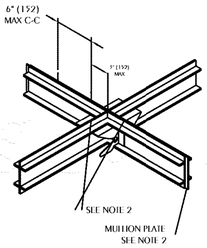


FIGURE 4
1 1/2 HOUR

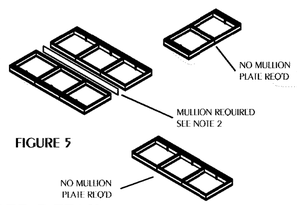


FIGURE 5

FIGURE 3

2 TYPICAL HORIZONTAL AND VERTICAL FIRE DAMPER DETAIL
M-302 SCALE: NONE

1. **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 much as 2" (51) larger than the damper/sleeve assembly if a 16ga (1.6) mounting angles is utilized.
2. **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 14 gage thick x 41/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/2" (13) long welds staggered intermittently 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.
3. **Damper Sleeve**
   Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 16 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (1.9) 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.
4. **Damper Orientation**
   Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic DIBD and DIBUX models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation.
5. **Mounting Angles**
   Mounting angles shall be a minimum of 11/2" x 11/2" 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 1249 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 on 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. Ruskin fire dampers may be installed using Ruskin FAST angle for one angle installation or Ruskin PFMA for two angle installations.
   a. **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
   b. **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 11/2" (38). For two angle installations the fasteners shall be spaced at 8" (203) o.c.
6. **Duct/Sleeve Connections**
   a. **Break-away Duct/Sleeve Connections**
      Rectangular ducts must use one or more of the connections: plain "S" slip, hemmed "S" slip, double "S" slip, inside slip joint, standing S, standing S (angle reinforced), standing, standing S (bar reinforced), standing S (angle reinforced), or drive slip joint.
      A maximum of two #10 sheet metal screws on each side and the bottom, located in the center of the slip pockets and penetrating both sides of the slip pocket may be used. Connections using these slip joints on the top and bottom with flat drive slips up to 20" (508) long on the sides may also be used.
   b. **Round and Oval Break-away Connections**
      Round and flat oval break-away connections must use either a 4" (102) wide drawband 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 191" (4851) total perimeter – 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:
      Hardcast, Inc. – Iron Grip 601 Precision –PA2084T
      Eco Duct Seal 44-52 Design Polymerics – DP 1010
   c. **Flanged Break-away Style Duct Sleeve Connections.**
      Flanged connection systems manufactured by Ductmate, Nexus or Ward are approved break-away connections when installed as shown on the Flanged System Breakaway Connections Supplement. TDC and TDF roll-formed flanged connections using 3/8" (10) steel bolts and nuts, and metal cleats, as tested by SMACNA, are approved break-away connections when installed as shown on the Flanged System Breakaway Connections Supplement.
   d. **Non-Break-away Duct/Sleeve Connections**
      If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.
7. **Installation and Maintenance**
   To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

NOTE: ALL SYSTEMS DETAILED ON MECHANICAL PENETRATIONS SHEETS ARE BASED ON THE MANUFACTURERS SPECIFIED AS BASIS OF DESIGN AND APPLY TO MECHANICAL 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.

WATFORD ENGINEERING
4452 Clinton Street Marianna, Florida 32446
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Project Number: 2022-041
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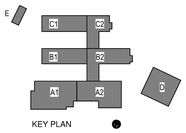
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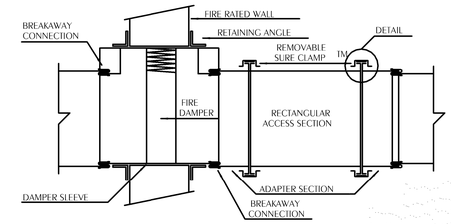
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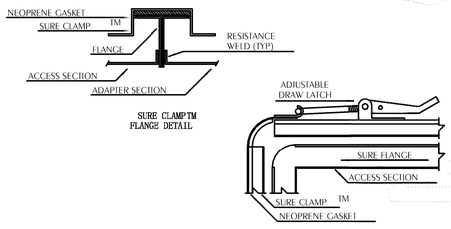
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Project Number	22023
Dated	09-18-2025

HVAC FIRE PENETRATION DETAILS

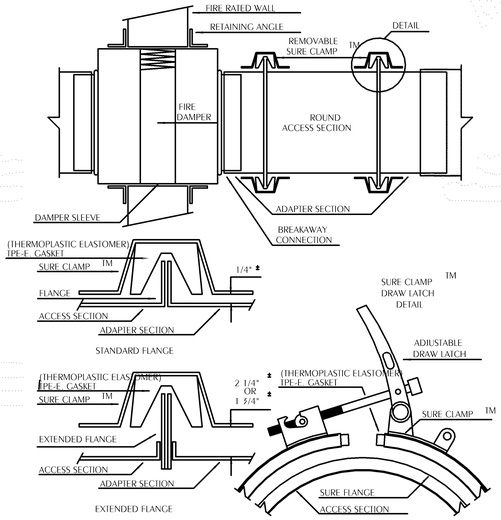
M-302





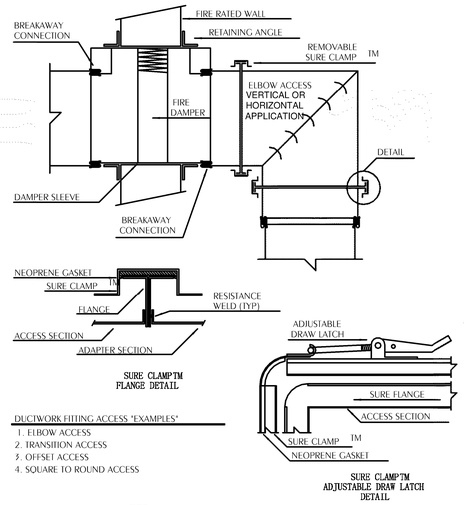
SURE • CLAMP ACCESS TM

RECTANGULAR REMOVABLE DUCTWORK SECTION
FIRE DAMPER ACCESS *NOT TO SCALE*



SURE • CLAMP ACCESS TM

ROUND REMOVABLE DUCTWORK SECTION
FIRE DAMPER ACCESS *NOT TO SCALE*

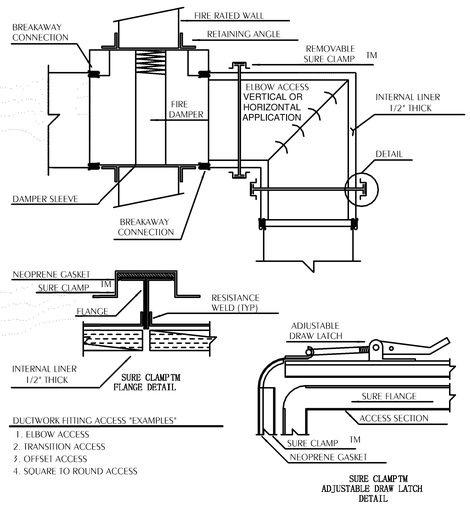


DUCTWORK FITTING ACCESS *"EXAMPLES"*

1. ELBOW ACCESS
2. TRANSITION ACCESS
3. OFFSET ACCESS
4. SQUARE TO ROUND ACCESS

SURE • CLAMP ACCESS TM

RECTANGULAR REMOVABLE DUCTWORK FITTING SECTION
FIRE DAMPER ACCESS *"NOT TO SCALE"*

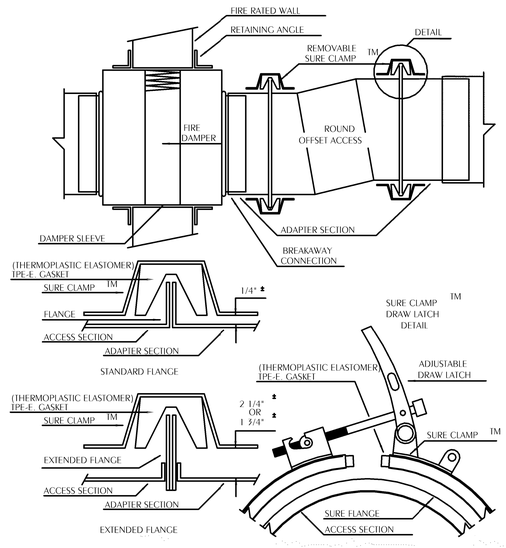


DUCTWORK FITTING ACCESS *"EXAMPLES"*

1. ELBOW ACCESS
2. TRANSITION ACCESS
3. OFFSET ACCESS
4. SQUARE TO ROUND ACCESS

SURE • CLAMP ACCESS TM

RECTANGULAR REMOVABLE DUCTWORK FITTING SECTION
FIRE DAMPER ACCESS INTERNAL LINER *"NOT TO SCALE"*



DUCTWORK FITTING ACCESS *"EXAMPLES"*

1. ELBOW ACCESS
2. TRANSITION ACCESS
3. OFFSET ACCESS
4. SQUARE TO ROUND ACCESS

SURE • CLAMP ACCESS TM

ROUND REMOVABLE DUCTWORK FITTING SECTION
FIRE DAMPER ACCESS *"NOT TO SCALE"*

PROVIDE REMOVABLE DUCTWORK SECTION PER DETAIL FOR ALL FIRE DAMPERS WHERE A MINIMUM 12"X12" DUCT ACCESS PANEL CAN NOT BE PROVIDED.

1 REMOVABLE DUCTWORK DETAILS

M-303 SCALE: NONE

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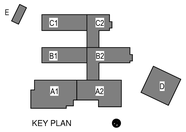
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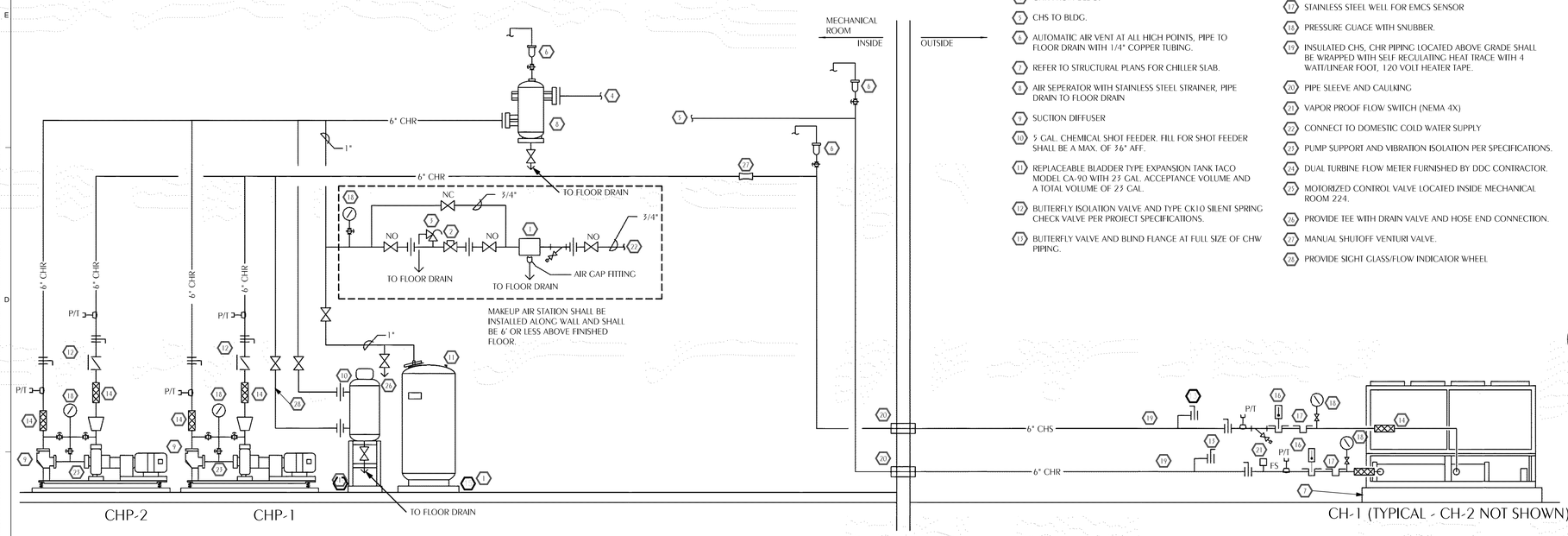
HVAC
REMOVABLE
DUCT DETAILS

M-303

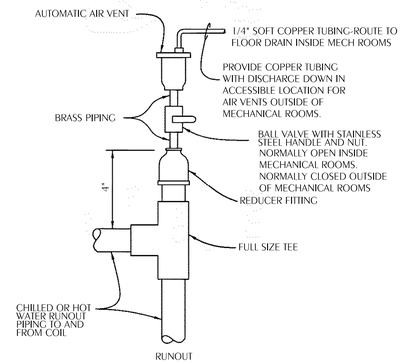
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CHILLED WATER PIPING DIAGRAM NOTES

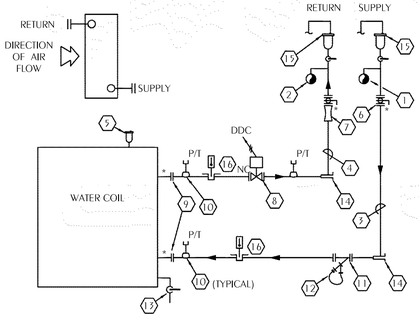
1. REDUCED PRESSURE BACKFLOW PREVENTER AND METER
2. PRESSURE REDUCING VALVE SET AT 20 PSI
3. 3/4" PRESSURE RELIEF VALVE SET AT 30 PSI
4. CHR FROM BLDG.
5. CHS TO BLDG.
6. AUTOMATIC AIR VENT AT ALL HIGH POINTS, PIPE TO FLOOR DRAIN WITH 1/4" COPPER TUBING.
7. REFER TO STRUCTURAL PLANS FOR CHILLER SLAB.
8. AIR SEPERATOR WITH STAINLESS STEEL STRAINER, PIPE DRAIN TO FLOOR DRAIN
9. SUCTION DIFFUSER
10. 5 GAL. CHEMICAL SHOT FEEDER. FILL FOR SHOT FEEDER SHALL BE A MAX. OF 36" AFF.
11. REPLACEABLE BLADDER TYPE EXPANSION TANK TACO MODEL CA-90 WITH 23 GAL. ACCEPTANCE VOLUME AND A TOTAL VOLUME OF 23 GAL.
12. BUTTERFLY ISOLATION VALVE AND TYPE CK10 SILENT SPRING CHECK VALVE PER PROJECT SPECIFICATIONS.
13. BUTTERFLY VALVE AND BLIND FLANGE AT FULL SIZE OF CHW PIPING.
14. FLEXIBLE CONNECTOR
15. CONCRETE HOUSEKEEPING PAD 6" LARGER THAN EQUIPMENT FOOTPRINT AND 4" THICK
16. THERMOMETER
17. STAINLESS STEEL WELL FOR EMCS SENSOR
18. PRESSURE GUAGE WITH SNUBBER.
19. INSULATED CHS, CHR PIPING LOCATED ABOVE GRADE SHALL BE WRAPPED WITH SELF REGULATING HEAT TRACE WITH 4 WATT/LINEAR FOOT, 120 VOLT HEATER TAPE.
20. PIPE SLEEVE AND CAULKING
21. VAPOR PROOF FLOW SWITCH (NEMA 4X)
22. CONNECT TO DOMESTIC COLD WATER SUPPLY
23. PUMP SUPPORT AND VIBRATION ISOLATION PER SPECIFICATIONS.
24. DUAL TURBINE FLOW METER FURNISHED BY DDC CONTRACTOR.
25. MOTORIZED CONTROL VALVE LOCATED INSIDE MECHANICAL ROOM 224.
26. PROVIDE TEE WITH DRAIN VALVE AND HOSE END CONNECTION.
27. MANUAL SHUTOFF VENTURI VALVE.
28. PROVIDE SIGHT GLASS/FLOW INDICATOR WHEEL



1 CHILLED WATER PLANT PIPING DIAGRAM
M-401 SCALE: NONE



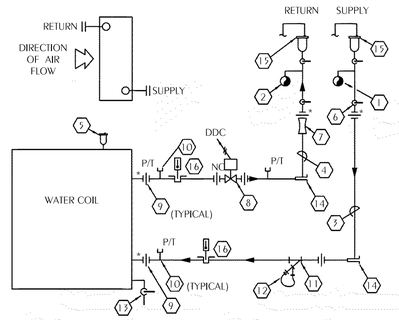
2 TYPICAL AUTOMATIC AIR VENT DETAIL
M-401 SCALE: NONE



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 AA025.
6. BUTTERFLY SERVICE VALVE, FLANGED
7. MANUAL SHUTOFF VENTURI VALVE
8. 2-WAY PRESSURE INDEPENDENT CONTROL VALVE, BRASS CONSTRUCTION.
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. PROVIDE PRESSURE INDEPENDENT ELECTRIC CONTROL VALVES WITH CONSTANT DIFFERENTIAL PRESSURE FOR 100% VALVE AUTHORITY, OPERATING RANGE 4-60 PSI.
2. INSTALL P/T PORTS IN FORGED STEEL THREDOLETS 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.

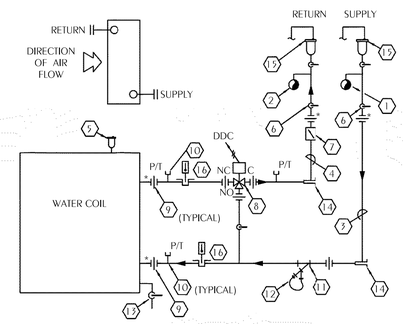
3 TYPICAL COIL CONNECTION SCHEMATIC-PIPE SIZE LARGER THAN 2"
M-401 SCALE: NONE



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 AA025.
6. BALL SERVICE VALVE, SCREWED
7. MANUAL SHUTOFF VENTURI VALVE
8. 2-WAY PRESSURE INDEPENDENT CONTROL VALVE, BRASS CONSTRUCTION
9. SERVICE UNION
10. PRESSURE/TEMPERATURE PORT WITH EXTENDED NECK
11. BRONZE STRAINER, SCREWED.
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. (OMIT ON TERMINAL UNITS AND FAN COIL UNITS).
15. 1/2" AUTOMATIC AIR VENT, SEE MOUNTING DETAIL THIS SHEET.
16. THERMOMETER (OMIT ON TERMINAL UNITS AND FAN COIL UNITS).

GENERAL NOTES:
1. SUPPLY AND RETURN RUNOUT PIPING FROM TEE AT AUTO AIR VENT TO COIL SHALL BE SCHEDULE 40 STEEL, TYPE L HARD DRAWN COPPER IS ACCEPTABLE AT THE CONTRACTOR'S OPTION
2. PROVIDE PRESSURE INDEPENDENT ELECTRIC CONTROL VALVES WITH CONSTANT DIFFERENTIAL PRESSURE FOR 100% VALVE AUTHORITY, OPERATING RANGE 4-60 PSI.
3. INSTALL COIL COMPONENTS IN THE PHYSICAL RELATIONSHIP INDICATED WITH RESPECT TO THE COIL, AND TO EACH OTHER.
4. INSTALL 2-WAY CONTROL VALVE WITH ACTUATOR IN VERTICAL POSITION.
5. INSTALL P/T PORTS IN REDUCING TEE. HALF COUPLINGS ARE NOT ALLOWABLE.
6. 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.

4 TYPICAL COIL CONNECTION SCHEMATIC-PIPE SIZE 2" AND SMALLER, TWO WAY
M-401 SCALE: NONE



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 AA025.
6. BALL SERVICE VALVE, SCREWED
7. AUTOMATIC FLOW CONTROL VALVE, SCREWED
8. 3-WAY CONTROL VALVE, BRONZE SCREWED BODY, MIXING PATTERN, LINEAR FLOW PLUG.
9. SERVICE UNION
10. PRESSURE/TEMPERATURE PORT WITH EXTENDED NECK
11. BRONZE STRAINER, SCREWED.
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. 1/2" AUTOMATIC AIR VENT, SEE MOUNTING DETAIL THIS SHEET.
16. THERMOMETER

GENERAL NOTES:
1. SUPPLY AND RETURN RUNOUT PIPING FROM TEE AT AUTO AIR VENT TO COIL SHALL BE HARD DRAWN TYPE L COPPER.
2. AUTOMATIC FLOW CONTROL VALVES SHALL BE FLOW DESIGN AUTO FLOW SERIES YR, SCREWED ENDS, Y-PATTERN, LINE SIZE, WITH TWO FACTORY P/T PORTS. RANGE 2-32 PSID.
3. INSTALL COIL COMPONENTS IN THE PHYSICAL RELATIONSHIP INDICATED WITH RESPECT TO THE COIL, AND TO EACH OTHER.
4. INSTALL 3-WAY CONTROL VALVE WITH ACTUATOR IN VERTICAL POSITION.
5. INSTALL P/T PORTS IN REDUCING TEE. HALF COUPLINGS ARE NOT ALLOWABLE.
6. 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.

5 TYPICAL COIL CONNECTION SCHEMATIC-PIPE SIZE 2" AND SMALLER, THREE WAY
M-401 SCALE: NONE

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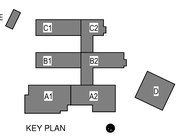
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GADSDEN COUNTY SCHOOL BOARD
New Quincy K-8 School

1400 W. KING STREET
QUINCY, FL 32351



REVISIONS

NO.	DESCRIPTION	DATE

RECEIVED
ALLSTATE CONSTRUCTION
09-18-2025

Project Number	22023
Dated	09-18-2025

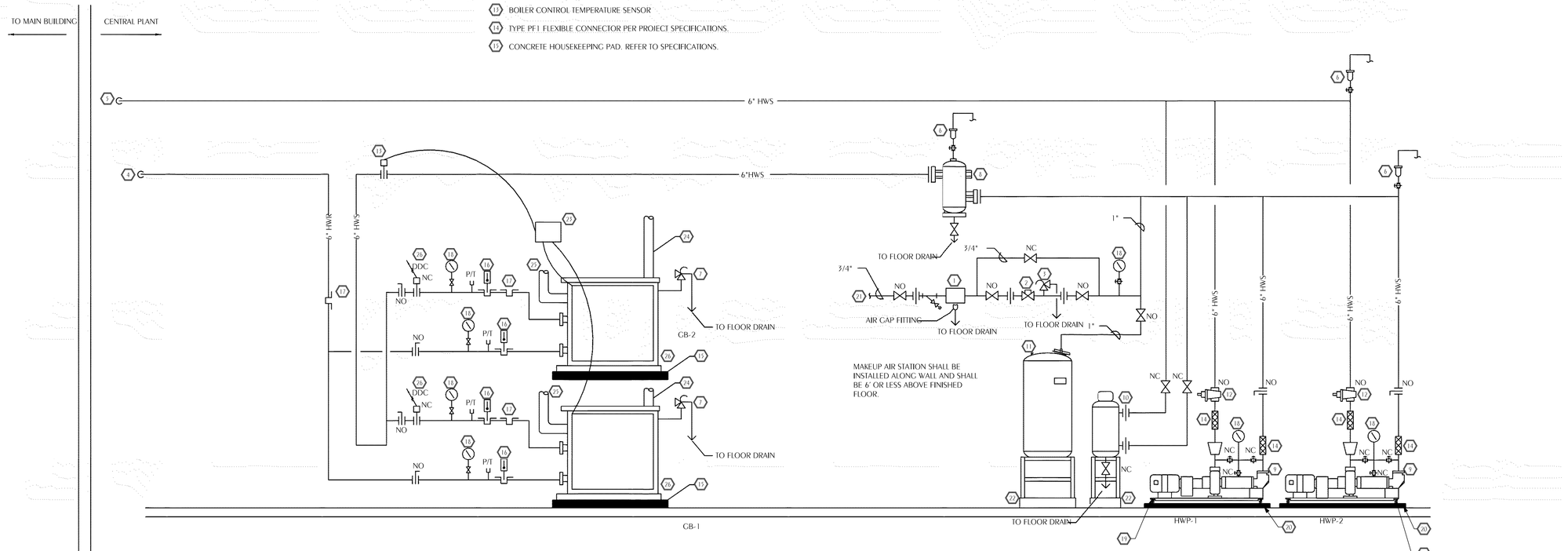
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Florida CA Number: 27825
Keith A. Johnson, PE
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850.326.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: IVB

CHILLED WATER PIPING DIAGRAM AND DETAILS

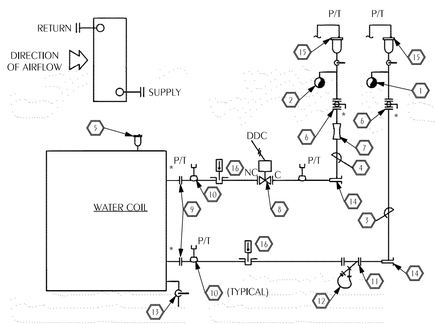
M-401

HEATING HOT WATER PLANT 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. HWR FROM BLDG.
5. HWS TO BLDG.
6. AUTOMATIC AIR VENT AT ALL HIGH POINTS IN SYSTEM, PIPE TO FLOOR DRAIN WITH 1/4" COPPER TUBING.
7. ASME RELIEF VALVE SET AT 30 PSI. PIPE DISCHARGE TO FLOOR DRAIN.
8. AIR SEPARATOR WITH STAINLESS STEEL STRAINER, PIPE DRAIN TO FLOOR DRAIN
9. SUCTION DIFFUSER
10. 5 GAL. CHEMICAL SHOT FEEDER. FILL FOR SHOT FEEDER SHALL BE A MAX. OF 36" AFF.
11. REPLACEABLE BLADDER TYPE EXPANSION TANK WITH MINIMUM 140 GAL. ACCEPTANCE VOLUME AND A TOTAL VOLUME OF 140 GAL.
12. PUMP DISCHARGE VALVE - DO NOT USE FOR BALANCING
13. BOILER CONTROL TEMPERATURE SENSOR
14. TYPE PF1 FLEXIBLE CONNECTOR PER PROJECT SPECIFICATIONS.
15. CONCRETE HOUSEKEEPING PAD. REFER TO SPECIFICATIONS.
16. THERMOMETER
17. STAINLESS STEEL WELL FOR EMCS SENSOR
18. PRESSURE GAUGE
19. TYPE BF2 VIBRATION ISOLATION PER SPECIFICATIONS
20. 6" THICK CONCRETE HOUSEKEEPING PAD.
21. CONNECT TO DOMESTIC COLD WATER SUPPLY
22. ANGLE IRON SUPPORT STAND - PAINT PER ARCHITECTURAL SPECIFICATIONS
23. BOILER CONTROL PANEL.
24. 6"Ø STAINLESS STEEL TYPE 'B' GAS FLUE VENT AND VENT CAP. REFER TO FLOOR PLANS FOR EXACT ROUTING.
25. 8"Ø PVC COMBUSTION AIR INTAKE ROUTED AS SHOWN ON FLOOR PLANS.
26. PROVIDE 1/4" MAKEUP WATER CONNECTION WITH BALL VALVE TO CONDENSATE DRAIN TRAP BOILER ACCESSORY.



1 HEATING HOT WATER PLANT DIAGRAM
M-402 SCALE: NONE



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 AA025.
6. BUTTERFLY SERVICE VALVE, FLANGED
7. VENTURI FLOW METER
8. 2-WAY PRESSURE INDEPENDENT CONTROL VALVE, BRASS CONSTRUCTION.
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. VENTURI FLOW METERS SHALL NOT REQUIRE MORE THAN 5 STRAIGHT PIPE DIAMETERS UPSTREAM NOR 2 PIPE DIAMETERS DOWNSTREAM TO ACHIEVE RATED ACCURACY (2%). VENTURI FLOW METERS TO BE BY FLOW DESIGN INC, AEROQUIP CORPORATION, GERAND ENGINEERING COMPANY, PRESCO, OR APPROVED EQUAL.
2. INSTALL P/T PORTS IN FORGED STEEL THREDOLETS 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.

2 TYPICAL COIL CONNECTION SCHEMATIC
M-402 SCALE: NONE

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AA26001957

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KEY PLAN

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HOT WATER PIPING DIAGRAM

M-402

DIRECT DIGITAL CONTROLS GENERAL NOTES

1. THE CONTRACTOR SHALL PROVIDE NEW DDC CONTROLLERS FOR ALL EQUIPMENT TO PERFORM THE INDICATED SEQUENCES, ALL OTHER FUNCTIONS REQUIRED BY THE CONTRACT DOCUMENTS, AND ALL OTHER FUNCTIONS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM.
2. ALL SEQUENCES ARE SUBJECT TO SAFETIES. DDC CONTRACTOR SHALL PROVIDE ALL NECESSARY AND CUSTOMARY SAFETIES.
3. ALL WIRING SHALL BE IN CONDUIT. ALL CONDUIT SHALL BE IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS, REQUIREMENTS FOR 120 VAC CIRCUITS.
4. ALL CONTROL TUBING SHALL BE RUN IN CONDUIT. ALL CONDUIT SHALL BE IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS, REQUIREMENTS FOR 120 VAC CIRCUITS.
5. ALL WELLS SHALL BE 316 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.
6. THE DDC CONTRACTOR IS CO-RESPONSIBLE, ALONG WITH THE TAB CONTRACTOR FOR COORDINATING THE PROPER INSTALLATION OF WELLS, PRESSURE TAPS, AND P/T TAPS IN ALL LOCATIONS INDICATED AND OTHERWISE AS REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM.
7. THE DDC CONTRACTOR AND THE TAB CONTRACTOR SHALL UTILIZE P/T'S TO CALIBRATE INSTRUMENTS TO CERTIFIED PRESSURE GAGES, PRESSURE METERS AND THERMOMETERS.
8. CONDUIT SHALL BE RUN PERPENDICULAR AND PARALLEL TO BUILDING LINES IN A FIRST CLASS WORKMANSHIP LIKE MANNER.

BACnet MONITORED SYSTEMS

DIVISION 26 SYSTEMS

THE DDC SHALL MONITOR SYSTEM CONTROLLERS BY OTHERS THROUGH A FACTORY BACnet INTERFACE. THE DDC SHALL READ AND IDENTIFY ALL POINTS TRANSMITTED BY THE FACTORY CONTROLLER. THE DDC SHALL INCLUDE A SYSTEM GRAPHIC FOR EACH CONTROLLED DEVICE WITH BACnet ADJUSTABLE SET POINTS IDENTIFIED AND ADJUSTABLE FROM THE GRAPHIC. THE FOLLOWING SYSTEMS ARE TO BE INCLUDED:

LIGHTING CONTROL PANEL

COORDINATE WITH THE EQUIPMENT AND CONTROLLERS PROVIDED BY OTHERS.

DIVISION 23 SYSTEMS

IN ADDITION TO SYSTEMS NOTED IN SPECIFIC CONTROL DIAGRAMS ON THESE DRAWINGS, THE DDC SHALL MONITOR MULTIZONE DUCTLESS SPLIT SYSTEM CONTROLLERS SERVING TELECOM AND ELECTRICAL ROOMS. THE DDC SHALL READ AND IDENTIFY ALL POINTS TRANSMITTED BY THE FACTORY CONTROLLER. THE DDC SHALL INCLUDE A SYSTEM GRAPHIC FOR EACH CONTROLLED DEVICE WITH SPACE SET POINTS IDENTIFIED AND ADJUSTABLE FROM THE GRAPHIC.

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 120V POWER TO EACH TERMINAL UNIT. PROVIDE 120V TO 24V CONTROLS TRANSFORMER FOR EACH TU.

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 0.15".

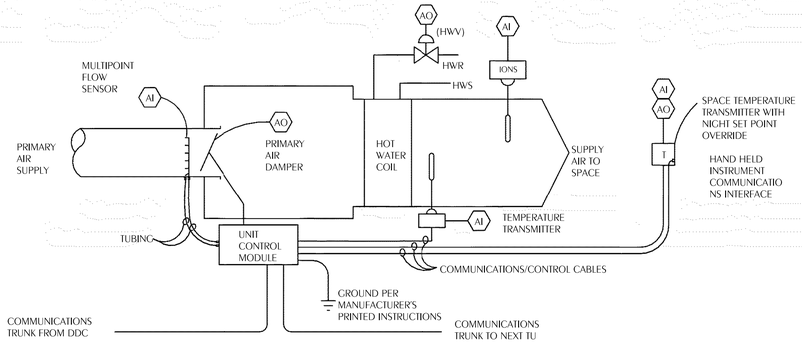
HEATING MODE: THE HOT WATER VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE (COOLING SETPOINT MINUS 3°F). THE MAXIMUM HEATING AIR TEMPERATURE SHALL BE 85°F. UPON REACHING THE MAXIMUM HEATING AIR TEMPERATURE, THE DDC SHALL INCREASE THE TERMINAL UNIT AIRFLOW AND MAINTAIN THE DISCHARGE AIR TEMPERATURE OF 85°F UNTIL THE CALL FOR HEATING IS SATISFIED. WHEN THE CALL FOR HEATING IS SATISFIED, THE DDC SHALL REVERSE THE SEQUENCE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT SETPOINT.

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.

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).

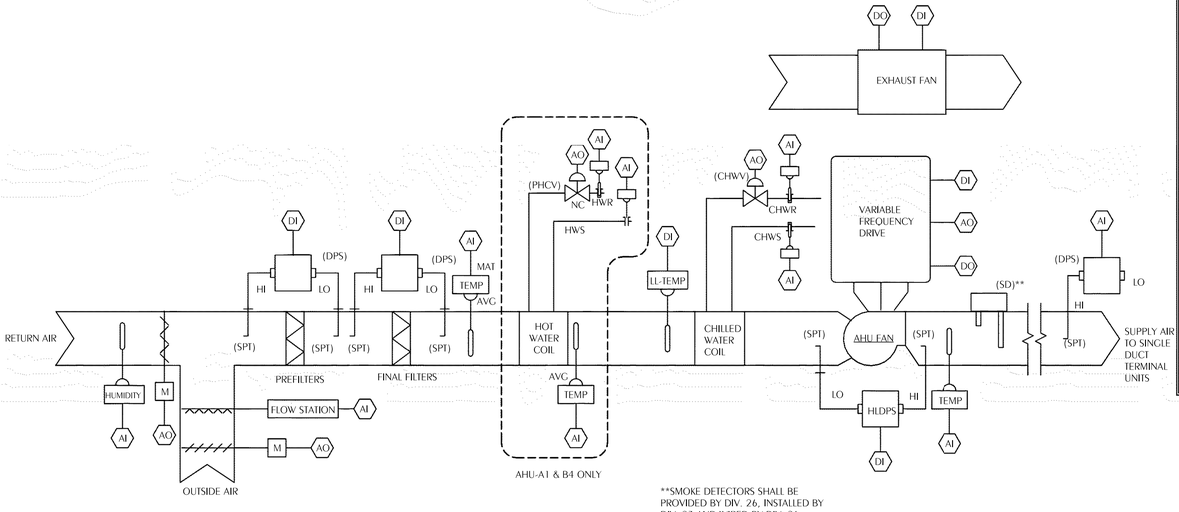
ION SENSOR: TU-A1.4, A3.5, A4.14, B1.10, B2.14, B3.11, B4.8, B5.4, B6.5B, C2.11, C3.4, C4.10, AND C5.9 SHALL BE EQUIPPED WITH A SUPPLY AIR MOUNTED ION SENSOR WITH ADJUSTABLE SETPOINT AND ANALOG INPUT. THE DDC SHALL POST AN ALARM WHEN THE ION COUNT FALLS BELOW THE SETPOINT. INITIAL SETPOINT MINIMUM SHALL 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.



1 SINGLE DUCT TU CONTROL DIAGRAM
M-501 SCALE: NONE

SINGLE DUCT TU POINTS LIST

SYSTEM POINT DESCRIPTION	ANALOG INPUT: GRAPHIC	TEMPERATURE	PERCENT	CFM	ION COUNT	ANALOG OUTPUT: DDC DRIVE	VARIABLE FREQ. DRIVE	SETPOINT ADJ.	DIGITAL INPUT: PNEU. TRANSDUCER	STATUS ON/OFF	FILTER STATUS	DIGITAL OUTPUT: START/STOP	OPEN/CLOSE	LOCK OUT	ENABLE/DISABLE	SYSTEM FEATURES ALARMS: HIGH/LOW	HIGH ANALOG	LOW ANALOG	SENSOR FAIL	COMM. FAIL	DIAGNOSTICS	PROGRAMS: LATCHING	TIME SCHEDULING	RUN TIME	TIMED OVERRIDE	REMOTE CONTROL
CONTROL PANEL																				X	X	X	X	X	X	X
SUPPLY AIR TO SPACE		X			X											X	X	X								
ZONE TEMPERATURE		X					X									X	X	X								
HEATING VALVE						X																				
DAMPER						X																				
FLOW SENSOR				X															X							



**SMOKE DETECTORS SHALL BE PROVIDED BY DIV. 26, INSTALLED BY DIV. 23 AND WIRED BY DIV. 26.

2 VAV AHU CONTROL DIAGRAM
M-501 SCALE: NONE

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:

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

PREHEAT CONTROL AHU-A1& B4 ONLY: ANYTIME THE MIXED AIR TEMPERATURE FALLS BELOW 45°F WITH NO CALL FOR COOLING, THE DDC SHALL MODULATE THE PREHEAT COIL VALVE TO MAINTAIN A 50°F SETPOINT. WHEN THE MIXED AIR TEMPERATURE REACHES 40°F, THE DDC SHALL MODULATE THE PREHEAT COIL TO MAINTAIN A 50°F SETPOINT REGARDLESS OF CALL FOR COOLING.

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 35°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 DUCT MOUNTED HIGH LIMIT STATIC PRESSURE SENSORS, THE ADJUSTABLE VARIABLE FREQUENCY DRIVE SHALL MODULATE FAN SPEED 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 TU'S ASSOCIATED WITH THE AHU HAVE BEEN IN FULL COOLING MODE FOR FIVE MINUTES, THE DDC SHALL RESET THE DUCT STATIC PRESSURE DOWN 0.15". 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 RA 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.

THE DDC SYSTEM SHALL MODULATE THE CHILLED WATER VALVE AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SET POINT (REFER TO AHU SCHEDULE).

INTERLOCKED EXHAUST FANS: INTERLOCKED EXHAUST FANS SHALL OPERATE ONLY DURING OCCUPIED TIMES AND MONITOR STATUS VIA CURRENT SENSOR.

VARIABLE VOLUME AHU POINTS LIST

SYSTEM POINT DESCRIPTION	ANALOG INPUT: GRAPHIC	TEMPERATURE	CFM	STATIC PRESSURE	HUMIDITY	ION COUNT	ANALOG OUTPUT: DDC DRIVE	VARIABLE FREQ. DRIVE	SETPOINT ADJ.	DIGITAL INPUT: FAULT	STATUS	FILTER STATUS	DIGITAL OUTPUT: START/STOP	OPEN/CLOSE	LOCK OUT	ENABLE/DISABLE	SYSTEM FEATURES ALARMS: HIGH/LOW	HIGH ANALOG	LOW ANALOG	SENSOR FAIL	COMM. FAIL	DIAGNOSTICS	PROGRAMS: LATCHING	TIME SCHEDULING	RUN TIME	TIMED OVERRIDE	REMOTE CONTROL
CONTROL PANEL	X																	X	X	X	X	X		X			
FAN CONTROL							X			X	X		X							X							
RETURN AIR				X														X	X	X							
MIXED AIR		X																X	X	X							
CHWC DISCHARGE AIR		X																X	X	X							
COOLING VALVE (CHWV)							X																				
CHWS		X																X	X	X							
CHWR		X																X	X	X							
FILTERS												X						X		X							
OUTSIDE AIR			X															X	X	X							
RETURN AIR DAMPER							X																				
DUCT STATIC PRESSURE				X														X	X	X							
OUTSIDE AIR DAMPER							X																				
HLDPS																		X	X								
EXHAUST FAN										X			X							X							

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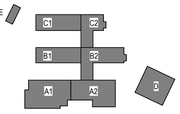
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HVAC CONTROLS
M-501

SEQUENCE OF OPERATION
SINGLE ZONE VARIABLE VOLUME AHU

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OCCUPIED MODE

THE DDC SHALL MONITOR AVAILABLE IONS VIA A RETURN AIR DUCT MOUNTED ION DETECTOR (2V TO 10V DC ANALOG OUTPUT), PROVIDED BY THE BIPOLAR IONIZATION MANUFACTURER. WHENEVER THE UNIT IS OPERATING IN THE OCCUPIED MODE, AND THE AVAILABLE IONS ARE LOWER THAN SETPOINT OF 500 IONS/CC, AN ALARM SHALL BE POSTED TO THE DDC SYSTEM.

OPEN THE OUTSIDE AIR DAMPERS AND START EXHAUST FANS INDICATED ON FAN SCHEDULE WHENEVER THE BUILDING IS IN OCCUPIED MODE.

COOLING COIL FREEZE PROTECTION: THE DDC SYSTEM SHALL CLOSE THE OUTSIDE AIR DAMPER ANYTIME THE MIXED 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 35°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 SCHEDULES) UNTIL MINIMUM SPEED IS REACHED. WHEN MINIMUM SPEED IS REACHED AND THERE IS A CALL FOR HEATING, THE DDC SHALL RESET SUPPLY AIR TEMPERATURE UP IN 2°F INCREMENTS EVERY FIVE MINUTES TO A MAXIMUM OF 65°F(ADJUSTABLE). THE DDC SHALL REVERSE SUPPLY AIR RESET UPON A CALL FOR COOLING OR WHEN ROOM AIR RH RISES ABOVE 60%.

FAN SPEED CONTROL: SUBJECT TO HIGH LIMIT DUCT STATIC PRESSURE SENSOR, AHU AIRFLOW SHALL BE LIMITED TO SCHEDULED MAXIMUM AND MINIMUM VALUES. THE ADJUSTABLE VARIABLE FREQUENCY DRIVE SHALL MODULATE FAN SPEED AS REQUIRED TO MAINTAIN ROOM TEMPERATURE AT SETPOINT (74°F ADJUSTABLE). UPON REACHING MINIMUM SPEED, THE DDC SHALL MODULATE THE HWV AS REQUIRED TO MAINTAIN ROOM TEMP AT SETPOINT. AHU FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE.

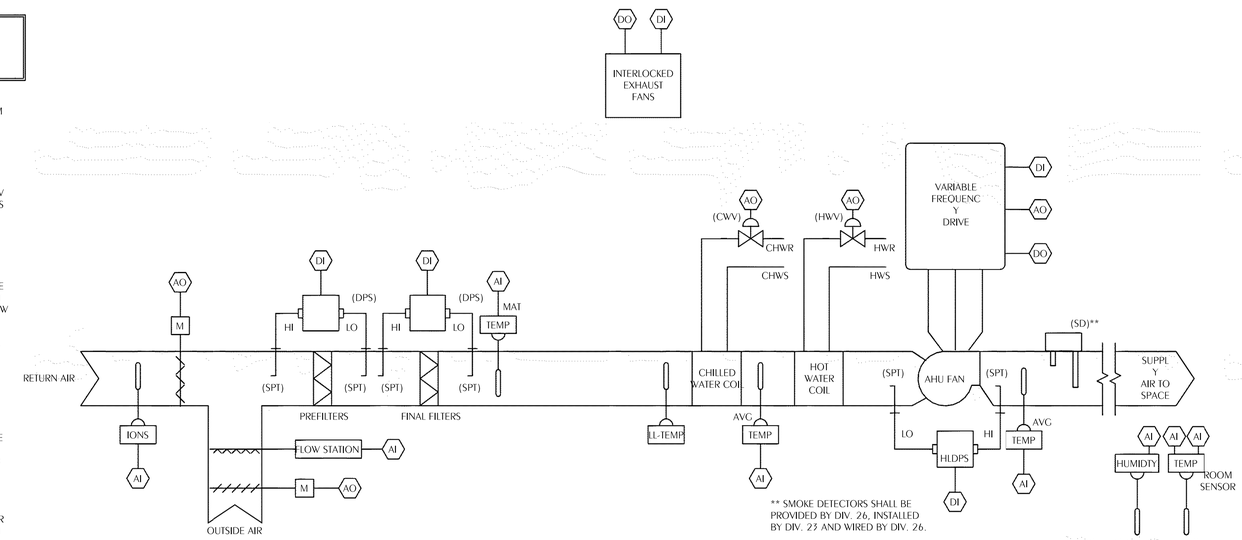
OUTSIDE AIR CONTROL: THE DDC SYSTEM, WITH OA DUCT MOUNTED FLOW MEASURING STATION, SHALL MODULATE RA AND OA DAMPERS AS REQUIRED TO MAINTAIN OUTSIDE AIR QUANTITY AT SET POINT REGARDLESS OF THE TOTAL AIR FLOW OF THE AIR HANDLING UNIT AT ANYTIME. READOUT OF OUTSIDE AIR QUANTITY SHALL BE IN CFM. OUTSIDE AIR DAMPER SHALL BE OPENED TO MAINTAIN OA AT THE MINIMUM SCHEDULED DURING OCCUPIED CYCLES.

UNOCCUPIED MODE:

THE DDC SHALL CYCLE THE FAN AND COOLING OR HEATING COIL AS NECESSARY TO MAINTAIN SETPOINT OF 85°F (ADJUSTABLE). OA DAMPER SHALL BE CLOSED DURING UNOCCUPIED TIME.

OVERRIDE: OVERRIDE SHALL PLACE THE UNIT IN OCCUPIED MODE FOR A PERIOD OF 1 HR.

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



1 SZVAV CONTROL DIAGRAM
M-502 SCALE: NONE

SINGLE ZONE VARIABLE VOLUME AHU POINTS LIST

SYSTEM POINT DESCRIPTION	ANALOG INPUT: GRAPHIC	TEMPERATURE	HUMIDITY	ION COUNT	ANALOG OUTPUT: DDC	VARIABLE FREQ. DRIVE SET POINT ADJ	DIGITAL INPUT: FAULT STATUS	FILTER STATUS	SMOKE	DIGITAL OUTPUT: START/STOP	OPEN/CLOSE	LOCK OUT	ENABLE/DISABLE	START/STOP	SYSTEMS FEATURES — ALARMS: HIGH/LOW ANALOG	LOW ANALOG	SENSOR FAIL	COMM. FAIL	DIAGNOSTICS	PROGRAMS: DATCHING	SCHEDULING	RUN TIME	TIMED OVERRIDE	MODE CONTROL
CONTROL PANEL	X																X	X	X	X	X	X		X
FAN CONTROL					X		X	X		X	X					X								
MIXED AIR		X													X	X	X							
PHC DISCHARGE AIR		X													X	X	X							
CWC DISCHARGE AIR		X													X	X	X							
UNIT DISCHARGE AIR		X													X	X	X							
ROOM SENSER	X	X		X		X									X	X	X							
PREHEAT VALVE					X																			
COOLING VALVE					X																			
HEATING VALVE					X																			
FILTERS								X							X		X							
OUTSIDE AIR		X													X	X	X							
RETURN AIR				X											X	X	X							
OUTSIDE AIR DAMPER					X																			
RETURN AIR DAMPER					X																			
HLDPS															X	X								
EXHAUST FAN							X			X														
OCCUPANCY (BCU-3 ONLY)								X									X							

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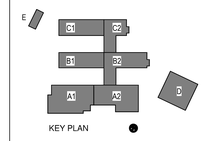
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Project Number 22023
Dated 09-18-2025

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850.326.3447
Project Number: 2022-041
Checked By: KAJ
Drawn By: IVB

HVAC CONTROLS
M-502

SEQUENCE OF OPERATION
HEATING HOT WATER PLANT

STARTING AND STOPPING OF EQUIPMENT SHALL BE ACCOMPLISHED THRU A "HAND-OFF-AUTO" SWITCH LOCATED ON FACE OF THE BOILER BOILER PLANT MANAGER. THE BOILER PANEL SHALL COMMUNICATE ALL POINT VALUES MONITORED WITH THE CAMPUS DDC SYSTEM THROUGH ITS BACNET INTERFACE. AN ALARM SHALL BE POSTED TO THE DDC SYSTEM ANYTIME THE BOILER PLANT MANAGER HOA SWITCH IS INDEXED TO THE "HAND" OR "OFF" POSITIONS. WITH THE HOA SWITCH IN THE "AUTO" POSITION, THE HOT WATER SYSTEM SHALL BE STARTED AUTOMATICALLY BY UPON CALL FROM THE DDC SYSTEM AND ALL CONTROLS ACTIVATED SUBJECT TO SAFETIES AND OVERLOADS. THE HOT WATER SYSTEM SHALL BE STARTED ON A CALL FOR HEATING FROM ANY TEMPERATURE CONTROLLER, SENSOR OR FREEZE PROTECTION SAFETY.

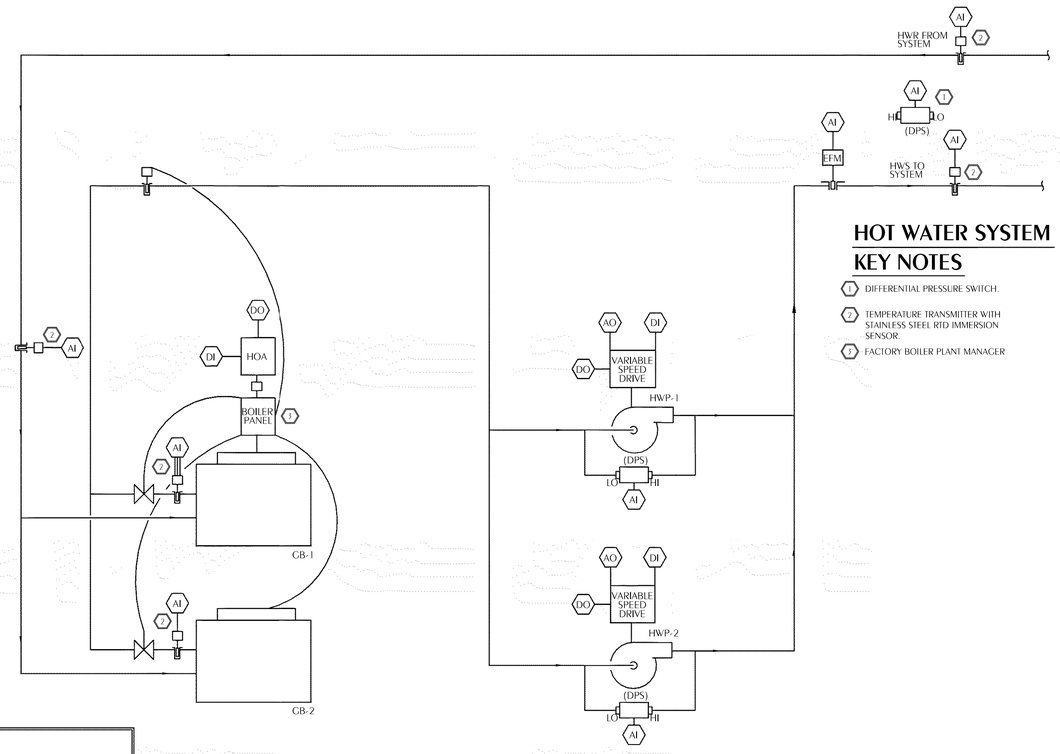
HEATING PLANT STAGING:

THE BOILER FACTORY CONTROL PANEL SHALL TO SEQUENCE AND STAGE GB-1 AND GB-2 TO MAINTAIN HWS TEMPERATURE AT SETPOINT OF 160ºF (SUBJECT TO RESET SCHEDULE).

PUMP CONTROL: UPON HW SYSTEM STARTUP, THE DDC SYSTEM SHALL START HWP-1 AND/OR HWP-2 AS REQUIRED. THE DDC SHALL ALTERNATE HWP'S DAILY BASED ON RUNTIME. WHENEVER THE HW SYSTEM IS IN OPERATION THE DDC SHALL MODULATE PUMP SPEED WITH THE VFD TO MAINTAIN CONSTANT DIFFERENTIAL PRESSURE INSIDE THE BUILDING. SETPOINT SHALL BE DETERMINED BY TEST AND BALANCE CONTRACTOR AS THE LOWEST DIFFERENTIAL PRESSURE REQUIRED TO OBTAIN DESIGN FLOW AT ALL UNITS. PUMPS SHALL MAINTAIN A MINIMUM OF 50 GPM. IF A PUMP FAILS TO OPERATE WHEN ENABLED, THE DDC SYSTEM SHALL START THE ALTERNATE PUMP AND POST AN ALARM. THE DDC SHALL MONITOR TOTAL FLOW. IF THE HWS TEMPERATURE FALLS BELOW 85ºF FOR MORE THAN 5 MINUTES, THE DDC SHALL POST AN ALARM, SHUT DOWN THE GB'S, AND STOP THE HWP'S. THE DDC SHALL MONITOR DIFFERENTIAL PRESSURE OF EACH PUMP AND SHUT DOWN THE PUMP WHEN DIFFERENTIAL PRESSURE EXCEEDS 95% OF SHUTOFF HEAD AND POST AN ALARM.

PUMP SPEED RESET: THE DDC SHALL RESET THE DIFFERENTIAL PRESSURE SETPOINT DOWN WHEN NO HOT WATER VALVES ARE OPEN 100%. THE DDC SHALL REDUCE THE SETPOINT IN STEPS EQUAL TO 10% OF THE ORIGINAL VALUE DETERMINED BY TEST AND BALANCE DOWN TO A MINIMUM 50% OF THE ORIGINAL VALUE DETERMINED BY TEST AND BALANCE DOWN TO A MINIMUM OF 50% OF THE ORIGINAL VALUE (ADJUSTABLE). THE DDC SHALL MAKE CHANGES (INCREASES OR DECREASES) IN SETPOINT IN FIVE MINUTE INTERVALS. THE DDC SHALL REVERSE SETPOINT ADJUSTMENT WHEN MORE THAN 10% OF THE HW VALUES ARE 100% OPEN FOR MORE THAN 5 MINUTES (ADJUSTABLE).

BOILER CONTROL: THE BOILER SHALL, THROUGH ITS INTERNAL CONTROLS, MAINTAIN THE HWS TEMPERATURE AT A BACNET INTERFACE ADJUSTABLE SET POINT OF 160ºF. THE DDC SHALL POST AN ALARM UPON FAILURE OF ANY HWP. THE BOILER CONTROL PANEL SHALL DISABLE BOILER IF FLOW IS NOT PROVEN THROUGH THE BOILER.



HOT WATER SYSTEM KEY NOTES

1. DIFFERENTIAL PRESSURE SWITCH.
2. TEMPERATURE TRANSMITTER WITH STAINLESS STEEL RTD IMMERSION SENSOR.
3. FACTORY BOILER PLANT MANAGER

1 HOT WATER PLANT CONTROL DIAGRAM
M-503 SCALE: NONE

HOT WATER PLANT POINTS LIST

SYSTEM POINT DESCRIPTION / BOILER	ANALOG INPUT: GRAPHIC	TEMPERATURE	PERCENT	DIFFERENTIAL PRESSURE	FLOWRATE	ANALOG OUTPUT: SPEED	PERCENT OPEN	AMBIENT TEMPERATURE	DIGITAL INPUT: PNEU. TRANSDUCER	STATUS ON/OFF	FILTER STATUS	STATUS OPEN/CLSD	START/STOP	OPEN/CLOSE	ENABLE/DISABLE	DIGITAL OUTPUT: HIGH/FLOW	SYSTEMS FEATURES ALARMS: HIGH ANALOG	LOW ANALOG	SENSOR FAIL	FLOW FAIL	DIAGNOSTICS	LATCHING	PROGRAMS: TIME SCHEDULING	RUN TIME	TIMED OVERRIDE	MODE CONTROL	ALTERNATE	BACNET INTERFACE
PLANT WATER SUPPLY		X		X	X												X	X	X									
PLANT WATER RETURN		X		X													X	X	X									
HWP				X		X				X			X		X						X			X	X	X		X
BOILER PLANT MANAGER										X						X					X			X	X			X
BOILER WATER SUPPLY		X			X												X	X	X									
BOILER WATER RETURN		X															X	X	X									

HOT WATER RESET SCHEDULE

HOT WATER SUPPLY TEMP	OUTSIDE AIR TEMP
115F	60F
160F	30F

NOTE: BETWEEN 60F AND 30F, THE HOT WATER SUPPLY TEMPERATURE SHALL VARY LINEARLY BETWEEN 115F AND 160F

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 INTHE "AUTO" POSITION, THE CHILLED WATER SYSTEM SHALL BE ENABLED BY THE DDC SYSTEM AND STARTED UNDER ITS OWN SEQUENCE SUBJECT TO SAFETIES AND OVERLOADS.

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

PUMP CONTROL: UPON CHW SYSTEM START UP, THE CHILLER SHALL SEND A REQUEST TO THE DDC SYSTEM AND DDC SHLL START CHP-1 OR CHP-2. THE DDC SHALL ALTERNATE CHP'S DAILY BASED ON RUNTIME. WHENEVER THE CHW SYSTEM IS IN OPERATION THE DDC SHALL MODULATE PUMP SPEED WITH THE VFD TO MAINTAIN CONSTANT DIFFERENTIAL PRESSURE INSIDE THE CHILLER PLANT AT A FLOATING DIFFERENTIAL PRESSURE SETPOINT. THE LOCAL PLANT FLOATING DIFFERENTIAL SETPOINT SHALL BE RESET UPWARD AND DOWNWARD BASED ON THE REMOTE BUILDING DIFFERENTIAL PRESSURE. IF THE REMOTE BUILDING DIFFERENTIAL PRESSURE IS BELOW ITS SETPOINT THEN THE FLOATING DIFFERENTIAL PRESSURE SETPOINT SHALL BE RESET DOWNWARD. IF AT ANY TIME THE REMOTE DIFFERENTIAL PRESSURE SETPOINT SIGNAL FAILS OR IS ABOVE/BELOW NORMAL RANGE OF VALUE, THEN THE LOCAL PLANT DIFFERENTIAL PRESSURE SETPOINT SHALL BE SET TO THE DEFAULT DIFFERENTIAL PRESSURE SETPOINT VALUE AND AN ALARM SHALL BE POSTED. THE DDC SHALL LIMIT CHANGES IN FLOW AFTER CHILLER STARTUP TO 10% PER MINUTE. IF A PUMP FAILS TO OPERATE WHEN ENABLED, THE DDC SYSTEM SHALL START THE ALTERNATE PUMP AND POST AN ALARM. WHEN ONE PUMP CANNOT MEET THE DEMAND OF THE SYSTEM, THE DDC SHALL START THE SECOND PUMP. THE DDC SHALL MONITOR TOTAL BUILDING FLOW.

CHILLER CONTROL SUMMARY: THE DDC SHALL ENABLE THE CHILLER BASED ON BUILDING LOAD AND THE CHILLER SHALL OPERATE THROUGH ITS INTERNAL CONTROLS TO MAINTIAN CHILLED WATER SUPPLY TEMPERATURE AT SETPOINT OF 42ºF. UPON A CALL FOR COOLING THE DDC SHALL START THE CHP. UPON PROOF OF FLOW, THE CHILLER SHALL OPERATE TO MAINTAIN LEAVING WATER AT SETPOINT. THE DDC SHALL MONITOR CHW FLOW THROUGH THE CHILLER. THE DDC SHALL MAINTAIN A MINIMUM FLOWRATE OF 296 GPM IN THE CHILLER WHEN IT IS ENABLED AND OPERATING. THE DDC SYSTEM SHALL MONITOR ALARM STATUS OF CHILLER AND POST AN ALARM IN THE EVENT THE CHILLER IS ENABLED AND NOT OPERATING. THE DDC SHALL MONITOR ALL POINTS AVAILABLE THROUGH THE MANUFACTURER'S FACTORY MOUNTED CHILLER MICROPROCESSOR CONTROL THROUGH BACNET PROTOCOL.

CHILLER CONTROL:

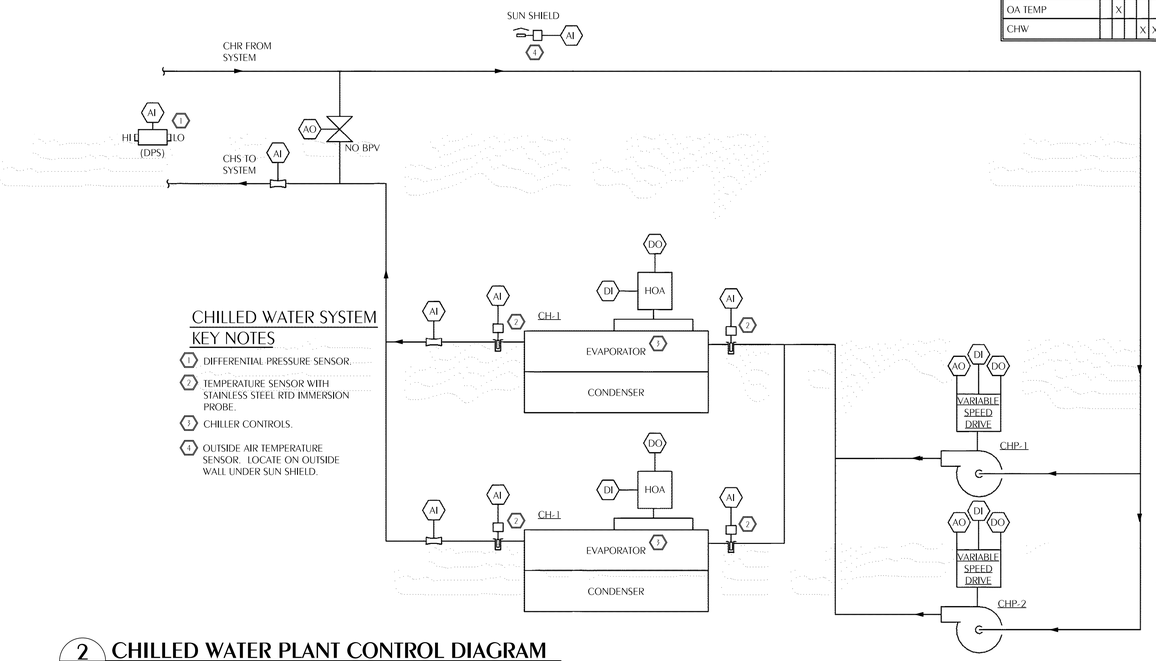
GENERAL - THE DDC PROGRAM SHALL BE FULLY EDITABLE AND SE-UP VIA POINT AND CLICK ON A STANDARD WINDOWS SCREEN. IT SHALL NOT REQUIRE SPECIAL SOFTWARE TOOLS OR A BAS TECHNICIAN TO OPERATE AND MODIFY CHILLER SEQUENCING CONTROL.

THE DDC SHALL PERFORM THE FOLLOWING CONTROL STRATEGIES:

1. COLOR GRAPHIC BASED CHILLER STATUS SCREENS
2. SYSTEM AND CHILLER DIAGNOSTIC MESSAGES
3. SYSTEM AND CHILLER REPORTS

CHILLER SYSTEM OPERATOR INTERFACE - DDC APPLICATION OPERATIONAL STATUS SCREEN TO INCLUDE:

A. CHILLER SYSTEM STATUS (OFF/SOFT START/NORMAL/AMBIENT LOCKOUT/SHUTDOWN IN PROCESS)
B. CHILLER PLANT SUPPLY WATER SETPOINT
C. CHILLED WATER SYSTEM SUPPLY WATER TEMPERATURE
D. CHILLED WATER SYSTEM RETURN WATER SYSTEM
E. INDIVIDUAL CHILLER FAILURE RESET
F. SYSTEM PUMP FAILURE RESET



CHILLED WATER SYSTEM KEY NOTES

1. DIFFERENTIAL PRESSURE SENSOR.
2. TEMPERATURE SENSOR WITH STAINLESS STEEL RTD IMMERSION PROBE.
3. CHILLER CONTROLS.
4. OUTSIDE AIR TEMPERATURE SENSOR. LOCATE ON OUTSIDE WALL UNDER SUN SHIELD.

2 CHILLED WATER PLANT CONTROL DIAGRAM
M-503 SCALE: NONE

CHILLED WATER SYSTEM POINTS LIST

SYSTEM POINT DESCRIPTION / CHILLER	ANALOG INPUT: GRAPHIC	TEMPERATURE	PERCENT	DIFFERENTIAL PRESSURE	FLOW RATE	ANALOG OUTPUT: DDC	SETPOINT ADJ	VFD SPEED	VFD ON/OFF	DIGITAL INPUT: HOA STATUS	STATUS ON/OFF	STATUS	STATUS OPEN/CLSD	START/STOP	OPEN/CLOSE	ENABLE/DISABLE	DIGITAL OUTPUT: HIGH/FLOW	SYSTEMS FEATURES ALARMS: HIGH ANALOG	LOW ANALOG	SENSOR FAIL	FLOW FAIL	DIAGNOSTICS	LATCHING	PROGRAMS: TIME SCHEDULING	RUN TIME	TIMED OVERRIDE	MODE CONTROL	ALTERNATE
CHILLER PLANT	X																											
CH-1					X					X						X				X	X	X	X	X	X	X	X	X
CH-2					X					X						X				X	X	X	X	X	X	X	X	X
CHP-1							X			X						X					X				X	X	X	X
CHP-2							X			X						X					X				X	X	X	X
CH-1 CHS		X															X	X	X									
CH-1 CHR		X															X	X	X									
CH-2 CHS		X															X	X	X									
CH-2 CHR		X															X	X	X									
OA TEMP		X																		X								
CHW				X	X																							

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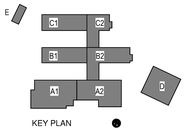
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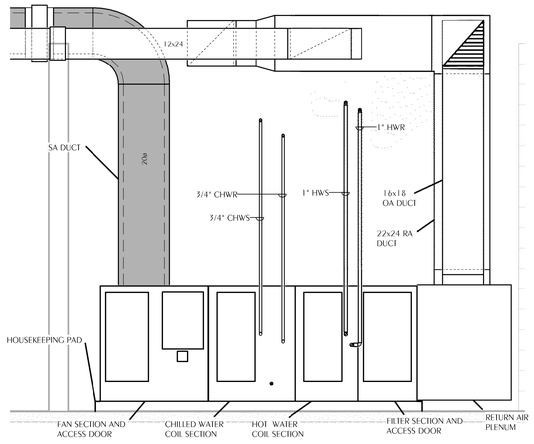
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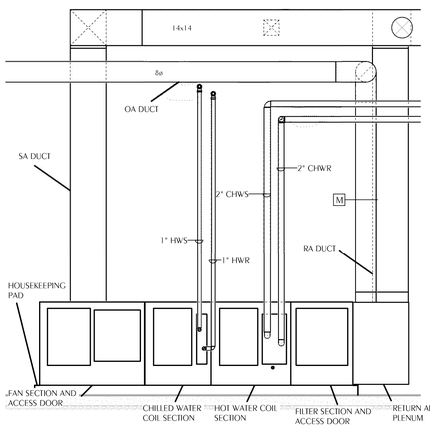
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HVAC CONTROLS
M-503

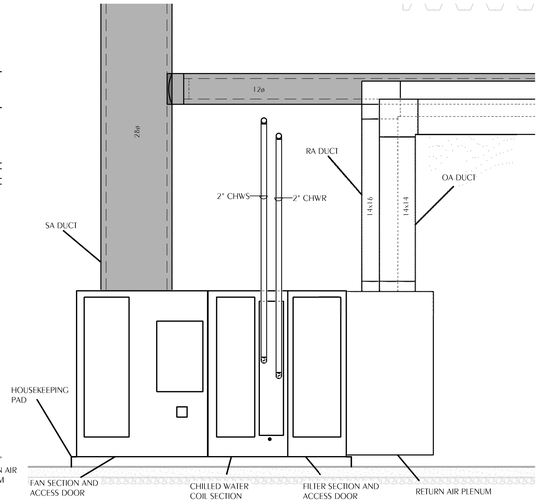
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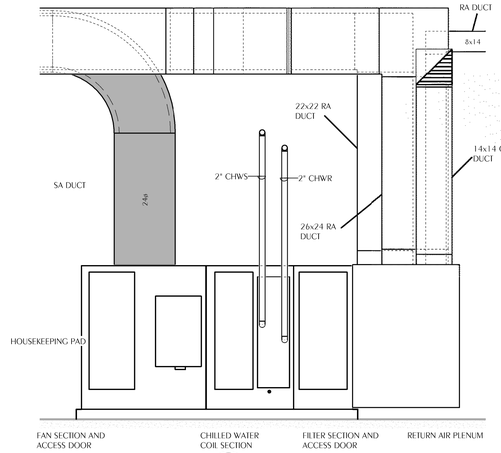
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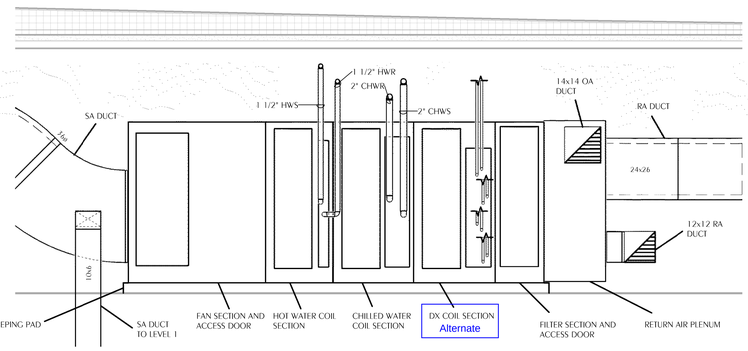
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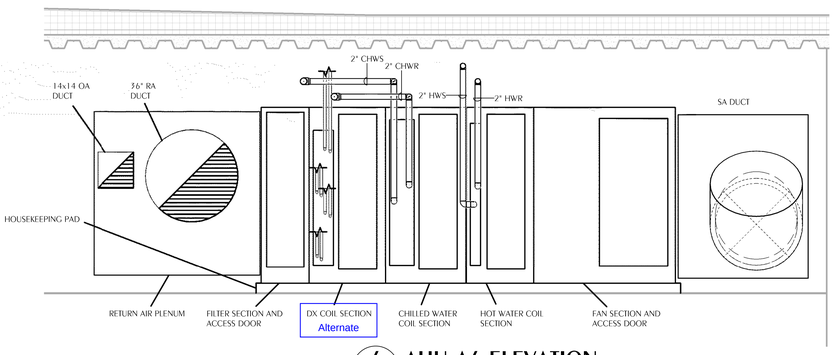
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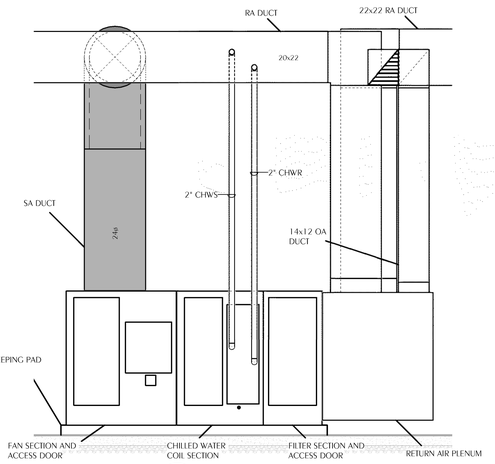
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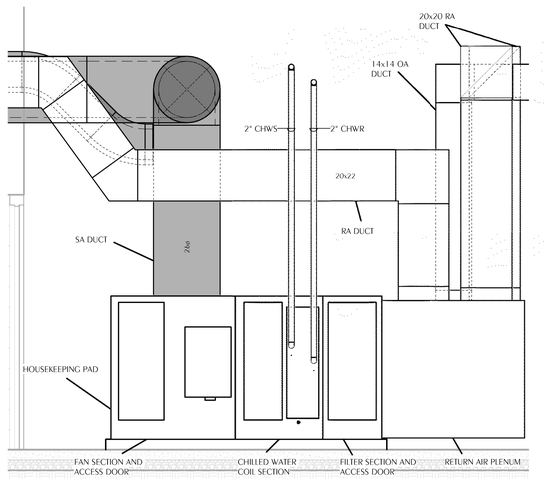
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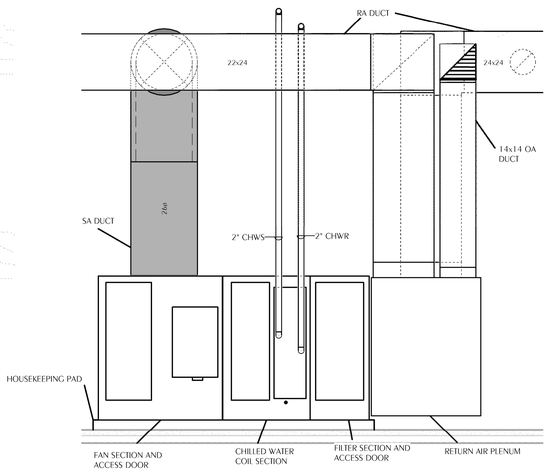
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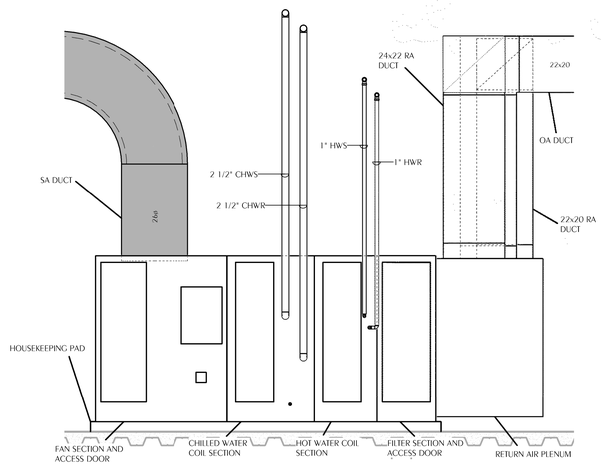
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SCALE: 1/2" = 1'-0"



8 M-601 **AHU-B2 ELEVATION**
SCALE: 1/2" = 1'-0"



9 M-601 **AHU-B3 ELEVATION**
SCALE: 1/2" = 1'-0"



10 M-601 **AHU-B4 ELEVATION**
SCALE: 1/2" = 1'-0"

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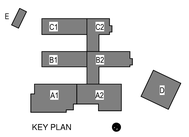
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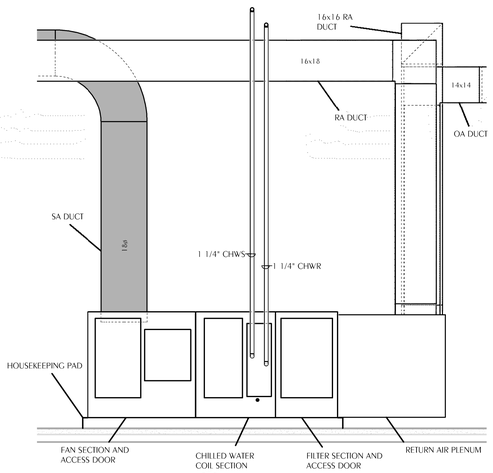
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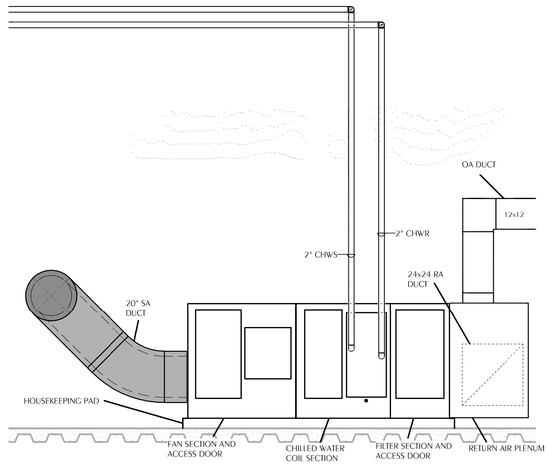
HVAC AHU ELEVATIONS

M-601

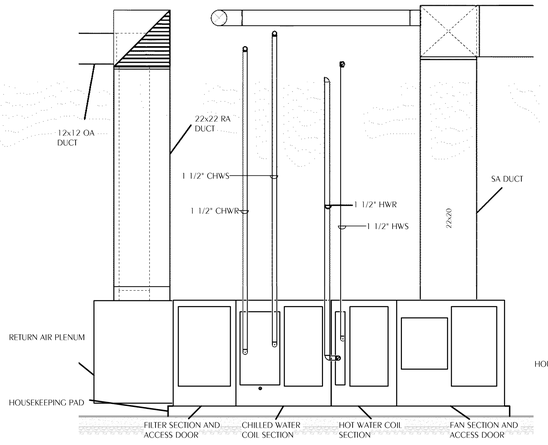
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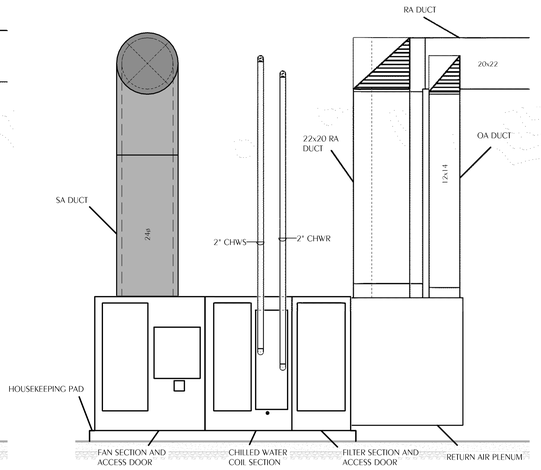
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M-602 SCALE: 1/2" = 1'-0"



2 AHU-B6 ELEVATION
M-602 SCALE: 1/2" = 1'-0"



3 AHU-C1 ELEVATION
M-602 SCALE: 1/2" = 1'-0"



4 AHU-C2 ELEVATION
M-602 SCALE: 1/2" = 1'-0"

5 AHU-C3 ELEVATION
M-602 SCALE: 1/2" = 1'-0"

6 AHU-C4 ELEVATION
M-602 SCALE: 1/2" = 1'-0"

7 AHU-C5 ELEVATION
M-602 SCALE: 1/2" = 1'-0"

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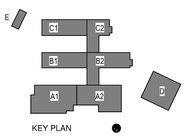
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M-602