

CCTC BUILDING M500 HVAC RENOVATION

506 N GUIGNARD DR BUILDING M500,
SUMTER, SC 29150

23253-01
T02-6341-PD



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PROJECT SUMMARY:
1. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SUPERVISION TO CONSTRUCT COMPLETE AND OPERABLE MECHANICAL AND ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFIED IN THE PROJECT MANUAL. ALL MATERIALS AND EQUIPMENT USED SHALL BE NEW, UNDAMAGED AND FREE FROM ANY DEFECTS.
2. SCOPE INCLUDES REPLACEMENT OF THE AIR HANDLING UNIT, BOILER, HOT WATER PUMPS, AND CHILLED WATER PUMPS ALONG WITH THE ASSOCIATED CONTROLS AND ELECTRICAL INFRASTRUCTURE.
3. CONTRACTOR SHALL COORDINATE SYSTEM SHUTDOWN WITH CCTC STAFF. TO REDUCE SYSTEM SHUTDOWN TO A MINIMUM, A COORDINATED SCHEDULE SHALL BE PROVIDED PRIOR TO ANY WORK. THE CONTRACTOR IS ENCOURAGED TO PRE MANUFACTURE AS MANY COMPONENTS AS POSSIBLE TO REDUCE TOTAL DOWN TIME OF THE HVAC SYSTEMS PRIOR TO THE DEMOLITION OF THE EXISTING. STAGING OF MATERIALS ON SITE IS PERMITTED WITH GUIDANCE AND APPROVAL OF CCTC STAFF. SEE THE MECHANICAL EQUIPMENT PHASING ON M001 FOR MORE INFORMATION.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A CRANE SAFETY PLAN TO THE OWNER FOR THEIR REVIEW AND APPROVAL.
5. THE CONTRACTOR IS RESPONSIBLE TO CONTACT OBTAIN HOT WORK PERMITS TO ALLOW WELDING, GRINDING, BRAZING AND OTHER SMOKE OR DUST PRODUCING ACTIVITIES TO PREVENT ACCIDENTAL ACTIVATION OF FIRE ALARM SYSTEMS.
6. ALL MATERIALS AND EQUIPMENT SHALL BE DISCARDED IN A MANNER APPROVED BY THE OWNER AND ACCEPTABLE PER LOCAL REGULATIONS.
7. STARTUP OF PUMPS, BOILERS, AND AIR HANDLERS SHALL BE PROVIDED BY A FACTORY START UP AGENT. STARTUP DOCUMENTS SHALL BE PROVIDED TO THE CCTC PROJECT MANAGER.
8. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THRID PARTY INSPECTIONS OF THE NEW BOILER SYSTEMS PROPR TO STARTUP.
9. NEW CONTROLS SHOWN ON THE DRAWINGS AND INTEGRATION WITH THE EXISTING BUILDING AUTOMATION SYSTEM SHALL BE PROVIDED BY THE OWNERS CONTROLS CONTRACTOR (CMI) TO BE HIRED DIRECTLY BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THEIR WORK WITH THE CONTROLS CONTRACTOR.
10.



CENTRAL CAROLINA TECHNICAL COLLEGE
CCTC BUILDING M500 HVAC RENOVATION
506 N GUIGNARD DR BUILDING M500, SUMTER, SC 29150

PROJECT TITLE SHEET

JOB. No.	23253-01
DATE:	06/18/2025
DRAWN BY:	CPM
CHECK BY:	WDB
SHEET	NUMBER

T001

MECHANICAL SYSTEMS SEISMIC AND WIND REQUIREMENTS PER IBC-2021/ASCE 7-16					
A.	PER THE 2021 INTERNATIONAL BUILDING CODE, MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AND COMPONENTS, INCLUDING THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED FOR SEISMIC FORCES IN ACCORDANCE WITH CHAPTER 13 OF ASCE 7.				
B.	EXTERIOR EQUIPMENT (INCLUDING ROOF CURBS, RAILS, SUPPORTS) EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH CHAPTER 26 TO 29 OF ASCE 7.				
C.	WHERE DESIGN FOR SEISMIC AND WIND LOADS IS REQUIRED, THE MORE DEMANDING FORCE MUST BE USED.				
D.	REFERENCE THE STRUCTURAL DRAWINGS FOR SITE SPECIFIC INFORMATION ON SEISMIC DESIGN CATEGORY, WIND SPEEDS, ETC.				
E.	USE THE TABLE BELOW TO DETERMINE SEISMIC RESTRAINT REQUIREMENTS FOR EACH COMPONENT.				
F.	FOR ALL COMPONENTS REQUIRING SEISMIC RESTRAINT, THE COMPONENT SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL REGISTERED IN THE STATE THE JOB IS LOCATED. SUBMITTALS MUST INCLUDE STAMPED AND SIGNED DRAWINGS AND CALCULATIONS.				
G.	WHERE SEISMIC RESTRAINT IS REQUIRED, HOUSEKEEPING PADS NEEDED FOR THE INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT MUST BE DESIGNED BY THE SEISMIC ENGINEER. DO NOT POUR ANY HOUSEKEEPING PADS PRIOR TO THE RECEIPT OF THE APPROVED SEISMIC SUBMITTAL.				
H.	SEISMIC RESTRAINTS FOR DUCTWORK, PIPING, CONDUIT, CABLE TRAYS AND BUS DUCT MUST BE SHOWN ON LAYOUT DRAWINGS SHOWING SPECIFIC RESTRAINT LOCATIONS ALONG WITH ACCOMPANYING DETAILS AND CALCULATIONS.				
MECHANICAL COMPONENT IMPORTANCE FACTOR (Ip) DESIGNATION					
Ip = 1.0			Ip = 1.5		
• ALL HVAC COMPONENTS EXCEPT AS NOTED IN Ip=1.5					
SEISMIC DESIGN CATEGORIES D,E,F					
COMPONENT IMPORTANCE FACTOR (Ip)					
		1.0		1.5	
COMPONENT IDENTIFICATION		SEISMIC RESTRAINT REQUIREMENT	NOTES	SEISMIC RESTRAINT REQUIREMENT	NOTES
ROOF MOUNTED		RESTRAIN ALL	1	RESTRAIN ALL	-
FLOOR MOUNTED		RESTRAIN ALL	1, 2	RESTRAIN ALL	-
WALL MOUNTED		RESTRAIN ALL	1, 2	RESTRAIN ALL	-
COMPONENT SUPPORTS		RESTRAIN ALL	1	RESTRAIN ALL	-
SUSPENDED EQUIPMENT	INLINE W/ DUCT	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN.	3	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN.	3
	NOT INLINE W/ DUCT/PIPE	RESTRAIN ALL	1	RESTRAIN ALL	-
SUSPENDED DUCTILE PIPING (STEEL, ALUMINUM, COPPER, ETC.)		>3"	4	>1"	4
SUSPENDED NON DUCTILE PIPING (CAST IRON, PLASTIC, CERAMIC)		RESTRAIN ALL	4	RESTRAIN ALL	4
SUSPENDED PIPE ON TRAPEZE		RESTRAIN IF ANY PIPE ON TRAPEZE > 3" RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE >	4	RESTRAIN IF ANY PIPE ON TRAPEZE > 1" RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE > 10	4
DUCTWORK		6 SQ.FT. AND LARGER AND >17 LBS/FT	4,5	6 SQ.FT. AND LARGER AND > 17 LBS/FT	4,5
MULTIPLE DUCTS ON TRAPEZE		RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT	4,5	RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT	4,3
COMPONENT CERTIFICATION		NOT REQUIRED	-	REQUIRED	6
NOTES:					
1. EQUIPMENT 20 LBS. OR LESS IS EXEMPT IF THE COMPONENT IS POSITIVELY ATTACHED TO THE STRUCTURE AND FLEXIBLE CONNECTIONS ARE PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.					
2. RESTRAINTS ARE NOT REQUIRED IF THE COMPONENT WEIGHS 400 LBS. OR LESS, IS MOUNTED WITH THE CENTER OF MASS LOCATED AT 4 FT. OR LESS ABOVE A FLOOR, IS POSITIVELY ATTACHED TO THE STRUCTURE AND HAS FLEXIBLE CONNECTIONS BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.					
3. FLEXIBLE CONNECTIONS REQUIRED FOR PIPE CONNECTIONS ONLY.					
4. RESTRAINT IS NOT REQUIRED IF THE PIPING / DUCTWORK IS SUPPORTED BY HANGERS AND EACH HANGER IN THE PIPING RUN IS 12 IN. OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE. WHERE PIPES ARE SUPPORTED ON A TRAPEZE, THE TRAPEZE SHALL BE SUPPORTED BY HANGERS HAVING A LENGTH OF 12 IN. OR LESS. WHERE ROD HANGERS ARE USED, THEY SHALL BE EQUIPPED WITH SWIVELS, EYE NUTS OR OTHER DEVICES TO PREVENT BENDING IN THE ROD.					
5. ALL DUCTWORK, REGARDLESS OF SIZE, DESIGNED TO CARRY TOXIC, HIGHLY TOXIC, OR EXPLOSIVE GASES OR USED FOR SMOKE CONTROL MUST BE RESTRAINED.					
6. COMPONENT CERTIFICATION MUST BE SUPPLIED BY THE EQUIPMENT MANUFACTURER AT TIME OF SUBMITTAL FOR REVIEW BY ENGINEER OF RECORD.					

MECHANICAL ABBREVIATIONS	
ABBR	DESCRIPTION
(E)	EXISTING
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AH	AIR HANDLER
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
BHP	BRAKE HORSE POWER
BMS	BUILDING MANAGMENT SYSTEM
BOD	BASIS OF DESIGN
BOP	BOTTOM OF PIPE
C	DOMESTIC COLD WATER SUPPLY
CFM	CUBIC FEET PER MINUTE
CHF	CHEMICAL FEED
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CO	CLEANOUT
CP	CENTRAL PLANT
DCW	DOMESTIC COLD WATER
DDC	DIRECT DIGITAL CONTROLS
DIA	DIAMETER
DRN	DRAIN
EA	EXHAUST AIR
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
ESP	EXTERNAL STATIC PRESSURE
FD	FLOOR DRAIN
FD	FIRE DAMPER
FPM	FEET PER MINUTE
FRPM	FAN ROTATIONS PER MINUTE
FT	FEET
GPM	GALLONS PER MINUTE
H	DOMESTIC HOT WATER SUPPLY
HD	HUB DRAIN
HP	HORSEPOWER
HR	DOMESTIC HOT WATER RETURN
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
IN	INCHES
LAT	LEAVING AIR TEMPERATURE
MBH	THOUSANDS OF BTU'S PER HOUR
MC	MECHANICAL CONTRACTOR
MD	MANUAL DAMPER
NC	NOISE CRITERIA
NG	NATURAL GAS PIPING
NO	NORMALLY OPEN
OA	OUTSIDE AIR
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PS	PIPE SUPPORT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RM	REMOTE MONITOR
RPM	ROTATIONS PER MINUTE
SA	SUPPLY AIR
SF	SUPPLY FAN
TDV	TRIPLE DUTY VALVE
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
VFD	VARIABLE FREQUENCY DRIVE
VNT	VENT
W/	WITH
°F	DEGREES FAHRENHEIT

HVAC SYMBOL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	AIR TERMINAL TAG, X=TYPE MARK, Y=CFM	---	COMPONENT TO BE DEMOLISHED
	SIDEWALL REGISTER / GRILLE		DUCTWORK (X" = WIDTH, Y" = HEIGHT)
	THERMOSTAT		TURNING VANES
	HUMIDISTAT		ROOF CAP
	CO2 SENSOR		FLEXIBLE DUCT CONNECTION
	DUCT MOUNTED SMOKE DETECTOR (BY E.C.)		CONNECTION TO EXISTING SYSTEM
	EQUIPMENT CLEARANCE		MOTORIZED DAMPER
	FIRE DAMPER		THERMOSTAT (DUCT MOUNTED)
	MANUAL DAMPER		HUMIDISTAT (DUCT MOUNTED)

HVAC PIPING SPECIALTIES SYMBOL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	AUTOMATIC AIR VENT		AUTOMATIC BALANCING CONTROL VALVE
	BACKFLOW PREVENTER		BALL VALVE
	BASKET STRAINER		CIRCUIT SENSOR
	CIRCUIT SETTER		CONCENTRIC REDUCER/INCREASER
	DIRECTION OF PIPING FLOW		DOUBLE SUCTION PUMP
	DRAIN VALVE W/ HOSE CONNECTION		EARTHQUAKE VALVE
	ECCENTRIC REDUCER/INCREASER		END SUCTION PUMP
	FLANGE CONNECTION		GATE VALVE
	HOSE BIBB		MOTORIZED BALL VALVE
	MOTORIZED BUTTERFLY VALVE		PIPE CAP
	PIPING SLOPE		PLUG VALVE
	PRESSURE REDUCING VALVE		PUMP CONNECTOR/FLEX CONNECTOR
	PUMP SUCTION DIFFUSER		RELIEF VALVE
	RINSE VALVE		SANITARY SEWER
	SOLENOID VALVE		STORM SEWER
	SWING CHECK VALVE		TRIPLE DUTY VALVE
	UNION		WAFER CHECK VALVE
	WYE STRAINER		WYE STRAINER W/BLOWDOWN BALL VALVE WITH HOSE CONNECTION
	2-WAY CONTROL VALVE		3-WAY CONTROL VALVE

MECHANICAL CODES AND STANDARDS (WITH ALL SOUTH CAROLINA MODIFICATIONS)	
CODE	DESCRIPTION
IBC (2021)	INTERNATIONAL BUILDING CODE
IECC (2009)	INTERNATIONAL ENERGY CONSERVATION CODE
IMC (2021)	INTERNATIONAL MECHANICAL CODE
NFPA 90A (2021)	STANDARD FOR THE INSTALLATION AIR-CONDITIONING & VENTILATING SYSTEMS
SMACNA (2020)	HVAC DUCT CONSTRUCTION STANDARDS MANUAL, FOURTH EDITION

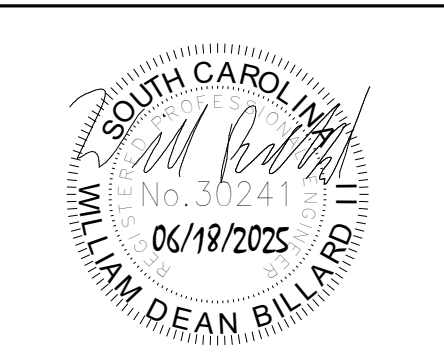
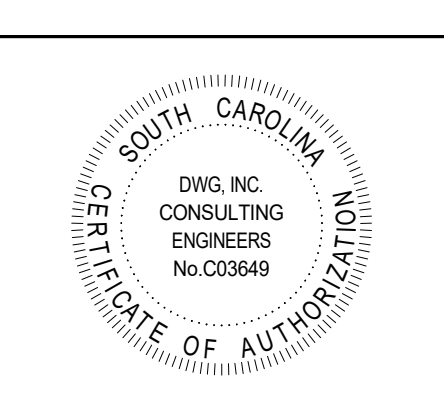
DESIGN CONDITIONS	
SUMMER	OUTDOOR: 95°F DB / 76°F WB INDOOR: 72°F DB / 50% RH
WINTER	OUTDOOR: 25°F DB INDOOR: 70°F DB / 50% RH

GENERAL HVAC NOTES

- THE DRAWINGS SHOW THE GENERAL ARRANGEMENT AND LOCATION OF EQUIPMENT, DUCTWORK, PIPING, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE MECHANICAL INSTALLATION W/ THE STRUCTURE AND OTHER TRADES AND SHALL PROVIDE ADDITIONAL OFFSETS AND FITTINGS AS NECESSARY.
- COORDINATE WORK WITH AUTHORITY HAVING JURISDICTION AND OBTAIN ALL PERMITS AND INSPECTIONS.
- PROVIDE OWNER WITH CERTIFICATES OF FINAL INSPECTION AND ACCEPTANCE FROM AUTHORITY HAVING JURISDICTION.
- THE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHALL COMPLY WITH THE THE CODES LISTED ON THIS SHEET AS WELL AS ALL LOCAL CODE OFFICIAL REQUIREMENTS. IN THE EVENT OF A CONFLICT BETWEEN CODES, THE MOST STRINGENT SHALL ALWAYS GOVERN.
- DUCT DIMENSIONS ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS.
- THE CONTRACTOR SHALL CHECK AND VERIFY ALL CLEARANCES PRIOR TO FABRICATION OR INSTALLATION OF EQUIPMENT, DUCTWORK, AND PIPING SYSTEMS. WHERE CONDITIONS REQUIRE A CHANGE IN DUCT OR PIPE ROUTING, NOTIFY THE ARCHITECT FOR AN ACCEPTABLE ALTERNATIVE METHOD. AVOID ROUTING DUCTWORK DIRECTLY OVER LIGHT FIXTURES, DIFFUSERS, AND OTHER CEILING MTD. DEVICES. LOCATE ALL MECHANICAL EQUIPMENT SO THAT FILTERS AND COMPONENTS REQUIRING ACCESS (SERVICE AND MAINTENANCE) ARE FULLY ACCESSIBLE.
- PROVIDE CURVED RADIUS ELBOW AT FIRST SUPPLY & RETURN FITTING FOR ALL HVAC UNITS. PROVIDE TURNING VANES IN ALL 90 DEGREE ELBOWS IN ALL RECTANGULAR SUPPLY/RETURN/EXHAUST DUCT SYSTEMS. ANY OFFSETS REQUIRED IN DUCT SYSTEMS SHALL BE INSTALLED PER SMACNA 2020 4TH EDITION MANUAL . SHARP ANGLED TRANSITIONS OR OFFSETS 'WILL NOT BE ALLOWED'. PROVIDE DUCT ACCESS DOORS AS REQUIRED.
- INSTALL ALL DUCT MOUNTED DEVICES (DAMPERS, ACCESS DOORS, ETC.) AND PIPING SPECIALTIES IN EASILY ACCESSIBLE LOCATIONS. ADVISE THE ARCHITECT IN ADVANCE OF INSTALLATION IF ACCESS WILL BE HINDERED SO AN ALTERNATE LOCATION CAN BE SELECTED.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS WITH PRESCRIBED CLEARANCES FOR SERVICE AND MAINTENANCE. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IF RECOMMENDED CLEARANCES ARE NOT POSSIBLE BEFORE INSTALLING EQUIPMENT.
- ALL ROTATING MECHANICAL EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATION. PROVIDE FLEXIBLE NEOPRENE DUCT CONNECTORS BETWEEN DUCTWORK AND ISOLATED MECHANICAL EQUIPMENT.
- THE CONTRACTOR SHALL FIRESTOP ALL PENETRATIONS OF FIRE RATED WALLS/FLOORS/CEILINGS BY DUCTWORK PIPING, ETC., WITH U.L. LISTED FIRE STOPPING MATERIAL TO MAINTAIN FIRE RATING OF THE BARRIER.
- SEISMIC PROTECTION OF EQUIPMENT, DUCTWORK, PIPING AND UTILITIES SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 16 OF THE INTERNATIONAL BUILDING CODE, 2021 EDITION. ALL SEISMIC RESTRAINT AND BRACING SHALL BE SUBSTANTIATED BY MANUFACTURER'S SUBMITTALS PER THE SPECIFICATIONS. FOR ADDITIONAL INFORMATION, SEE 'MECHANICAL SYSTEMS SEISMIC AND WIND REQUIREMENTS' ON THIS SHEET. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF SEISMIC BRACING DEVICES WITH THE OWNER'S SEISMIC SPECIAL INSPECTOR. PROVIDE A MINIMUM OF SEVEN DAYS ADVANCE NOTICE OF INSTALLATION.
- BALANCE ALL AIR DISTRIBUTION DEVICES, EXHAUST FANS, AND OUTSIDE AIR QUANTITIES AS SCHEDULED OR SHOWN ON THE DRAWINGS. PROVIDE MARKERS AT ALL DAMPER LOCATIONS SHOWING FULL OPEN/CLOSED POSITIONS AND DAMPER SETTING FOR REQUIRED AIRFLOW. PROVIDE FINAL TEST AND BALANCE REPORT ALONG W/ SCHEMATIC DRAWINGS SHOWING DIFFUSER LOCATION W/ DESIGN AND ACTUAL CFM. THE DIFFUSER TAGS ON THE DRAWINGS SHALL CORRESPOND TO THE DIFFUSER TAGS ON THE REPORT. THIS REPORT SHALL BE SUBMITTED BEFORE THE FINAL INSPECTION IS PERFORMED. SEE SPECIFICATIONS FOR FURTHER INFORMATION.
- ALL CONTROL WIRING, CONDUIT AND CONTROLS ACCESSORIES NECESSARY TO IMPLEMENT THE OUTLINED SEQUENCES OF OPERATION SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR.
- WIND LOAD PROTECTION OF ROOF MOUNTED EQUIPMENT AND DUCTWORK SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 16 OF THE INTERNATIONAL BUILDING CODE, 2021 EDITION. ALL WIND LOAD RESTRAINT AND BRACING SHALL BE SUBSTANTIATED BY MANUFACTURER'S SUBMITTALS PER THE SPECIFICATIONS.
- ALL EXPOSED PIPING AND DUCTWORK SHALL BE PAINTED. COORDINATE W/ ARCHITECTURAL PLANS/SPECIFICATIONS FOR EXPOSED LOCATIONS AND PAINTING REQUIREMENTS.
- SEE ARCHITECTURAL DOCUMENTS FOR ROOF PENETRATION AND FLASHING REQUIREMENTS.
- WHERE "APPROXIMATELY" IS USED TO DEFINE INSTALLATION LOCATIONS, CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES TO VERIFY THERE ARE NO CONFLICTS PRIOR TO INSTALLATION AT DIMENSION LISTED.

MECHANICAL EQUIPMENT CONSTRUCTION PHASING:

- CONSTRUCTION TIMELINE IS INTENDED FOR WINTER EQUIPMENT REPLACEMENT WITH MINIMIZED DOWNTIME TO THE HEATING WATER SYSTEM.
- SINGLE BOILER AND ASSOCIATED SINGLE PUMP REPLACEMENT SHALL TAKE PLACE FIRST (ALONG WITH STARTUP) TO MINIMIZE HEATING WATER SYSTEM DOWNTIME. ONCE ONE BOILER AND PUMP IS RUNNING THE REMAINDER OF THE AHU, SECOND BOILER, SECOND PUMP AND CHILLED WATER PUMPS SHALL TAKE PLACE WHILE THE SINGLE BOILER IS PROVIDING HEAT FOR THE BUILDING.
- DURING THE DOWNTIME OF THE HEATING HOT WATER SYSTEM THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY SPACE HEATING FOR THE SPACES DEEMED NECESSARY BY THE OWNER.



CCTC BUILDING M500 HVAC RENOVATION
506 N GUIGNARD DR BUILDING M500, SUMTER, SC 29150
H59-6344-PD

MECHANICAL NOTES & LEGENDS

#	Description	01/01/01
JOB No.	23253-01	
DATE:	06/18/2025	
DRAWN BY:	ACR	
CHECKED BY:	WDB	
SHEET	NUMBER	

M001

AIR HANDLING UNIT SCHEDULE																																	
MARK	AIR CAPACITY CFM		FAN RPM	FAN QTY	NOMINAL HP PER FAN	E.S.P. INCHES W.G.	T.S.P. INCHES W.G.	COOLING COIL										HEATING COIL										FILTER EFFICIENCY	BASIS OF DESIGN	MODEL			
	TOTAL	OUTSIDE AIR						TOTAL MBH	SENS. MBH	MAX FV (FPM)	ENTERING AIR		LEAVING AIR		GPM	EWT °F	LWT °F	AIR P.D. (IN W.G.)	WATER P.D. (FT W.G.)	NO. ROWS	TOTAL MBH	MAX FV (FPM)	HEATING CFM	AIR PD (IN W.G.)	EAT °F	LAT °F	EWT °F				LWT °F	GPM	WATER P.D. (FT W.G.)
AHU-1	22,536	6,460	3290	6	8.05	4.00	5.75	869	621	517	80.0	67.0	55.0	54.5	173.2	45.0	55.0	0.76	3.45	8	733	529	22,536	0.09	25.0	55.0	140.0	120.0	73.5	4.33	MERV 8	TRANE	PSCA

- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS.
 - PROVIDE DUCT MOUNTED AIRFLOW MONITORING STATION FOR OUTSIDE AIR INTAKE DUCT.
 - PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.
 - UNIT MANUFACTURER SHALL PROVIDE UNIT MOUNTED VFD FOR AHU FAN.

AIR SEPARATOR SCHEDULE							
MARK	CONNECTION SIZE	MAX FLOW GPM	MAX WORKING PRESSURE (PSIG)	MAX OPERATING TEMPERATURE (°F)	TYPE	BASIS OF DESIGN	MODEL
AS-1	0" - 5"	500	125	350	ROLAIRTROL	BELL & GOSSETT	R-5F
AS-2	0" - 3"	190	125	350	ROLAIRTROL	BELL & GOSSETT	R-3F

- NOTES:
- PROVIDE WITH AUTOMATIC AIR VENT AND BLOWDOWN VALVE.
 - INSTALL SEPARATORS INLINE PER THE MANUFACTURER'S DIRECTION. SEPARATORS SHALL BE INSULATED.
 - PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.
 - AIR SEPARATORS SHALL BE ASME RATED.

EXPANSION TANK SCHEDULE						
MARK	TANK VOLUME (GALLONS)	TANK DIAMETER (INCHES)	MAX DESIGN PRESSURE (PSIG)	TYPE	BASIS OF DESIGN	MODEL
ET-1	106	30	125	ASME BLADDER	WESSELS	NLA-400
ET-2	53	24	125	ASME BLADDER	WESSELS	NLA-200

- NOTES:
- TANKS SHALL BE PAD MOUNTED. PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.
 - TANKS SHALL BE ASME RATED.

BOILER SCHEDULE									
MARK	CAPACITY (MBH)	FLOW RATE	INPUT (MBH)	OUTPUT (MBH)	TURNDOWN	TYPE	FLUID TEMPERATURE		MODEL
							ENTERING	LEAVING	
B-1	1500	144 GPM	1500	1443	25:1	CONDENSING BOILER	120 °F	140 °F	LOCHINVAR FBN1501
B-2	1500	144 GPM	1500	1443	25:1	CONDENSING BOILER	120 °F	140 °F	LOCHINVAR FBN1501

- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS. PROVIDE WITH INTEGRAL DISCONNECT.
 - UNITS SHALL BE INTEGRATED INTO THE BUILDING AUTOMATION SYSTEM. SEE CONTROLS SEQUENCES.
 - ROUTE CONDENSATE TO A NEUTRALIZING KIT PER THE MANUFACTURER'S INSTRUCTIONS.
 - PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.
 - PROVIDE BOILER WITH A PRIMARY PUMP. BASIS OF DESIGN IS ECOCIRC XL 40-275.

FAN SCHEDULE									
MARK	CAPACITY CFM	ESP INCHES WG	FRPM	MOTOR HP	SOUND RATING SONES	TYPE	FAN CONTROL	BASIS OF DESIGN	MODEL
EF-7	3,080	0.125	1096	1	14.7	ROOF MOUNTED	THERMOSTAT	GREENHECK	G-160-VG
EF-9	4,622	0.375	1265	2	19.4	ROOF MOUNTED	INTERLOCK W/ AHU-1	GREENHECK	G-180-VG
EF-10	15,936	0.375	438	3	17.9	ROOF MOUNTED	INTERLOCK W/ AHU-1	GREENHECK	GB-420-30

- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS. PROVIDE ALL FANS WITH INTEGRAL DISCONNECTS.
 - PROVIDE ALL FANS WITH BACKDRAFT DAMPERS AND SPEED CONTROLLERS FOR BALANCING.
 - PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.

HYDRONIC PUMP SCHEDULE											
MARK	FLOW RATE	PUMP HEAD	MOTOR HP	RPM	DUTY POINT EFF (%)	MAX BHP	TYPE	FLOOR SPACE (SF)	VFD	BASIS OF DESIGN	MODEL
CHWP-1	270 GPM	80 FT	10	1800	72.6	7.5	BASE MOUNTED END SUCTION PUMP	5.53	Yes	BELL & GOSSETT	E-1510: 2EB
CHWP-2	270 GPM	80 FT	10	1800	72.6	7.5	BASE MOUNTED END SUCTION PUMP	5.53	Yes	BELL & GOSSETT	E-1510: 2EB
HWP-1	115 GPM	50 FT	3	1800	71.3	2.02	BASE MOUNTED END SUCTION PUMP	3.48	Yes	BELL & GOSSETT	E-1510: 2BD
HWP-2	115 GPM	50 FT	3	1800	71.3	2.02	BASE MOUNTED END SUCTION PUMP	3.48	Yes	BELL & GOSSETT	E-1510: 2BD

- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS.
 - VFD'S WITH INTEGRAL DISCONNECTS SHALL BE PROVIDED FOR ALL PUMPS BY THE CONTROLS CONTRACTOR.
 - PUMPS SHALL BE INTEGRATED INTO THE BUILDING AUTOMATION SYSTEM. SEE CONTROLS SEQUENCES.
 - PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT AND INERTIA BASE MOUNT.

BOILER CIRCULATION PUMP SCHEDULE							
MARK	DESIGN FLOW	HEAD FT.	ELECTRICAL INPUT POWER (HP)	DUTY POINT EFF (%)	DUTY POINT RPM	MANUFACTURER	MODEL
BP-1	151 GPM	10.0	0.636	58.9	2010	BELL & GOSSETT	ECOCIRC XL 40-275
BP-2	151 GPM	10.0	0.636	58.9	2010	BELL & GOSSETT	ECOCIRC XL 40-275

- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS.
 - PROVIDE ALL PUMPS WITH AQUASTATS AND TIMERS.
 - PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.

INSTANTANEOUS GAS WATER HEATER SCHEDULE									
MARK	INPUT (MBH)	GPM @ 77° TEMP RISE	GAS SUPPLY SIZE	FUEL	VENT DIAMETER	UNIFORM ENERGY FACTOR	TURNDOW N	MANUFACTURER	MODEL
GWH-1	199	5.1 GPM	3/4"	NATURAL GAS	2"	0.95	11:1	BRADFORD WHITE	RTG-R-199-N1

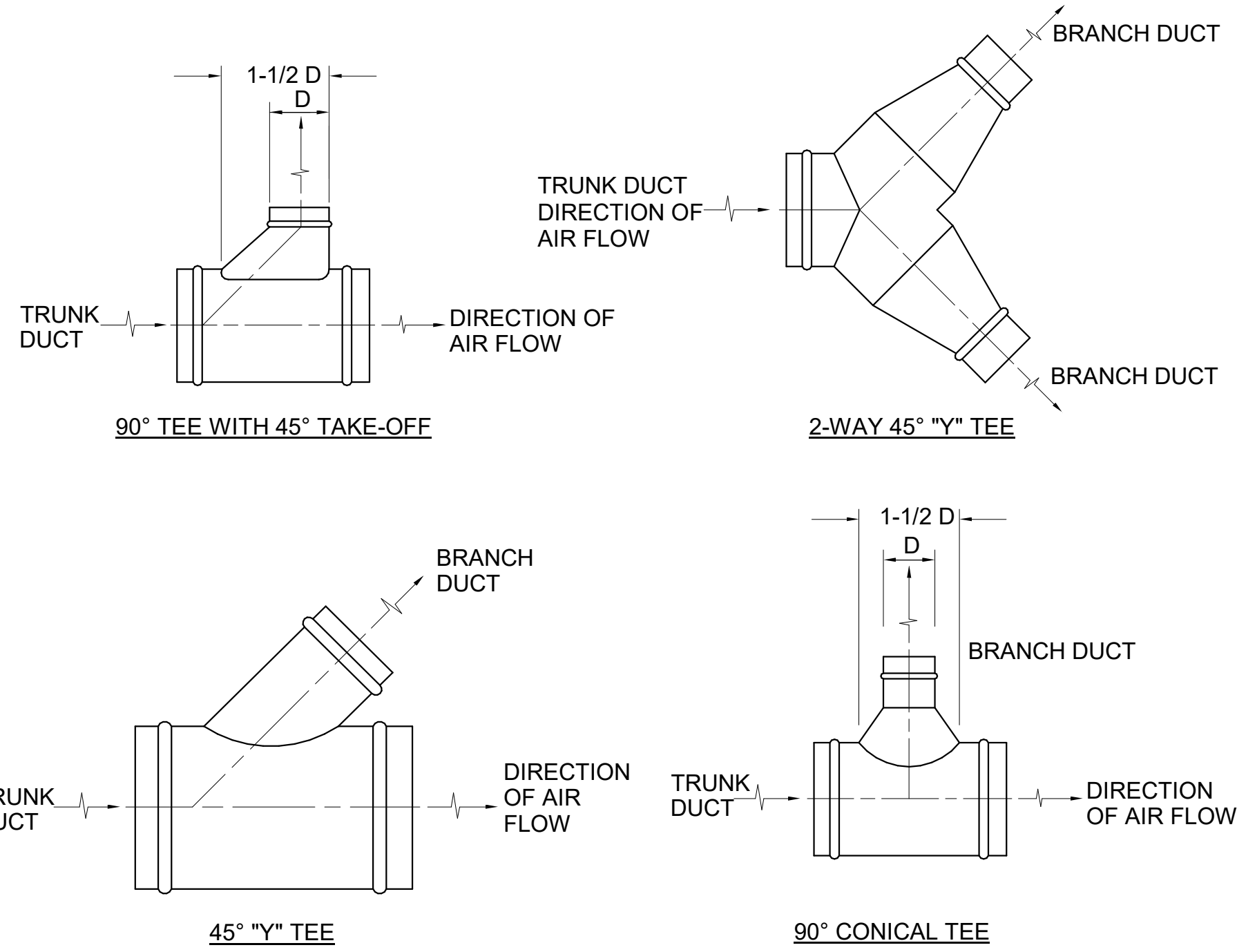
- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS.
 - INSTALL PER MANUFACTURER'S INSTRUCTIONS.
 - ROUTE CONDENSATE TO A NEUTRALIZING KIT PER THE MANUFACTURER'S INSTRUCTIONS.
 - PROVIDE A DELEGATED DESIGN FOR SEMSIC RESTRAINT.

DOMESTIC WATER STORAGE TANK SCHEDULE						
MARK	TANK VOLUME (GALLONS)	TANK DIAMETER (INCHES)	RATED PRESSURE	DESCRIPTION	BASIS OF DESIGN	MODEL
ST-1	80	25"	150 psi	ASME RATED INSULATED VERTICAL GLASS LINED TANK	LOCHINVAR	RJS085M

- NOTES:
- TANK SHALL BE PAD MOUNTED. PROVIDE A DELEGATED DESIGN FOR SEISMIC RESTRAINT.
 - TANK SHALL BE ASME RATED.

DOMESTIC HOT WATER RECIRCULATING PUMP SCHEDULE					
MARK	DESIGN FLOW	HEAD FT W.G.	MOTOR POWER (WATTS)	MANUFACTURER	MODEL
RP-1	5.1 GPM	7.5	70	BELL & GOSSETT	ECOCIRC 20-18
RP-2	8.0 GPM	20.0	70	BELL & GOSSETT	ECOCIRC 20-18

- NOTES:
- SEE ELECTRICAL FOR VOLTAGE REQUIREMENTS.
 - PROVIDE ALL PUMPS WITH AQUASTATS AND TIMERS.



1 ROUND DUCT BRANCH TAKE OFF DETAIL
M003 NOT TO SCALE

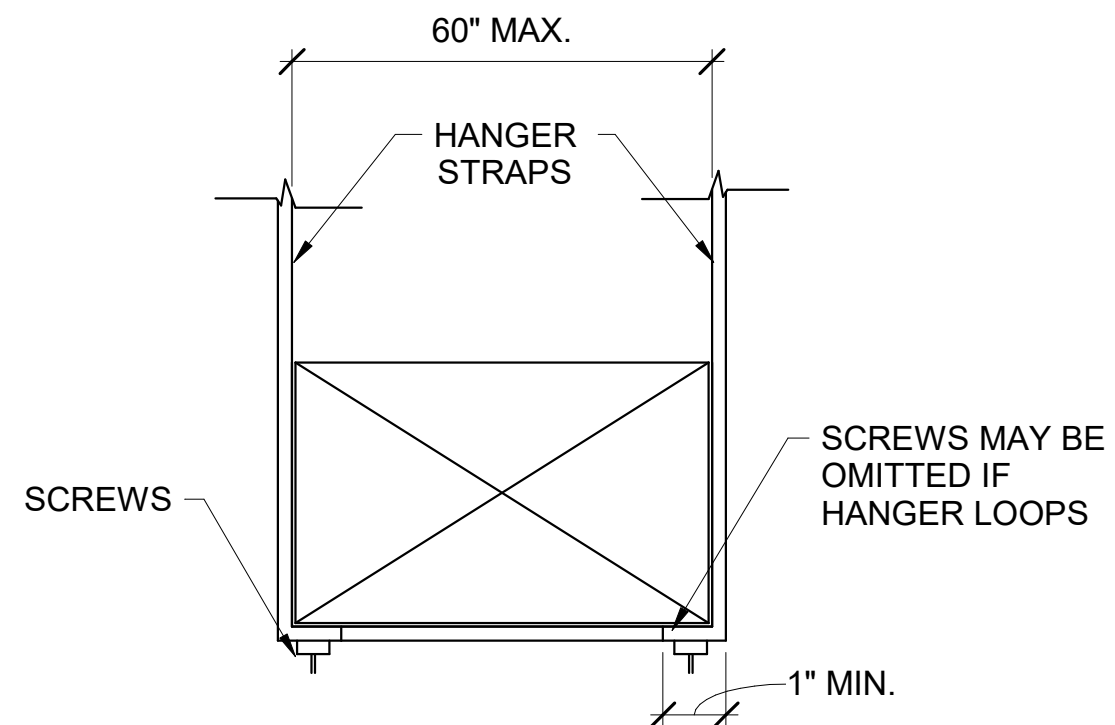
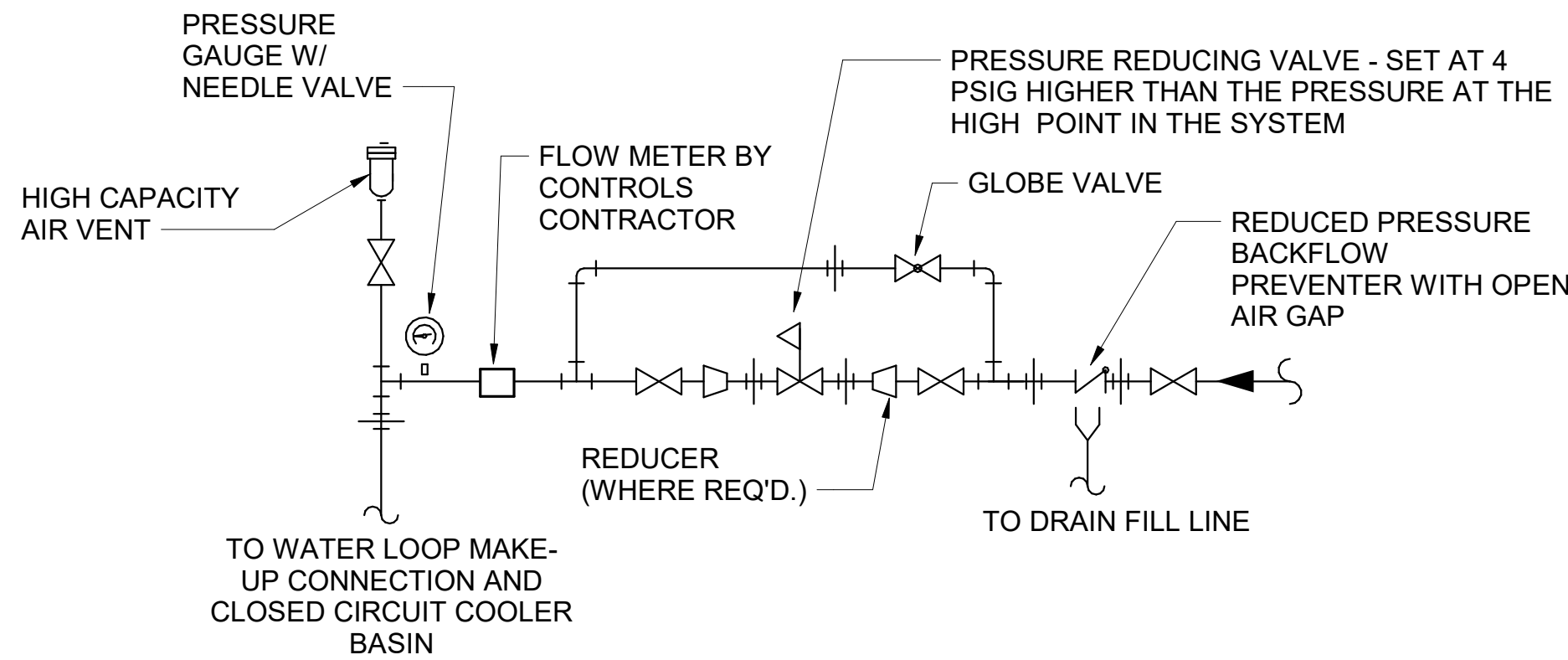
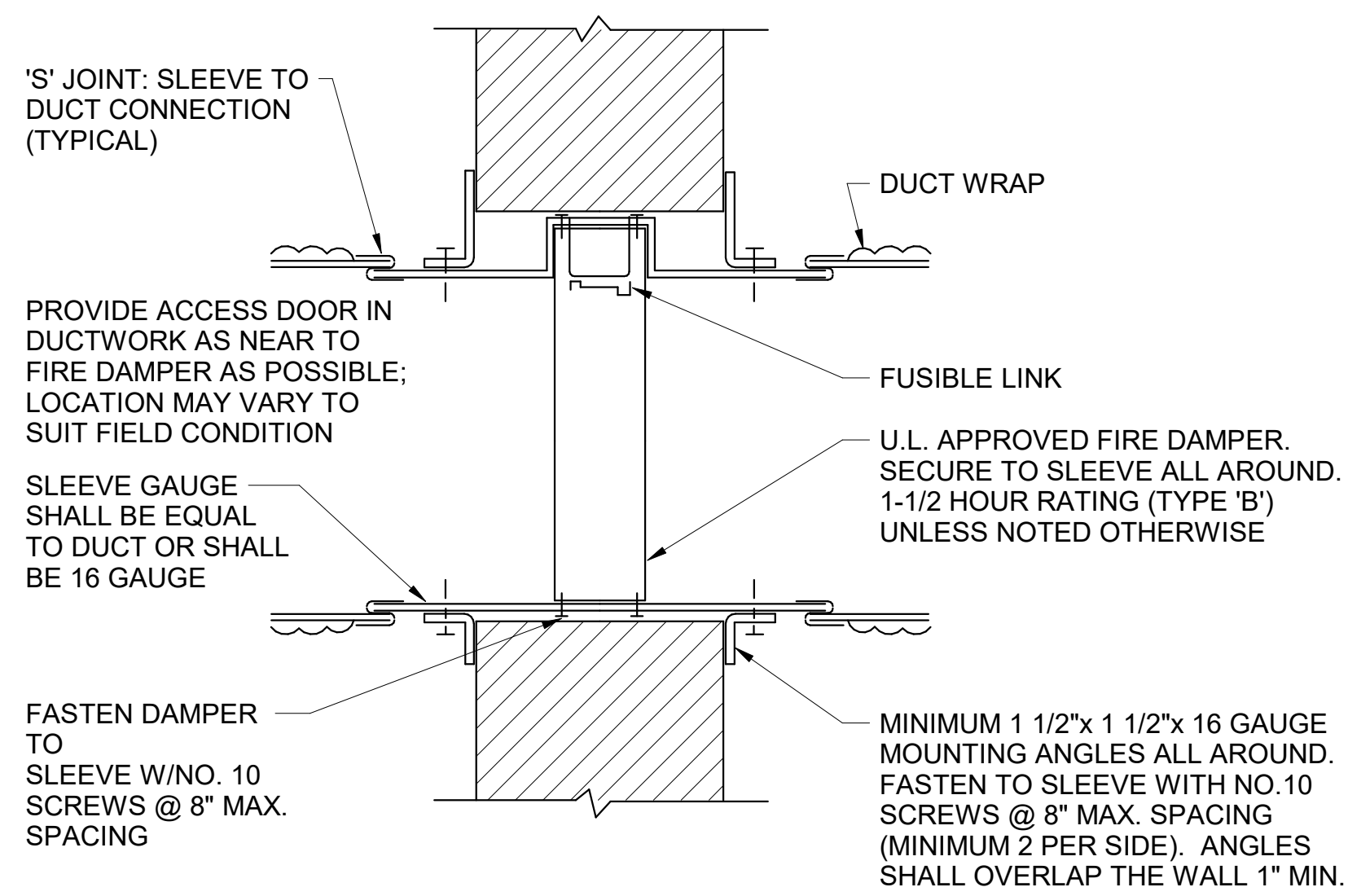


TABLE 4-1 RECTANGULAR DUCT HANGERS MINIMUM SIZE								
MAXIMUM HALF OF DUCT PERIMETER	PAIR AT 10 FT. SPACING		PAIR AT 8 FT. SPACING		PAIR AT 5 FT. SPACING		PAIR AT 4 FT. SPACING	
	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD
P/2= 30"	1" X 22 GA.	10 GA. (.135")	1" X 22 GA.	10 GA. (.135")	1" X 22 GA.	12 GA. (.106")	1" X 22 GA.	12 GA. (.106")
P/2= 72"	1" X 18 GA.	3/8"	1" X 20 GA.	1/4"	1" X 22 GA.	1/4"	1" X 22 GA.	1/4"
P/2= 96"	1" X 16 GA.	3/8"	1" X 18 GA.	3/8"	1" X 20 GA.	3/8"	1" X 22 GA.	1/4"
P/2= 120"	1-1/2"X16GA.	1/2"	1" X 16 GA.	3/8"	1" X 18 GA.	3/8"	1" X 20 GA.	1/4"
P/2= 168"	1-1/2"X16GA.	1/2"	1-1/2"X16GA.	1/2"	1" X 16 GA.	3/8"	1" X 18 GA.	3/8"
P/2= 192"	NOT GIVEN	1/2"	1-1/2"X16GA.	1/2"	1" X 16 GA.	3/8"	1" X 16 GA.	3/8"
P/2=193" UP	SPECIAL ANALYSIS REQUIRED							
WHEN STRAPS ARE LAP JOINED, USE THESE MINIMUM FASTENERS 1" X 18,20,22 GA. - TWO #10 OR ONE 1/4" BOLT 1" X 16 GA. - TWO 1/4" DIA. 1-1/2" X 16 GA. - TWO 3/8" DIA. PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE.			SINGLE HANGER MAXIMUM ALLOWABLE LOAD					
			STRAP		WIRE OR ROD (DIA.)			
			1" X 22 GA. - 260 LBS.		1/4"-270 LBS.			
			1" X 20 GA. - 320 LBS.		3/8"-680 LBS.			
			1" X 18 GA. - 420 LBS.		1/2"-1250 LBS.			
			1" X 16 GA. - 700 LBS.		5/8"-2000 LBS.			
			1-1/2" X 16 GA. - 1100 LBS.		3/4"-3000 LBS.			

4 SUPPORT DETAIL
M003 NOT TO SCALE



7 MAKE-UP WATER PIPING CONNECTION DETAIL
M003 NOT TO SCALE

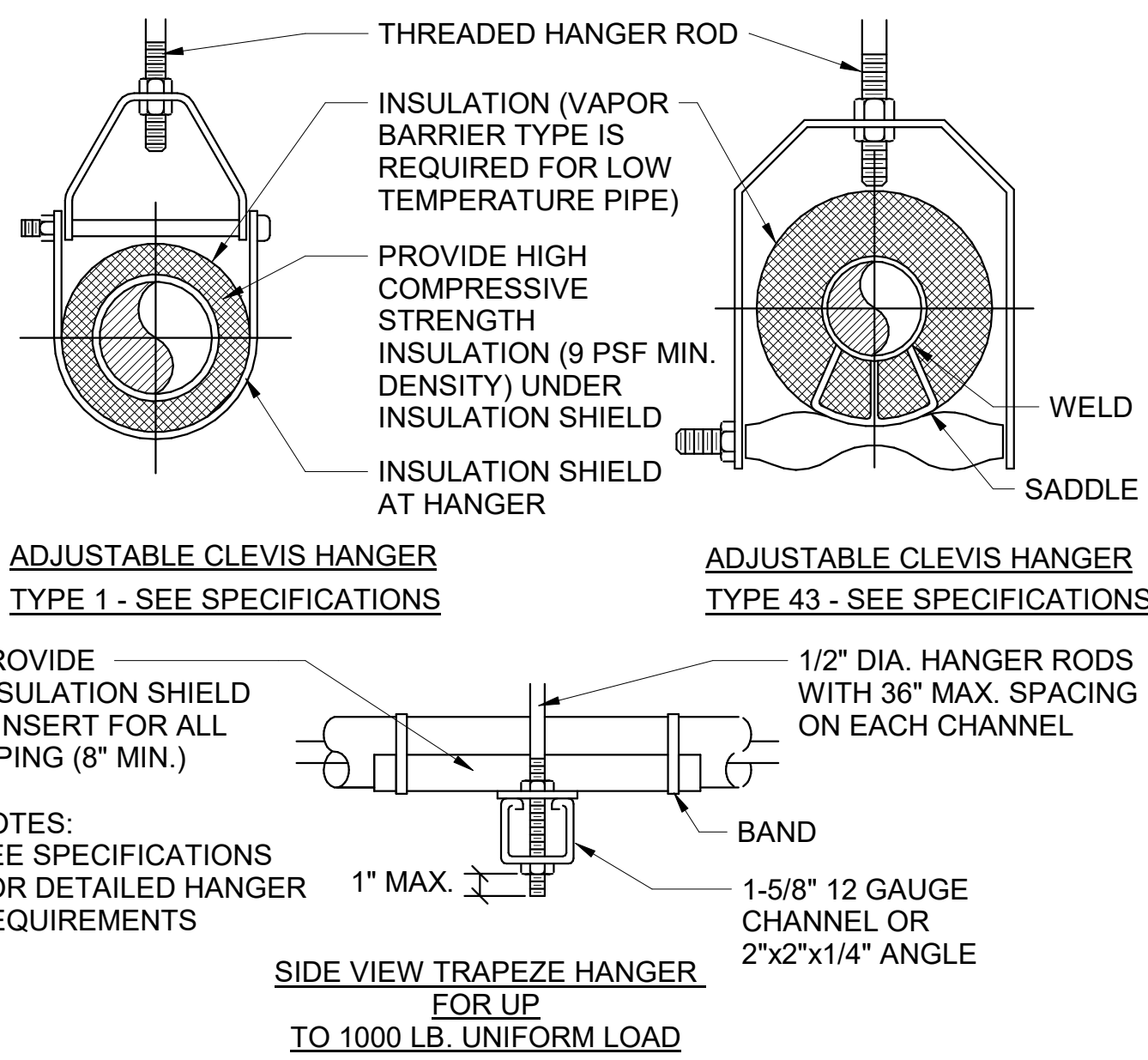


- NOTES:
- WALL OPENINGS SHALL BE 1/8" PER FOOT LARGER THAN THE OVERALL DAMPER/SLEEVE ASSEMBLY. MINIMUM OPENING SHALL BE AT LEAST 1/4" ON ALL SIDES.
 - ABOVE SHOWS TYPICAL REQUIREMENTS FOR THE INSTALLATION OF A FIRE DAMPER. MODIFY INSTALLATION TO MEET U.L. LISTED INSTALLATION INSTRUCTIONS PUBLISHED BY THE MANUFACTURER.

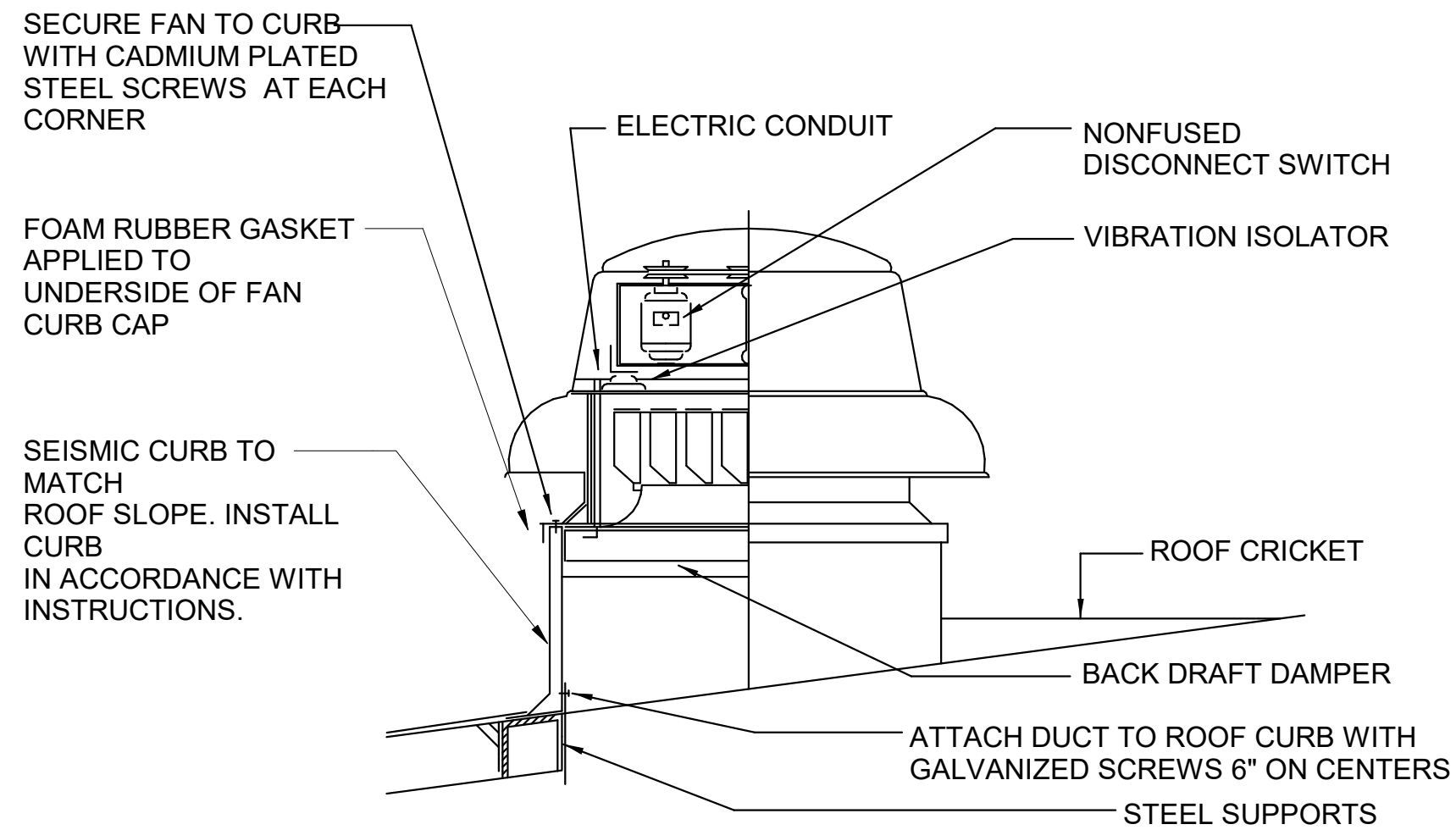
2 FIRE DAMPER INSTALLATION DETAIL
M003 NOT TO SCALE

MAXIMUM PIPE/TUBING SUPPORT SPACING												
NOM. SIZE	IN.	THRU 3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
PIPE	FT.	7	7	7	9	10	11	12	14	16	17	19
TUBING	FT.	5 FT	6	7	8	8	9	10	12	13	14	16

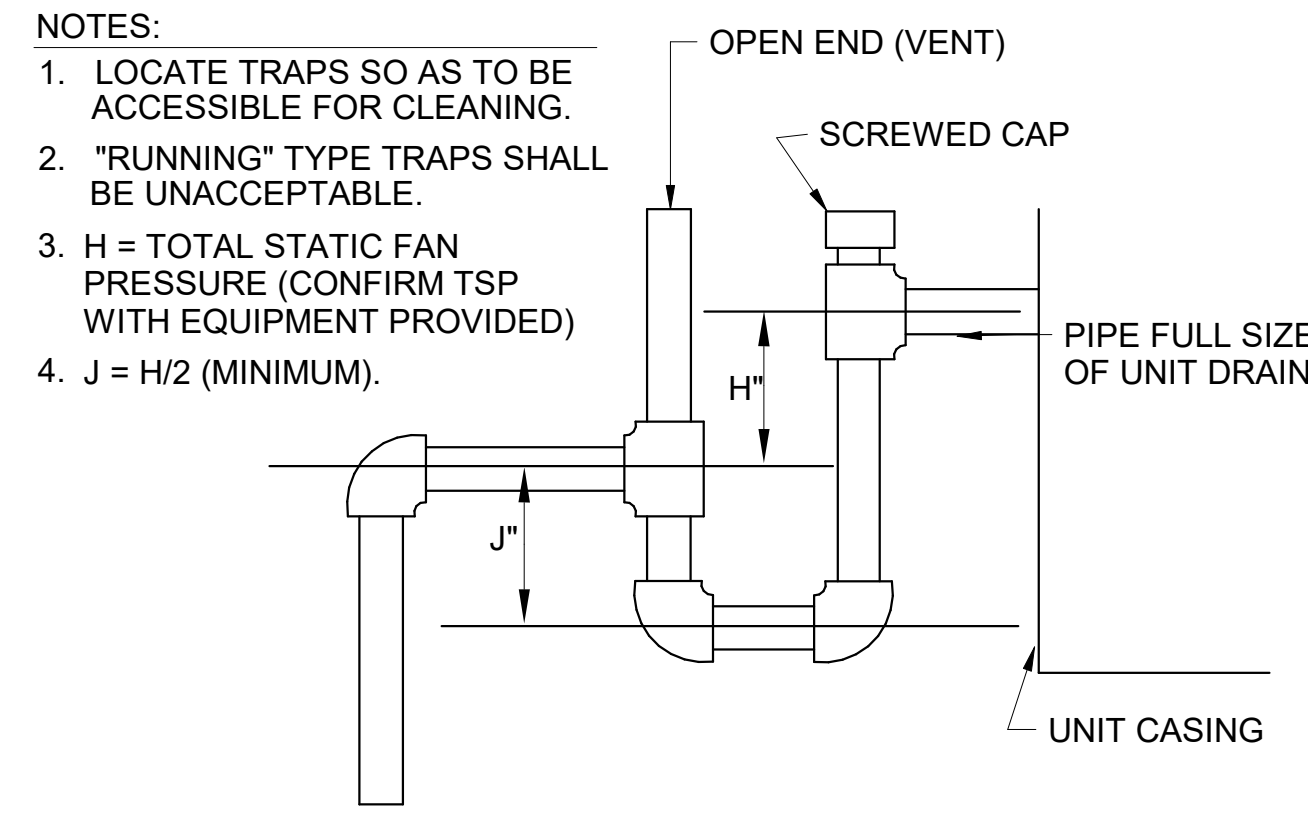
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE



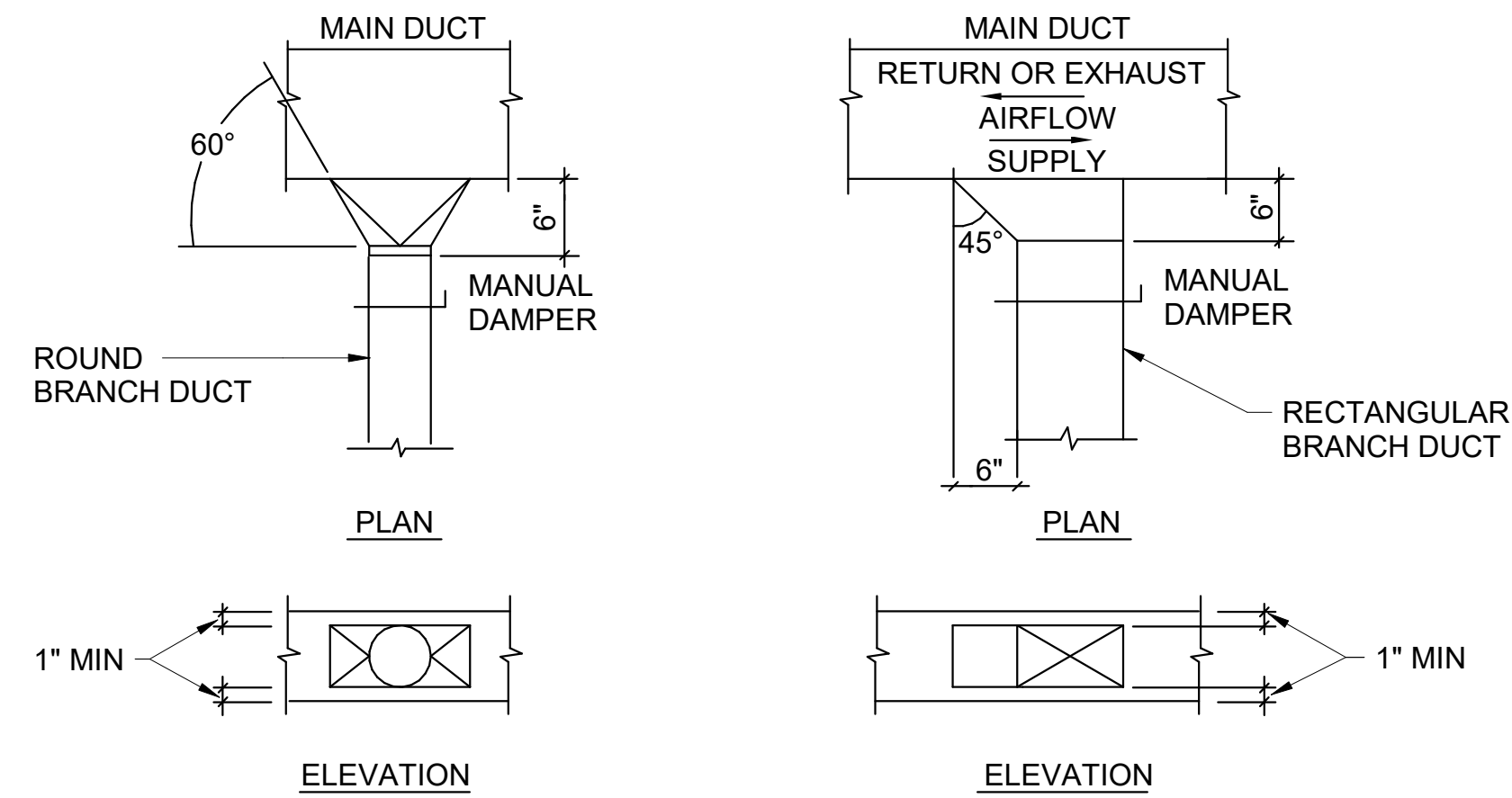
5 MECHANICAL PIPE SUPPORT DETAIL
M003 NOT TO SCALE



8 ROOF EXHAUST FAN INSTALLATION DETAIL
M003 NOT TO SCALE

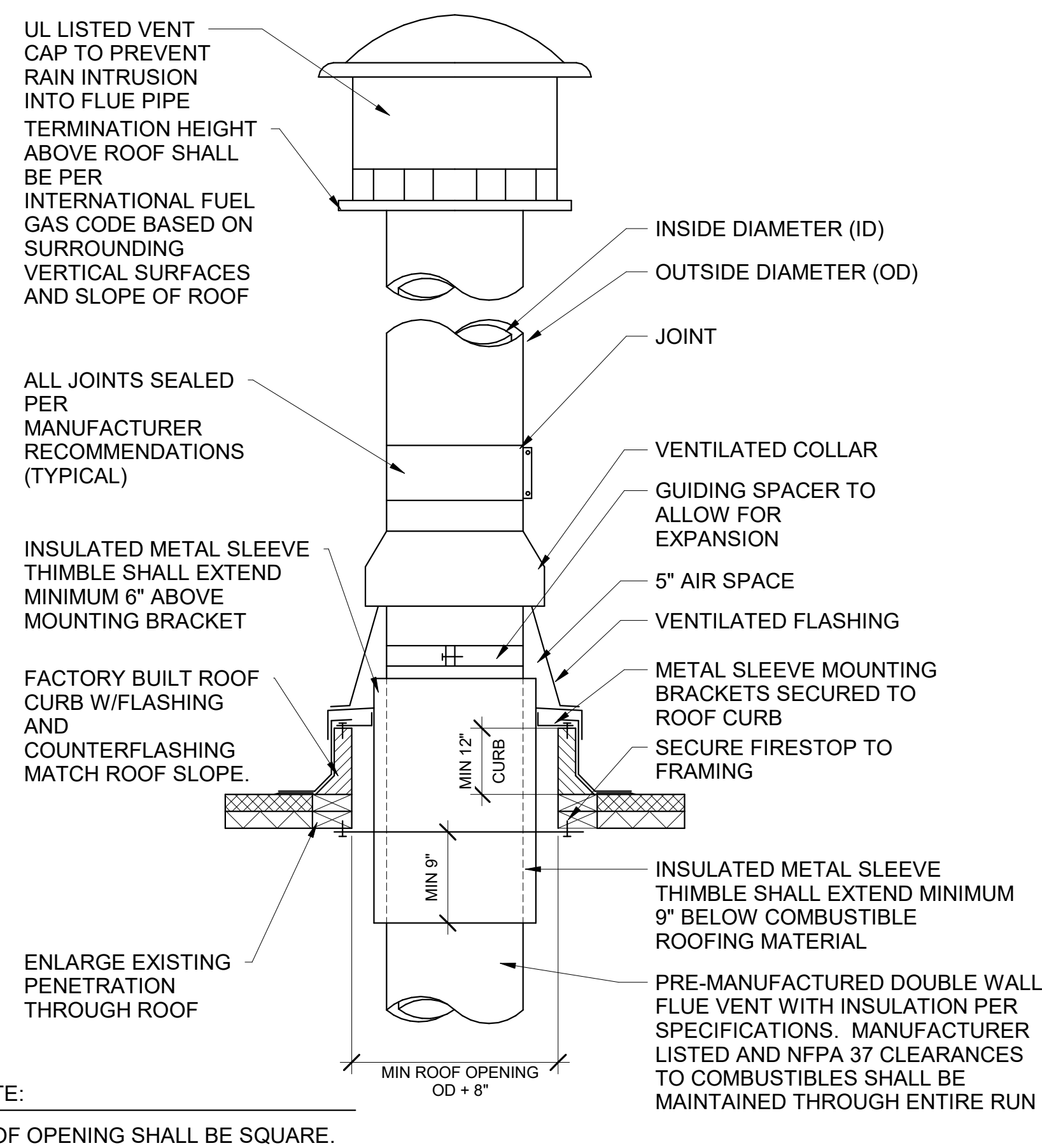


3 CONDENSATE DRAIN TRAP INSTALLATION DETAIL
M003 NOT TO SCALE



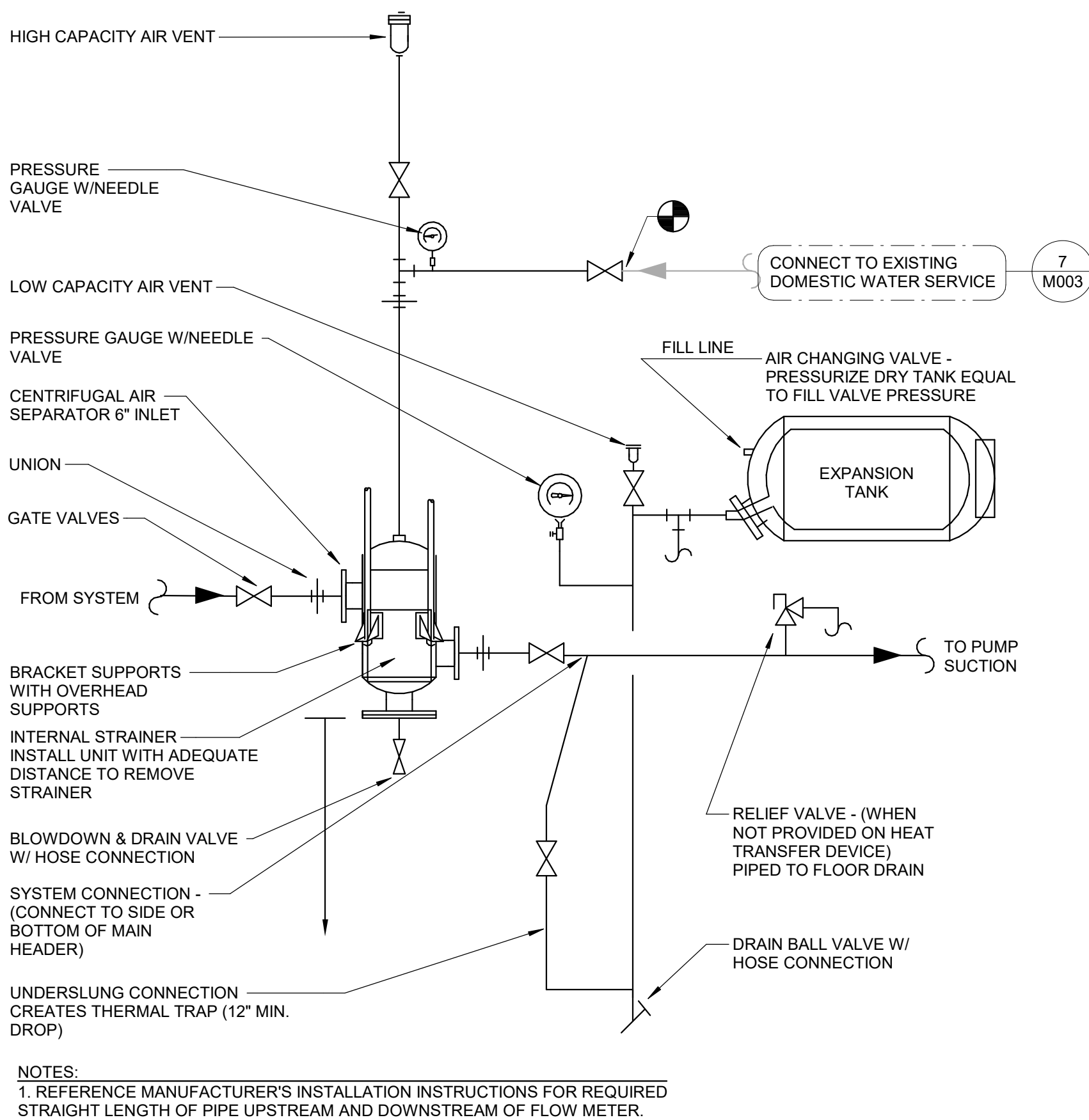
- NOTES:
- CONTRACTOR MAY SUBSTITUTE A MANUFACTURED FITTING FOR THE DETAILED TAKE-OFF ABOVE.
 - TAKE-OFFS IN MEDIUM PRESSURE DUCT SHALL HAVE AN OVERSIZED INTAKE.
 - SPIN-IN FITTINGS WITH INTEGRAL SCOOP AND DAMPER SHALL ONLY BE USED ON LOW PRESSURE DUCT.
 - FITTINGS SHALL BE SCREWED TO THE TRUNK DUCT AND SEALED WITH MASTIC. MASTIC TAPE IS NOT ACCEPTABLE, SEE SPECIFICATIONS.
 - IF VAV BOX IS LOCATED IN BRANCH DUCT, BALANCE DAMPER SHALL NOT BE INSTALLED IN TAKOFF FROM MAIN TRUNK DUCT.

6 TYPICAL DUCT TAKE OFF INSTALLATION DETAIL
M003 NOT TO SCALE

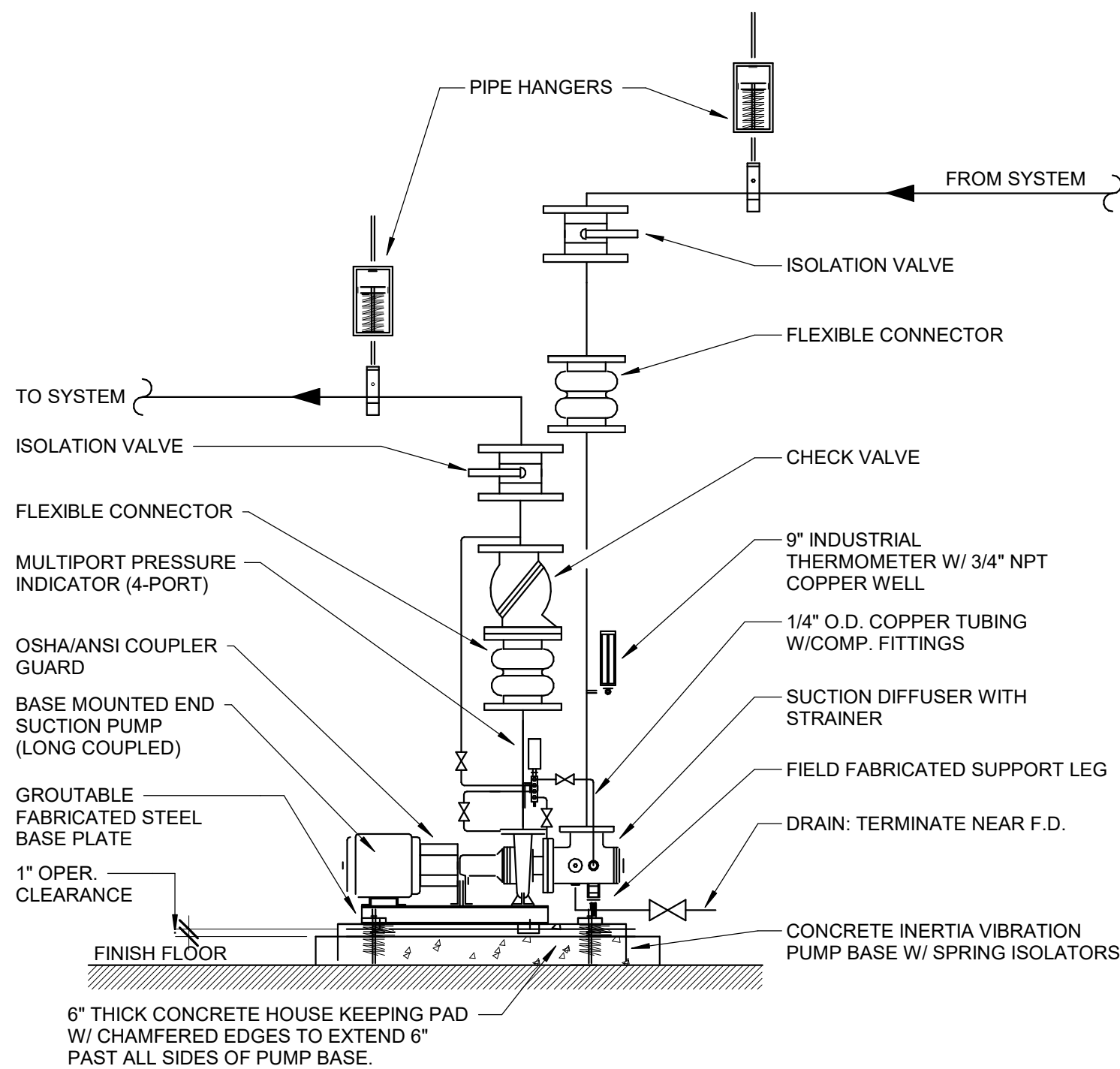


9 FLUE ROOF PENETRATION DETAIL
M003 NOT TO SCALE

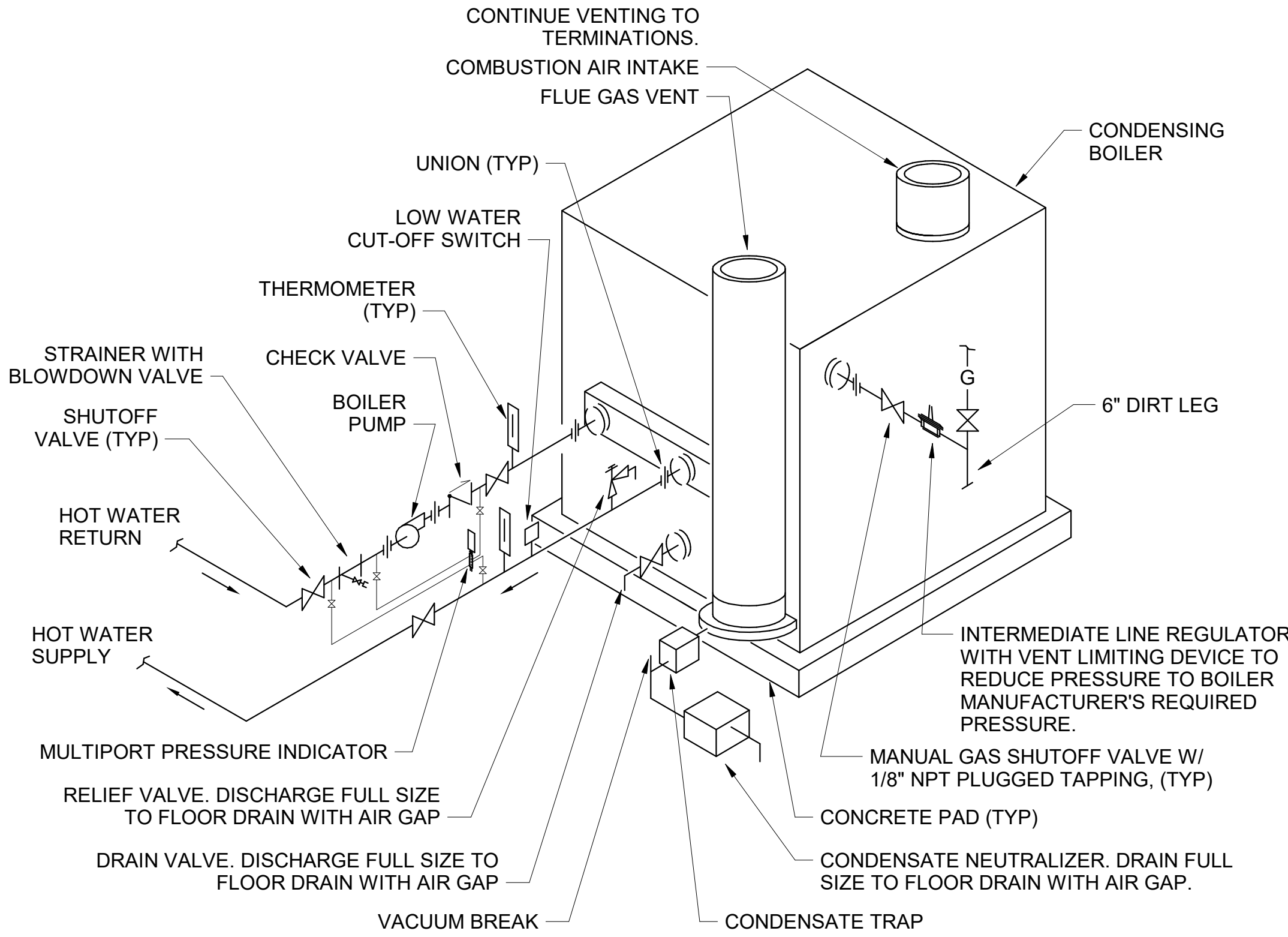
#	Description	01/01/01
JOB No. 23253-01		
DATE: 06/18/2025		
DRAWN BY: ACR		
CHECKED BY: WDB		
SHEET NUMBER		



1 AIR SEPARATOR AND EXPANSION TANK PIPING DETAIL
NOT TO SCALE



2 END SUCTION PUMP DETAIL
NOT TO SCALE

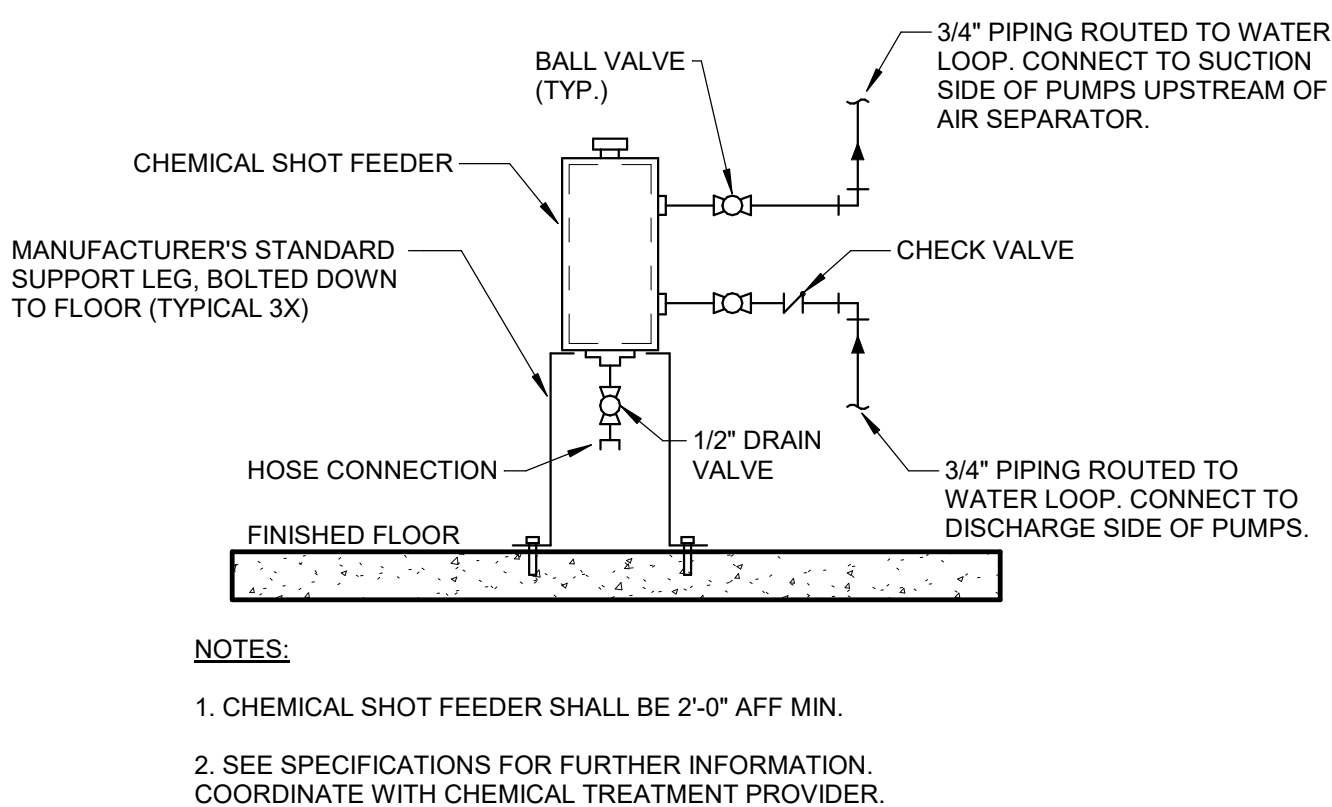


- NOTES:
- DRAIN VALVE AND CONDENSATE DRAIN TRAP SHOULD BE ARRANGED TO PERMIT THE FLUIDS TO DRAIN FREELY, BY GRAVITY, TO A NEARBY FLOOR DRAIN. CONDENSATE SHALL DRAIN THROUGH A CONDENSATE NEUTRALIZER. RELIEF VALVE SHOULD BE PIPED VERTICALLY TO A HEIGHT 18" ABOVE FLOOR DRAIN.
 - LOCATE WATER INLET AND OUTLET FITTINGS (I.E. UNIONS, ELBOWS, ETC.) A MINIMUM OF 6" FROM BOILER FITTINGS TO PREVENT INTERFERENCE WITH REMOVAL OF BOILER PANELS AND COVERS. ALL PIPING AND ELECTRIC CONNECTIONS (SERVICE SWITCHES, CONDUIT BOXES) SHOULD LIKEWISE BE 6" AWAY FROM SIDE PANELS.
 - FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

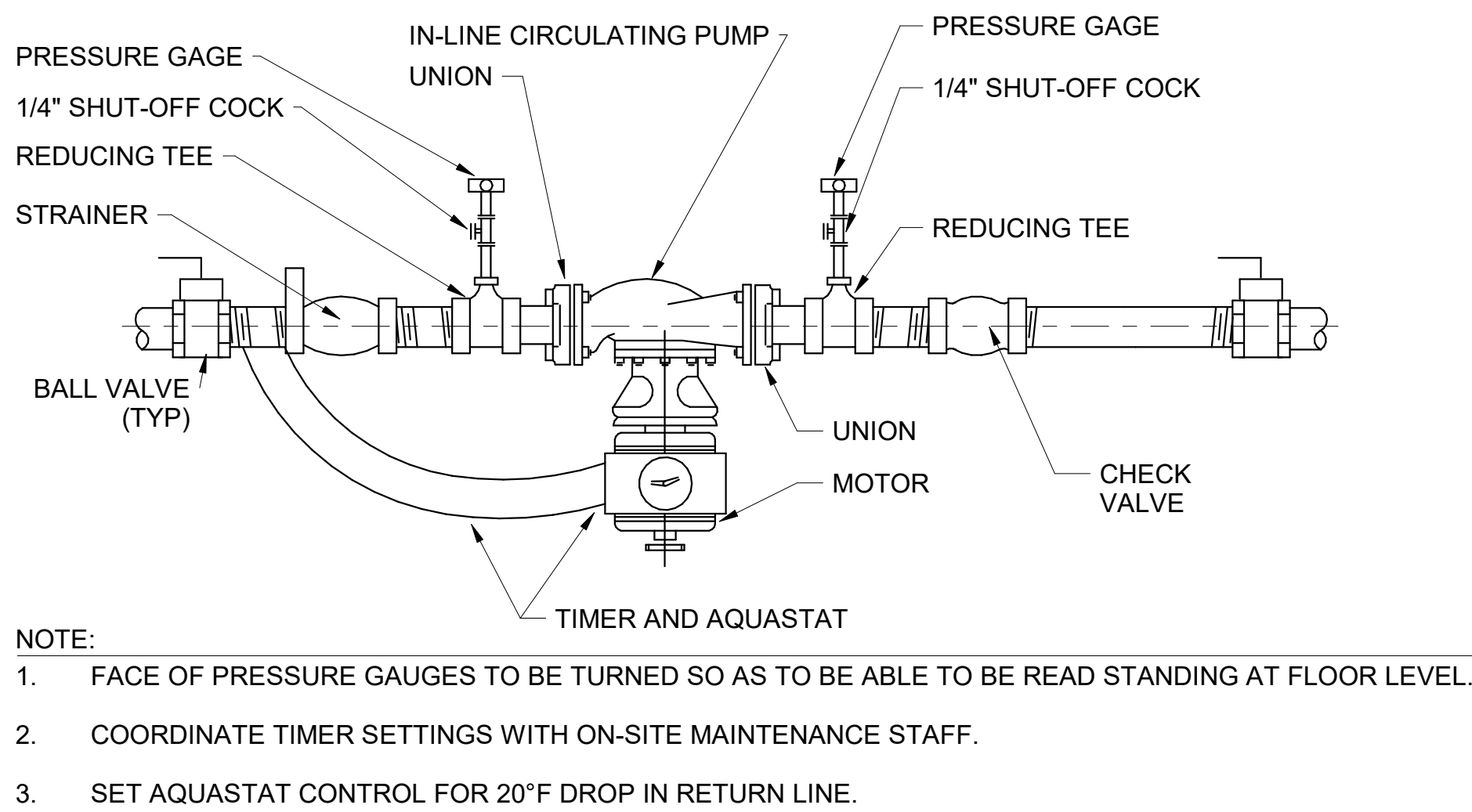
INSTALLATION, INSPECTION, & COMMISSIONING NOTES:

- INSTALLING CONTRACTOR MUST HAVE A BL SUB CLASSIFICATION.
- STEPS FOR BOILER INSPECTION & COMMISSIONING:
 - THE CONTRACTOR SHALL FILL OUT THE I-1 FORM FOR EACH BOILER INSTALLATION AND SCHEDULE A THIRD PARTY INSPECTION PRIOR TO ANY FIELD INSTALLED INSULATION.
 - THIRD PARTY INSPECTOR TO PROVIDE A REPORT TO LLR AND OSE TO REVIEW.
 - MANUFACTURER SHALL PERFORM STARTUP AND TESTING AND PROVIDE DOCUMENTATION TO THE OWNER AND LLR FOR BOILER COMMISSIONING.
 - OWNER'S INSURANCE COMPANY WILL INSPECT THE BOILER INSTALLATION.
 - SUBSTANTIAL COMPLETION INSPECTION CAN BE SCHEDULED AND OSE CAN PROVIDE THE CERTIFICATE OF OCCUPANCY AFTER SUBSTANTIAL COMPLETION.

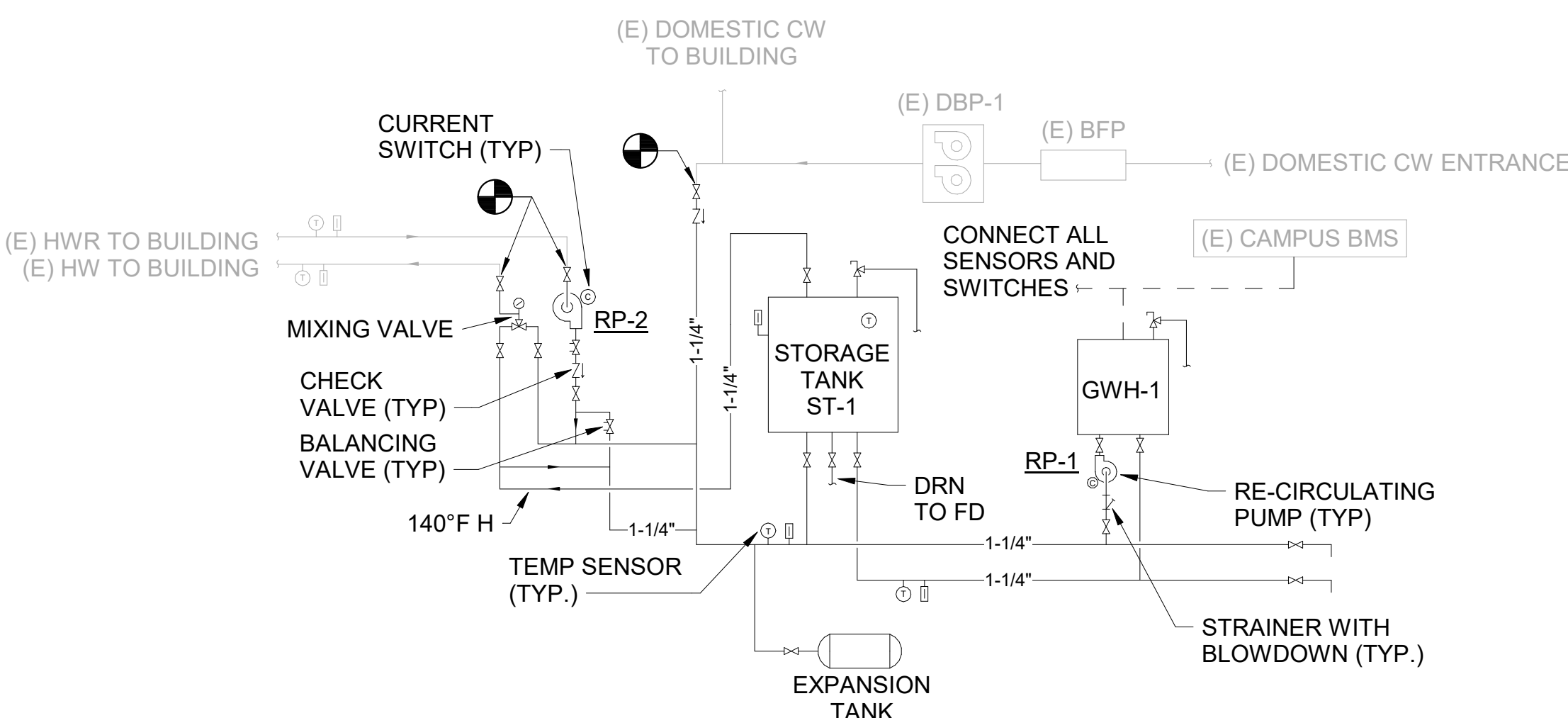
3 BOILER INSTALLATION DETAIL
NOT TO SCALE



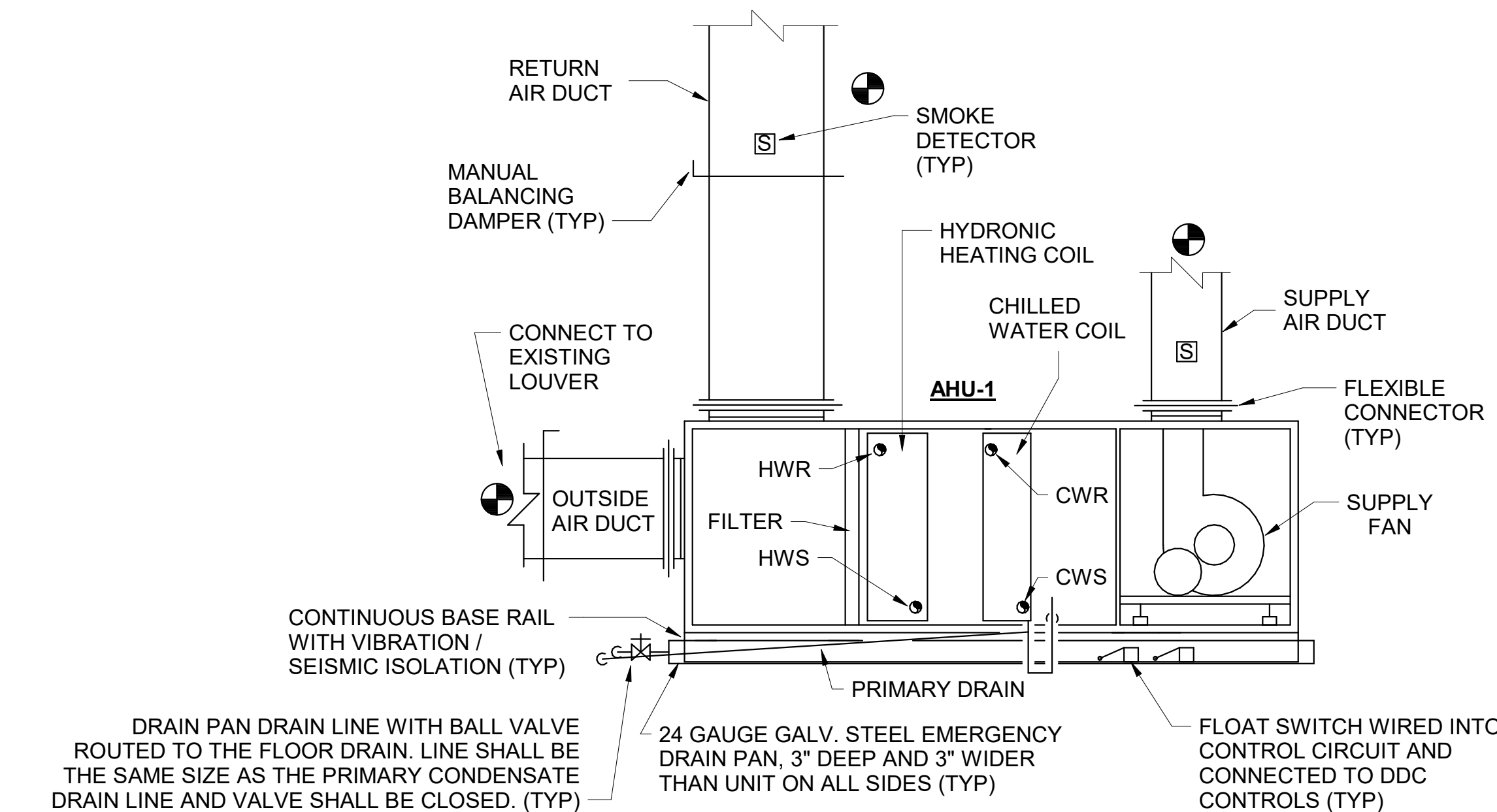
4 CHEMICAL TREATMENT INSTALLATION DETAIL
NOT TO SCALE



5 IN-LINE CIRCULATING PUMP DETAIL
NOT TO SCALE

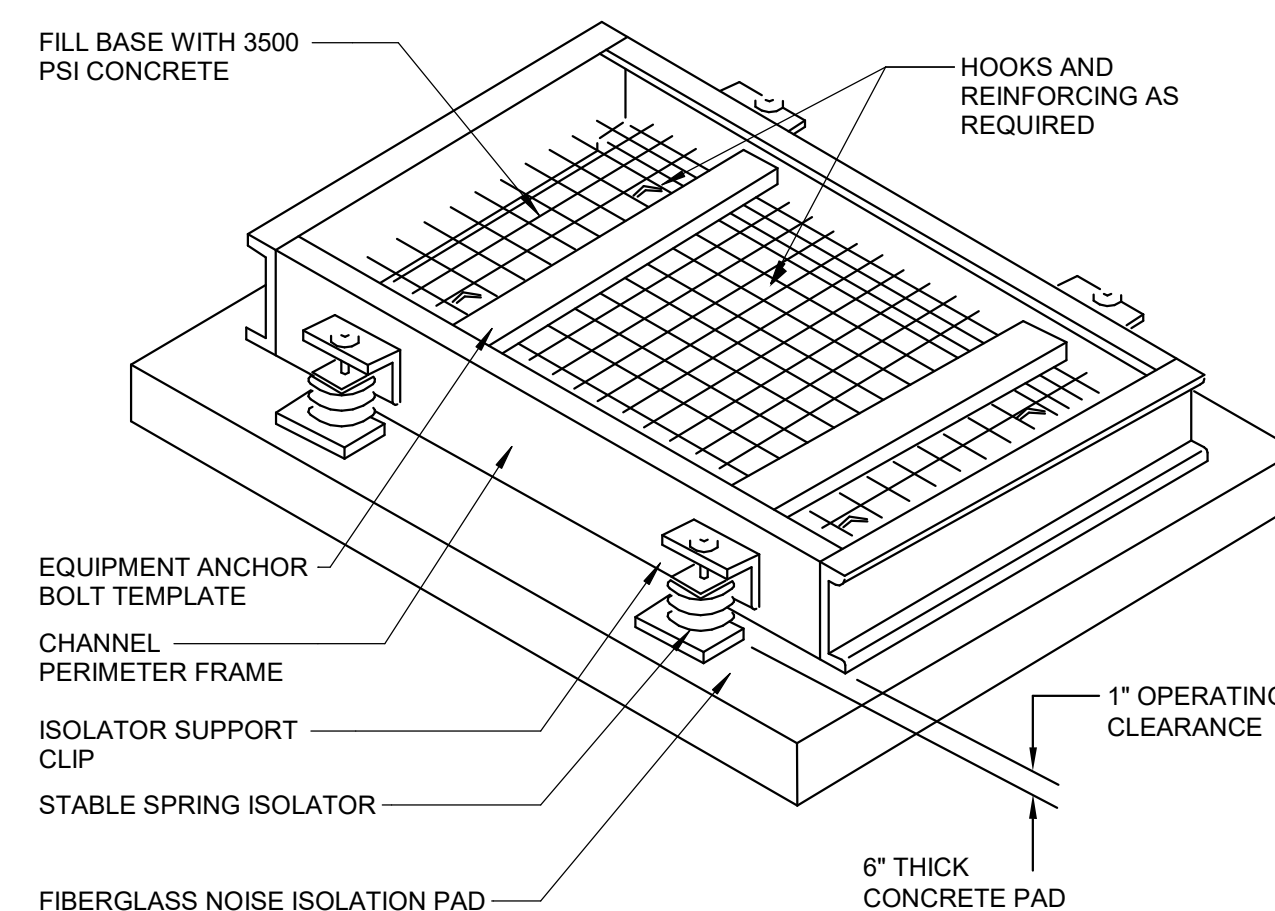


6 DOMESTIC HOT WATER PIPING SCHEMATIC
NOT TO SCALE

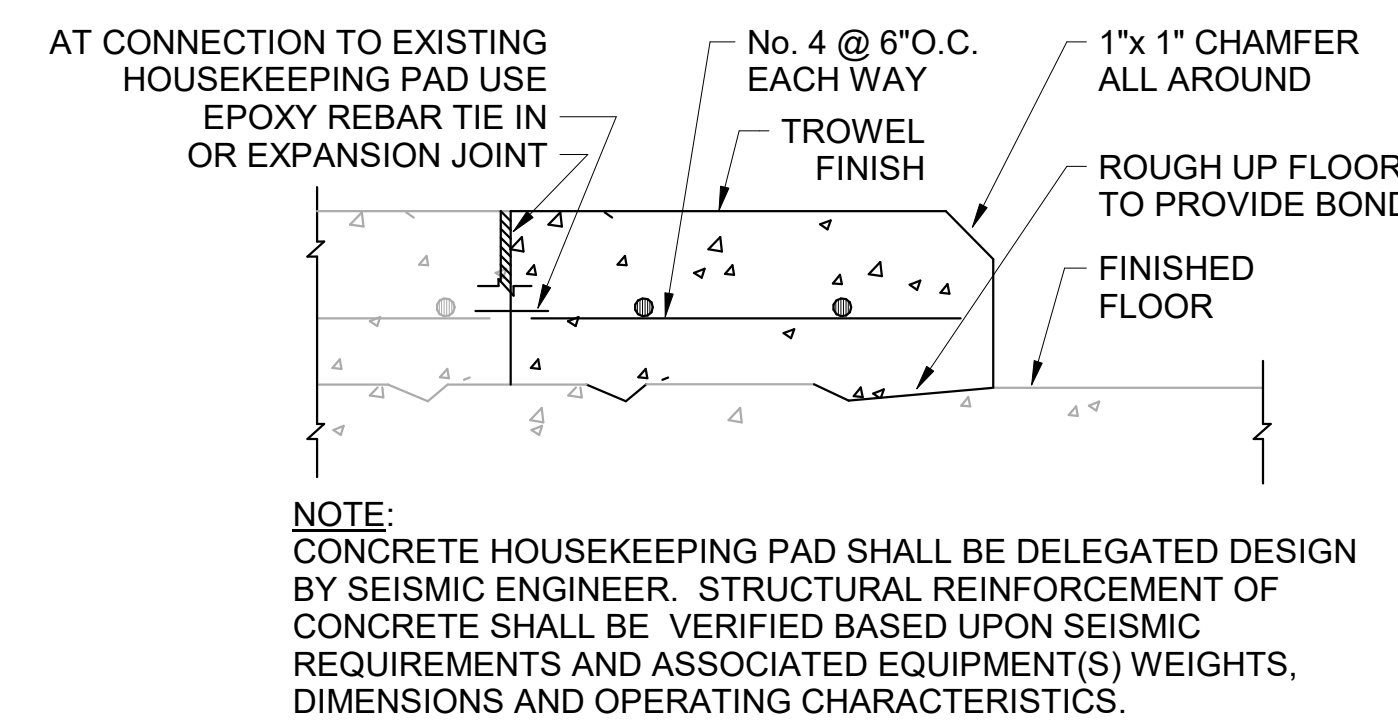


- NOTES:
- ROUTE INSULATED DRAIN LINES AS INDICATED ON DRAWINGS. ALL DRAIN LINES SHALL SLOPE AT LEAST 1" PER 10 FT CONTINUOUSLY. LINES SHALL NOT BE ALLOWED TO RUN ALONG THE CEILING STRUCTURE AND RISE UP AGAIN. SEE DRAIN P-TRAP INSTALLATION DETAIL FOR ADDITIONAL INFORMATION.
 - ADJUST UNIT SUPPORT HEIGHT FOR PROPER PIPING AND MAINTENANCE CLEARANCE.
 - SMOKE DETECTOR (SUPPLIED BY THE ELECTRICAL CONTRACTOR) SHALL BE INSTALLED IN THE RETURN AIR AND SUPPLY AIR DUCTS BY THE MECHANICAL CONTRACTOR AS SHOWN. SMOKE DETECTOR SHALL BE WIRED (BY THE CONTROL CONTRACTOR) TO SHUT DOWN THE SUPPLY FAN UPON SENSING SMOKE. SMOKE DETECTOR SHALL BE WIRED TO THE BUILDING FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR.

7 AIR HANDLING UNIT INSTALLATION DETAIL
NOT TO SCALE



8 INERTIA BASE DETAIL
NOT TO SCALE



9 CONCRETE HOUSEKEEPING PAD DETAIL
NOT TO SCALE

#	Description	01/01/01
JOB No.	23253-01	
DATE:	06/18/2025	
DRAWN BY:	ACR	
CHECKED BY:	WDB	
SHEET	NUMBER	

1 HYDRONIC HOT WATER PIPING DIAGRAM
M005 NOT TO SCALE

HOT WATER SYSTEM SEQUENCE OF OPERATIONS

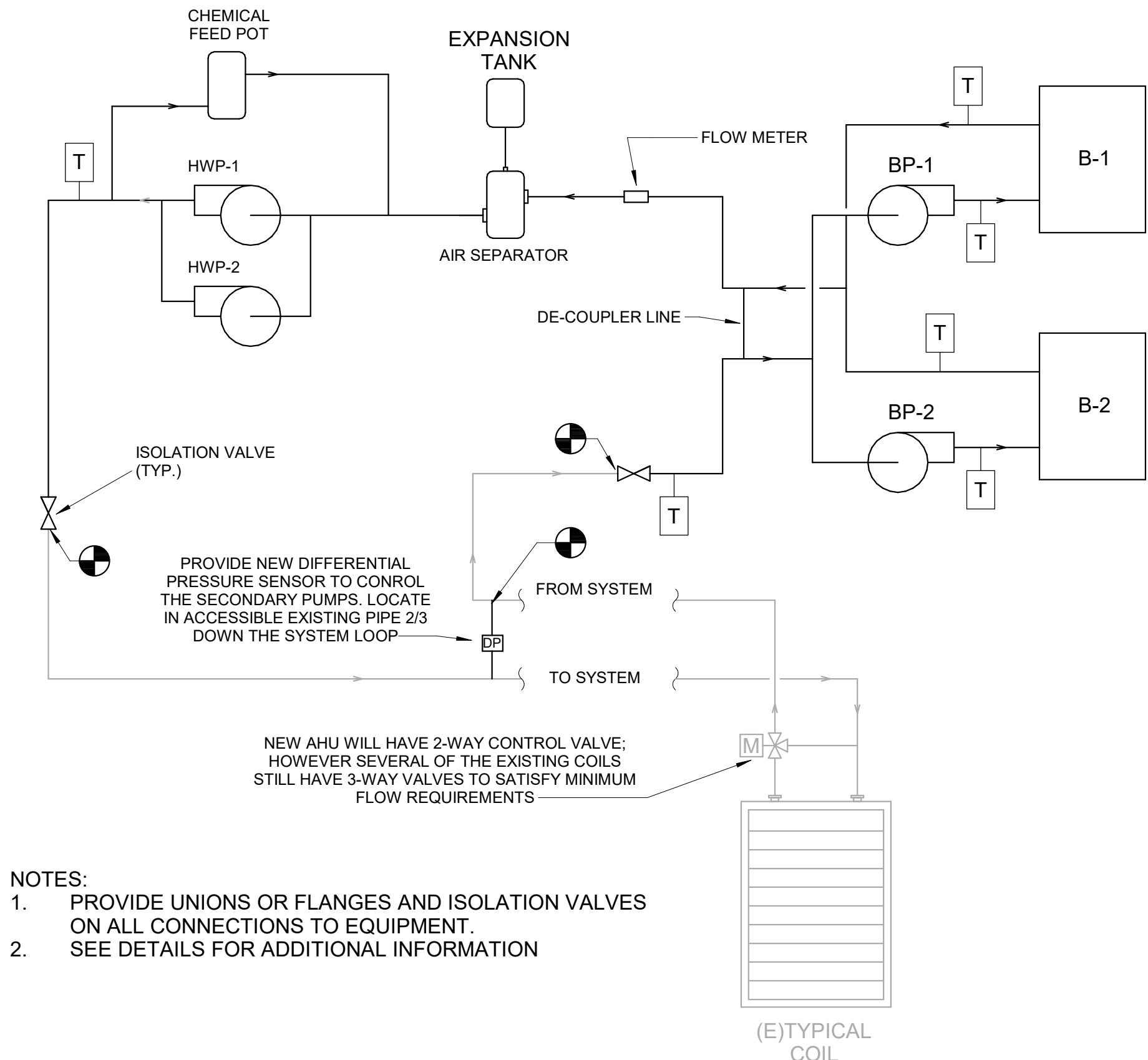
THE HOT WATER SYSTEM PUMPS AND BOILER SHALL BE ENERGIZED TO PROVIDE HEATING HOT WATER.

THE BAS SYSTEM SHALL INTERFACE TO THE BOILER SYSTEM CONTROL UTILIZING BACNET. THE BAS SHALL ENABLE THE BOILER SYSTEM CONTROLLER. THE BOILER SYSTEM CONTROLLER SHALL CONTROL THE BOILER CIRCULATION PUMPS, ROTATE THE LEAD AND STAND-BY BOILERS TO EQUALIZE RUN TIME, AND ALSO SHALL PROVIDE STAGING OF THE HEATING BASED ON BUILDING HOT WATER SUPPLY TEMPERATURE. IN THE EVENT OF LEAD BOILER FAILURE THE STAND-BY BOILER SHALL BE ENERGIZED AND GENERATE AN ALARM AT THE OPERATOR'S WORKSTATION. OUTDOOR TEMPERATURE RESET SCHEDULE SHALL BE CONTROLLED THROUGH THE BAS WITH MIN SETPOINT (ADJ), MAX SETPOINT (ADJ), AND THE ABILITY TO DISABLE/ENABLE THE RESET MODE FOR A FIXED HOT WATER SUPPLY TEMPERATURE. THE BAS SHALL MONITOR THE SYSTEM BOILER ALARMS AND RELAY/GENERATE ANY AND ALL SYSTEM ALARMS AT THE OPERATOR'S WORKSTATION.

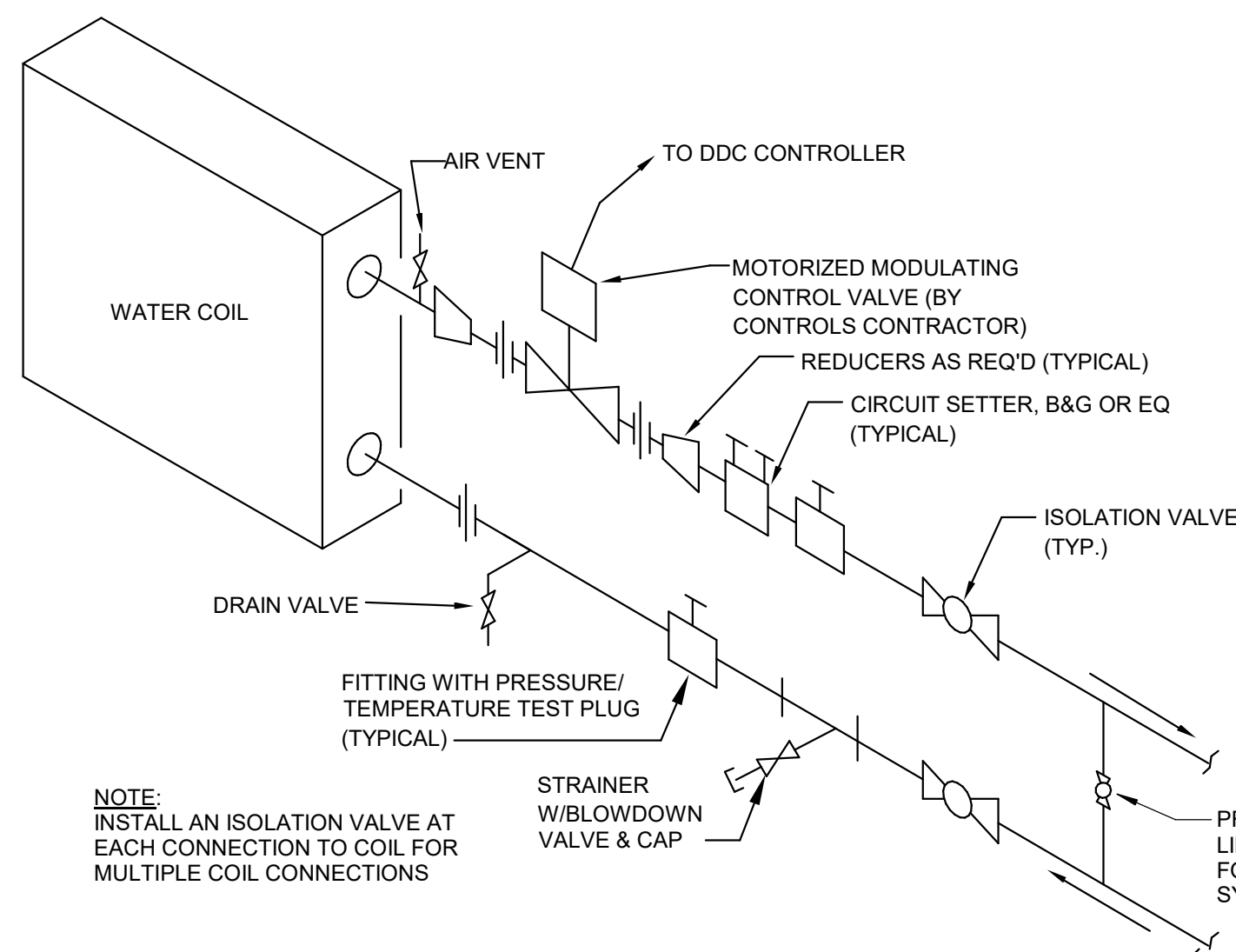
THE FULLY REDUNDANT SECONDARY BUILDING HOT WATER PUMPS SHALL BE CONTROLLED THROUGH THE BAS. THE BAS SHALL ROTATE THE LEAD AND STAND-BY HOT WATER PUMPS ON A MONTHLY BASIS TO EQUALIZE RUN-TIME HOURS. IN THE EVENT OF THE LEAD HOT WATER PUMP FAILURE THE BAS SHALL ENERGIZE THE STAND-BY HOT WATER PUMP AND GENERATE AN ALARM AT THE OPERATOR'S WORKSTATION. THE HOT WATER PUMPS SHALL PROVIDE PROOF OF OPERATION AT THE OPERATOR'S WORKSTATION THROUGH THE USE OF A CURRENT SWITCH.

SECONDARY HOT WATER SYSTEM SHALL RUN AT VARIABLE FLOW TO SATISFY THE REQUIREMENTS OF THE NEW DIFFERENTIAL PRESSURE SENSOR.

- NOTES:
1. PROVIDE UNIONS OR FLANGES AND ISOLATION VALVES ON ALL CONNECTIONS TO EQUIPMENT.
 2. SEE DETAILS FOR ADDITIONAL INFORMATION



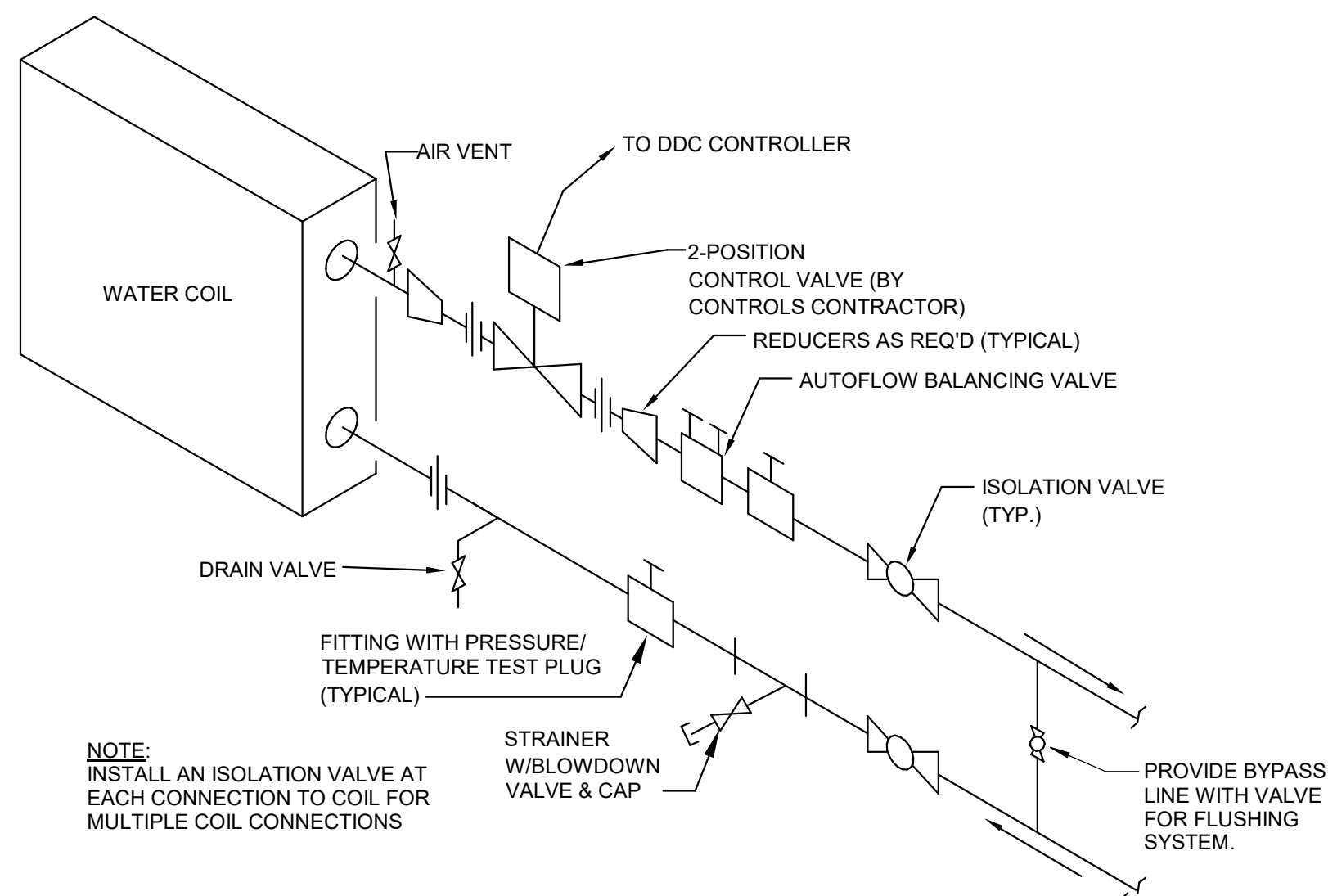
3 CHILLED WATER COIL PIPING DETAIL
M005 NOT TO SCALE



2 CHILLED WATER SYSTEM FLOW DIAGRAM
M005 NOT TO SCALE

SYSTEM POINT DESCRIPTION	POINTS										ALARMS	
	GRAPHIC	ANALOG HARDWARE	BINARY HARDWARE	INPUT (BI)	OUTPUT (BO)	ANALOG HARDWARE	BINARY HARDWARE	SOFTWARE POINT	WIRELESS (WLS)	INTERLOCK (HDW)	WIRELESS (WLS)	WIRELESS (WLS)
CHILLER DIFFERENTIAL PRESSURE	X	X										
CHILLED WATER FLOW STATUS	X	X										
CHILLER ISO VALVE OUTPUT	X		X									
CHILLER ISO VALVE OPEN STATUS	X		X									
CHILLED WATER PUMP REQUEST	X	X										
PRIMARY PUMP START/STOP	X	X	X									
PRIMARY PUMP STATUS	X	X										
PRIMARY PUMP SPEED	X	X										
OUTDOOR AIR RELATIVE HUMIDITY	X	X										
OUTDOOR AIR TEMPERATURE	X	X										
PRIMARY CW FLOW METER	X	X							X	X	X	X
PRIMARY CW RETURN TEMPERATURE	X	X							X	X	X	X
PRIMARY CW SUPPLY TEMPERATURE	X	X							X	X	X	X
BAS COMMUNICATION	X	X							X	X	X	X
CHILLER PLANT ENABLE									X			
CW SUPPLY TEMP SETPOINT									X			
CHILLER PRIMARY PUMP FAILURE	X								X		X	
OUTDOOR AIR TEMP ENABLE SETPOINT									X			

4 HOT WATER COIL PIPING DETAIL
M005 NOT TO SCALE



SEQUENCE OF OPERATION: COOLING PLANT SYSTEMS

SYSTEM GENERAL DESCRIPTION:
THE COOLING PLANT CONTROL SYSTEM SHALL MONITOR AND CONTROL THE SYSTEM'S CHILLER(S), PUMP(S), AND CONTROL VALVES AS SHOWN ON THE COOLING PLANT FLOW DIAGRAM, IN THE COOLING PLANT POINTS LIST AND AS DETAILED IN THE SEQUENCE OF OPERATION LISTED BELOW.
THE COOLING PLANT SYSTEM CONSISTS OF AIR-COOLED CHILLER(S) WITH ITS PIPING CONFIGURATION ARRANGED AS A VARIABLE PRIMARY LOOP SUPPLYING CHILLED WATER TO THE FACILITY.
THE MANFOLDED CHILLED WATER DISTRIBUTION PUMPS ARE CONFIGURED AS LEAD / LAG CONTROL.

COOLING PLANT SYSTEM ENABLE/DISABLE:
THE COOLING PLANT SYSTEM SHALL BE ENABLED/DISABLED BY THE COOLING PLANT CONTROLLER AS REQUESTED BY THE BUILDING AUTOMATION SYSTEM (BAS) OPERATOR INTERFACE PANEL OR THE BAS TIME OF DAY SCHEDULE. THE COOLING PLANT CONTROL SYSTEM WILL START AND STOP THE CHILLED WATER PUMPS AND CHILLERS BASED UPON SYSTEM LOAD.
WHEN THE COOLING PLANT SYSTEM IS ENABLED THE SYSTEM SHALL ENABLE THE LEAD CHILLED WATER PUMP TO START BASED ON A CALL FOR COOLING FROM THE BAS. WHEN FLOW STATUS FOR THE PUMP IS PROVEN, THE SYSTEM SHALL REPORT RUNNING STATUS TO THE BAS.
WHEN THE COOLING PLANT SYSTEM IS ENABLED THE SYSTEM SHALL SEND AN ENABLE SIGNAL TO THE LEAD CHILLER. UPON RECEIVING THE ENABLE SIGNAL THE CHILLER SHALL SEND A CHILLED WATER PUMP REQUEST SIGNAL TO THE CONTROL SYSTEM TO ENABLE THE CHILLED WATER PUMPING SEQUENCE.
WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM SHALL RESPOND TO A CHILLED WATER PUMP REQUEST FROM THE CHILLER TO ENABLE THE ASSOCIATED DEDICATED PRIMARY CHILLED WATER PUMP TO START. AS ADDITIONAL CHILLERS PROVIDE REQUESTS, ADDITIONAL PRIMARY CHILLED WATER PUMP(S) SHALL START.
THE COOLING PLANT IS DISABLED WHEN ALL CHILLERS ARE DISABLED AND THERE IS NOT AN ACTIVE CHILLED WATER PUMP REQUEST WHEN THE PLANT IS DISABLED, THE CHILLED WATER PUMPS SHALL BE COMMANDED OFF AND THE CHILLER ISOLATION VALVES SHALL BE CLOSED.

CHILLER ISOLATION VALVES:
EXISTING CHILLER ISOLATION VALVES SHALL PREVENT THE FLOW OF FLUID THROUGH NON-OPERATING CHILLERS. WHEN THE SYSTEM RECEIVES A CHILLER WATER PUMP REQUEST FROM A CHILLER, THE CHILLER ISOLATION VALVE WILL BE CONTROLLED TO 100% OPEN. CHILLER ISOLATION VALVE STROKE TIME SHALL BE (60-120) SECONDS (ADJ.) TO REDUCE OPERATING CHILLER FLOW TRANSIENTS. WHEN THE VALVE IS CONFIRMED TO BE 100% OPEN THE SYSTEM WILL START THE RESPECTIVE CHILLED WATER PUMP. IF THE CHILLER'S ISOLATION VALVE IS NOT CONFIRMED OPEN AFTER (VALVE STROKE TIME PLUS 60 SEC) 180 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLER ISOLATION VALVE FAILURE ALARM TO THE BAS OPERATOR INTERFACE.

PRIMARY CHILLED WATER PUMP COMMANDS:
WHEN THE CHILLED WATER SYSTEM IS ENABLED, THE SYSTEM SHALL START A CHILLED WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMPS VARIABLE SPEED DRIVE RUN-ENABLE CONTACTS. THE SYSTEM SHALL DETECT PRIMARY CHILLED WATER PUMP RUN STATUS BY A VARIABLE SPEED DRIVE CURRENT SWITCH. WHEN AN ADDITIONAL CHILLER IS REQUESTED TO STAGE ON, ITS DEDICATED CHILLED WATER PUMP WILL BE COMMANDED ON.

PRIMARY CHILLED WATER PUMP SPEED:
SYSTEM SHALL RUN IN VARIABLE PRIMARY MODE.

THE PRIMARY CHILLED WATER PUMP SPEED SHALL BE CONTROLLED TO PROVIDE THE GREATER OF THE FOLLOWING CALCULATED FLOW RATES. CONTROL WILL BE BASED ON THE OPERATING CHILLERS' MINIMUM EVAPORATOR FLOW REQUIREMENT OR BASED ON THE SYSTEMS' PRIMARY FLOW TO BE SLIGHTLY GREATER THAN THE SECONDARY FLOW.
THE COOLING PLANT SYSTEM CONTROLLER SHALL MONITOR EACH CHILLERS' EVAPORATOR DIFFERENTIAL PRESSURE TRANSDUCER. NOTE: THE CHILLER MANUFACTURERS' MINIMUM ALLOWED FLOW FOR EACH CHILLER IN THE COOLING PLANT SYSTEM SHALL BE ENTERED INTO THE SYSTEM CONTROLLER. THE CHILLED WATER MINIMUM DIFFERENTIAL PRESSURE SHALL BE CALCULATED FOR EACH CHILLER. WHEN A CHILLER IS ENABLED THE COOLING PLANT SYSTEM CONTROLLER SHALL RUN A PID LOOP THAT MONITORS EACH CHILLERS' EVAPORATOR DIFFERENTIAL PRESSURE TRANSDUCER, THEN CONTROL ITS ASSOCIATED PUMP(S) SPEED TO MAINTAIN A PRESSURE NO LESS THAN THE CHILLER MANUFACTURERS' MINIMUM ALLOWED DIFFERENTIAL PRESSURE + 10%.
PRIMARY FLOW TO BE SLIGHTLY GREATER THAN SECONDARY FLOW.
THIS FLOW CONTROL WILL BE ACHIEVED BY CONTROLLING THE SYSTEMS' DIFFERENTIAL CHILLED WATER RETURN TEMPERATURE. THE SYSTEM CONTROLLER SHALL MONITOR THE DISTRIBUTION SYSTEM (SECONDARY) RETURN CHILLED WATER TEMPERATURE AND THE PRODUCTION SYSTEM (PRIMARY) RETURN CHILLED WATER TEMPERATURE. NOTE: IT IS CRITICAL THAT THE PRIMARY AND SECONDARY RETURN CHILLED WATER TEMPERATURE SENSORS ARE MATCHED AND OF HIGH ACCURACY. THE SYSTEM CONTROLLER SHALL CALCULATE THE DIFFERENTIAL TEMPERATURE BETWEEN THE SYSTEMS' PRODUCTION AND DISTRIBUTION CHILLED WATER RETURN TEMPERATURES (SYSTEM CHILLED WATER DIFFERENTIAL TEMPERATURE = SECONDARY CHILLED WATER RETURN TEMPERATURE - PRIMARY CHILLED WATER RETURN TEMPERATURE). THE SYSTEM CONTROLLER SHALL RUN A PID LOOP TO CONTROL THE SPEED OF THE PRIMARY CHILLED WATER PUMP(S) TO MAINTAIN THE SYSTEMS' CHILLED WATER DIFFERENTIAL TEMPERATURE TO A SETPOINT OF 1 DEG F (ADJ.). IF THE DIFFERENTIAL TEMPERATURE DROPS BELOW SETPOINT THE PRIMARY FLOW IS INCREASED, IF THE DIFFERENTIAL TEMPERATURE RISES ABOVE SETPOINT THE PRIMARY FLOW IS DECREASED.
THE CONTROL SYSTEM WILL USE THE OUTPUT OF PID LOOP THAT GENERATES THE HIGHEST CALCULATED FLOW RATE TO CONTROL THE SPEED OF THE PRIMARY CHILLED WATER PUMP(S).

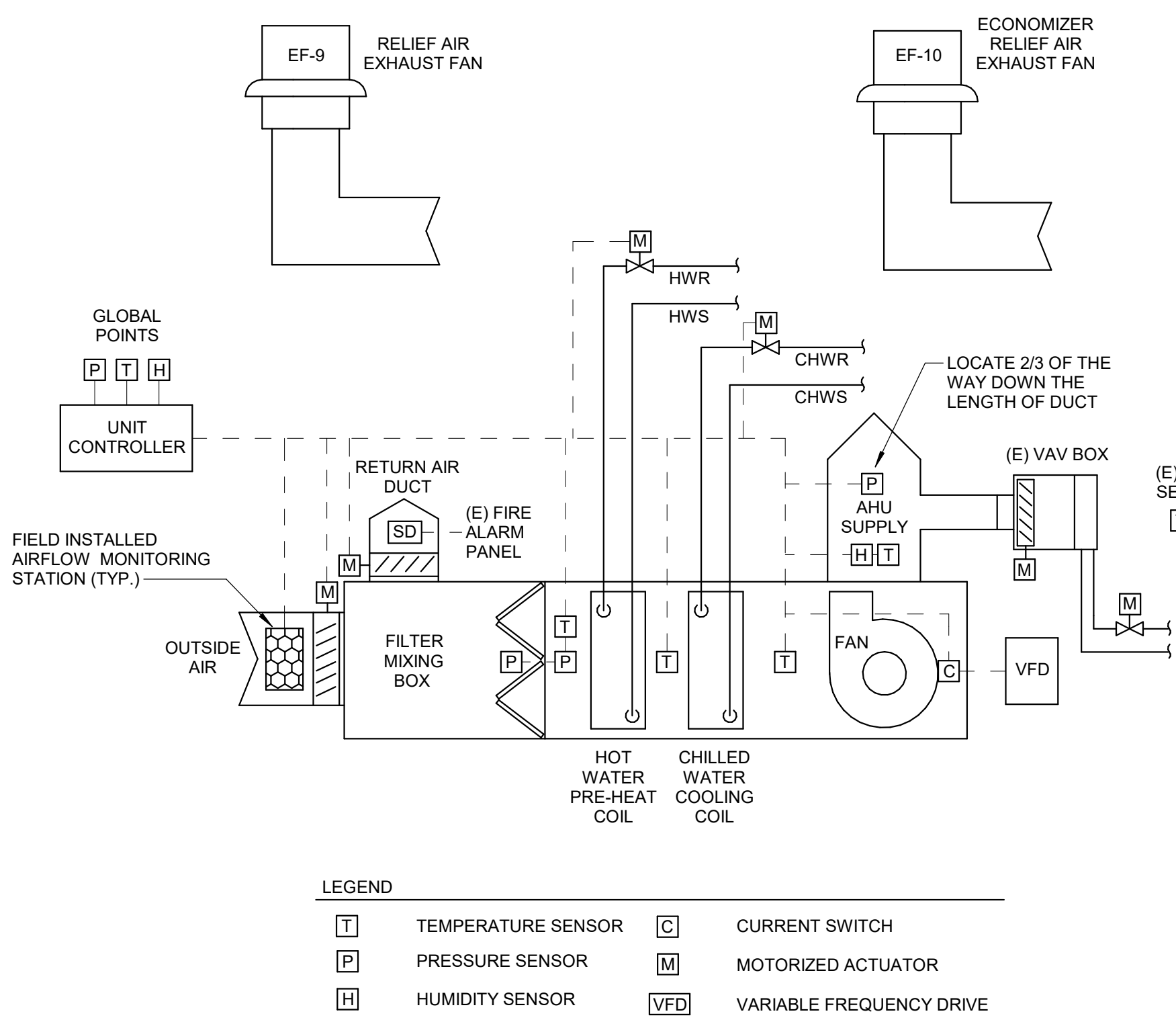
PRIMARY CHILLED WATER PUMP FAILURE:
IF THE PUMP START/STOP RELAY IS ENABLED AND THE PUMPS' RUNNING STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLED WATER PUMP FAILURE ALARM TO THE BAS. ONCE THE ERROR HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS OPERATOR INTERFACE OR BY MANUALLY OVERRIDING THE PUMP ON.

OPTIMIZED DISTRIBUTION PUMP DIFFERENTIAL PRESSURE CONTROL:
THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. THE SYSTEM SHALL CONTROL THE CHILLED WATER PUMP(S) VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE TO ITS SETPOINT. THE BAS SHALL MONITOR THE POSITION OF ALL CHILLED WATER CONTROL VALVES SERVED BY THE COOLING PLANT. AT CHILLED WATER SYSTEM STARTUP, THE CHILLED WATER SYSTEM PRESSURE SETPOINT WILL BE SET TO THE SYSTEM DESIGN VALUE OF XX PSI (ADJ.). IN ALL CASES THE DISTRIBUTION PUMP DIFFERENTIAL PRESSURE SETPOINT SHALL BE BOUND BETWEEN A MINIMUM OF 30 PSI (ADJ) AND A MAXIMUM OF THE SYSTEM DESIGN VALUE.
THE SETPOINT CONTROL SHALL BE BASED ON ASHRAE GUIDELINE 36 "TRIM AND RESPOND LOGIC": AT A FREQUENCY OF ONCE EVERY 10 MINUTES (ADJ.), THE CONTROL SYSTEM SHALL CALCULATE REQUESTS FOR COOLING BASED ON THE CRITERIA SHOWN BELOW:
1) THE AIR HANDLER UNIT (AHU) OTHER EQUIPMENT SERVED BY THE COOLING PLANT HAS BEEN RUNNING IN A COOLING MODE FOR 15 MINUTES (ADJ.).
2) IF AN AHU(S) (OR OTHER EQUIPMENT) CHILLED WATER VALVE IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE CHILLED WATER VALVE IS LESS THAN 70%.
3) IF AN AHU(S) (OR OTHER EQUIPMENT) CHILLED WATER VALVE IS SERVING A CRITICAL LOAD (I.E DATA CENTER), SEND 2 REQUESTS (ADJ.) IF AN AHU(S) CHILLED WATER VALVE IS GREATER THAN 95%, SEND 1 REQUEST WHEN THE CHILLED WATER VALVE IS BETWEEN 80% AND 95%. SEND ZERO REQUESTS WHEN THE CHILLED WATER VALVE IS LESS THAN 65%.
4) ELSE IF THE CHILLED WATER VALVE IS LESS THAN 95%, SEND 0 REQUESTS.
(NOTE: AT STARTUP SET IGNORE VALUE TO AT LEAST 40% OF THE NUMBER OF AHUS SERVED).
WHEN (REQUESTS > IGNORES) THE SYSTEM SHALL RESPOND BY ADJUSTING THE CHILLED WATER PUMP DIFFERENTIAL PRESSURE SETPOINT UPWARD BY (REQUESTS - IGNORES) * 10 (PSI) (ADJ.), BUT NO LARGER THAN 10 PSI (ADJ.). WHEN REQUESTS ARE EQUAL TO, OR LESS THAN IGNORES, THE SETPOINT SHALL BE RESET DOWNWARD BY 2 PSI (ADJ.).

#	Description	01/01/01
JOB No.	23253-01	
DATE:	06/18/2025	
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MULTI-ZONE VAV AHU SCHEMATIC AND CONTROLS SEQUENCE
NOT TO SCALE

SYSTEM POINT DESCRIPTION	POINTS										ALARMS	
	GRAPHIC	ANALOG HARDWARE	ANALOG INPUT (AI)	ANALOG INPUT (BI)	ANALOG HARDWARE	BINARY HARDWARE	BINARY OUTPUT (BO)	HARDWARE	SOFTWARE	WIRELESS (WLS)	NETWORK (NET)	LOW ANALOG LIMIT
EXHAUST AIR FLOW		X	X									
CONDENSATE OVERFLOW	X	X	X								X	X
COOLING COIL LAT	X										X	X
COOLING OUTPUT COMMAND	X			X								
UNIT DISCHARGE AIR TEMP	X	X									X	X
DISCHARGE AIR STATIC PRESSURE	X										X	X
FILTER ALARM	X										X	
FILTER STATUS	X	X									X	
HIGH STATIC ALARM	X		X								X	X
HIGH STATIC ALARM INTERLOCK	X							X				
MIXED AIR DAMPER COMMAND	X			X							X	
MIXED AIR LOW TEMP CUTOUT	X										X	
MIXED AIR TEMPERATURE LOCAL	X	X									X	X
OUTDOOR AIR DAMPER COMMAND	X		X									
OUTDOOR AIR FLOW	X											
OUTDOOR AIR RELATIVE HUMIDITY	X	X									X	
OUTDOOR AIR TEMPERATURE	X									X		
PREHEAT LEAVING COIL TEMP	X	X										X
PREHEAT OUTPUT COMMAND	X			X								
RELIEF AIR DAMPER COMMAND	X			X								
RETURN AIR DAMPER COMMAND	X											
RETURN AIR FLOW LOCAL	X		X									
RETURN FAN SPEED COMMAND	X			X								
RETURN FAN STOP/START	X				X							
RETURN FAN STATUS	X		X									
RETURN FAN HIGH STATIC ALARM	X	X									X	X
RETURN FAN HIGH STATIC INTERLOCK	X											
RETURN SMOKE DETECTOR INPUT	X							X				
SPACE HUMIDITY LOCAL	X								X			X
SPACE STATIC PRESSURE LOCAL	X	X									X	X
SUPPLY FAN FLOW LOCAL	X											
SUPPLY FAN SPEED COMMAND	X			X								
SUPPLY FAN STOP/START	X											
SUPPLY FAN STATUS	X		X									
BAS COMMUNICATION								X				X
DISCHARGE AIR COOLING SETPOINT												
DISCHARGE AIR HEATING SETPOINT												
MAINTENANCE REQUIRED					X						X	
NAT LOW LIMIT SETPOINT												
OCCUPIED COOLING SETPOINT	X											
OCCUPIED HEATING SETPOINT	X				X							
RETURN FAN FAILURE	X										X	
SUPPLY FAN FAILURE	X										X	
UNOCCUPIED COOLING SETPOINT	X							X				
UNOCCUPIED HEATING SETPOINT	X							X				



SEQUENCE OF OPERATION: VARIABLE AIR VOLUME TERMINAL UNITS

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED, AND UNOCCUPIED COMMANDS. THE BAS MAY ALSO SEND A HEAT/COOL MODE. PRIORITY SHUTDOWN COMMANDS, SPACE TEMPERATURE AND/OR SPACE TEMPERATURE SETPOINT. IF COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPERATE USING ITS LOCAL SETPOINTS.

OCCUPIED:
THE OCCUPANCY MODE WILL BE COMMUNICATED OR HARDWIRED TO THE CONTROLLER VIA A BINARY INPUT. WHEN THE UNIT IS IN THE OCCUPIED MODE THE VAV WILL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE OCCUPIED HEATING OR COOLING SETPOINT. APPLICABLE VENTILATION AND AIRFLOW SETPOINTS WILL BE ENFORCED. THE OCCUPIED MODE WILL BE THE DEFAULT MODE OF THE VAV. APPLICABLE VENTILATION AND AIRFLOW SETPOINTS WILL BE ENFORCED. THE OCCUPIED MODE WILL BE THE DEFAULT MODE OF THE VAV.

OCCUPIED STANDBY:
THE OCCUPANCY MODE WILL BE COMMUNICATED OR HARDWIRED TO THE CONTROLLER VIA A BINARY INPUT. EVEN THOUGH THE BAS HAS SCHEDULED THE SPACE AS OCCUPIED, IN THE OCCUPIED STANDBY MODE, THE ACTIVE COOLING AND HEATING SETPOINTS SHALL BE RELAXED (SEE COOLING AND HEATING MODE) AND BOTH THE VENTILATION AIRFLOW AND MINIMUM AIRFLOW SETPOINTS SHALL BE LOWERED (SEE VAV SCHEDULE).

OCCUPIED BYPASS:
MODE USED TO TEMPORARILY PLACE THE UNIT INTO THE OCCUPIED OPERATION. TENANTS SHALL BE ABLE TO OVERRIDE THE UNOCCUPIED MODE FROM THE SPACE SENSOR. THE OVERRIDE SHALL LAST FOR A MAXIMUM OF 4 HOURS (ADJ.). THE TENANTS SHALL BE ABLE TO CANCEL THE OVERRIDE FROM THE SPACE SENSOR AT ANY TIME. DURING THE OVERRIDE THE UNIT SHALL OPERATE IN OCCUPIED MODE.

HEAT/COOL MODE:
THE HEAT/COOL MODE SHALL BE SET BY A COMMUNICATED VALUE OR AUTOMATICALLY BY THE VAV. IN STANDALONE OR AUTO MODE THE VAV SHALL COMPARE THE PRIMARY AIR TEMPERATURE WITH THE CONFIGURED AUTO CHANGEOVER SETPOINT TO DETERMINE IF THE AIR IS "HOT" OR "COLD". HEATING MODE IMPLIES THE PRIMARY AIR TEMPERATURE IS HOT. COOLING MODE IMPLIES THE PRIMARY AIR TEMPERATURE IS COLD.

HEAT/COOL SETPOINT:
THE SPACE TEMPERATURE SETPOINT SHALL BE DETERMINED EITHER BY A LOCAL (E.G., THUMBWHEEL) SETPOINT, THE VAV DEFAULT SETPOINT OR A COMMUNICATED VALUE. THE VAV SHALL USE THE LOCALLY STORED DEFAULT SETPOINTS WHEN NEITHER A LOCAL SETPOINT NOR COMMUNICATED SETPOINT IS PRESENT. IF BOTH A LOCAL SETPOINT AND COMMUNICATED SETPOINT EXIST, THE VAV SHALL USE THE COMMUNICATED VALUE.

COOLING MODE:
WHEN THE UNIT IS IN COOLING MODE, THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE COOLING SETPOINT BY MODULATING THE AIRFLOW BETWEEN THE ACTIVE COOLING MINIMUM AIRFLOW SETPOINT TO THE MAXIMUM COOLING AIRFLOW SETPOINT. THE VAV SHALL USE THE MEASURED SPACE TEMPERATURE AND THE ACTIVE COOLING SETPOINT TO DETERMINE THE REQUESTED COOLING CAPACITY OF THE UNIT. THE OUTPUTS WILL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED COOLING CAPACITY. BASED ON THE VAV CONTROLLER OCCUPANCY MODE, THE ACTIVE COOLING SETPOINT WILL BE ONE OF THE FOLLOWING:

REHEAT CONTROL MODE:
REHEAT WILL ONLY BE ALLOWED WHEN THE SUPPLY AIR TEMPERATURE IS 5.0 DEG. F BELOW THE CONFIGURED REHEAT ENABLE SETPOINT OF 70.0 DEG. F (ADJ.). REHEAT CONTROL: IN HEAT MODE, REHEAT WILL BE ENABLED WHEN:
PRIMARY AIR TEMPERATURE IS 5.0 DEG. F BELOW THE CONFIGURED REHEAT ENABLE SETPOINT OF 70.0 DEG. F (ADJ.).
SPACE TEMPERATURE DROPS BELOW THE ACTIVE HEATING SETPOINT AND THE MINIMUM AIRFLOW REQUIREMENTS ARE MET.

SUPPLY AIR TEMPERATURE IS BELOW THE CONFIGURED REHEAT ENABLE SETPOINT. WHEN REHEAT ENABLED, THE VAV WILL OPERATE AT ITS MINIMUM HEATING AIRFLOW SETPOINT AND CONTROL THE HEAT AS FOLLOWS:
MODULATING HOT WATER REHEAT:
IF THE SPACE TEMPERATURE IS BELOW THE HEATING SETPOINT THE HOT WATER REHEAT VALVE WILL MODULATE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT WHILE THE VAV OPERATES AT ITS MINIMUM HEATING AIRFLOW SETPOINT. IF THE DISCHARGE AIR TEMPERATURE REACHES THE DESIGN HEATING DISCHARGE AIR TEMPERATURE SETPOINT (ADJ.), THE VAV WILL MODULATE AIRFLOW BETWEEN THE MINIMUM HEATING AIRFLOW SETPOINT AND THE MAXIMUM HEATING AIRFLOW SETPOINT AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT. WHILE THE HOT WATER REHEAT VALVE MODULATES TO MAINTAIN DISCHARGE AIR TEMPERATURE AT THE DESIGN HEATING DISCHARGE AIR TEMPERATURE SETPOINT, IF THE AIRFLOW REACHES THE MAXIMUM HEATING AIRFLOW SETPOINT, THE VAV WILL MODULATE THE HOT WATER REHEAT VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT. WHILE THE VAV OPERATES AT ITS MAXIMUM HEATING AIRFLOW SETPOINT.

HEATING MODE: WHEN THE UNIT IS IN HEATING MODE, THE VAV CONTROLLER WILL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT BY MODULATING THE VAV DAMPER (BETWEEN THE ACTIVE HEATING MINIMUM AND MAXIMUM AIRFLOW SETPOINTS).

LOCAL REHEAT CONTROL:
REHEAT WILL ONLY BE ALLOWED WHEN THE PRIMARY AIR TEMPERATURE IS 5.0 DEG. F BELOW THE CONFIGURED REHEAT ENABLE SETPOINT OF 70.0 DEG. F (ADJ.). THE REHEAT SHALL BE ENABLED WHEN THE SPACE TEMPERATURE DROPS BELOW THE ACTIVE HEATING SETPOINT AND THE MINIMUM AIRFLOW REQUIREMENTS ARE MET. DURING REHEAT THE VAV SHALL OPERATE AT ITS MINIMUM HEATING AIRFLOW SETPOINT AND ENERGIZE THE HEAT AS FOLLOWS:

PROPORTIONAL HOT WATER REHEAT:
IF THE SPACE TEMPERATURE IS BELOW THE HEATING SETPOINT THE HOT WATER REHEAT VALVE SHALL CONTROL AS REQUIRED TO MAINTAIN THE ACTIVE HEATING SETPOINT.

DEMAND CONTROL VENTILATION:
WHEN THE UNIT IS IN UNOCCUPIED MODE, THE VENTILATION AIRFLOW SETPOINT WILL BE ZERO. WHEN THE UNIT IS IN OCCUPIED MODE, THE VENTILATION AIRFLOW SETPOINT SHALL BE EQUAL THE DESIGN OUTDOOR AIRFLOW AND RESET BASED ON OCCUPANCY.
OCCUPANCY SENSOR: WHEN THE UNIT IS IN OCCUPIED MODE, AND THE OCCUPANCY SENSOR INDICATES THAT THE SPACE IS CURRENTLY UNOCCUPIED, THE VENTILATION AIRFLOW SETPOINT SHALL BE THE "OCCUPIED STANDBY" OUTDOOR AIRFLOW (SEE VAV SCHEDULE).
THE CURRENT VENTILATION AIRFLOW SETPOINT SHALL BE COMMUNICATED TO THE BAS FOR CONTROL OF THE SYSTEM OUTDOOR AIR INTAKE.

SPACE SENSOR FAILURE:
IF THERE IS A FAULT WITH THE OPERATION OF THE ZONE SENSOR AN ALARM SHALL BE ANNUNCIATED AT THE BAS. SPACE SENSOR FAILURE SHALL CAUSE THE VAV TO DRIVE THE DAMPER TO MINIMUM AIR FLOW IF THE VAV IS IN THE OCCUPIED MODE, OR DRIVE IT CLOSED IF THE VAV IS IN THE UNOCCUPIED MODE.

SEQUENCE OF OPERATION: MULTI-ZONE VAV AIR HANDLING UNIT (AHU-1)

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, PRE-COOL, OCCUPIED/UNOCCUPIED AND HEAT/COOL MODES. THE BAS SHALL ALSO SEND THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE DUCT STATIC PRESSURE SETPOINT. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

OCCUPIED:
DURING OCCUPIED PERIODS, THE SUPPLY FAN AND RETURN FAN SHALL RUN CONTINUOUSLY, AND THE MIXED AIR DAMPERS SHALL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS. THE RELIEF AIR DAMPER SHALL MODULATE BY TRACKING THE MIXED AIR DAMPERS. THE CHILLED WATER VALVE SHALL CONTROL TO MAINTAIN THE ACTIVE DISCHARGE AIR TEMPERATURE SETPOINT. IF ECONOMIZING IS ENABLED, THE OUTDOOR AIR OR MIXED AIR DAMPERS SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE RELIEF AIR DAMPER SHALL TRACK THE MIXED AIR DAMPERS. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE DYNAMICALLY RESET BASED ON THE DEVIATION OF ACTUAL SPACE TEMPERATURE FROM THE ACTIVE SPACE TEMPERATURE SETPOINT. IF THE DISCHARGE AIR TEMPERATURE SENSOR FAILS, THE CHILLED WATER VALVE SHALL CLOSE AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

UNOCCUPIED:
WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) THE SUPPLY FAN AND RETURN FAN SHALL START. THE OUTSIDE AIR DAMPER SHALL OPEN IF ECONOMIZING IS ENABLED AND REMAIN CLOSED IF ECONOMIZING IS DISABLED AND THE CHILLED WATER VALVE SHALL OPEN. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN AND RETURN FAN SHALL STOP. THE CHILLED WATER VALVE SHALL CLOSE AND THE OUTSIDE AIR DAMPER SHALL CLOSE.

OPTIMAL START:
THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.

OPTIMAL STOP:
THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP MODE IS ACTIVE. THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT. OUTSIDE AIR DAMPER SHALL REMAIN ENABLED TO PROVIDE MINIMUM VENTILATION.

OCCUPIED BYPASS:
THE BAS SHALL MONITOR THE STATUS OF THE ON AND CANCEL BUTTONS OF THE SPACE TEMPERATURE SENSOR. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).

HEAT/COOL MODE:
WHEN THE SPACE TEMPERATURE RISES ABOVE THE OCCUPIED COOLING SETPOINT THE MODE SHALL TRANSITION TO COOLING. WHEN THE SPACE TEMPERATURE FALLS BELOW THE OCCUPIED HEATING SETPOINT THE MODE SHALL TRANSITION TO HEATING. WHEN THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT OR BELOW THE OCCUPIED HEATING SETPOINT THE MODE SHALL REMAIN IN ITS LAST STATE. IF THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT AND AN ALARM SHALL ANNUNCIATE AT THE BAS. IF THE LOCAL AND COMMUNICATED SETPOINTS FAIL, THE CONTROLLER SHALL DISABLE THE SUPPLY FAN AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

MORNING WARM-UP MODE:
DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM-UP IS INITIATED THE UNIT SHALL ENABLE THE HEATING AND FAN(S). THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

DAYTIME WARM-UP CONTROL:
DURING OCCUPIED PERIODS, WHEN THE SPACE TEMPERATURE IS BELOW THE DAYTIME WARM-UP INITIATE SETPOINT, A DAYTIME WARM-UP SEQUENCE SHALL BE ACTIVATED. THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS, AND THE HEATING SHALL ENABLE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE HEATING SETPOINT. DAYTIME WARM-UP SHALL TERMINATE WHEN THE AVERAGE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT.

PRE-COOL MODE:
DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

ECONOMIZER MODE:
ENABLE: OUTSIDE AIR (OA) ENTHALPY SHALL BE COMPARED WITH RETURN AIR (RA) ENTHALPY POINT. THE ECONOMIZER SHALL ENABLE WHEN OA ENTHALPY IS LESS THAN RA ENTHALPY - 2.0 BTULB. THE ECONOMIZER SHALL DISABLE WHEN OA ENTHALPY IS GREATER THAN RA ENTHALPY.
OPERATION: WHEN ECONOMIZING IS ENABLED AND THE UNIT IS OPERATING IN THE COOLING MODE, THE ECONOMIZER DAMPER SHALL BE MODULATED BETWEEN ITS MINIMUM POSITION AND 100% TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE ECONOMIZER DAMPER SHALL MODULATE TOWARD MINIMUM POSITION IN THE EVENT THE MIXED AIR TEMPERATURE FALLS BELOW THE LOW TEMPERATURE LIMIT SETTING.

DISCHARGE AIR TEMPERATURE RESET CONTROL:
THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET TO THE OPTIMAL SETPOINT COMMUNICATED BY THE BAS. THE BAS SHALL RESET THE DISCHARGE AIR TEMPERATURE SETPOINT BASED ON THE CURRENT OUTSIDE AIR TEMPERATURE BUT SHALL OVERRIDE THIS RESET FUNCTION AND RETURN THE DISCHARGE AIR TEMPERATURE SETPOINT TO 55.0 DEG. F (ADJ.) IF MORE THAN TWO (ADJ.) ZONES BEGIN TO OVERHEAT. ALSO, THE BAS SHALL OVERRIDE THIS RESET FUNCTION WHENEVER OUTDOOR DEW POINT IS HIGHER THAN 80.0 DEG. F (ADJ.) OR INDOOR HUMIDITY (MEASURED AT THE SOURCE OF CONTROL) IS HIGHER THAN 60% RH (ADJ.). IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW THE MINIMUM LIMIT, A LOW TEMPERATURE ALARM SHALL ANNUNCIATE, AND THE UNIT SHALL SHUT DOWN. IF THE DISCHARGE AIR TEMPERATURE RISES ABOVE THE MAXIMUM LIMIT, A HIGH TEMPERATURE ALARM SHALL ANNUNCIATE.

SUPPLY FAN:
THE SUPPLY FAN SHALL BE OFF IN THE UNOCCUPIED MODE. THE SUPPLY FAN SHALL BE ON IF THE CONTROL IS HEATING OR COOLING IN THE UNOCCUPIED MODE. WHEN THE CONTROLLER IS IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY AND ITS SPEED SHALL BE MODULATED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT. THE DUCT STATIC PRESSURE SETPOINT SHALL BE SENT BY THE BAS AND IS RESET BETWEEN THE MINIMUM AND MAXIMUM STATIC PRESSURE LIMITS TO MAINTAIN THE CRITICAL ZONE VAV AIR DAMPER IN A POSITION BETWEEN 65% AND 75% OPEN.
A MANUAL RESET OF THE HIGH STATIC PRESSURE CUT-OFF SWITCH SHALL BE REQUIRED TO RESTART THE FAN.

BUILDING PRESSURE CONTROL (RELIEF AIR):
RELIEF AIR FANS SHALL BE BALANCED AFTER THE AHU OUTSIDE AIR TO A CFM 20% LESS THAN THE OUTSIDE AIR FLOW IN BOTH OCCUPIED AND ECONOMIZED OPERATION MODE. RELIEF AIR EXHAUST FANS SHALL BE ENABLED BY THE BAS BASED ON THE OPERATING CONDITION. EF-9 ON WHEN IN OCCUPIED MODE, EF-10 ON WHEN IN ECONOMIZER MODE AND NO FANS ON IN UNOCCUPIED MODE. RELIEF AIR FAN SPEED SETPOINT SHALL BE ADJUSTABLE THROUGH THE BAS.

PREHEAT CONTROL:
WHEN THE FAN IS OFF, IF THE OUTDOOR AIR TEMPERATURE IS BELOW 40.0 DEG. F (ADJ.) OR THE OUTSIDE AIR TEMPERATURE SENSOR IS FAILED, THE PREHEAT VALVE SHALL MODULATE TO MAINTAIN A MIXED AIR TEMPERATURE OF 45.0 DEG. F (ADJ.). IF THE OUTDOOR AIR TEMPERATURE IS ABOVE 40.0 DEG. F (ADJ.) AND THE OUTDOOR AIR TEMPERATURE SENSOR IS NOT FAILED THE PREHEAT VALVE SHALL BE CLOSED. IF THE MIXED AIR TEMPERATURE SENSOR FAILS THE PREHEAT VALVE SHALL BE 10% OPEN.
WHEN THE FAN IS ON, THE PREHEAT SHALL CONTROL TO MAINTAIN A LEAVING PREHEAT TEMPERATURE OF 45.0 DEG. F (ADJ.). IF THE PREHEAT TEMPERATURE SENSOR FAILS AND THE MIXED AIR TEMPERATURE IS BELOW 45.0 DEG. F (ADJ.) THE PREHEAT VALVE SHALL BE 10% OPEN. IF THE PREHEAT TEMPERATURE SENSOR FAILS AND THE MIXED AIR TEMPERATURE IS ABOVE 50.0 DEG. F (ADJ.) THE PREHEAT VALVE SHALL BE COMMANDO CLOSED. AN ALARM SHALL ANNUNCIATE AT THE BAS IF THE LEAVING PREHEAT TEMPERATURE SENSOR, THE MIXED AIR TEMPERATURE SENSOR OR THE OUTSIDE AIR TEMPERATURE SENSOR ARE FAILED.

MIXED AIR LOW LIMIT:
THE INITIAL DAMPER OPENING RATE SHALL BE LIMITED TO 2% PER MINUTE (ADJ.) UNTIL THE DAMPER HAS REACHED ITS MINIMUM VENTILATION POSITION. THE OUTSIDE AIR DAMPER SHALL MODULATE TO A POSITION LESS THAN THE MINIMUM DAMPER POSITION WHEN THE MIXED AIR TEMPERATURE DROPS BELOW 50.0 DEG. F (ADJ.). IF THE MIXED AIR TEMPERATURE SENSOR FAILS AN ALARM SHALL ANNUNCIATE AT THE BAS AND THE OUTSIDE AIR DAMPER SHALL RETURN TO THE ALARM POSITION.

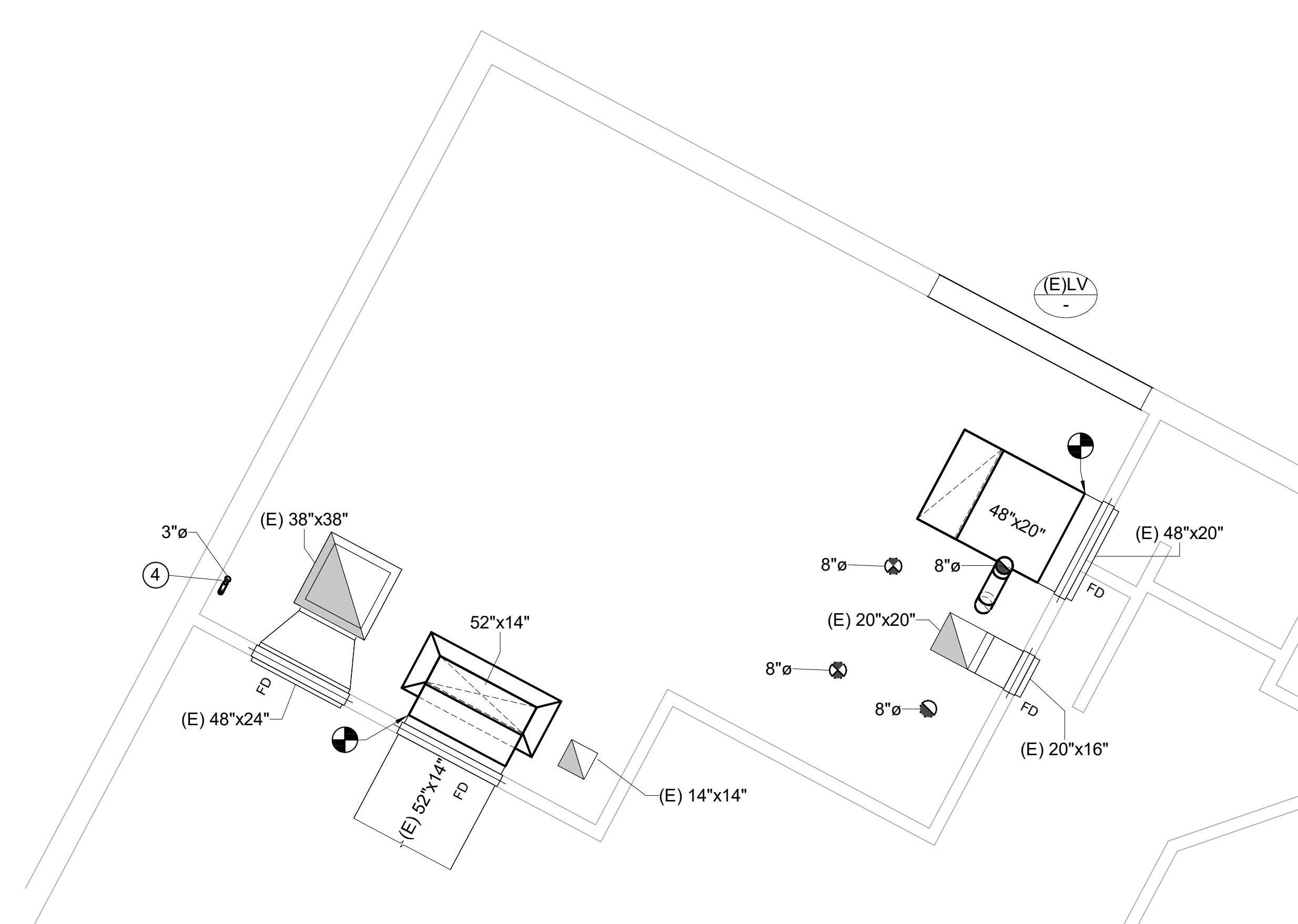
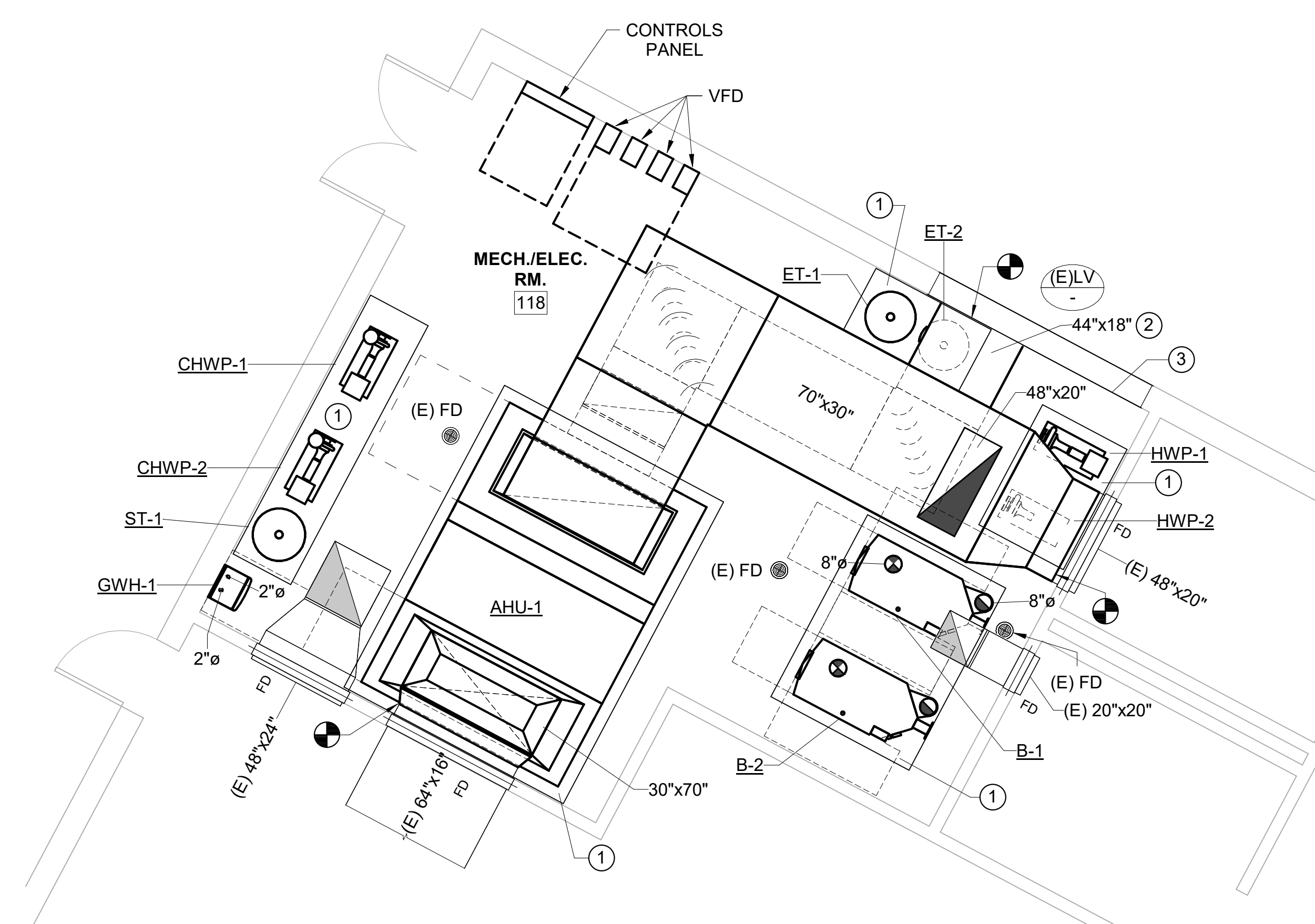
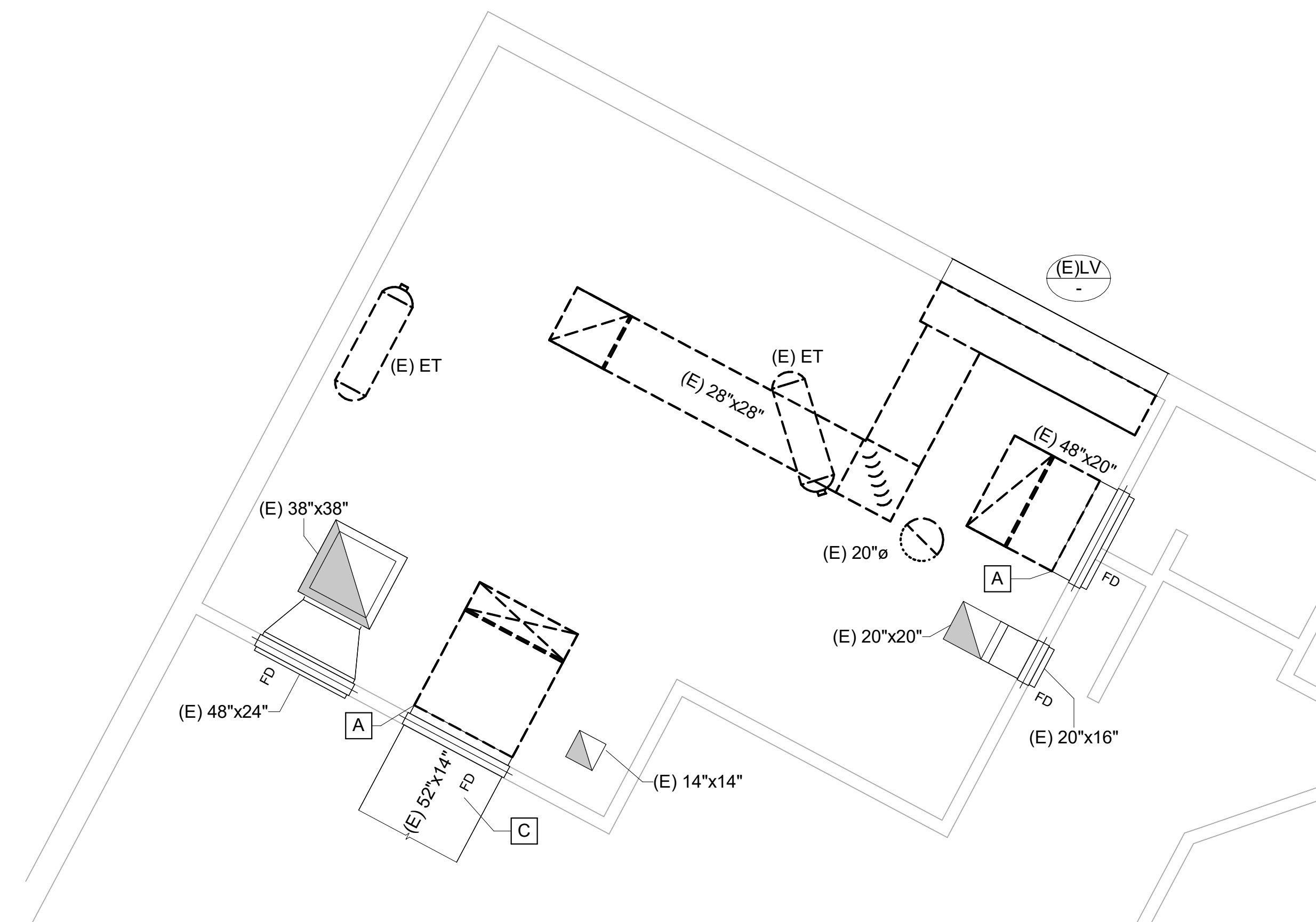
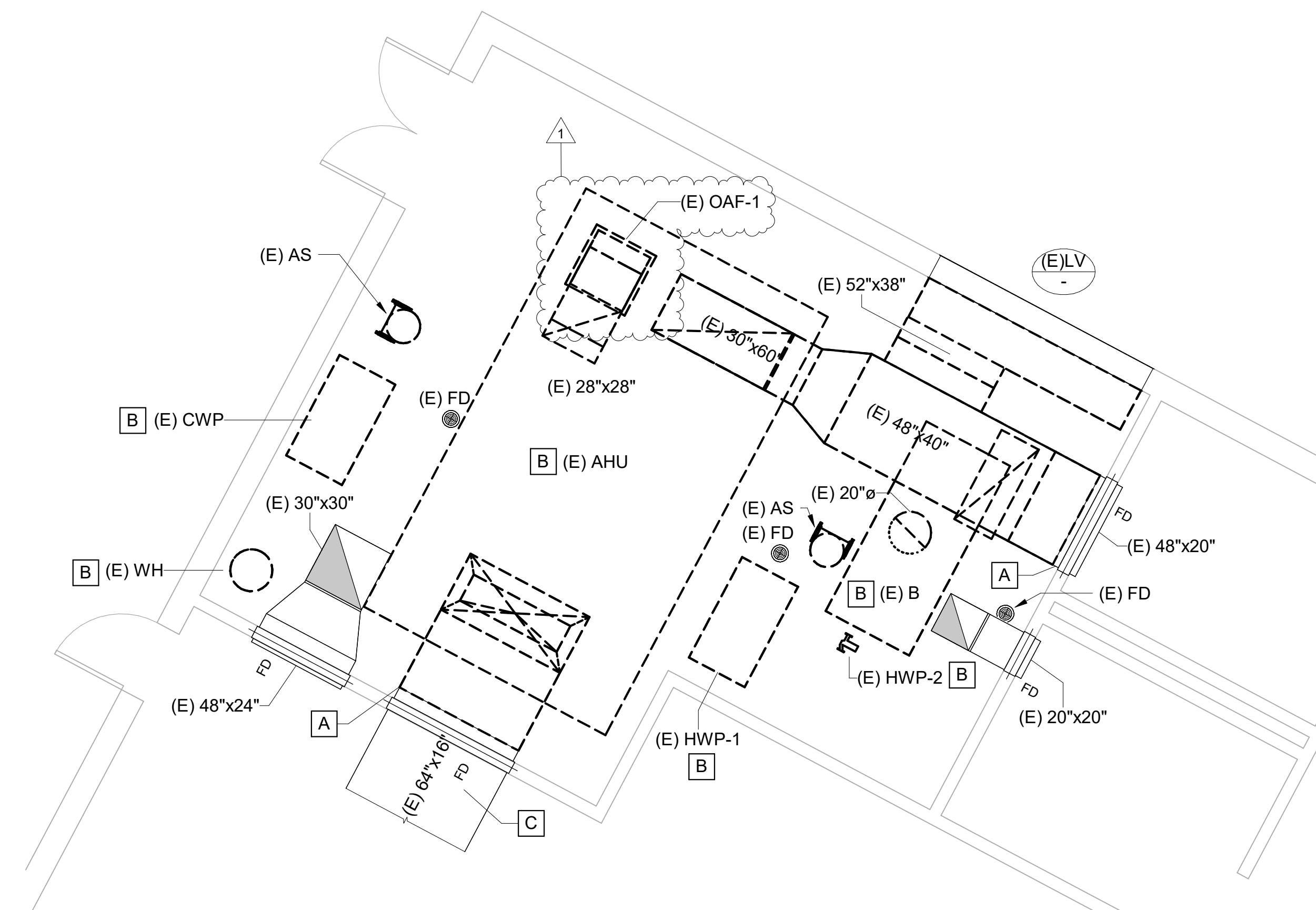
FREEZE PROTECTION:
A HARDWIRED, LOW LIMIT TEMPERATURE SWITCH SHALL BE ELECTRICALLY INTERLOCKED WITH THE VARIABLE SPEED DRIVE. IF THE LOW LIMIT TEMPERATURE SWITCH IS TRIPPED 38.0 DEG. F (ADJ.), THE FAN SHALL BE COMMANDED OFF AND THE OUTSIDE AIR DAMPER SHALL CLOSE. ALL VALVES SHALL BE COMMANDED OPEN TO 100% (ADJUST PER CLIMATE). AN ALARM SHALL ANNUNCIATE AT THE BAS AND MANUAL RESET OF THE LOW LIMIT TEMPERATURE SWITCH SHALL BE REQUIRED TO RESTART THE FAN.

CONDENSATE OVERFLOW MONITORING:
IF THE CONDENSATE LEVEL REACHES THE TRIP POINT, A CONDENSATE OVERFLOW DIAGNOSTIC SHALL ANNUNCIATE AT THE BAS. TO PREVENT THE CONDENSATE DRAIN PAN FROM OVERFLOWING AND CAUSING WATER DAMAGE TO THE BUILDING THE FAN SHALL BE DISABLED AND THE CHILLED WATER VALVE SHALL CLOSE.

FILTER STATUS:
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSURES DURING NORMAL OPERATION A 100% FILTER ALARM SHALL ANNUNCIATE AT THE BAS.

SMOKE DETECTOR SHUTDOWN:
THE UNIT SHALL SHUT DOWN IN RESPONSE TO A SIGNAL FROM THE SMOKE DETECTOR INDICATING THE PRESENCE OF SMOKE. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO THE UNIT THROUGH THE DRY CONTACTS OF THE SMOKE DETECTOR. A MANUAL RESET OF THE SMOKE DETECTOR SHALL BE REQUIRED TO RESTART THE UNIT.

#	Description	01/01/01
JOB No.	23253-01	
DATE:	06/18/2025	
DRAWN BY:	ACR	
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SHEET	NUMBER	

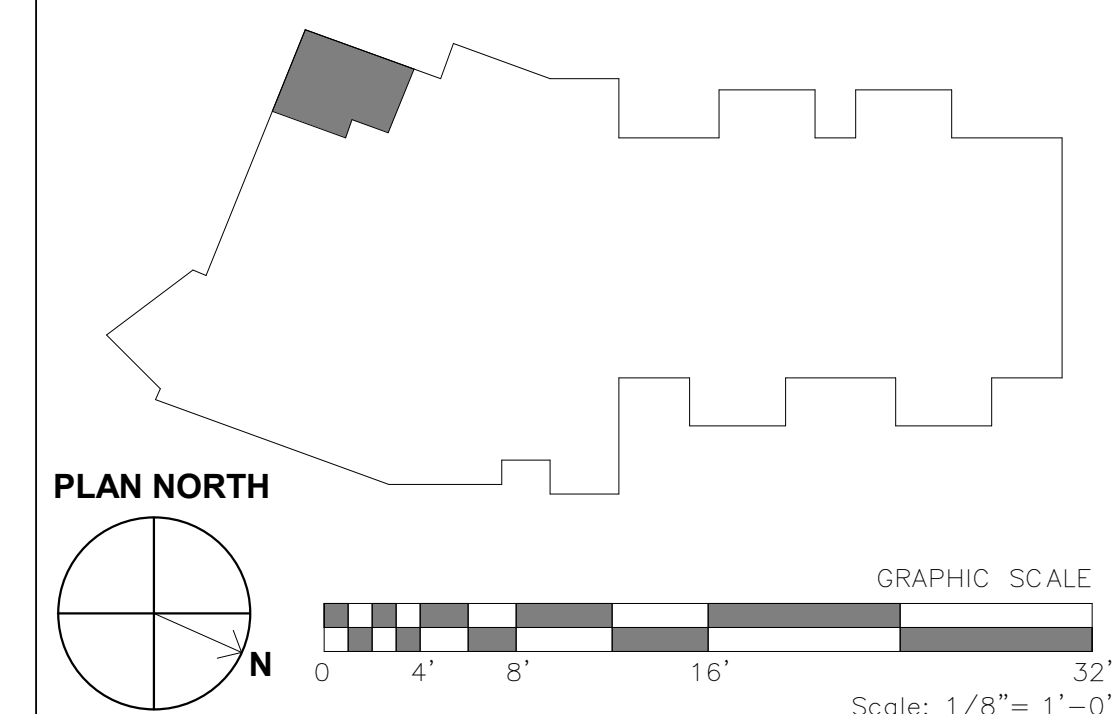


- ## DEMOLITION KEYNOTES
- | | |
|---|---|
| A | DEMOLISH DUCTWORK TO THIS POINT TO BE CONNECTED TO NEW DUCTWORK DURING RENOVATION. |
| B | DEMOLISH EXISTING EQUIPMENT AND ASSOCIATED CONCRETE MOUNTING PAD. |
| C | THE CONTRACTOR SHALL PROVIDE AN AID ALTERNATE FOR DUCT CLEANOUT OF EXISTING SYSTEM AFTER EXISTING DUCT IS DEMOLISHED AND BEFORE RENOVATION WORK ON DUCT BEGINS. |
| D | DEMOLISH EXISTING INLINE OUTSIDE AIR FAN. |

- ## RENOVATION KEYNOTES
- 1 PROVIDE NEW EQUIPMENT PADS TO BE 6" LARGER THAN EQUIPMENT ON ALL SIDES. SEE DETAIL FOR MORE INFORMATION.
 - 2 PROVIDE DUCT MOUNTED AIRFLOW MONITORING STATION FOR OUTSIDE AIR INTAKE DUCT.
 - 3 BLANK OFF EXISTING LOUVER EXCEPT AT NEW OUTSIDE AIR DUCT CONNECTION.
 - 4 PROVIDE A CONCENTRIC VENT THROUGH THE ROOF FOR THE WATER HEATER. ROUTE PER THE MANUFACTURER'S INSTRUCTIONS.

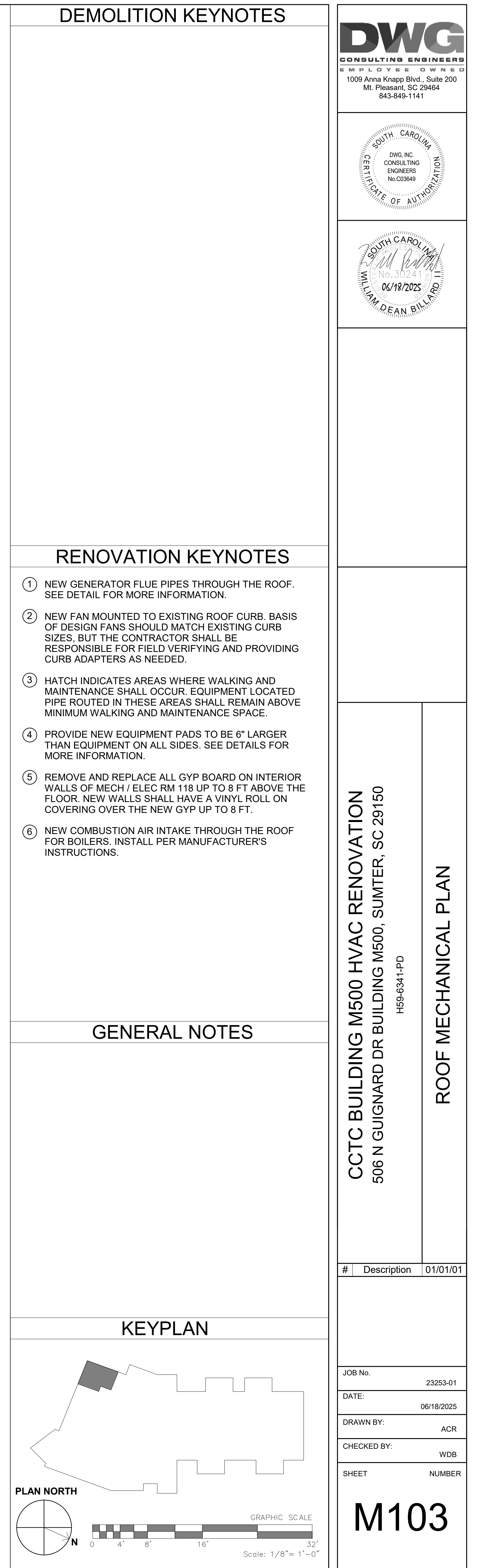
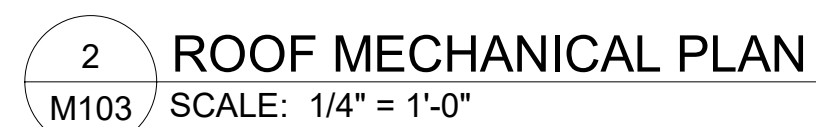
GENERAL NOTES

KEYPLAN



#	Description	01/01/01
1	Addendum #1	06/18/25

JOB No.	23253-01
DATE:	06/18/2025
DRAWN BY:	ACR
CHECKED BY:	WDB
SHEET	NUMBER



ELECTRICAL SYSTEMS
SEISMIC REQUIREMENTS
PER IBC-2021/ASCE 7-16

- A. PER THE 2021 INTERNATIONAL BUILDING CODE, MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AND COMPONENTS, INCLUDING THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED FOR SEISMIC FORCES IN ACCORDANCE WITH CHAPTER 13 OF ASCE 7.
- B. EXTERIOR EQUIPMENT (INCLUDING ROOF CURBS, RAILS, SUPPORTS) EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH CHAPTER 26 TO 29 OF ASCE 7.
- C. WHERE DESIGN FOR SEISMIC AND WIND LOADS IS REQUIRED, THE MORE DEMANDING FORCE MUST BE USED.
- D. REFERENCE THE STRUCTURAL DRAWINGS FOR SITE SPECIFIC INFORMATION ON SEISMIC DESIGN CATEGORY, WIND SPEEDS, ETC.
- E. USE THE TABLE BELOW TO DETERMINE SEISMIC RESTRAINT REQUIREMENTS FOR EACH COMPONENT.
- F. FOR ALL COMPONENTS REQUIRING SEISMIC RESTRAINT, THE COMPONENT SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL REGISTERED IN THE STATE THE JOB IS LOCATED. SUBMITTALS MUST INCLUDE STAMPED AND SIGNED DRAWINGS AND CALCULATIONS.
- G. WHERE SEISMIC RESTRAINT IS REQUIRED, HOUSEKEEPING PADS NEEDED FOR THE INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT MUST BE DESIGNED BY THE SEISMIC ENGINEER. DO NOT POUR ANY HOUSEKEEPING PADS PRIOR TO THE RECEIPT OF THE APPROVED SEISMIC SUBMITTAL.
- H. SEISMIC RESTRAINTS FOR DUCTWORK, PIPING, CONDUIT, CABLE TRAYS AND BUS DUCT MUST BE SHOWN ON LAYOUT DRAWINGS SHOWING SPECIFIC RESTRAINT LOCATIONS ALONG WITH ACCOMPANYING DETAILS AND CALCULATIONS.

ELECTRICAL COMPONENT IMPORTANCE FACTOR (Ip) DESIGNATION				
Ip = 1.0			Ip = 1.5	
• ALL ASSOCIATED ELECTRICAL WORK UNLESS NOTED OTHERWISE			• FIRE ALARM	
SEISMIC DESIGN CATEGORIES D,E,F				
	COMPONENT IMPORTANCE FACTOR (Ip)			
	1.0		1.5	
COMPONENT IDENTIFICATION	SEISMIC RESTRAINT REQUIREMENT	NOTES	SEISMIC RESTRAINT REQUIREMENT	NOTES
ROOF MOUNTED	RESTRAIN ALL	1	RESTRAIN ALL	-
FLOOR MOUNTED	RESTRAIN ALL	1,2	RESTRAIN ALL	-
WALL MOUNTED	RESTRAIN ALL	1,2	RESTRAIN ALL	-
COMPONENT SUPPORTS	RESTRAIN ALL	1	RESTRAIN ALL	-
SUSPENDED EQUIPMENT	RESTRAIN ALL	1	RESTRAIN ALL	-
SINGLE CONDUIT	RESTRAIN IF ≥ 2.5"	3	RESTRAIN IF ≥ 2.5"	3
CABLE TRAY/BUS DUCT TRAPEZED CONDUIT	DO NOT DELETE ON TRAPEZE ≥ 2.5". RESTRAIN IF TOTAL WEIGHT OF SUSPENDED COMPONENT > 10 LBS/FT	3	RESTRAIN IF ANY CONDUIT ON TRAPEZE ≥ 2.5". RESTRAIN IF TOTAL WEIGHT OF SUSPENDED COMPONENT > 10 LBS/FT	3
COMPONENT CERTIFICATION	NOT REQUIRED	-	REQUIRED	5
PENDANT, LAY-IN AND CAN LIGHTS	REQUIRED	4	REQUIRED	4

- NOTES:
1. EQUIPMENT 20 LBS. OR LESS IS EXEMPT IF THE COMPONENT IS POSITIVELY ATTACHED TO THE STRUCTURE AND FLEXIBLE CONNECTIONS ARE PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT.
2. RESTRAINTS ARE NOT REQUIRED IF THE COMPONENT WEIGHS 400 LBS. OR LESS, IS MOUNTED WITH THE CENTER MASS AT 4' OR LESS ABOVE A FLOOR, IS POSITIVELY ATTACHED TO THE STRUCTURE, AND HAS FLEXIBLE CONNECTIONS BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT.
3. RESTRAINT IS NOT REQUIRED IF THE CONDUIT IS SUPPORTED BY HANGERS AND EACH HANGER IN THE RUN IS 12" IN. OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE. WHERE PIPES ARE SUPPORTED ON A TRAPEZE, THE TRAPEZE SHALL BE SUPPORTED BY HANGERS HAVING A LENGTH OF 12" IN. OR LESS. WHERE ROD HANGERS ARE USED, THEY SHALL BE EQUIPPED WITH SWIVELS, EYE NUTS OR OTHER DEVICES TO PREVENT BENDING IN THE ROD.
4. THE RESTRAINT OF PENDANT, LAY-IN AND CAN LIGHTS IS ADDRESSED IN ASTM C636 AND E580.
5. COMPONENT CERTIFICATION MUST BE SUPPLIED BY THE EQUIPMENT MANUFACTURER AT TIME OF SUBMITTAL FOR REVIEW BY ENGINEER OF RECORD.

GENERAL ELECTRICAL NOTES

1. BRANCH CIRCUIT WIRING FOR 20A CIRCUITS SHALL BE SIZED PER WIRE SIZING CHART. WHERE CONDUCTOR AND RACEWAY SIZE ARE SHOWN AT HOMERUN, SUCH SIZE SHALL BE USED FOR THE ENTIRE CIRCUIT. EXCEPTION: FINAL CONNECTION TO DEVICES IN OUTLET BOXES IS NOT REQUIRED TO BE LARGER THAN #12.
2. PRIOR TO ROUGH-IN, COORDINATE THE LOCATION AND MOUNTING HEIGHT OF ALL WALL MOUNTED DEVICES WITH THE ARCHITECTURAL INTERIOR ELEVATIONS AND MILLWORK SHOP DRAWINGS. IN THE EVENT OF A CONFLICT, NOTIFY THE ARCHITECT. MINOR ADJUSTMENTS IN DEVICE LOCATION, SUCH AS 5'-0" IN ANY DIRECTION, SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
3. RACEWAYS SHALL BE INSTALLED CONCEALED IN NEW WALL CONSTRUCTION, ABOVE CEILINGS, BELOW FLOOR AND IN OTHER CAVITIES TO THE GREATEST EXTENT POSSIBLE. EXPOSED RACEWAYS MAY BE USED IN UNFINISHED SPACES, WHERE EXPLICITLY NOTED ON PLANS AND WHERE APPROVED BY THE ENGINEER. LAY OUT EXPOSED RACEWAYS TO MINIMIZE THE NUMBER OF VERTICAL RUNS.
4. FEEDER CONDUITS AND BRANCH CIRCUITS SHALL COMPLY WITH DETAILS ON DRAWINGS AND SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES BEFORE AND DURING CONSTRUCTION. FEEDER CONDUITS AND BRANCH CIRCUITS SHALL BE ROUTED OVERHEAD UNLESS PRIOR APPROVAL HAS BEEN GRANTED BY THE AND ENGINEER.
5. A FIRESTOP SYSTEM SHALL BE USED TO SEAL ALL PENETRATIONS OF ELECTRICAL CONDUITS AND CABLES THROUGH FIRE-RATED PARTITIONS. THE FIRESTOP SYSTEM SHALL CONSIST OF A FIRE-RATED CAULK TYPE SUBSTANCE AND HIGH TEMPERATURE FIBER INSULATION BY STI OR APPROVED EQUAL. ONLY METAL CONDUIT SHALL BE USED TO PENETRATE FIRE-RATED PARTITIONS. SEE ARCHITECTURAL DRAWINGS FOR ALL LOCATIONS OF FIRE-RATED WALLS.
6. THE USE OF MC CABLE IS NOT ALLOWED, UNLESS NOTED OTHERWISE.
7. PROVIDE A LISTED EXPANSION/DEFLECTION FITTING FOR ALL CONDUIT CROSSING EXPANSION JOINTS PER NEC 300.4.H.
8. WHEREVER THE WORD "PROVIDE" IS USED ON THE ELECTRICAL DRAWINGS, IT SHALL BE INFERRED TO MEAN "FURNISH AND INSTALL", UNLESS NOTED OTHERWISE.
9. THE ARRANGEMENT, GROUPING, AND ROUTING OF BRANCH CIRCUITS SHALL BE PROVIDED AT THE CONTRACTOR'S DISCRETION IN ACCORDANCE WITH GENERALLY ACCEPTED PRACTICE FOR ELECTRICAL WORK, THE NATIONAL ELECTRICAL CODE REQUIREMENTS, LOCAL ORDINANCES, AND THE FOLLOWING: 1 - A COMMON NEUTRAL MAY BE INSTALLED IN A HOMERUN FOR 2 OR 3 BRANCH CIRCUITS ONLY IF A MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT OF ORIGIN IS PROVIDED PER NEC 210.4.B. 2 - MULTIPLE SINGLE-POLE BRANCH CIRCUITS (UP TO 3 HOTS, 3 NEUTRALS AND 1 GROUND) RATED FOR 30A OR LESS MAY BE PULLED INTO A SINGLE RACEWAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING THE RACEWAYS AND DE-RATING CONDUCTORS PER NEC 310.15. 3 - A GROUND CONDUCTOR SHALL BE PROVIDED IN ALL RACEWAYS UNLESS NOTED OTHERWISE.

GENERAL DEMOLITION NOTES

1. ALL ELECTRICAL EQUIPMENT TO BE REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIALS UNTIL RELEASED BY THE OWNER'S PROJECT MANAGER. MATERIALS THAT THE OWNER'S PROJECT MANAGER CHOOSES TO RETAIN SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION DESIGNATED BY THE PROJECT MANAGER. ALL OTHER MATERIALS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.

GENERAL EXISTING CONDITION NOTES

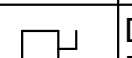
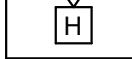
1. AREAS OF WORK EXIST FOR THIS PROJECT WHICH WERE NOT ACCESSIBLE OR HAD LIMITED ACCESS DURING DESIGN. AS SUCH, CONTRACTOR SHALL VERIFY ALL UTILITIES IN AREA OF WORK BEFORE DEMOLITION OF ANY SERVICE. ANY ELECTRICAL COMPONENTS NOT SHOWN SHALL BE IDENTIFIED AND THE ARCHITECT AND ENGINEER SHALL BE NOTIFIED AS SOON AS POSSIBLE. NO ELECTRICAL REWORK SHALL BE COMMENCED WITHOUT COORDINATION OF THE ENGINEER. WHERE INFORMATION SHOWN ON THESE DRAWINGS CONFLICTS WITH VERIFIED FIELD CONDITIONS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
2. IN AREAS WHERE THE EXISTING CEILINGS ARE NOT SLATED TO BE REPLACED, THE CONTRACTOR SHALL WORK THROUGH THE EXISTING CEILINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY DAMAGED TILE OR GRID THAT IS A RESULT OF THEIR WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A FIRESTOP SYSTEM IN ALL PENETRATIONS OF FIRE-RATED FLOORS AND WALLS CREATED BY THE REMOVAL OF EXISTING ELECTRICAL CONDUIT OR CABLES, AS WELL AS THOSE CREATED BY NEWLY INSTALLED CONDUITS AND SLEEVES.
4. WHERE INSTALLATION REQUIRES CUTTING OR DRILLING OF THE EXISTING FLOOR SLAB, THE CONTRACTOR SHALL X-RAY THE EXISTING SLAB PRIOR TO WORK TO ENSURE THAT NO EXISTING UTILITIES OR STRUCTURAL ELEMENTS IN THE SLAB WILL BE COMPROMISED BY THE WORK. NOTIFY THE ENGINEER OF ANY CONFLICTS THAT WILL REQUIRE RELOCATING THE PROPOSED SLAB WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGED UTILITIES OR STRUCTURAL ELEMENTS CAUSED BY THE SLAB DEMOLITION.
5. SUPPORT ALL EXISTING CONDUITS AND JUNCTION BOXES ABOVE THE CEILING IN THE CONSTRUCTION AREA PER NEC.
6. REMOVE ALL ABANDONED CONDUIT, WIRE AND CABLES ABOVE THE CEILING IN THE CONSTRUCTION AREA.
7. PROVIDE JUNCTION BOX COVERS ON ALL EXISTING JUNCTION BOXES ABOVE THE CEILING IN THE CONSTRUCTION AREA.
8. SUPPORT ALL EXISTING CABLES ABOVE THE CEILING IN THE CONSTRUCTION AREA.

GENERAL HVAC CONTROLS CONDUIT NOTES

1. PROVIDE CONDUIT FOR HVAC CONTROL CIRCUITS AS REQUIRED TO INTERCONNECT HVAC UNIT TO CONTROL CIRCUITS. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR AND CONTROLS PROVIDER TO DETERMINE SCOPE OF CONDUITS REQUIRED FOR HVAC CONTROLS. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED CONDUIT. COORDINATE POINTS OF CONNECTION WITH DIVISION 23. PROVIDE PULL CORD IN ALL EMPTY CONDUITS. SEE MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL HVAC EQUIPMENT (AHU, DUCT SMOKE DETECTORS, ETC).
2. THESE DOCUMENTS MAY NOT INCLUDE ENTIRE ELECTRICAL INFRASTRUCTURE REQUIRED TO SUPPORT THE BUILDING AUTOMATION SYSTEM. COORDINATE WITH BAS PROVIDER ON ALL NECESSARY INFRASTRUCTURE FOR A COMPLETE AND WORKING SYSTEM.

GENERAL FIRE ALARM SYSTEM NOTES

1. PROVIDE ALL DUCT SMOKE DETECTORS AND ACCESSORIES NECESSARY FOR INTERLOCKING WITH MECHANICAL EQUIPMENT (AHU'S, SMOKE DAMPERS, ETC). COORDINATE WITH MECHANICAL PLANS FOR LOCATIONS AND REQUIREMENTS.
2. INSTALL DUCT SMOKE DETECTORS TO COMPLY WITH NFPA 72. WHERE TWO DETECTOR LOCATIONS ARE SHOWN AT A SINGLE PIECE OF EQUIPMENT, INSTALL ONE DETECTOR IN THE SUPPLY DUCTWORK AND ONE DETECTOR IN THE RETURN DUCTWORK. COORDINATE MOUNTING LOCATION WITH THE MECHANICAL CONTRACTOR. LOCATION SHOWN IS FOR REFERENCE ONLY.

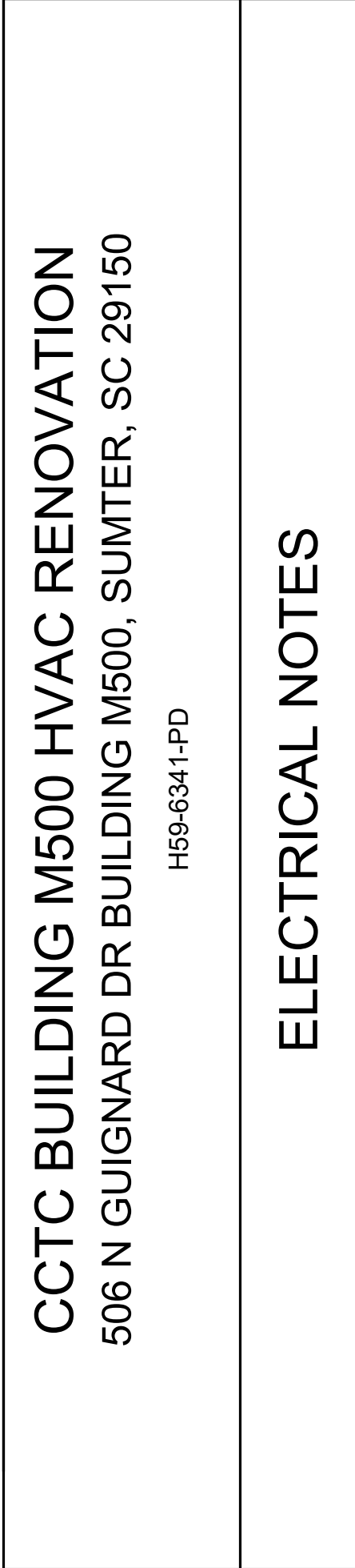
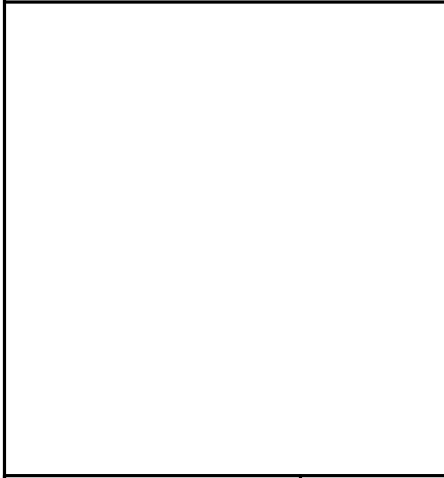
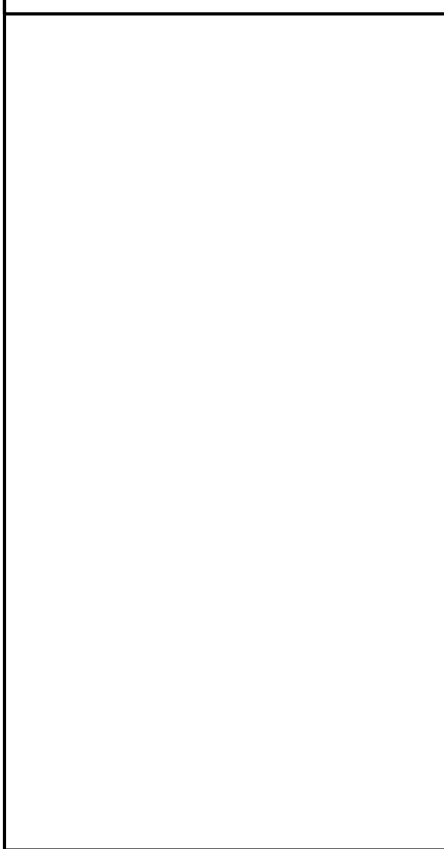
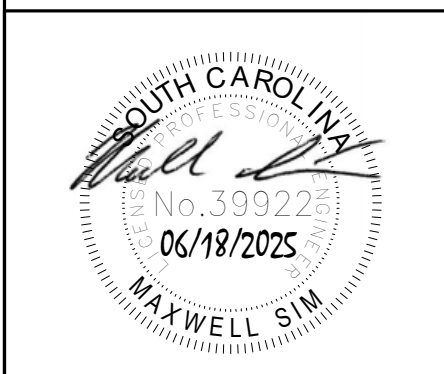
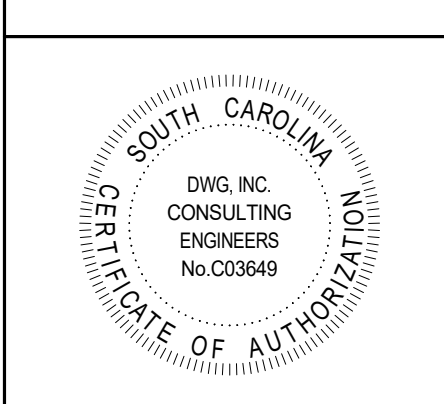
ELECTRICAL SYMBOL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	MOTOR CONTROL CABINET		TRANSFORMER
	PANELBOARD - BRANCH, SURFACE MOUNTED		DISCONNECT SWITCH (FUSIBLE OR NON-FUSIBLE)
	FIRE ALARM HORN/STROBE NOTIFICATION APPLIANCE (WALL MOUNTED)		SMOKE DETECTOR (CEILING MOUNTED)
	FIRE ALARM PULL STATION		EXIT SIGN, SINGLE SIDED

ELECTRICAL ABBREVIATIONS	
ABBR	DESCRIPTION
(E)	EXISTING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
B	BOILER
BP	BOILER PUMP
CHWP	CHILLED WATER PUMP
DS	DISCONNECT SWITCH
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
FDS	FUSED DISCONNECT SWITCH
GWH	GAS WATER HEATER
HWP	HOT WATER PUMP
J-BOX	JUNCTION BOX
MCC	MOTOR CONTROL CABINET
NEC	NATIONAL ELECTRICAL CODE
NFDS	NON-FUSED DISCONNECT SWITCH
RP	RECIRCULATING PUMP
WH	WATER HEATER
WP	WEATHERPROOF
XFMR	TRANSFORMER

ELECTRICAL CODES AND STANDARDS (WITH ALL SOUTH CAROLINA MODIFICATIONS)	
CODE	DESCRIPTION
IBC (2021)	INTERNATIONAL BUILDING CODE
NFPA 70 (2020)	NATIONAL ELECTRICAL CODE
NFPA 72 (2019)	NATIONAL FIRE ALARM AND SIGNALING CODE

WIRE SIZING CHART 20 AMP BRANCH CIRCUITS	
DISTANCE, 120V	MINIMUM WIRE SIZE
0 - 90 FEET	#12 AWG
90 - 230 FEET	#10 AWG
230 - 446 FEET	#8 AWG

LINE LEGEND	
SYMBOL	DESCRIPTION
	EXISTING TO REMAIN
	NEW CONSTRUCTION
	DEMOLISH



#	Description	01/01/01
1	Addendum #1	06/18/25

JOB No.	23253-01
DATE:	06/18/2025
DRAWN BY:	KMD
CHECKED BY:	MHS
SHEET	NUMBER

E001

PANELBOARD SCHEDULE

PANEL NAME: MH				VOLTS: 480/277 Wye				A.I.C. RATING: 35,000			
LOCATION: MECH/ELEC. RM. 118				PHASES: 3				MAINS RATING: 125 A			
SOURCE: MCC				WIRES: 4				MAINS TYPE: MAIN CIRCUIT BREAKER			
MOUNTING: SURFACE				ENCLOSURE: TYPE 1							
CKT NO.	CIRCUIT DESIGNATION	TRIP	POLES	A	B	C	POLES	TRIP	CIRCUIT DESIGNATION	CKT NO.	
1				1330 VA / 1330 VA						2	
3	HVAC: HWP-1	15 A	3		1330 VA / 1330 VA		3	15 A	HVAC: HWP-2	4	
5						1330 VA / 1330 VA				6	
7				3880 VA / 3880 VA						8	
9	HVAC: CHWP-1	25 A	3		3880 VA / 3880 VA		3	25 A	HVAC: CHWP-2	10	
11						3880 VA / 3880 VA				12	
13				13670 VA / 0 VA						14	
15	HVAC: AHU-1	60 A	3		13670 VA / 0 VA		3	30 A	PANEL 'ML' VIA XFMR 'TM'	16	
17						13670 VA / 0 VA				18	
19	PREPARED SPACE	--	1	0 VA / 0 VA			1	--	PREPARED SPACE	20	
21	PREPARED SPACE	--	1		0 VA / 0 VA		1	--	PREPARED SPACE	22	
23	PREPARED SPACE	--	1			0 VA / 0 VA	1	--	PREPARED SPACE	24	
25	PREPARED SPACE	--	1	0 VA / 0 VA			1	--	PREPARED SPACE	26	
27	PREPARED SPACE	--	1		0 VA / 0 VA		1	--	PREPARED SPACE	28	
29	PREPARED SPACE	--	1			0 VA / 0 VA	1	--	PREPARED SPACE	30	
TOTAL PHASE LOAD:				24088 VA	24088 VA	24088 VA					
TOTAL PHASE CURRENT:				87 A	87 A	87 A					
PANEL TOTALS											
TOTAL CONNECTED LOAD:				72265 VA							
TOTAL CONNECTED CURRENT:				87 A							

PANELBOARD SCHEDULE

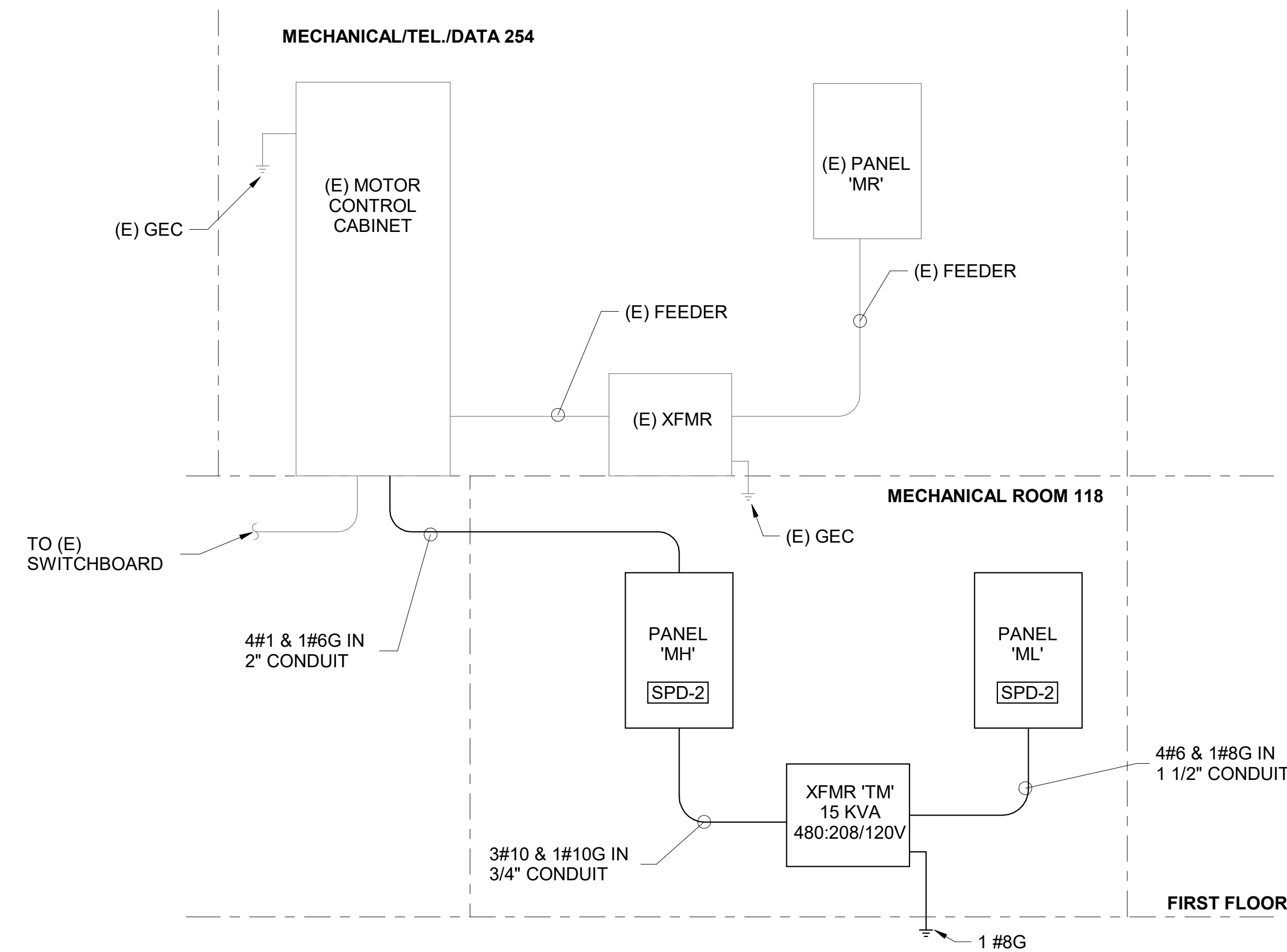
PANEL NAME: ML				VOLTS: 120/208 Wye				A.I.C. RATING: 22,000			
LOCATION: MECH/ELEC. RM. 118				PHASES: 3				MAINS RATING: 50 A			
SOURCE: XFMR 'TM'				WIRES: 4				MAINS TYPE: MAIN CIRCUIT BREAKER			
MOUNTING: SURFACE				ENCLOSURE: TYPE 1							
CKT NO.	CIRCUIT DESIGNATION	TRIP	POLES	A	B	C	POLES	TRIP	CIRCUIT DESIGNATION	CKT NO.	
1	HVAC: RP-2	20 A	1	200 VA / 200 VA			1	20 A	HVAC: RP-1	2	
3	HVAC: GWH-1	20 A	1		240 VA / 200 VA		1	20 A	HVAC: BP-1	4	
5	HVAC: B-1	20 A	1			1200 VA / 200 VA	1	20 A	HVAC: BP-2	6	
7	HVAC: B-2	20 A	1	1200 VA / 0 VA			1	20 A	SPARE	8	
9	SPARE	20 A	1		0 VA / 0 VA		1	20 A	SPARE	10	
11	SPARE	20 A	1			0 VA / 0 VA	1	20 A	SPARE	12	
13	SPARE	20 A	1	0 VA / 0 VA			1	20 A	SPARE	14	
15	SPARE	20 A	1		0 VA / 0 VA		1	20 A	SPARE	16	
17	SPARE	20 A	1			0 VA / 0 VA	1	20 A	SPARE	18	
TOTAL PHASE LOAD:				1600 VA	440 VA	1400 VA					
TOTAL PHASE CURRENT:				15 A	4 A	13 A					
PANEL TOTALS											
TOTAL CONNECTED LOAD: 3440 VA											
TOTAL CONNECTED CURRENT: 10 A											

GENERAL PANEL SCHEDULE NOTES:

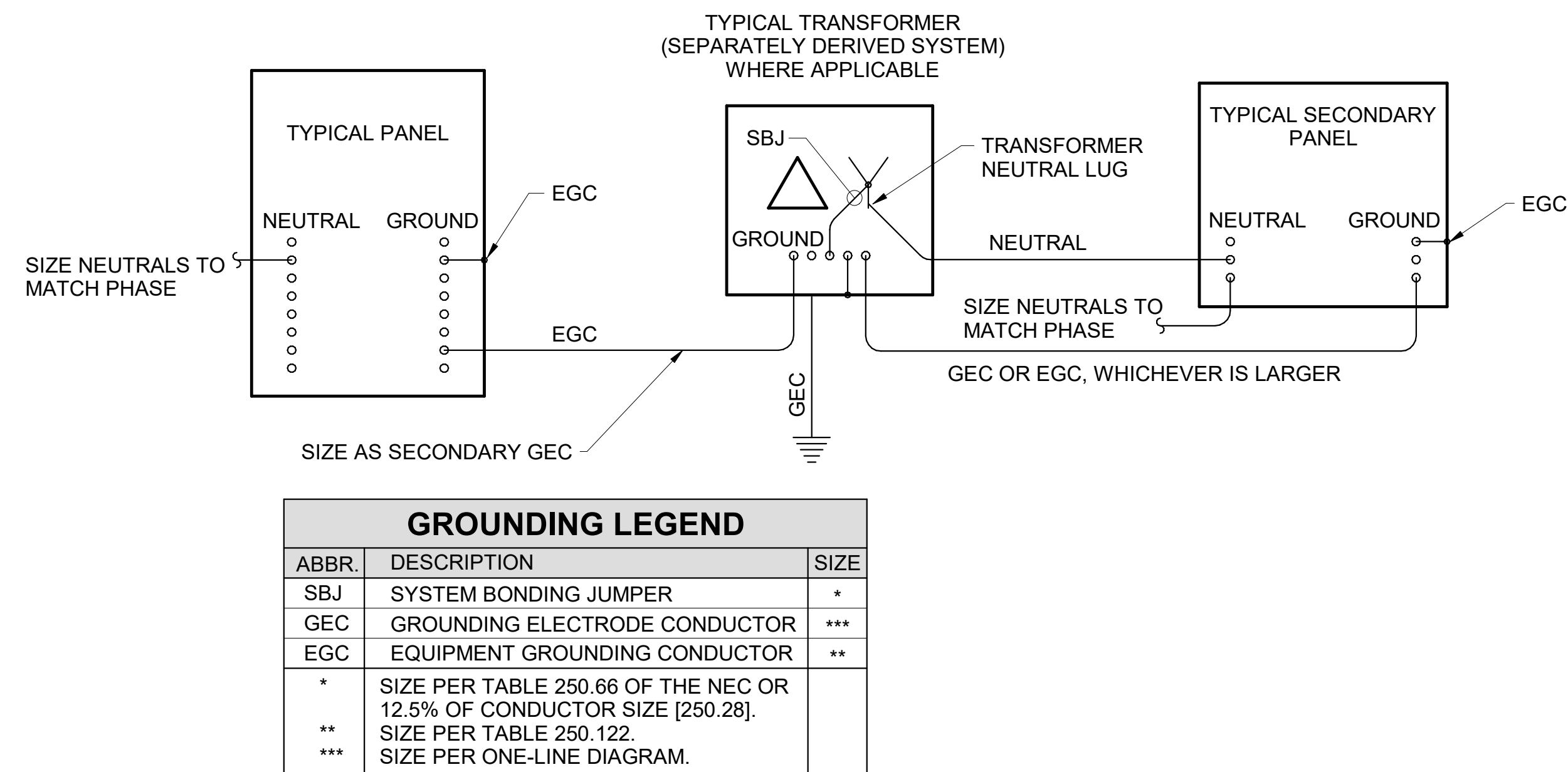
- EXISTING PANEL SCHEDULES AND BREAKER SIZES ARE BASED ON ASBULTS AND VISUAL OBSERVATION. INFORMATION MUST BE FIELD VERIFIED.

EQUIPMENT CONNECTION SCHEDULE

UNIT I.D.	VOLTS	# OF POLES	LOAD (VA)	BRANCH CIRCUIT WIRING	DISCONNECT / STARTER	NOTES
OAF-1	0 V	1	0			
PR-1	0 V	1	0			
PR-2	0 V	1	0			
AIR HANDLING UNITS						
AHU-1	480 V	3	41004	3#4 & #10G IN 1 1/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
BOILERS						
B-1	120 V	1	1200	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
B-2	120 V	1	1200	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
EXHAUST FANS						
EF-7	208 V	2	1456	EXISTING TO REMAIN	30A/2P/NEMA 1 NFDS	
EF-9	480 V	3	2660	EXISTING TO REMAIN	30A/3P/NEMA 1 NFDS	
EF-10	480 V	3	3991	EXISTING TO REMAIN	30A/3P/NEMA 1 NFDS	
PUMPS						
BP-1	120 V	1	200	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
BP-2	120 V	1	200	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
CHWP-1	480 V	3	11639	3#10 & #10G IN 3/4" CONDUIT	VFD WITH INTEGRAL DISCONNECT	
CHWP-2	480 V	3	11639	3#10 & #10G IN 3/4" CONDUIT	VFD WITH INTEGRAL DISCONNECT	
HWP-1	480 V	3	3991	3#12 & #12G IN 3/4" CONDUIT	VFD WITH INTEGRAL DISCONNECT	
HWP-2	480 V	3	3991	3#12 & #12G IN 3/4" CONDUIT	VFD WITH INTEGRAL DISCONNECT	
RP-1	120 V	1	200	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
RP-2	120 V	1	200	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	
WATER HEATER						
GWH-1	120 V	1	240	2#12 & #12G IN 3/4" CONDUIT	CIRCUIT BREAKER SERVES AS DISCONNECT	



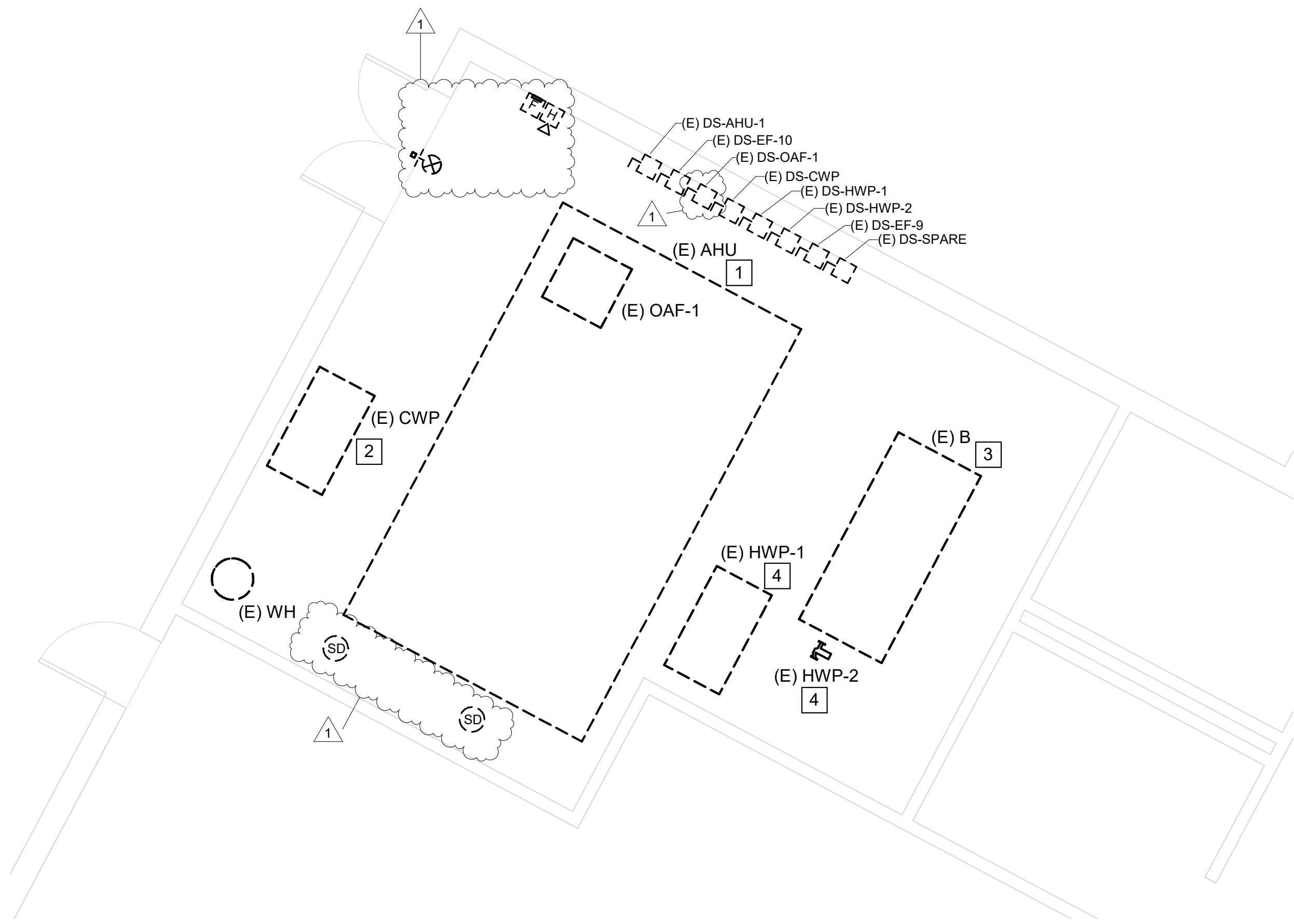
1 ONE-LINE DIAGRAM
E002 NOT TO SCALE

**GROUNDING NOTES:**

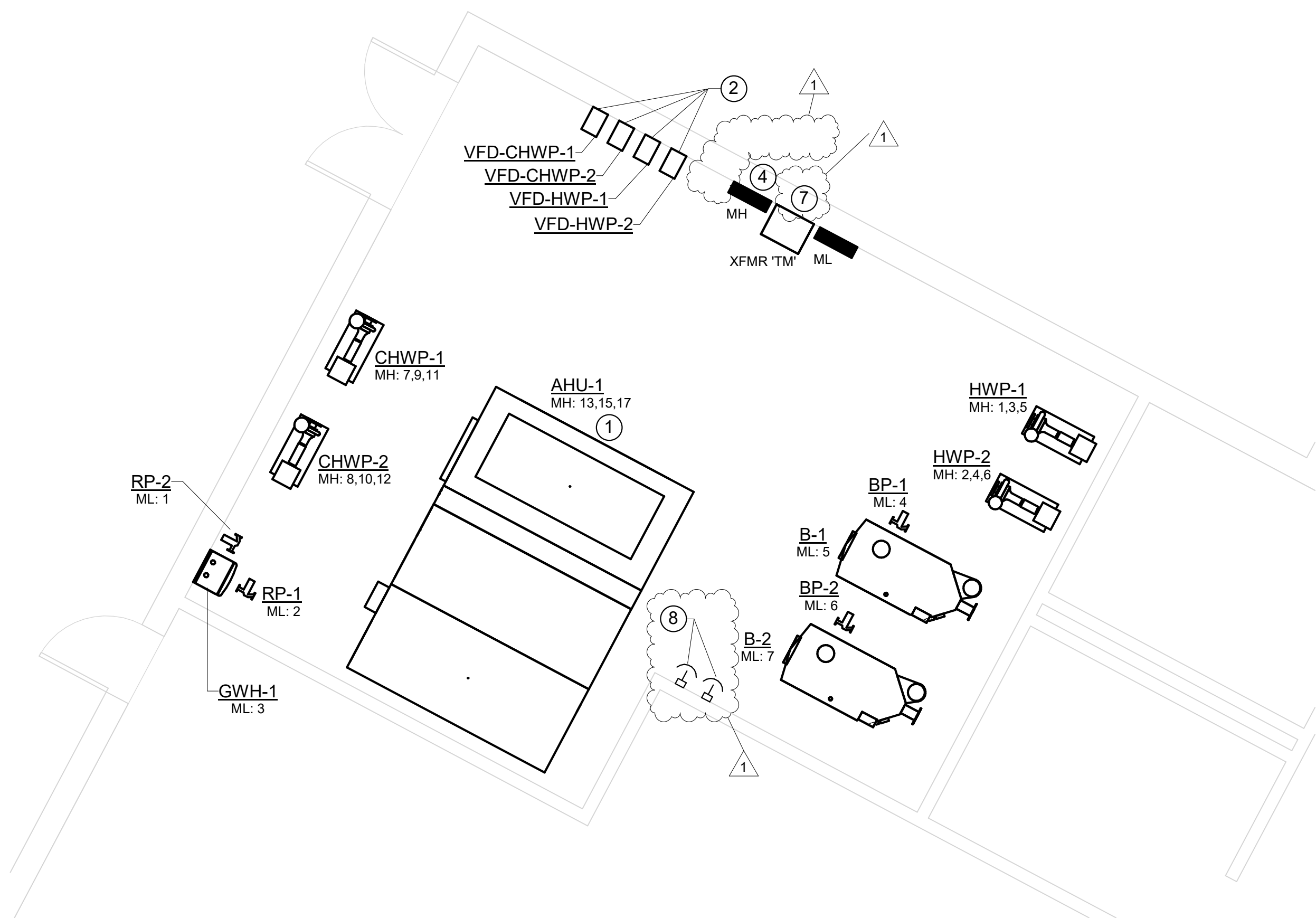
- NUMBERS IN BRACKETS REFER TO SPECIFIC SECTIONS OF THE NATIONAL ELECTRICAL CODE.
- ALL UNDERGROUND OR OTHERWISE INACCESSIBLE GROUND CONNECTIONS AND SPLICES SHALL BE EXOTHERMICALLY WELDED [250.68].
- GROUND ELECTRODE FOR SEPARATELY DERIVED SYSTEMS SHALL BE THE NEAREST METAL WATER PIPE OR STRUCTURAL METAL. IF EITHER IS NOT AVAILABLE, PROVIDE GROUNDING CONDUCTOR BACK TO MAIN GROUND BUS AT SERVICE ENTRANCE.
- PROVIDE A GROUND WIRE IN ALL CONDUITS.
- EARTH SHALL NOT BE USED AS THE SOLE GROUND RETURN PATH FOR ANY EQUIPMENT POWERED UNDER THIS PROJECT. OTHERWISE OVERCURRENT PROTECTION MIGHT NOT WORK, OR IT MIGHT CAUSE POWER QUALITY PROBLEMS.
- NO ALUMINUM SHALL BE USED FOR GROUNDING WORK WITHOUT THE SPECIFIC WRITTEN PERMISSION OF THE ENGINEER. EXCEPTION: ALUMINUM BUILDING STRUCTURAL MATERIALS SHALL BE BONDED WITH LISTED ALUMINUM EQUIPMENT WITH ALUMINUM TO COPPER CONNECTORS FOR ROUTING COPPER EGC'S.
- ALL METAL ENCLOSURES AND RACEWAYS SHALL BE BONDED TO GROUND [250.86]. FOR CIRCUITS OVER 250V PROVIDE BOND PER [250.97]. STANDARD LOCKNUTS ARE NOT ACCEPTABLE.
- PROVIDE EGC CONNECTED TO ANY JUNCTION BOX WHERE SPLICE IS MADE [250.148].
- PROVIDE BOND TO EXPOSED METAL ON ALL MOTORS, PUMPS, AND LIGHTING FIXTURES PER [250.112].

2 GROUNDING DETAIL
E002 NOT TO SCALE

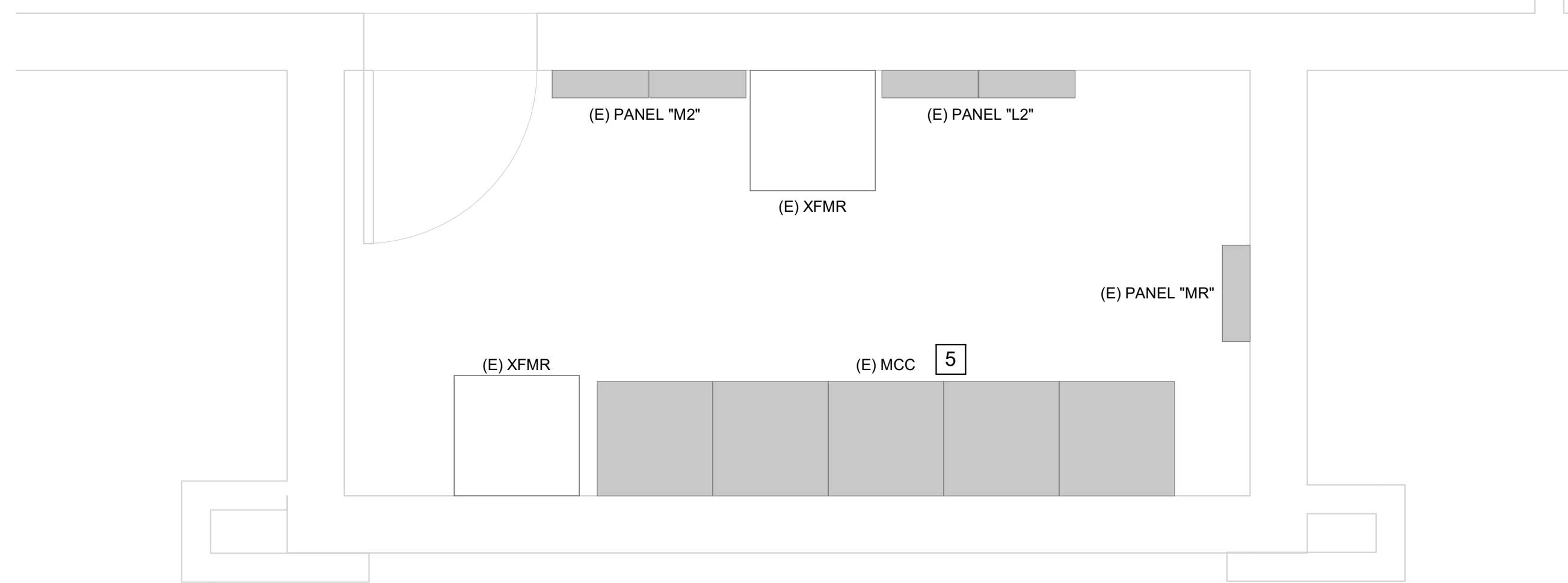
#	Description	01/01/01
1	Addendum #1	06/18/25
JOB No.	23253-01	
DATE:	06/18/2025	
DRAWN BY:	KMD	
CHECKED BY:	MHS	
SHEET	NUMBER	



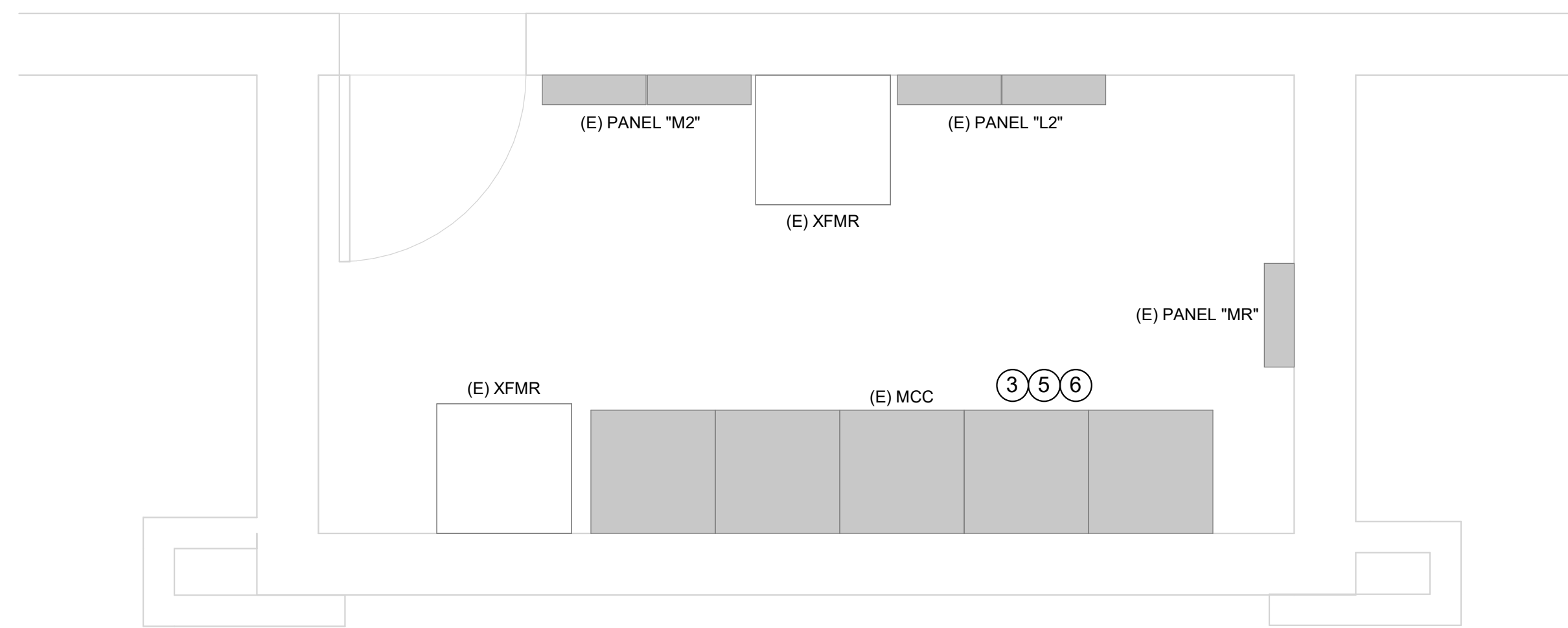
1 FIRST FLOOR MECH ROOM ELECTRICAL DEMO PLAN
E101 SCALE: 1/4" = 1'-0"



2 FIRST FLOOR MECH ROOM ELECTRICAL PLAN
E101 SCALE: 1/4" = 1'-0"



3 SECOND FLOOR MECH/DATA ROOM ELECTRICAL DEMOLITION PLAN
E101 SCALE: 1/2" = 1'-0"



4 SECOND FLOOR MECH/DATA ROOM ELECTRICAL PLAN
E101 SCALE: 1/2" = 1'-0"

DEMOLITION KEYNOTES

- 1 ELECTRICALLY DISCONNECT AIR HANDLER UNIT AND DEMOLISH ALL ASSOCIATED WIRE, CONDUIT AND DISCONNECTING MEANS BACK TO SOURCE.
- 2 ELECTRICALLY DISCONNECT CHILLED WATER PUMP AND DEMOLISH ALL ASSOCIATED WIRE, CONDUIT AND DISCONNECTING MEANS BACK TO SOURCE.
- 3 ELECTRICALLY DISCONNECT BOILER AND DEMOLISH ALL ASSOCIATED WIRE, CONDUIT AND DISCONNECTING MEANS BACK TO SOURCE.
- 4 ELECTRICALLY DISCONNECT HWP AND DEMOLISH ALL ASSOCIATION WIRE, CONDUIT AND DISCONNECTING MEANS BACK TO SOURCE.
- 5 DEMOLISH EXISTING MOTOR STARTER BUCKETS SERVING EF-9, EF-10, AND AHU-1. CAP WIRE AND CONDUIT FOR EF-9 AND EF-10 FOR RE-USE.

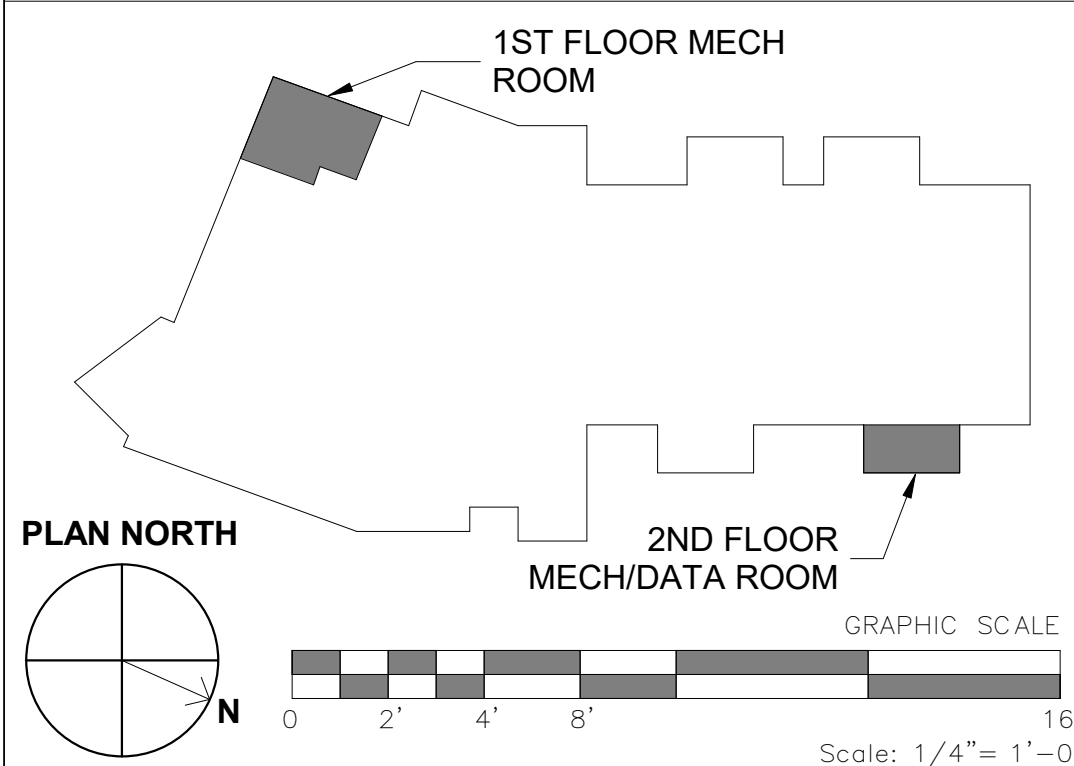
RENOVATION KEYNOTES

- 1 EXISTING DUCT MOUNTED SMOKE DETECTOR AT THIS APPROXIMATE LOCATION SHALL BE REWIRED TO NEW AHU BY CONTROL CONTRACTOR.
- 2 NEW VFD WITH INTEGRAL DISCONNECT. TO BE PROVIDED BY CONTROLS CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR.
- 3 PROVIDE NEW ABB BREAKER FOR EXISTING GENERAL ELECTRIC MODEL 8000 MOTOR CONTROL CENTER, CATALOG NUMBER: M-FB-125-QMR6-A. INSTALL NEW BREAKER INTO SPACE MADE FROM DEMOLITION OF THE EXISTING AHU-1. UTILIZE NEW BREAKER FOR NEW PANEL 'MH'.
- 4 PROVIDE NEW PANEL FEEDER CONNECTION TO NEW 125A ABB BREAKER IN EXISTING MCC. ROUTE FEEDER FOR PANELBOARD ACROSS THE ATRIUM VIA THE 1ST FLOOR ACCESSIBLE CEILING SPACE.
- 5 PROVIDE NEW ABB BREAKER FOR EXISTING GENERAL ELECTRIC MODEL 8000 MOTOR CONTROL CENTER, CATALOG NUMBER: M-FB-015-QMR6-A. INSTALL NEW BREAKER INTO SPACE MADE FROM DEMOLITION OF THE EXISTING EF-9. MODIFY AND EXTEND EXISTING WIRE AND CONDUIT AS NEEDED TO MAKE CONNECTION TO NEW BREAKER. UTILIZE NEW BREAKER FOR NEW ROOF EXHAUST FAN.
- 6 PROVIDE NEW ABB BREAKER FOR EXISTING GENERAL ELECTRIC MODEL 8000 MOTOR CONTROL CENTER, CATALOG NUMBER: M-FB-015-QMR6-A. INSTALL NEW BREAKER INTO SPACE MADE FROM DEMOLITION OF THE EXISTING EF-10. MODIFY AND EXTEND EXISTING WIRE AND CONDUIT AS NEEDED TO MAKE CONNECTION TO NEW BREAKER. UTILIZE NEW BREAKER FOR NEW ROOF EXHAUST FAN.
- 7 NEW 15KVA TRANSFORMER SHALL BE MOUNTED TO THE WALL 3' AFF. PROVIDE MOUNTING PLATFORM WITH A MINIMUM WEIGHT CAPACITY OF 250 POUNDS.
- 8 PROVIDE EMERGENCY STOP BUTTON FOR BOILERS B-1 & B-2.

GENERAL NOTES

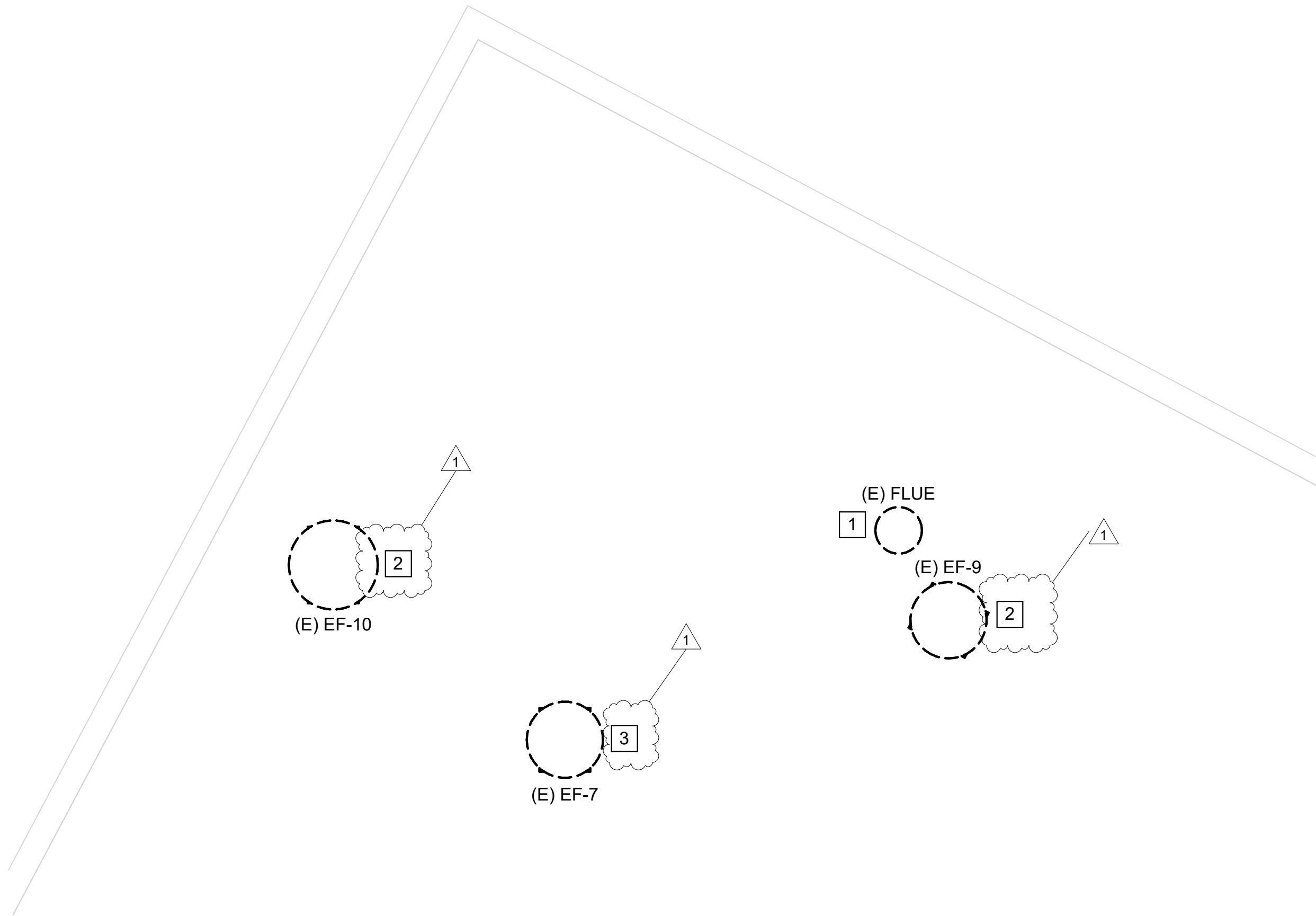
1. CONTRACTOR SHALL FIELD VERIFY EXISTING DUCT MOUNTED SMOKE DETECTORS ARE WITHOUT DEFECT AND SUITABLE FOR REUSE FOR THE REPLACEMENT AHU. IF A SMOKE DETECTOR REPLACEMENT IS REQUIRED, DETECTORS SHALL BE SUPPLIED BY ELECTRICAL CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR, WIRED TO AHU BY CONTROL CONTRACTOR, AND WIRED TO EXISTING BUILDING FIRE ALARM SYSTEM BY ELECTRICAL CONTRACTOR. EXISTING FIRE ALARM CONTROL PANEL IS LOCATED IN THE ELECTRICAL ROOM ON THE FIRST FLOOR.
2. WHERE DEVICES ARE DEMOLISHED IN EXISTING WALLS TO REMAIN, PATCH WALLS TO MATCH EXISTING.

KEYPLAN

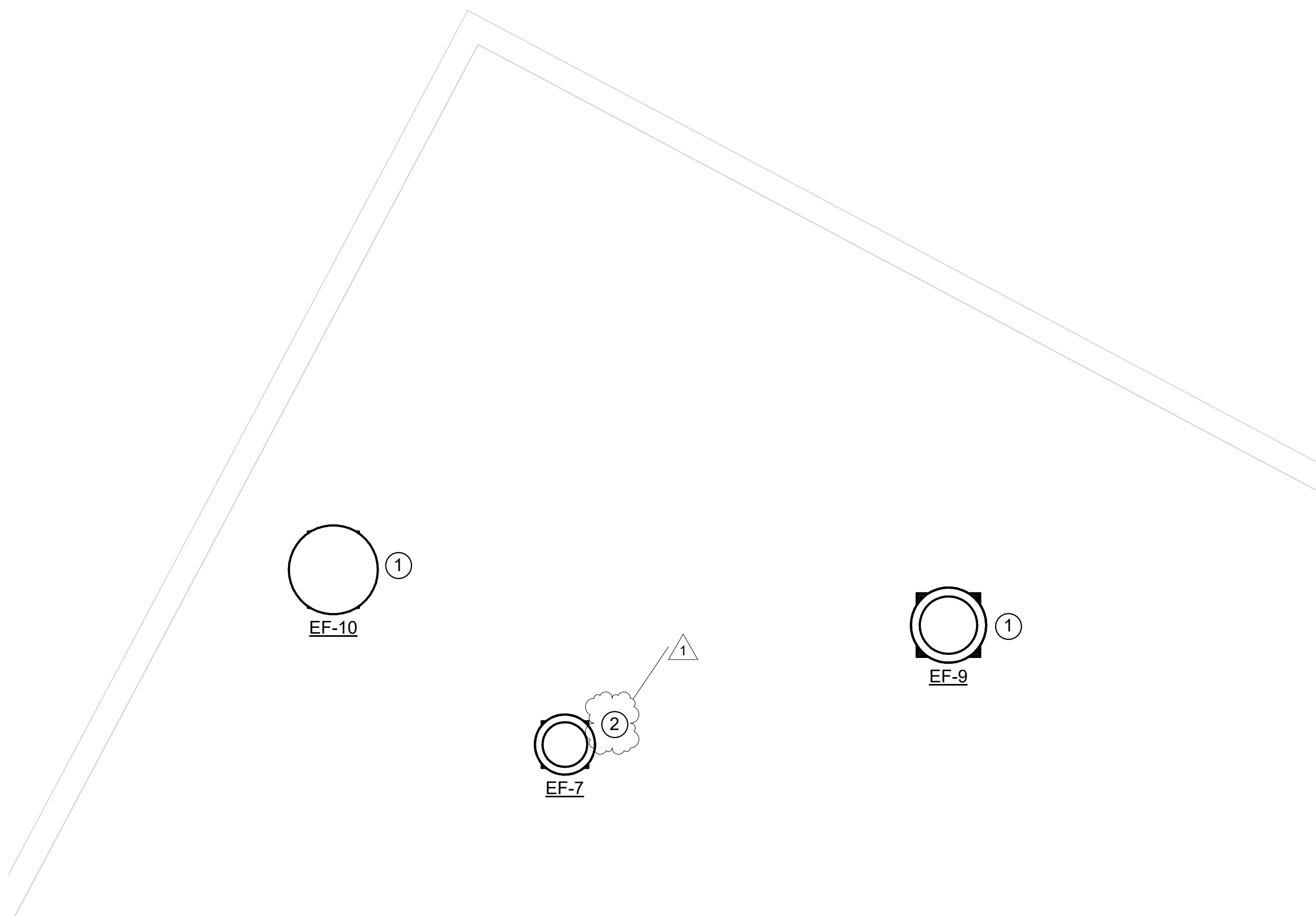


#	Description	01/01/01
1	Addendum #1	06/18/25

JOB No.	23253-01
DATE:	06/18/2025
DRAWN BY:	KMD
CHECKED BY:	MHS
SHEET	NUMBER



2 ROOF ELECTRICAL DEMOLITION PLAN
E102 SCALE: 1/4" = 1'-0"



1 ROOF ELECTRICAL PLAN
E102 SCALE: 1/4" = 1'-0"

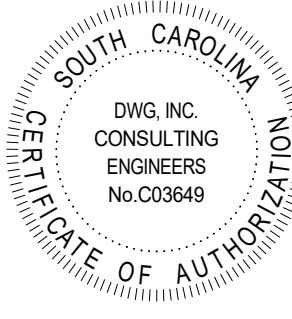
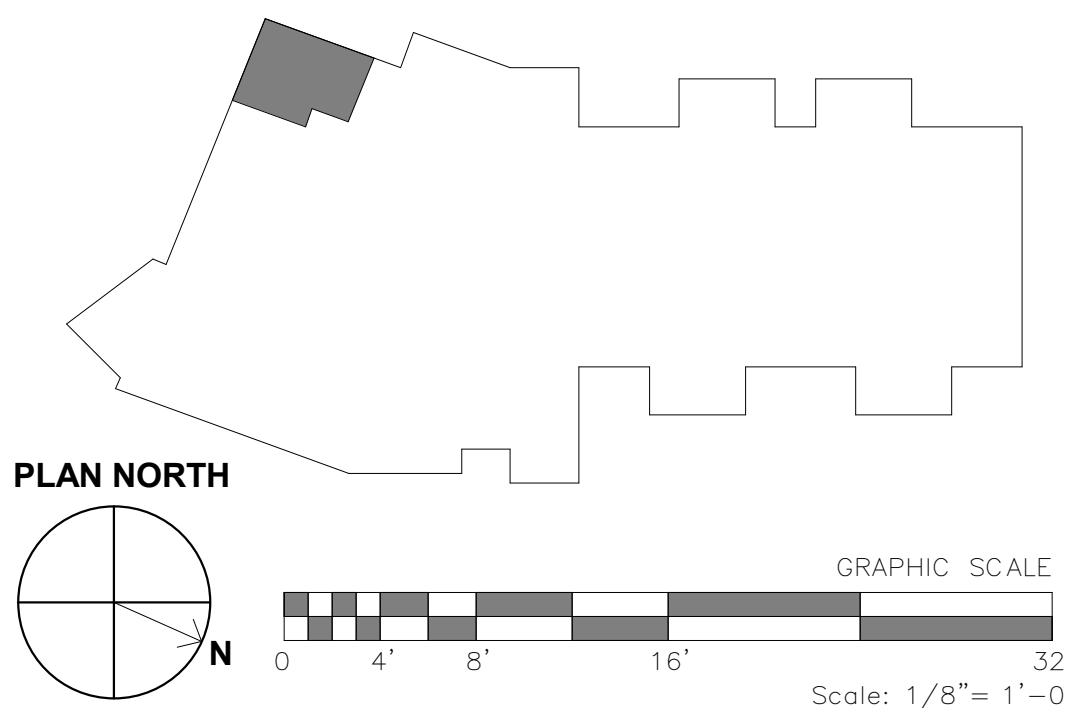
DEMOLITION KEYNOTES

- 1 ELECTRICALLY DISCONNECT EXHAUST FAN AND DEMOLISH ALL ASSOCIATED WIRE, CONDUIT AND DISCONNECTING MEANS BACK TO SOURCE.
- 2 ELECTRICALLY DISCONNECT EXHAUST FAN AND DEMOLISH DISCONNECTING MEANS. CAP WIRE AND CONDUIT FOR RE-USE.
- 3 ELECTRICALLY DISCONNECT EXHAUST FAN AND DEMOLISH DISCONNECTING MEANS. CAP WIRE AND CONDUIT FOR RE-USE. DEMOLISH EXISTING BREAKER IN PANELBOARD FEEDING EF-7. BREAKER TO BE REPLACED IN RENOVATION.

RENOVATION KEYNOTES

- 1 MODIFY AND EXTEND EXISTING WIRE AND CONDUIT AS NEEDED FOR NEW EXHAUST FAN AND NEW DISCONNECT. NEW DISCONNECT SHALL BE LOCATED WITHIN SITE OF EQUIPMENT. PROVIDE FINAL CONNECTION TO NEW 15A ABB BREAKER IN EXISTING MCC.
- 2 MODIFY AND EXTEND EXISTING WIRE AND CONDUIT AS NEEDED FOR NEW EXHAUST FAN AND NEW DISCONNECT. NEW DISCONNECT SHALL BE LOCATED WITHIN SITE OF EQUIPMENT. PROVIDE NEW 15A, 1 POLE BREAKER IN SPACE MADE DURING DEMOLITION. MATCH EXISTING MAKE, MANUFACTURER AND RATINGS.

KEYPLAN



CCTC BUILDING M500 HVAC RENOVATION
506 N GUIGNARD DR BUILDING M500, SUMTER, SC 29150

H59-6341-PD

ROOF ELECTRICAL PLAN

#	Description	01/01/01
1	Addendum #1	06/18/25

JOB No.	23253-01
DATE:	06/18/2025
DRAWN BY:	KMD
CHECKED BY:	MHS
SHEET	NUMBER

E102