



REFLECTED CEILING PLAN

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

KEY NOTES

- 1 REMOVE GYPSUM BOARD CEILING AS REQUIRED FOR MECHANICAL WORK, RE: MECH. REPAIR GYPSUM BOARD TO MATCH EXISTING. PAINT ENTIRE CEILING.
- 2 REMOVE SUSPENDED ACOUSTIC CEILING AS REQUIRED FOR MECHANICAL WORK, RE: MECH. REPLACE CEILING TILE AND GRID. PROVIDE NEW CEILING GRIDS TO REPLACE DAMAGED TILE/GRID.

GENERAL NOTES

REPAIR GYPSUM BOARD ON STRUCTURE TO MAINTAIN FIRE RESISTANT ROOF CEILING ASSEMBLY WHERE DAMAGED BY MECHANICAL WORK. INSTALL FIRESTOPPING AT PIPE/DUCTWORK PENETRATIONS.

ALERT OWNER & ARCHITECT IF PREVIOUS DAMAGE TO FIRE-RESISTANT ROOF-CEILING ASSEMBLY IS OBSERVED.



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PRF - Power HVAC Boiler Upgrades

ISSUE	DATE
Construction Documents	09/22/2023
Issued for Construction	10/27/2023

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PLUMBING FIXTURE SCHEDULE												
SYMBOL	TYPE	ADA	ACCESSORIES	FINISH	MANUFACTURER & MODEL NUMBER	FAUCET TRIM MANUFACTURER & MODEL NUMBER	ACCEPTABLE MANUFACTURERS	REMARKS	ROUGH IN CONNECTION SIZING			
									WASTE (INCHES)	VENT (INCHES)	HOT (INCHES)	COLD (INCHES)
EFW-I	EMERGENCY EYE AND FACE WASH PEDESTAL MOUNTED, STAINLESS STEEL BOWL, YELLOW POP-OFF DUST COVER.	YES	INTEGRAL FLOW CONTROL, 1/2" IPS STAY OPEN BALL VALVE OPERATED BY SWING ARM OPERATION, IN-LINE MESH WATER STRAINER	COMPOSITE	HANS T351-1641	--	BRADLEY GUARDIAN EQUIP. SPEAKMAN	PROVIDE WITH THERMAL DISPERSION MONITOR EQUAL TO AMERITROL MODEL FX1000. SEE NOTE 2.	2	2	1/2 (85F-105F)	--
FD-I	FLOOR DRAIN - 5" ROUND TOP, ROUND CAST IRON BODY FLASHING COLLAR, ADJUSTABLE STRAINER HEAD, SECURED GRATE	YES	Z10T2 TRAP PROTECTOR	NICKLE BRONZE	ZURN Z415-BZ1	--	JOSAM JR SMITH MIFAB	FOR FINISHED FLOOR AREAS PROVIDED BY AHU MANUFACTURER	NOTED ON PLANS	2	--	--
NOTE: 1. ALL CONNECTIONS TO POTABLE WATER SYSTEM SHALL CONFORM TO NSF/ANSI-61 AND NSF/ANSI-372 EFFECTIVE 01/04/2014. 2. COORDINATE INTERLOCKING SENSOR NOTIFICATIONS FROM THERMAL DISPERSION MONITOR WITH SIEMENS.												

WATER PRESSURE REDUCING VALVE SCHEDULE									
SYMBOL	MODEL	SIZE (IN)	DESIGN FLOW (GPM)	MINIMUM FLOW (GPM)	INLET PRESSURE (PSIG)	OUTLET PRESSURE (PSIG)	SET PRESSURE (PSIG)	FALLOFF PRESSURE (PSIG)	NOTES
PRV-I	MILKINS 500XL	1	31	0	75	55	55	11	1, 2
NOTES: 1. EQUIPMENT SCHEDULE BASED ON: MILKINS. 2. ACCEPTABLE MANUFACTURERS INCLUDE: A.W. CASH, MATTS, MILKINS. SPECIFICATION: ALL BRONZE SPRING AND DIAPHRAGM MANUAL ADJUSTMENT FOR OUTLET WATER PRESSURE. 2" AND SMALLER SHALL HAVE FEMALE THREAD CONNECTIONS. 2-1/2" AND LARGER SHALL HAVE FLANGED CONNECTIONS. PROVIDE WITH IN-LINE INLET STRAINER. VALVES SHALL BE SUITABLE FOR WATER PRESSURES UP TO 300PSI.									

THERMOSTATIC MIXING VALVE SCHEDULE										
SYMBOL	MODEL	SERVICE	HOT WATER INLET TEMP (F)	COLD WATER INLET TEMP (F)	OUTLET TEMP (F)	MINIMUM FLOW (GPM)	DESIGN FLOW (GPM)	PRESSURE DROP (PSI)	SIZE (IN)	NOTES
TMV-I	9201EM	EYEWASH STATION	140	55	85	3.7	3.7	2	1/2"	1, 2
NOTES: 1. EQUIPMENT SCHEDULE BASED ON: HANS. 2. ACCEPTABLE MANUFACTURERS INCLUDE: LAHLER, POWERS, WEBSTONE, BRADLEY, AND SYMONS. SPECIFICATION: THERMOSTATIC WATER MIXING VALVE WITH SOLID BIMETAL OR LIQUID FILLED THERMOSTAT, ADJUSTABLE TEMPERATURE LIMIT STOP, INTEGRAL COMBINATION CHECK STOPS ON INLETS, COLOR CODED DIAL THERMOMETER ON OUTLET, INTEGRAL WALL SUPPORT, CAST LEVER HANDLES. BRONZE, BRASS AND STAINLESS STEEL INTERNAL COMPONENTS WITH ROUGH BRONZE OR CHROME PLATED FINISH. LOCKING TEMPERATURE REGULATOR. MASTER MIXING TYPE VALVE SHALL CONSIST OF LARGE THERMOSTATIC WATER MIXING VALVE FOR HIGH FLOWS, SMALL THERMOSTATIC WATER MIXING VALVE FOR SMALL FLOWS, WITH PRESSURE REGULATING VALVE WITH PRESSURE GAUGES, FACTORY PREASSEMBLED AND TESTED PIPING MANIFOLD, INLET AND OUTLET BALL VALVES. EACH THERMOSTATIC MIXING VALVE SHALL BE AS SPECIFIED ABOVE. ASSEMBLY SHALL BE SURFACE MOUNTED TO STEEL FRAMEWORK.										

BACKFLOW PREVENTER SCHEDULE											
SYMBOL	MODEL	TYPE	MINIMUM FLOW (GPM)	MAXIMUM FLOW (GPM)	DESIGN FLOW (GPM)	PRESSURE DROP - DESIGN (PSI)	PRESSURE DROP - MAX (PSI)	SIZE (IN)	LENGTH (IN)	SERVICE	NOTES
BFP-I	LF825F	DOUBLE CHECK	0	30	15	11	20	1	13	DOMESTIC	1, 2, 3
1. ACCEPTABLE MANUFACTURERS INCLUDE: ZURN-MILKINS, MATTS, CASH-ACME, FEBCO, AMES. 2. CONNECTIONS TO DOMESTIC WATER SYSTEM SHALL BE LEAD FREE											

STEAM BOILER SCHEDULE																			
SYMBOL	MANUFACTURER	MODEL	SERVICE	TYPE	BOILER (HP)	MBH INPUT @5L	MBH OUTPUT @5300'	LBS/HR	BOILER			NUMBER OF TUBES	NATURAL GAS SUPPLY PRESSURE (IN WG)	FUEL	OPERATING WEIGHT (LBS)	ELECTRICAL			REMARKS
						BURNER (HP)	MAX FIRING RATE (CFH)		OPERATING PRESSURE (PSIG)	BURNER RPM	VOLT					PHASE			
B-I	RITE	P506	STEAM	WATER TUBE	50	2,043	1,313	1,125	3/4	2,841	75	63	7	NAT. GAS	3,000	3,450	480	3	1 - 10
REMARKS: 1. EQUIPMENT SCHEDULE BASED ON: RITE. ACCEPTABLE MANUFACTURERS INCLUDE: A.JAX, BRYAN. 2. 150 PSI CONSTRUCTION. 3. BASED ON 830 CUFT /HR NATURAL GAS FUEL HEATING. 4. PROVIDE SINGLE POINT POWER CONNECTION FOR BOILER CONTROL PANEL. 5. POWERFLAME G2-G-15 MODULATING BURNER. BURNER CAPACITY SHALL BE SIZED FOR 5,280' ELEVATION. 6. PROVIDE MANUFACTURER'S BOILER SKID PACKAGE SYSTEM INCLUDING CONDENSATE RETURN TANK (CRT-I) AND PUMP (P-6), BLOWDOWN SEPARATOR (BS-I), WATER SOFTENER SYSTEM (WS-I), AND CHEMICAL TREATMENT SYSTEM (CTP-I). 7. PROVIDE 208V/3PH CONNECTION FOR CONDENSATE RETURN TANK PUMP P-6. 8. PROVIDE 120V CONNECTION FOR WS-I METERED TWIN VALVE. 9. PROVIDE 120V CONNECTION FOR CTP-I CHEMICAL METERING PUMP.																			

PUMP SCHEDULE													
SYMBOL	SERVICE	MANUFACTURER	PUMP TYPE	MODEL	GPM	HEAD FEET HIG	EFF %	HP	RPM	VOLTS/ PHASE	SUCTION SIZE INCHES	DISCH SIZE INCHES	REMARKS
(EP-I	HEATING WATER	B & G	BASE MOUNTED	ISO 2-1/2 BB	245	50	73	1 1/2	1750	480/3	3	2-1/2	1
P-4	PH-I HEATING COIL	B & G	IN-LINE	SERIES 60 2-1/2 F	125	20	44	2	1750	480/3	2-1/2	2-1/2	2
P-6	CONDENSATE RETURN TANK	MTH PUMPS	BASE MOUNTED	T4LJ-BF	10	100 PSI OPERATION	---	2	1750	480/3	---	---	3
REMARKS: 1. PUMP IS EXISTING TO REMAIN SHOWN HERE FOR REFERENCE ONLY. 2. INTERLOCK WITH EXISTING PH COIL FREEZE PROTECTION CONTROL OPERATION. SEE SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION. 3. INTERLOCK WITH BOILER FEED WATER CONTROLLER. TC TO INTERLOCK WITH EXISTING FEED WATER CONDENSATE PUMP SERVING CLEAN STEAM GENERATOR													

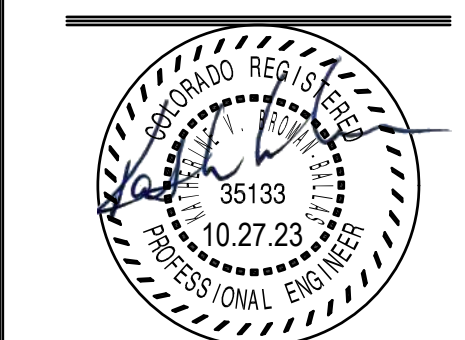
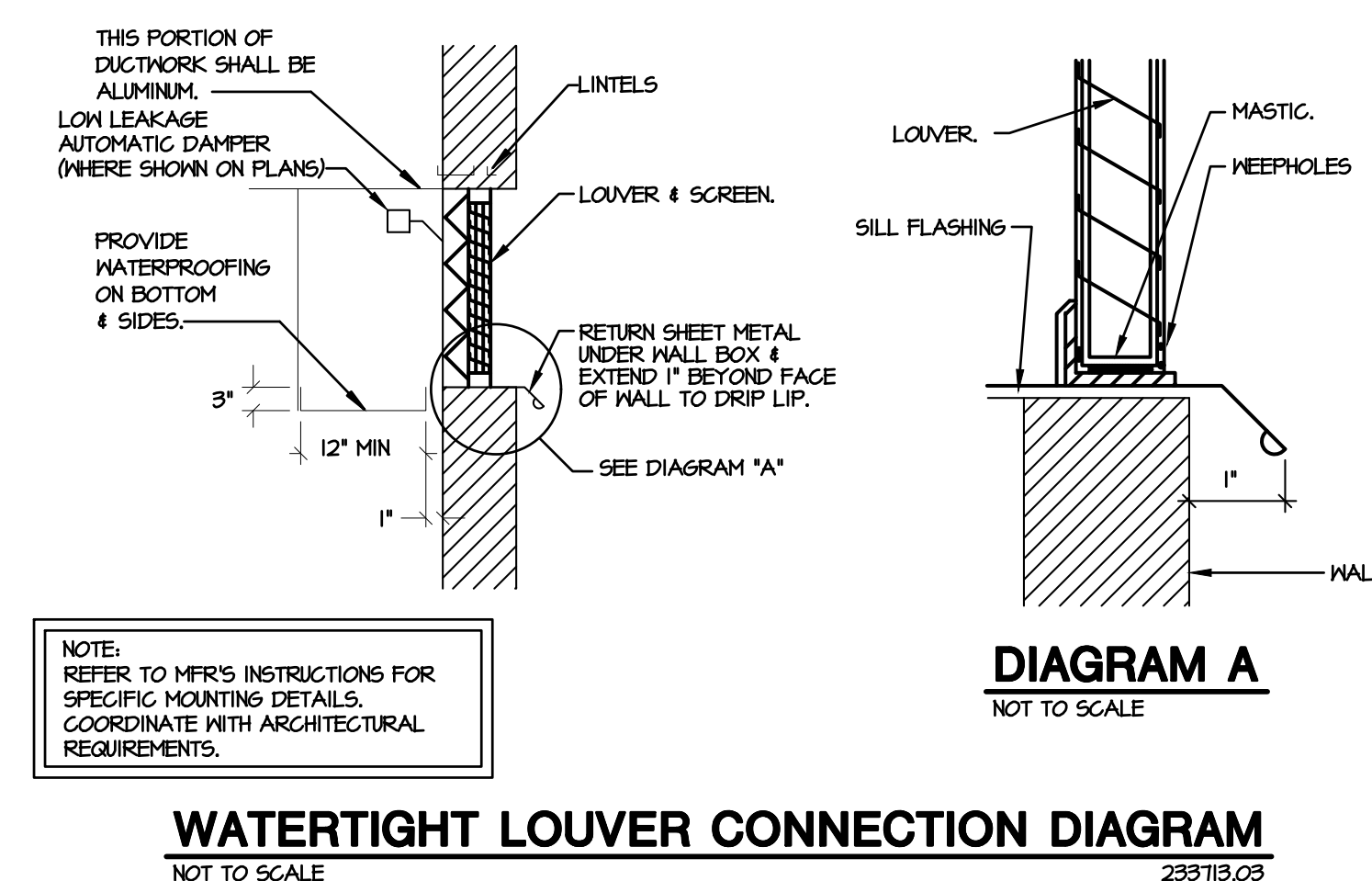
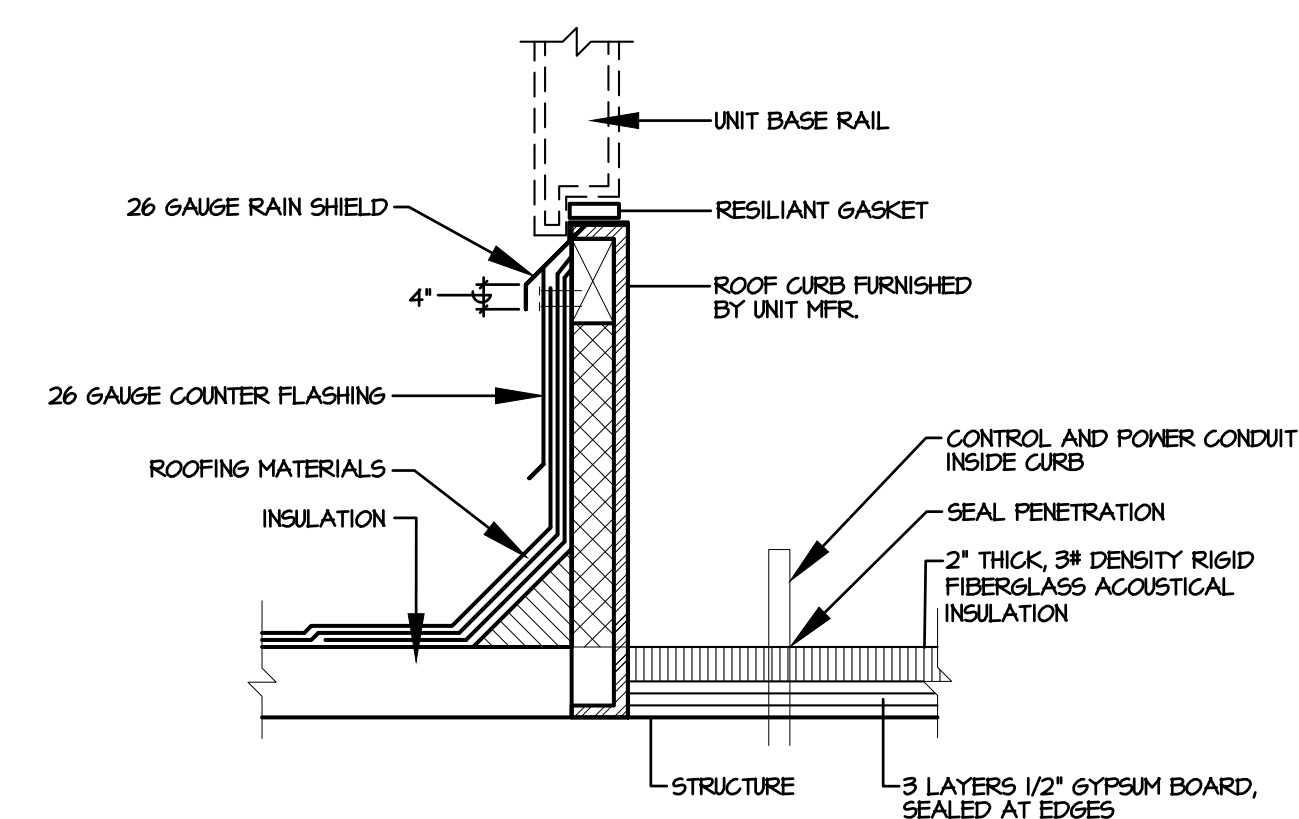
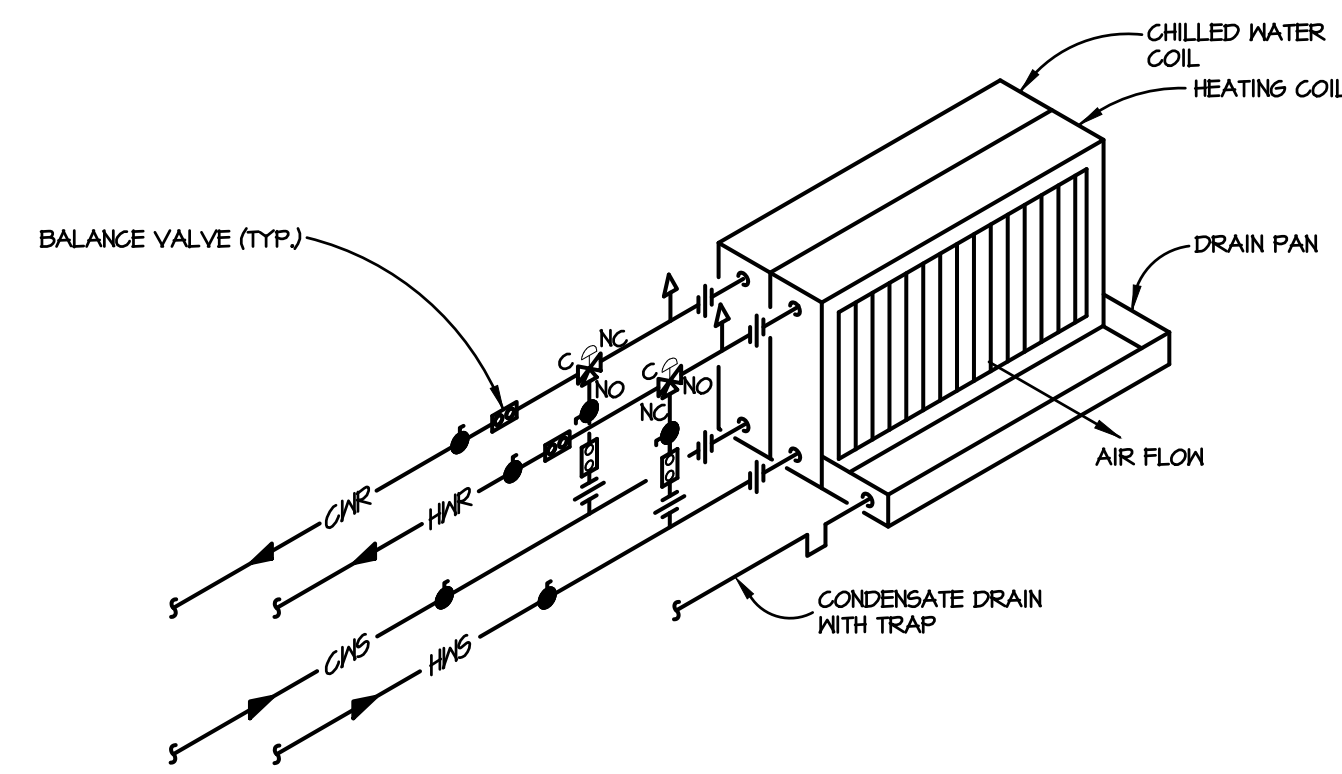
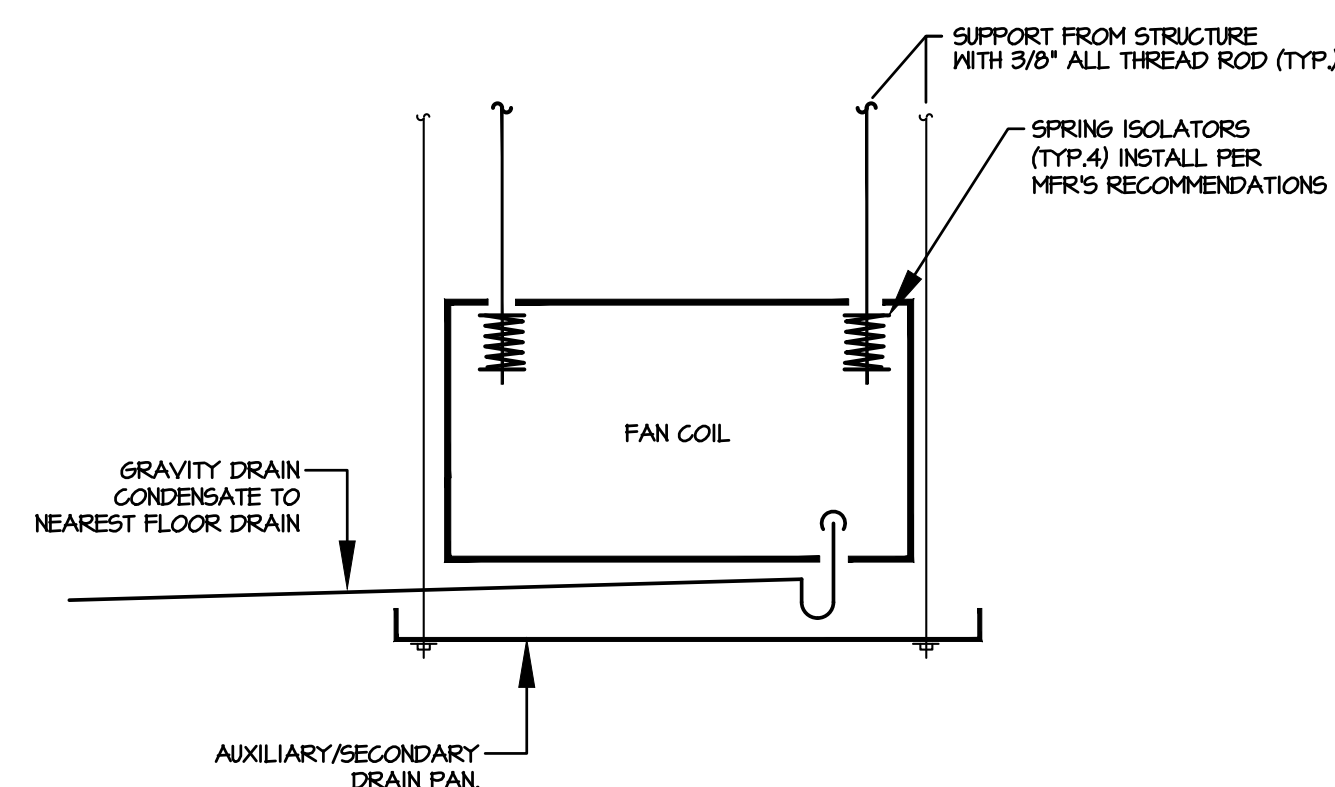
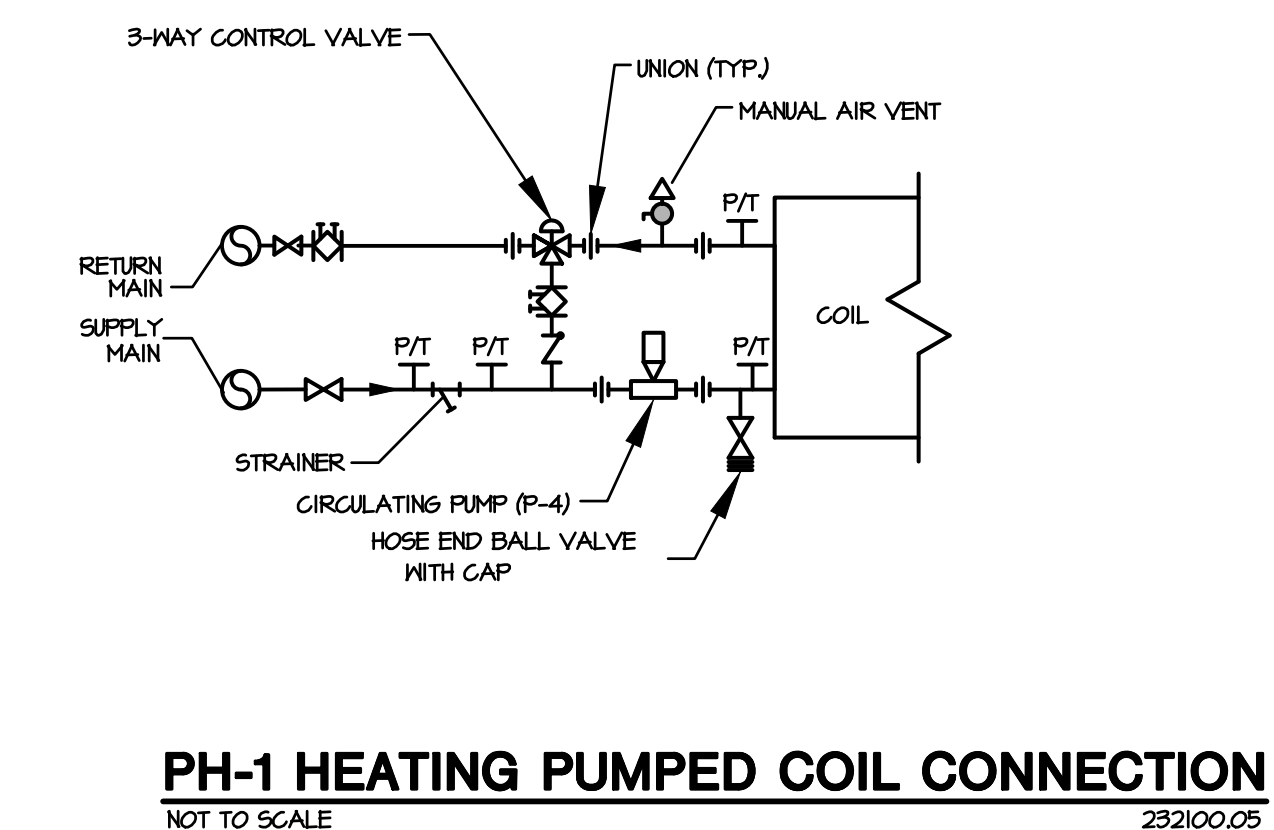
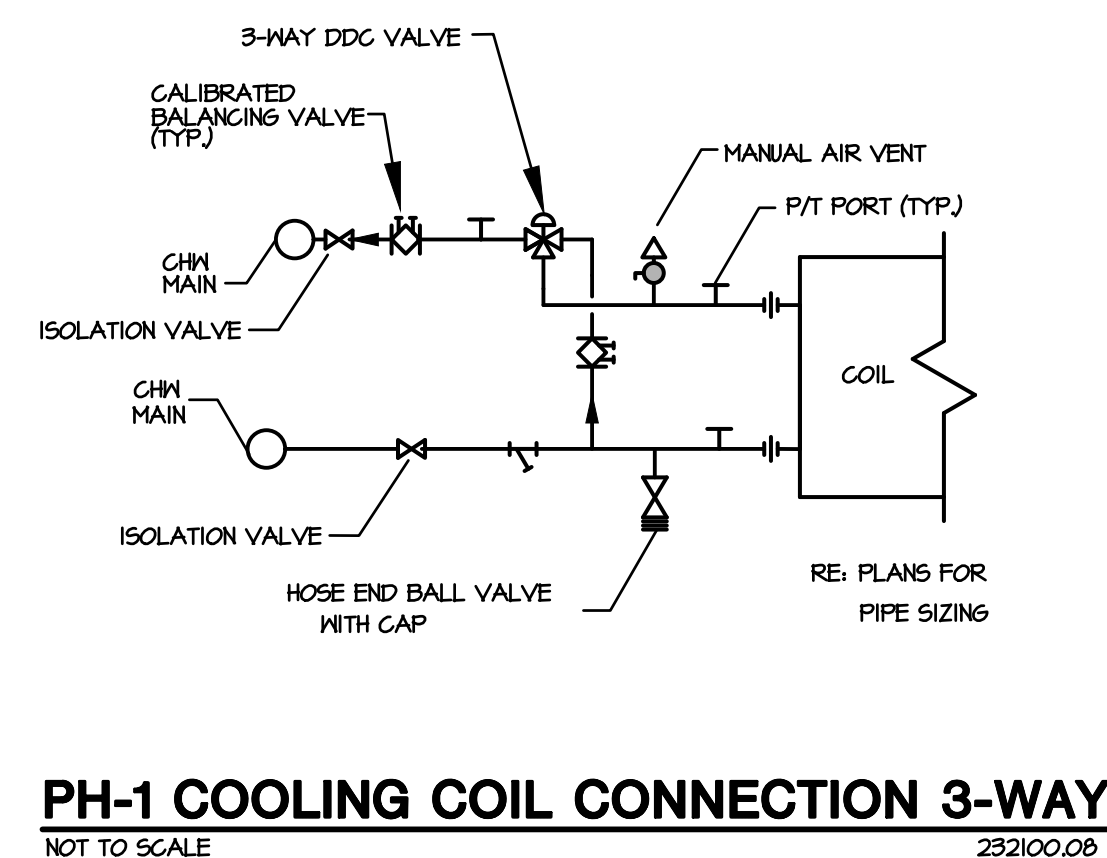
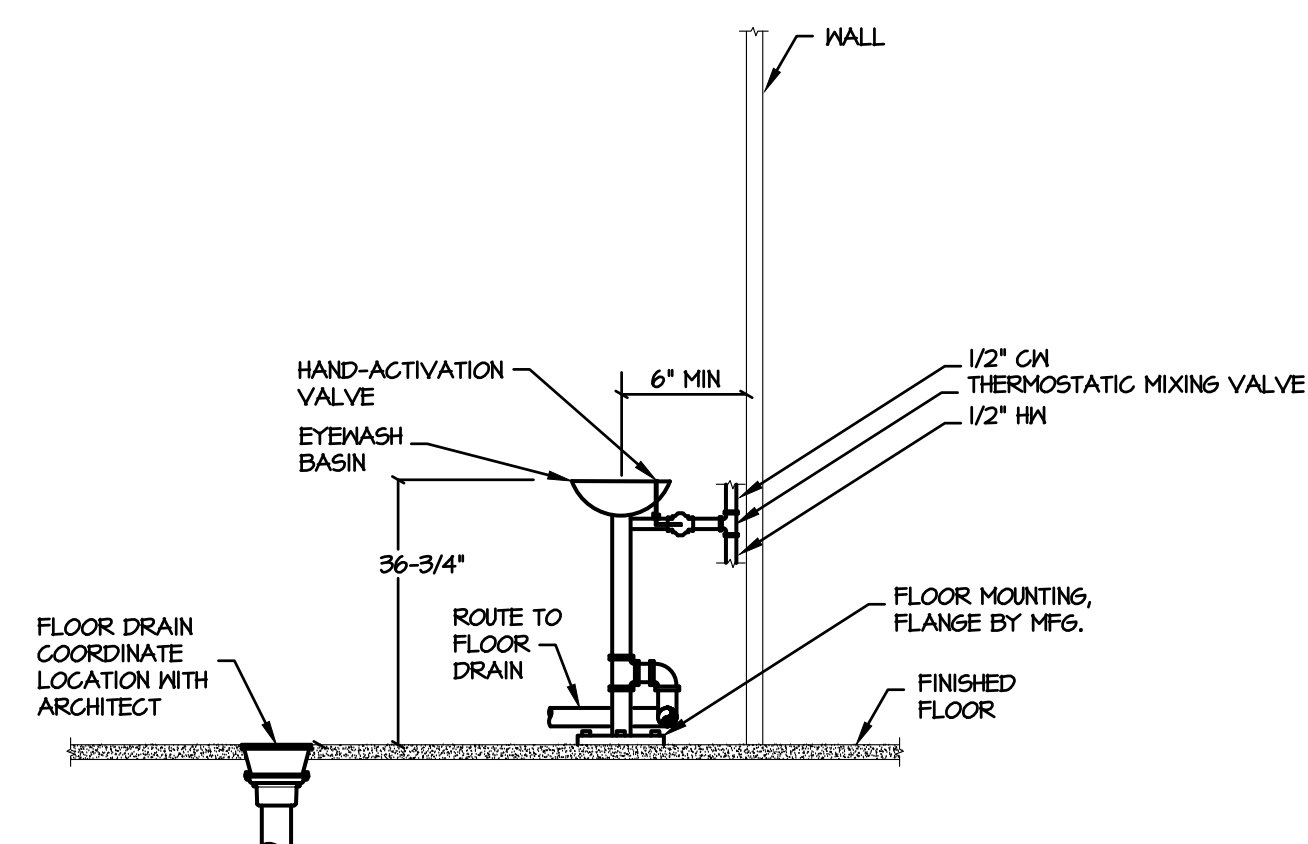
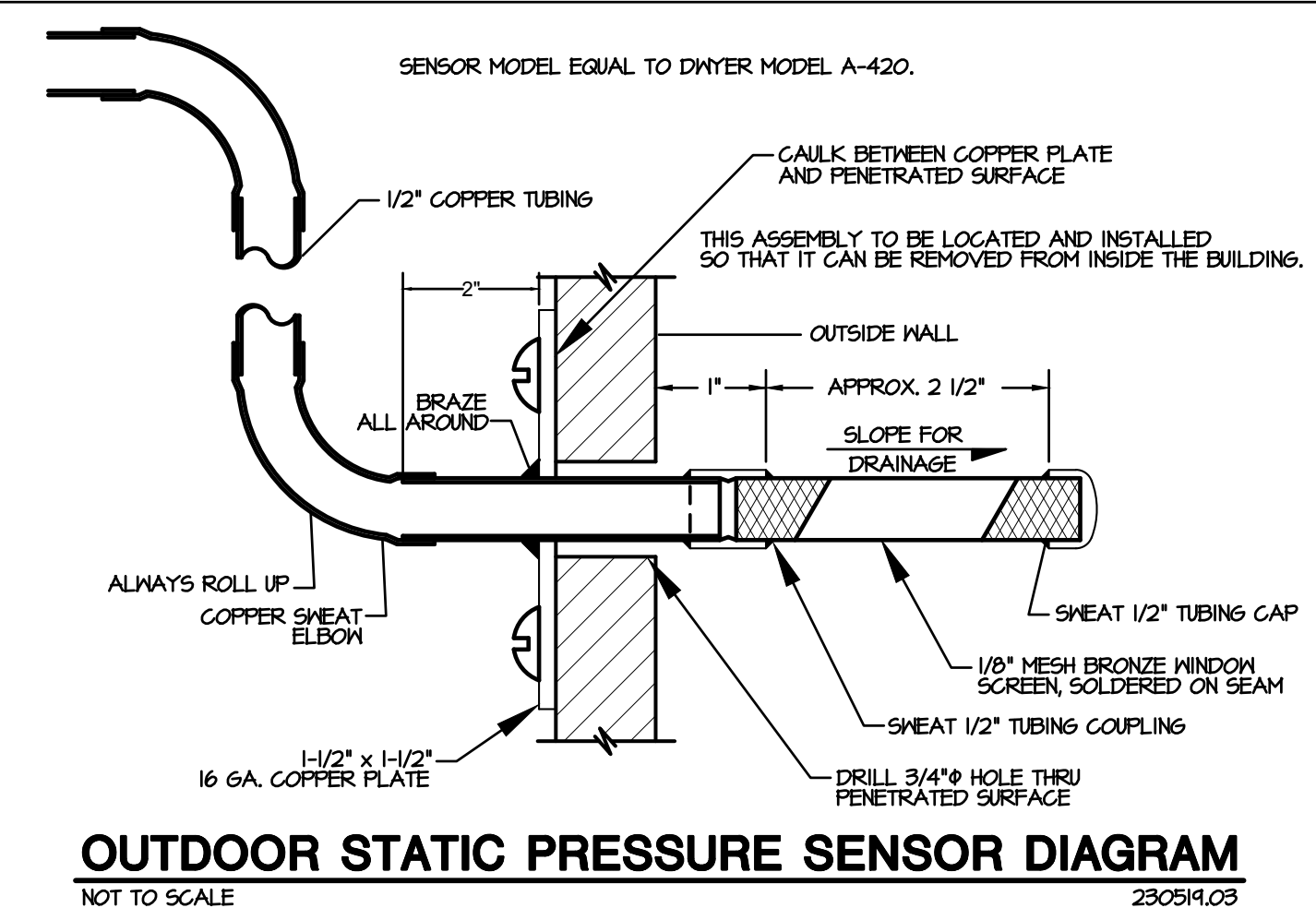
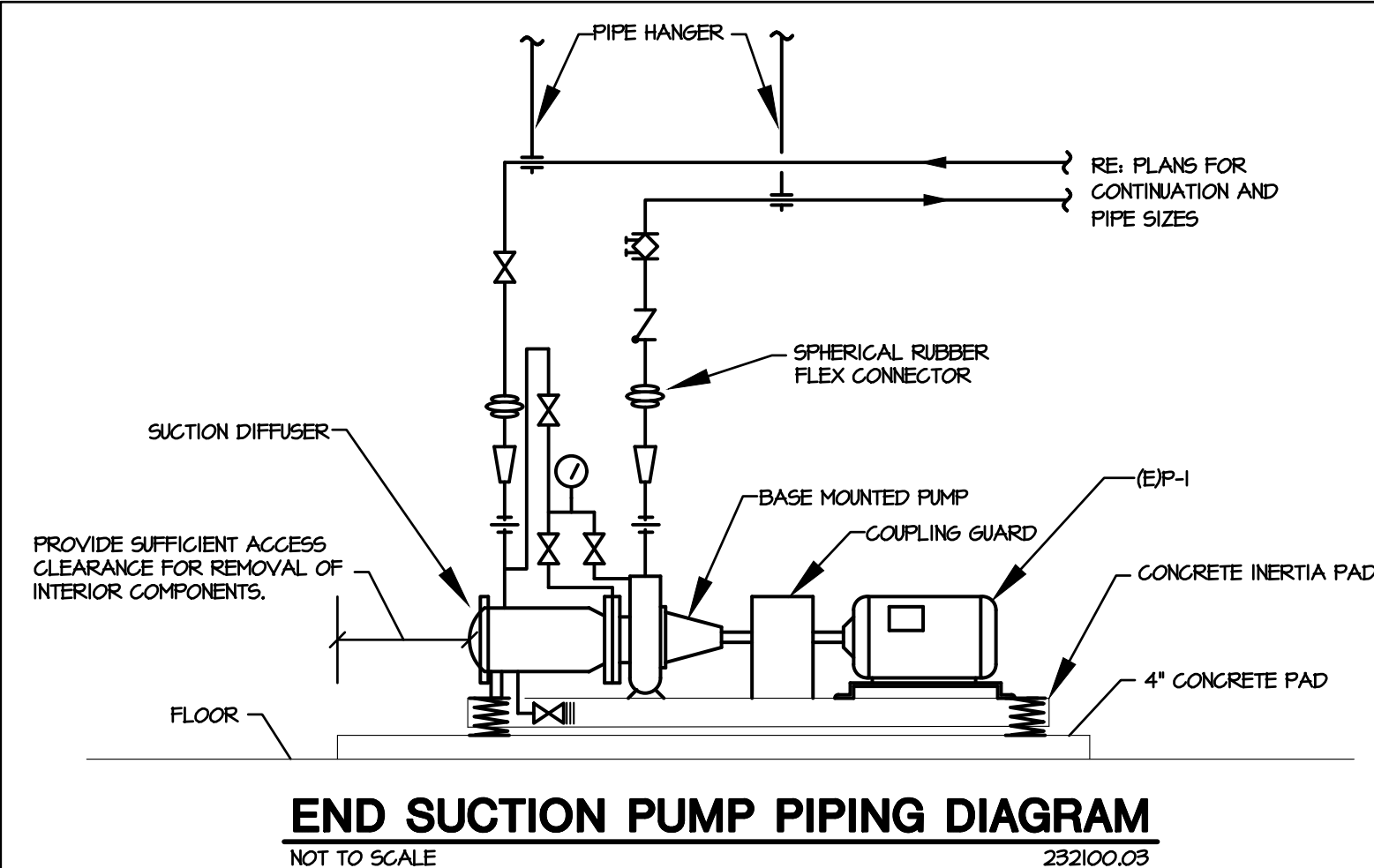
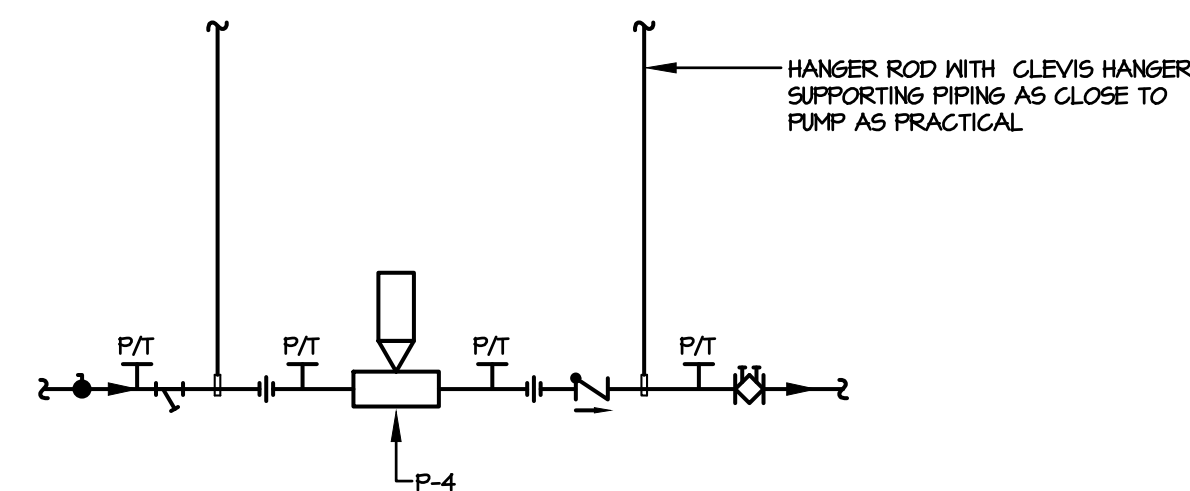
MECHANICAL LEGEND									
NOT ALL ITEMS LISTED BELOW ARE USED ON THIS SET OF MECHANICAL DRAWINGS									
GENERAL					PIPING				
SYMBOL		DESCRIPTION			SYMBOL		ABBV./DESCRIPTION		
		REFERENCE BUBBLE					HS HOT WATER SUPPLY		
		MECHANICAL/ELECTRICAL EQUIPMENT DESIGNATION					HR HOT WATER RETURN		
		REMOVE EXISTING UNDERCUT DOOR					CHS CHILLED WATER SUPPLY		
		AIR FLOW					CHR CHILLED WATER RETURN		
		CONNECT NEM TO EXISTING					CS CONDENSER SUPPLY		
							CR CONDENSER RETURN		
							HPS HIGH PRESSURE STEAM		
							HFC HIGH PRESSURE CONDENSATE		
							PC PUMPED CONDENSATE		
							D EQUIPMENT DRAIN		
							RL REFRIGERANT LIQUID		
							RS REFRIGERANT LIQUID SUCTION		
PIPING SYMBOLS									
SYMBOL		DESCRIPTION							
		ARROW IN LINE INDICATES DIRECTION OF FLOW							
		INDICATES PIPE SLOPE DOWN							
		BOTTOM PIPE CONNECTION							
		PIPING UP							
		PIPING DOWN							
		FIXTURE TRAP OR DRAIN TRAP							
		PIPING CAP OR PLUG							
		PUMP							
		BALANCING VALVE/ FLOW MEASURING DEVICE							
		CALIBRATED BALANCING VALVE							
		BALL VALVE							
		PLUG VALVE							
		GATE VALVE							
		CHECK VALVE							
		BUTTERFLY VALVE							
		FLOW SWITCH							
		SOLENOID VALVE							
		PRESSURE REDUCING VALVE							
		3-WAY TEMPERATURE CONTROL VALVE							
		2-WAY TEMPERATURE CONTROL VALVE							
		RELIEF VALVE							
		STRAINER							
		STRAINER WITH BLOW-OFF VALVE							
		UNION							
		PRESSURE GAUGE							
		THERMOMETER							
		PRESSURE AND TEMPERATURE TAP							
		CONCENTRIC REDUCER							
		ECCENTRIC REDUCER							
		FLEXIBLE CONNECTOR							
		HOSE END DRAIN VALVE							
		MANUAL AIR VENT							
ABBREVIATIONS									
AFF		ABOVE FINISHED FLOOR		MC	MECHANICAL CONTRACTOR		RA	RETURN AIR	
AP		ACCESS PANEL		(N)	NEW		RE	REFER TO	
C		COMMON		NC	NORMALLY CLOSED		SA	SUPPLY AIR	
(E)		EXISTING		NIC	NOT IN CONTRACT		SRV	SAFETY RELIEF VALVE	
EC		ELECTRICAL CONTRACTOR		NO	NORMALLY OPEN		TCC	TEMPERATURE CONTROL CONTRACTOR	
ELEV		ELEVATION		NTS	NOT TO SCALE			TYPICAL	
EQ		EQUIPMENT		OA	OUTSIDE AIR				
GC		GENERAL CONTRACTOR		PRV	PRESSURE REDUCING VALVE				
NOTE:									
APPLICABLE CODE STANDARDS									
2021 INTERNATIONAL BUILDING CODE 2021 INTERNATIONAL MECHANICAL CODE 2021 INTERNATIONAL ENERGY CONSERVATION CODE									
2021 INTERNATIONAL FIRE CODE 2021 INTERNATIONAL PLUMBING CODE 2021 INTERNATIONAL FUEL GAS CODE									

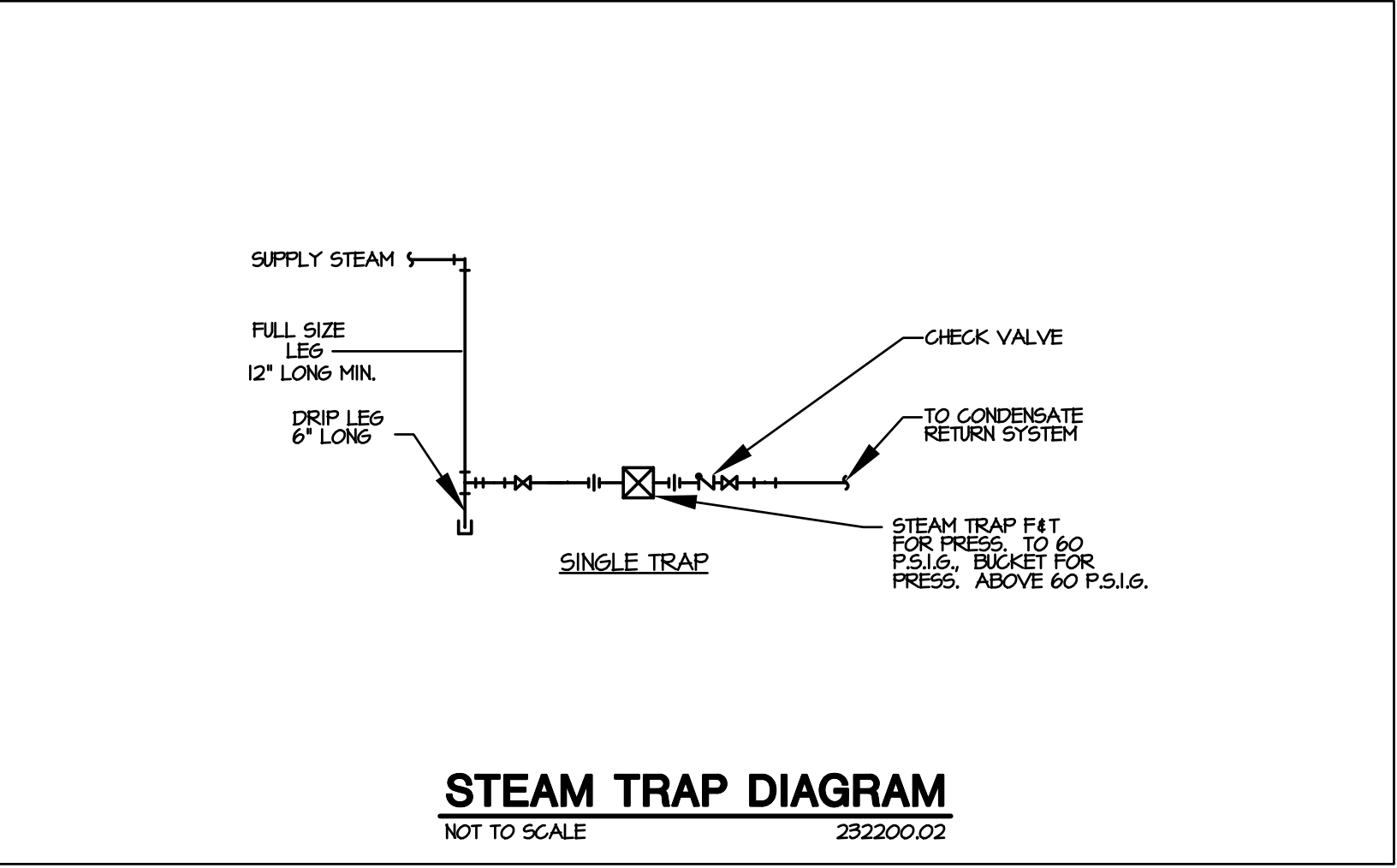
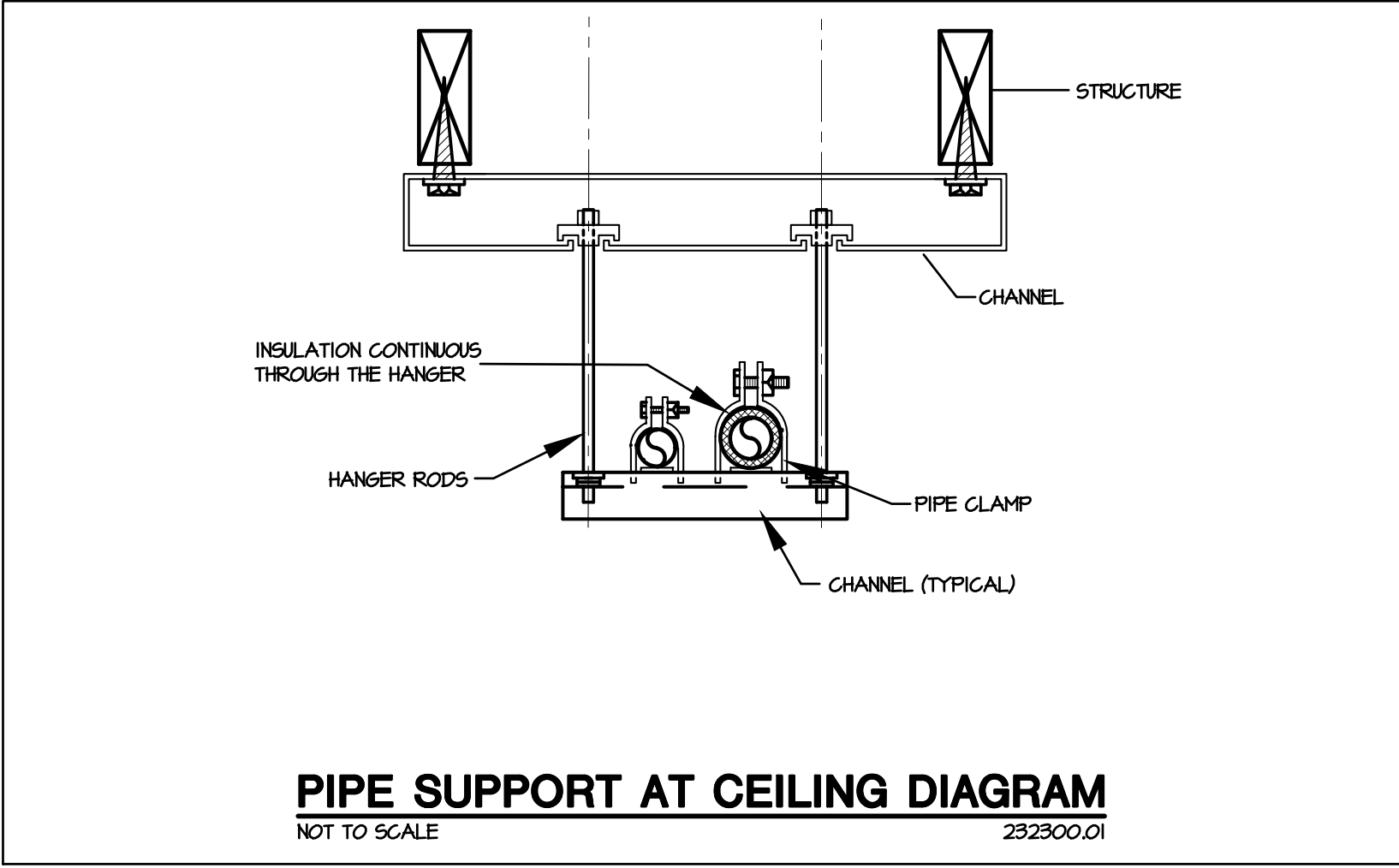
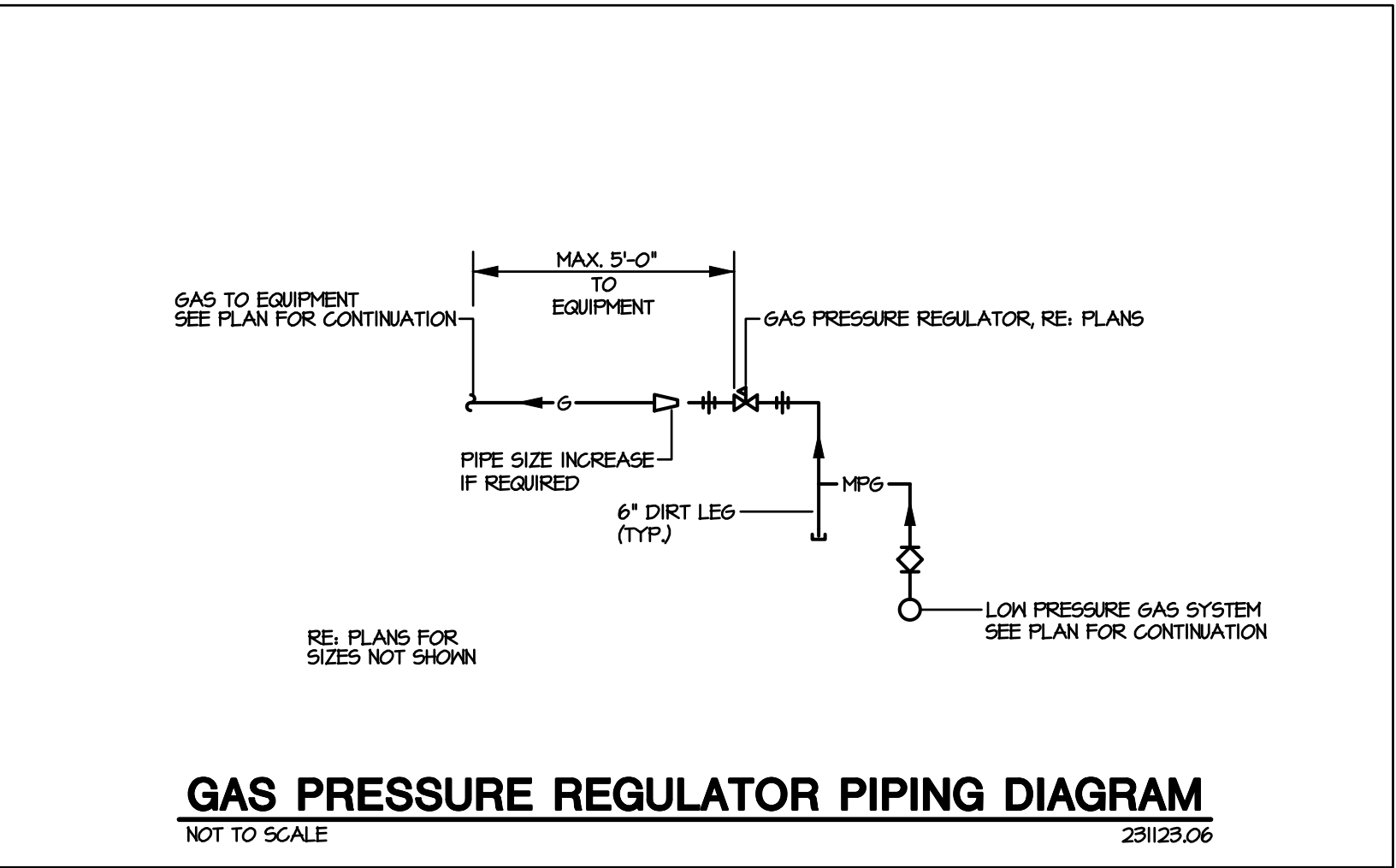
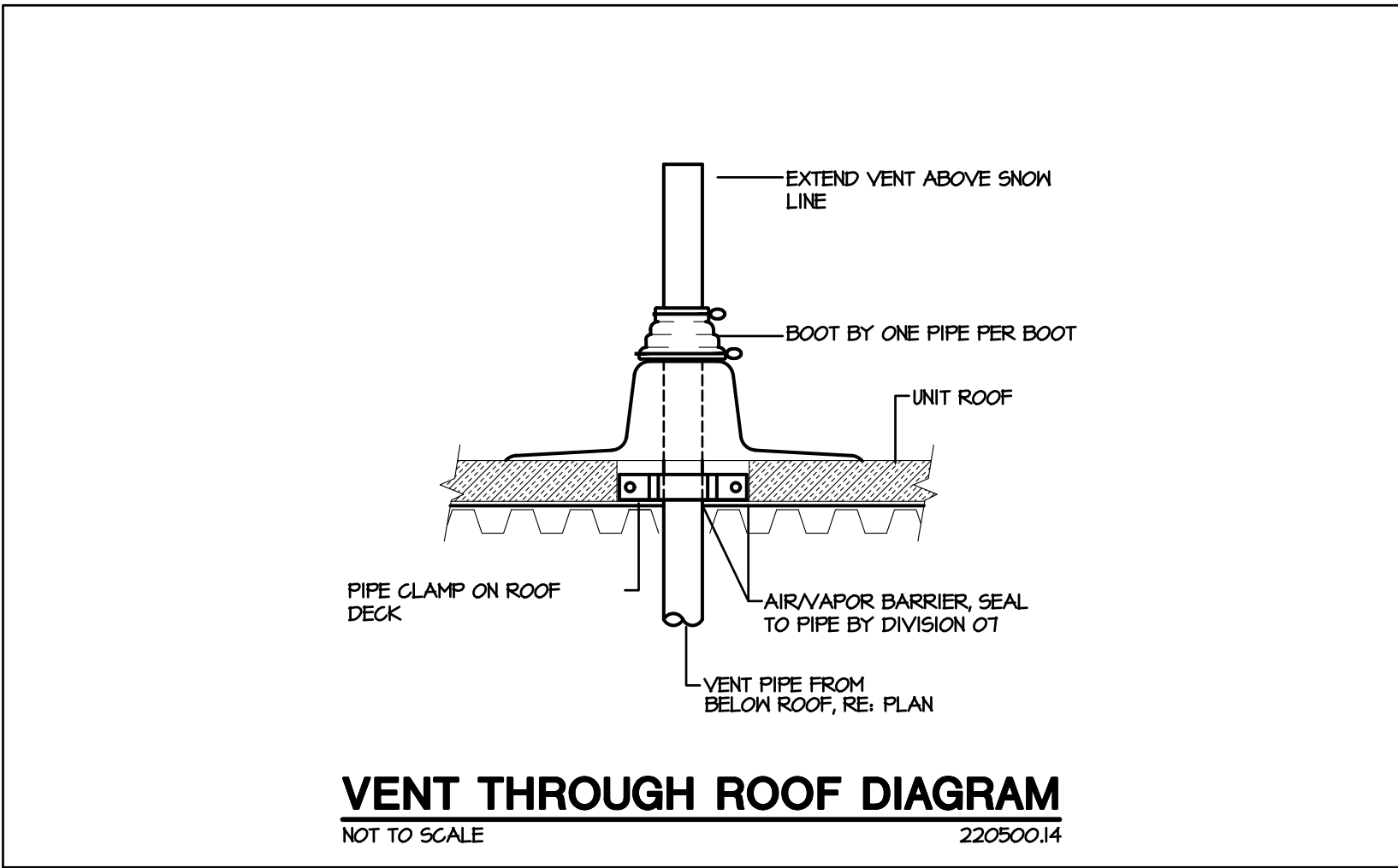


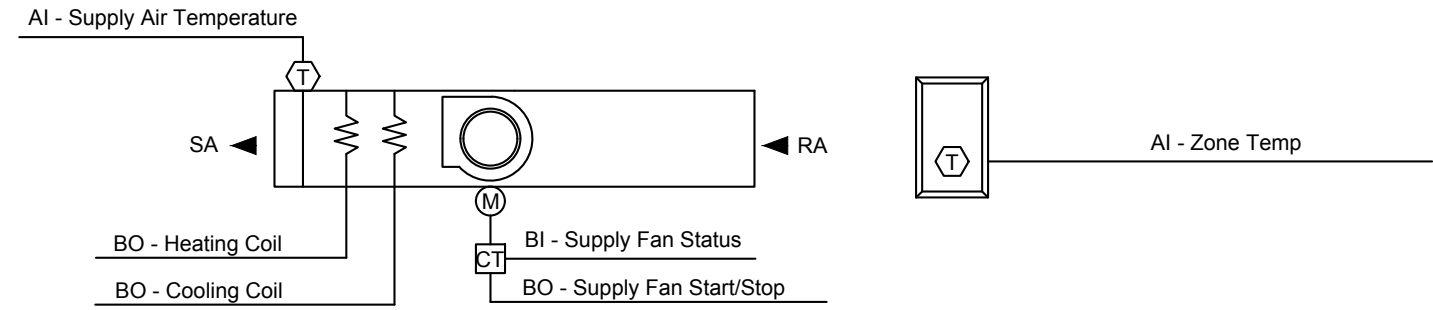
EVAPORATIVE PRE-COOLER MODULE SCHEDULE																						
SYMBOL	MANUFACTURER	CELL DATA		CELL PERFORMANCE					EVAPORATIVE COOLING DATA						ELECTRICAL		UNIT DIMENSIONS					
		CFM TOTAL @ 5300'	ESP IN W.G. @ 5300'	ENTERING AIR TEMP DB (F)	ENTERING AIR TEMP WB (F)	LV6 AIR TEMP DB (F)	LV6 AIR TEMP WB (F)	TOTAL MBH DISPLACED	CELL DEPTH (IN)	MEDIA FACE (SQ/FT)	MAX VEL (FPM)	SAT EFF %	TOTAL FLOW RATE (GPM)	MAKE-UP WATER (GPM)	PUMP SIZE (HP)	VOLT/ PHASE	UNIT WIDTH (IN)	UNIT HEIGHT (IN)	UNIT DEPTH (IN)	SUMP DEPTH (IN)	UNIT WEIGHT (LBS)	REMARKS
EVAP-I	PREMIER IND.	20,000	.25	90	59	62.2	62	546.2	12	40	500	84.8%	4.53	1.3	1/3	120/1	116	66	26	10	1,843	1 - 7
REMARKS: 1. ACCEPTABLE MANUFACTURERS INCLUDE PREMIER INDUSTRIES. 2. COOLING MODULE SHALL BE STAINLESS STEEL GRADE 304. 3. PROVIDE WITH FLOAT VALVE ASSEMBLY AND BALANCING VALVE. 4. PROVIDE WITH AUTOFLUSH, LOW WATER FLOW SENSOR AND DRAIN DOWN FREEZE PROTECTION SYSTEM 5. PROVIDE WITH ACCUMULATIVE FLOW METER WITH TRANSMITTING READ-OUT. 6. PROVIDE WITH ELECTRICAL CONTROLS TO INTERFACE WITH EXISTING BAS PROVIDED BY TC CONTRACTOR. 7. PROVIDE WITH MAGNETIC GAUGES WITH TRANSMITTING TYPE OUTPUT SIGNAL WIRED TO REMOTE CONTROL SYSTEM.																						
SEQUENCE OF OPERATION: SEE SHEET M-0.5 FOR SEQUENCE OF OPERATIONS.																						

PH-1 AIR TO AIR HEAT EXCHANGER SCHEDULE																		
SYMBOL	MANUFACTURER	MODEL	MODE	SUPPLY AIR						EXHAUST AIR								REMARKS
				FLOW	APD	EAT		LAT		FLOW	APD	EAT		LAT		THERMAL PERFORMANCE		
						DB	WB	DB	WB			DB	WB					
														(F)	(F)			
				(CFM)	(IN)	(F)	(F)	(F)	(F)	(CFM)	(IN)	(F)	(F)	(F)	(F)	%	Q MBH/HR	
HX-1	MINTERS	85M20	SUMMER	20,000	1.05	95	---	80	---	20,000	1.25	T2	---	85	---	64	230	1, 2
			WINTER	20,000	1.33	-10	---	32	---	20,000	1.10	T2	X	21	X	63	013	1, 2
REMARKS: 1. TO BE PROVIDED AND INSTALLED BY CUSTOM AIR HANDLER MANUFACTURER. 2. FIELD INSTALL ELECTRIC HEAT TRACING ON CONCEALED CONDENSATE PIPING FOR FREEZE PROTECTION.																		

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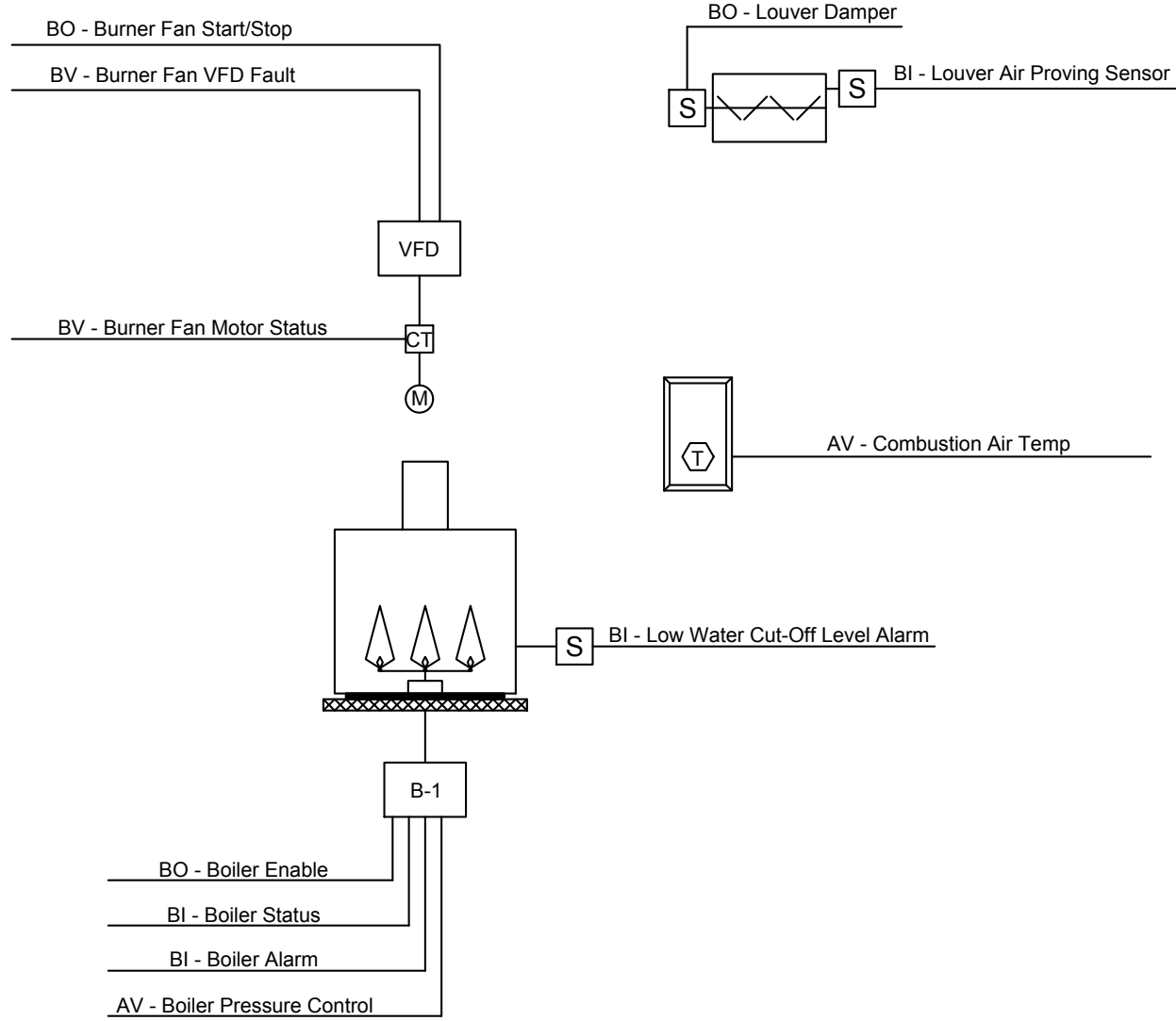
FCU-1 CONTROLS DIAGRAM
SCALE: NONE

SEQUENCE OF OPERATIONS: FCU-1

GENERAL:
HEATING MODE: UPON A DROP IN ZONE TEMPERATURE BELOW 68 DEG. F ZONE HEATING SETPOINT, THE SUPPLY FAN AND HEATING COIL SHALL ENERGIZE TO MAINTAIN ZONE TEMPERATURE.
COOLING MODE: UPON AN INCREASE IN ZONE TEMPERATURE ABOVE 85 DEG. F (ADJ.) ZONE COOLING SETPOINT, THE SUPPLY FAN AND COOLING COIL SHALL ENERGIZE TO MAINTAIN ZONE TEMPERATURE.
ALARMS: ALARMS SHALL BE PROVIDED AS FOLLOWS:
- SUPPLY FAN FAILURE, COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND, COMMANDED OFF, BUT THE STATUS IS ON.

POINTS LIST: FCU-1

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS					SHOWN ON GRAPHIC
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	
ZONE TEMPERATURE	X							X		X
ZONE COOLING SETPOINT					X			X		
ZONE HEATING SETPOINT					X			X		
COOLING COIL				X				X		X
HEATING COIL			X					X		X
SUPPLY FAN START/STOP				X				X		X
SUPPLY FAN FAILURE									X	
SUPPLY FAN IN HAND									X	
SUPPLY AIR TEMPERATURE	X							X		X
TOTALS	1	0	1	2	1	0	0	4	2	5



HEATING WATER PLANT CONTROL DIAGRAM
SCALE: NONE

SEQUENCE OF OPERATIONS: STEAM BOILER SYSTEM

GENERAL:
BOILER(S) SHALL RUN SUBJECT TO ALL INTERNAL CONTROLS AND SAFETIES. THE FOLLOWING SAFETIES SHALL BE MONITORED BY THE BAS. ALL SETPOINTS ARE RECOMMENDED AND SHALL BE FIELD ADJUSTED DURING COMMISSIONING TO MEET THE REQUIREMENTS OF THE ACTUAL FIELD CONDITIONS.
RUN CONDITIONS:
THE BOILER SHALL BE REGULATED AND CONTROLLED BY THE BOILER OPERATOR. AN INTERNAL PRESSURE CONTROL SHALL SENSE THE STEAM PRESSURE AND TURN BOILER ON AND OFF ACCORDINGLY.
BEFORE THE BOILER TURNS ON, THE LOUVER DAMPER SHALL OPEN TO 100%. WHEN THE LOUVER AIR PROVING SENSOR SENSES AIRFLOW, THE BOILER SHALL ENABLE. WHENEVER THE BOILER TURNS OFF, THE LOUVER DAMPER SHALL CLOSE.
ALARMS:
BOILER ALARMS SHALL BE PROVIDED AS FOLLOWS:

- BOILER SYSTEM ALARM
- LOW WATER CUT-OFF & FEEDER LEVEL ALARM
- BOILER FAILURE, COMMANDED ON BUT STATUS OFF
- BOILER IN HAND, COMMANDED OFF BUT STATUS ON
- HIGH PRESSURE LIMIT.

POINTS LIST: HEATING WATER SYSTEM

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS					SHOWN ON GRAPHIC
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	
BOILER PRESSURE CONTROL					X			X		X
COMBUSTION AIR TEMPERATURE					X					X
BOILER ALARM			X					X	X	X
BOILER STATUS			X					X		X
BURNER FAN MOTOR STATUS						X		X		X
BOILER ENABLE				X				X		X
BOILER SYSTEM ALARM									X	
LOW WATER CUT-OFF LEVEL ALARM			X						X	
BOILER FAILURE									X	
BOILER IN HAND									X	
LOUVER AIR PROVING SENSOR			X							X
LOUVER DAMPER				X						X
BURNER FAN VFD FAULT						X		X	X	X
BURNER FAN START/STOP				X				X		X
TOTALS	0	0	4	3	2	2	0	8	6	10

SEQUENCE OF OPERATIONS: PH-1

PH-1 IS TO BE RUN MANUALLY AND WILL RUN CONTINUOUSLY. THE EXHAUST FAN IS HARDWIRED TO PH-1 SUPPLY FAN.

START-UP:
UPON FAN START UP, THE OUTSIDE AIR DAMPERS WILL OPEN 100% AND THE INLET VANES WILL BE ENABLED. THE INLET VANES WILL BE MODULATED BY A RECEIVER/CONTROLLER TO MAINTAIN DUCT STATIC.

NORMAL OPERATING MODE:
THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL OPEN ANY TIME UNIT IS ENERGIZED AND SHALL CLOSE ANY TIME THE UNIT IS DE ENERGIZED. OUTSIDE AIR DAMPER SHALL CLOSE FOR 4 SEC (ADJ.) AFTER THE SUPPLY FAN STOPS. THE SUPPLY FAN SPEED SHALL BE MODULATED TO MAINTAIN DISCHARGE AIR STATIC PRESSURE SETPOINT.

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. THE FAN SHALL HAVE A USER DEFINABLE ADJUSTABLE MINIMUM RUNTIME, UNLESS SHUTDOWN ON SAFETIES. THE SUPPLY FAN SHALL HAVE A 10 MINUTE (ADJ.) DELAY ON STOP IN ORDER TO DRY OUT THE DIRECT EVAPORATIVE PRE-COOLING MEDIA.

EXHAUST FAN:
THE EXHAUST FAN SHALL RUN WHENEVER THE SUPPLY FAN IS ENABLED, UNLESS SHUTDOWN ON SAFETIES.

DIRECT EVAPORATIVE PRE-COOLING SECTION:
THE CONTROLLER SHALL MONITOR THE OUTSIDE AIR TEMPERATURE AND STAGE ON THE SPRAY PUMP ON RISING TEMPERATURE TO MAINTAIN ITS COOLING SETPOINT. THE SUPPLY FAN SHALL RUN FOR A USER DEFINABLE TIME (ADJ.) AFTER THE SPRAY PUMP/S HAVE DISABLED ON UNIT SHUTDOWN TO DRY OUT THE EVAPORATIVE MEDIA.

THE EVAPORATIVE PRE-COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 75 DEG F (ADJ.)
- AND OUTSIDE AIR WET BULB IS LESS THAN 60 DEG F (ADJ.)
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT
- AND THE ZONE HUMIDITY IS LESS THAN 60% (ADJ.)
- AND THE SUPPLY FAN STATUS IS ON.

SPRAY PUMP CONTROL

EVAPORATIVE PRECOOLING SHALL BE COMPOSED OF 3 VERTICAL SECTIONS WITH PUMPS. THE MIDDLE SECTION SHALL BE STAGE 1, THE OUTSIDE SECTION WILL BE STAGE 2 AND ALL THREE SECTIONS WILL BE STAGE 3.

- STAGE 1 SHALL BE ENABLED ON CALL FOR PRE-COOLING.
- STAGE 2 SHALL BE ENABLED WHEN DISCHARGE AIR TEMPERATURE IS MORE THAN 3 DEG F (ADJ.) ABOVE SETPOINT FOR 10 MINS (ADJ.)
- STAGE 3 SHALL BE ENABLED WHEN DISCHARGE AIR TEMPERATURE IS MORE THAN 3 DEG F (ADJ.) ABOVE SETPOINT FOR 30 MINS (ADJ.).

SUMP CONTROL

THE CONTROLLER SHALL DRAIN AND FILL THE SUMP AS FOLLOWS:

FREEZE PROTECTION:

IF THE OUTSIDE AIR TEMPERATURE DROPS BELOW 40 DEG F (ADJ.), THE EVAPORATIVE COOLER SUMP SHALL OPEN THE DRAIN VALVE AND CLOSE THE FILL VALVE. IF THE OUTSIDE AIR TEMPERATURE RISES ABOVE 55 DEG F (ADJ.), THE CONTROLLER SHALL ACTIVATE THE FILL VALVE AND CLOSE THE DRAIN VALVE.

SCHEDULED FLUSH AND FILL:

DAILY:

A FLUSH CYCLE SHALL OCCUR EVERY 24HR (ADJ.) AT A USER DEFINABLE TIME OF DAY (DEFAULT 2:00AM). DURING CYCLE, THE SPRAY PUMP SHALL STOP, THE FILL VALVE SHALL CLOSE AND THE DRAIN VALVE SHALL OPEN FOR 60 MINUTES (ADJ.) AFTER THE CYCLE TIME IS COMPLETE, THE DRAIN VALVE SHALL CLOSE, THE FILL VALVE SHALL OPEN.

A BLEED CYCLE SHALL BE INITIATED IF CONDUCTIVITY PROBE LOCATED IN THE SUMP MEASURES 1200 PPM. CLOSE DRAIN VALVE AT 400 PPM. LOCATE BLEED VALVE AS GRAVITY FEED FROM THE SUMP AND NOT OFF THE DISCHARGE OF THE PUMPS.

HIGH WATER LEVEL ALARM:

IF WATER LEVEL IS TOO HIGH, SUMP FILL VALVE SHALL CLOSE.

HEAT RECOVERY VENTILATOR CORE:

THE CONTROLLER SHALL MODULATE THE BYPASS DAMPER FOR ENERGY RECOVERY AS FOLLOWS:

COOLING RECOVERY MODE:

THE CONTROLLER SHALL MEASURE THE DISCHARGE AIR TEMPERATURE AND MODULATE THE BYPASS DAMPER CLOSED TO MAINTAIN A SETPOINT 2 DEG F (ADJ.) LESS THAN THE UNIT SUPPLY AIR TEMPERATURE SETPOINT. THE BYPASS DAMPER SHALL CLOSE FOR COOLING RECOVERY WHENEVER:

- UNIT ENTERING EXHAUST AIR TEMPERATURE IS 5 DEG F (ADJ.) OR MORE BELOW THE OUTSIDE AIR TEMPERATURE.
- AND THE UNIT IS IN COOLING MODE
- AND THE SUPPLY FAN IS ON.

HEATING RECOVERY MODE:

THE CONTROLLER SHALL MEASURE THE DISCHARGE AIR TEMPERATURE AND MODULATE THE BYPASS DAMPER CLOSED TO MAINTAIN A SETPOINT 2 DEG F (ADJ.) GREATER THAN THE UNIT SUPPLY AIR TEMPERATURE SETPOINT. THE BYPASS DAMPER SHALL CLOSE FOR HEAT RECOVERY WHENEVER:

- UNIT ENTERING EXHAUST AIR TEMPERATURE IS 5 DEG F (ADJ.) OR MORE ABOVE THE OUTSIDE AIR TEMPERATURE.
- AND THE UNIT IS IN HEATING MODE
- AND THE SUPPLY FAN IS ON.

THE BYPASS DAMPER WILL OPEN WHENEVER AIR HEAT RECOVERY IS DISABLED.

COOLING COIL VALVE:

THE CONTROLLER SHALL MEASURE THE DISCHARGE AIR TEMPERATURE AND MODULATE THE COOLING COIL 3-WAY VALVE TO MAINTAIN ITS COOLING SETPOINT. THE COOLING SHALL BE ENABLED WHEN:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 65 DEG F (ADJ.)
- AND THE SUPPLY AIR TEMPERATURE IS ABOVE COOLING SETPOINT
- AND THE FAN STATUS IS ON.

THE COOLING COIL VALVE SHALL OPEN TO 50% (ADJ.) WHENEVER THE FREEZESTAT IS ON.

HEATING COIL VALVE:

THE CONTROLLER SHALL MEASURE THE DISCHARGE AIR TEMPERATURE AND MODULATE THE HEATING COIL 3-WAY VALVE TO MAINTAIN ITS HEATING SETPOINT. THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65 DEG F (ADJ.)
- AND THE SUPPLY AIR TEMPERATURE IS BELOW HEATING SETPOINT
- AND THE FAN STATUS IS ON.

THE HEATING COIL VALVE SHALL OPEN TO 100% (ADJ.) WHENEVER THE FREEZESTAT IS ON.

HEATING COIL PUMP:

- THE RECIRCULATION PUMP P-4 SHALL RUN WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 55 DEG F (ADJ.)
- AND THE HEATING COIL VALVE IS ENABLED
- OR THE FREEZESTAT IS ON.

FILTER DIFFERENTIAL PRESSURE MONITOR:

THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS ACROSS ALL OF THE FOLLOWING FILTER BANKS:

- PREFILTER
- INTERMEDIATE FILTER
- FINAL FILTER
- EXHAUST PRE-FILTER
- EXHAUST HEPA FILTER BANK

- HEAT EXCHANGER OUTSIDE AIR FILTER
- HEAT EXCHANGER EXHAUST AIR FILTER

PERIODIC FILTER CLEANING:

THE UNIT SHALL HAVE NOTIFICATIONS TO CHANGE OUTSIDE AIR AND EXHAUST AIR FILTERS AT RECOMMENDED INTERVALS. THE EXHAUST FAN SHALL MODULATE TO COMPENSATE FOR FILTER LOADING.

DISCHARGE AIR TEMPERATURE:

ALARMS SHALL BE PROVIDED AS FOLLOWS:

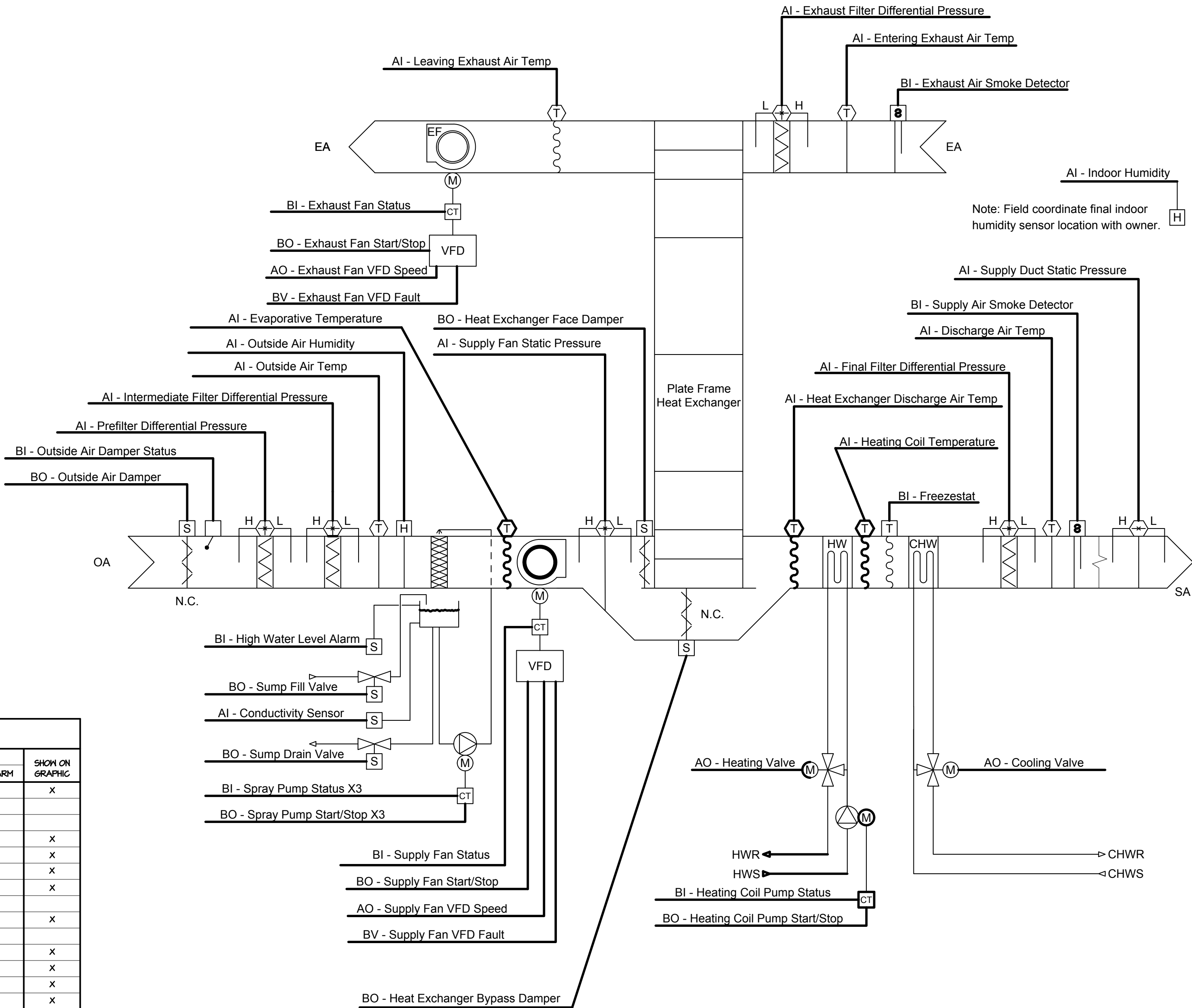
- HIGH DISCHARGE AIR TEMP: IF DISCHARGE AIR TEMPERATURE IS GREATER THAN 10 DEGREES ABOVE SETPOINT.
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 10 DEGREES ABOVE SETPOINT.

SMOKE DETECTOR SHUTDOWN:

THE UNIT SHALL SHUT DOWN IN RESPONSE TO A SIGNAL FROM THE SMOKE DETECTOR IN EITHER THE SUPPLY DUCT OR EXHAUST DUCT, INDICATING THE PRESENCE OF SMOKE. THE EXHAUST FAN SHALL RUN FULL SPEED. 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.

POINTS LIST: AHU-1, AHU-2

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS							SHOWN ON GRAPHIC
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM			
ENTERING EXHAUST AIR TEMP	X							X				X
FINAL FILTER DIFFERENTIAL PRESSURE	X							X				
EXHAUST FILTER DIFFERENTIAL PRESSURE	X							X				
HEAT WHEEL DISCHARGE AIR TEMP	X							X				X
OUTSIDE AIR TEMP	X							X				X
EVAPORATIVE TEMPERATURE	X							X				X
OUTSIDE AIR HUMIDITY	X							X				X
PRE-FILTER DIFFERENTIAL PRESSURE	X							X				
LEAVING EXHAUST AIR TEMP	X							X				X
INTERMEDIATE FILTER DIFFERENTIAL PRESSURE	X							X				
DISCHARGE AIR TEMP	X							X				X
COOLING VALVE		X						X				X
SPRAY PUMP 1 START/STOP				X				X				X
SPRAY PUMP 2 START/STOP				X				X				X
SUMP DRAIN VALVE				X				X				X
SUMP FILL VALVE				X				X				X
CONDUCTIVITY SENSOR	X							X				X
HIGH WATER LEVEL ALARM			X					X	X			X
SPRAY PUMP 1 STATUS			X					X				X
SPRAY PUMP 2 STATUS			X					X				X
HEATING VALVE		X						X				X
EXHAUST FAN 1 STATUS			X					X				X
EXHAUST FAN 2 STATUS			X					X				X
EXHAUST FAN 3 STATUS			X					X				X
FREEZESTAT			X					X	X			X
SUPPLY FAN STATIC PRESSURE	X							X				
SUPPLY FAN 1 STATUS			X					X				X
SUPPLY FAN 2 STATUS			X					X				X
SUPPLY FAN 3 STATUS			X					X				X
EXHAUST FAN VFD FAULT						X		X	X			X
SUPPLY FAN VFD FAULT						X		X	X			X
HEATING COIL PUMP STATUS			X					X				X
OUTSIDE AIR DAMPER STATUS			X					X				X
EXHAUST AIR SMOKE DETECTOR			X					X	X			X
SUPPLY AIR SMOKE DETECTOR			X					X	X			X
EXHAUST FAN START/STOP				X				X				X
HEAT EXCHANGER FACE DAMPER				X				X				X
HEAT EXCHANGER BYPASS DAMPER				X				X				X
SUPPLY FAN VFD SPEED		X						X				X
EXHAUST FAN VFD SPEED		X						X				X
HEATING COIL PUMP START/STOP				X				X				X
OUTSIDE AIR DAMPER				X				X				X
SUPPLY FAN START/STOP				X				X				X
SUPPLY AIR TEMP SETPOINT					X			X				X
EXHAUST FAN FAILURE									X			X
SCHEDULE							X					
EXHAUST FAN IN HAND									X			
EXHAUST FAN RUNTIME EXCEEDED									X			X
HEAT COIL PUMP FAILURE									X			
HEATING COIL PUMP RUNTIME EXCEEDED									X			
HIGH SUPPLY AIR TEMP									X			
LOW SUPPLY AIR TEMP									X			
OUTSIDE AIR DAMPER FAILURE									X			
SUPPLY FAN FAILURE									X			
SUPPLY FAN IN HAND									X			
SUPPLY FAN RUNTIME EXCEEDED									X			
INDOOR HUMIDITY	X							X	X			X
SUPPLY DUCT STATIC PRESSURE	X								X			
TOTALS	15	4	14	10	1	2	1	45	14			42



PH-1 CONTROL DIAGRAM

SCALE: NONE



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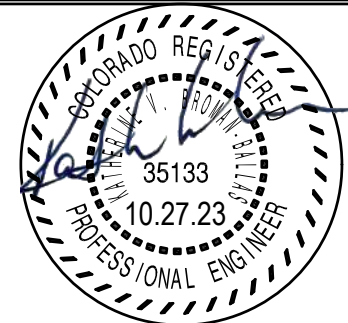
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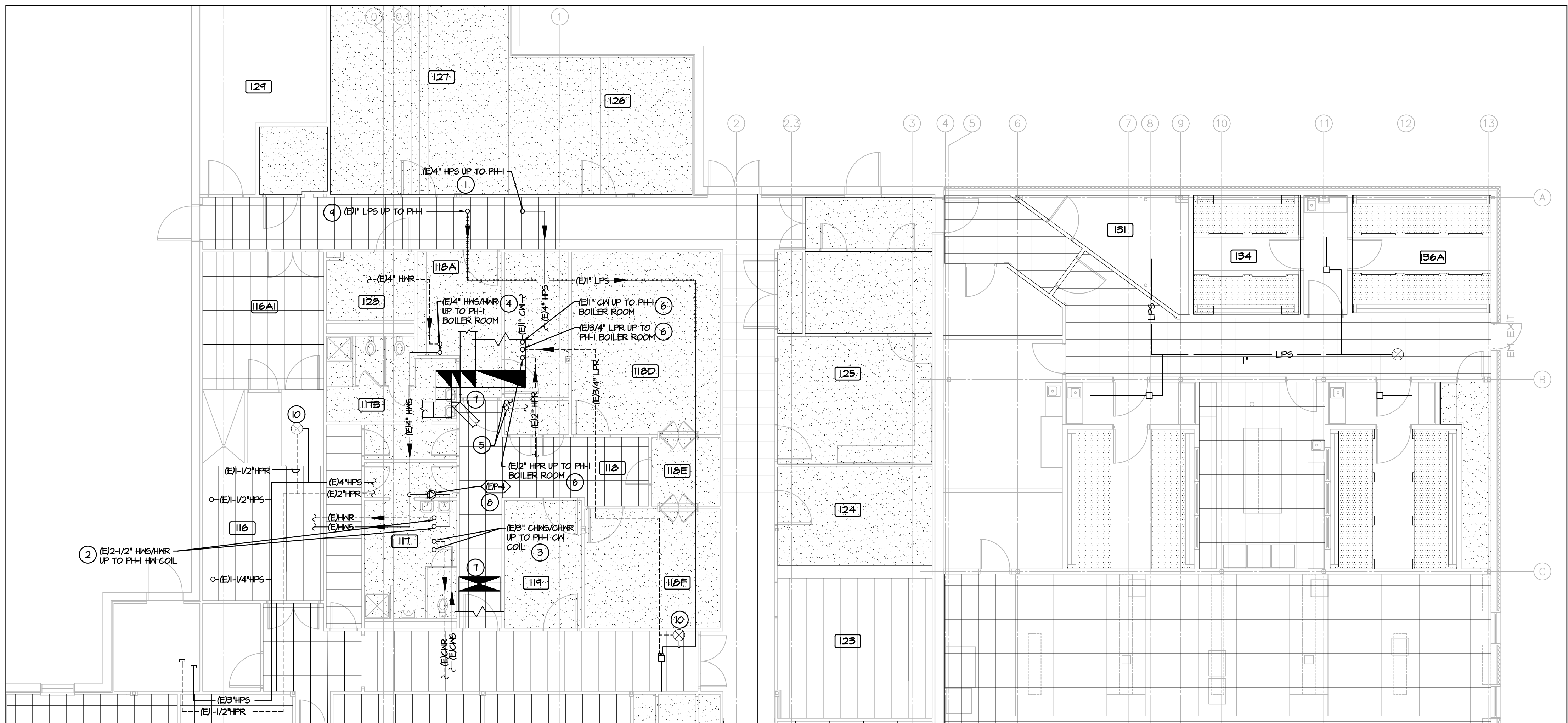
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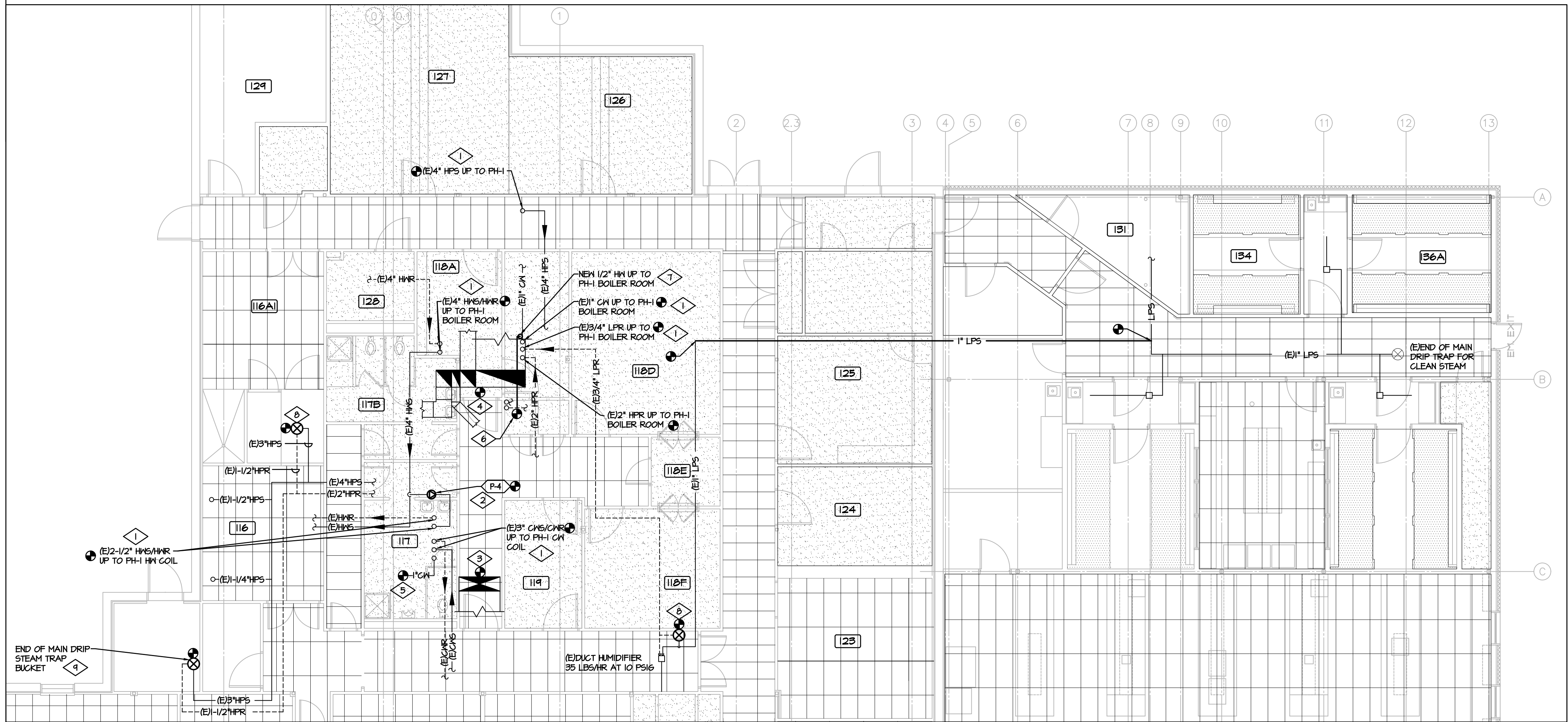
PH-1 CONTROL MATRIX



M-0.6



PARTIAL FLOOR PLAN - DEMOLITION
SCALE: 1/8" = 1'-0"



PARTIAL FLOOR PLAN - NEW
SCALE: 1/8" = 1'-0"

MECHANICAL GENERAL NOTES

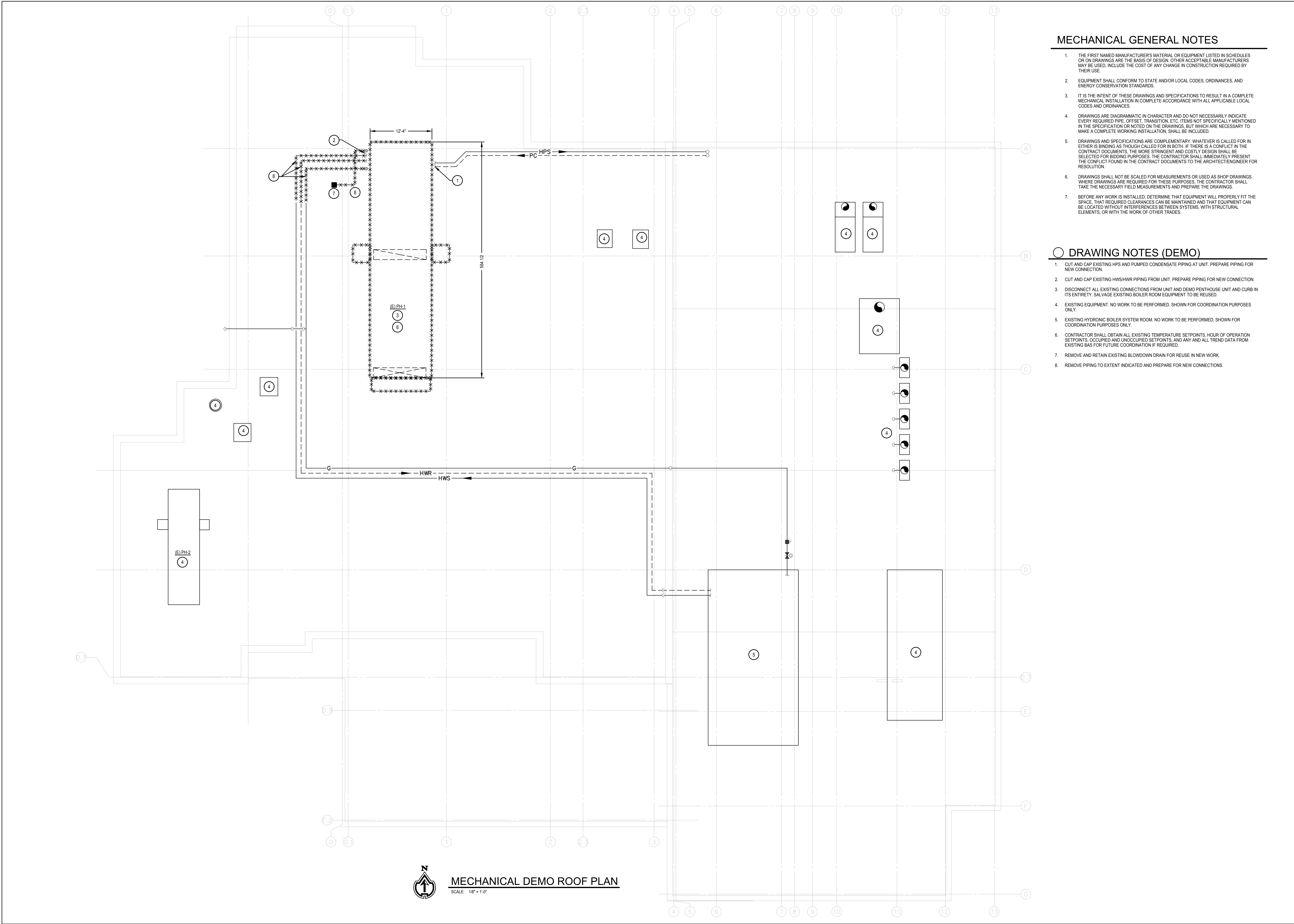
- THE FIRST NAMED MANUFACTURER'S MATERIAL OR EQUIPMENT LISTED IN SCHEDULES OR ON DRAWINGS ARE THE BASIS OF DESIGN. OTHER ACCEPTABLE MANUFACTURERS MAY BE USED, INCLUDE THE COST OF ANY CHANGE IN CONSTRUCTION REQUIRED BY THEIR USE.
- EQUIPMENT SHALL CONFORM TO STATE AND/OR LOCAL CODES, ORDINANCES, AND ENERGY CONSERVATION STANDARDS.
- IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO RESULT IN A COMPLETE MECHANICAL INSTALLATION IN COMPLETE ACCORDANCE WITH ALL APPLICABLE LOCAL CODES AND ORDINANCES.
- DRAWINGS ARE DIAGNAMTIC IN CHARACTER AND DO NOT NECESSARILY INDICATE EVERY REQUIRED PIPE, OFFSET, TRANSITION, ETC. ITEMS NOT SPECIFICALLY MENTIONED IN THE SPECIFICATION OR NOTED ON THE DRAWINGS, BUT WHICH ARE NECESSARY TO MAKE A COMPLETE WORKING INSTALLATION, SHALL BE INCLUDED.
- DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY. WHATEVER IS CALLED FOR IN EITHER IS BINDING AS THOUGH CALLED FOR IN BOTH. IF THERE IS A CONFLICT IN THE CONTRACT DOCUMENTS, THE MORE STRINGENT AND COSTLY DESIGN SHALL BE SELECTED FOR BIDDING PURPOSES. THE CONTRACTOR SHALL IMMEDIATELY PRESENT THE CONFLICT FOUND IN THE CONTRACT DOCUMENTS TO THE ARCHITECT/ENGINEER FOR RESOLUTION.
- DRAWINGS SHALL NOT BE SCALED FOR MEASUREMENTS OR USED AS SHOP DRAWINGS. WHERE DRAWINGS ARE REQUIRED FOR THESE PURPOSES, THE CONTRACTOR SHALL TAKE THE NECESSARY FIELD MEASUREMENTS AND PREPARE THE DRAWINGS.
- BEFORE ANY WORK IS INSTALLED, DETERMINE THAT EQUIPMENT WILL PROPERLY FIT THE SPACE, THAT REQUIRED CLEARANCES CAN BE MAINTAINED AND THAT EQUIPMENT CAN BE LOCATED WITHOUT INTERFERENCES BETWEEN SYSTEMS, WITH STRUCTURAL ELEMENTS, OR WITH THE WORK OF OTHER TRADES.
- ISOLATE ALL SUPPLY AND RETURN PIPING SERVING PENTHOUSE UNIT. CUT AND CAP PIPING AT ROOF PENETRATION FOR PENTHOUSE UNIT REMOVAL. (TYPICAL ALL PIPE CONNECTIONS.)

DRAWING NOTES (DEMO)

- DISCONNECT EXISTING HPS PIPING FROM UNIT.
- DISCONNECT EXISTING 2-1/2" HWS/HNR PIPING FROM UNIT COIL. PREPARE PIPING FOR RECONNECTION TO NEW UNIT.
- DISCONNECT EXISTING 3" CHWS/CHNR PIPING FROM UNIT COIL. PREPARE PIPING FOR RECONNECTION TO NEW UNIT.
- DISCONNECT EXISTING 4" HWS/HNR PIPE DISTRIBUTION PIPING FROM UNIT. PREPARE PIPING FOR RECONNECTION.
- EXISTING 1/2" CH AND HW SERVING MOP SINK. CONTRACTOR TO FIELD VERIFY EXACT LOCATION.
- DISCONNECT EXISTING HFR, LPR AND 1" CH PIPING TO UNIT.
- DISCONNECT EXISTING SUPPLY AND EXHAUST AIR DUCT FROM UNIT ABOVE. PREPARE FOR RECONNECTION TO NEW UNIT.
- DEMO EXISTING CIRCULATING PUMP SERVING HOT WATER COIL. PREPARE EXISTING PIPING FOR RECONNECTION.
- DEMO EXISTING LPS STEAM PIPING AS SHOWN BACK TO PENTHOUSE.
- REMOVE EXISTING STEAM TRAP. PREPARE PIPING FOR REPLACEMENT.

DRAWING NOTES

- EXTEND AND RECONNECT EXISTING PIPING UP TO NEW PENTHOUSE CONNECTIONS.
- PROVIDE NEW CIRCULATION PUMP.
- PROVIDE NEW TRANSITION FROM EXISTING 50"x20" SUPPLY DUCT TO 126"x24" UNIT SUPPLY OPENING. EXPAND METAL OVER OPENING INSIDE UNIT.
- PROVIDE NEW TRANSITION FROM EXISTING EXHAUST DUCTS TO 126"x24" EXHAUST AIR OPENING IN UNIT. EXPAND METAL OVER OPENING INSIDE UNIT.
- PROVIDE NEW 1" CH LINE UP TO NEW PH-I IN PIPE CHASE. ROUTE TO NEW EVAPORATIVE COOLER. PROVIDE WITH SHUTOFF VALVE AND ACCESS PANEL.
- CONNECT NEW 1/2" HW TO EXISTING 1/2" HW AS SHOWN.
- ROUTE NEW 1/2" HW FROM EXISTING MOP SINK CONNECTION UP TO NEW PENTHOUSE TO SERVE EYEWASH STATION.
- REPLACE EXISTING STEAM TRAP BUCKET WITH NEW EQUAL TO ARMSTRONGS MODEL 800 SERIES.
- PROVIDE NEW END OF MAIN STEAM TRAP BUCKET FOR HIGH PRESSURE STEAM (75 PSIG). EQUAL TO ARMSTRONGS MODEL 816.




MECHANICAL GENERAL NOTES

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- BEFORE ANY WORK IS INSTALLED, DETERMINE THAT EQUIPMENT WILL PROPERLY FIT THE SPACE. THAT REQUIRED CLEARANCES CAN BE MAINTAINED AND THAT EQUIPMENT CAN BE LOCATED WITHOUT INTERFERENCES BETWEEN SYSTEMS, WITH STRUCTURAL ELEMENTS, OR WITH THE WORK OF OTHER TRADES.

DRAWING NOTES (DEMO)

- CUT AND CAP EXISTING HPS AND PUMPED CONDENSATE PIPING AT UNIT. PREPARE PIPING FOR NEW CONNECTION.
- CUT AND CAP EXISTING HWS/HWR PIPING FROM UNIT. PREPARE PIPING FOR NEW CONNECTION.
- DISCONNECT ALL EXISTING CONNECTIONS FROM UNIT AND DEMO PENTHOUSE UNIT AND CURB IN ITS ENTIRETY. SALVAGE EXISTING BOILER ROOM EQUIPMENT TO BE REUSED.
- EXISTING EQUIPMENT. NO WORK TO BE PERFORMED. SHOWN FOR COORDINATION PURPOSES ONLY.
- EXISTING HYDRONIC BOILER SYSTEM ROOM. NO WORK TO BE PERFORMED. SHOWN FOR COORDINATION PURPOSES ONLY.
- CONTRACTOR SHALL OBTAIN ALL EXISTING TEMPERATURE SETPOINTS, HOUR OF OPERATION SETPOINTS, OCCUPIED AND UNOCCUPIED SETPOINTS, AND ANY AND ALL TREND DATA FROM EXISTING BAS FOR FUTURE COORDINATION IF REQUIRED.
- REMOVE AND RETAIN EXISTING BLOWDOWN DRAIN FOR REUSE IN NEW WORK.
- REMOVE PIPING TO EXTENT INDICATED AND PREPARE FOR NEW CONNECTIONS.



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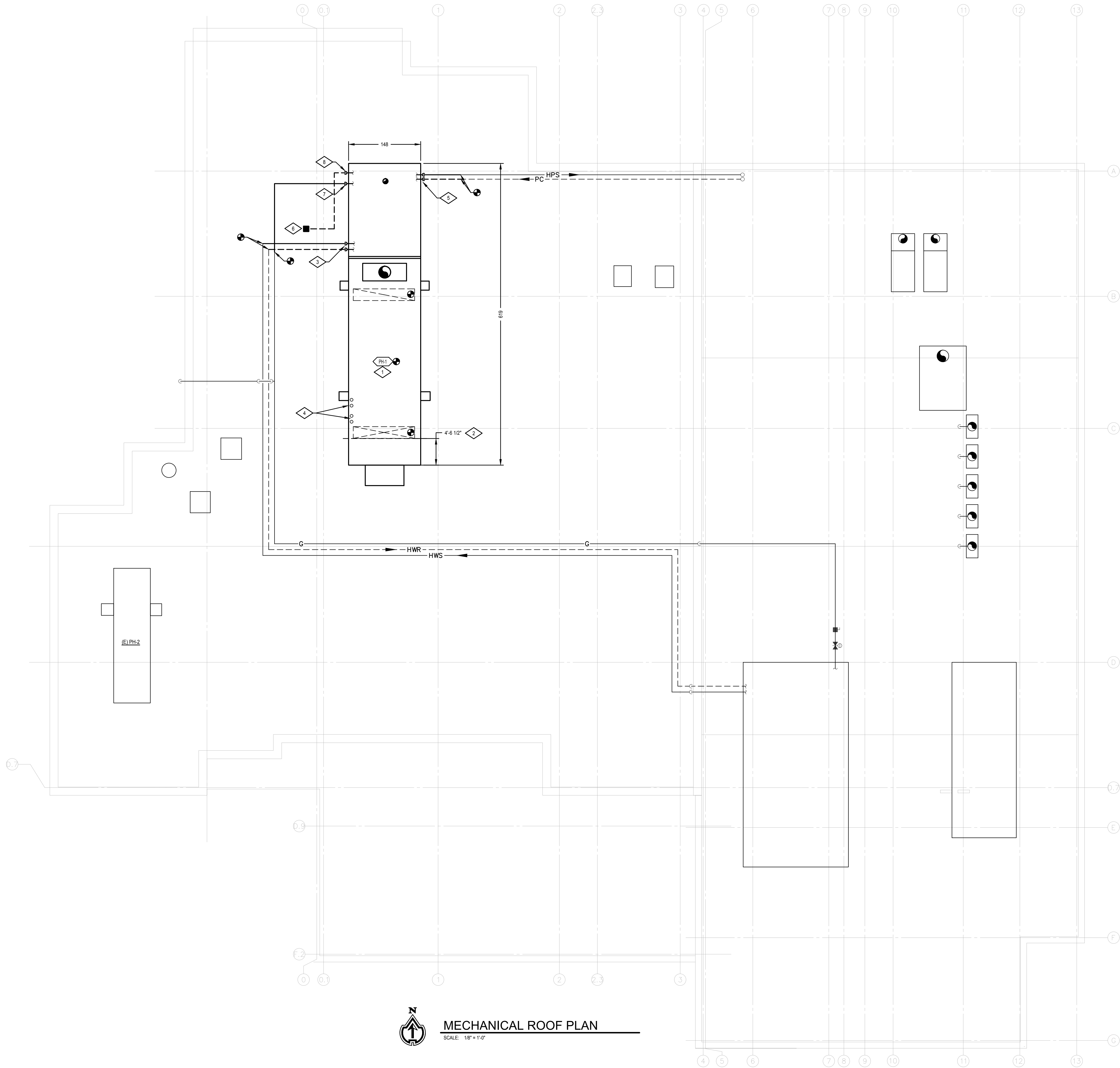
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MECHANICAL
DEMO ROOF PLAN



MD-2.0



MECHANICAL GENERAL NOTES

- REFERENCE DIAGRAMMS FOR INSTALLATION OF NEW HVAC EQUIPMENT AND DEVICES.
- PLANS ARE DIAGRAMMATIC AND ONLY SHOW THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED. THE PLANS DO NOT SHOW EVERY OFFSET AND TRANSITION. CONTRACTOR SHALL FOLLOW PLANS IN LAYING OUT WORK AND COORDINATE WITH OTHER TRADES TO VERIFY SPACE IN WHICH WORK IS INSTALLED.
- ALL DUCT DIMENSIONS SHOWN ARE SHEET METAL DIMENSIONS.
- NOT ALL DUCT TRANSITIONS AND OFFSETS ARE SHOWN. CONTRACTOR SHALL PROVIDE THE NECESSARY FITTING REQUIRED AND INSTALL ACCORDINGLY.
- NEW CONTROLS SHALL MATCH EXISTING BUILDING AUTOMATION SYSTEM. EXISTING DDC CONTROLS ARE SIEMENS.

DRAWING NOTES

- INSTALL NEW PENTHOUSE AIR HANDLER WITH NEW CURB.
- ADJUST ROOF OPENING AS REQUIRED FOR NEW CURB LENGTH. PROVIDE WITH NEW 14\"/>



MECHANICAL ROOF PLAN

SCALE: 1/8\"/>



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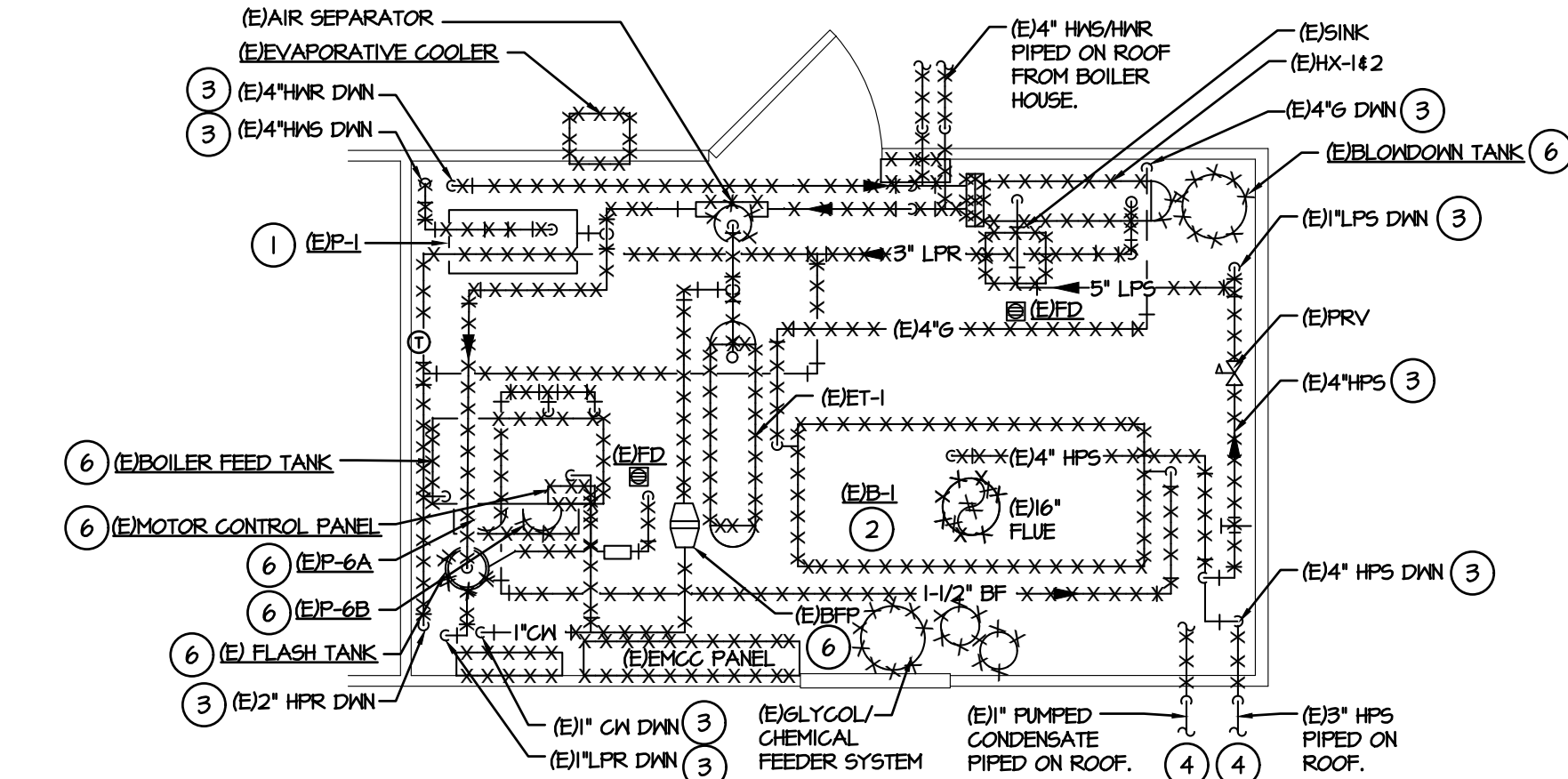
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MECHANICAL
ROOF PLAN



M-2.0



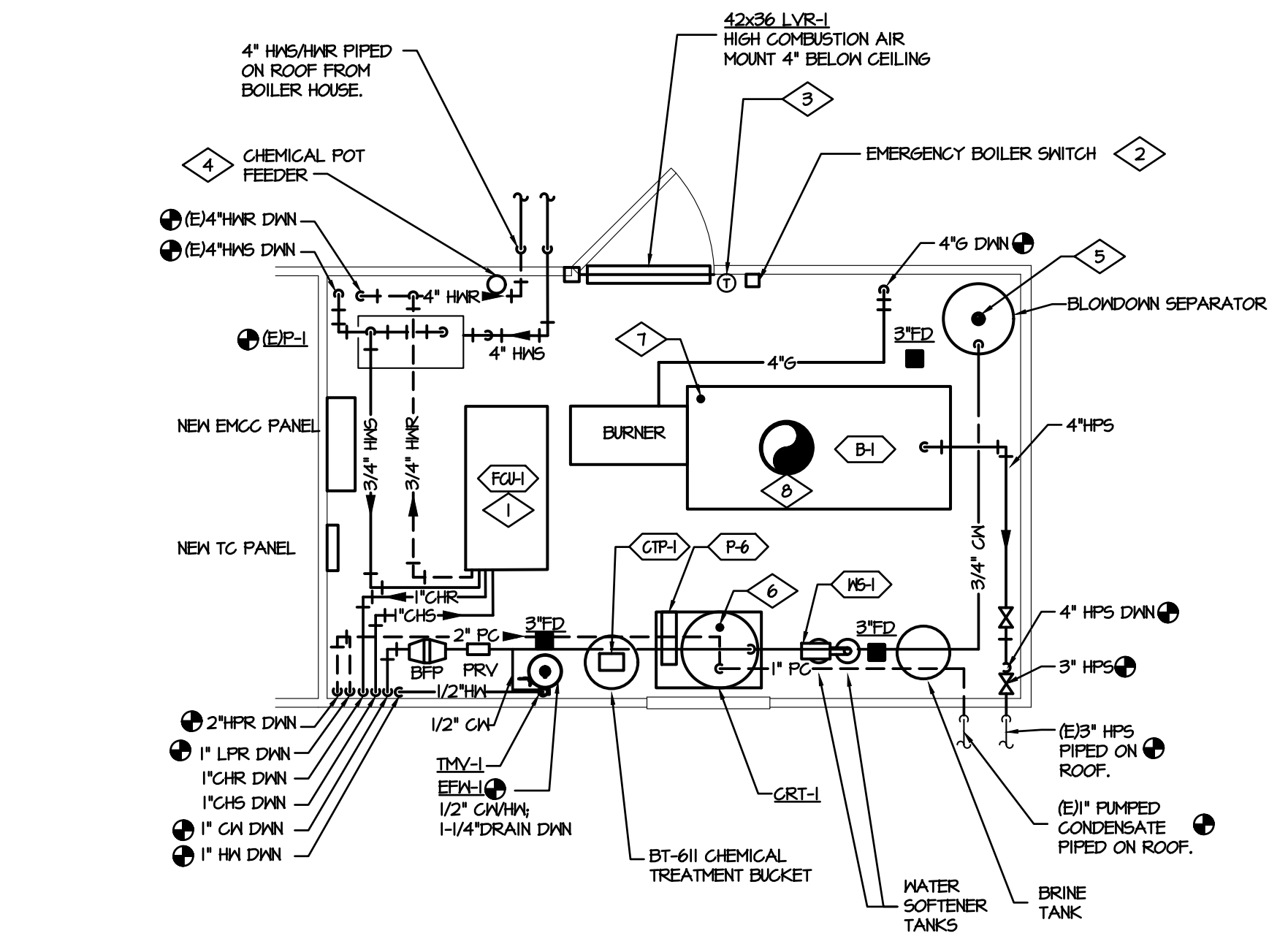
PENTHOUSE BOILER DEMOLITION PLAN
SCALE: 1/4" = 1'-0"

DRAWING NOTES (DEMO)

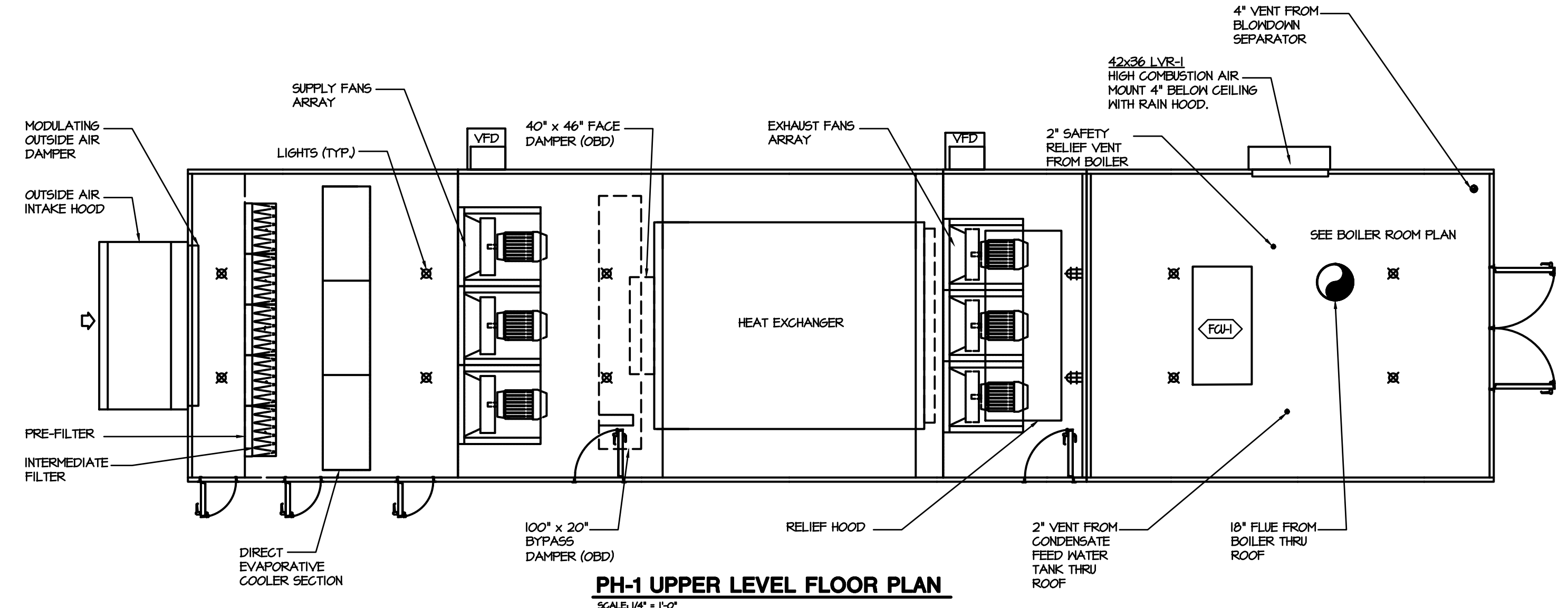
1. REMOVE AND RETAIN EXISTING EQUIPMENT AND PREPARE FOR RELOCATION.
2. DISCONNECT AND REMOVE EXISTING BOILER.
3. CUT AND CAP PIPING BELOW ROOF AND PREPARE FOR NEW CONNECTION.
4. CUT AND CAP PIPING ON EXTERIOR WALL AND PREPARE FOR NEW CONNECTION.
5. REMOVE AND RETAIN EXISTING EQUIPMENT WITH FLASH NEUTRALIZER KIT AND PREPARE FOR RELOCATION.
6. REMOVE EXISTING EQUIPMENT AND RETURN TO OWNER'S STOCK.

DRAWING NOTES

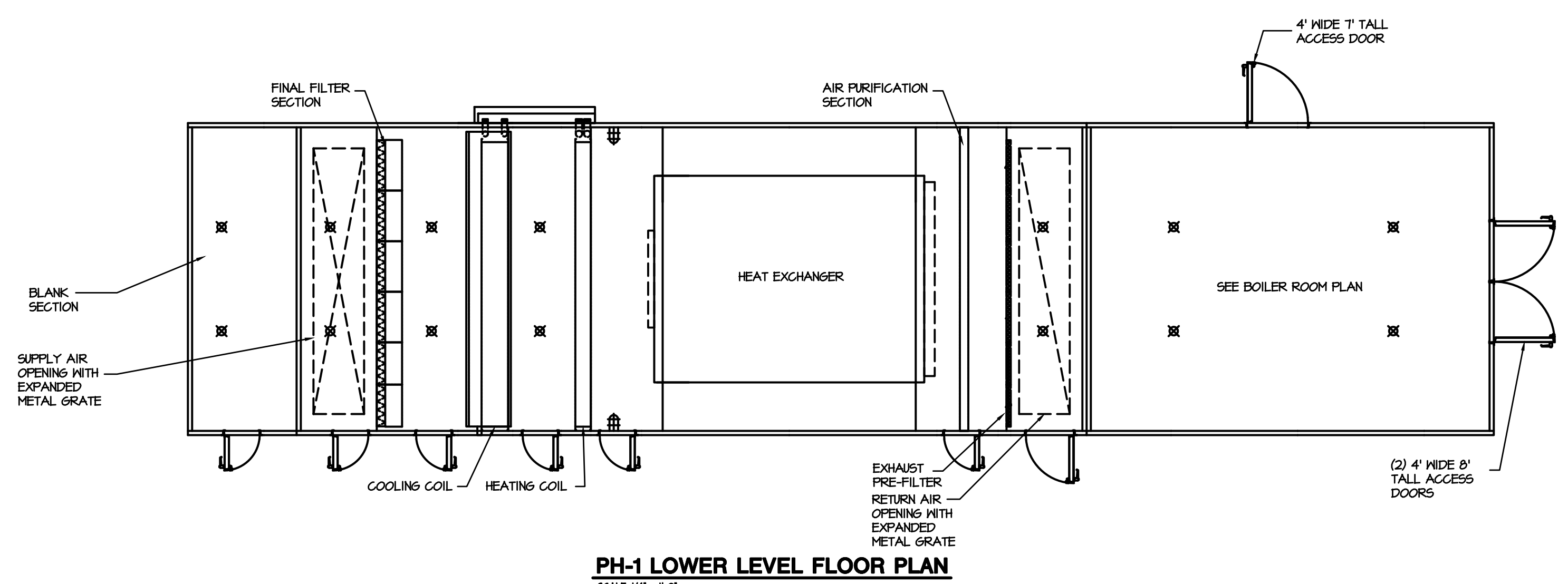
1. MOUNT BOTTOM OF FAN COIL UNIT 4'-0" AFF. SUPPORT FROM STRUCTURE ABOVE. RE. INSTALLATION DIAGRAM ON M-0-3.
2. MOUNT EMERGENCY BOILER SHUT-OFF SWITCH 4'-0" AFF NEXT TO DOOR. COORDINATE WITH ELECTRICAL TO INTERLOCK WITH BOILER CONTROLS.
3. MOUNT THERMOSTAT 4'-0" AFF NEXT TO DOOR. INTERLOCK WITH FCU-I.
4. CHEMICAL POT FEEDER SHALL BE EQUAL TO 20L NI-CALSON MODEL 4628-0. INSTALL PER MANUFACTURER'S RECOMMENDED INSTALLATION.
5. 4" BLowDOWN SEPARATOR VENT TO APPROVED VENT CAP ON ROOF.
6. 2" CONDENSATE RETURN TANK VENT TO APPROVED VENT CAP ON ROOF.
7. 2" BOILER SAFETY RELIEF VENT TO APPROVED VENT CAP ON ROOF.
8. 18" BOILER FLUE TO APPROVED VENT CAP ON ROOF.



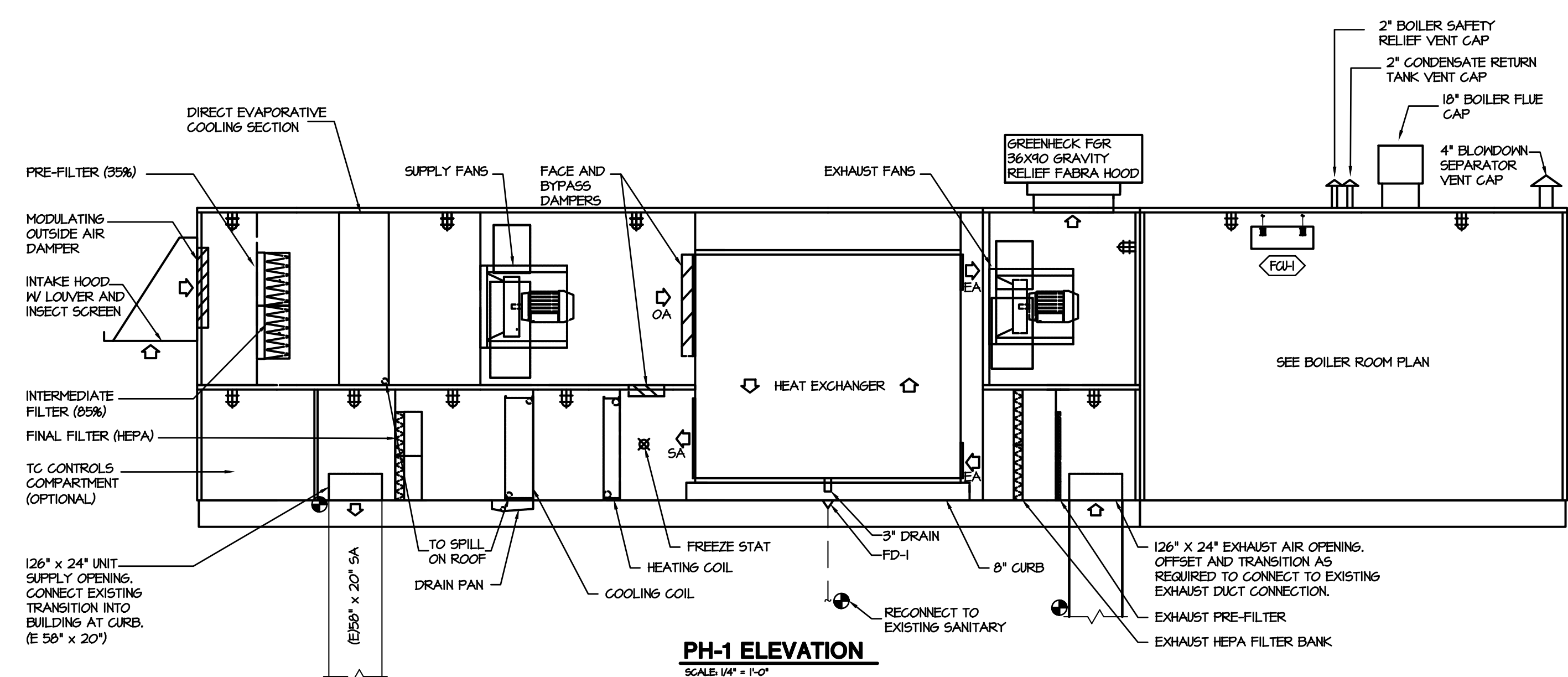
PENTHOUSE BOILER NEW PLAN
SCALE: 1/4" = 1'-0"



PH-1 UPPER LEVEL FLOOR PLAN
SCALE: 1/4" = 1'-0"



PH-1 LOWER LEVEL FLOOR PLAN
SCALE: 1/4" = 1'-0"



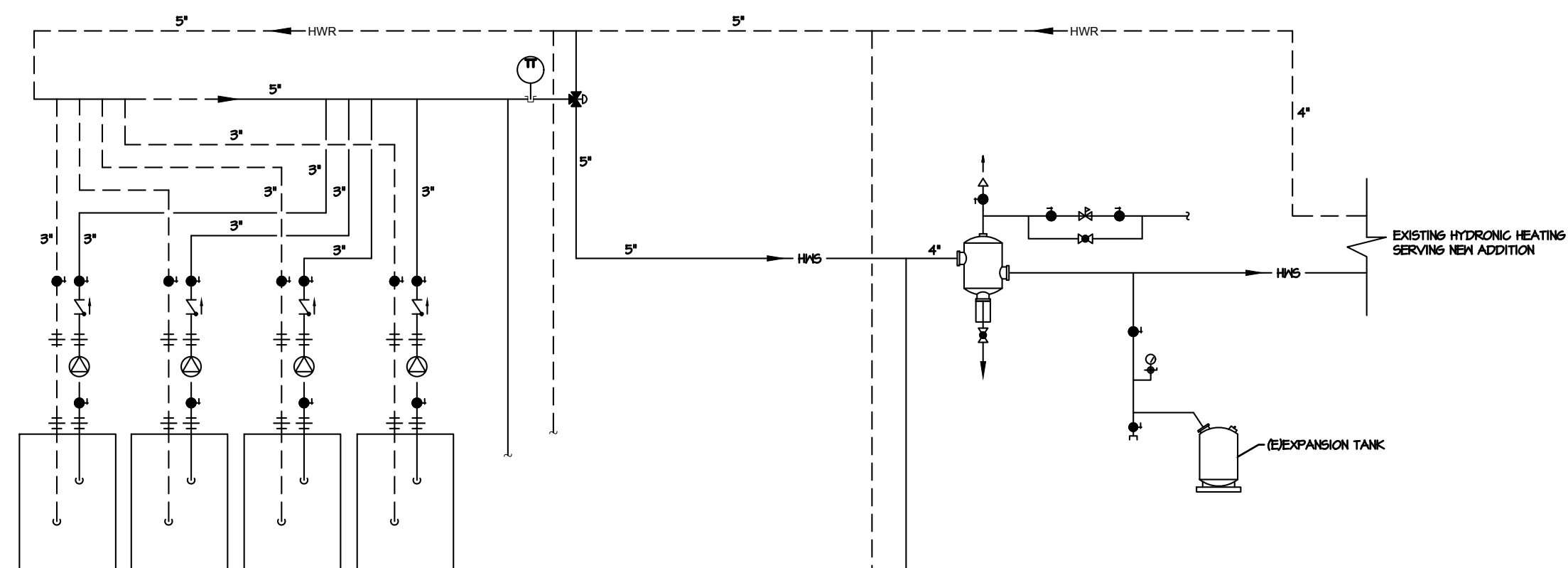
PH-1 ELEVATION
SCALE: 1/4" = 1'-0"

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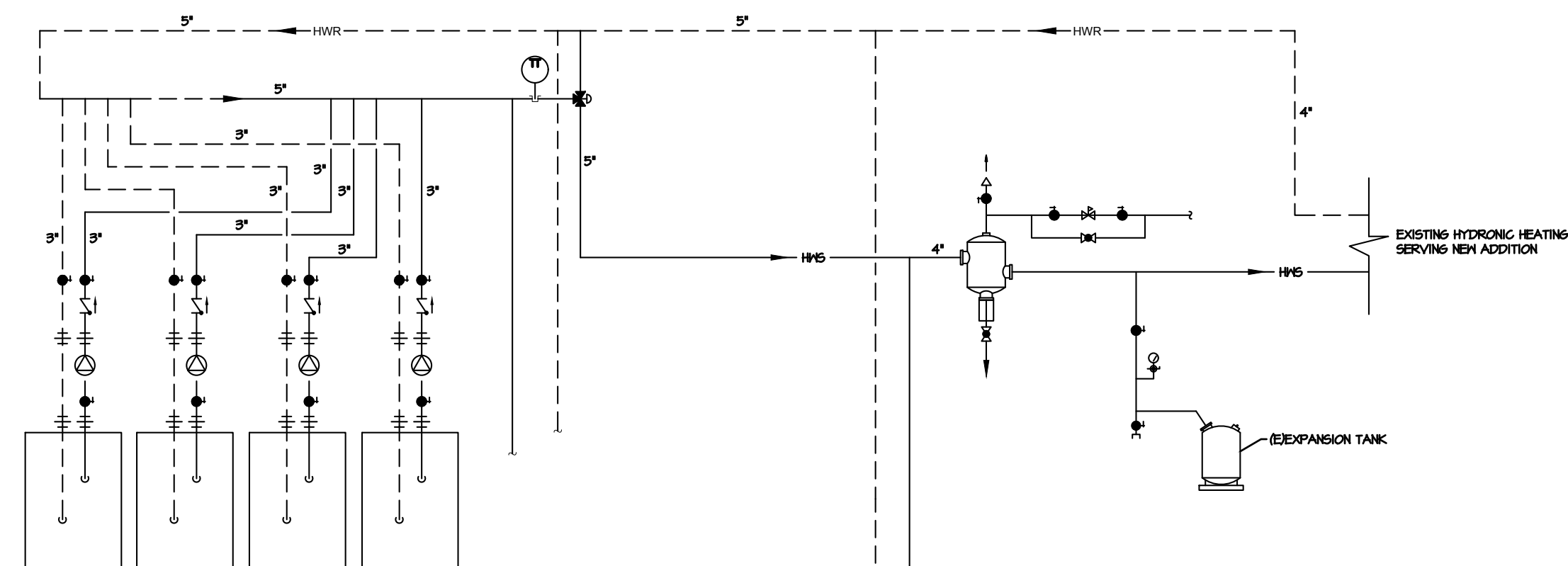
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**MECHANICAL
ENLARGED PLAN**

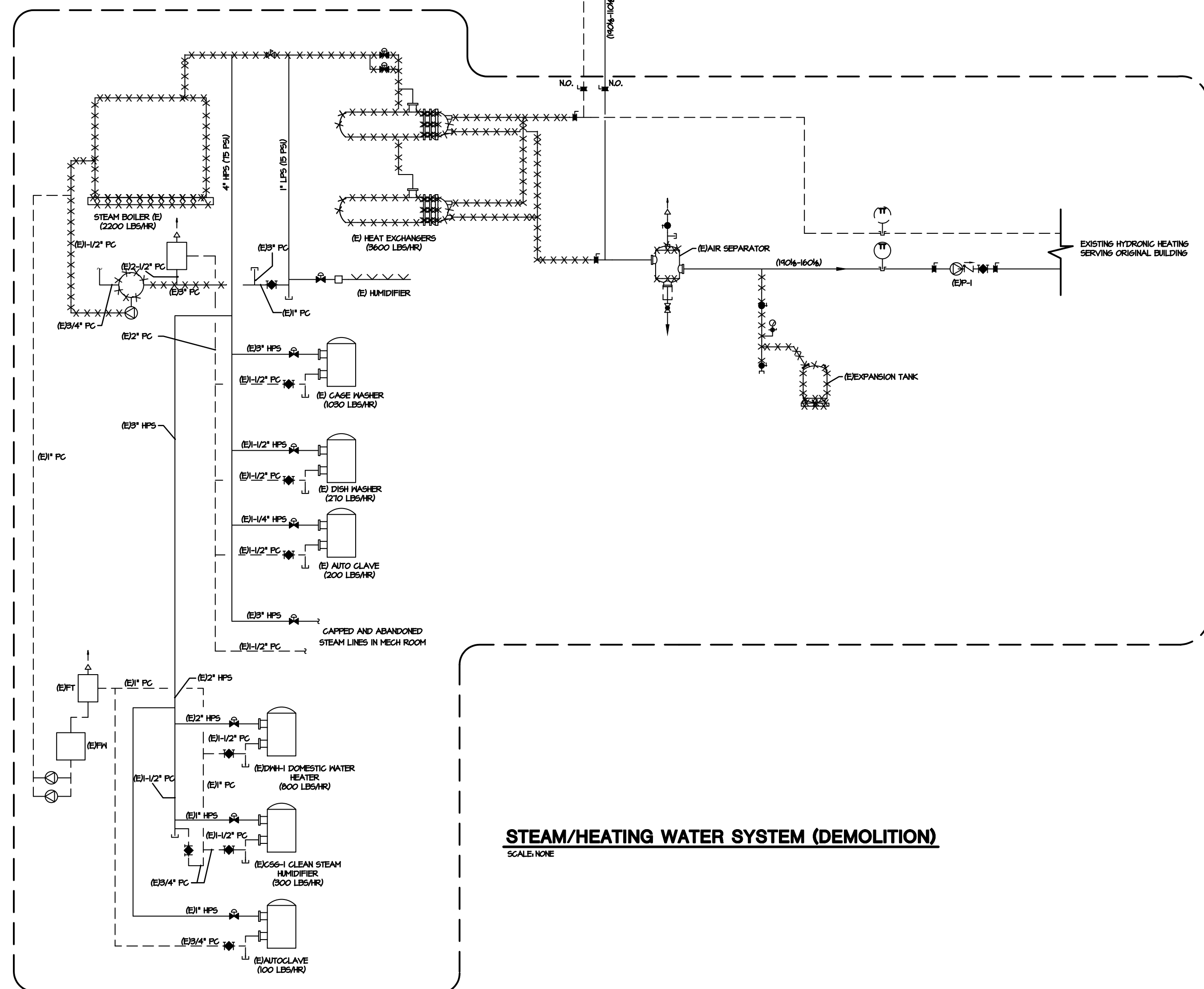




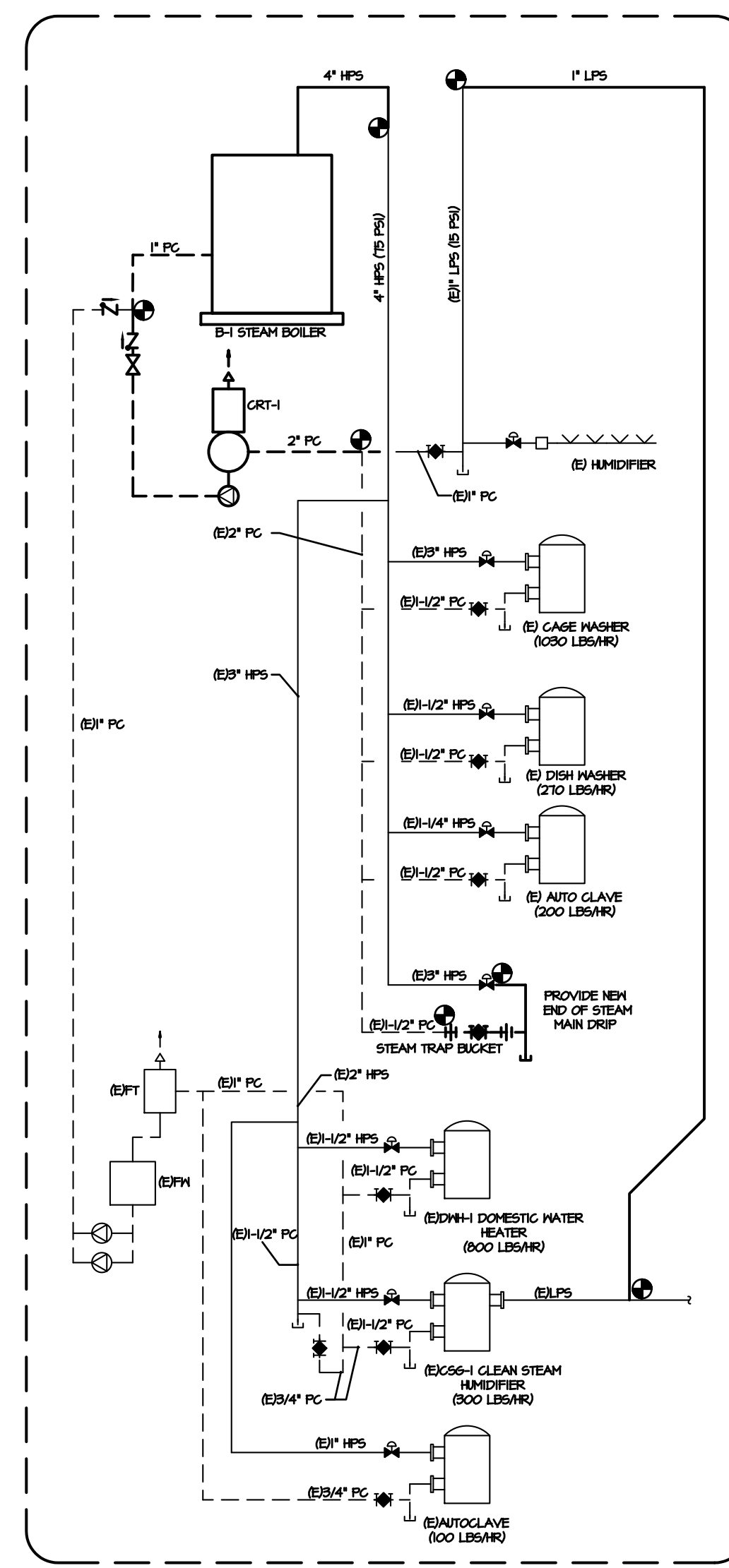
EXISTING HYDRONIC BOILER SYSTEM
SCALE: NONE



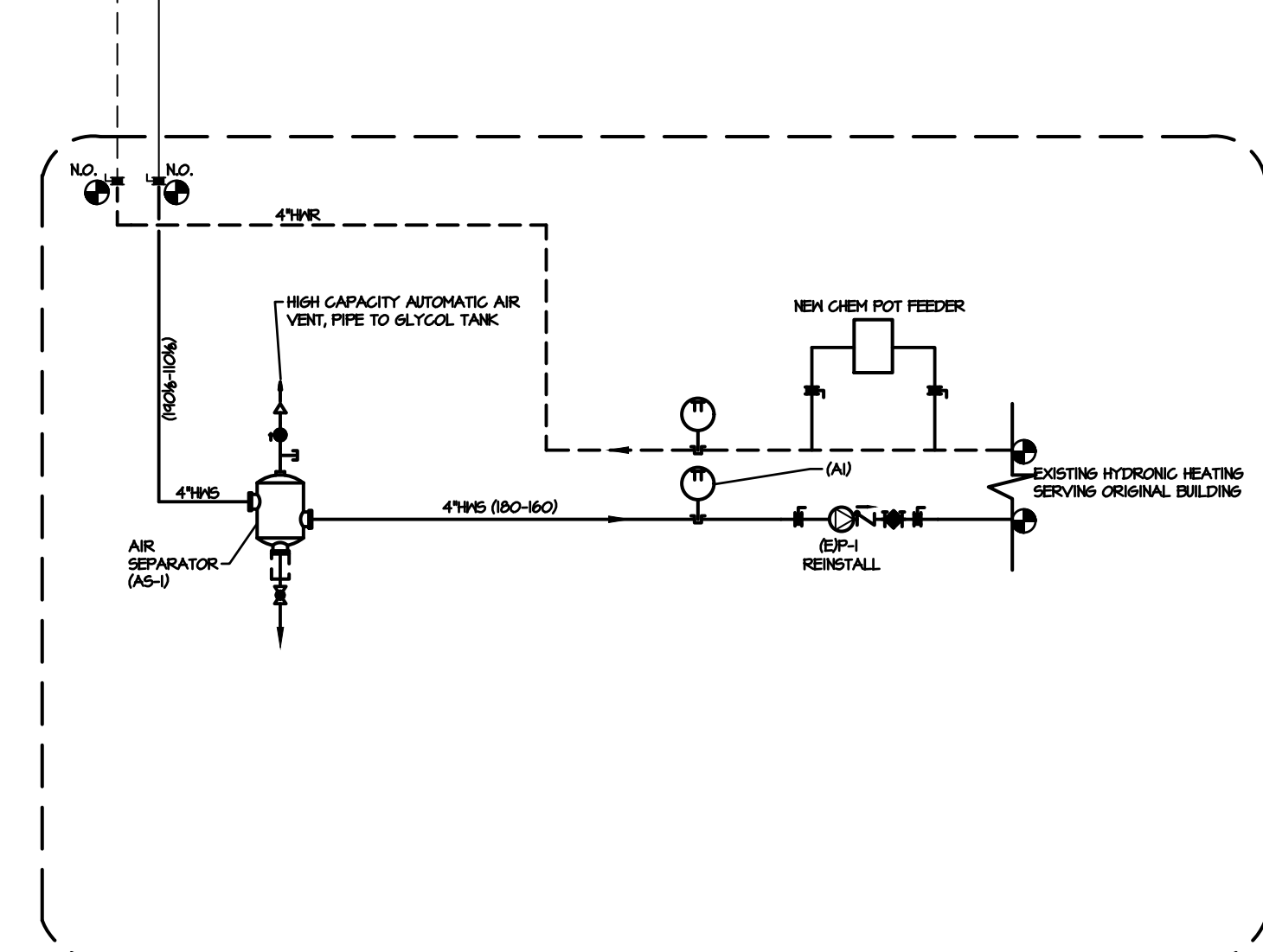
EXISTING HYDRONIC BOILER SYSTEM
SCALE: NONE



STEAM/HEATING WATER SYSTEM (DEMOLITION)
SCALE: NONE



STEAM BOILER SYSTEM (EXISTING/NEW)
SCALE: NONE



HEATING WATER SYSTEM (EXISTING/NEW)
SCALE: NONE



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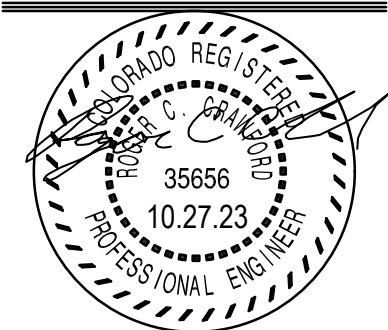
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ELECTRICAL LEGEND AND DETAILS



E-0.1

ISC CALCULATION - 3 PHASE

Point #1 - At The Utility Transformer

IsC = 16,900

Point #2 - At the Main Distribution System "MDS"

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 60 X 16,900 / 6 X 20,565 X 480

f = 0.030

M = 1/(1+f)

M = 0.971

IsC = IsC(Prev) x M

IsC = 16,413

Point #3 - At the Main Distribution Center "MDC"

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 60 X 16,413 / 2 X 22,165 X 480

f = 0.089

M = 1/(1+f)

M = 0.926

IsC = IsC(Prev) x M

IsC = 15,196

Point #4 - At Panel "EMCC"

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 60 X 15,196 / 1 X 12,843 X 480

f = 0.256

M = 1/(1+f)

M = 0.798

IsC = IsC(Prev) x M

IsC = 12,097

Point #5 - At the 150kVA Transformer

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 10 X 12,097 / 1 X 981 X 480

f = 0.445

M = 1/(1+f)

M = 0.692

IsC = IsC(Prev) x M

IsC = 8,372

Point #6 - Through the Transformer, 3-phase

f = IsC(Pr) X Vl(Pr) X 1.73 X (%Z) / 100,000 X kVA trans

f = 8,372 X 480 X 1.73 X 3.5 / 100,000 X 15

f = 16,222

M = 1/(1+f)

M = 0.058

IsC = Vl(Pr) / V(Sec) X M X IsC(Pr)

IsC = 1,122

Point #7 - At Panel "ELP1"

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 15 X 1,122 / 1 X 2,425 X 208

f = 0.058

M = 1/(1+f)

M = 0.945

IsC = IsC(Prev) x M

IsC = 1,061

Point #8 - At Panel "HP"

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 50 X 1,061 / 1 X 8,924 X 480

f = 0.307

M = 1/(1+f)

M = 0.765

IsC = IsC(Prev) x M

IsC = 11,625

Point #9 - At 100A ATS

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 15 X 11,625 / 1 X 7,292 X 480

f = 0.086

M = 1/(1+f)

M = 0.921

IsC = IsC(Prev) x M

IsC = 10,701

Point #10 - At Panel "GEN1"

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 5 X 10,701 / 1 X 7,292 X 480

f = 0.028

M = 1/(1+f)

M = 0.974

IsC = IsC(Prev) x M

IsC = 10,425

Point #11 - At 450kVA Transformer

f = 1.732 X length X IsC(Prev) / # runs X wire factor X voltage

f = 1.732 X 5 X 10,425 / 1 X 3,806 X 480

f = 0.049

M = 1/(1+f)

M = 0.953

IsC = IsC(Prev) x M

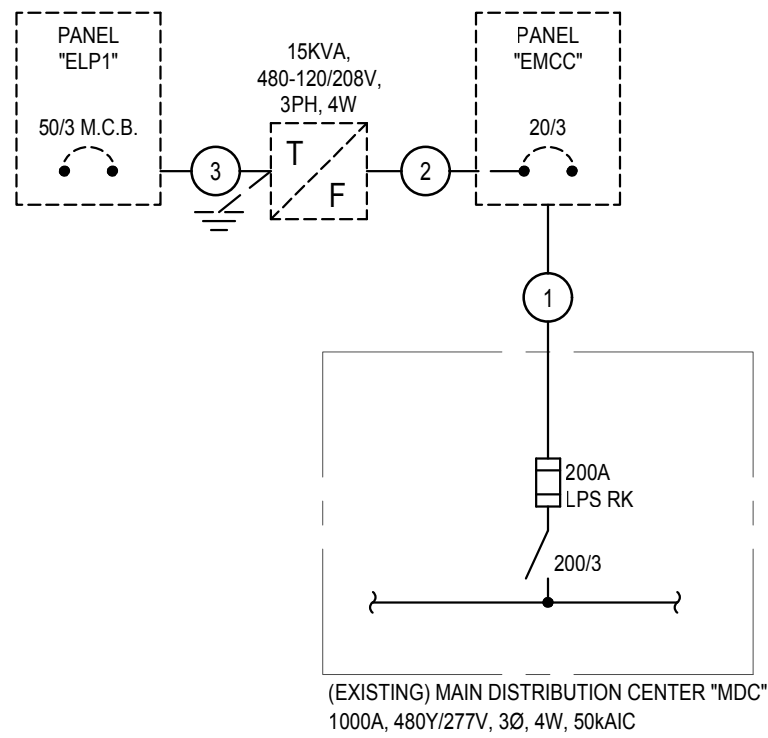
IsC = 9,934

Point #12 - Through the Transformer, 3-phase																	
f =	IsC(Pr)	X	Vl(Pr)	X	1.73	X	(%Z)	/	100,000 X kVA trans								
f =	9,934	X	480	X	1.73	X	3.5	/	100,000 X 45								
f =	8,416																
M =	1/(1+f)																
M =	0.135																
IsC = Vl(Pr) / V(Sec) X M X IsC(Pr)																	
IsC = 3,091																	
Point #13 - At Panel "GEN1A"																	
f =	1.732	X	length	X	IsC(Prev)	/	# runs	X	wire factor X voltage								
f =	1.732	X	5	X	3,091	/	1	X	8,924 X 208								
f =	0.014																
M =	1/(1+f)																
M =	0.986																
IsC = IsC(Prev) x M																	
IsC = 3,047																	
Point #14 - At Ph-1 Supply Fans																	
f =	1.732	X	length	X	IsC(Prev)	/	# runs	X	wire factor X voltage								
f =	1.732	X	50	X	12,097	/	1	X	7,292 X 480								
f =	0.299																
M =	1/(1+f)																
M =	0.770																
IsC = IsC(Prev) x M																	
IsC = 9,311																	
Point #15 - At Ph-1 Exhaust Fans																	
f =	1.732	X	length	X	IsC(Prev)	/	# runs	X	wire factor X voltage								
f =	1.732	X	50	X	12,097	/	1	X	2,425 X 480								
f =	0.900																
M =	1/(1+f)																
M =	0.526																
IsC = IsC(Prev) x M																	
IsC = 8,367																	

ELECTRICAL SYMBOLS LEGEND									
ALL SYMBOLS INDICATED IN THE LEGEND MAY NOT NECESSARILY BE USED ON PLANS.									
CIRCUITING		POWER SYMBOLS		FIRE ALARM SYMBOLS		ONE LINE DIAGRAM SYMBOLS			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CIRCUITING DESIGNATION - OPEN 27' MAX., SOLID 1200' MAX. CIRCUITING - RUN CONCEALED IN WALL OR CEILING CIRCUITING - RUN CONCEALED IN FLOOR OR GRADE CONDUIT RISER - TURNED UP, TURNED DOWN CIRCUITING - CONTINUED AS DESIGNATED CIRCUITING - END CAP		JUNCTION BOX, J-BOX WITH BLANK COVER SIMPLEX RECEPTACLE DUPLEX RECEPTACLE COMBINATION DUPLEX RECEPT / USB OUTLET HALF SWITCHED DUPLEX RECEPTACLE DEDICATED DUPLEX RECEPTACLE CEILING MOUNTED DUPLEX RECEPTACLE FOURPLEX RECEPTACLE DEDICATED FOURPLEX RECEPTACLE CLG MOUNTED FOURPLEX RECEPTACLE SPECIAL RECEPTACLE - SEE DRAWING NOTES FLOOR MOUNTED POWER FLOOR BOX DEVICE FLOOR COMBINATION POWER FLOOR BOX DEVICE NON FUSED DISCONNECT SWITCH FUSED DISCONNECT SWITCH VARIABLE FREQUENCY DRIVE MOTOR ONE, TWO AND THREE BUTTON PUSH SWITCH POWER POLE TIME CLOCK CONTACTOR GROUND BAR EMERGENCY POWER OFF PUSH BUTTON METER PANEL BOARD PULLBOX CURRENT TRANSFORMER TRANSFORMER SWITCHES SWITCH SINGLE POLE SWITCH DOUBLE POLE SWITCH THREE WAY SWITCH FOUR WAY SWITCH DIMMER SWITCH KEYED SWITCH WITH PILOT LIGHT SWITCH THERMAL OVERLOAD SWITCH LOW VOLTAGE - SEE DRAWING NOTES SWITCH VARIABLE SPEED CONTROL SWITCH WITH TYPE F FUSE HOLDER LTO SCENE CONTROLLER-SEE DRAWING NOTES		CEILING MOUNTED FIRE HORN/STROBE CEILING MOUNTED STROBE CEILING MOUNTED FIRE SPEAKER REMOTE INDICATOR LAMP MANUAL PULL STATION FLOW SWITCH TAMPER SWITCH PRESSURE SWITCH WALL MOUNTED STROBE WALL MOUNTED FIRE HORN WALL MOUNTED FIRE HORN/STROBE MAGNETIC DOOR HOLD OPEN FIRE ALARM CONTROL PANEL FIRE ALARM ANNUNCIATOR PANEL FIRE ALARM GRAPHIC MAP DUCT DETECTOR FIRE SMOKE DAMPER HEAT DETECTOR SMOKE DETECTOR FIREFIGHTERS PHONE JACK / WALL PHONE TWO-WAY COMMUNICATION STATION		PANEL BOARD CURRENT TRANSFORMER ENCLOSURE PULL BOX FUSED DISCONNECT SWITCH NON-FUSED DISCONNECT SWITCH TRANSFORMER PAD MOUNTED TRANSFORMER TRANSFER SWITCH OVERHEAD POLE MOUNTED TRANSFORMER BANK		FUSED DISCONNECT SWITCH WITHIN SWITCHBOARD SPARE SWITCH WITHIN SWITCHBOARD SPACE WITHIN SWITCHBOARD CIRCUIT BREAKER SERVICE WEATHER HEAD CURRENT TRANSFORMER GROUNDING CONNECTION MOTOR GENERATOR METER GROUND BAR
LINE TYPES AND LINE HEIGHTS		NOTES AND TAGS		TELECOMMUNICATION SYMBOLS		TELECOMMUNICATION SYMBOLS			
	NEW CIRCUITING - CONTINUOUS AND BOLD NEW CIRCUITING - UNDER FLOOR OR SPACE - LARGER, UNDERLINED AND BOLD EXISTING CIRCUITING - CONTINUOUS AND THIN REMODELING CIRCUITING - LARGER, DASHED AND THIN NEW AND RELOCATED DEVICES AND FIXTURES - CONTINUOUS AND BOLD EXISTING DEVICES AND FIXTURES - CONTINUOUS AND THIN REMODELING DEVICES AND FIXTURES - SMALLER, DASHED AND THIN		REVISION DELTA DRAWING NOTE MECHANICAL EQUIPMENT KITCHEN EQUIPMENT LIGHTING CONTROL NOTE		TELEPHONE OUTLET, DOUBLE GANG BOX, 1/2 CONDUIT STUB TO ACCESSIBLE CEILING DATA OUTLET, DOUBLE GANG BOX, 1/2 CONDUIT STUB TO ACCESSIBLE CEILING TELEPHONE/DATA OUTLET, DOUBLE GANG BOX, 1/2 CONDUIT STUB TO ACCESSIBLE CEILING CABLE TV OUTLET, DOUBLE GANG BOX, 1/2 CONDUIT STUB TO ACCESSIBLE CEILING FLOOR DATA OUTLET - SEE DRAWING NOTES FLOOR TELEPHONE/DATA OUTLET - SEE DRAWING NOTES		WALL VACANCY SENSOR, DUAL TECH, SINGLE ZONE, INTEGRAL, OVERRIDE SWITCH WALL VACANCY SENSOR, DUAL TECH, SINGLE ZONE, INTEGRAL, OVR SWITCH, DIMMING WALL VACANCY SENSOR, DUAL TECH, SINGLE ZONE, INTEGRAL, OVERRIDE SWITCH, LTO WALL VACANCY SENSOR, DUAL TECH, SINGLE ZONE, 3P POWER PACK, LTO OVERRIDE SWITCHES CEILING VACANCY SENSOR, DUAL TECH, SINGLE ZONE, POWER PACK, LTO OVERRIDE SWITCHES CEILING VACANCY SENSOR, DUAL TECH, SINGLE ZONE, 3P POWER PACK, LTO OVERRIDE SWITCHES INTERIOR DAYLIGHT SENSOR		
ABBREVIATIONS									
	JAMP AMPERE ABOVE COUNTER ABOVE FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR ABOVE FINISHED GRADE ALUMINUM BUILDING C CIRCUIT BREAKER CONDUIT CIRCUIT FISHION CURRENT TRANSFORMER COPPER								

PANEL "EMCC" (DEMO)		VOLTAGE 277 / 480 V		3 PH 4 W							
FLUSH _____		MAIN _____		MLO X _____							
SURFACE X _____		BUS 200A _____		FEED THRU _____ A.I.C. 22,000A _____							
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)		CIR	BKR	DESCRIPTION	TYPE		
				A	B	C					
	P-1: HEAT PUMP	30	1	0	0		2	125	PH-1 FANSLIGHT CNTRL		
	-		3		0	0	4	3	-		
	-		5				6	4	-		
	P-6: FEEDWATER PUMP	30	7	0	0	0	8	30	B-1		
	-		9		0	0	10	3	-		
	-		11				12	3	-		
	P-4: PH-1 CIRC PUMP	30	13	0	0		14	20	PANEL "ELP1"		
	-		15		0	0	16	20	-		
	-		17				18	3	-		
	SPARE	30	19	0	0		20		SPACE		
	-		21		0	0	22		SPACE		
	-		23				24		SPACE		
	IT COMPRESSOR	30	25	0	0		26		SPACE		
	-		27		0	0	28		SPACE		
	-		3	29			30		SPACE		
				0	0	0					
LOAD TYPE		CONNECTED KVA			TOTAL	FACTOR	DEMAND KVA			TOTAL	
		A	B	C	ALL		A	B	C	ALL	
	LIGHTING/CONTINUOUS	0.0	0.0	0.0	0.0	125%	0.0	0.0	0.0	0.0	
	RECEPTACLE (10KVA OR LESS)	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0	
	RECEPTACLE (OVER 10KVA)	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0	
	HVAC/MOTOR	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0	
	MOTOR(LARGEST)	0.0	0.0	0.0	0.0	125%	0.0	0.0	0.0	0.0	
	KITCHEN EQUIPMENT	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0	
	MISCELLANEOUS	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0	
TOTAL KVA		0.0	0.0	0.0	0.0		TOTAL KVA	0.0	0.0	0.0	
						TOTAL AMPERES	0.0	0.0	0.0	0.0	
LEGEND		L = LIGHTING		R = RECEPTACLE		M = HVAC / MOTOR		K = KITCHEN		G = MISCELLANEOUS	

- 1 EXISTING LOAD TO BE RECONNECTED IN NEW "EMCC" PANEL. REFER TO SHEET E-0.3 FOR NEW PANEL INFORMATION.
- 2 EXISTING LOAD TO BE REMOVED AND REPLACED. REFER TO SHEETS E-0.1 AND E-0.3 FOR ADDITIONAL INFORMATION.



PARTIAL ELECTRICAL ONE-LINE DIAGRAM (DEMO)
NOT TO SCALE

PANEL "ELP1" (DEMO)		VOLTAGE 120 / 208 V		3 PH 4 W	
FLUSH		MAIN 50/3		MLO X	
SURFACE X		BUS 100A		FEED THRU A.I.C. 10,000A	

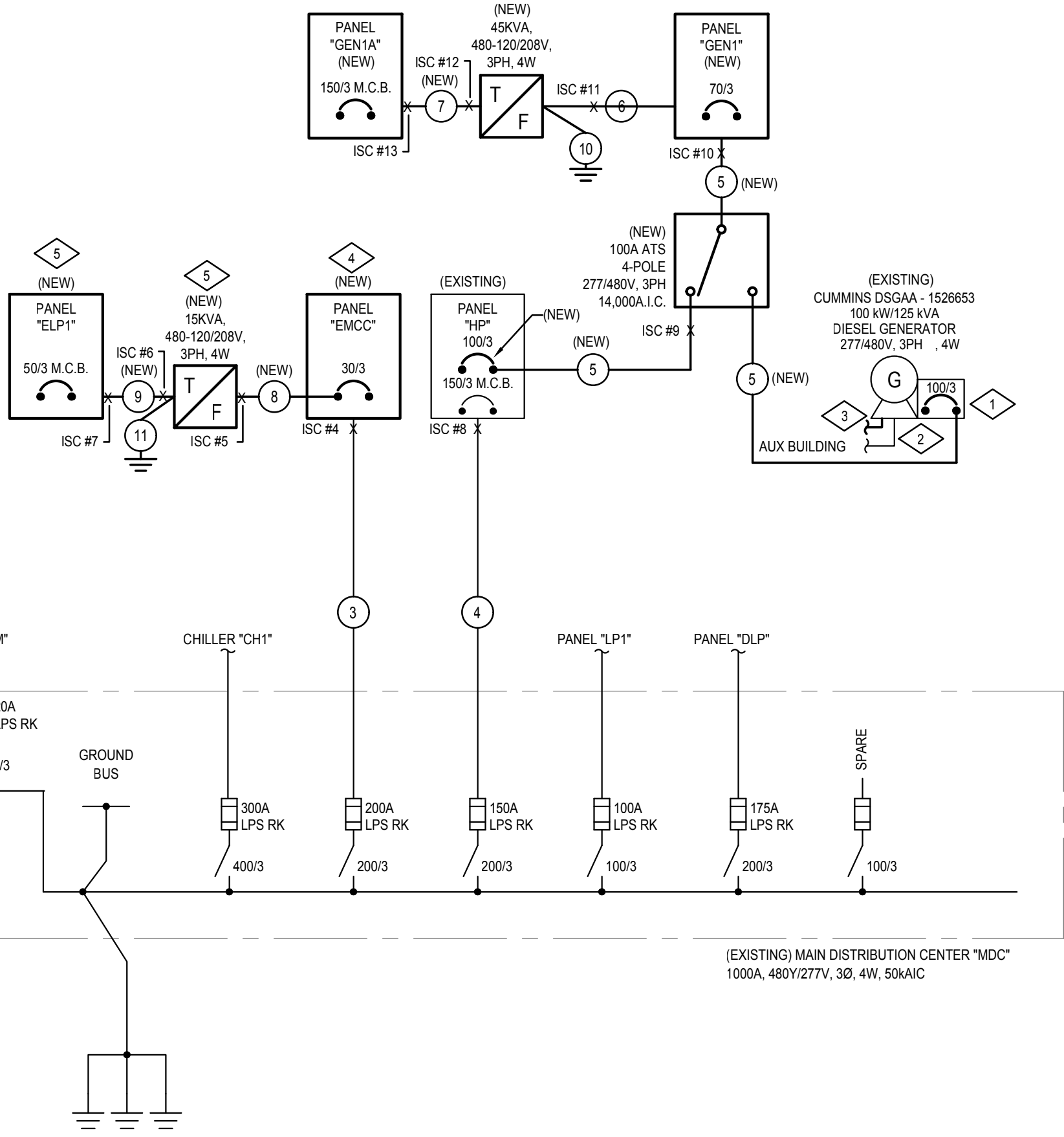
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)			CIR	BKR	DESCRIPTION	TYPE
				A	B	C				
	FIRE PANEL	20	1	0	0		2	20	SWAMPER TC	
	BOILER T.C. CNTL PAN	20	3		0	0	4	20	PS PUMP	
	RM 127	20	5			0	6	20	P7	
	RM 139	20	7	0	0		8	20	P8	
	SURG. LTG 127,132,136	20	9		0	0	10	20	T.C.-152	
	SURG. LGT. 139	20	11			0	12	20	REFRIG. DRYER	
	SURG. LGT 139	20	13	0	0		14	20	FACP	
	RECEPT BY LGT SWITCH	20	15				16	20	SPARE	
	LTG P. HOUSE 111,152	20	17				18	20	SPARE	
	BOILER ALARM CKT	20	19	0	0		20	20	SPARE	
	SPARE	20	21		0	0	22	20	WALL HEATER	
	SPARE	20	23			0	24	20		
				0	0	0				

LOAD TYPE	CONNECTED KVA				FACTOR	DEMAND KVA			
	A	B	C	ALL		A	B	C	ALL
LIGHTINGS/CONTINUOUS	0.0	0.0	0.0	0.0	125%	0.0	0.0	0.0	0.0
RECEPTACLE (10KVA OR LESS)	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
RECEPTACLE (OVER 10KVA)	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
HVAC/MOTOR	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
MOTOR(LARGEST)	0.0	0.0	0.0	0.0	125%	0.0	0.0	0.0	0.0
KITCHEN EQUIPMENT	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
MISCELLANEOUS	0.0	0.0	0.0	0.0	100%	0.0	0.0	0.0	0.0
TOTAL KVA	0.0	0.0	0.0	0.0	TOTAL KVA	0.0	0.0	0.0	0.0
				TOTAL AMPERES				0.0	0.0

LEGEND	L = LIGHTING	R = RECEPTACLE	M = HVAC / MOTOR	K = KITCHEN	G = MISCELLANEOUS
--------	--------------	----------------	------------------	-------------	-------------------

- 1 EXISTING LOADS TO BE CONNECTED IN NEW "ELP1" PANEL. REFER TO SHEET E-0.3 FOR NEW PANEL INFORMATION.

LOAD CALCULATION	
LOAD ON 125KVA GENERATOR	26.7 KVA
PEAK DEMAND	33.4 KVA
PEAK DEMAND AT 125%	19.4 KVA
LOAD ADDED	52.8 KVA

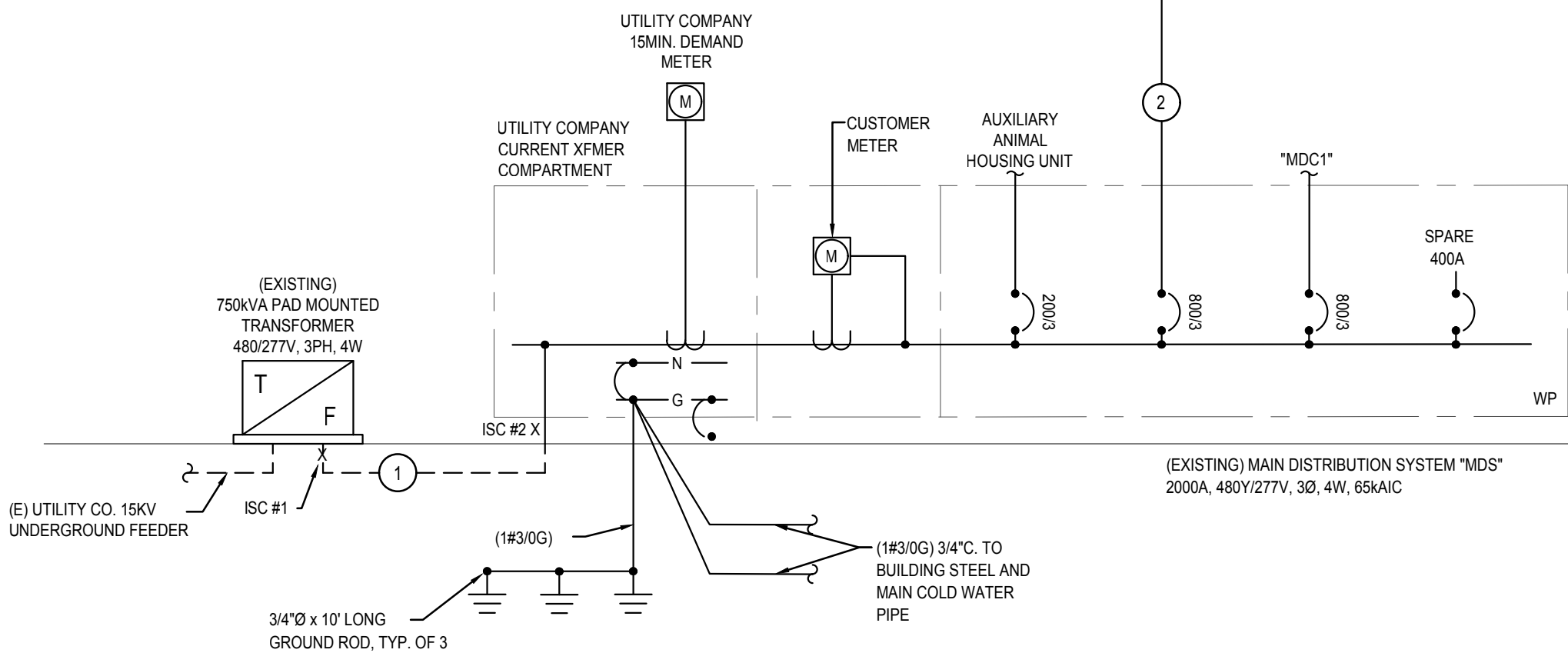


DRAWING NOTES

- DEMOLISH AND REPLACE EXISTING SPARE CIRCUIT BREAKER IN EXISTING GENERATOR. REPLACE 175A, 3-POLE BREAKER WITH 100A, 3-POLE BREAKER.
- EXISTING GENERATOR FED FROM SEPARATE AUX BUILDING SYSTEM. GENERATOR AND EXISTING FEEDS TO REMAIN AS IS, ONLY UTILIZE EXISTING SPARE CIRCUIT BREAKER FROM GENERATOR.
- PROVIDE 1" CONDUIT FROM EXISTING GENERATOR TO NEW ATS FOR NEW CONTROL WIRING.
- DEMOLISH AND REPLACE EXISTING PANELBOARD "EMCC" WITH NEW 200A, 3PH, 4W, 22,000A/IC RATED PANELBOARD. SEE SHEET E-0.3 FOR MORE INFORMATION.
- DEMOLISH AND REPLACE EXISTING PANELBOARD "ELP1" AND EXISTING 15KVA TRANSFORMER. BOTH TO BE FED OUT OF NEW PANELBOARD "EMCC". SEE SHEET E-0.3 FOR MORE INFORMATION.

FEEDER SCHEDULE:

- 6[4-400 KCMIL CU] 3°C
- 2[4-500 KCMIL CU, 1-#1 CU GND] 3-1/2°C
- (4-#3/0 CU, 1-#6 CU GND) 2-1/2°C
- (4-#1/0 CU, 1-#6 CU GND) 2°C
- (4-#1 CU, 1-#8 CU GND) 1-1/2°C
- (4-#4 CU, 1-#8 CU GND) 1-1/2°C
- (4-#10 CU, 1-#6 CU SSB) 2°C
- (3-#10 CU, 1-#10 CU GND) 3/4°C
- (4-#6 CU, 1-#8 CU SSB) 1°C
- (1-#6 CU GND) 3/4°C
- (1-#8 CU GND) 3/4°C





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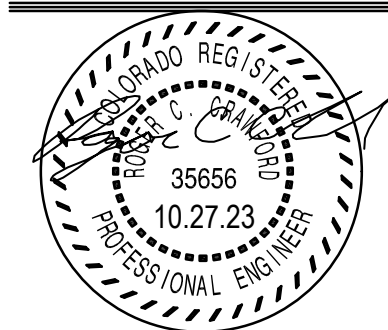
Aurora, CO 80045

PRF - Power HVAC Boiler Upgrades

ISSUE DATE
100% CD 10/06/2023
Issued for Construction 10/27/2023

MEP JOB: 22318
DESIGNED: CMM
CHECKED: RCC

ELECTRICAL PANEL SCHEDULES



E-0.3

PANEL "MDS" (EXISTING)		VOLTAGE 277 / 480 V		3 PH 4 W	
FLUSH	MAIN	MLO X			
SURFACE X	BUS 2000A	FEED THRU		A.I.C. 65,000A	
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)	CIR BKR DESCRIPTION TYPE
				A B C	
1. LMG	"MDC"	800	1	168933 177280	2 800 "MDC1" G
1. LRMG	-	3	3	168073 177280	4 - G
1. LMG	-	3	5	169005 177280	6 3 - G
-	SPARE	400	7	0 44320	8 200 AUX ANIMAL HOUSE G
-	-	9	0	0 44320	10 - G
-	-	3	11	0 44320	12 3 - G
		390533	390673	390605	
LOAD TYPE		CONNECTED KVA		TOTAL	FACTOR
		A	B	C	ALL
LIGHTING/CONTINUOUS		1.0	0.5	1.0	2.5
RECEPTACLE (10KVA OR LESS)		0.0	0.7	0.0	0.7
RECEPTACLE (OVER 10KVA)		0.0	0.0	0.0	0.0
HVAC/MOTOR		0.9	0.9	0.5	2.2
MOTOR(LARGEST)		0.0	0.0	0.0	0.0
KITCHEN EQUIPMENT		0.0	0.0	0.0	0.0
MISCELLANEOUS		388.7	388.6	389.1	1166.4
TOTAL KVA		390.5	390.7	390.6	1171.8
		390.8	390.8	390.9	1172.4
TOTAL AMPERES		1410.8	1410.8	1411.0	1411.0
LEGEND		L = LIGHTING		R = RECEPTACLE	M = HVAC / MOTOR
		K = KITCHEN		G = MISCELLANEOUS	

1. CIRCUIT REVISED THIS CONTRACT.

PANEL "MDC" (EXISTING)		VOLTAGE 277 / 480 V		3 PH 4 W	
FLUSH	MAIN	MLO X			
SURFACE X	BUS 1000A	FEED THRU		A.I.C. 50,000A	
TYPE	DESCRIPTION	FUSE	CIR	LOAD (VA/PHASE)	CIR FUSE DESCRIPTION TYPE
				A B C	
G	CHILLER "CH1"	400	1	88640 6477	2 100 PANEL "LP1" G
G	-	3	3	88640 6477	4 - G
G	-	3	5	88640 6477	6 3 - G
1. LMG	PANEL "EMCC"	200	7	45129 4987	8 200 PANEL "DLP" G
1. LRMG	-	3	11	45209 4987	10 - G
1. LMG	-	3	9	45201 4987	12 3 - G
1. G	PANEL "HP"	200	13	23700 0	14 100 SPARE G
1. G	-	15	0	23700 0	16 - G
1. G	-	3	17	23700 0	18 3 - G
		168933	169073	169005	
LOAD TYPE		CONNECTED KVA		TOTAL	FACTOR
		A	B	C	ALL
LIGHTING/CONTINUOUS		1.0	0.5	1.0	2.5
RECEPTACLE (10KVA OR LESS)		0.0	0.7	0.0	0.7
RECEPTACLE (OVER 10KVA)		0.0	0.0	0.0	0.0
HVAC/MOTOR		0.9	0.9	0.5	2.2
MOTOR(LARGEST)		0.0	0.0	0.0	0.0
KITCHEN EQUIPMENT		0.0	0.0	0.0	0.0
MISCELLANEOUS		167.1	167.0	167.5	501.6
TOTAL KVA		168.9	169.1	169.0	507.0
		169.2	169.2	169.3	507.6
TOTAL AMPERES		610.8	610.8	611.0	611.0
LEGEND		L = LIGHTING		R = RECEPTACLE	M = HVAC / MOTOR
		K = KITCHEN		G = MISCELLANEOUS	

1. CIRCUIT REVISED THIS CONTRACT.

PANEL "ELP1" (NEW)		VOLTAGE 120 / 208 V		3 PH 4 W	
FLUSH	MAIN 50/3	MLO X			
SURFACE X	BUS 100A	FEED THRU		A.I.C. 10,000A	
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)	CIR BKR DESCRIPTION TYPE
				A B C	
1.2. G	FIRE PANEL	20	1	100 100	2 20 SWAMPER TC G
1.2. G	BOILER T.C. CNTL PAN	20	3	100 300	4 20 PS PUMP G
1.2. G	RM 127	20	5	500 300	6 20 P7 G
1.2. G	RM 139	20	7	500 300	8 20 P8 G
1.2. L	SURG. LTG 127,132,136	20	9	500 100	10 20 T.C.-152 G
1.2. L	SURG. LGT 139	20	11	500 500	12 20 REFREG DRYER G
1.2. L	SURG. LGT 139	20	13	500 100	14 20 FACP G
1.2. R	RECEPT PH	20	15	360 864	16 20 EVAP-1 G
1.2. L	LTG. P. HOUSE 111,152	20	17	500 500	18 20 TC PANEL G
1.2. G	BOILER ALARM CKT	20	19	100 500	20 20 AIR HANDLER LIGHTS L
1.2. R	EXISTING EQUIP	20	21	380 1000	22 20 WALL HEATER G
1.2. G	SPARE	20	23	0 1000	24 20 - G
G	WS-1	20	25	864 864	26 20 EVAP-1 M
G	LVR-1	20	27	100 864	28 20 EVAP-1 M
G	EPO	20	29	200 480	30 20 FCU-1 M
SPACE	-	31	0	480	32 20 CTP-1 G
SPACE	-	33	0	0	34 SPACE
SPACE	-	35	0	0	36 SPACE
SPACE	-	37	0	0	38 SPACE
SPACE	-	39	0	0	40 SPACE
SPACE	-	41	0	0	42 SPACE
LOAD TYPE		CONNECTED KVA		TOTAL	FACTOR
		A	B	C	ALL
LIGHTING/CONTINUOUS		1.0	0.5	1.0	2.5
RECEPTACLE (10KVA OR LESS)		0.0	0.7	0.0	0.7
RECEPTACLE (OVER 10KVA)		0.0	0.0	0.0	0.0
HVAC/MOTOR		0.9	0.9	0.5	2.2
MOTOR(LARGEST)		0.0	0.0	0.0	0.0
KITCHEN EQUIPMENT		0.0	0.0	0.0	0.0
MISCELLANEOUS		2.5	2.5	3.0	8.0
TOTAL KVA		4.4	4.5	4.5	13.4
		4.7	4.7	4.7	14.1
TOTAL AMPERES		38.8	38.9	39.4	38.4
LEGEND		L = LIGHTING		R = RECEPTACLE	M = HVAC / MOTOR
		K = KITCHEN		G = MISCELLANEOUS	

1. RECONNECT EXISTING CIRCUITRY TO NEW REPLACEMENT PANELBOARD. EXTEND WIRING AND CONDUIT AS NECESSARY.
2. CONTRACTOR TO VERIFY CIRCUIT REUSE UPON INSTALLATION. TURN OFF ANY UNUSED CIRCUITS AND RELABEL AS SPARE.

PANEL "HP" (EXISTING)		VOLTAGE 277 / 480 V		3 PH 4 W	
FLUSH	MAIN 150/3	MLO X			
SURFACE X	BUS 225A	FEED THRU		A.I.C. 22,000A	
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)	CIR BKR DESCRIPTION TYPE
				A B C	
1ST FLR LIGHTING	20	1	0	0	2 20 DUC-1
1ST FLR LIGHTING	20	3	0	0	4 20 SPARE
1ST FLR LIGHTING	20	5	0	0	6 20 SPARE
1ST FLR LIGHTING	20	7	0	0	8 20 SPARE
RM 118,119 LTGS	20	9	0	0	10 15 SPARE
SPARE	20	11	0	0	12 3 -
PH-2	30	13	0	0	14 3 -
-	15	0	0	0	16 20 SPARE
-	3	17	0	0	18 20 SPARE
SPACE	19	0	0	0	20 3 -
EXISTING LOAD	20	21	0	0	22 30 WASHER
OUTSIDE LIGHTS	20	23	0	0	24 3 -
SPACE	25	0	0	0	26 3 -
SPACE	27	0	0	0	28 30 HUMIDIFIER
SPACE	29	0	0	0	30 -
SPACE	31	0	0	0	32 3 -
SPACE	33	0	0	0	34 SPACE
SPACE	35	0	0	0	36 SPACE
SPACE	37	0	7689	0	38 100 ATS FOR GEN1 G
SPACE	39	0	5444.2	0	40 - G
SPACE	41	0	6276.2	0	42 3 - G
		7689	5444.2	6276.2	
LOAD TYPE		CONNECTED KVA		TOTAL	FACTOR
		A	B	C	ALL
LIGHTING/CONTINUOUS		0.0	0.0	0.0	0.0
RECEPTACLE (10KVA OR LESS)		0.0	0.0	0.0	0.0
RECEPTACLE (OVER 10KVA)		0.0	0.0	0.0	0.0
HVAC/MOTOR		0.0	0.0	0.0	0.0
MOTOR(LARGEST)		0.0	0.0	0.0	0.0
KITCHEN EQUIPMENT		0.0	0.0	0.0	0.0
MISCELLANEOUS		7.7	5.4	6.3	19.4
TOTAL KVA		7.7	5.4	6.3	19.4
		7.7	5.4	6.3	19.4
TOTAL AMPERES		27.8	19.7	22.7	27.8
LEGEND		L = LIGHTING		R = RECEPTACLE	M = HVAC / MOTOR
		K = KITCHEN		G = MISCELLANEOUS	

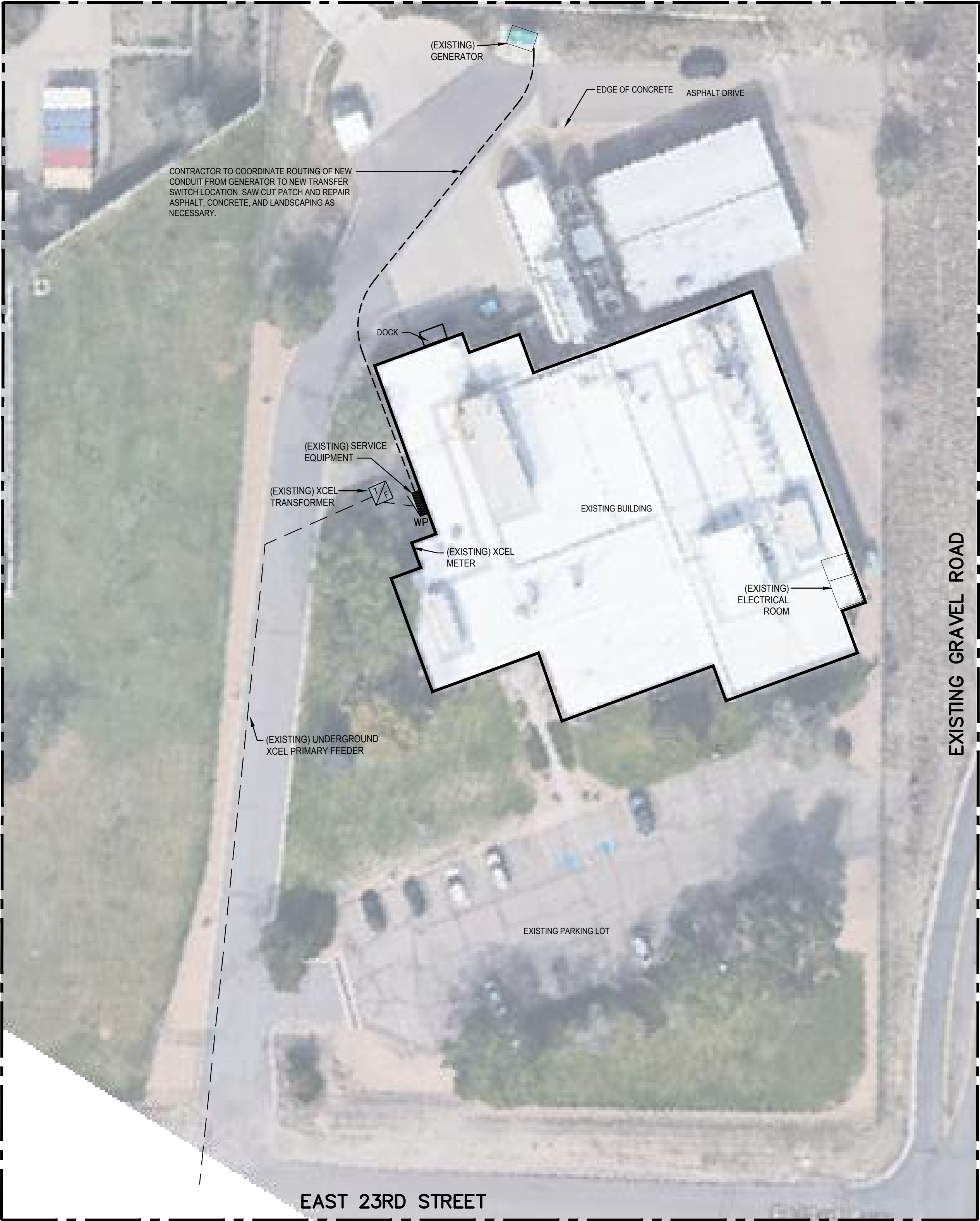
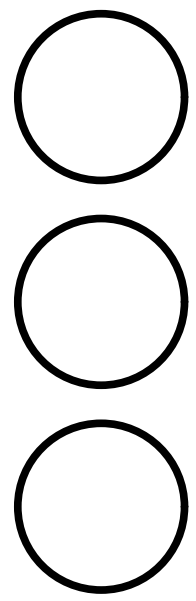
1. PROVIDE NEW CIRCUIT BREAKER ON EXISTING PANELBOARD. MATCH EXISTING TYPE AND AIC RATING.
2. LOAD ADDED TO PANEL THIS CONTRACT. SEE LOAD CALCULATION THIS SHEET FOR TOTAL LOAD ON PANEL.

LOAD CALCULATION

LOAD ON PANEL "HP"	
EXISTING LOAD	36.9 KVA
EXISTING LOAD AT 125%	46.1 KVA
LOAD ADDED	19.4 KVA
TOTAL LOAD	65.5 KVA

PANEL "GEN1A" (NEW)		VOLTAGE 277 / 480 V		3 PH 4 W	
FLUSH	MAIN 70/3	MLO X			
SURFACE X	BUS 100A	FEED THRU		A.I.C. 14,000A	
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)	CIR BKR DESCRIPTION TYPE
				A B C	
G	PANEL "GEN1A"	70	1	7689 0	2 - SPACE
G	-	3	0	5444.2 0	4 - SPACE
G	-	3	5	6276.2 0	6 - SPACE
SPACE	-	7	0	0	8 - SPACE
SPACE	-	9	0	0	10 - SPACE
SPACE	-	11	0	0	12 - SPACE
SPACE	-	13	0	0	14 - SPACE
SPACE	-	15	0	0	16 - SPACE
SPACE	-	17	0	0	18 - SPACE
SPACE	-	19	0	0	20 - SPACE
SPACE	-	21	0	0	22 - SPACE
SPACE	-	23	0	0	24 - SPACE
SPACE	-	25	0	0	26 - SPACE
SPACE	-	27	0	0	28 - SPACE
SPACE	-	29	0	0	30 - SPACE
		7689	5444.2	6276.2	
LOAD TYPE		CONNECTED KVA		TOTAL	FACTOR
		A	B	C	ALL
LIGHTING/CONTINUOUS		0.0	0.0	0.0	0.0
RECEPTACLE (10KVA OR LESS)		0.0	0.0	0.0	0.0
RECEPTACLE (OVER 10KVA)		0.0	0.0	0.0	0.0
HVAC/MOTOR		0.0	0.0	0.0	0.0
MOTOR(LARGEST)		0.0	0.0	0.0	0.0
KITCHEN EQUIPMENT		0.0	0.0	0.0	0.0
MISCELLANEOUS		7.7	5.4	6.3	19.4
TOTAL KVA		7.7	5.4	6.3	19.4
		7.7	5.4	6.3	19.4
TOTAL AMPERES		27.8	19.7	22.7	27.8
LEGEND		L = LIGHTING		R = RECEPTACLE	M = HVAC / MOTOR
		K = KITCHEN		G = MISCELLANEOUS	

PANEL "EMCC" (NEW)		VOLTAGE 277 / 480 V		3 PH 4 W	
FLUSH	MAIN	MLO X			
SURFACE X	BUS 200A	FEED THRU		A.I.C. 22,000A	
TYPE	DESCRIPTION	BKR	CIR	LOAD (VA/PHASE)	CIR BKR DESCRIPTION TYPE
				A B C	
1. G	P-1: HEAT PUMP	30	1	3048 21606	2 125 PH-1 (SUPPLY FANS) G
1. G	-	3	3	3048 21606	4 - G
1. G	-	3	5	3048 21606	6 3 - G
G	P-6: FEED WATER PUMP	20	7	942 10803	8 50 PH-1 (EXHAUST FANS) G
G	-	9	0	942 10803	10 - G
G	-	3	11	942 10803	12 3 - G
G	P-4: CIRC PUMP	20	13	831 4408	14 30 PANEL "ELP1" LMG



GENERAL NOTES

1. SITE PLAN SHOWN FOR INFORMATION ONLY.



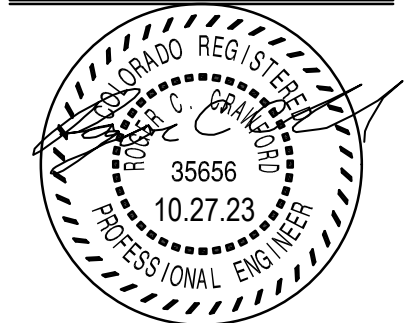
ELECTRICAL SITE PLAN

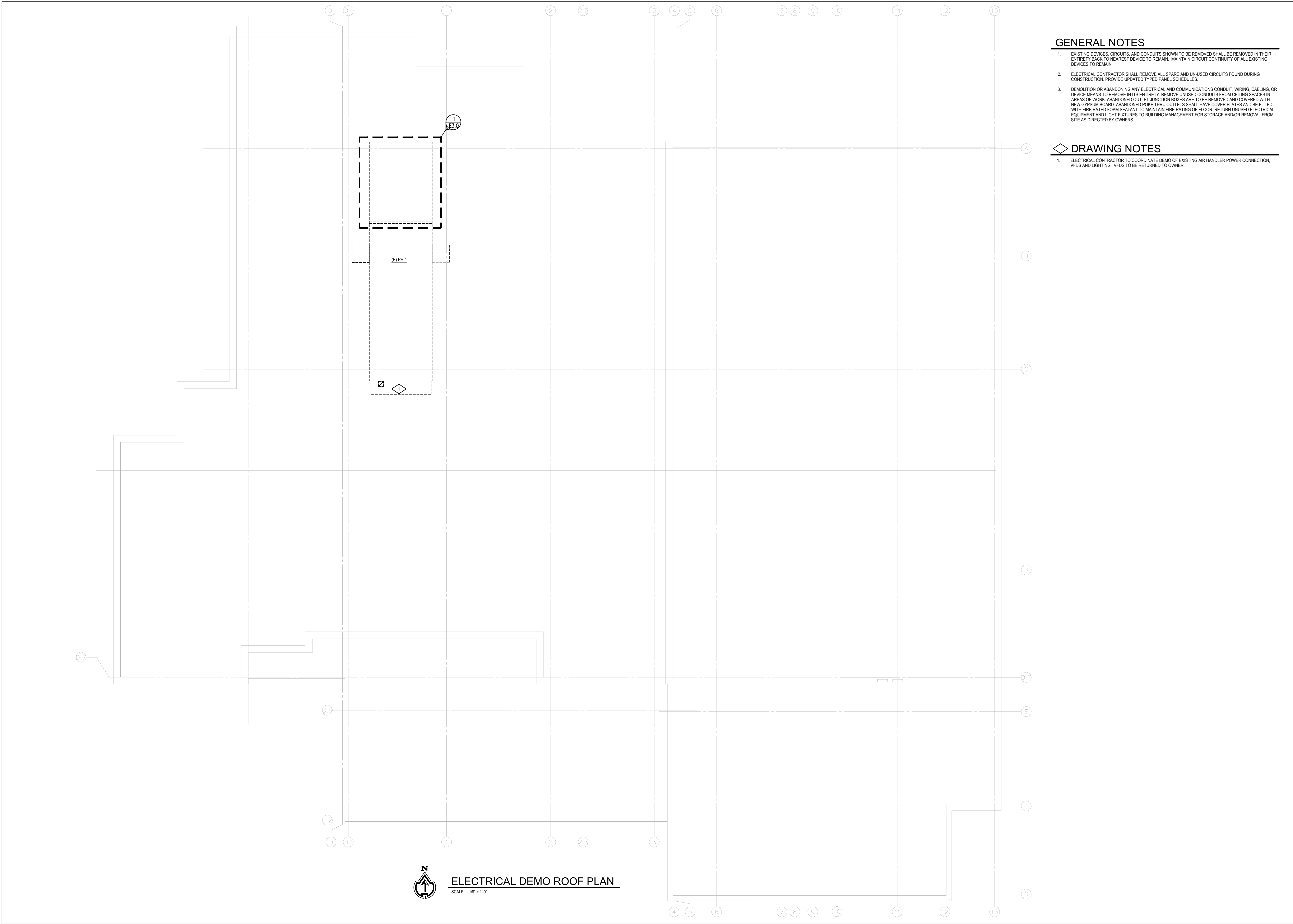
SCALE: 1" = 30'-0"

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DESIGNED: CMM
CHECKED: RCC

ELECTRICAL
SITE PLAN





GENERAL NOTES

- EXISTING DEVICES, CIRCUITS, AND CONDUITS SHOWN TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY BACK TO NEAREST DEVICE TO REMAIN. MAINTAIN CIRCUIT CONTINUITY OF ALL EXISTING DEVICES TO REMAIN.
- ELECTRICAL CONTRACTOR SHALL REMOVE ALL SPARE AND UN-USED CIRCUITS FOUND DURING CONSTRUCTION. PROVIDE UPDATED TYPED PANEL SCHEDULES.
- DEMOLITION OR ABANDONING ANY ELECTRICAL AND COMMUNICATIONS CONDUIT, WIRING, CABLING, OR DEVICE MEANS TO REMOVE IN ITS ENTIRETY. REMOVE UNUSED CONDUITS FROM CEILING SPACES IN AREAS OF WORK. ABANDONED OUTLET JUNCTION BOXES ARE TO BE REMOVED AND COVERED WITH NEW GYPSUM BOARD. ABANDONED POKE THRU OUTLETS SHALL HAVE COVER PLATES AND BE FILLED WITH FIRE RATED FOAM SEALANT TO MAINTAIN FIRE RATING OF FLOOR. RETURN UNUSED ELECTRICAL EQUIPMENT AND LIGHT FIXTURES TO BUILDING MANAGEMENT FOR STORAGE AND/OR REMOVAL FROM SITE AS DIRECTED BY OWNERS.

DRAWING NOTES

- ELECTRICAL CONTRACTOR TO COORDINATE DEMO OF EXISTING AIR HANDLER POWER CONNECTION, VFDS AND LIGHTING. VFDS TO BE RETURNED TO OWNER.



ELECTRICAL DEMO ROOF PLAN

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



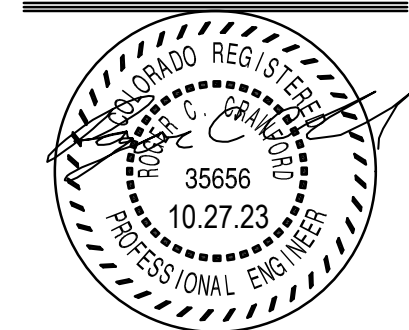
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University of Colorado - Anschutz Medical Campus
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PRF - Power HVAC Boiler Upgrades

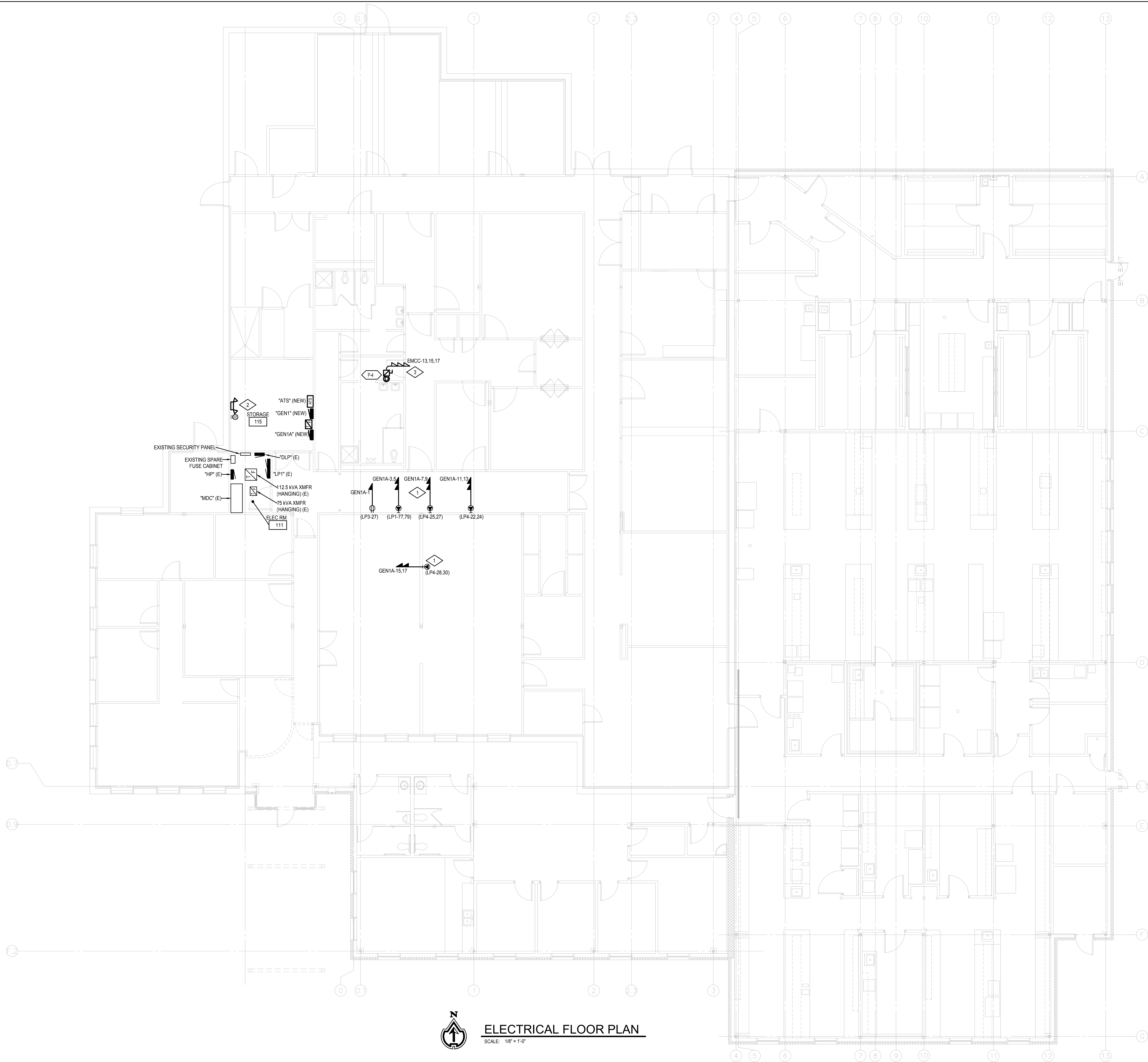
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DESIGNED:	CMM
CHECKED:	RCC

ELECTRICAL
DEMO ROOF PLAN



ED-2.0



GENERAL NOTES

- ELECTRICAL CONTRACTOR SHALL REMOVE ALL SPARE AND UN-USED CIRCUITS FOUND DURING CONSTRUCTION. PROVIDE UPDATED TYPED PANEL SCHEDULES.
- ELECTRICAL CONTRACTOR TO LABEL ALL SWITCHES AND RECEPTACLES. NEW AND EXISTING WITH CIRCUIT NUMBERS AND PANEL NAME. CIRCUIT NUMBERS AND PANEL NAMES SHALL BE CLEAR AND LEGIBLE ON COVER PLATES. ELECTRICAL CONTRACTOR SHALL COORDINATE COLOR OF COVER PLATES WITH BUILDING MANAGEMENT.
- CONTRACTOR TO VERIFY THAT MAINTENANCE RECEPTACLE IS LOCATED WITHIN 25'-0" OF EQUIPMENT.
- PROVIDE EMERGENCY LIGHT SPECIFICATION: LITHONIA ELM8L-UVOLT-LTP. CONNECT BATTERY TO UNCONTROLLED LEG OF LOCAL LIGHTING CIRCUIT.

DRAWING NOTES

- CONTRACTOR TO LOCATE AND VERIFY EXISTING FREEZER CIRCUITS AND CONNECTIONS. INTERCEPT EXISTING NORMAL POWER CIRCUIT AND EXTEND TO NEW STANDBY POWER CIRCUIT AS INDICATED.
- PROVIDE EMERGENCY LIGHT SPECIFICATION: LITHONIA ELM8L-UVOLT-LTP. CONNECT BATTERY TO UNCONTROLLED LEG OF LOCAL LIGHTING CIRCUIT.
- NEW PUMP P-4 TO REPLACE EXISTING PUMP AT SAME LOCATION. CONNECT TO CIRCUIT AS SHOWN. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.



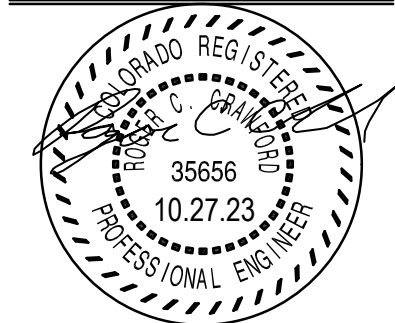
ELECTRICAL FLOOR PLAN

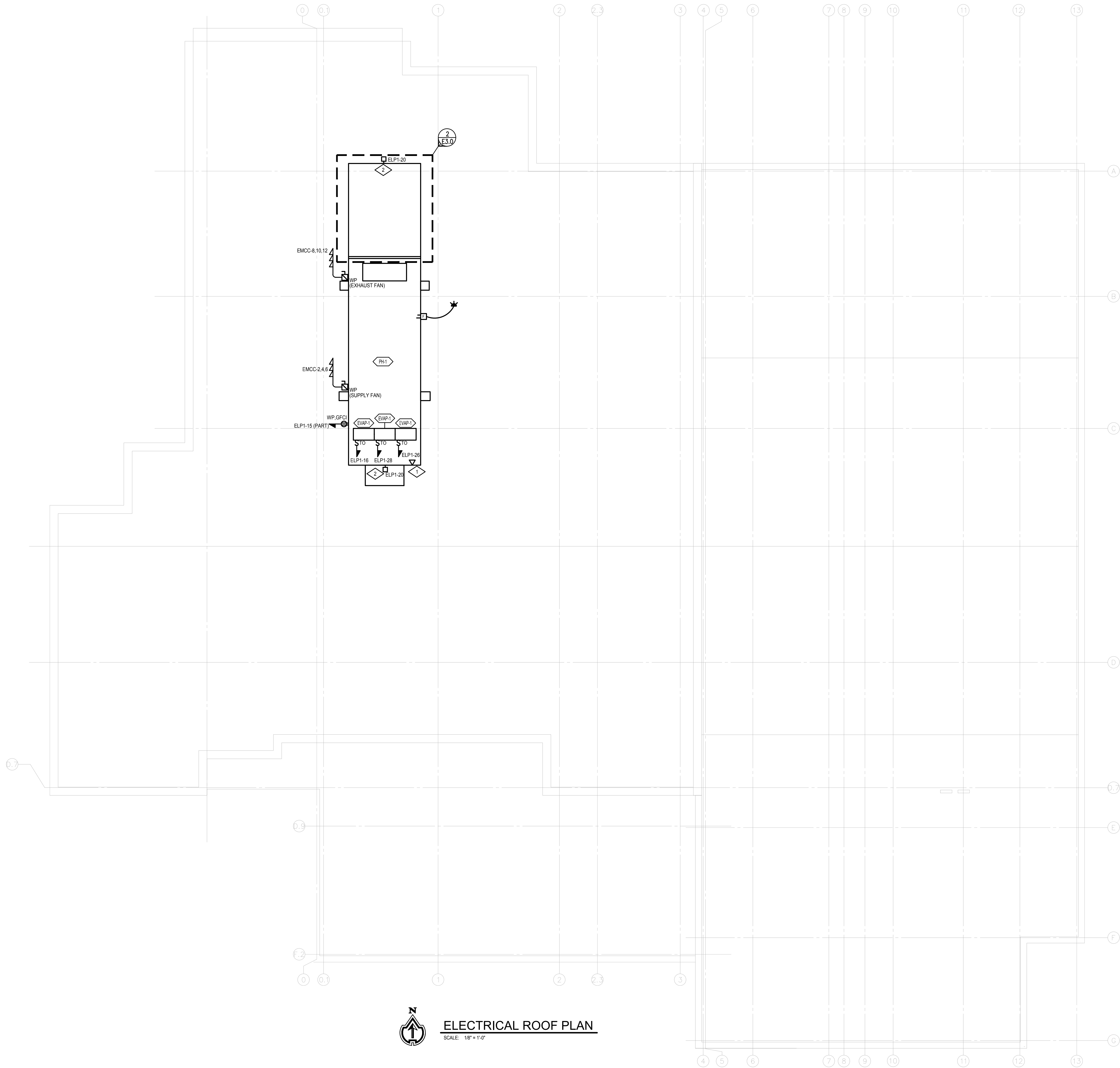
SCALE: 1/8" = 1'-0"

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DESIGNED:	CMM
CHECKED:	RCC

POWER FLOOR
PLAN





GENERAL NOTES

- ELECTRICAL CONTRACTOR SHALL REMOVE ALL SPARE AND UN-USED CIRCUITS FOUND DURING CONSTRUCTION. PROVIDE UPDATED TYPED PANEL SCHEDULES.
- ELECTRICAL CONTRACTOR TO LABEL ALL SWITCHES AND RECEPTACLES, NEW AND EXISTING WITH CIRCUIT NUMBERS AND PANEL NAME. CIRCUIT NUMBERS AND PANEL NAMES SHALL BE CLEAR AND LEGIBLE ON COVER PLATES. ELECTRICAL CONTRACTOR SHALL COORDINATE COLOR OF COVER PLATES WITH BUILDING MANAGEMENT.
- PROVIDE "IN-USE" COVER FOR ALL EXTERIOR RECEPTACLES.

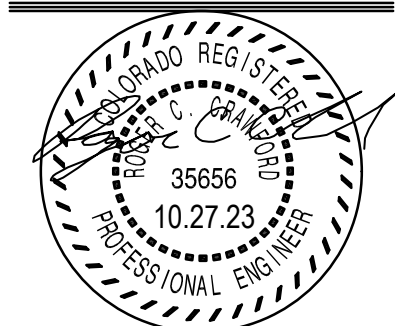
DRAWING NOTES

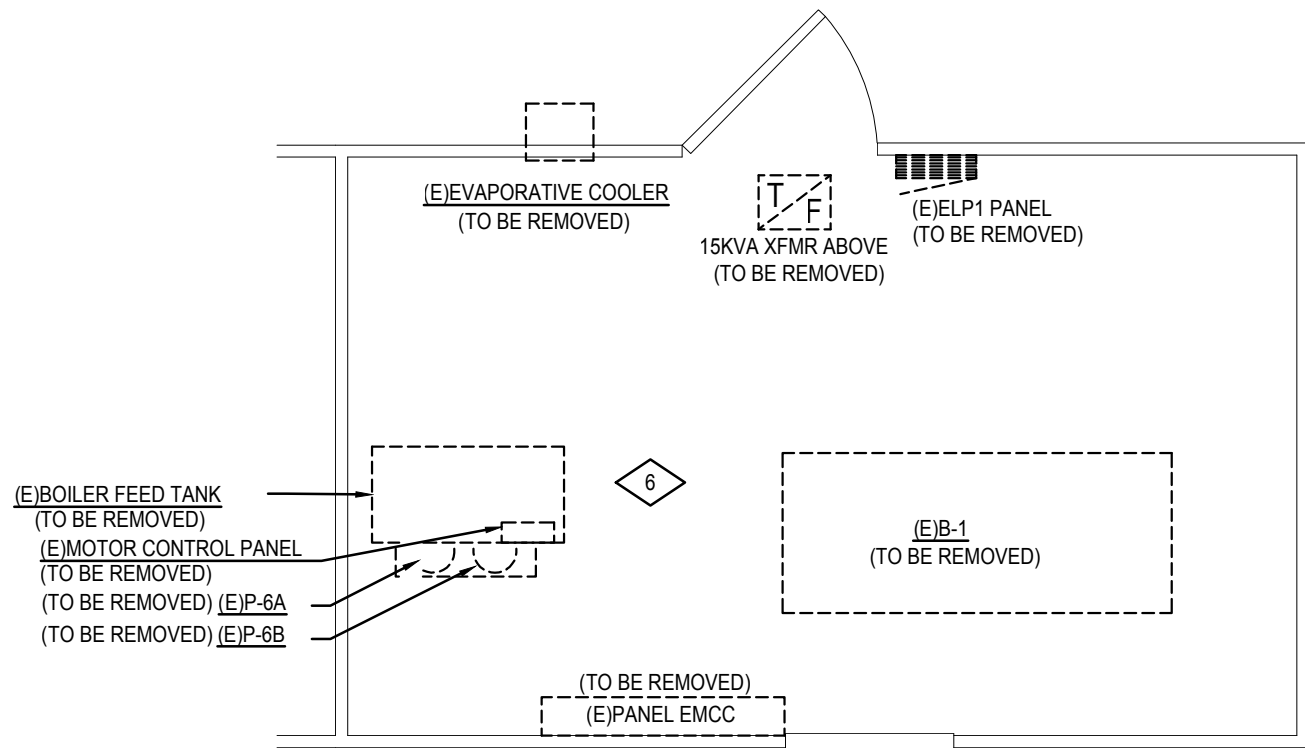
- PROVIDE DATA CONNECTION FOR TEMPERATURE CONTROLS. ROUTE DATA CABLING FROM FIRST FLOOR MECHANICAL ROOM. COORDINATE WITH CONTROLS CONTRACTOR.
- PROVIDE NEW EXTERIOR LIGHTING FIXTURE WITH INTEGRAL PHOTOCELL ON/OFF. EQUAL TO WPX0-LED-AL0-SHW2400K-4WVOLT-TYPE-003X0. PROVIDE MANUAL OVERRIDE TOGGLE SWITCH AT BOILER ROOM PORTION OF AIR HANDLER FOR MANUAL OFF FUNCTIONALITY.

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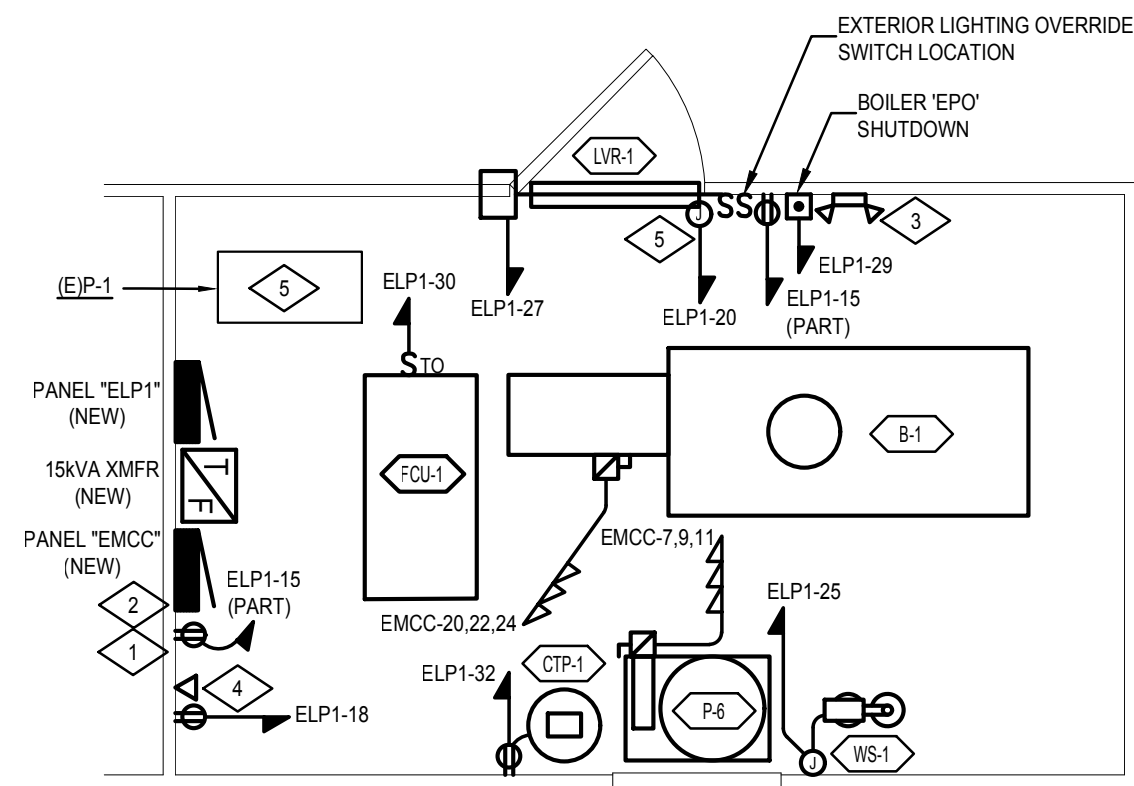
MEP JOB:	22318
DESIGNED:	CMM
CHECKED:	RCC

ELECTRICAL
ROOF PLAN

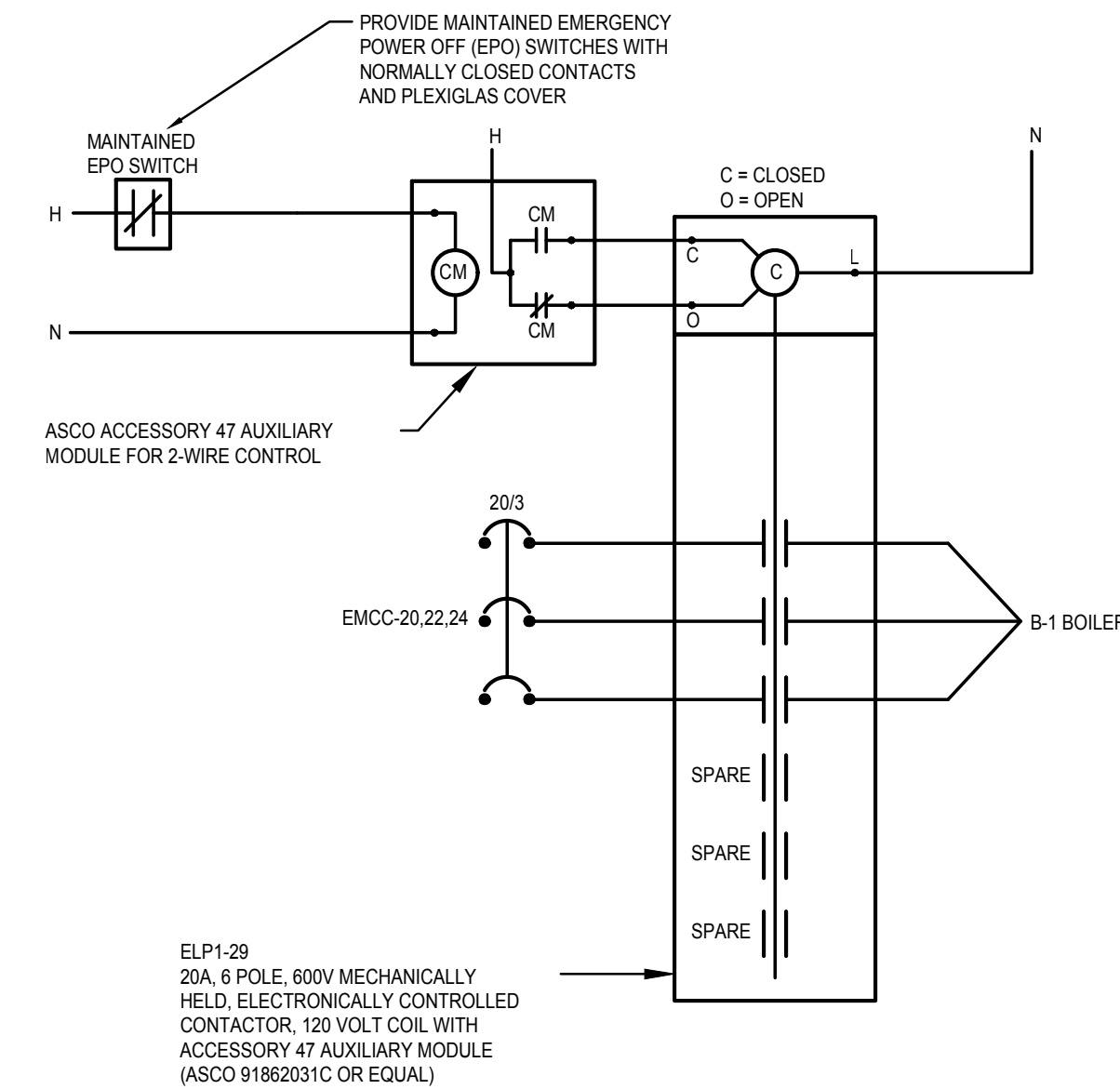




1 PENTHOUSE BOILER DEMOLITION PLAN
SCALE: 1/4" = 1'-0"



2 PENTHOUSE BOILER NEW PLAN
SCALE: 1/4" = 1'-0"



BOILER SHUT DOWN DIAGRAM
SCALE: N.T.S.

GENERAL NOTES

- EXISTING DEVICES, CIRCUITS, AND CONDUITS SHOWN TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY BACK TO NEAREST DEVICE TO REMAIN. MAINTAIN CIRCUIT CONTINUITY OF ALL EXISTING DEVICES TO REMAIN.
- ELECTRICAL CONTRACTOR SHALL REMOVE ALL SPARE AND UN-USED CIRCUITS FOUND DURING CONSTRUCTION. PROVIDE UPDATED TYPED PANEL SCHEDULES.
- DEMOLITION OR ABANDONING ANY ELECTRICAL AND COMMUNICATIONS CONDUIT, WIRING, CABLEING, OR DEVICE MEANS TO REMOVE IN ITS ENTIRETY. REMOVE UNUSED CONDUITS FROM CEILING SPACES IN AREAS OF WORK. ABANDONED OUTLET JUNCTION BOXES ARE TO BE REMOVED AND COVERED WITH NEW GYPSUM BOARD. ABANDONED POKE THRU OUTLETS SHALL HAVE COVER PLATES AND BE FILLED WITH FIRE RATED FOAM SEALANT TO MAINTAIN FIRE RATING OF FLOOR. RETURN UNUSED ELECTRICAL EQUIPMENT AND LIGHT FIXTURES TO BUILDING MANAGEMENT FOR STORAGE AND/OR REMOVAL FROM SITE AS DIRECTED BY OWNERS.
- ELECTRICAL CONTRACTOR TO LABEL ALL SWITCHES AND RECEPTACLES, NEW AND EXISTING WITH CIRCUIT NUMBERS AND PANEL NAME. CIRCUIT NUMBERS AND PANEL NAMES SHALL BE CLEAR AND LEGIBLE ON COVER PLATES. ELECTRICAL CONTRACTOR SHALL COORDINATE COLOR OF COVER PLATES WITH BUILDING MANAGEMENT.
- CONNECT ALL EXIT SIGN BATTERIES TO THE UNCONTROLLED LEG OF LOCAL LIGHTING CIRCUIT SERVING THIS AREA. CONNECT ALL LUMINAIRE'S BATTERY PACKS TO THE UNCONTROLLED LEG OF LOCAL LIGHTING CIRCUIT AND DRIVER TO THE SWITCHED LEG AS INDICATED. PROVIDE NINETY MINUTE BATTERY PACK.

DRAWING NOTES

- RECONNECT ALL EXISTING BRANCH CIRCUITRY TO NEW PANELBOARD "EMCC". EXTEND BRANCH CIRCUITRY AND PROVIDE NEW CONDUIT, CONDUCTORS AND JUNCTION BOXES FOR RECONNECTION AS NECESSARY.
- NEW LIGHTING IN SPACE IS TO BE FACTORY INSTALLED AND PREWIRED BY CUSTOM AIR HANDLING MANUFACTURER FOR PH-1. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION. NEW LIGHTING TO BE FED FROM PANEL "EMCC". SEE SHEET E.03 FOR MORE INFORMATION.
- PROVIDE EMERGENCY LIGHT SPECIFICATION: LITHONIA ELM&L-UVOLT-LTP. CONNECT BATTERY TO UNCONTROLLED LEG OF LOCAL LIGHTING CIRCUIT.
- DATA JACK CONNECTION FOR TC PANEL. CABLEING TO ROUTE FROM FIRST FLOOR MECHANICAL ROOM, COORDINATE WITH CONTROLS CONTRACTOR.
- COORDINATE CONNECTION OF NEW AIR HANDLER MANUFACTURER PROVIDED LIGHTS. PROVIDE TOGGLE SWITCH FOR CONTROLS IF REQUIRED.
- CONTRACTOR TO PREPARE ALL ELECTRICAL DEVICES/EQUIPMENT/CIRCUITS/FEEDERS FOR COMPLETE DEMOLITION OF EXISTING AIR HANDLER. PREPARE PANEL FEEDER FOR RE-FEED AS NECESSARY TO ALLOW FOR DEMO.