

**Energy Research and Development Division
FINAL PROJECT REPORT**

**PLUMAS ENERGY EFFICIENCY AND
RENEWABLES MANAGEMENT
ACTION PLAN (PEER MAP)**

**Appendix E: Site Specific Engineering
and Architectural Plan for Eastern
Plumas Health Care**

Prepared for: California Energy Commission
Prepared by: Sierra Institute for Community and Environment



NOVEMBER 2016
CEC-500-2016-067-APE

FIRE RESISTIVE SCHEDULE

APPLICABLE CODES

PROJECT GENERAL NOTES

PROJECT DESIGN TEAM

CUSTOMER

**EASTERN PLUMAS
HEALTH CARE**

500 1ST 1ST AVE
PORTOLA, CA 96122

PROJECT

**BIOMASS BOILER
INSTALLATION**

DESIGN FIRM



TEL. 503.608.7366
FAX 503.715.0483
INFO@WISEWOOD.US
WWW.WISEWOOD.US
2409 N KERBY AVENUE
PORTLAND, OR 97227

California Mechanical Code (Part 4, Title 24, California Code of Regulations, Chapter 3, 304.2)
Room Large in Comparison to size of Equipment: central-heating boilers not listed for closet or alcove installation shall be installed in a room or space having a volume sixteen (16) times the volume of the boiler.
Exceptions:
(2) [For OSHPD 1, 2, 3 & 4] A 25 percent reduction in the boiler room volume is allowed with forced-draft boilers and approved ventilation of the boiler room.

Boiler room length = 40 ft	Boiler length = 11.7 ft
Boiler room width = 30 ft	Boiler width = 5.7 ft
Applicable room height = 8 ft	Boiler height = 11.4 ft
Boiler room volume = 9600 ft ^3	Boiler volume = 760 ft ^3

Boiler room volume / Boiler volume ratio	
9600 / 760 =	12.6

OSHPD INTENT

ALT METHODS OF COMPLIANCE, PROTECTION, AND PROGRAM FLEX

DRAWING TITLE

**VICINITY MAP,
PROJECT DATA,
GENERAL NOTES**

REV	DESCRIPTION	DATE
A	INITIAL REVIEW	10/13/2014

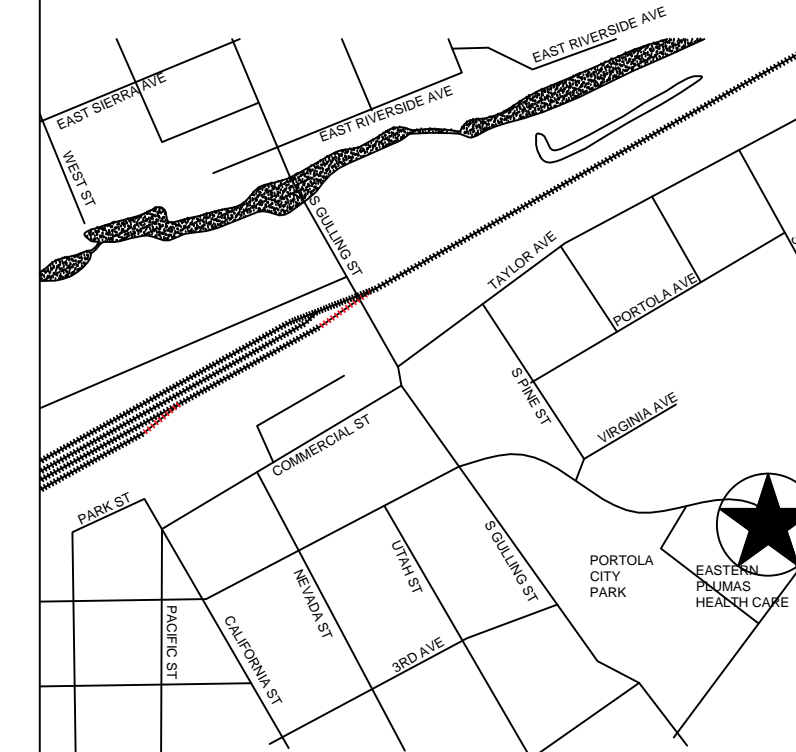
PLUMBING FIXTURE SCHEDULE

BOILER EQUIPMENT SCHEDULE

VICINITY MAP

PROJECT INFORMATION

PROJECT LOCATION



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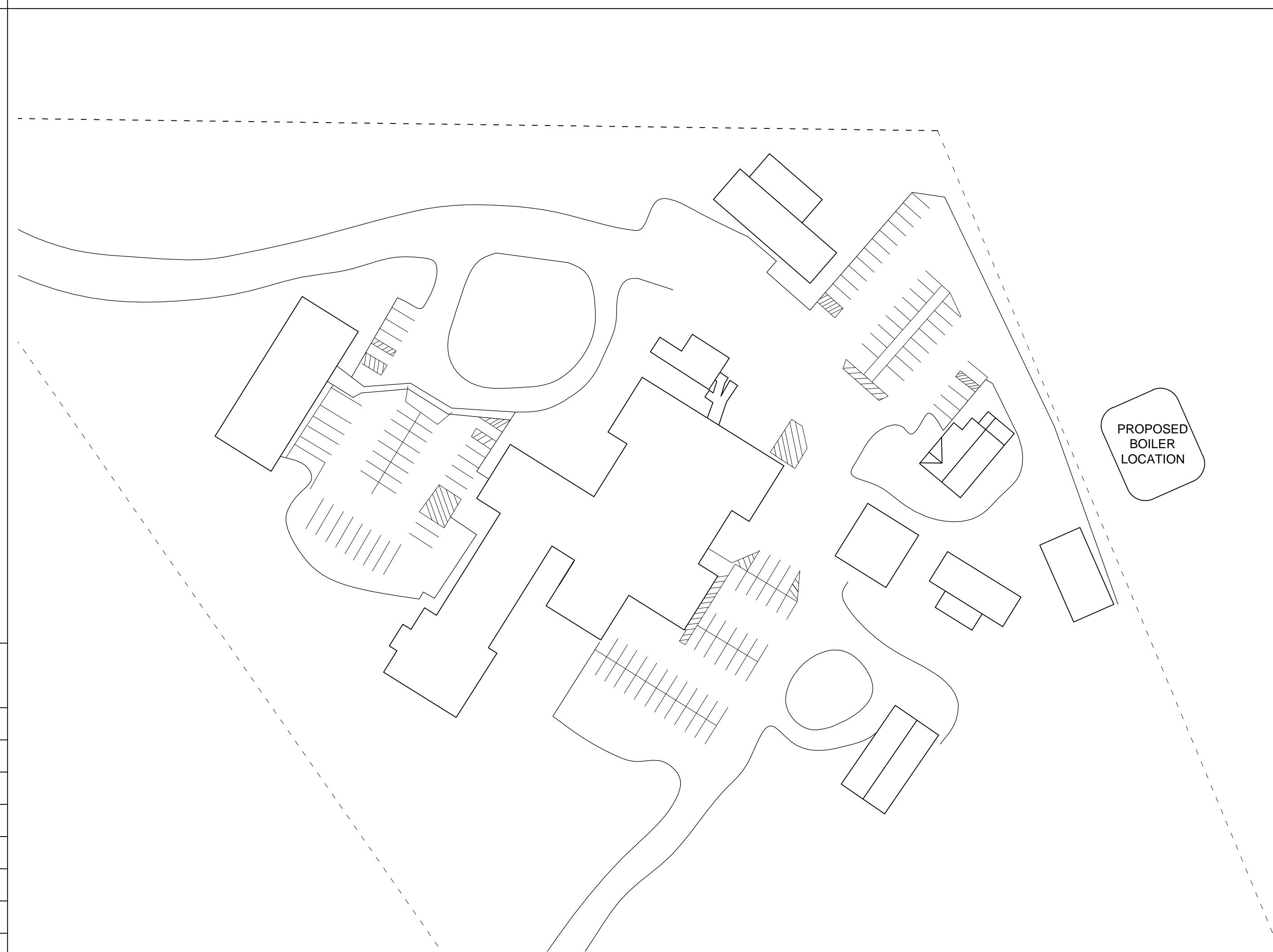
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SHEET 1 OF 9

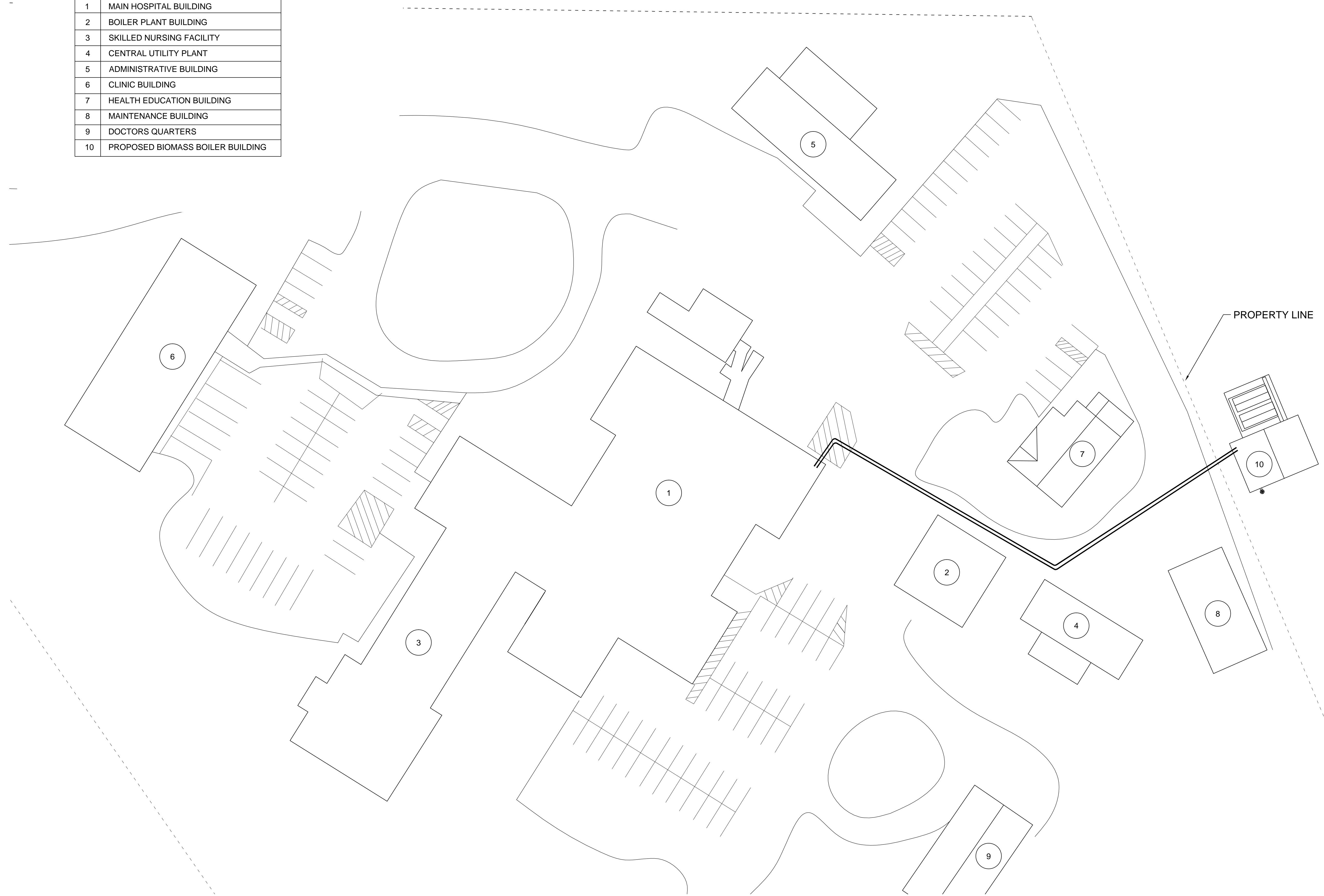


1 PROJECT SITE PLAN
M0.0 SCALE: 1/64" = 1'

DRAWING INDEX

M0.0	VICINITY MAP, PROJECT DATA, GENERAL NOTES
M0.1	PROJECT SITE PLAN
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M1.0	MECHANICAL EQUIPMENT SCHEDULE
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M2.1	MECHANICAL ELEVATION ELEVATIONS
M3.0	MECHANICAL PIPING SCHEMATIC, BIOMASS BOILER BUILDING
M3.1	MECHANICAL PIPING SCHEMATIC, HOSPITAL MECHANICAL ROOM

EXISTING BUILDINGS	
1	MAIN HOSPITAL BUILDING
2	BOILER PLANT BUILDING
3	SKILLED NURSING FACILITY
4	CENTRAL UTILITY PLANT
5	ADMINISTRATIVE BUILDING
6	CLINIC BUILDING
7	HEALTH EDUCATION BUILDING
8	MAINTENANCE BUILDING
9	DOCTORS QUARTERS
10	PROPOSED BIOMASS BOILER BUILDING



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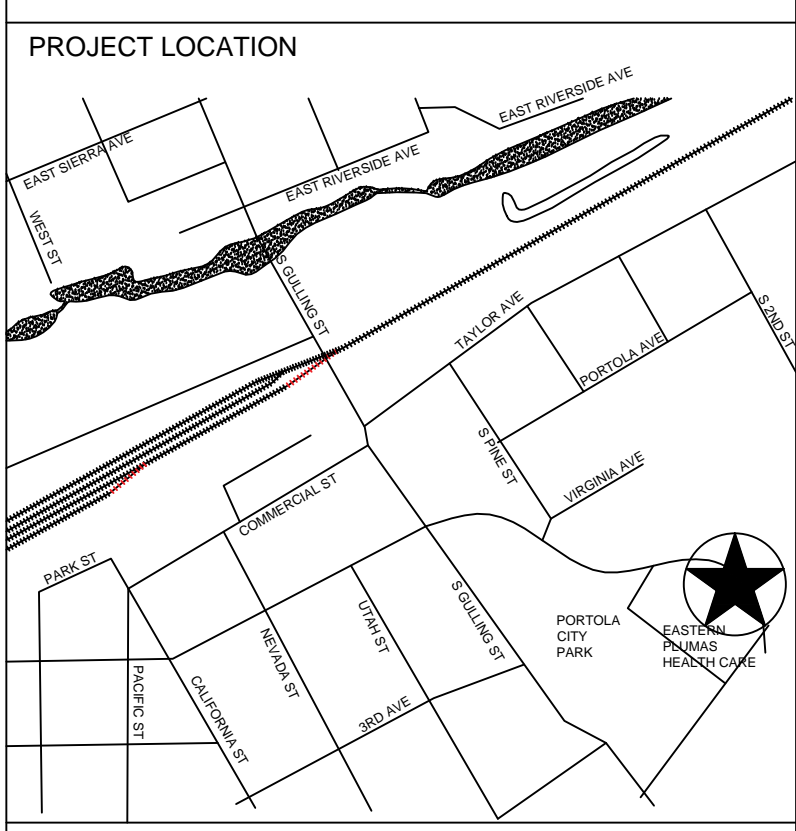
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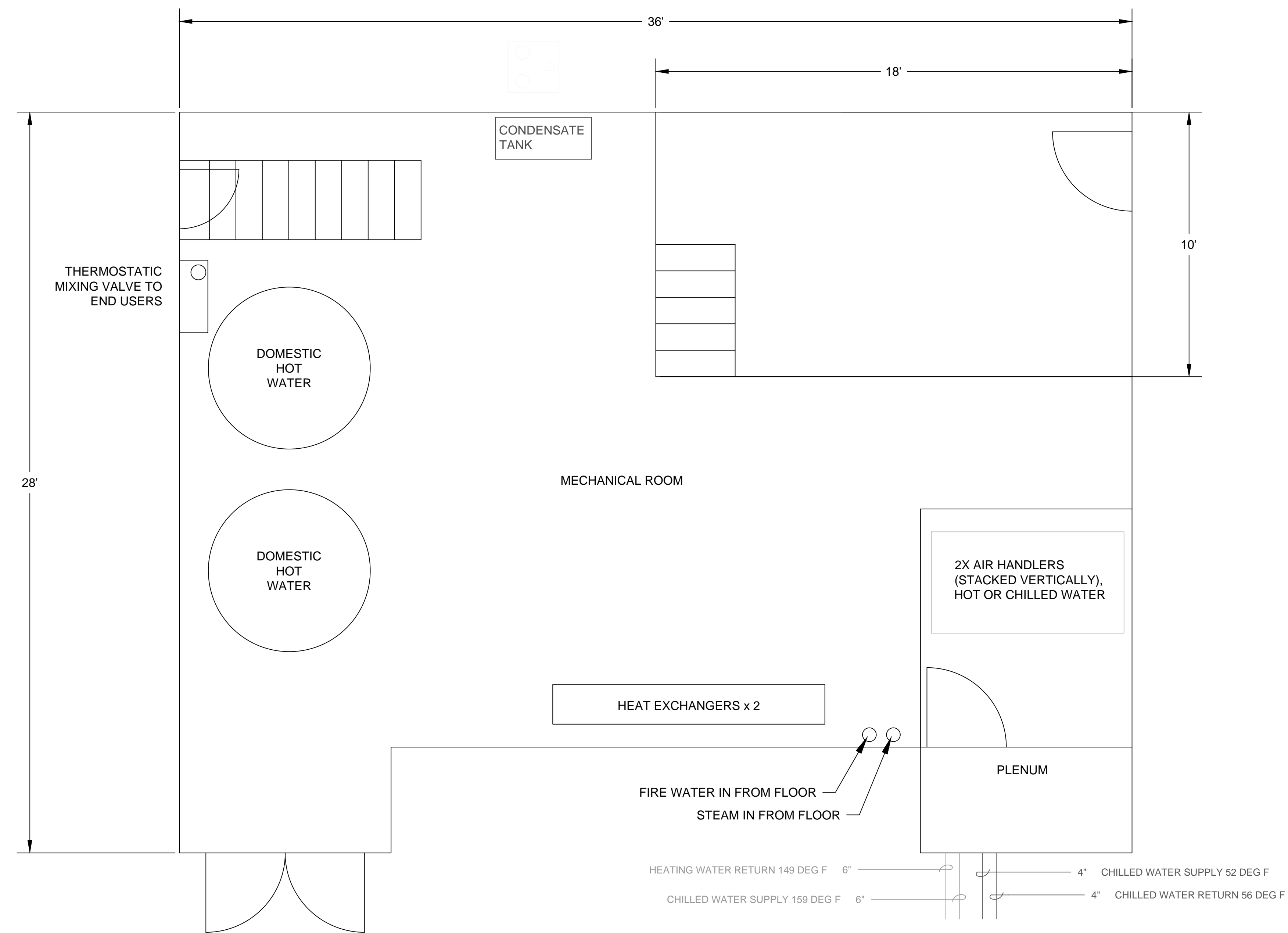
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M0.1
 SHEET 2 OF 9

1 PROJECT SITE PLAN
 M0.1 SCALE: 1/16" = 1'



1 MECHANICAL ROOM PLAN
M0.1 SCALE: 3/8" = 1'

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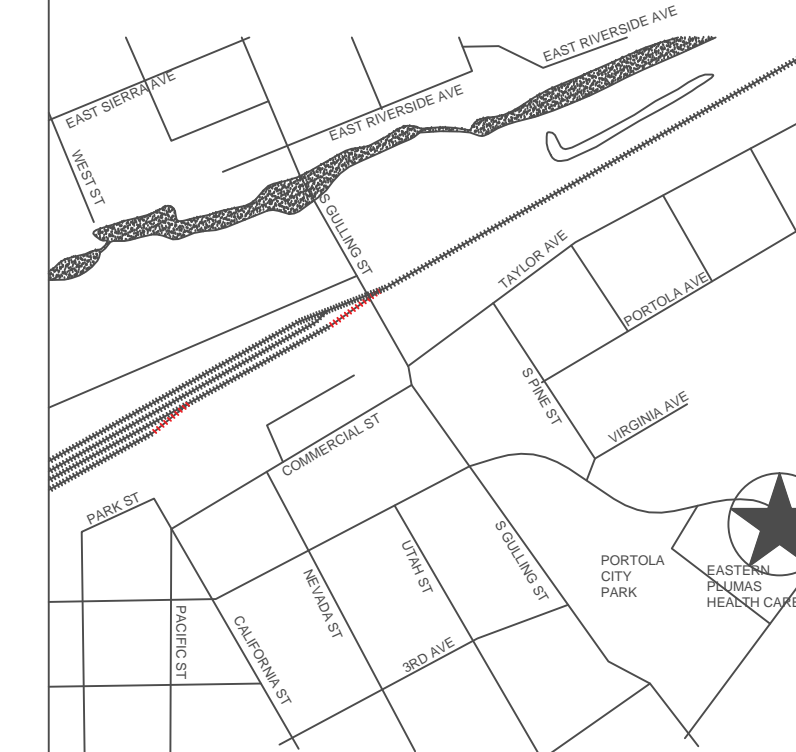
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**MECHANICAL
 ROOM PLAN**

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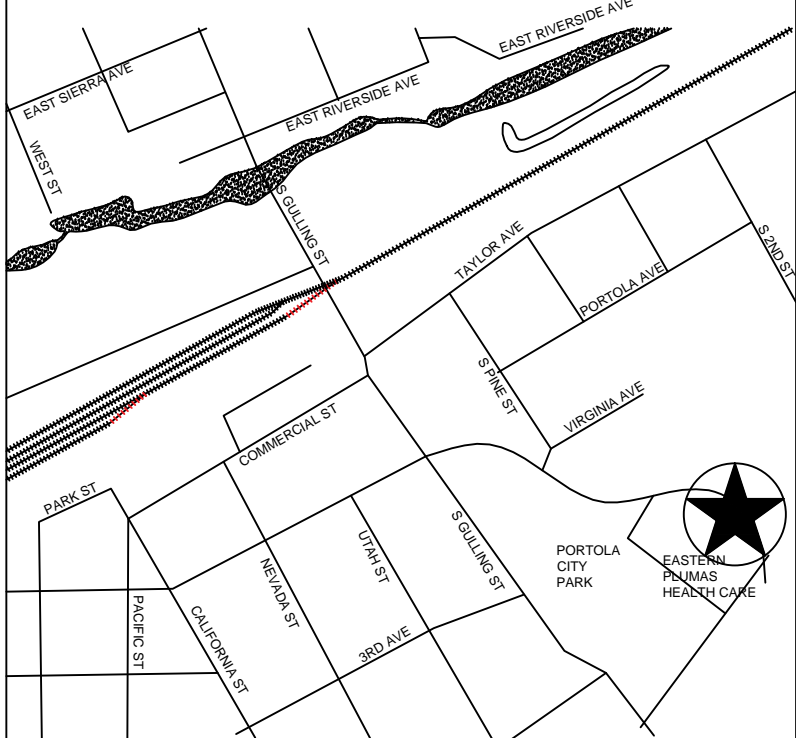
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**EXISTING
EQUIPMENT
SCHEMATIC**

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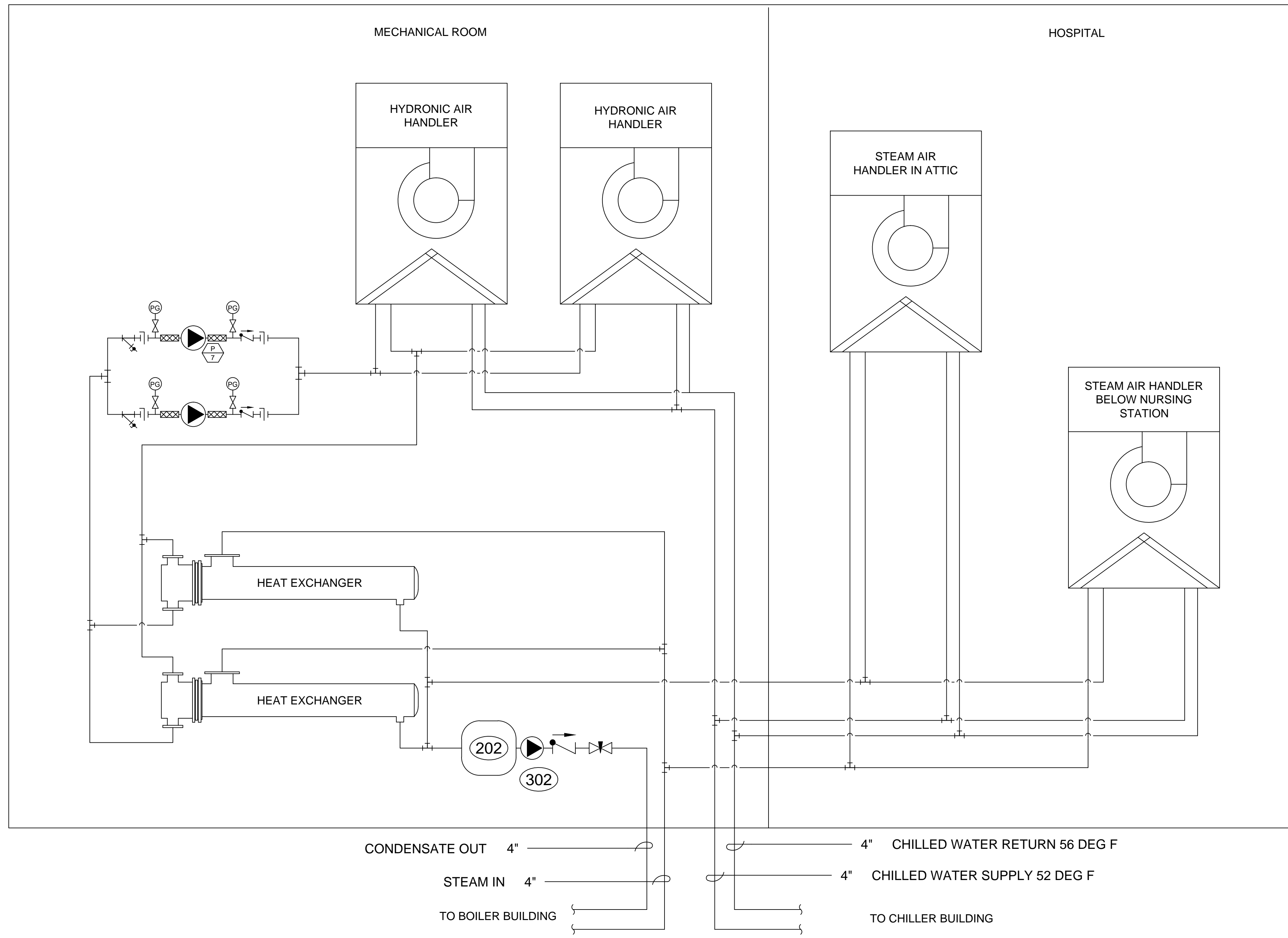


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LEGEND

- BACKFLOW PREVENTER
- FLEX COUPLING
- FLOOR DRAIN
- FLOW METER
- GAUGE, PRESSURE
- GAUGE, TEMPERATURE
- PIPE CAP
- PUMP, CENTRIFUGAL
- REDUCER, CONCENTRIC
- REDUCER, ECCENTRIC
- STRAINER WITH VALVE
- UNION, THREADED
- VALVE, BALL NORMALLY OPEN
- VALVE, BALL NORMALLY CLOSED
- VALVE, BUTTERFLY
- VALVE, GATE
- VALVE, MOTORIZED
- VALVE, PLUG
- VALVE, PRESSURE REGULATING
- VALVE, PRESSURE RELIEF
- VALVE, THERMOSTATIC MIXING
- VALVE, SWING CHECK
- VENT, AIR

- EQUIPMENT TAG
- SHEET NOTE
- DOMESTIC WATER
- HEATING WATER SUPPLY
- HEATING WATER RETURN
- PROCESS WATER
- WASTE
- CONTROL WIRING

1 EXISTING EQUIPMENT SCHEMATIC
M0.2 SCALE: NONE

B-1	BOILER		AH-1,2	AIR HANDLERS		AS-1	AIR SEPARATOR		CF-1	CHEMICAL FEED	
UNIT DATA	QUANTITY	2	UNIT DATA	QUANTITY	2	UNIT DATA	QUANTITY	1	UNIT DATA	QUANTITY	1
	SERVICE	HYDRONIC		SERVICE	HYDRONIC, CHILLED		SERVICE	HEATING WATER		SERVICE	HEATING WATER
	TYPE	BIOMASS		TYPE	FORCED AIR		CONFIGURATION	VERTICAL		CONFIGURATION	
	MANUFACTURER			MANUFACTURER			MATERIAL	STEEL		MATERIAL	
	MODEL			MODEL			MANUFACTURER			MANUFACTURER	
CONNECTION		CONNECTION		CONNECTION		CONNECTION		CONNECTION		CONNECTION	
WEIGHT		[LB]	1)	WEIGHT		[LB]		WEIGHT		[LB]	
RATING		[PSIG]		RATING		[PSIG]		RATING		[GPM]	
CAPACITY		[BTU/HR]		CAPACITY		[BTU/HR]		CAPACITY		[GAL]	
PROPYLENE GLYCOL	10	[%]		PROPYLENE GLYCOL	10	[%]		PROPYLENE GLYCOL	10	[%]	
HEATING WATER COIL	INLET TEMPERATURE	[°F]	HEATING WATER COIL	INLET TEMPERATURE	[°F]			PROPYLENE GLYCOL	10	[%]	
	EXIT TEMPERATURE	[°F]		EXIT TEMPERATURE	[°F]			MAX TEMPERATURE	200	[°F]	
	FLOW	[GPM]		FLOW	[GPM]						
	PRESSURE DROP	[PSI]		PRESSURE DROP	[PSI]						
CHILLED WATER COIL	CAPACITY	[BTU/HR]	CHILLED WATER COIL	CAPACITY	[BTU/HR]	TK-1	BUFFER TANK		ET-1	EXPANSION TANK	
	PROPYLENE GLYCOL	10	[%]	PROPYLENE GLYCOL	10	[%]	QUANTITY	1	QUANTITY	1	
	INLET TEMPERATURE	[°F]		INLET TEMPERATURE	[°F]		SERVICE	HEATING WATER	SERVICE	HEATING WATER	
	EXIT TEMPERATURE	[°F]		EXIT TEMPERATURE	[°F]		CONFIGURATION	VERTICAL	CONFIGURATION	VERTICAL	
	FLOW	[GPM]		FLOW	[GPM]		MATERIAL	STEEL	MATERIAL	STEEL	
	PRESSURE DROP	[PSI]		PRESSURE DROP	[PSI]		MANUFACTURER		MANUFACTURER		
AIR SIDE	INLET TEMPERATURE	[°F]	AIR SIDE	INLET TEMPERATURE	[°F]	UNIT DATA	MODEL		UNIT DATA	MODEL	
	EXIT TEMPERATURE	[°F]		EXIT TEMPERATURE	[°F]		CONNECTION		CONNECTION		
	FLOW	[CFM]		FLOW	[CFM]		WEIGHT		WEIGHT		
	PRESSURE DROP	[IN WC]		PRESSURE DROP	[IN WC]		RATING	150	[PSIG]	RATING	150
MOTOR	POWER	[HP]	MOTOR	POWER	[HP]		CAPACITY	20	[GAL]	CAPACITY	20
	SPEED	[RPM]		SPEED	[RPM]		PROPYLENE GLYCOL	10	[%]	PROPYLENE GLYCOL	10
	VOLTAGE/PHASE	[V/-]		VOLTAGE/PHASE	[V/-]		MAX TEMPERATURE	200	[°F]	MAX TEMPERATURE	200
	MCA	[A]		MCA	[A]						
	MOCU	[A]		MOCU	[A]						
P-1,2	PUMPS		P-3,4	PUMPS		P-5,6	PUMPS		HX-1,2	HEAT EXCHANGERS	
UNIT DATA	QUANTITY	2	UNIT DATA	QUANTITY	2	UNIT DATA	QUANTITY	2	UNIT DATA	QUANTITY	2
	SERVICE	BOILER FEED		SERVICE	PRIMARY LOOP		SERVICE	NEW AIR HANDLERS		SERVICE	SATURATED STEAM
	TYPE	CENTRIFUGAL		TYPE	CENTRIFUGAL		TYPE	CENTRIFUGAL		TYPE	HORIZONTAL
	CONFIGURATION	DUPLEX		CONFIGURATION	DUPLEX		CONFIGURATION	DUPLEX		CONFIGURATION	
	MANUFACTURER			MANUFACTURER			MANUFACTURER			MANUFACTURER	
MODEL		MODEL		MODEL		MODEL		MODEL			
CONNECTION		CONNECTION		CONNECTION		CONNECTION		CONNECTION			
FLOW		[GPM]	FLOW		[GPM]	FLOW		[GPM]	CAPACITY	[BTU/HR]	
TOTAL DYNAMIC HEAD		[FT]	TOTAL DYNAMIC HEAD		[FT]	TOTAL DYNAMIC HEAD		[FT]	WEIGHT	[LB]	
INLET TEMPERATURE		[°F]	INLET TEMPERATURE		[°F]	INLET TEMPERATURE		[°F]	RATING	[PSIG]	
PROPYLENE GLYCOL		[%]	PROPYLENE GLYCOL		[%]	PROPYLENE GLYCOL		[%]	FLOW	[LB/HR]	
WEIGHT		[LB]	WEIGHT		[LB]	WEIGHT		[LB]	INLET PRESSURE	[PSIG]	
RATING		[PSIG]	RATING		[PSIG]	RATING		[PSIG]	INLET TEMPERATURE	[°F]	
POWER		[HP]	POWER		[HP]	POWER		[HP]	PRESSURE DROP	[PSI]	
SPEED		[RPM]	SPEED		[RPM]	SPEED		[RPM]	FLOW	[GPM]	
MOTOR	VOLTAGE/PHASE	[V/-]	MOTOR	VOLTAGE/PHASE	[V/-]	MOTOR	VOLTAGE/PHASE	[V/-]	WATER SIDE	PROPYLENE GLYCOL	10.0
	MCA	[A]		MCA	[A]		MCA	[A]		PRESSURE DROP	[PSI]
	MOCU	[A]		MOCU	[A]		MOCU	[A]		INLET TEMPERATURE	[°F]
										EXIT TEMPERATURE	[°F]

- NOTES:
- 1) WEIGHT INCLUDES...
 - 2) PUMP MOTORS EQUIPPED WITH VFDS.
 - 3)
 - 4)

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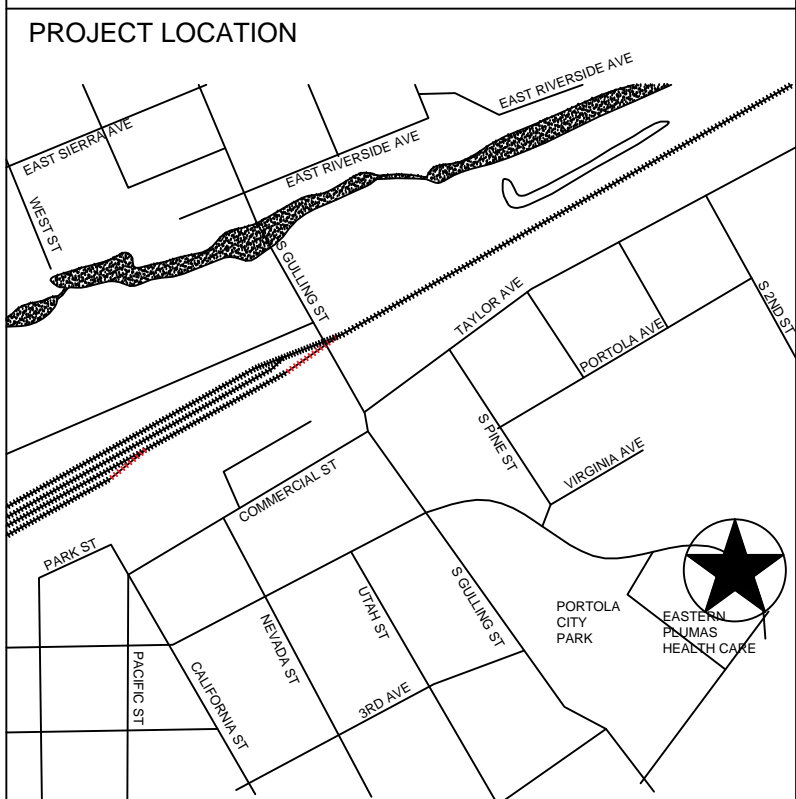
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MECHANICAL EQUIPMENT SCHEDULE

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M1.0
 SHEET 2 OF 9

DETAILS	
1	HYDRAULIC PACK
2	FLUE GAS STACK
3	BOILER CONTROL PANEL
4	ASH BIN PIT
5	BIOMASS HOT WATER BOILER
6	UNIT HEATER, 120 v, LINE VOLTAGE REMOTE T'STAT
7	EMERGENCY EYEWASH STATION / SHOWER STATION
8	CHEM FEED PUMPS ON A SHELF ABOVE CONTAINMENT
9	12' H X 4" CONTAINMENT CURB FOR FLOOR DRAIN AND CHEMICAL STORAGE AREA
10	FLOOR MOUNTED SERVICE SINK
11	FLOOR DRAIN (TYP)

NOTES THIS SHEET
 BIOMASS BOILER

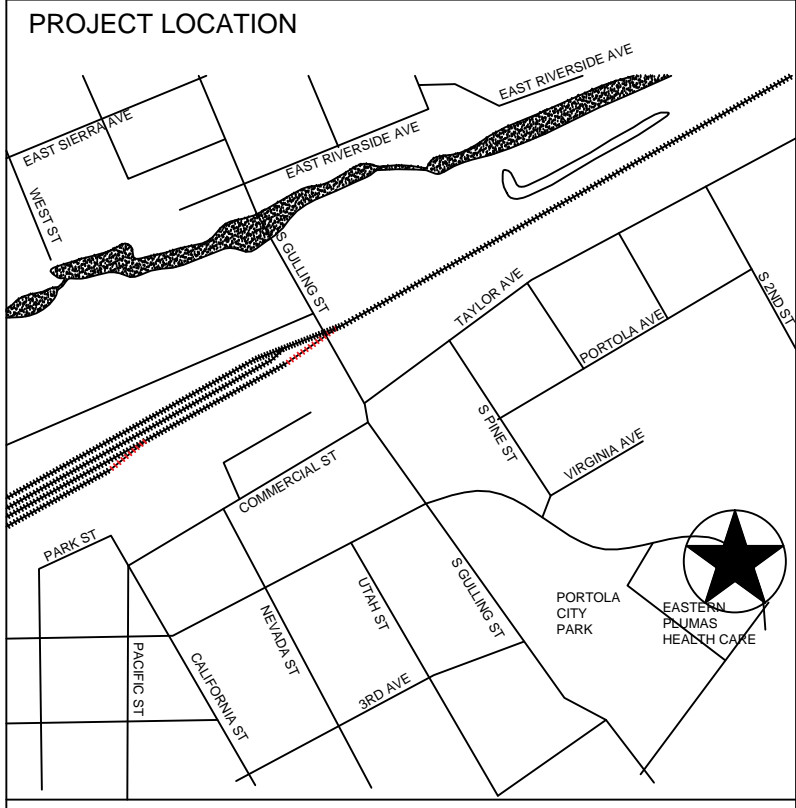
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MECHANICAL PARTIAL PLAN BOILER

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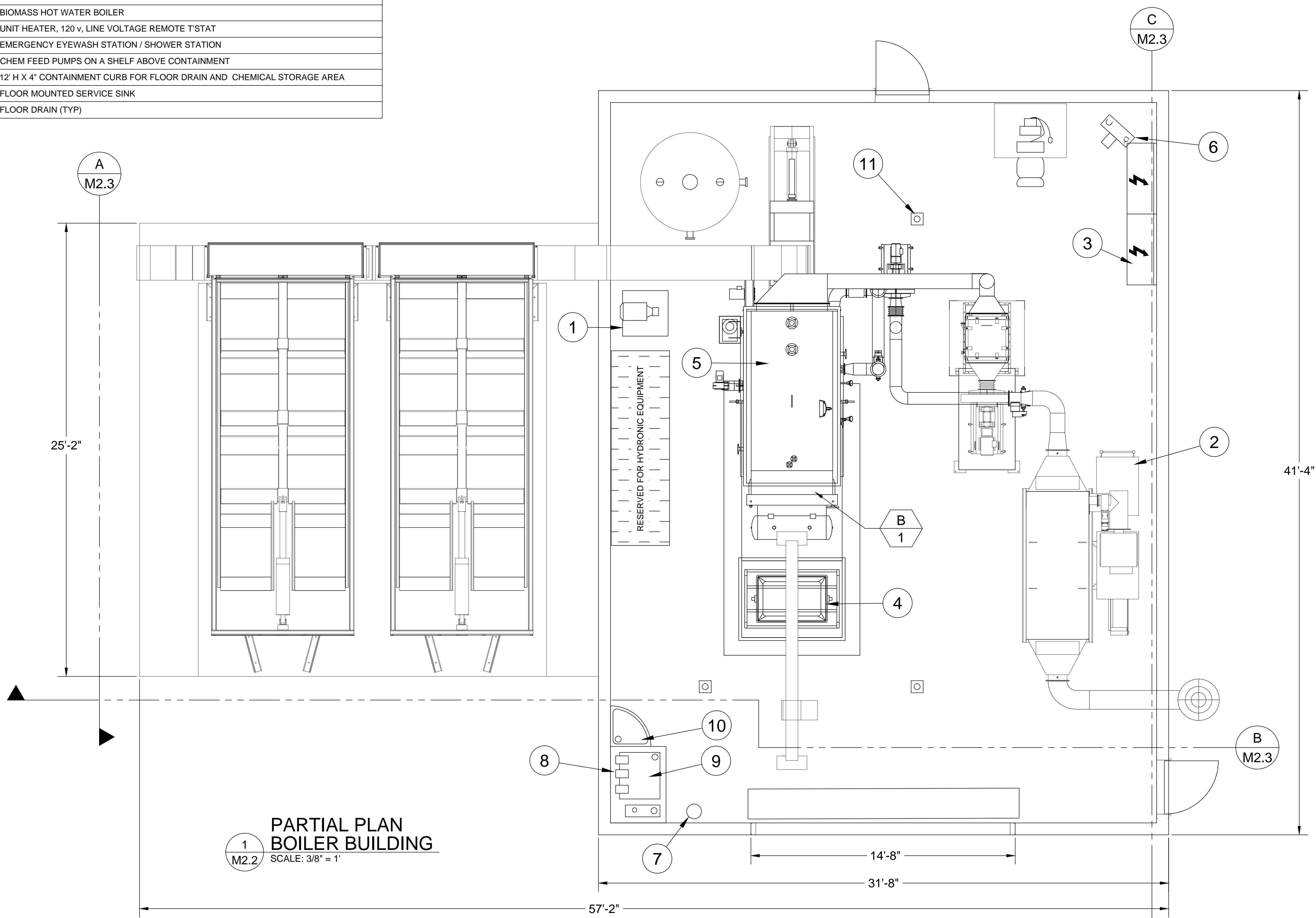
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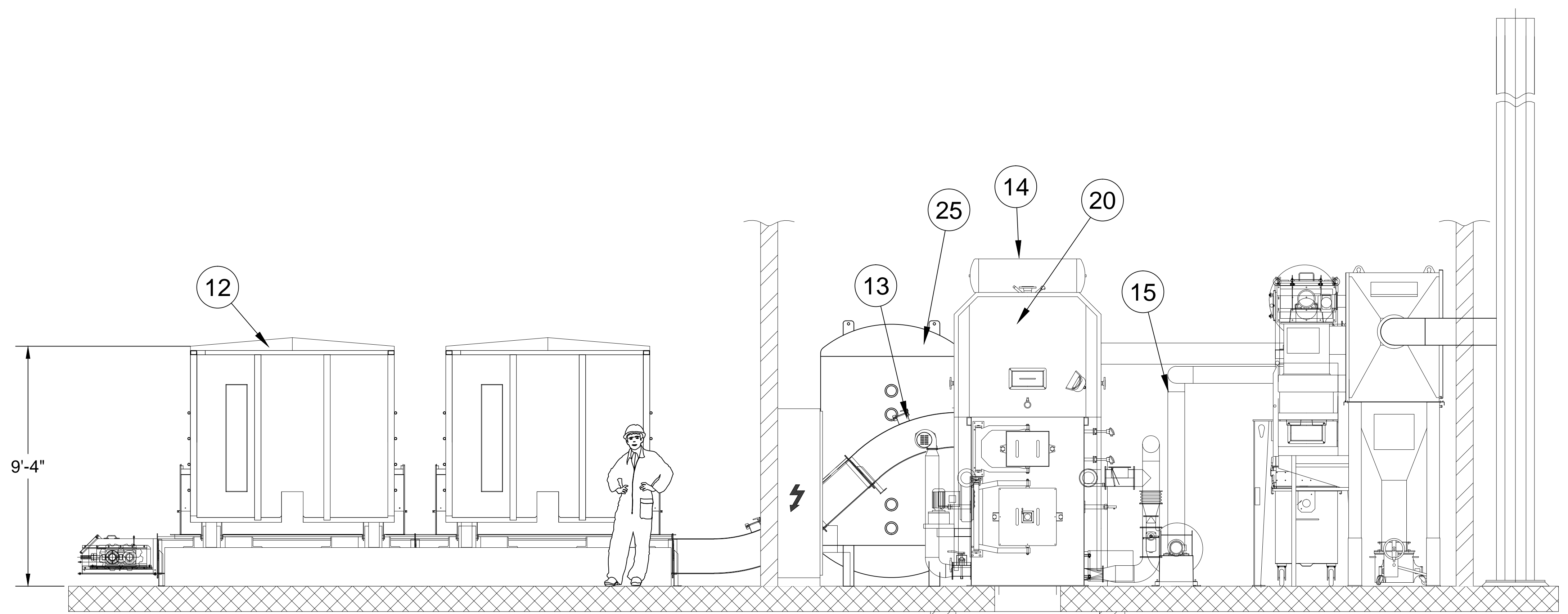
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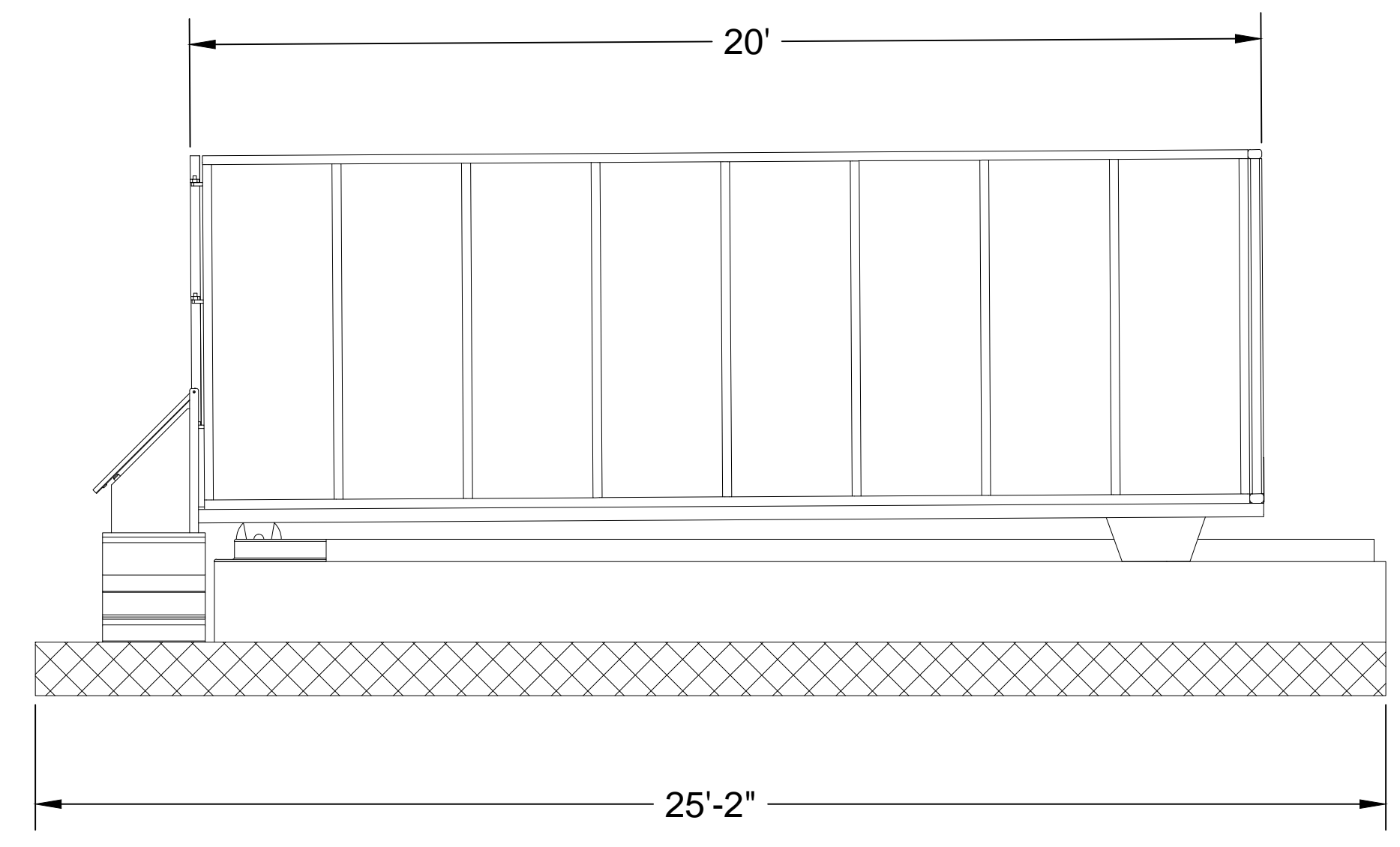


1 PARTIAL PLAN BOILER BUILDING
 M2.2 SCALE: 3/8" = 1'

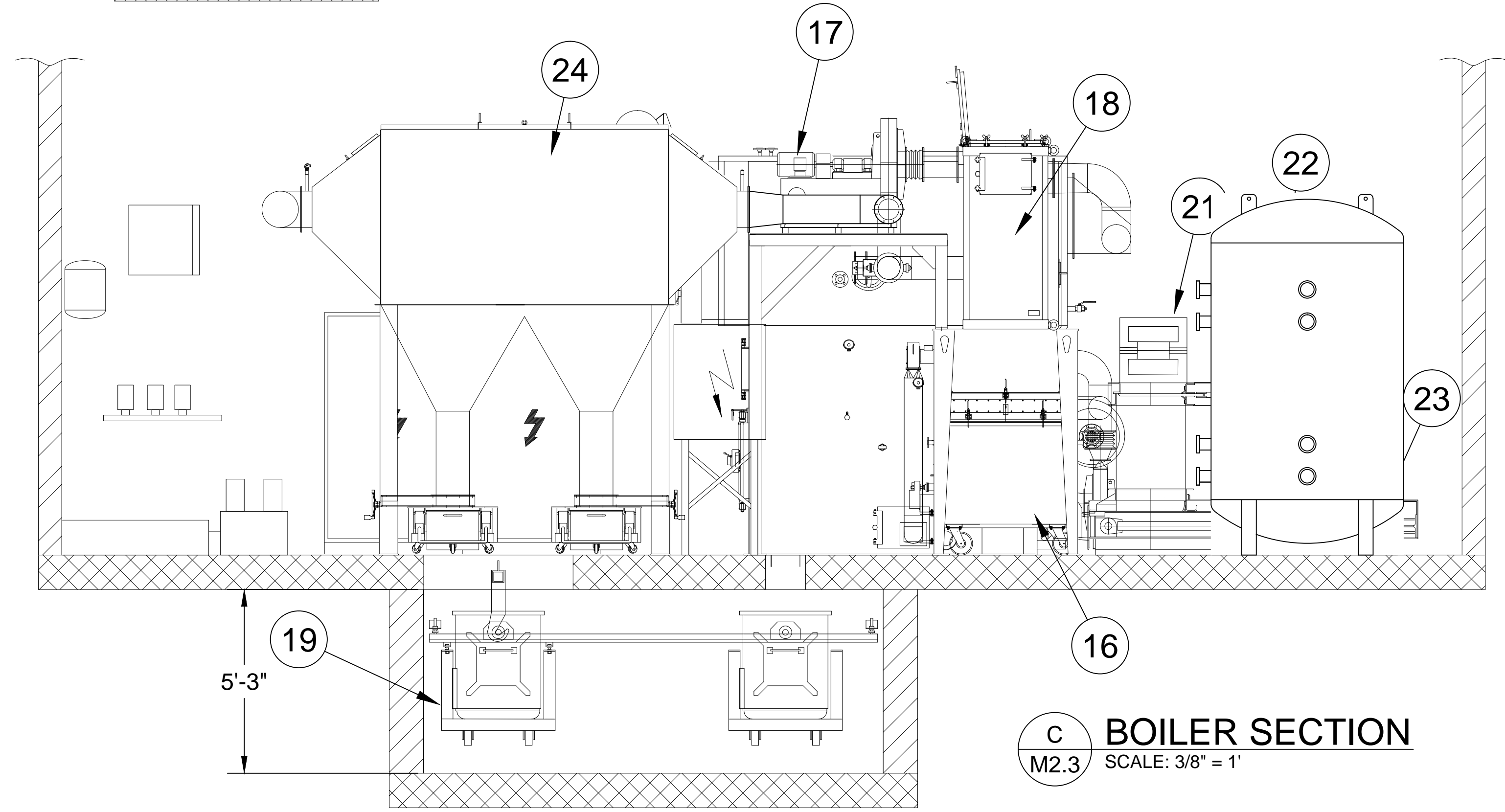
A B C D E F G H



B BOILER SECTION
M2.3 SCALE: 3/8" = 1'



A CHIP CONTAINER SECTION
M2.3 SCALE: 3/8" = 1'



C BOILER SECTION
M2.3 SCALE: 3/8" = 1'

DETAILS	
12	BIOMASS FUEL STORAGE BIN
13	DRAG CHAIN FUEL CONVEYOR
14	SOOT BLOWER COMPRESSED AIR TANK
15	FLUE GAS RECIRCULATION
16	FLY ASH BIN
17	INDUCED DRAFT FAN
18	MULTICYCLONE
19	BOTTOM ASH BIN
20	400KW HOT WATER BOILER
21	DRAG CHAIN FUEL CONVEYOR
22	BURNBACK PREVENTOR DOOR
23	HYDRAULIC RAM FUEL FEED
24	ELECTROSTATIC PRECIPITATOR
25	THERMAL BUFFER TANK

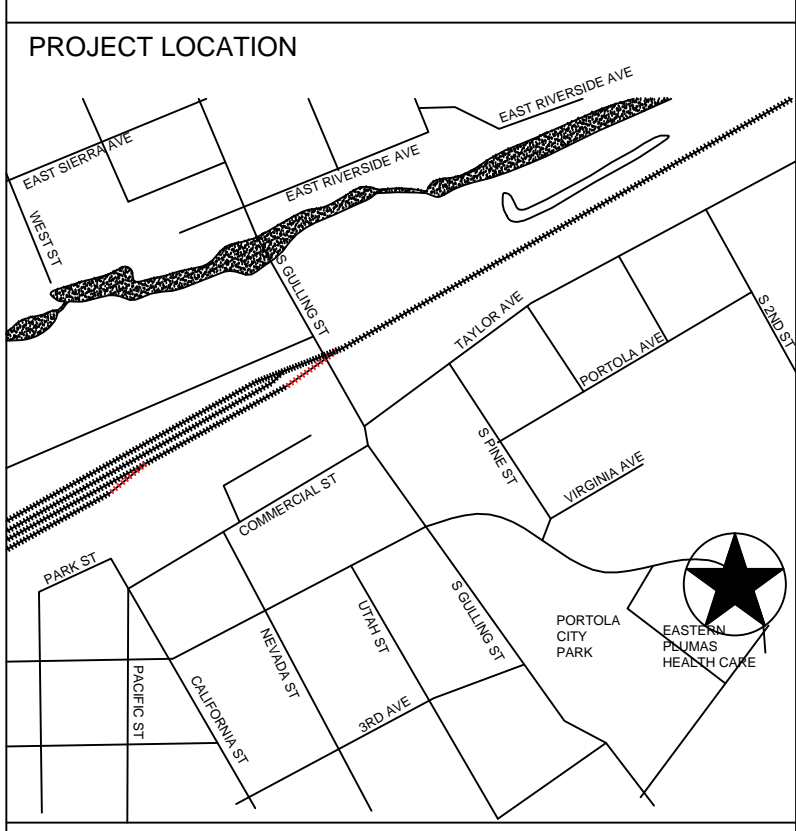
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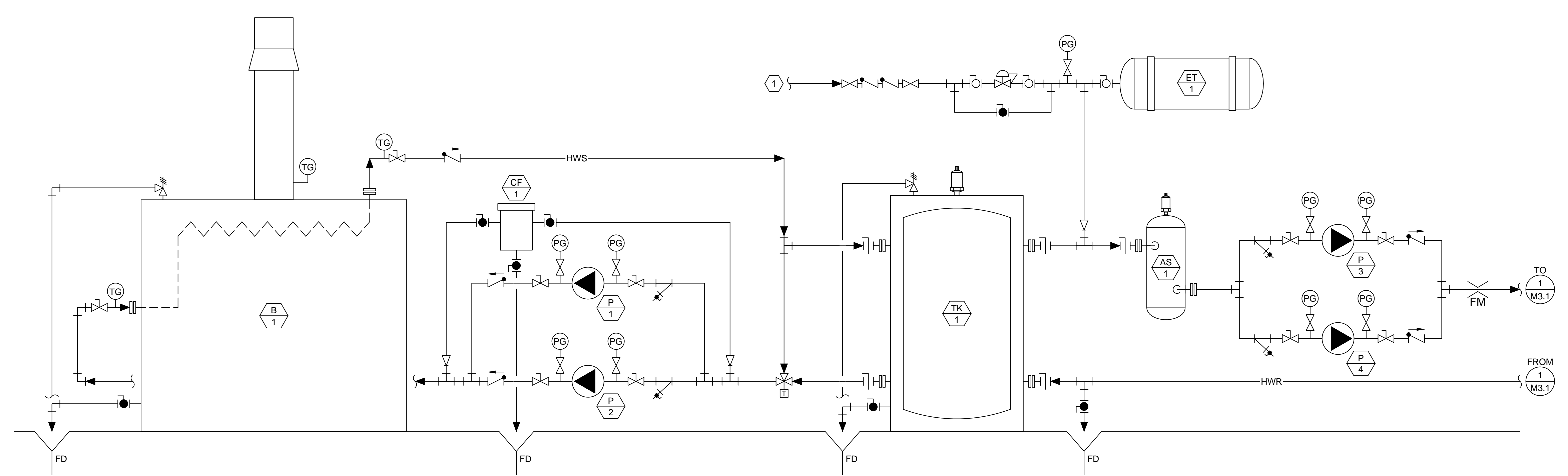
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SHEET 4 OF 9

NOTES THIS SHEET

1 DOMESTIC WATER FROM SUPPLY FOR BOILER FILL.



**MECHANICAL PIPING SCHEMATIC
BIOMASS BOILER BUILDING**
1 M3.0 SCALE: NONE

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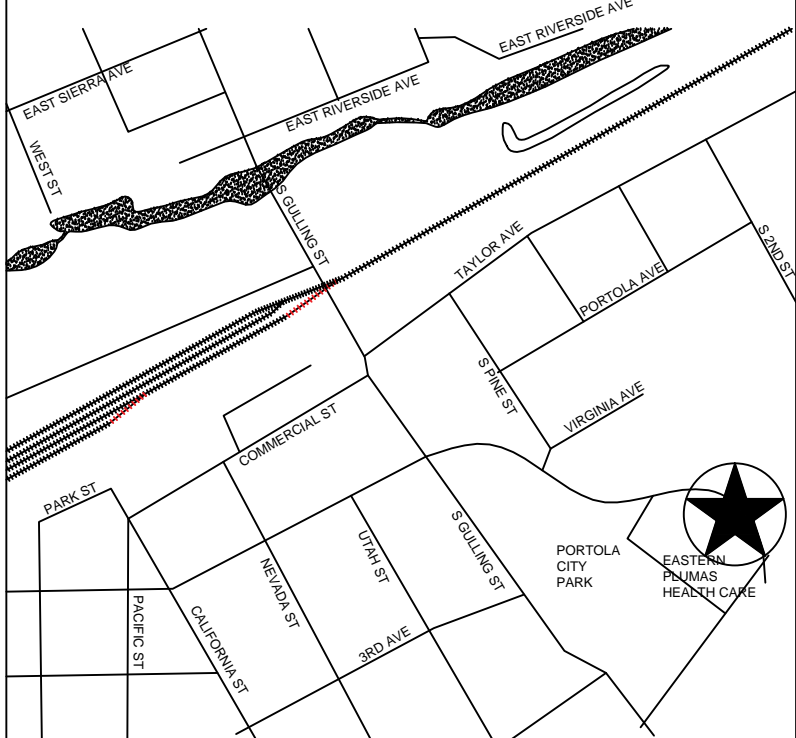
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**EXISTING
EQUIPMENT
SCHEMATIC**

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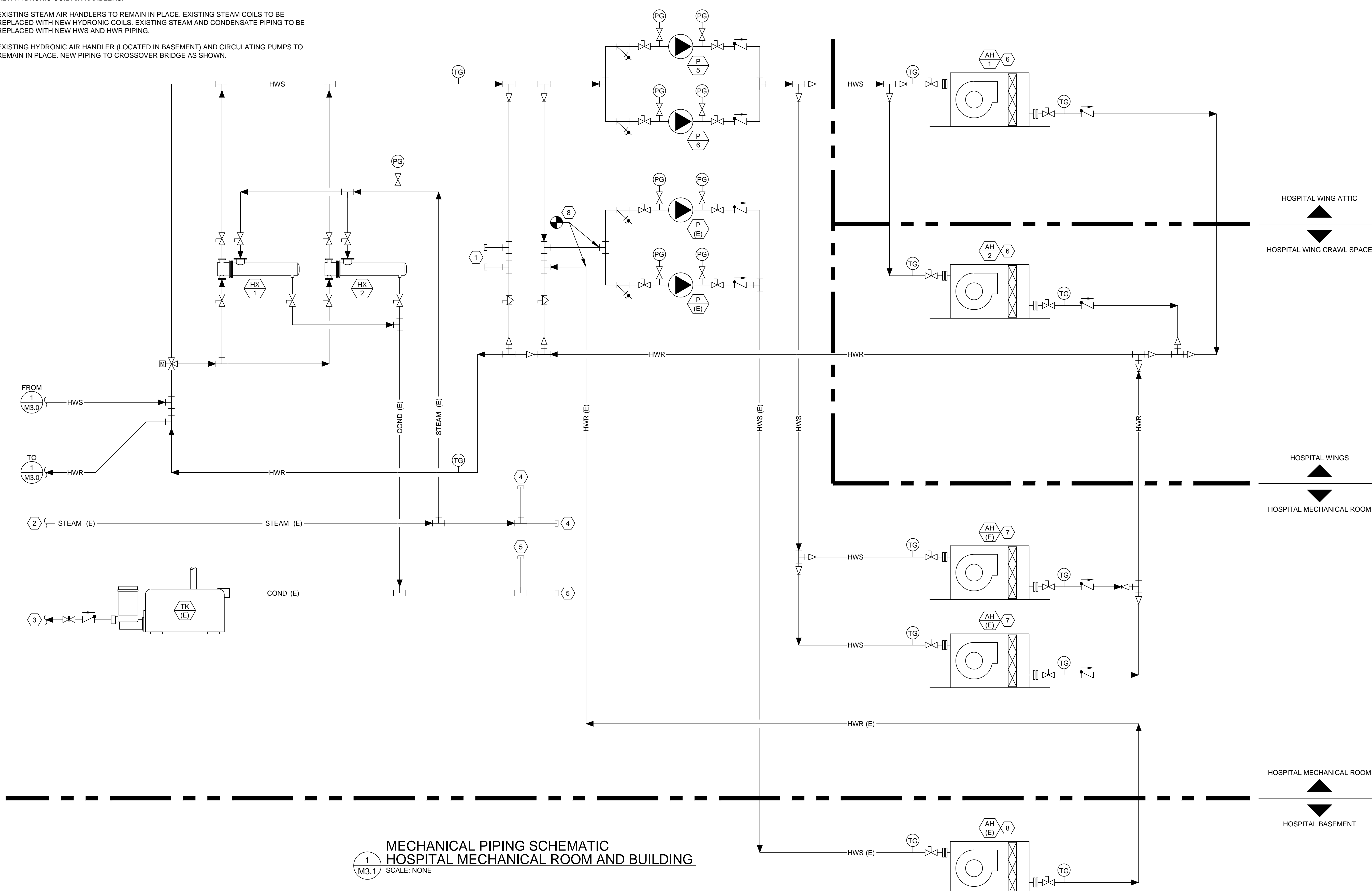
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NOTES THIS SHEET

- 1 FUTURE CONNECTION TO INDIRECT DOMESTIC WATER HEATING TANKS LOCATED IN HOSPITAL MECHANICAL ROOM.
- 2 STEAM SUPPLY FROM STEAM BOILERS IN EXISTING HOSPITAL BOILER BUILDING.
- 3 CONDENSATE RETURN TO STEAM BOILERS IN EXISTING HOSPITAL BOILER BUILDING.
- 4 CUT AND CAP EXISTING STEAM SUPPLY LINES TO EXISTING STEAM AIR HANDLERS AT THE LOCATIONS SHOWN. ABANDON DOWNSTREAM STEAM PIPING.
- 5 CUT AND CAP EXISTING CONDENSATE RETURN LINES AT THE LOCATIONS SHOWN. ABANDON UPSTREAM CONDENSATE RETURN PIPING.
- 6 EXISTING STEAM-COIL AIR HANDLERS LOCATED IN HOSPITAL BUILDING REPLACED WITH NEW HYDRONIC-COIL AIR HANDLERS.
- 7 EXISTING STEAM AIR HANDLERS TO REMAIN IN PLACE. EXISTING STEAM COILS TO BE REPLACED WITH NEW HYDRONIC COILS. EXISTING STEAM AND CONDENSATE PIPING TO BE REPLACED WITH NEW HWS AND HWR PIPING.
- 8 EXISTING HYDRONIC AIR HANDLER (LOCATED IN BASEMENT) AND CIRCULATING PUMPS TO REMAIN IN PLACE. NEW PIPING TO CROSSOVER BRIDGE AS SHOWN.



MECHANICAL PIPING SCHEMATIC
HOSPITAL MECHANICAL ROOM AND BUILDING
SCALE: NONE

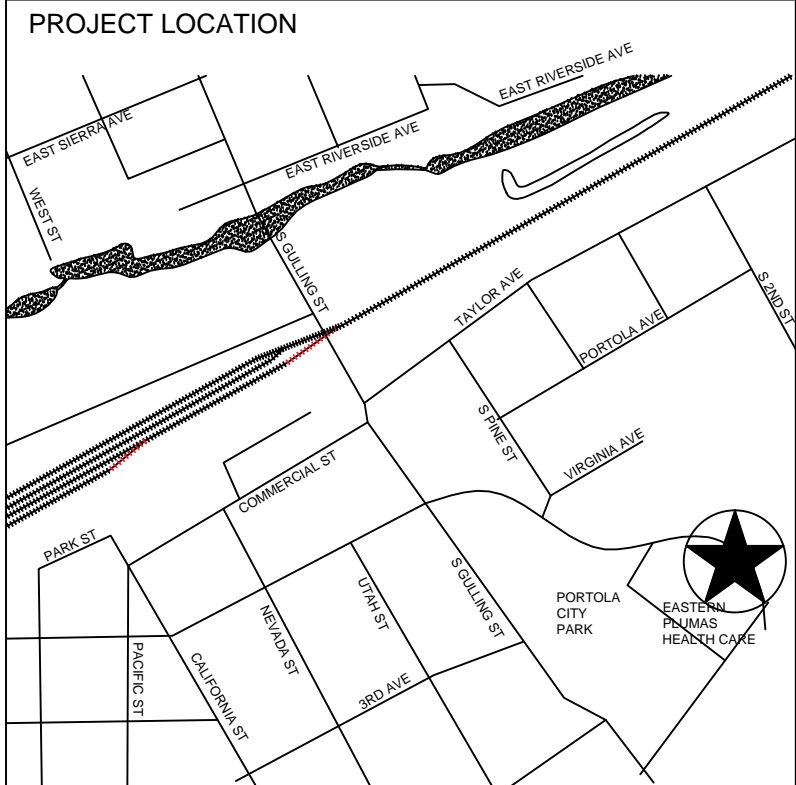
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