Salt Lake Community College Redwood

Central Heating Plant Boiler Replacement

LEGEND OF MECHANICAL SYMBOLS AND ABBREVIATIONS

PLUMBING

- ARROW INDICATES DIRECTION OF FLOW IN PIPE
- CHECK VALVE
- PRESSURE REDUCING, EXTERNAL PRESSURE VALVE
- PRESSURE REDUCING, SELF CONTAINED VALVE
- ATC VALVE – 2 WAY
- ATC VALVE – 3 WAY
- SOLENOID VALVE
- GATE VALVE
- GATE VALVE – NON RISING STEM
- GLOBE VALVE
- BRANCH – BOTTOM CONNECTION
- BRANCH – TOP CONNECTION
- BRANCH – SIDE CONNECTION
- RISE OR DROP
- RISER – DOWN (ELBOW)
- RISER – DOWN (ELBOW)
- RELIEF VALVE
- ANGLE VALVE
- FLOW METER
- UNION
- BALANCING COCK
- SHUT-OFF COCK FOR USE WITH PRESSURE GAUGE
- FLEXIBLE EXPANSION JOINT
- LATERAL STRAINER WITH BLOW-OFF VALVE, PROVIDE HOSE END WITH CAP WHERE DISCHARGE IS NOT PIPED TO DRAIN
- AIR VENT-MANUAL
- AIR VENT-AUTO
- FLOW SWITCH
- REDUCER
- PIPE CAP
- 90° ELBOW
- 45° ELBOW
- F&T — STEAM TRAP, F&T=FLOAT & THERMOSTATIC B=BUCKET, T=THERMOSTATIC
- DEMOLITION

SYMBOLS

- 1 — KEYED NOTE IDENTIFICATION
- INLINE PUMP
- POINT OF CONNECTION

LINETYPES

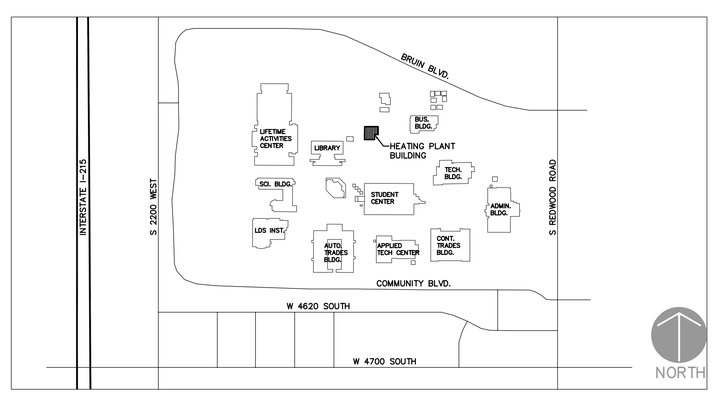
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CS — CONDENSER WATER SUPPLY
- CR — CONDENSER WATER RETURN
- E(NAME) — EXISTING PIPING
- (NAME) — EXISTING PIPING TO BE REMOVED
- HPC — HIGH PRESSURE CONDENSATE
- HPS — HIGH PRESSURE STEAM
- HWR — HEATING HOT WATER RETURN
- HWS — HEATING HOT WATER SUPPLY
- LPC — LOW PRESSURE CONDENSATE
- LPS — LOW PRESSURE STEAM
- MPC — MEDIUM PRESSURE CONDENSATE
- MPS — MEDIUM PRESSURE STEAM
- PUMPED CONDENSATE
- FOS — FUEL OIL SUPPLY
- FOR — FUEL OIL RETURN
- G — GAS
- SW — SOFT WATER (NON-POTABLE)

State of Utah—Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

4110 State Office Building / Salt Lake City, Utah 84114 / 538-3018

DFCM Project No. - 06313660



SLCC Redwood Campus Vicinity Map

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PD1.1	PLUMBING DEMOLITION PLAN
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ED101	ELECTRICAL DEMOLITION PLAN
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E-601	SINGLE LINE DIAGRAM AND SCHEDULES

GENERAL NOTES

1. ON PIPING SYSTEMS BEING DEMOLISHED, REMOVE PIPE, FITTINGS, VALVES, INSULATION, ETC.
2. IF CONTRACTOR ENCOUNTERS MATERIALS WHICH MAY CONTAIN ASBESTOS, STOP WORK IN THAT AREA AND NOTIFY OWNER.

CONSULTANTS

PROJECT ENGINEER: VAN BOERUM & FRANK ASSOCIATES, INC.
330 SOUTH 300 EAST
SALT LAKE CITY, UT 84111
(801) 530-3148

ELECTRICAL ENGINEER: THOMAS & KOLKMAN ENGINEERING, INC.
64 WEST 1700 SOUTH
SALT LAKE CITY, UT 84115
(801) 484-8161

VAN BOERUM & FRANK ASSOCIATES INC.
CONSULTING ENGINEERS
WWW.VBFA.COM
330 South 300 East
Salt Lake City, UT 84111
801.530.3148 T
801.530.3150 F

LICENSED PROFESSIONAL ENGINEER No. 5484 NEIL H. SPENCER STATE OF UTAH

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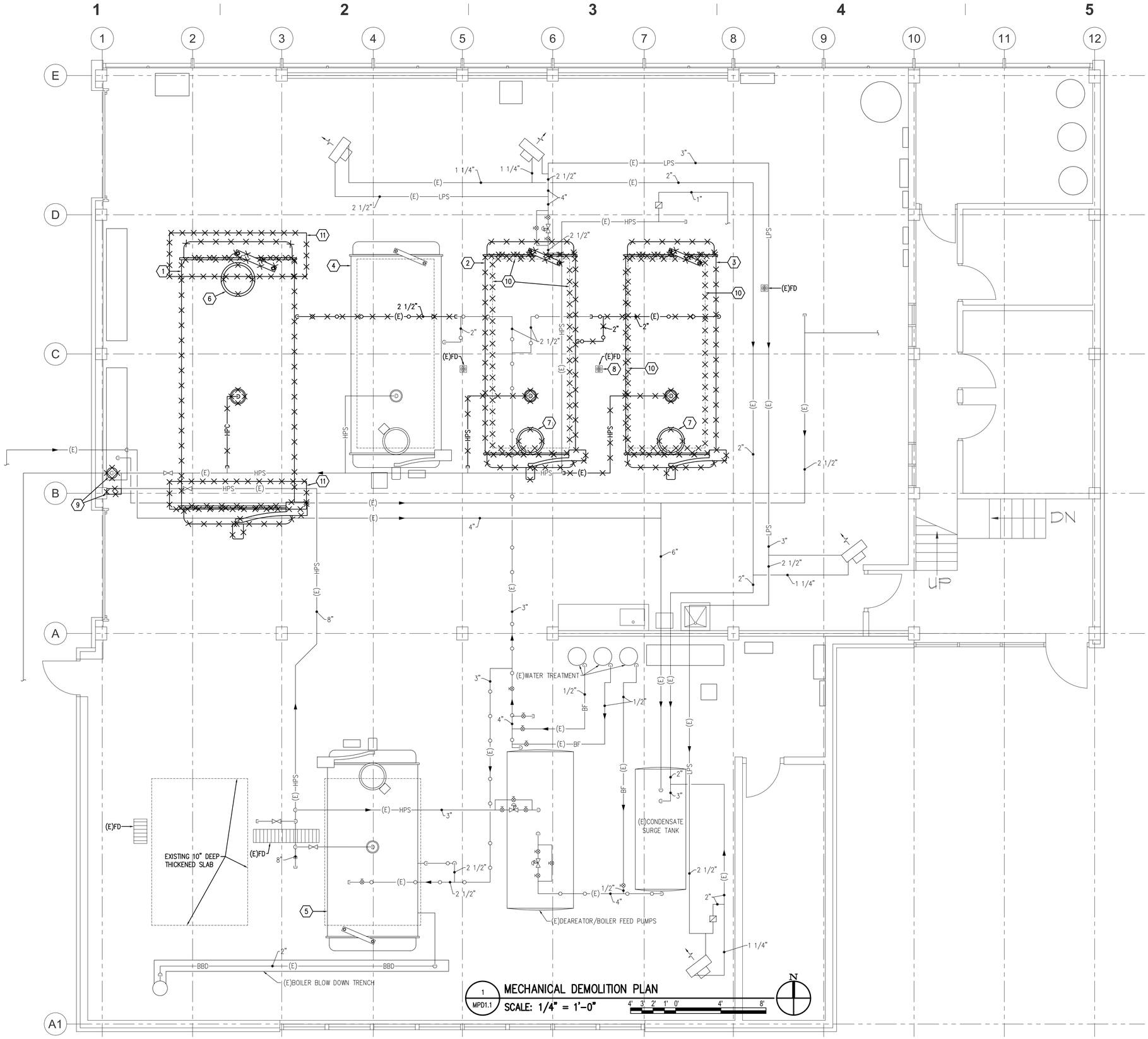
COVER SHEET

C0.0



1 MPD1.1 MECHANICAL DEMOLITION PLAN

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

KEYED NOTES

1. REMOVE EXISTING TRANE 500 HP BOILER. THIS BOILER TO REMAIN OPERATIONAL UNTIL NEW BOILERS ARE OPERATIONAL.
2. REMOVE EXISTING SUPERIOR 200 HP BOILER.
3. REMOVE EXISTING SUPERIOR 250 HP BOILER.
4. EXISTING CLEAVER BROOKS 250 HP BOILER TO REMAIN.
5. EXISTING CLEAVER BROOKS 500 HP BOILER TO REMAIN.
6. REMOVE EXISTING STACK THROUGH ROOF. PATCH & REPAIR ROOF.
7. REMOVE EXISTING STACK THROUGH ROOF. PATCH & REPAIR ROOF.
8. REMOVE EXISTING FLOOR DRAIN.
9. REMOVE EXISTING STEAM METER & ORIFICE IN 8" STEAM MAIN & ASSOCIATED TUBING.
10. REMOVE EXISTING CONCRETE HOUSEKEEPING PAD/THICKENED FLOOR SLAB. PROVIDE NEW 6" THICK FLOOR FLUSH WITH EXISTING FLOOR.
11. REMOVE EXISTING CONCRETE HOUSEKEEPING PAD.

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801.530.3148 T
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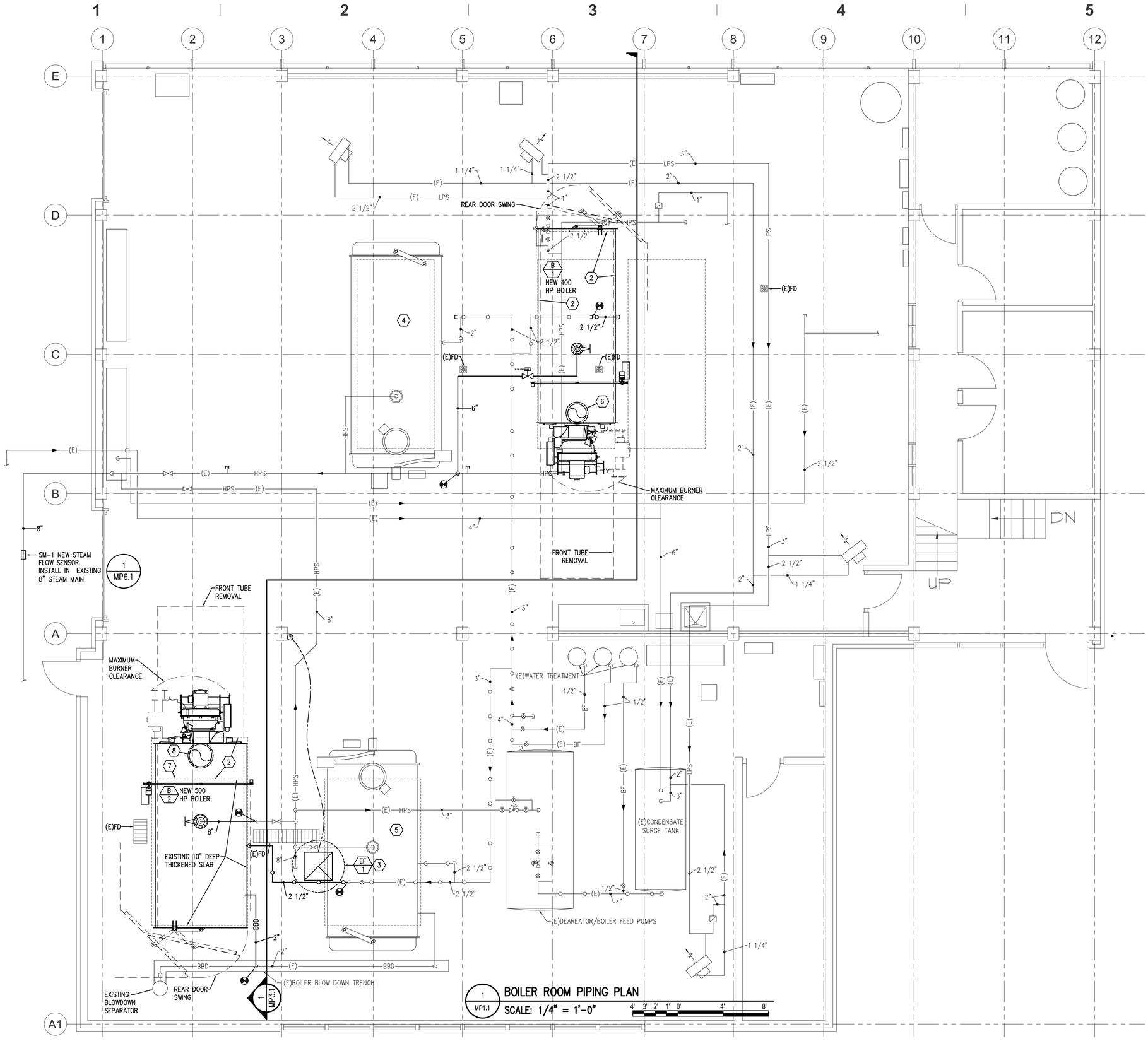
MECHANICAL DEMOLITION PLAN

MPD1.1



1 MP1.1 BOILER ROOM PIPING PLAN
SCALE: 1/4" = 1'-0"

KEYED NOTES

1. REPLACE 13'-0" VERTICAL SECTION OF 8" STEAM PIPE WITH 6" PIPE & PROVIDE NEW STEAM METER.
2. REMOVE SECTION OF 6" FLOOR SLAB & REPLACE WITH 10" THICKENED SLAB.
3. NEW ROOFTOP EXHAUST FAN. SEE DETAIL 2/MP6.1.
4. EXISTING CLEAVER BROOKS 250 HP BOILER TO REMAIN.
5. EXISTING CLEAVER BROOKS 500 HP BOILER TO REMAIN.
6. 20"ø STACK THROUGH ROOF.
7. CONNECT NEW 10" THICKENED SLAB TO EXISTING 10" SLAB. SEE DETAIL 3/MP6.1.
8. 24"ø STACK THROUGH ROOF.

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CONSULTING ENGINEERS
WWW.VBFA.COM

330 South 300 East
Salt Lake City, UT 84111
801.530.3148 T
801.530.3150 F

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STATE OF UTAH

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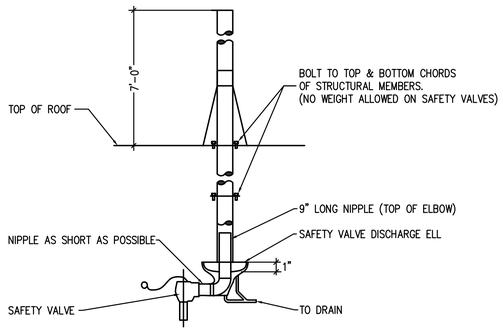
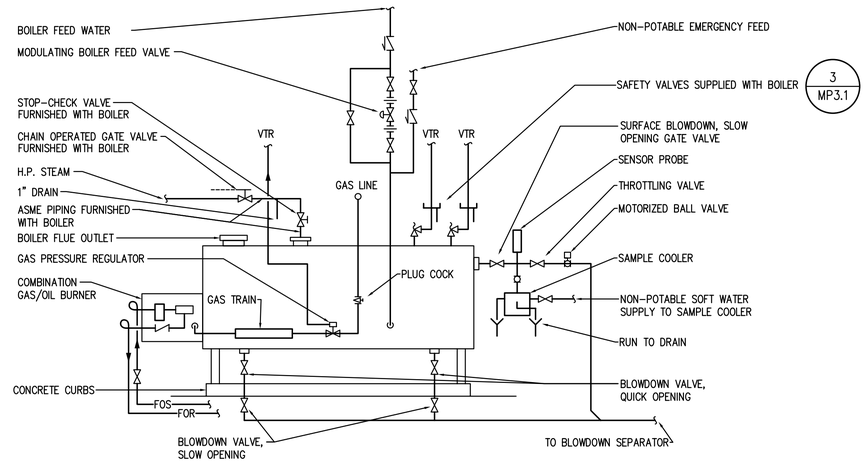
BOILER ROOM PIPING PLAN

MP1.1



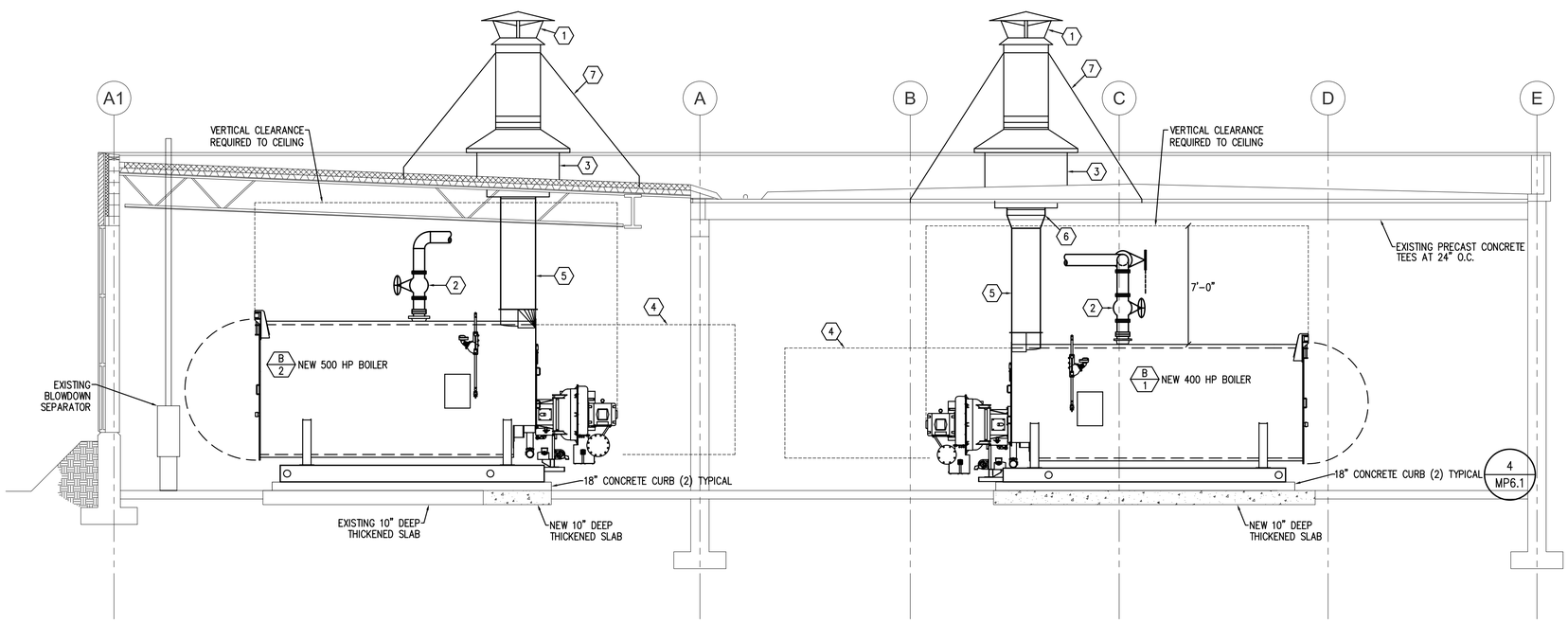
3 / MP3.1 SAFETY VALVE DISCHARGE PIPING DETAIL
NO SCALE



2 / MP3.1 HIGH PRESSURE STEAM BOILER DETAIL
NO SCALE

KEYED NOTES

1. STACK CAP, TYPICAL.
2. STOP CHECK VALVE, TYPICAL.
3. ROOF SUPPORT ASSEMBLY, TYPICAL.
4. BOILER TUBE PULL SPACE.
5. DRAIN SECTION OF POSITIVE PRESSURE DOUBLE WALL FLUE STACK.
6. TRANSITION 20"ø STACK TO RECTANGULAR TO FIT THROUGH EXISTING STRUCTURE. TRANSFER TO ROUND ABOVE ROOF.
7. GUY WIRES, TYPICAL.



1 / MP3.1 BOILER ROOM SECTION
SCALE: 1/4" = 1'-0"

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Salt Lake City, UT 84111
801.530.3148 T
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LICENSED PROFESSIONAL ENGINEER
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STATE OF UTAH

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SHEET CONTENTS
BOILER ROOM SECTION

MP3.1

STEAM BOILER SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	TYPE	DRAFT TYPE	FUEL TYPE	INPUT LOAD (BTU/H)	OUTPUT LOAD (BTU/H)	STEAM FLOW RATE (LB/H)	STEAM OPERATING PRESSURE (PSIG)	ELECTRICAL MOTOR	MOTOR SIZE (HP)	MOTOR VOLT/PH/HZ	CONTROL CIRCUIT VOLT/PH/HZ	PHYSICAL STACK DIAMETER (IN)	LENGTH/ WIDTH/ HEIGHT (IN)	NOTES
B-1	CLEAVER-BROOKS ICB-400	CENTRAL PLANT	FIRE TUBE LOW-NOX 30 PPM	FORCED	GAS/OIL	16,329,000	13,390,000	13,800	150	BLOWER	30	208/3/60	120/1/60	20"	22'-7" L/ 9'-1" W/ 8'-6" H	(1)
										AIR COMP.	7 1/2	208/3/60				(2)
										OIL PUMP	1/2	208/3/60				(3)
B-2	CLEAVER-BROOKS ICB-500	CENTRAL PLANT	FIRE TUBE LOW-NOX 30 PPM	FORCED	GAS/OIL	20,415,000	16,738,000	17,250	150	BLOWER	40	208/3/60	120/1/60	24"	21'-6" L/ 10'-2" W/ 9'-10" H	(1)
										AIR COMP.	7 1/2	208/3/60				(2)
										OIL PUMP	3/4	208/3/60				(3)

(1) FOUR-PASS, INTERCOOLED BACK.

(2) FURNISH WITH STOP-CHECK VALVE, STOP VALVE AND INTERCONNECTING PIPING (ASME).

(3) 82% EFFICIENT.

EXHAUST FAN SCHEDULE

ID	MANUFACTURER	MODEL NO.	AREA SERVED OR LOCATION	AIR MAXIMUM AIRFLOW RATE (CFM)	AIR STATIC PRESSURE (IN. WATER)	FAN OUTLET VELOCITY (FPM)	FAN SPEED (RPM)	FAN STATIC EFFICIENCY (%)	ELECTRICAL MOTOR SIZE (HP)	MOTOR BHP (HP)	VOLT/PH/HZ	CONTROL METHOD	NOTES
EF-1	LOREN COOK	210 ACEB	CENTRAL PLANT	4000	0.38	1386	804	44	3/4	0.54	208/3/60	A	1, 2

1 ALL CAPACITIES AT 4500 FT. ELEVATION.

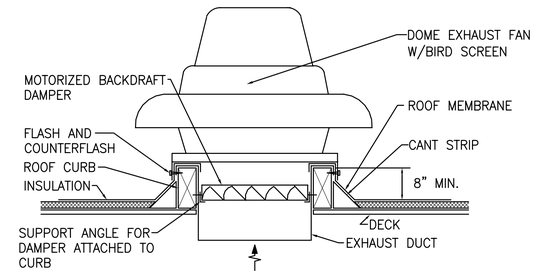
2 ROOF MOUNTED EXHAUST FAN, COMPLETE WITH PRE-FAB ROOF CURB, MOTORIZED BACKDRAFT DAMPER, BIRD SCREEN, INTEGRAL THERMAL OVERLOAD PROTECTION AND SERVICE DISCONNECT.

A CONTROL: THERMOSTAT

STEAM METER SCHEDULE

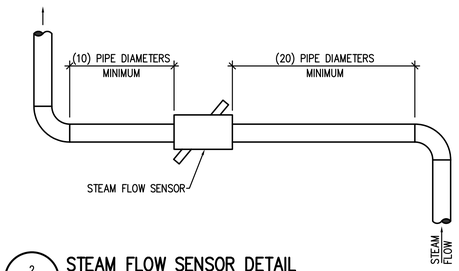
ID	MANUFACTURER AND MODEL NUMBER	TYPE OF METER	FLOW RATE LBS/HOUR	PIPE SIZE	TURNDOWN RATIO	PRESSURE DROP INCHES WATER	NOTES
SM-1	GENERAL ELECTRIC GS868	ULTRASONIC	42,000	8"	150:1	0	1

1 INCLUDES FLOW SENSOR & REMOTE COMPUTER.



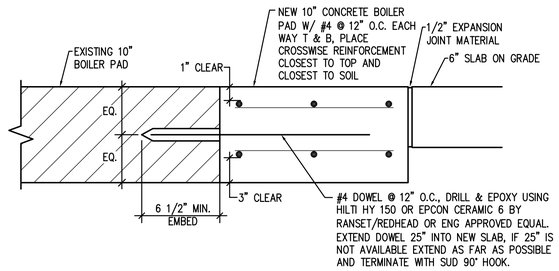
1 MP6.1 EXHAUST FAN DETAIL

NO SCALE



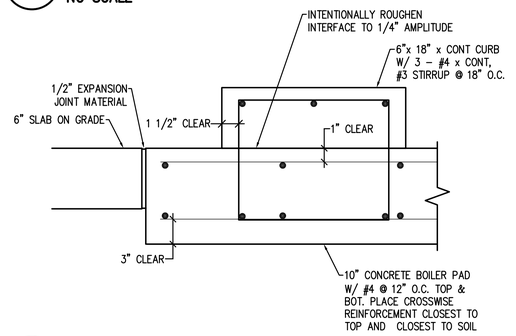
2 MP6.1 STEAM FLOW SENSOR DETAIL

NO SCALE



3 MP6.1 NEW BOILER PAD TO EXISTING BOILER PAD

NO SCALE



4 MP6.1 NEW BOILER PAD WITH CURB

NO SCALE

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WWW.VBFA.COM

330 South 300 East
Salt Lake City, UT 84111
801.530.3148 T
801.530.3150 F

LICENSED PROFESSIONAL ENGINEER No. 5484 NEIL H. SPENCER STATE OF UTAH

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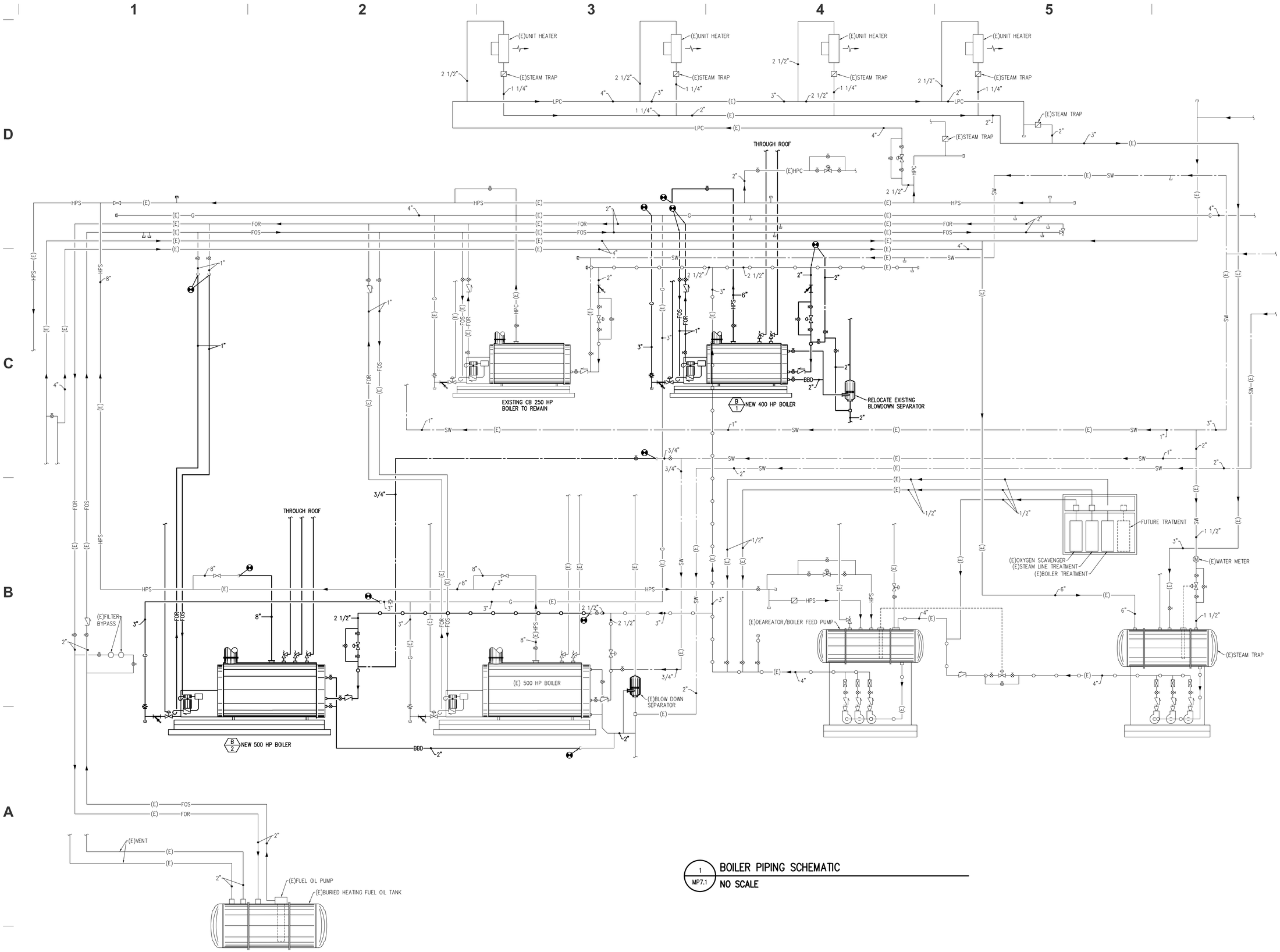
SCHEDULES

MP6.1



1 MP7.1 BOILER PIPING SCHEMATIC
NO SCALE

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CONSULTING ENGINEERS
WWW.VBFA.COM
330 South 300 East
Salt Lake City, UT 84111
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801.530.3150 F

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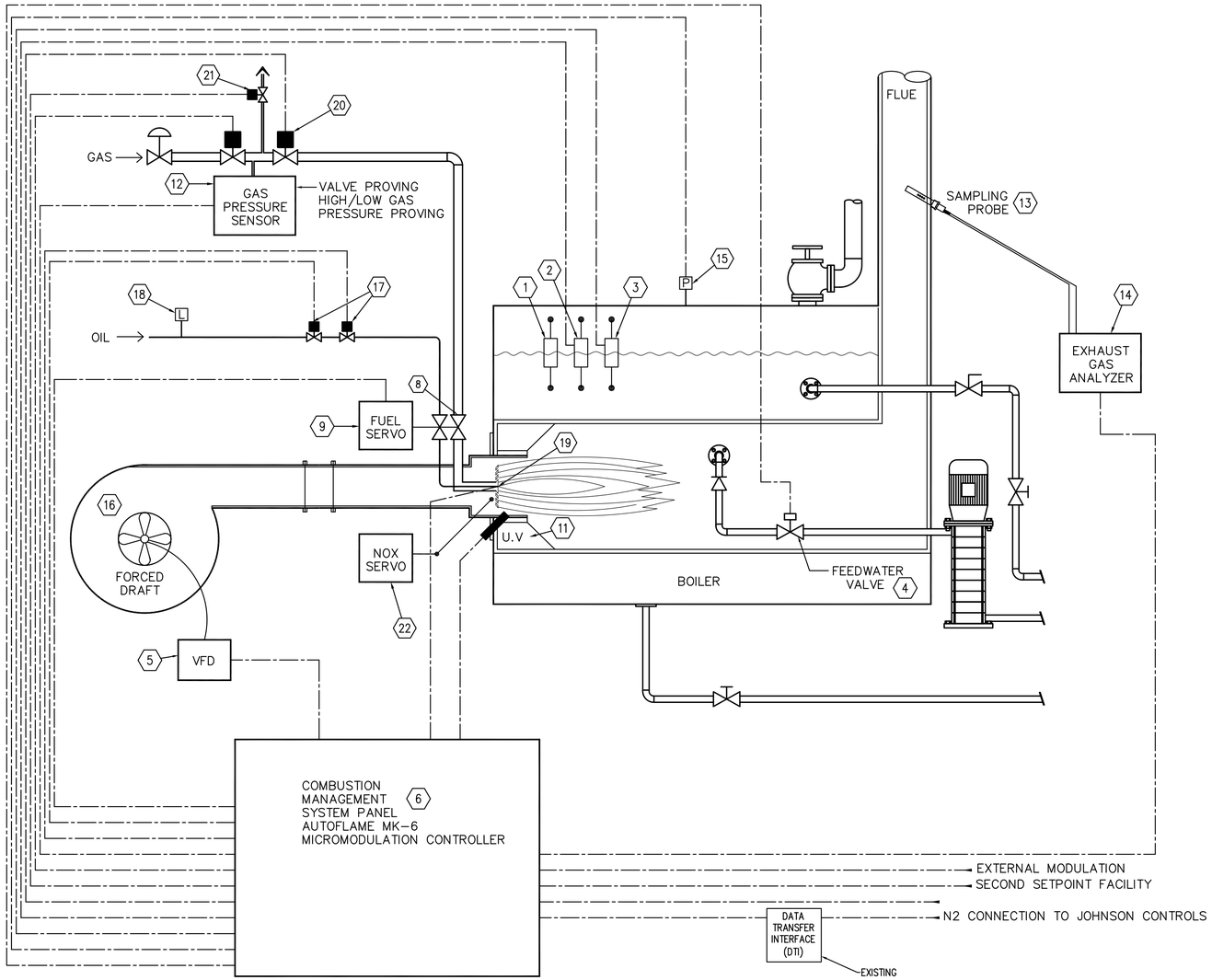
BOILER PIPING SCHEMATIC

MP7.1



1 / MP7.2 STEAM BOILER CONTROL SCHEMATIC

NO SCALE

KEYED NOTES

1. WATER LEVEL CONTROLLER.
2. LOW WATER CUTOFF.
3. LOW WATER CUTOFF (WITH MANUAL RESET).
4. AUTO FEED WATER VALVE.
5. FAN VARIABLE FREQUENCY DRIVE.
6. BOILER CONTROL PANEL.
7. NOT USED.
8. GAS VALVE WITH SERVO.
9. OIL VALVE WITH SERVO.
10. NOT USED.
11. UV SCANNER.
12. GAS PRESSURE SENSOR.
13. FLUE GAS SAMPLING PROBE.
14. EXHAUST GAS ANALYZER.
15. PRESSURE TRANSMITTER.
16. BURNER FAN.
17. OIL SAFETY SHUTOFF VALVES.
18. LOW PRESSURE SAFETY SWITCH WITH RESET BUTTON.
19. IGNITOR AND PILOT.
20. GAS SAFETY SHUTOFF VALVES..
21. VENT VALVE.
22. LOW NOX SERVO.

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WWW.VBFA.COM
330 South 300 East
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801.530.3150 F

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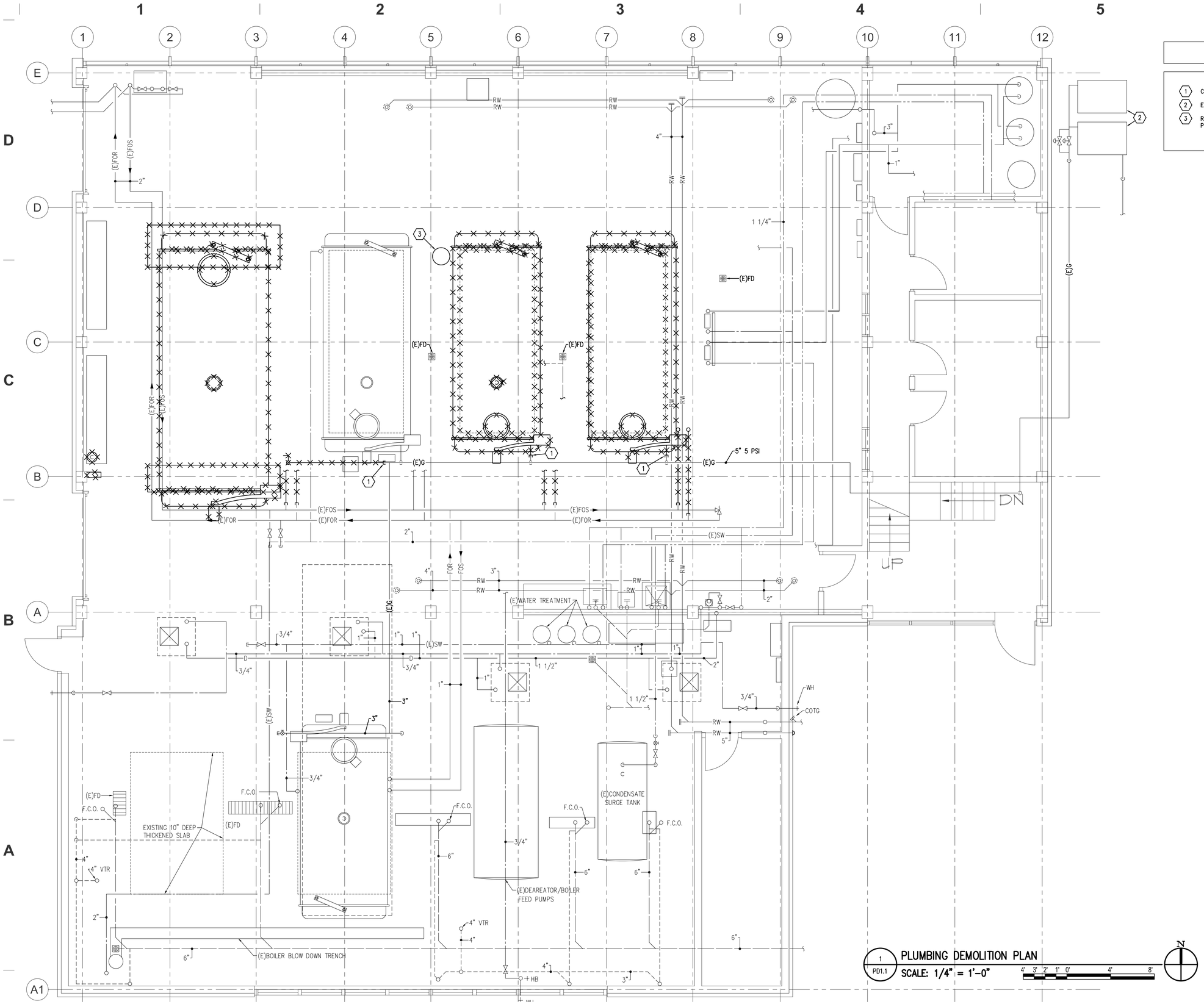
STEAM BOILER CONTROL SCHEMATIC

MP7.2



1 PD1.1 PLUMBING DEMOLITION PLAN

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

KEYED NOTES

1. CAP EXISTING GAS LINE AND REMOVE BEYOND.
2. EXISTING GAS METERS.
3. RELOCATE EXISTING BLOWDOWN SEPARATOR. SEE SHEET P1.1 FOR NEW LOCATION.

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CONSULTING ENGINEERS
WWW.VBFA.COM

330 South 300 East
Salt Lake City, UT 84111
801.530.3148 T
801.530.3150 F

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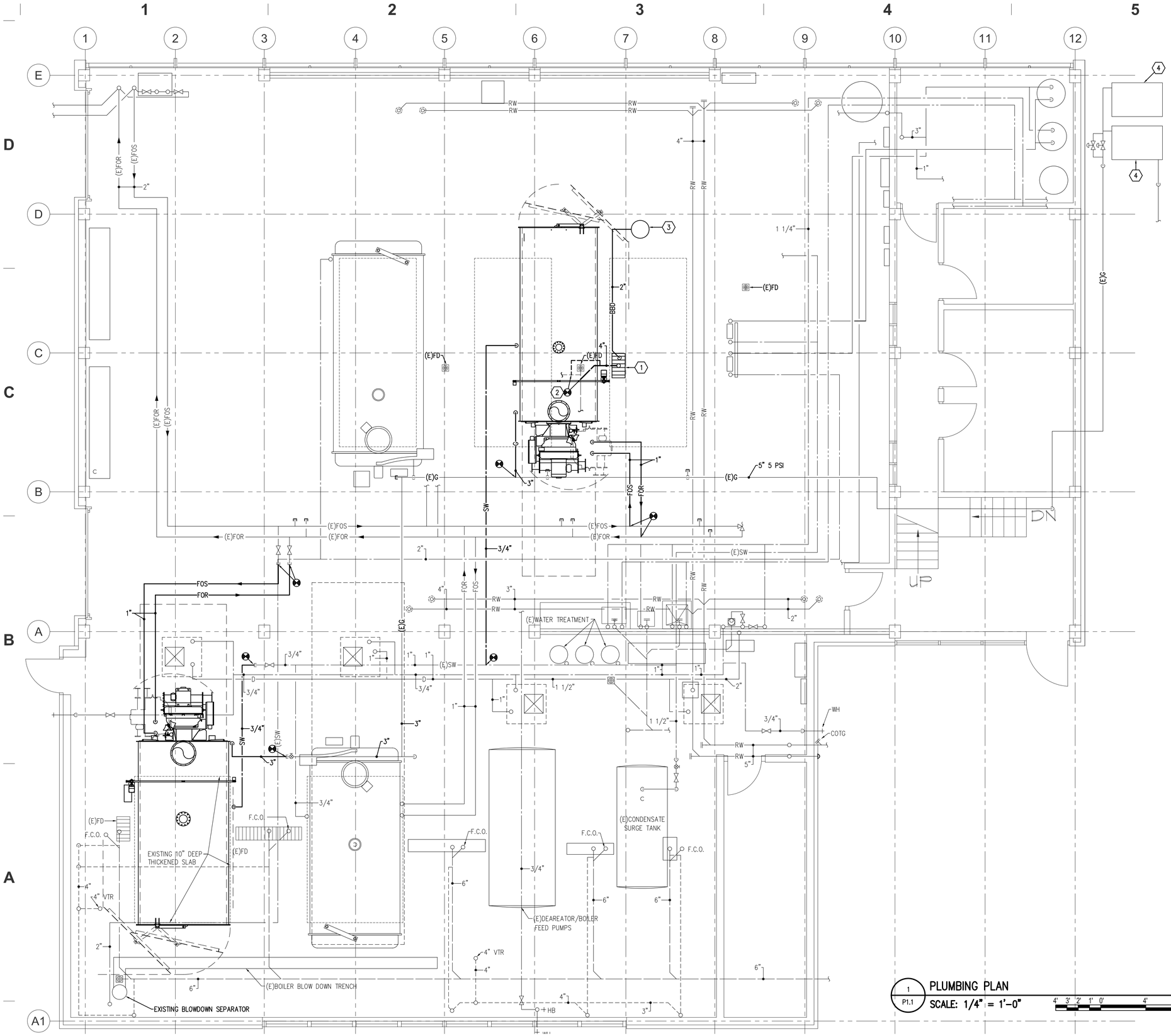
PLUMBING DEMOLITION PLAN

PD1.1



KEYED NOTES

1. NEW TRENCH DRAIN D-1.
2. CONNECT TO EXISTING WASTE & VENT LINES. FIELD DETERMINE LOCATIONS.
3. CONNECT EXISTING RELOCATED BLOWDOWN SEPARATOR TO NEW BOILER. RECONNECT TO EXISTING WATER AND VENT LINES. CONNECT DRAIN TO NEW FLOOR DRAIN.
4. EXISTING GAS METER.

1 / P1.1 PLUMBING PLAN

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

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CONSULTING ENGINEERS
WWW.VBFA.COM

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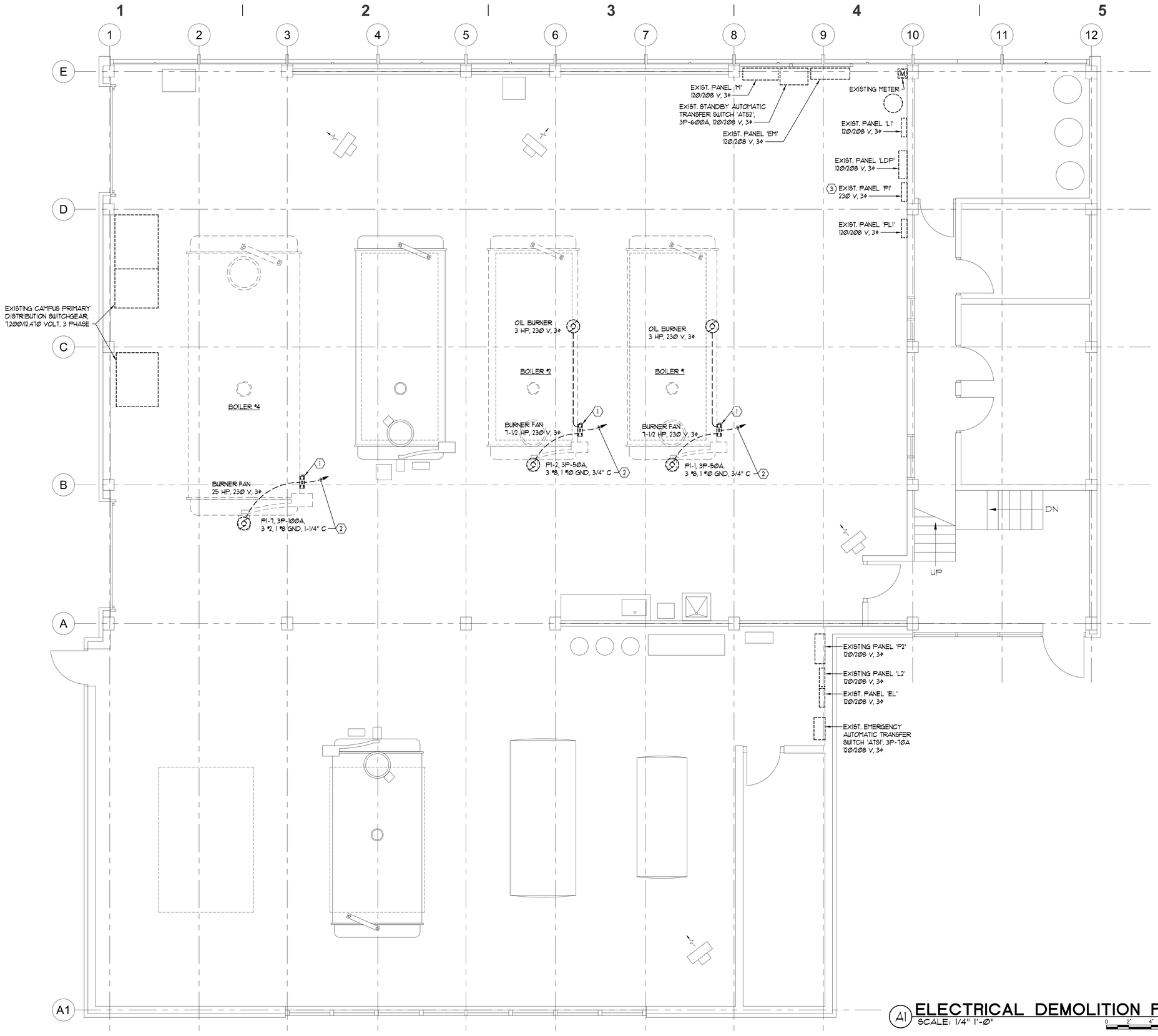
PLUMBING PLAN

P1.1



A1 ELECTRICAL DEMOLITION PLAN
SCALE: 1/4" 1'-0"

NORTH

ELECTRICAL DEMOLITION NOTES:

1. LOCATIONS OF EXISTING ELECTRICAL EQUIPMENT, BRANCH CIRCUIT WIRING, ETC., ARE BASED ON EXISTING BUILDING ELECTRICAL DRAWINGS AND FIELD OBSERVATION OF EXISTING SURFACE CONDITIONS. FIELD VERIFY EXISTING LOCATIONS AND CIRCUITING AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES WHICH MAY ADVERSELY AFFECT COMPLETION OF THE WORK.
2. DEMOLITION PLAN IS SHOWN FOR CONTRACTORS REFERENCE ONLY. FIELD VERIFY QUANTITIES AND LOCATIONS OF ALL EXISTING MATERIAL AND EQUIPMENT TO BE REMOVED. REMOVE ALL ABANDONED CONDUIT WIRING, JUNCTION BOXES, OUTLETS, EQUIPMENT, ETC., ASSOCIATED WITH MECHANICAL EQUIPMENT TO BE REMOVED, WHETHER SPECIFICALLY SHOWN OR NOT.
3. WHERE REMOVAL OF EXISTING ELECTRICAL EQUIPMENT INTERRUPTS EXISTING BRANCH CIRCUITS OR FEEDERS TO EXISTING EQUIPMENT TO REMAIN, PROVIDE NEW CONDUIT AND WIRING AS REQUIRED TO RECONNECT THE EXISTING EQUIPMENT TO REMAIN.
4. ALL MATERIALS AND EQUIPMENT REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER FOR STORAGE OR BE DISPOSED OF BY THE CONTRACTOR AS DIRECTED BY THE OWNER.
5. TAKE ALL PRECAUTIONS NECESSARY TO AVOID DAMAGE TO THE EXISTING BUILDING. REPAIR ALL DAMAGE INCURRED BY DEMOLITION AND NEW CONSTRUCTION TO EXACTLY MATCH SURROUNDING SURFACES AND/OR CONDITIONS WITHOUT ADDITIONAL COST TO THE OWNER. COORDINATE REPAIRS WITH THE GENERAL CONTRACTOR.

KEYED NOTES:

1. REMOVE EXISTING ELECTRICAL SERVICE TO EXISTING BOILER INCLUDING ALL ABANDONED WIRING, CONDUIT, BOXES, DISCONNECTS, ETC..
2. EXISTING CONDUIT INSTALLED UNDER FLOOR SLAB MAY BE ABANDONED IN PLACE WITH ALL WIRING REMOVED. CUT CONDUIT FLUSH WITH EXISTING FLOOR AND FILL WITH NON-SHRINK GROUT. REFINISH CONCRETE FLOOR AS REQUIRED TO MATCH EXISTING.
3. EXISTING BREAKERS IN EXISTING PANELBOARDS SERVING REMOVED EQUIPMENT ARE TO REMAIN IN PLACE AND BE TURNED OFF. PROVIDE NEW TYPEWRITTEN CIRCUIT DIRECTORY TO INDICATE BREAKERS AS "SPARE".

VAN BOERUM & FRANK ASSOCIATES INC.
CONSULTING ENGINEERS
WWW.VBFA.COM
330 South 300 East
Salt Lake City, UT 84111
801.530.3148 T
801.530.3150 F

REGISTERED PROFESSIONAL ENGINEER
RAYMOND G. KOLKMAN
175780
STATE OF UTAH

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SLCC REDWOOD CAMPUS BOILER REPLACEMENT

REVISIONS

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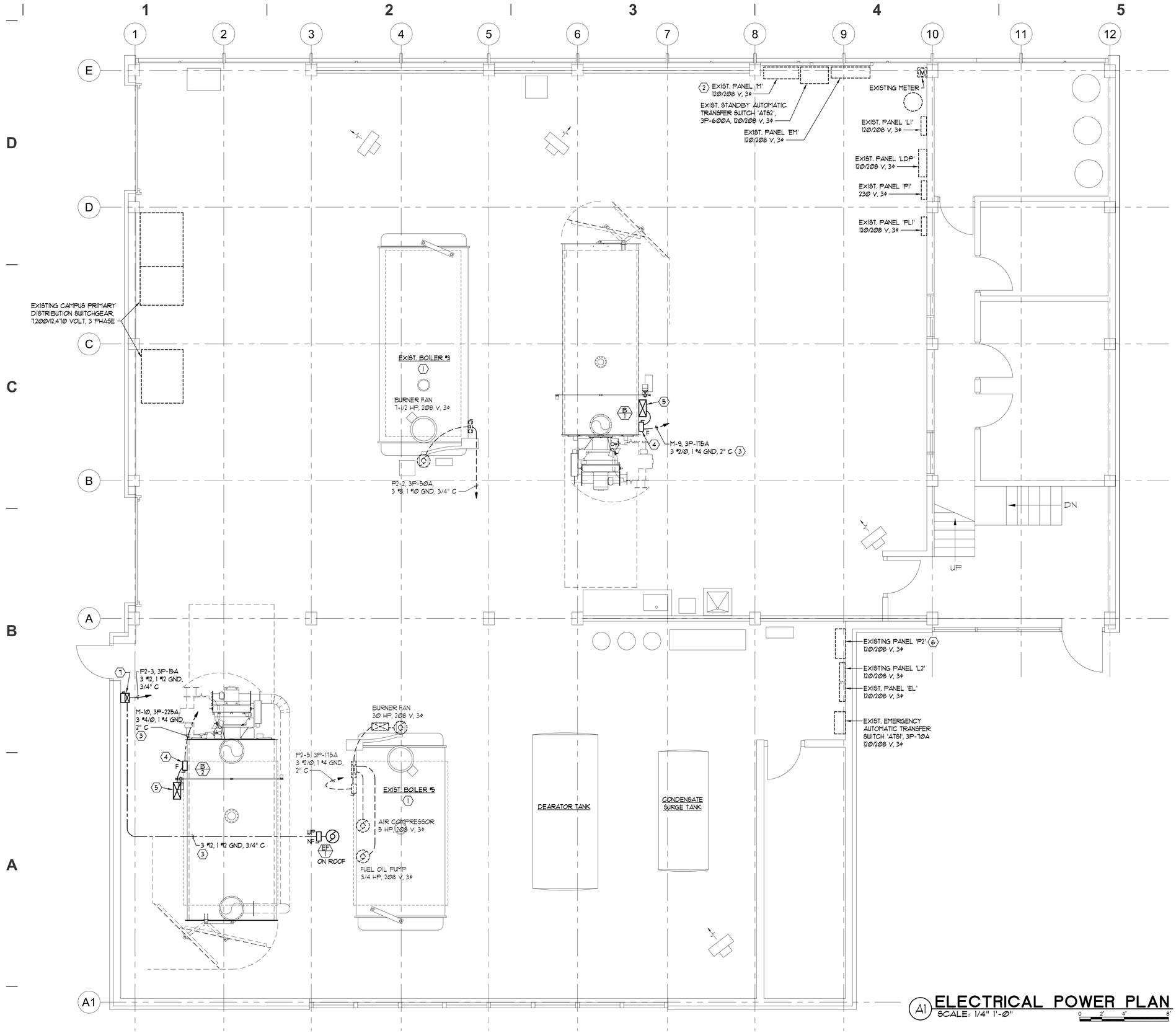
SHEET CONTENTS
ELECTRICAL DEMOLITION PLAN

ED101



A1 ELECTRICAL POWER PLAN
SCALE: 1/4" 1'-0"

NORTH

ELECTRICAL NOTES:

1. LOCATIONS OF EXISTING ELECTRICAL EQUIPMENT, BRANCH CIRCUIT WIRING, ETC., ARE BASED ON EXISTING BUILDING ELECTRICAL DRAWINGS AND FIELD OBSERVATION OF EXISTING SURFACE CONDITIONS. FIELD VERIFY EXISTING LOCATIONS AND CIRCUITING AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES WHICH MAY ADVERSELY AFFECT COMPLETION OF THE WORK.
2. COORDINATE MECHANICAL EQUIPMENT LOCATIONS WITH MECHANICAL PLANS AND MECHANICAL CONTRACTOR.
3. WHERE BRANCH CIRCUIT HOMERUNS INDICATE WIRE SIZES, THE BRANCH CIRCUIT SHALL BE THAT SIZE WIRE THROUGHOUT, INCLUDING SWITCH LEGS, ETC.
4. TAKE ALL PRECAUTIONS NECESSARY TO AVOID DAMAGE TO THE EXISTING BUILDING. REPAIR ALL DAMAGE INCURRED BY DEMOLITION AND NEW CONSTRUCTION TO EXACTLY MATCH SURROUNDING SURFACES AND/OR CONDITIONS WITHOUT ADDITIONAL COST TO THE OWNER. COORDINATE REPAIRS WITH THE GENERAL CONTRACTOR.

KEYED NOTES:

1. ELECTRICAL SERVICE TO EXISTING BOILER TO REMAIN. SHOWN FOR REFERNCE ONLY.
2. PROVIDE 2 NEW SIEMENS TYPE 'QJH2' BRANCH CIRCUIT BREAKERS WITH NEW MOUNTING HARDWARE IN EXISTING PANEL 'M' TO SERVE NEW BOILERS. PROVIDE NEW ENGRAVED NAMEPLATES TO IDENTIFY NEW BREAKERS.
3. INSTALL NEW CONDUIT EXPOSED THROUGH EXISTING BUILDING STRUCTURE AND PAINT CONDUIT TO MATCH SURROUNDING SURFACES.
4. NEW FUSED SAFETY SWITCH BY CONTRACTOR. FIELD COORDINATE LOCATION AND MOUNTING WITH MECHANICAL CONTRACTOR.
5. CONNECT TO NEW BOILER CONTROL PANEL FURNISHED WITH BOILER.
6. PROVIDE NEW SIEMENS TYPE 'BLH' BRANCH CIRCUIT BREAKERS IN EXISTING PANEL 'P2' TO SERVE NEW EXHAUST FAN. PROVIDE NEW ENGRAVED NAMEPLATE TO IDENTIFY NEW BREAKER.
7. PROVIDE COMBINATION STARTER WITH MCP DISCONNECT TO SERVE NEW EXHAUST FAN. SEE SPECIFICATION SECTION 16480 FOR REQUIREMENTS.

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CONSULTING ENGINEERS
WWW.VBFA.COM
330 South 300 East
Salt Lake City, UT 84111
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SHEET CONTENTS
ELECTRICAL POWER PLAN

EP101

EQUIPMENT SCHEDULE

EQUIP. NO.	DESCRIPTION	CIRCUIT NUMBER	VOLTS	PHASE	WATTS H.P.	BREAKER	STARTERS FURNISH	STARTERS INSTALL	STARTERS SIZE	AUX. CONT.	LOCATION
B 1	BOILER	M-9	208	3	1146 AMPS	3P-175A	M	M	M	-	NORTH BOILER ROOM
B 2	BOILER	M-10	208	3	1412 AMPS	3P-225A	M	M	M	-	SOUTH BOILER ROOM
EF 1	EXHAUST FAN	P2-3	208	3	3/4 HP	3P-7A MCP	E	E	Ø	2 N.O. 2 N.C.	ON ROOF

E - ELECTRICAL CONTRACTOR
M - MECHANICAL CONTRACTOR

SYMBOL LIST

SYMBOL	DESCRIPTION
	EXISTING POWER PANELBOARD
A-13.5	BRANCH CIRCUIT HOMERUN INDICATING PANEL AND CIRCUIT NUMBERS
	NEW BRANCH CIRCUIT EXPOSED ON WALL OR CEILING
	EXISTING BRANCH CIRCUIT TO BE REMOVED
	EXISTING MOTOR
	EXISTING DISCONNECT SWITCH
	EXISTING MOTOR STARTER OR CONTROL PANEL
	NEW MOTOR
F	NEW SAFETY SWITCH, 'F' INDICATES FUSED, 'NF' INDICATES NON-FUSED
	NEW MOTOR STARTER OR CONTROL PANEL
	NEW COMBINATION MOTOR STARTER WITH 'MCP' DISCONNECT
$TH	NEW MANUAL MOTOR SWITCH WITH THERMAL OVERLOAD PROTECTION
2	KEYED NOTE SYMBOL
WP	INDICATES ITEM IN WEATHERPROOF ENCLOSURE

KEYED NOTES:

1. REMOVE EXISTING ELECTRICAL SERVICE TO EXISTING BOILER INCLUDING ALL ABANDONED WIRING, CONDUIT, BOXES, DISCONNECTS, ETC.
2. EXISTING BREAKERS IN EXISTING PANELBOARDS SERVING REMOVED EQUIPMENT ARE TO REMAIN IN PLACE AND BE TURNED OFF. PROVIDE NEW TYPEWRITTEN CIRCUIT DIRECTORY TO INDICATE BREAKERS AS "SPARE".
3. PROVIDE 2 NEW SIEMENS TYPE 'QJH2' BRANCH CIRCUIT BREAKERS WITH NEW MOUNTING HARDWARE IN EXISTING PANEL 'M' TO SERVE NEW BOILERS. PROVIDE NEW ENGRAVED NAMEPLATES TO IDENTIFY NEW BREAKERS.
4. NEW FUSED SAFETY SWITCH BY CONTRACTOR. FIELD COORDINATE LOCATION AND MOUNTING WITH MECHANICAL CONTRACTOR.
5. CONNECT TO NEW BOILER CONTROL PANEL FURNISHED WITH BOILER. FIELD VERIFY ELECTRICAL RATINGS FOR INSTALLED BOILERS AND INCLUDE ON "AS-BUILT" DRAWINGS.
6. PROVIDE NEW SIEMENS TYPE 'BLH' BRANCH CIRCUIT BREAKERS IN EXISTING PANEL 'P2' TO SERVE NEW EXHAUST FAN. PROVIDE NEW ENGRAVED NAMEPLATE TO IDENTIFY NEW BREAKER.
7. PROVIDE COMBINATION STARTER WITH MCP DISCONNECT TO SERVE NEW EXHAUST FAN. SEE SPECIFICATION SECTION 16480 FOR REQUIREMENTS.

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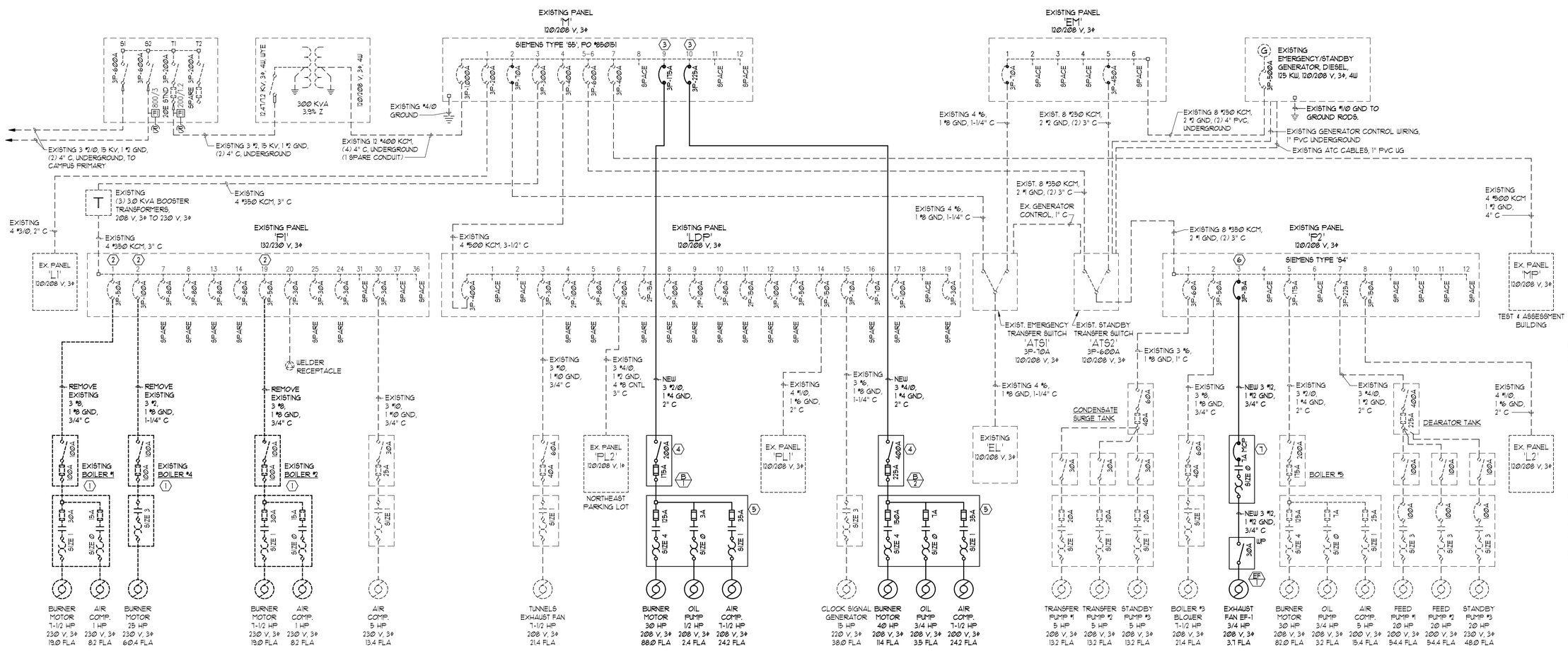

A1 SINGLE LINE DIAGRAM
SCHEMATIC

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SINGLE LINE DIAGRAM AND SCHEDULES

E-601