

OIT GEOTHERMAL POWER PLANT UNIT AND INFRASTRUCTURE RESPONSIBILITY MATRIX

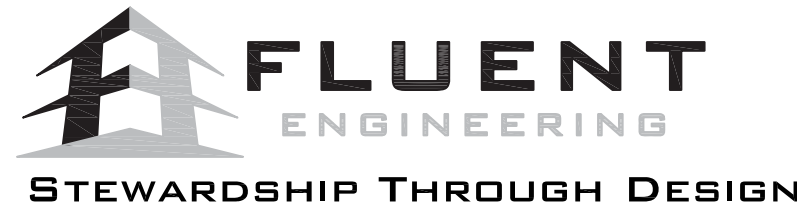
REF #	SCOPE ITEMS	FURNISHED BY OIT	PROVIDED BY OIT UNDER A SEPARATE CONTRACT	FURNISHED BY JCI	GEO POWER PLANT INFRASTRUCTURE DB CONTRACTOR FURNISH	GEO POWER PLANT INFRASTRUCTURE DB CONTRACTOR INSTALL	COMMENTS
1	CIVIL ENGINEERING - DESIGN FOR SITE GRADING FOR NEW GEO POWER PLANT BUILDING, COOLING TOWER FOUNDATION, PARKING AREA, AND SITE ACCESS DRIVE				X		
2	CIVIL ENGINEERING - DESIGN FOR SITE STORM WATER DRAINAGE AS WELL AS STORM DRAIN SERVICE TO NEW GEO POWER PLANT BUILDING AND COOLING TOWER				X		
3	CIVIL ENGINEERING - DESIGN FOR SITE DOMESTIC WATER SERVICE TO NEW GEO POWER PLANT BUILDING AND COOLING TOWER				X		
4	CIVIL ENGINEERING - DESIGN FOR SITE SANITARY SEWER SERVICE TO NEW GEO POWER PLANT BUILDING				X		
5	CIVIL ENGINEERING - THRUST BLOCK DESIGN FOR UNDERGROUND GEOTHERMAL WATER AND DOMESTIC WATER PIPING				X		
6	CIVIL ENGINEERING - LANDSCAPE DESIGN FOR NEW GEO POWER PLANT BUILDING	X					
7	CIVIL ENGINEERING - SITE GRADING DESIGN AND UTILITY RELOCATION REQUIRED FOR NEW ROUTING OF NEW 12" UNDERGROUND GEO HWS FROM HEAT EXCHANGE BLDG CONNECTION TO NEW BUILDING				X		COORDINATE DESIGN WITH GEOTHERMAL WELL #7 UTILITY CORRIDOR DESIGN
8	CIVIL ENGINEERING - SITE GRADING DESIGN AND UTILITY RELOCATION REQUIRED FOR NEW ROUTING OF NEW 12" UNDERGROUND GEO HWR FROM NEW BUILDING TO INJECTION PIPELINE SOUTH POINT OF CONNECTION				X		COORDINATE DESIGN WITH GEOTHERMAL INJECTION WELL #3 UTILITY CORRIDOR DESIGN
9	STRUCTURAL ENGINEERING - PRE-ENGINEERED BUILDING DESIGN FOR GEOTHERMAL POWER PLANT EQUIPMENT TO MEET APPLICABLE BUILDING CODE REQUIREMENTS				X		
10	STRUCTURAL ENGINEERING - GEO POWER PLANT UNIT FOUNDATION DESIGN				X		
11	STRUCTURAL ENGINEERING - GEO POWER PLANT BUILDING FOUNDATION DESIGN				X		
12	STRUCTURAL ENGINEERING - GEO POWER PLANT COOLING TOWER FOUNDATION AND SUPPORT STRUCTURE DESIGN				X		
13	STRUCTURAL ENGINEERING - GEO POWER PLANT SITE RETAINING WALL(S) DESIGN				X		
14	STRUCTURAL ENGINEERING - PIPING AND ELECTRICAL CONDUITS SUPPORT AND SEISMIC BRACING DESIGN				X		
15	MECHANICAL ENGINEERING - DESIGN FOR THE EXTENSION OF NEW 12 INCH GEOTHERMAL HW PIPING FROM UNDERGROUND TEE CONNECTION AT HEAT EXCHANGE BLDG TO NEW GEO POWER PLANT BUILDING. TERMINATE WITH FLANGED CONNECTION STUBBED 24 INCHES ABOVE FLOOR.				X		REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS FOR BUILDING TERMINATION POINT. COORDINATE DESIGN WITH GEOTHERMAL WELL #7 UTILITY CORRIDOR DESIGN.
16	MECHANICAL ENGINEERING - DESIGN FOR THE EXTENSION OF NEW 12 INCH GEOTHERMAL HW RE-INJECTION PIPING FROM THE NEW GEO POWER PLANT BUILDING TO RE-INJECTION PIPELINE PROJECT MANHOLE. TERMINATE IN BUILDING WITH FLANGED CONNECTION STUBBED 24 INCHES ABOVE FLOOR				X		REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS FOR BUILDING TERMINATION POINT. COORDINATE DESIGN WITH GEOTHERMAL INJECTION WELL #3 UTILITY CORRIDOR DESIGN
17	MECHANICAL ENGINEERING - GEO POWER PLANT COOLING TOWER AND INTERCONNECTING CONDENSER WATER PIPING SYSTEM DESIGN		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
18	MECHANICAL ENGINEERING - GEO POWER PLANT INTERCONNECTING GEOTHERMAL PIPING SYSTEM DESIGN WITHIN POWER PLANT BUILDING		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS. DEMARICATION FOR JCI SCOPE IS GEO HW SUPPLY AND RE-INJECTION CONNECTIONS WITHIN BUILDING PROVIDED UNDER INFRASTRUCTURE RFP
19	MECHANICAL ENGINEERING - GEO POWER PLANT DOMESTIC WATER PIPING SYSTEM DESIGN WITHIN POWER PLANT BUILDING. SYSTEM TO SERVE BUILDING HOSE BIBBS, EMERGENCY EYEWASH/SHOWER, FLOOR DRAIN TRAP PRIMERS, AND PIPING SYSTEM MAKE-UP.				X		COORDINATE WITH CIVIL DESIGN. PROVIDE MAKE-UP WATER FOR COOLING TOWER, BASIN HEATING SYSTEM, AND BUILDING HEATING SYSTEM. COORDINATE DESIGN WITH GEOTHERMAL INJECTION WELL #3 UTILITY CORRIDOR DESIGN.
20	MECHANICAL ENGINEERING - GEO POWER PLANT TOWER BASIN HEATING SYSTEM MAKE-WATER PIPING SYSTEM DESIGN WITHIN POWER PLANT BUILDING		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
21	MECHANICAL ENGINEERING - GEO POWER PLANT TOWER BASIN FILTRATION AND HEATING SYSTEM DESIGN		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
22	MECHANICAL ENGINEERING - GEO POWER PLANT TOWER NON-CHEMICAL TREATMENT SYSTEM DESIGN		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
23	MECHANICAL ENGINEERING - GEO POWER PLANT BUILDING HEATING SYSTEM DESIGN; DESIGN OF GEOTHERMAL HWS/R PIPING BETWEEN EXIST. HEAT EXCHANGE BUILDING AND NEW BUILDING; HWS/R PIPING TO TOWER BASIN HEATER HEAT EXCHANGER.						OIT HAS DIRECTED THAT NO BUILDING HEATING WILL BE REQUIRED
24	MECHANICAL ENGINEERING - STORM DRAIN PIPING DESIGN WITHIN NEW GEO POWER PLANT BUILDING AND AT COOLING TOWER				X		COORDINATE WITH CIVIL DESIGN
25	MECHANICAL ENGINEERING - SANITARY SEWER PIPING DESIGN WITHIN NEW GEO POWER PLANT BUILDING TO SERVE FLOOR DRAINS				X		COORDINATE WITH CIVIL DESIGN
26	MECHANICAL ENGINEERING - GEO POWER PLANT REFRIGERANT VENTILATION SYSTEM DESIGN		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
27	MECHANICAL ENGINEERING - GEO POWER PLANT BUILDING VENTILATION SYSTEM DESIGN				X		
28	MECHANICAL ENGINEERING - GEO POWER PLANT UNIT CONTROL SYSTEM DESIGN		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
29	MECHANICAL ENGINEERING - GEO POWER PLANT SYSTEM BALANCE OF PLANT CONTROL SYSTEM DESIGN		X				REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
30	MECHANICAL ENGINEERING - GEO POWER PLANT BUILDING VENTILATION EQUIPMENT CONTROL SYSTEM DESIGN				X		
31	MECHANICAL ENGINEERING - GEO POWER PLANT PIPING AND EQUIPMENT INSTALLATION DESIGN				X		
32	ELECTRICAL ENGINEERING - CONDUCT INTERCONNECTION APPLICATION PROCESS ON BEHALF OF OIT	X					
33	ELECTRICAL ENGINEERING - INTERCONNECTION DESIGN AND COORDINATION WITH LOCAL UTILITY.				X		
34	ELECTRICAL ENGINEERING - COORDINATION WITH INTERCONNECTION ENGINEER TO FURNISH INFORMATION FOR GEO POWER PLANT EQUIPMENT				X		
35	ELECTRICAL ENGINEERING - ELECTRICAL DESIGN FOR GEO POWER PLANT ELECTRICAL SYSTEM		X				REFER TO JCI GEO POWER PLANT ELECTRICAL DRAWINGS
36	ELECTRICAL ENGINEERING - ELECTRICAL FEEDER DESIGN FOR GEO POWER PLANT EQUIPMENT		X				REFER TO JCI GEO POWER PLANT ELECTRICAL DRAWINGS
37	ELECTRICAL ENGINEERING - ELECTRICAL DESIGN FOR GEO POWER PLANT BUILDING ELECTRICAL SERVICE FROM GPPU EXTERIOR UTILITY DISCONNECT (SHOWN ON E1.0) TO UTILITY INTERCONNECTION				X		
38	ELECTRICAL ENGINEERING - ELECTRICAL METERING DESIGN (IN CONJUNCTION WITH WEST ENGINEERS)				X		

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REF #	SCOPE ITEMS	FURNISHED BY OIT	PROVIDED BY OIT UNDER A SEPARATE CONTRACT	FURNISHED BY JCI	GEO POWER PLANT INFRASTRUCTURE DB CONTRACTOR FURNISH	GEO POWER PLANT INFRASTRUCTURE DB CONTRACTOR INSTALL	COMMENTS
39	ELECTRICAL ENGINEERING - DETERMINATION OF GEO POWER PLANT TRANSFORMER REQUIREMENTS - DESIGN FOR REPLACEMENT OF 1000 KVA TRANSFORMER WITH LARGER TRANSFORMER IF REQUIRED				X		COORDINATE WITH UTILITY INTERCONNECTION REQUIREMENTS
40	ELECTRICAL ENGINEERING - DESIGN FOR ELECTRICAL INTERCONNECT PROVISIONS REQUIRED BY LOCAL UTILITY FOR INTERCONNECTION				X		
41	ELECTRICAL ENGINEERING - GEO POWER PLANT BUILDING LIGHTING AND BUILDING RECEIPT POWER DESIGN				X		
42	ELECTRICAL ENGINEERING - GEO POWER PLANT BUILDING GROUNDING SYSTEM DESIGN				X		
43	GEOTECH ENGINEERING - GEOTECHNICAL SURVEY AND REPORT FOR GEO POWER PLANT BUILDING AND COOLING TOWER FOUNDATION				X		
44	GENERAL - ANCHOR BOLTS FOR THE EQUIPMENT IN JCI EQUIPMENT SCOPE				X	X	COORDINATE WITH JCI EQUIPMENT SUPPLIERS TO INSTALL ALL REQUIRED ANCHOR BOLTS
45	GENERAL - FIELD MARKUPS OF ENGINEER DRAWINGS - CONSTRUCTION RECORD				X	X	
46	GENERAL - PERMIT FEES	X					
47	GENERAL - PROVIDE ON-SITE SUPPORT DURING COMMISSIONING			X	X	X	
48	GENERAL - PROVIDE STARTUP ON-SITE SUPPORT	X		X	X	X	
49	GENERAL - PROVIDE OWNER TRAINING OF GEO POWER PLANT SYSTEM EQUIPMENT			X			
50	GENERAL - PROVIDE OWNER TRAINING OF GEO POWER PLANT BUILDING SYSTEM EQUIPMENT				X		
51	GENERAL - OIT FACILITY SUPPORT DURING COMMISSIONING	X					
52	GENERAL - EQUIPMENT RIGGING OF EQUIPMENT SUPPLIED BY JCI (RECEIVE, UNLOAD, SET)				X	X	INCLUDING COST OF CRANE & LABOR
53	GENERAL - PAINTING OF BUILDING STEEL, EXTERIOR STRUCTURAL SUPPORTS, AND UNINSULATED PIPING (ONLY AS REQUIRED BY PLANS & SPECS)				X	X	
54	GENERAL - SUPERVISION OF GEO POWER PLANT SYSTEM INSTALLATION CONTRACTORS			X			
55	GENERAL - SUPERVISION OF GEO POWER PLANT BUILDING CONSTRUCTION INCLUDING SITE WORK, RETAINING WALLS, AND EQUIPMENT FOUNDATIONS				X		
56	GENERAL - OVERALL PROJECT SCHEDULING				X		
57	GENERAL - TEMPORARY SHELTERED STORAGE FOR MATERIALS SUCH AS PIPING, INSULATION, ETC.	X					
58	CIVIL - TEMPORARY FENCING				X	X	
59	CIVIL - SITE EXCAVATION, BACKFILL, AND COMPACTION REQUIRED FOR NEW GEO POWER PLANT BUILDING FOUNDATIONS, COOLING TOWER FOUNDATIONS, PARKING AREA, AND SITE ACCESS DRIVE				X	X	
60	CIVIL - SITE ELEVATIONS, GRADING, AND LEVELING FOR NEW GEO POWER PLANT BUILDING, COOLING TOWER FOUNDATION, PARKING AREA, AND SITE ACCESS DRIVE				X	X	
61	CIVIL - SITE STORM WATER DRAINAGE AROUND NEW GEO POWER PLANT BUILDING AND COOLING TOWER				X	X	
62	CIVIL - SITE ACCESS ROADS / PARKING LOT TO BE GRAVEL BASE DESIGNED PER ODOT REQUIREMENTS				X	X	
63	CIVIL - EXCAVATION AND BACKFILL FOR BUILDING UNDERGROUND ELECTRICAL AND PLUMBING				X	X	
64	CIVIL - BOLLARDS				X	X	
65	CIVIL - SITE STORM SEWER TO WITHIN 5 FT OF BUILDING, BACKFILL, COMPACTION				X	X	
66	CIVIL - SITE SANITARY SEWER TO WITHIN 5 FT OF BUILDING, BACKFILL, COMPACTION				X	X	
67	CIVIL - SITE DOMESTIC WATER PIPING TO WITHIN 5 FT OF BUILDING, BACKFILL, COMPACTION				X	X	
68	CIVIL - SITE STORM DRAINAGE STRUCTURES				X	X	
69	CIVIL - EROSION CONTROL & MAINTENANCE DURING CONSTRUCTION				X	X	
70	CIVIL - SITE RESTORATION, LANDSCAPING, SEED, STRAW	X					
71	CIVIL - SITE GRADING AND UTILITY RELOCATION REQUIRED FOR NEW ROUTING OF NEW 12" UNDERGROUND GEO HWS FROM HEAT EXCHANGE BLDG CONNECTION TO NEW BUILDING		X				
72	CIVIL - SITE GRADING AND UTILITY RELOCATION REQUIRED FOR NEW ROUTING OF NEW 12" UNDERGROUND GEO HWR FROM NEW BUILDING TO INJECTION PIPELINE SOUTH CONNECTION		X				
73	STRUCTURAL - FOUNDATION FOR GEO POWER PLANT UNIT				X	X	
74	STRUCTURAL - FOUNDATION FOR GEO POWER PLANT BUILDING				X	X	
75	STRUCTURAL - ANCHORAGE OF OF JCI EQUIPMENT TO MEET JCI REQUIREMENTS AND BUILDING CODE SEISMIC REQUIREMENTS				X	X	INCLUDES COORDINATION WITH JCI FURNISHED EQUIPMENT ANCHOR BOLT LOCATIONS WITH FOUNDATION DESIGN
76	STRUCTURAL - COOLING TOWER FOUNDATIONS AND RETAINING WALLS				X	X	COORDINATE WITH JCI EQUIPMENT INFORMATION
77	STRUCTURAL - COOLING TOWER SUPPORT STRUCTURE				X	X	COORDINATE WITH JCI EQUIPMENT INFORMATION
78	STRUCTURAL - PADS FOR ELECTRICAL EQUIPMENT				X	X	COORDINATE WITH JCI EQUIPMENT INFORMATION
79	STRUCTURAL - PADS FOR MECHANICAL EQUIPMENT				X	X	COORDINATE WITH JCI EQUIPMENT INFORMATION
80	STRUCTURAL - SUPPLY AND INSTALL AN PRE-ENGINEERED ENCLOSED BUILDING TO HOUSE GEO POWER PLANT AND ASSOCIATED EQUIPMENT				X	X	COORDINATE WITH JCI EQUIPMENT LAYOUT PLAN
81	STRUCTURAL - ALL BUILDING CONCRETE WORK, FOOTINGS, FOUNDATIONS, FLAT WORK				X	X	COORDINATE WITH JCI EQUIPMENT LAYOUT PLAN
82	STRUCTURAL - STEEL FOR BUILDING CONSTRUCTION				X	X	COORDINATE WITH JCI EQUIPMENT LAYOUT PLAN
83	STRUCTURAL - STEEL FOR COOLING TOWER SUPPORT FRAME				X	X	COORDINATE WITH JCI EQUIPMENT LAYOUT PLAN
84	STRUCTURAL - MECHANICAL PIPING AND ELECTRICAL CONDUIT SUPPORTS AND SEISMIC BRACING				X	X	COORDINATE WITH JCI MECHANICAL AND ELECTRICAL DRAWINGS
85	MECHANICAL EQUIPMENT - GEO POWER PLANT UNIT			X			REFER TO JCI EQUIPMENT INFORMATION
86	MECHANICAL EQUIPMENT - COOLING TOWER			X			REFER TO JCI EQUIPMENT INFORMATION
87	MECHANICAL EQUIPMENT - (2) CONDENSER WATER PUMPS			X			REFER TO JCI EQUIPMENT INFORMATION
88	MECHANICAL EQUIPMENT - (2) NON-CHEMICAL WATER TREATMENT SYSTEMS			X			REFER TO JCI EQUIPMENT INFORMATION
89	MECHANICAL EQUIPMENT - TOWER FILTRATION SYSTEM			X			REFER TO JCI EQUIPMENT INFORMATION
90	MECHANICAL EQUIPMENT - GEOTHERMAL WATER AUTO STRAINER			X			REFER TO JCI EQUIPMENT INFORMATION
91	MECHANICAL EQUIPMENT - TOWER BASIN HEATING SYSTEM PUMP AND HEAT EXCHANGER			X			REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
92	MECHANICAL EQUIPMENT - GEO POWER PLANT SYSTEM MAKE-UP WATER BACKFLOW PREVENTER			X			REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS



Engineering by:
 Brian Brown Engineering LLC
 PO Box 563
 Fort Klamath, Oregon 97626
 541-783-3347



695 COMMERCIAL ST. SE
 SALEM, OREGON 97301
 503-447-5030
 FLUENTENGINEERING.COM



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Geothermal Power Plant
 Oregon Institute of Tech.
 Klamath Falls, OR

Johnson Controls, Inc.

No.	Revision	Date

GEOTHERMAL POWER PLANT
 EQUIPMENT LAYOUT
 RESPONSIBILITY MATRIX

JOB NO: XXXX
 DATE: 10.16.12
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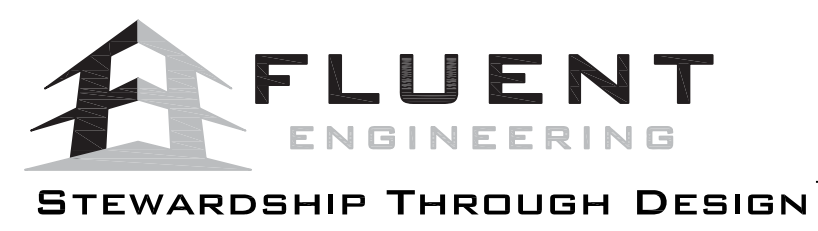
G1.1

REF #	SCOPE ITEMS	FURNISHED BY OIT PROVIDED BY OIT UNDER A SEPARATE CONTRACT	FURNISHED BY JCI	GEO POWER PLANT INFRASTRUCTURE DB CONTRACTOR FURNISH	GEO POWER PLANT INFRASTRUCTURE DB CONTRACTOR INSTALL	COMMENTS
93	MECHANICAL EQUIPMENT - REFRIGERANT MONITOR AND EXHAUST FAN		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
94	MECHANICAL EQUIPMENT - (4) COOLING TOWER VFDS		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
95	MECHANICAL EQUIPMENT - (2) CONDENSER PUMP VFDS		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
96	MECHANICAL EQUIPMENT - HEAT TRACE SYSTEM FOR EXTERIOR PIPING		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
97	MECHANICAL - GEO POWER PLANT COOLING TOWER AND INTERCONNECTING CONDENSER WATER PIPING SYSTEM		X		X	
98	MECHANICAL - GEO POWER PLANT INTERCONNECTING GEOTHERMAL PIPING SYSTEM WITHIN POWER PLANT BUILDING		X		X	
99	MECHANICAL - EXTENSION OF 12 INCH GEOTHERMAL HW PIPING FROM UNDERGROUND TEE CONNECTION AT HEAT EXCHANGE BLDG TO NEW GEO POWER PLANT BUILDING. TERMINATE WITH FLANGED CONNECTION STUBBED 24 INCHES ABOVE FLOOR			X	X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS FOR BUILDING TERMINATION POINT. COORDINATE DESIGN WITH GEOTHERMAL WELL #7 UTILITY CORRIDOR DESIGN.
100	MECHANICAL - EXTENSION OF 12 INCH GEOTHERMAL HW RE-INJECTION PIPING FROM NEW GEO POWER PLANT BUILDING TO RE-INJECTION PIPELINE PROJECT SOUTH CONNECTION POINT. TERMINATE IN BUILDING WITH FLANGED CONNECTION STUBBED 24 INCHES ABOVE FLOOR. TERMINATE IN MANHOLE WITH FLANGED CONNECTION.			X	X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS FOR BUILDING TERMINATION POINT. COORDINATE DESIGN WITH GEOTHERMAL INJECTION WELL #3 UTILITY CORRIDOR DESIGN
101	MECHANICAL - GEO POWER PLANT DOMESTIC WATER PIPING SYSTEM WITHIN POWER PLANT BUILDING. SYSTEM TO INCLUDE BUILDING HOSE BIBBS, EMERGENCY EYEWASH/SHOWERS, FLOOR DRAIN TRAP PRIMERS, AND ASSOCIATED PIPING SYSTEM SPECIALTIES			X	X	COORDINATE WITH CIVIL DESIGN. PROVIDE MAKE-UP WATER FOR COOLING TOWER, BASIN HEATING SYSTEM, AND BUILDING HEATING SYSTEM. REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
102	MECHANICAL - GEO POWER PLANT TOWER AND BASIN HEATING SYSTEM MAKE-UP WATER PIPING WITHIN POWER PLANT BUILDING		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
103	MECHANICAL - GEO POWER PLANT TOWER BASIN FILTRATION AND HEATING SYSTEM		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
104	MECHANICAL - GEO POWER PLANT TOWER NON-CHEMICAL TREATMENT SYSTEM CONTROLS AND PIPING		X		X	REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
105	MECHANICAL - GEO POWER PLANT BUILDING HEATING SYSTEM; GEOTHERMAL HWS/R PIPING BETWEEN EXIST. HEAT EXCHANGE BUILDING AND NEW BUILDING; HWS/R PIPING TO TOWER BASIN HEATER HEAT EXCHANGER.	X				UTILIZE GEOTHERMAL HEATING WATER FROM EXISTING HEAT EXCHANGE BUILDING. REFER TO JCI GEO POWER PLANT MECHANICAL DRAWINGS
106	MECHANICAL - STORM DRAIN PIPING WITHIN NEW GEO POWER PLANT BUILDING AND AT COOLING TOWER			X	X	COORDINATE WITH CIVIL DESIGN
107	MECHANICAL - SANITARY SEWER PIPING, FLOOR DRAINS, CLEANOUTS, AND ASSOCIATED PLUMBING SPECIALTIES WITHIN NEW GEO POWER PLANT BUILDING TO SERVE FLOOR DRAINS AND FUTURE RESTROOMS			X	X	COORDINATE WITH CIVIL DESIGN
108	MECHANICAL - GEO POWER PLANT REFRIGERANT VENTILATION SYSTEM DUCTWORK		X		X	COORDINATE WITH JCI MECHANICAL DRAWINGS
109	MECHANICAL - GEO POWER PLANT BUILDING VENTILATION SYSTEM			X	X	
110	MECHANICAL - GEO POWER PLANT BUILDING PIPING SYSTEM CLEANING, FLUSHING AND TESTING			X	X	
111	TEST & BALANCE OF GEO POWER PLANT PIPING SYSTEMS AND REFRIG. EXHAUST SYSTEM		X			COORDINATE WITH JCI MECHANICAL DRAWINGS
113	MECHANICAL CONTROLS- NEW GEO POWER PLANT UNIT CONTROL SYSTEM INSTRUMENTATION AND WIRING (INCLUDING AIR COMPRESSOR SYSTEM AND PIPING)		X			GPPU CONTROLS AND INSTRUMENTATION TO BE FACTORY INSTALLED
114	MECHANICAL CONTROLS - NEW GEO POWER PLANT SYSTEM BALANCE OF PLANT CONTROL SYSTEM INSTRUMENTATION AND WIRING IN NEW GEO POWER PLANT BUILDING		X		X	
115	MECHANICAL CONTROLS- NEW POWER PLANT BUILDING VENTILATION SYSTEM CONTROL SYSTEM WIRING AND INSTRUMENTATION			X	X	
116	MECHANICAL CONTROLS - NEW CONTROL SYSTEM COMMUNICATION CAT6 WIRING BETWEEN HEAT EXCHANGE BUILDING CONTROL PANEL AND NEW POWER PLANT BUILDING CONTROL PANEL; BETWEEN NEW POWER PLANT BUILDING CONTROL PANEL TO NEW SUPPLY WELL PUMP CONTROL PANEL			X	X	
117	MECHANICAL CONTROLS - NEW CONTROL SYSTEM WIRING AND DEVICES TO CONTROL NEW SUPPLY WELL PUMP		X			
118	MECHANICAL CONTROLS - FLOW METERS AND PIPE WELLS FOR NEW GEO POWER PLANT BALANCE OF PLANT CONTROL SYSTEM		X		X	
119	ELECTRICAL EQUIPMENT - GEO POWER PLANT MCC		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
120	ELECTRICAL EQUIPMENT - GEO POWER PLANT 15 KVA TRANSFORMER		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
121	ELECTRICAL EQUIPMENT - GEO POWER PLANT EQUIPMENT SUB-DISTRIBUTION BOARD		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
122	ELECTRICAL EQUIPMENT - GEO POWER PLANT COOLING TOWER FAN DISCONNECTS		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
123	ELECTRICAL EQUIPMENT - GEO POWER PLANT BASIN HEATING PUMP STARTER/DISC.		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
124	ELECTRICAL EQUIPMENT - GEO POWER PLANT SYSTEM MDP DISTRIBUTION			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
125	ELECTRICAL EQUIPMENT - GEO POWER PLANT SYSTEM MDP PULL			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
126	ELECTRICAL EQUIPMENT - GEO POWER PLANT SYSTEM MDP MAIN			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
127	ELECTRICAL EQUIPMENT - GEO POWER PLANT SYSTEM SEL	X			X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
128	ELECTRICAL EQUIPMENT - GEO POWER PLANT SYSTEM EXTERIOR UTILITY DISCONNECT			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
129	ELECTRICAL - ELECTRICAL WIRING AND RACEWAY SYSTEMS FOR GEO POWER PLANT ELECTRICAL SYSTEM		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
130	ELECTRICAL - ELECTRICAL WIRING AND RACEWAY SYSTEMS FOR GEO POWER PLANT EQUIPMENT		X		X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
131	ELECTRICAL - ELECTRICAL SERVICE FROM GPPU EXTERIOR UTILITY DISCONNECT TO MDP EQUIPMENT AND TO GPPU MCC			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
132	ELECTRICAL - ELECTRICAL SERVICE FOR GEO POWER PLANT BUILDING; ELECTRICAL SERVICE FROM GPPU EXTERIOR UTILITY DISCONNECT (SHOWN ON E1.0) TO UTILITY INTERCONNECTION			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
133	ELECTRICAL - REPLACEMENT OF 1000 KVA TRANSFORMER WITH LARGER TRANSFORMER - IF REQUIRED			X	X	MAY BE REQUIRED DUE TO UTILITY INTERCONNECT REQUIREMENTS
134	ELECTRICAL - ELECTRICAL INTERCONNECT PROVISIONS REQUIRED BY LOCAL UTILITY FOR INTERCONNECTION			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
135	ELECTRICAL - GEO POWER PLANT BUILDING WIRING AND RACEWAY SYSTEMS TO BUILDING HVAC EQUIPMENT			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS

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136	ELECTRICAL - GEO POWER PLANT BUILDING GROUNDING SYSTEM			X	X	REFER TO GEO POWER PLANT ELECTRICAL DRAWINGS
137	ELECTRICAL - ELECTRICAL TESTING			X	X	
138	ELECTRICAL - JCI CONTROL DEVICES AND INSTRUMENTATION CALIBRATION		X			
139	ELECTRICAL - INFRASTRUCTURE SCOPE CONTROL DEVICES AND INSTRUMENTATION CALIBRATION			X	X	
140	ELECTRICAL - WIRING OF JCI CONTROLS, INSTRUMENTATION, AND NETWORK		X		X	
141	ELECTRICAL - WIRING OF INFRASTRUCTURE CONTROLS, INSTRUMENTATION, AND NETWORK			X	X	
142	ELECTRICAL - HIGH SPEED INTERNET CONNECTION	X				
143	ELECTRICAL - EXTERIOR LIGHTING FOR GPP BUILDING AND COOLING TOWER			X	X	
144	ELECTRICAL - TELEPHONES & DATA	X				
145	ELECTRICAL - JCI EQUIPMENT RELAY AND METER SETTING, CALIBRATION, TESTING, TURNOVER DOCUMENTATION		X			
146	ELECTRICAL - INFRASTRUCTURE SCOPE RELAY AND METER SETTING CALIBRATION, TESTING, TURNOVER DOCUMENTATION			X	X	
147	ELECTRICAL - TEMPORARY POWER & LIGHTING DURING CONSTRUCTION			X	X	PROVIDED AS REQUIRED
148	ELECTRICAL - WELDING OUTLETS, INCLUDING CIRCUITS, RACEWAYS			X	X	
149	ELECTRICAL - NEW SUPPLY WELL PUMP COMMUNICATION RACEWAY FROM HEAT EXCHANGE BLDG CONNECTION TO NEW GEO POWER PLANT BUILDING; BETWEEN NEW GEO POWER PLANT BUILDING TO SUPPLY WELL PUMP			X	X	COORDINATE DESIGN WITH GEOTHERMAL WELL #7 UTILITY CORRIDOR DESIGN
150	ELECTRICAL - NEW INJECTION WELL COMMUNICATION RACEWAY FROM NEW BUILDING TO INJECTION PIPELINE SOUTH CONNECTION			X	X	COORDINATE DESIGN WITH GEOTHERMAL INJECTION WELL #3 UTILITY CORRIDOR DESIGN
151	COMMISSIONING - GEO POWER PLANT EQUIPMENT		X		X	INSTALLATION CONTRACTOR TO ASSIST



Engineering by:
 Brian Brown Engineering LLC
 PO Box 583
 Fort Klamath, Oregon 97626
 541-783-3347



STEWARDSHIP THROUGH DESIGN™
 695 COMMERCIAL ST. SE
 SALEM, OREGON 97301
 503-447-5030
 FLUENTENGINEERING.COM



Expires: 12-31-2013

Geothermal Power Plant
 Oregon Institute of Tech.
 Klamath Falls, OR

Johnson Controls, Inc.

No.	Revision	Date
		2-15-12

**GEOTHERMAL POWER PLANT
 EQUIPMENT LAYOUT
 RESPONSIBILITY MATRIX**

JOB NO: XXXX
 DATE: 10.16.12
 DRAWN: BB
 CHECKED:
 CAD FILE:

G1.2

STAMP



P.O. Box 4460 - 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 - Fax: 541.773.6523
CCB No. 132902

Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT

Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4900

CLIENT:
Oregon TECH

3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

PROJECT:

MARK	DATE	DESCRIPTION

DATE: 10-19-12

PROJECT NO: 3071-02

DRAWN BY: MDR

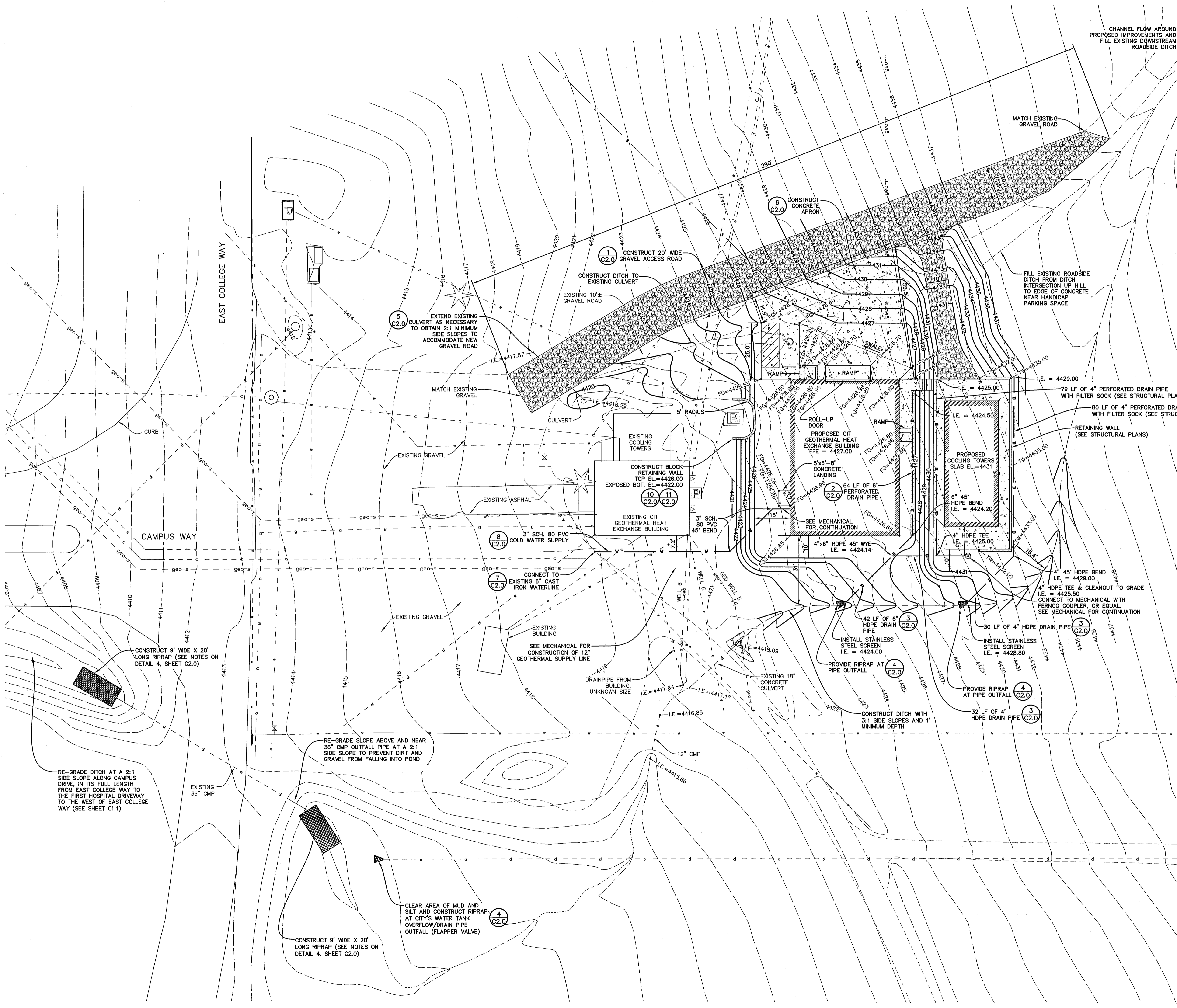
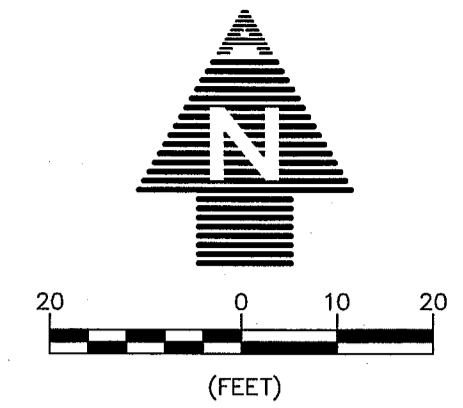
CHECKED BY: JMM

APPROVED BY OWNER DATE

SHEET TITLE:
GRADING & UTILITY PLAN

PLOT DATE: 10/22/2012 5:25 PM

C1.0



LEGEND

EXISTING

- 4436 --- CONTOUR WITH ELEVATION
- - - ELECTRICAL LINE, UNDERGROUND
- - - WATER LINE
- geo-s --- GEOTHERMAL SUPPLY LINE
- geo-r --- GEOTHERMAL RETURN LINE
- - - GAS LINE, UNDERGROUND
- - - EDGE OF GRAVEL
- - - CULVERT OR STORM PIPE
- - - COMMON UTILITY
- - - SWALE CENTERLINE
- ★ TREE
- Ⓟ POWER TRANSFORMER
- Ⓜ POWER PANEL

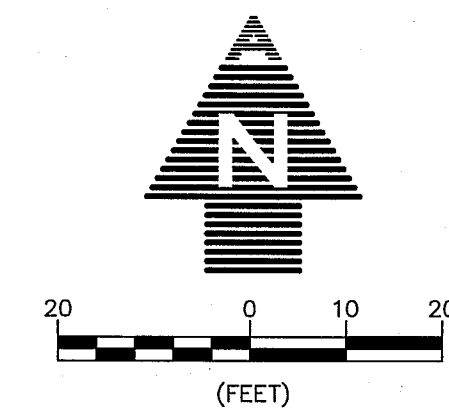
PROPOSED

- 4436 --- CONTOUR WITH ELEVATION
- ▨ BUILDING OR COOLING TOWER
- ▨ BLOCK RETAINING WALL
- - - DITCH CENTERLINE
- - - DRAIN PIPE, PERFORATED OR SOLID
- - - GEOTHERMAL SUPPLY LINE
- - - COLD WATER SUPPLY LINE
- ▨ GRAVEL
- ▨ CONCRETE
- Ⓜ ACCESS DOOR
- ▨ VAN ACCESSIBLE HANDICAP PARKING SPACE

ABBREVIATIONS

- BLDG. BUILDING
- EL. ELEVATION
- FFE FINISH FLOOR ELEVATION
- FG FINISH GRADE
- I.E. INVERT ELEVATION
- TW TOP OF WALL
- FG=4426.90 → FINISH GRADE ELEVATION
- I.E.=4426.90 → INVERT ELEVATION
- TW=4426.90 → TOP OF WALL ELEVATION

Log# Name: Jan
 Plot Date: Monday, October 22, 2012 5:25:59 PM
 File Name: 3071-02_Batzer Construction - OIT.dwg (JMM) (PANEL DESIGN) (JMM)



ADKINS
CONSULTING
ENGINEERING, LLC

2950 Shasta Way
Klamath Falls, Oregon 97603
Oregon · California

Engineers ▲ Planners ▲ Surveyors
(541) 884-4666
FAX (541) 884-5335

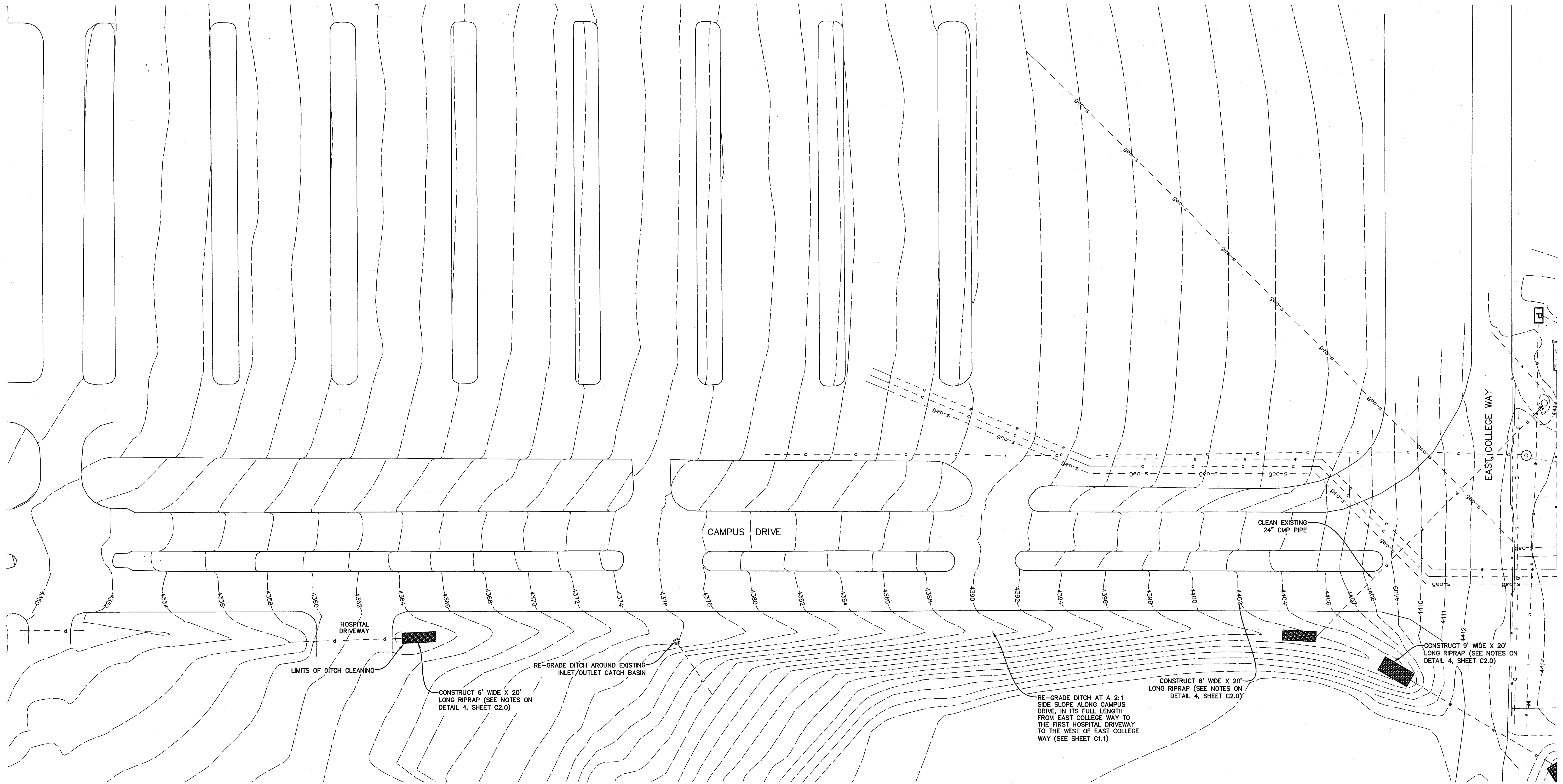
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BATZER
CONSTRUCTION

P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553, Fax: 541.773.6523
CCB No. 132802
Web: WWW.BATZERINC.COM

PROJECT: **A NEW GEOTHERMAL POWER PLANT**
Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Textlot Reference: 30 09 20 - 4900
CLIENT: **Oregon TECH**
3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600



MARK	DATE	DESCRIPTION

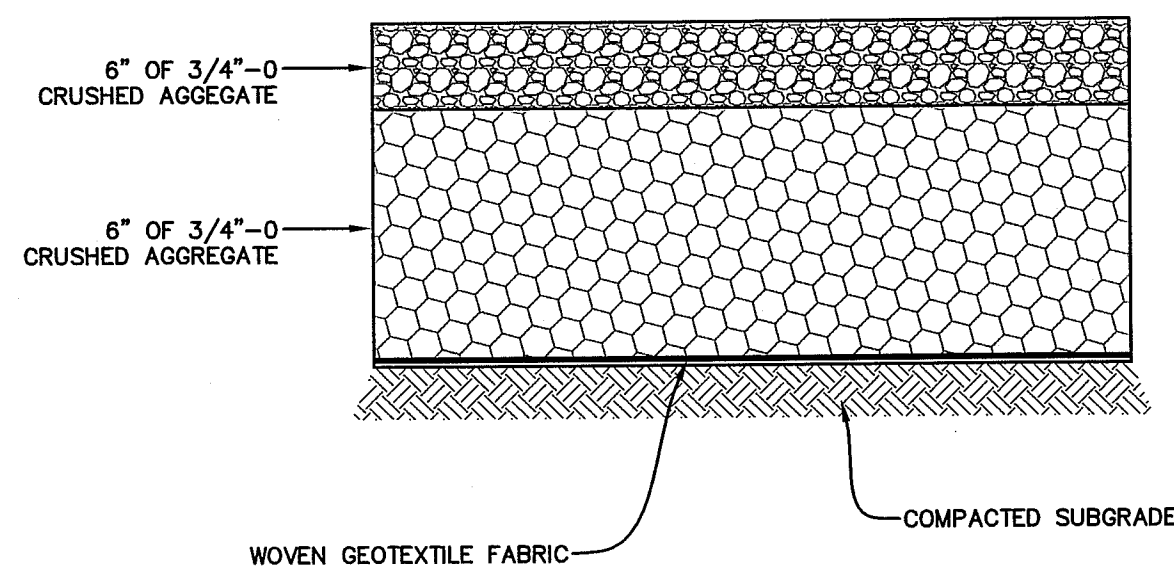
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PROJECT NO: 3071-02
DRAWN BY: MDR
CHECKED BY: JMM

APPROVED BY OWNER _____ DATE _____
SHEET TITLE:
GRADING PLAN

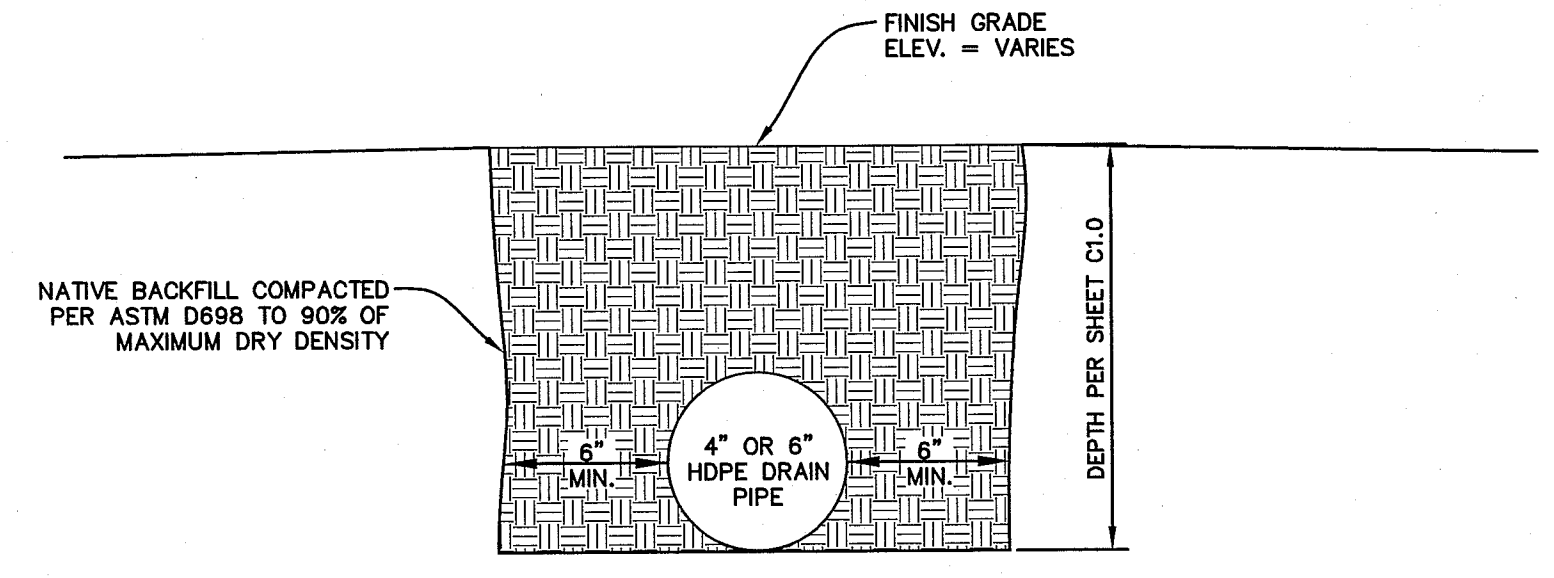
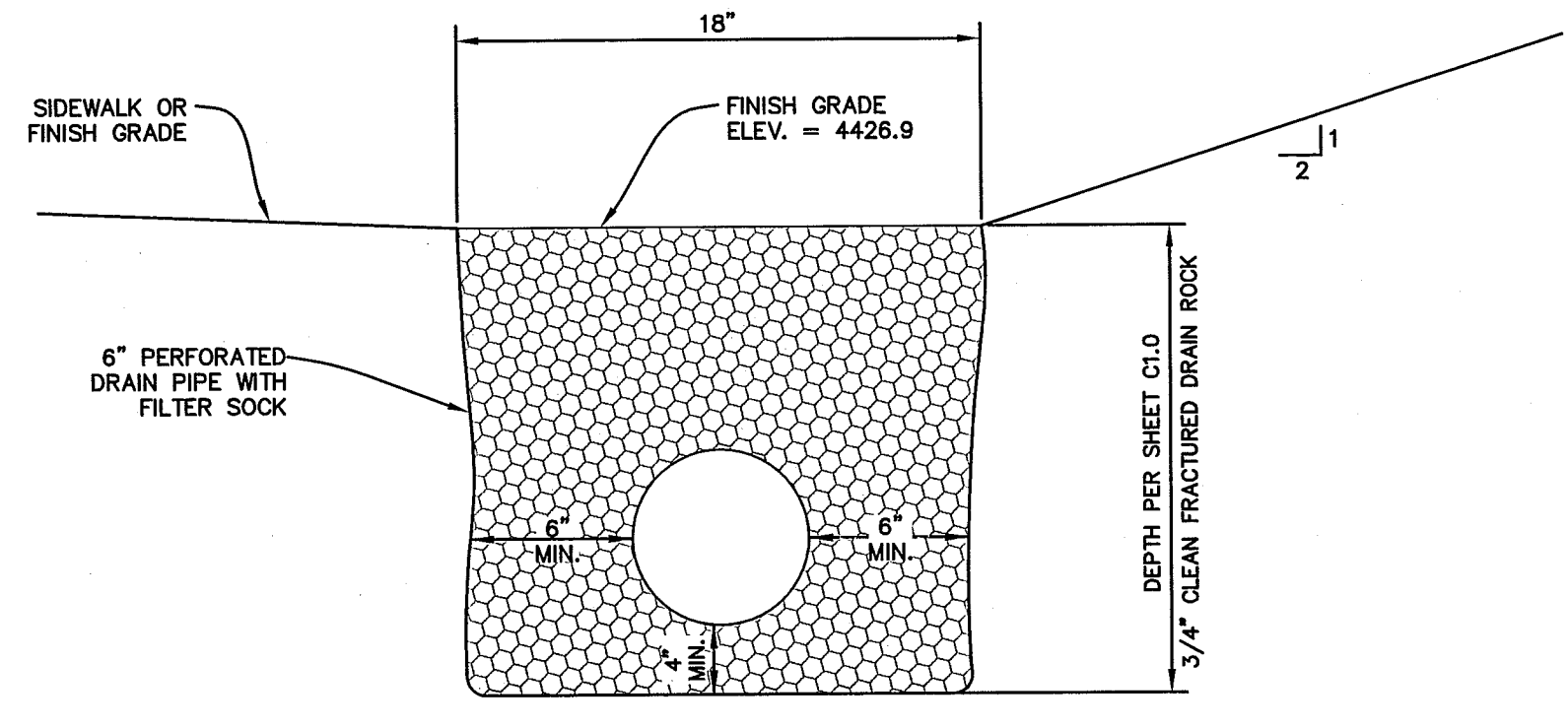
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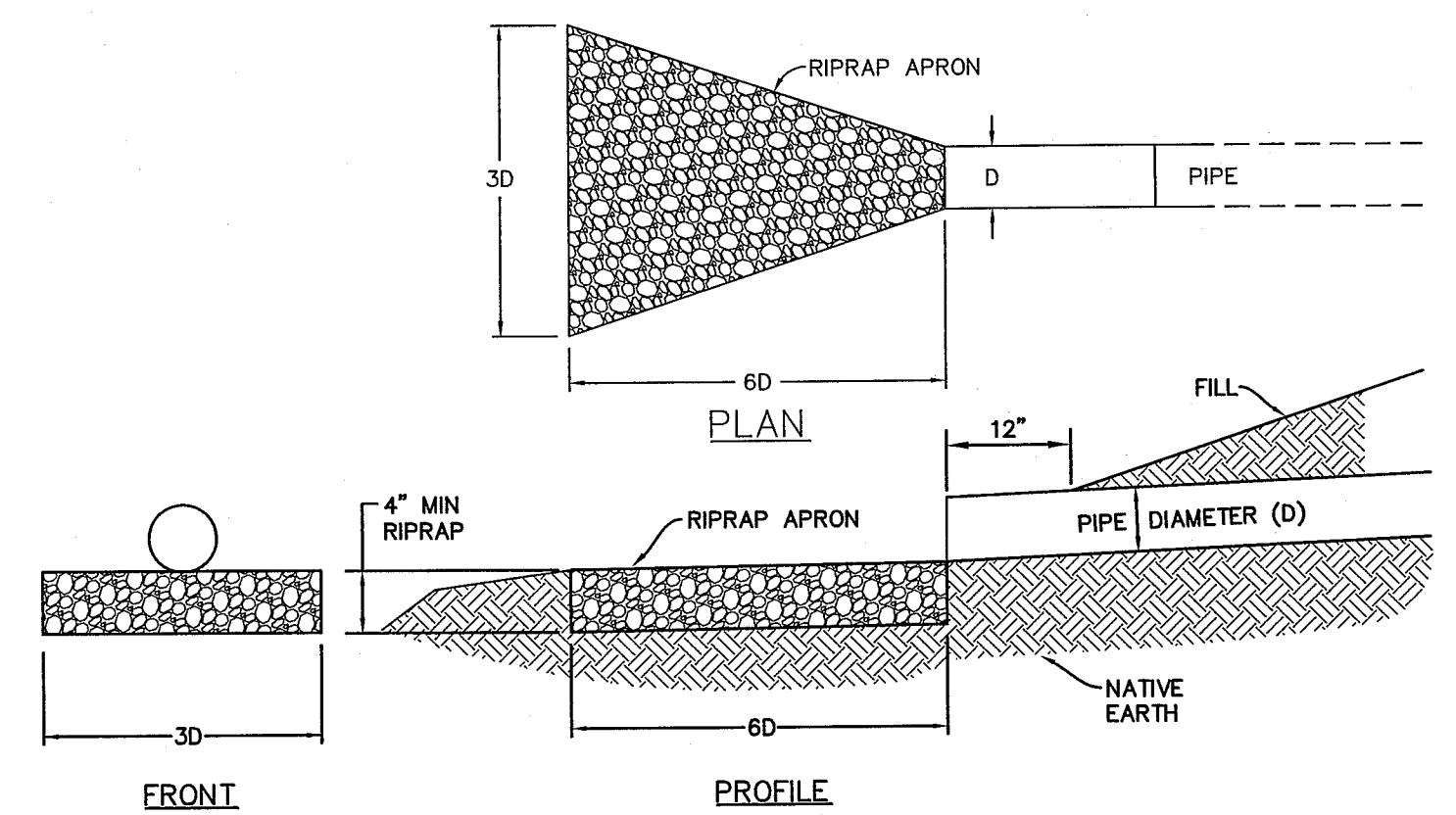
- NOTES**
- 3/4"-0 CRUSHED AGGREGATE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER ASTM D698.
 - 4"-0 CRUSHED AGGREGATE SHALL CONTAIN LESS THAN 8% PASSING THE No. 200 SIEVE (WASHED ANALYSIS) AND SHALL BE PROOF-ROLLED WITH A FULLY LOADED 10-WHEEL, TANDEM-AXLE DUMP TRUCK.
 - WOVEN GEOTEXTILE FABRIC SHALL BE 6 OUNCE MINIMUM WEIGHT.
 - SUBGRADE SHALL BE EVALUATED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ANY STRUCTURAL FILL AND SHALL HAVE A PROOF-ROLL PERFORMED THAT MEETS THE REQUIREMENTS OF NOTE 3 TO CHECK FOR SOFT SPOTS.



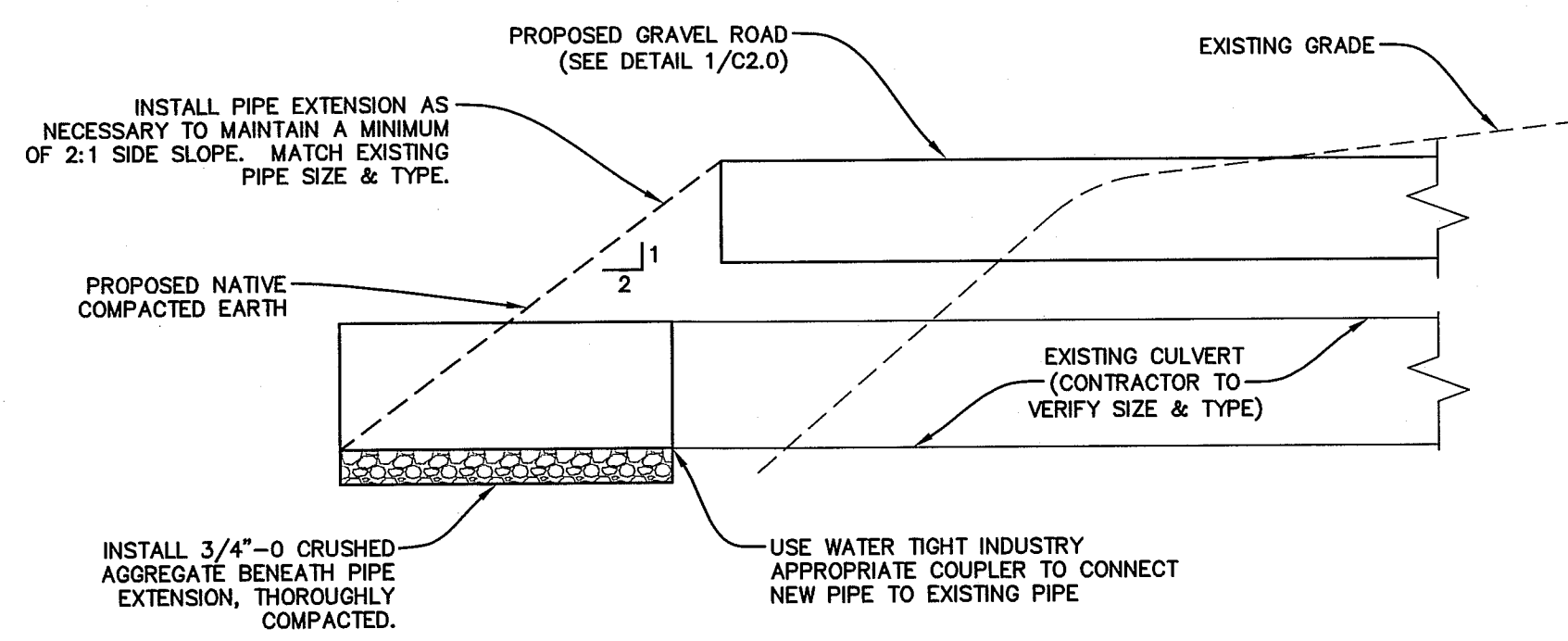
1 GRAVEL ROAD SECTION
C2.0 N.T.S.

2 TYPICAL TRENCH SECTION FOR PERFORATED DRAIN PIPE
C2.0 N.T.S.

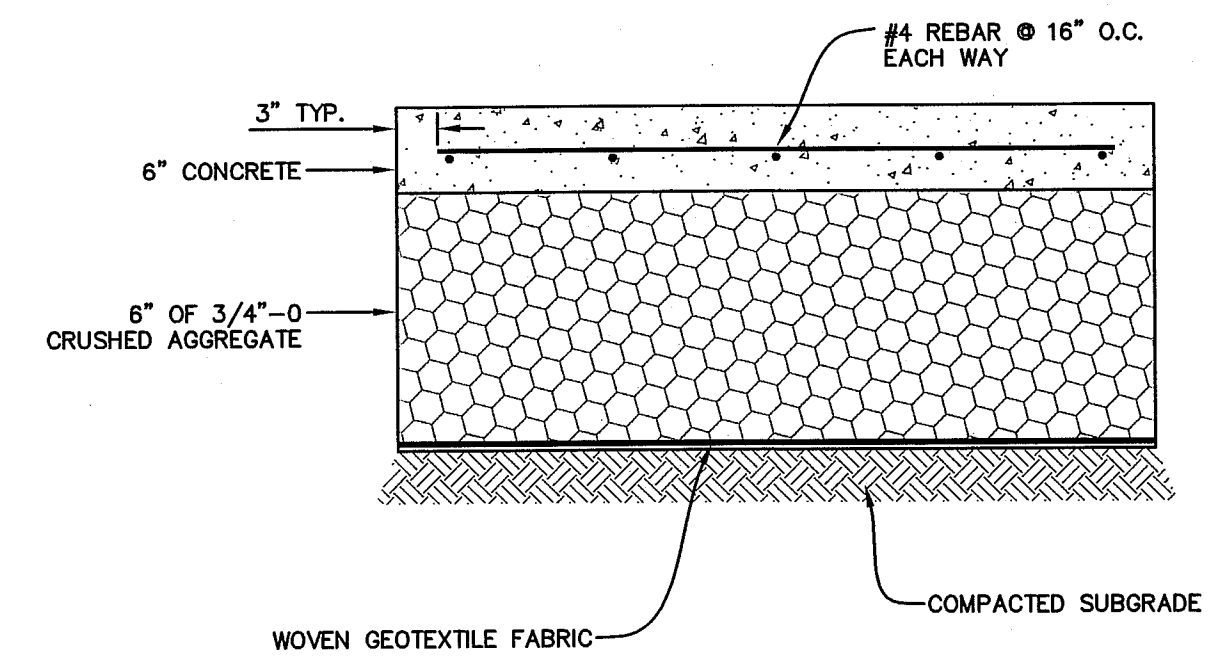
3 TYPICAL TRENCH SECTION FOR HDPE DRAIN PIPE
C2.0 N.T.S.



- NOTES**
- RIPRAP SHALL CONSIST OF 4" DIAMETER STONE PLACED AS SHOWN.
 - EMBED RIPRAP SO THAT THE SURFACE IS AT GROUND LEVEL AND DOES NOT BLOCK THE NORMAL FLOW OF THE DITCH.



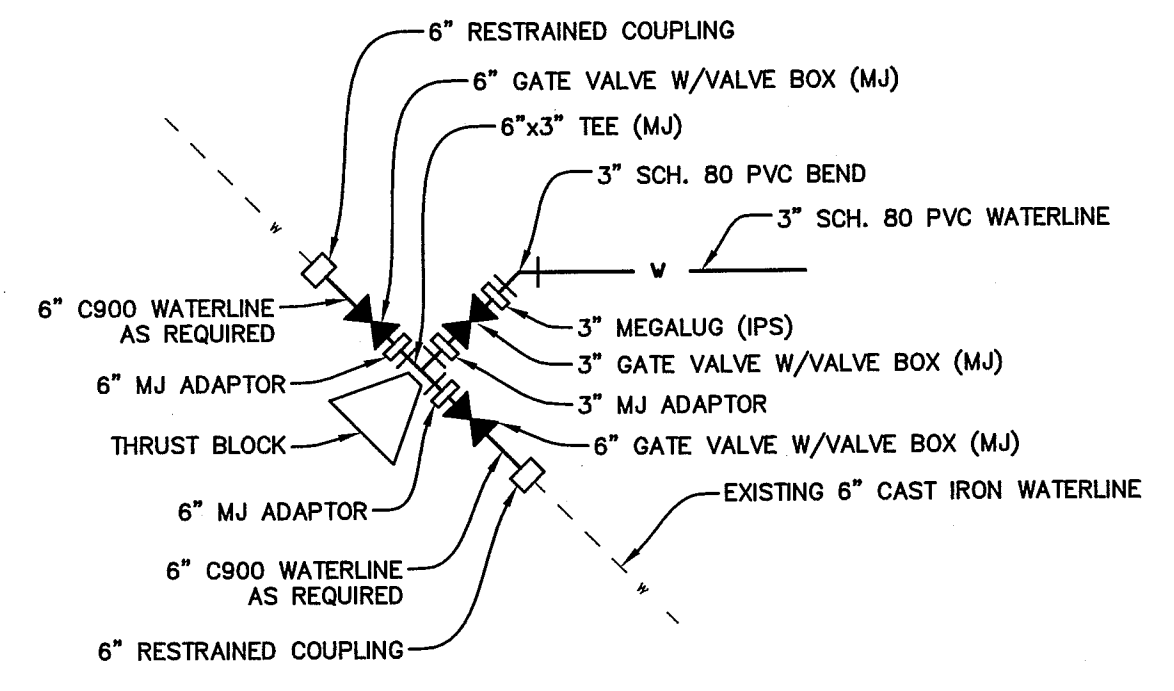
5 CULVERT EXTENSION DETAIL
C2.0 N.T.S.



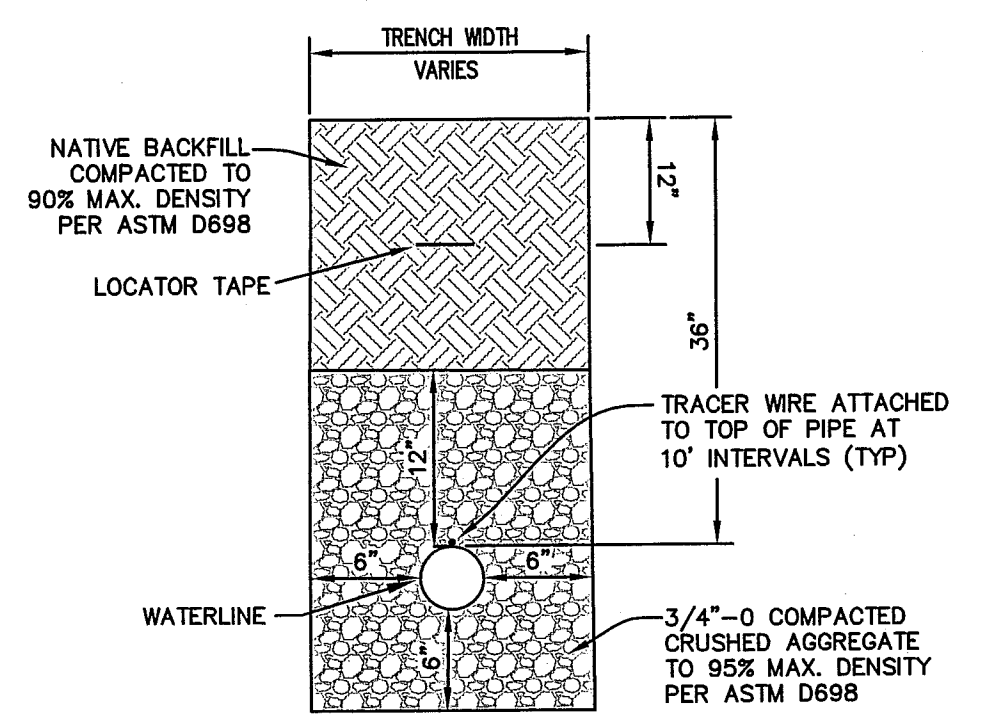
- NOTES**
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 - WOVEN GEOTEXTILE FABRIC SHALL BE 6 OUNCE MINIMUM WEIGHT.
 - SUBGRADE SHALL BE EVALUATED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ANY STRUCTURAL FILL AND SHALL HAVE A PROOF-ROLL PERFORMED THAT MEETS THE REQUIREMENTS OF NOTE 3 TO CHECK FOR SOFT SPOTS.

6 CONCRETE APRON SECTION
C2.0 N.T.S.

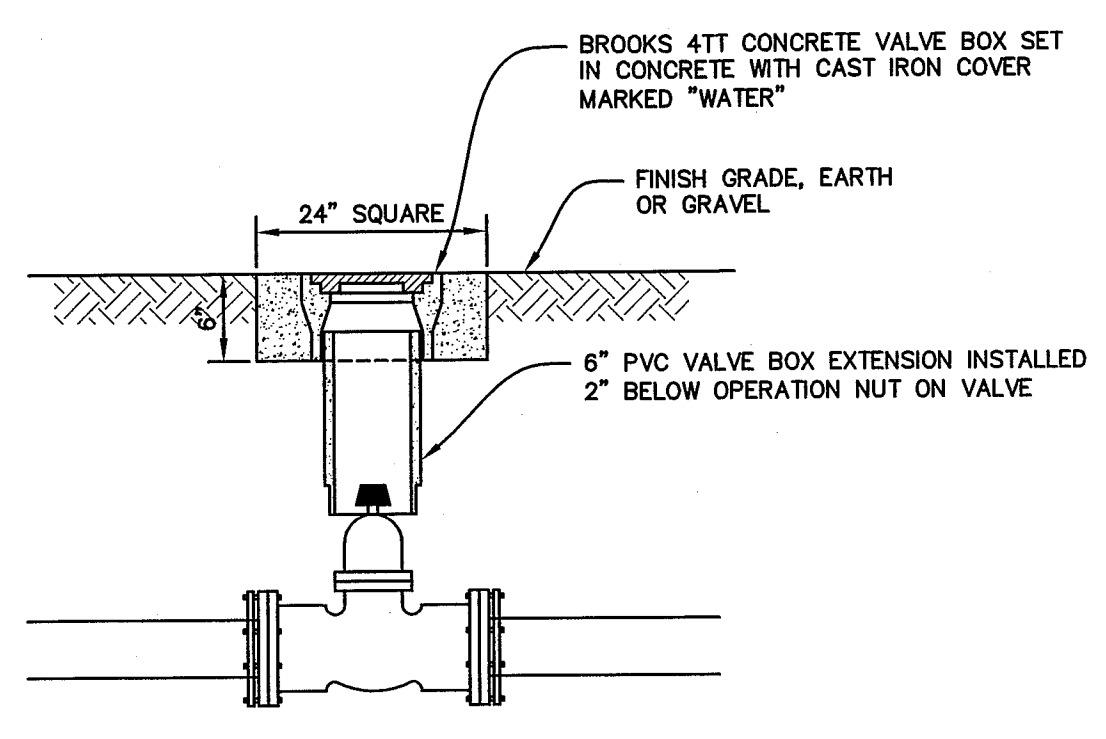
4 RIPRAP DETAIL FOR DRAIN PIPE OUTFALLS
C2.0 N.T.S.



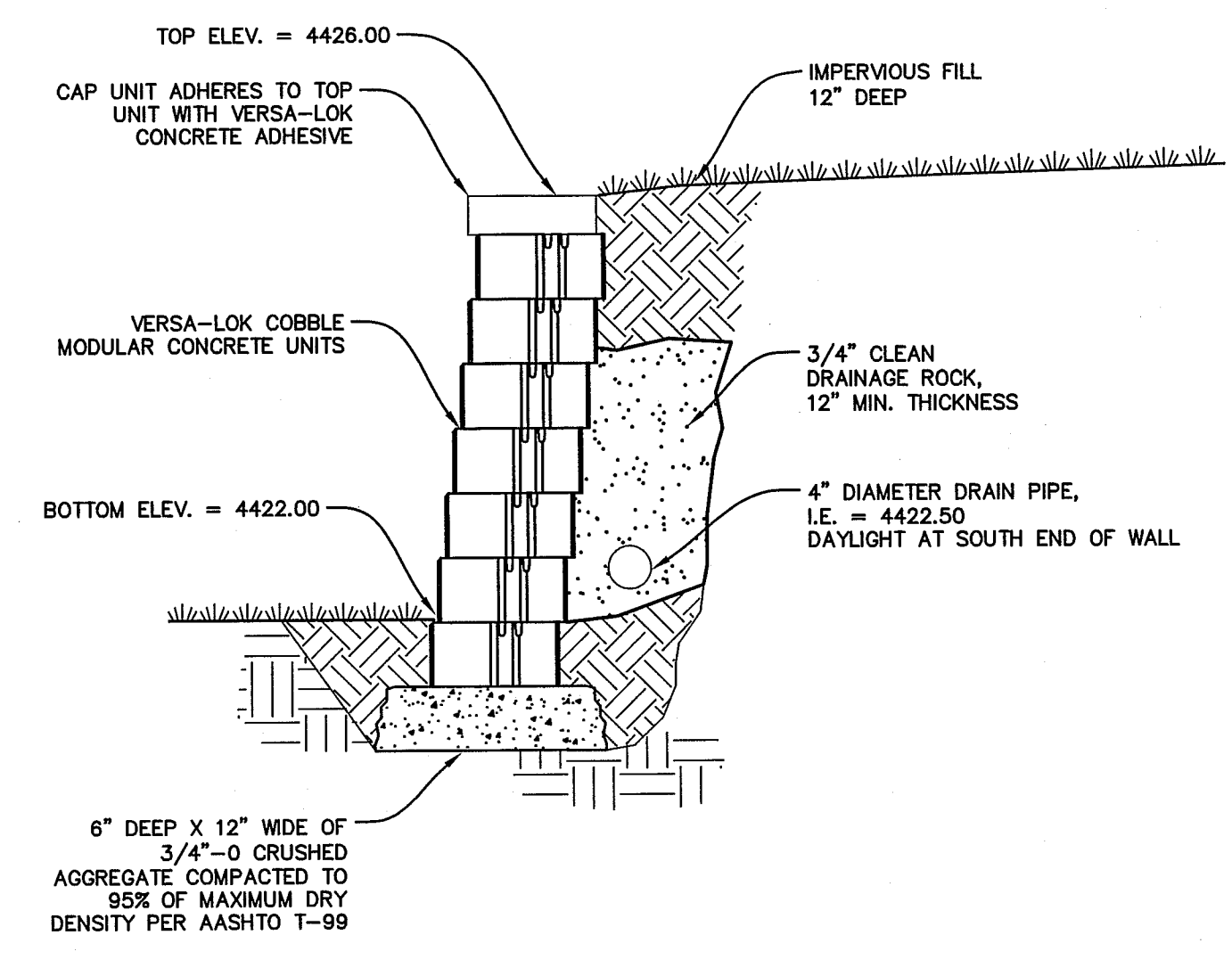
7 CONNECTION DETAIL
C2.0 N.T.S.



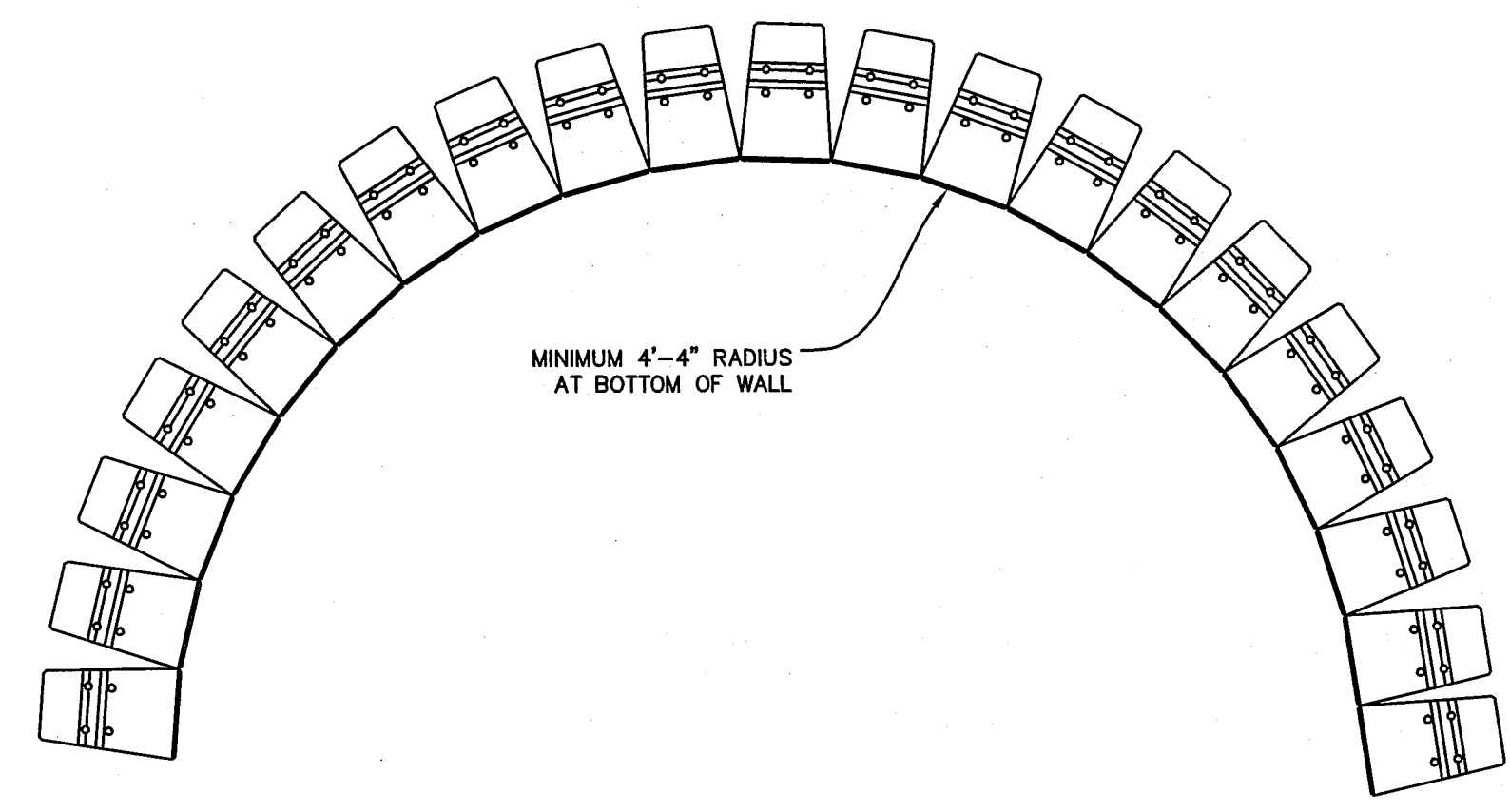
8 WATERLINE TRENCH SECTION DETAIL
C2.0 N.T.S.



9 VALVE BOX DETAIL
C2.0 N.T.S.



10 TYPICAL SECTION - UNREINFORCED RETAINING WALL
C2.0 N.T.S.



11 TYPICAL CURVE SECTION - UNREINFORCED RETAINING WALL
C2.0 N.T.S.

ADKINS
CONSULTING
ENGINEERING, LLC
2950 Shaets Way
Klamath Falls, Oregon 97603
Oregon - California
Engineers ▲ Planners ▲ Surveyors
(541) 884-4666
FAX (541) 884-5335

STAMP
REGISTERED PROFESSIONAL
ENGINEER
58062
OREGON
JANUARY 28, 2008
LONATHAN M. MORITZ
EXPIRES 12/31/12

BATZER
CONSTRUCTION
P.O. Box 4460 · 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
CCB No. 132902
Web: WWW.BATZERINC.COM

PROJECT:
A NEW GEOTHERMAL POWER PLANT
Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4900
CLIENT:
Oregon TECH 3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

MARK	DATE	DESCRIPTION

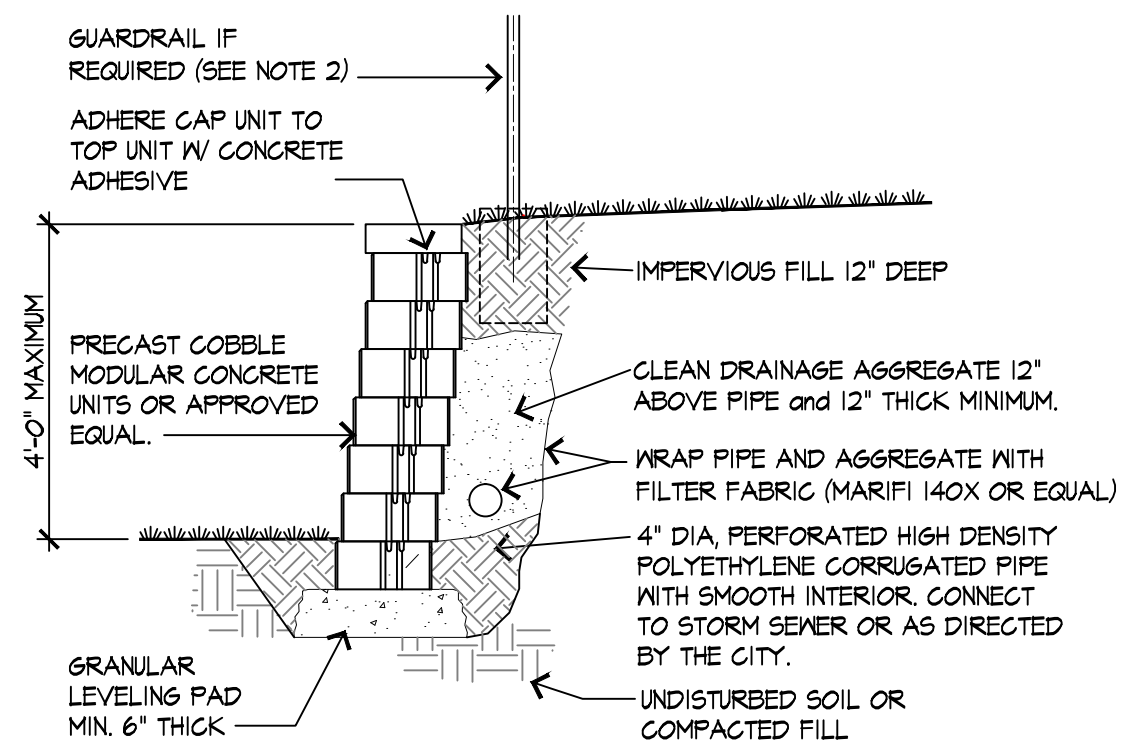
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PROJECT NO: 3071-02
DRAWN BY: MDR
CHECKED BY: JMM

APPROVED BY OWNER DATE
SHEET TITLE:
DETAILS

PLOT DATE: 10/22/2012 1:52 PM

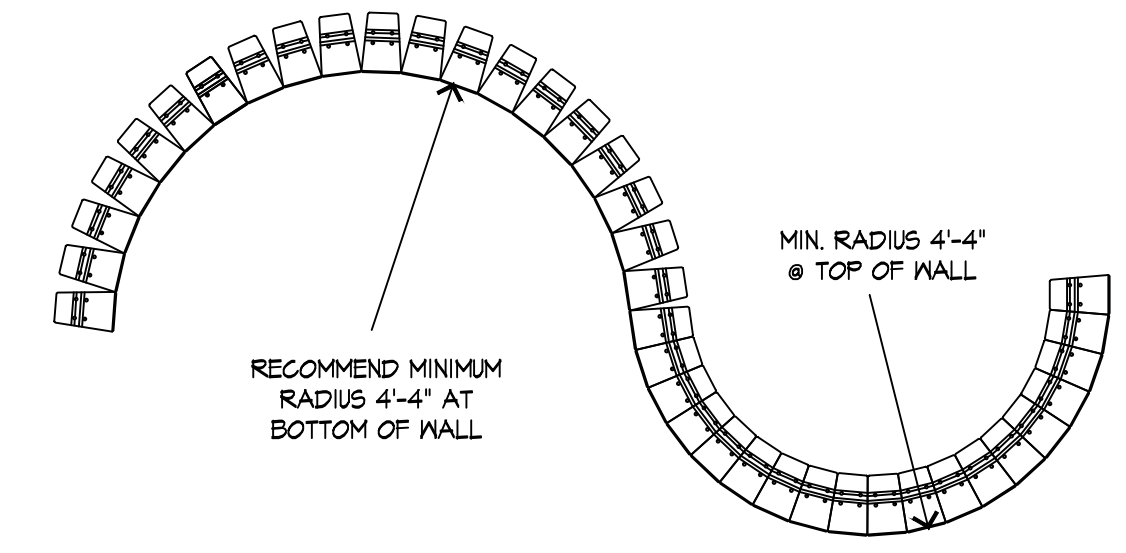
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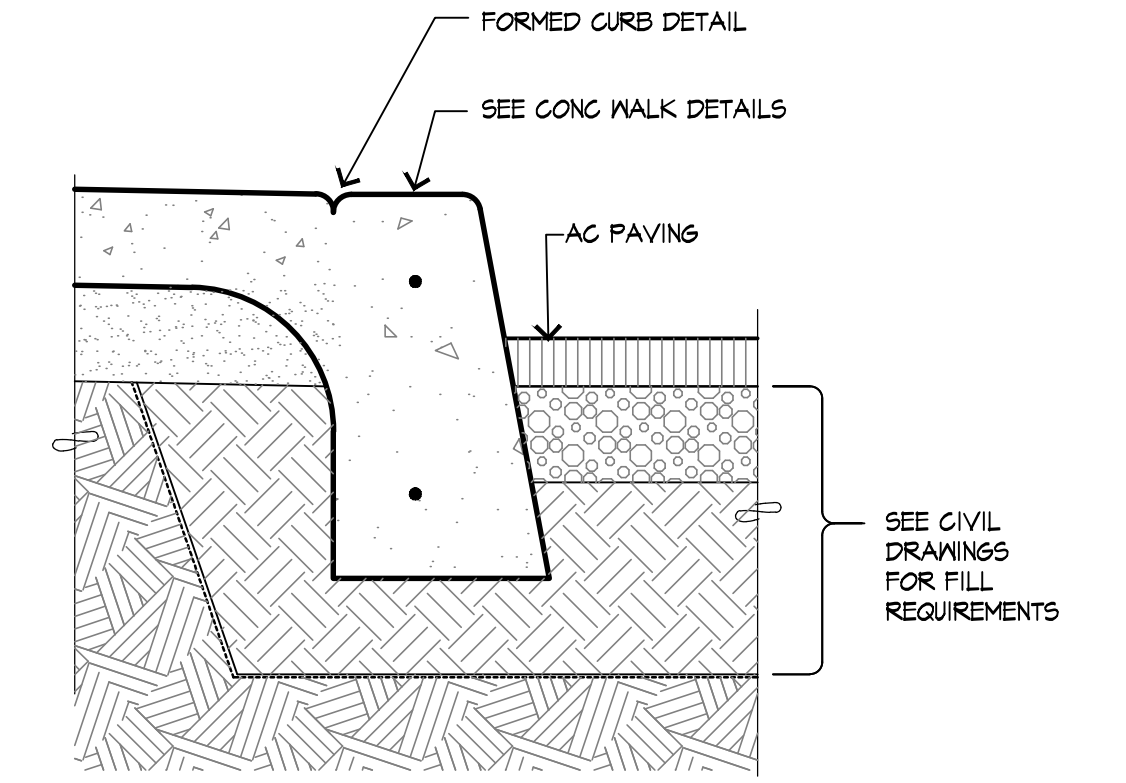
1. RETAINING WALLS OVER FOUR (4) FEET HIGH MUST BE DESIGNED BY A CIVIL ENGINEER LICENSED IN THE STATE OF OREGON PER RECOMMENDATIONS OF A LICENSED GEOTECHNICAL ENGINEER.
2. RETAINING WALLS WHICH ARE MORE THAN 30 INCHES ABOVE GRADE OR FLOOR BELOW SHALL BE PROTECTED BY A GUARDRAIL OR PEDESTRIAN RAILING. TYPE TO BE APPROVED BY THE CITY THROUGH FENCE PERMIT PROCESS.

16 TYPICAL SECTION - UNREINFORCED STACKED BLOCK RETAINING WALL
SCALE: NONE

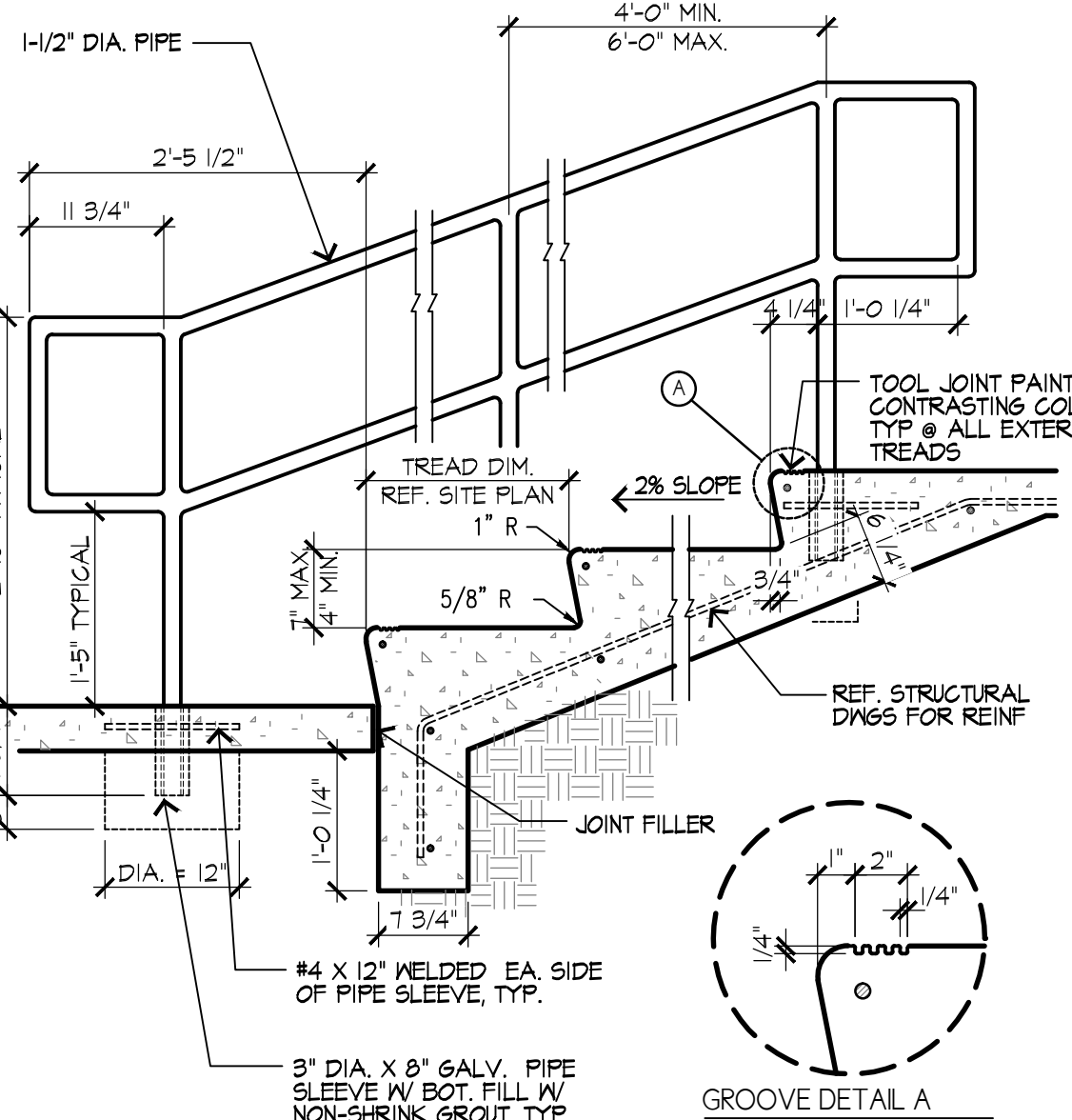


- NOTES:
• FOLLOW BLOCK MANUFACTURER'S INSTRUCTIONS and REINFORCEMENT PLACEMENT AT CURVES AND CORNERS

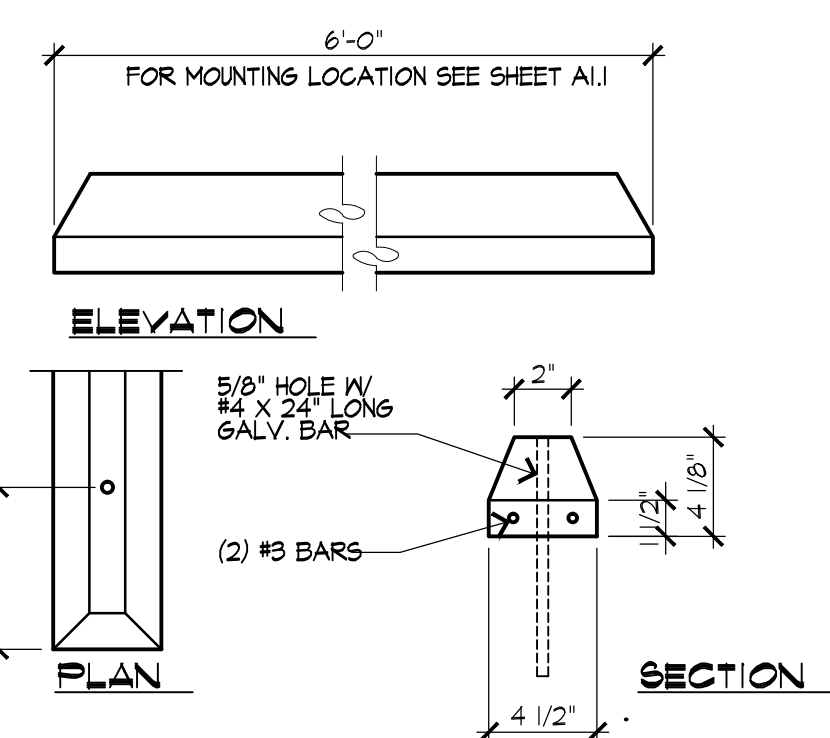
15 TYPICAL CURVE DETAIL - UNREINFORCED STACKED BLOCK RETAINING WALL
SCALE: NONE



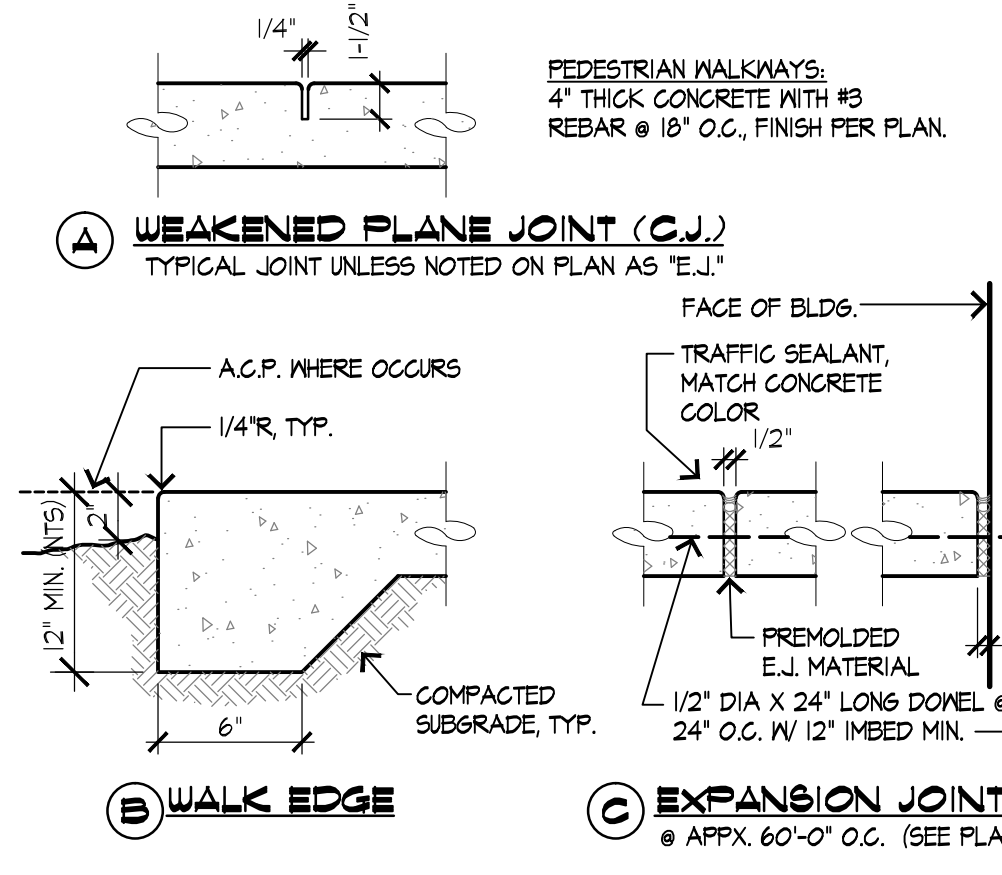
14 TYPICAL SIDEWALK TO AC TRANSITION AT WELL HOUSE
SCALE: NONE



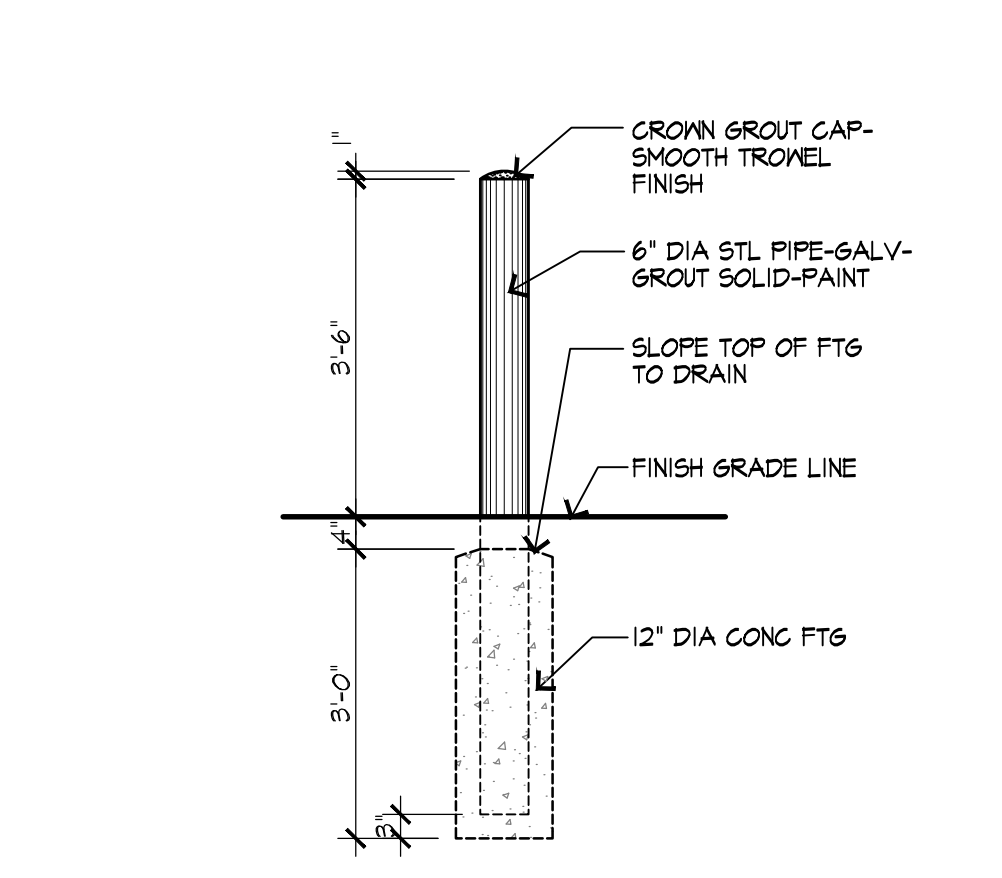
13 TYPICAL SITE STAIR & HANDRAIL DETAIL
SCALE: 3/4"=1'-0"



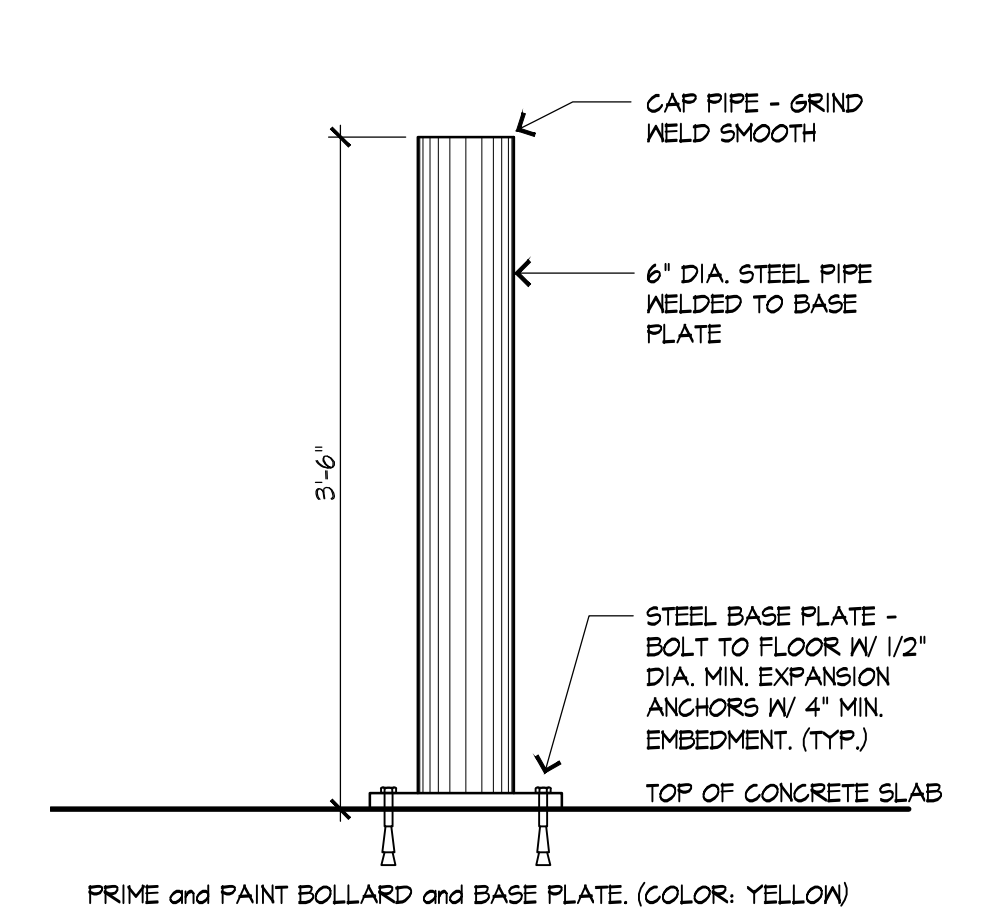
12 TYPICAL PRECAST PARKING BUMPERS
SCALE: NONE



11 TYPICAL CONCRETE WALK JOINT DETAILS
SCALE: NONE



10 TYPICAL EXTERIOR BOLLARD DETAIL
SCALE: NONE



9 FLOOR MOUNTED STEEL PIPE BOLLARD
SCALE: 1"=1'-0"

RESERVED

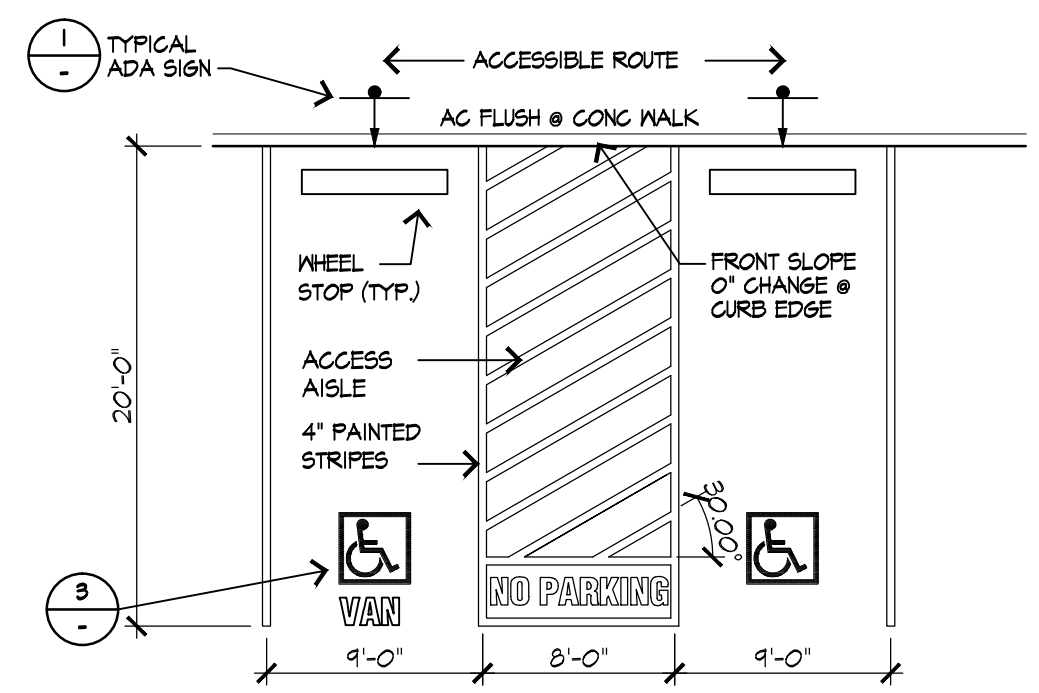
RESERVED

8 DETAIL
SCALE: NONE

7 DETAIL
SCALE: NONE

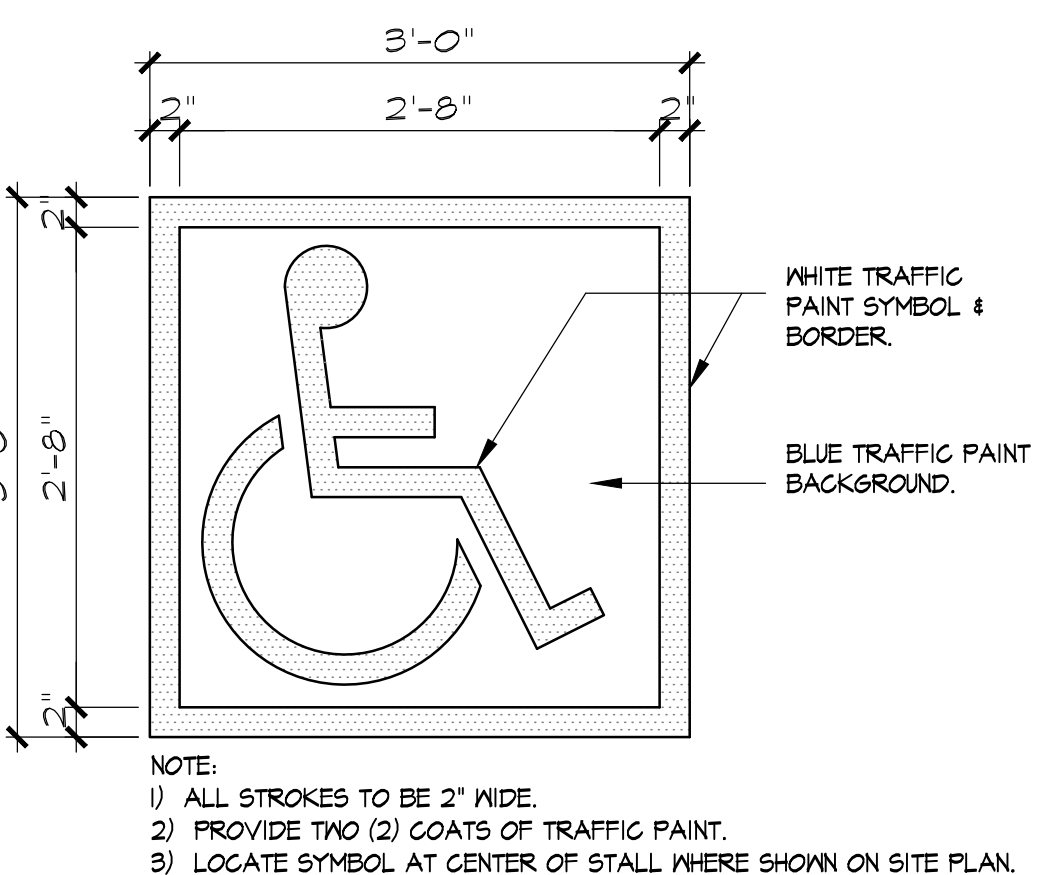
6 WARNING SIGN DETAIL
SCALE: NONE

5 FLOOR MOUNTED WELDED PIPE WALL PROTECTION
SCALE: 1/4"=1'-0"

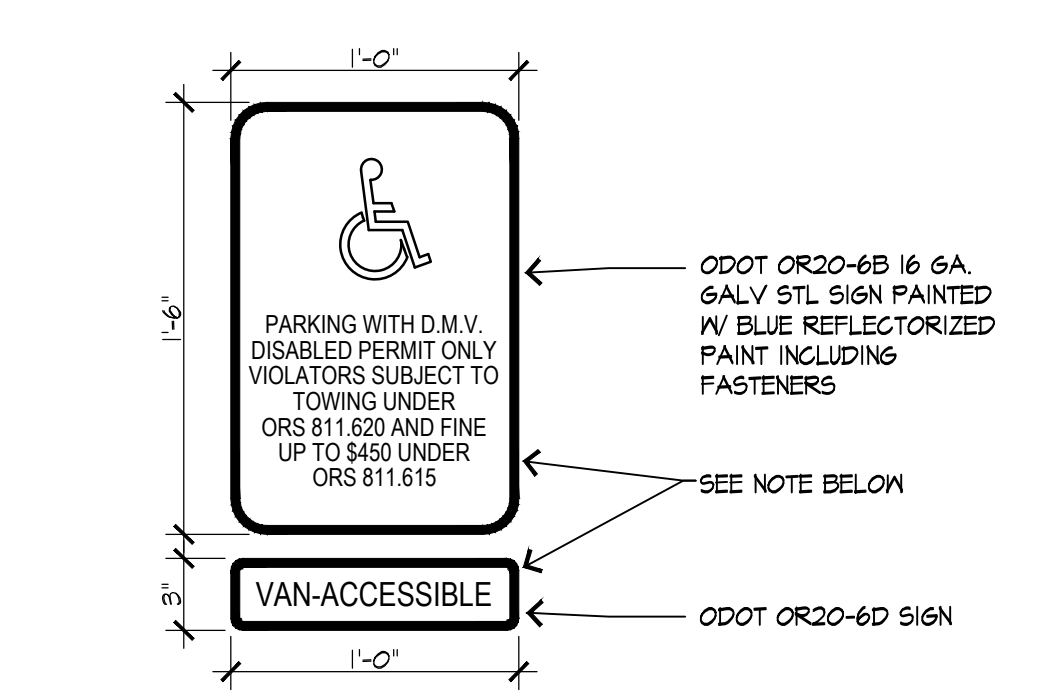


- PARKING NOTES:**
1. HANDICAPPED SPACE MUST PERMIT USE OF EITHER OF CAR DOORS.
 2. BUMPER REQUIRED WHEN NO CURB OR BARRIER IS PROVIDED WHICH WILL PREVENT ENCROACHMENT OF CARS OVER REQUIRED WALKWAY WIDTH.
 3. WHEELCHAIR USERS MUST NOT BE FORCED TO GO BEHIND PARKED CARS OTHER THAN THEIR OWN.
 4. MAXIMUM SLOPE OF PARKING STALL SHALL NOT EXCEED 1/4" PER FOOT IN ANY DIRECTION.
 5. PROVIDE A MIN. OF (1) 8'-0" WIDE VAN AISLE PER EVERY 8 H.C. SPACES.
 6. LOWER EDGE OF RAMP SHALL HAVE 1/2" MAXIMUM LIP, BEVEL AT 2:1 SLOPE.

4 TYPICAL ACCESSIBLE PARKING SPACE LAYOUT
SCALE: NONE

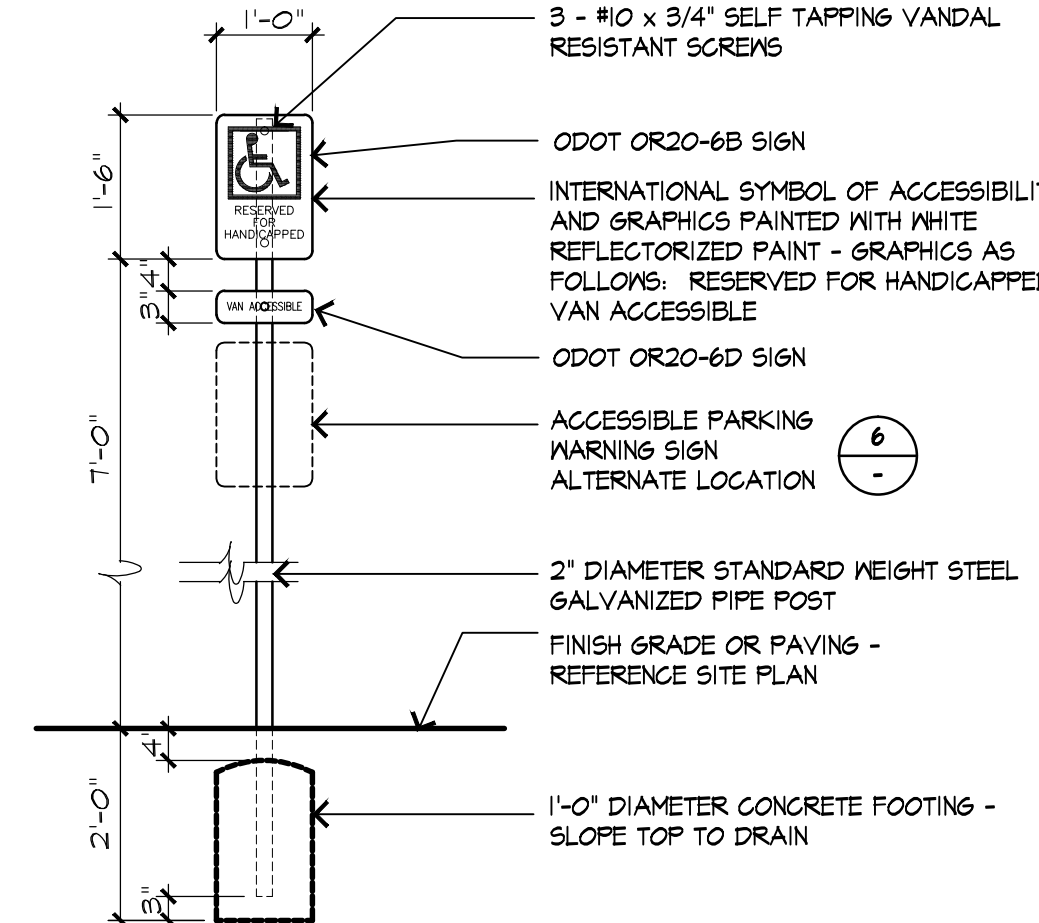


3 ACCESSIBLE PARKING SYMBOL
SCALE: NONE



NOTE (ODOT OR20-6B AND ODOT OR20-6D SIGN). THIS ARE THE OREGON STANDARD ACCESSIBLE PARKING SIGNS AND MAY BE ORDERED FROM ANY TRAFFIC SIGN SUPPLIER BY NUMBER. THE SIGN MUST BE SUPPLEMENTED WITH A "VAN ACCESSIBLE" SIGN (OR20-6D) AS APPLICABLE.

2 ACCESSIBLE VAN PARKING SIGN DETAIL
SCALE: NONE



1 ACCESSIBLE VAN PARKING SIGN DETAIL
SCALE: NONE

GARY R. CAPERNA ARCHITECT
architecture planning
190 North Ross Lane, Medford, Oregon
Post Office Box 4460 97501
541.773.7553 Fax: 541.773.8523
Email: garycaperna@charter.net
Oregon Architect License #247
Arizona Architect License
Member American Institute Of Architects

REGISTERED ARCHITECT
STATE OF OREGON
GARY R. CAPERNA
ARCHITECT
190 NORTH ROSS LANE
MEDFORD, OREGON 97501
541.773.7553 FAX: 541.773.8523
WWW.GARYCAPERNA.COM

BATZER CONSTRUCTION
P.O. Box 4460 - 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.8523
CGB No. 132902
Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT
Project Location: 3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Traxlot Reference: 38 09 20 - 4900
CLIENT: Oregon TECH
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Contact: Mr. David Ebsen (541) 885-1600

MARK	DATE	DESCRIPTION

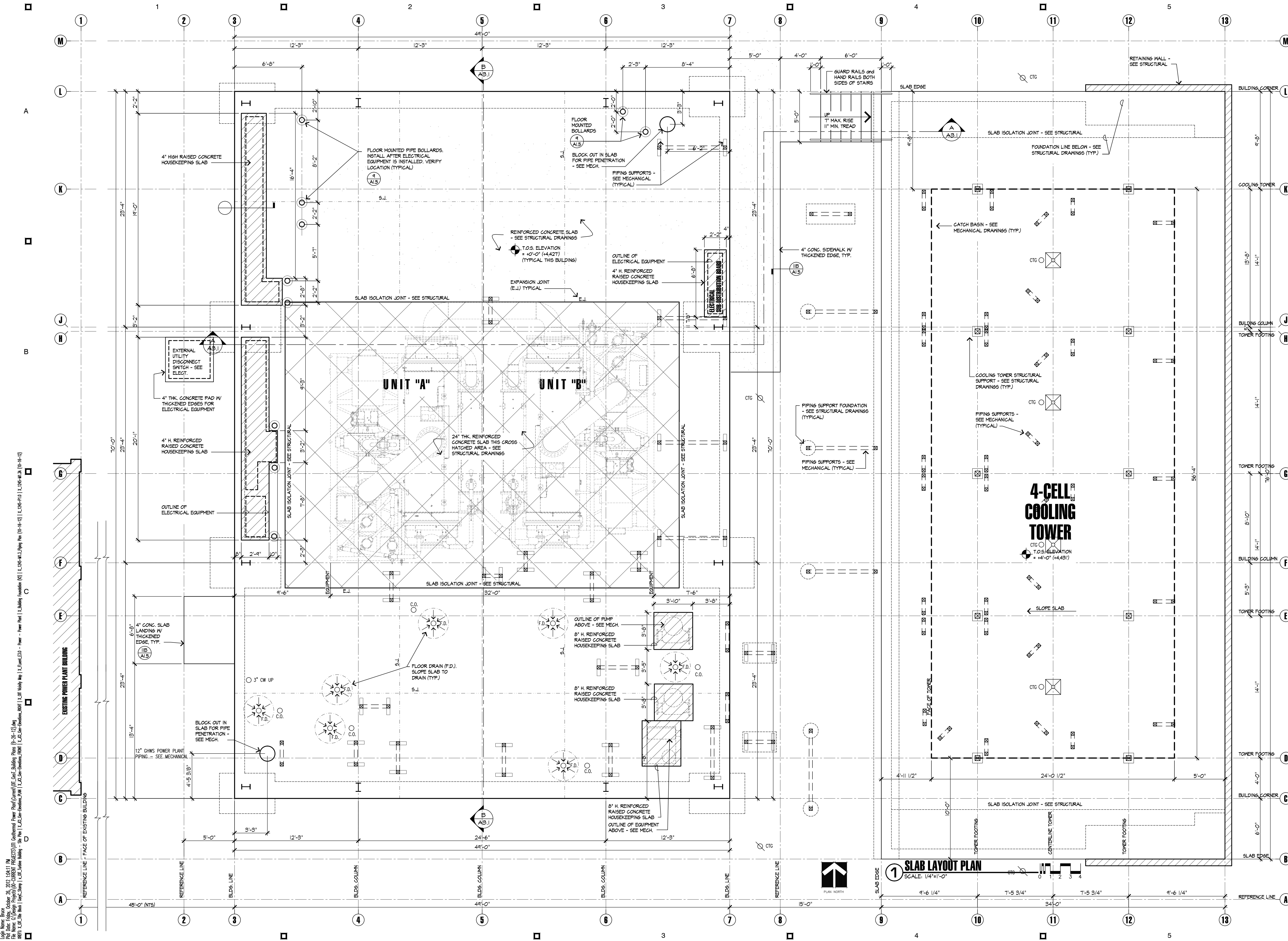
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DRAWN BY: EJA
CHECKED BY:

APPROVED FOR THE OWNER DATE:

SHEET TITLE: TYPICAL SITE DETAILS
PLT DATE: 10/26/2012 1:07 PM

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BID SET - ISSUED 10-26-12

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 Plot Date: 10/26/2012 10:41 AM
 Plot File Name: 10-26-2012 10:41 AM
 Plot Scale: 1/4"=1'-0"
 Plot Sheet: 1 of 1
 Plot Title: SLAB LAYOUT PLAN
 Plot Date: 10/26/2012 10:41 AM

GARY R. CAPERNA ARCHITECT
 architecture planning
 190 North Ross Lane, Medford, Oregon
 Post Office Box 4460 97501
 541.773.7553 Fax: 541.773.8523
 Email: garycaperna@charter.net
 Oregon Architect License 52477
 Member American Institute Of Architects

REGISTERED ARCHITECT
 Gary R. Caperna
 State of Oregon
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BATZER CONSTRUCTION
 P.O. Box 4460 - 190 North Ross Lane
 Medford, Oregon 97501
 Office: 541.773.7553 Fax: 541.773.8523
 CCB No. 132902
 Web: WWW.BATZERINC.COM

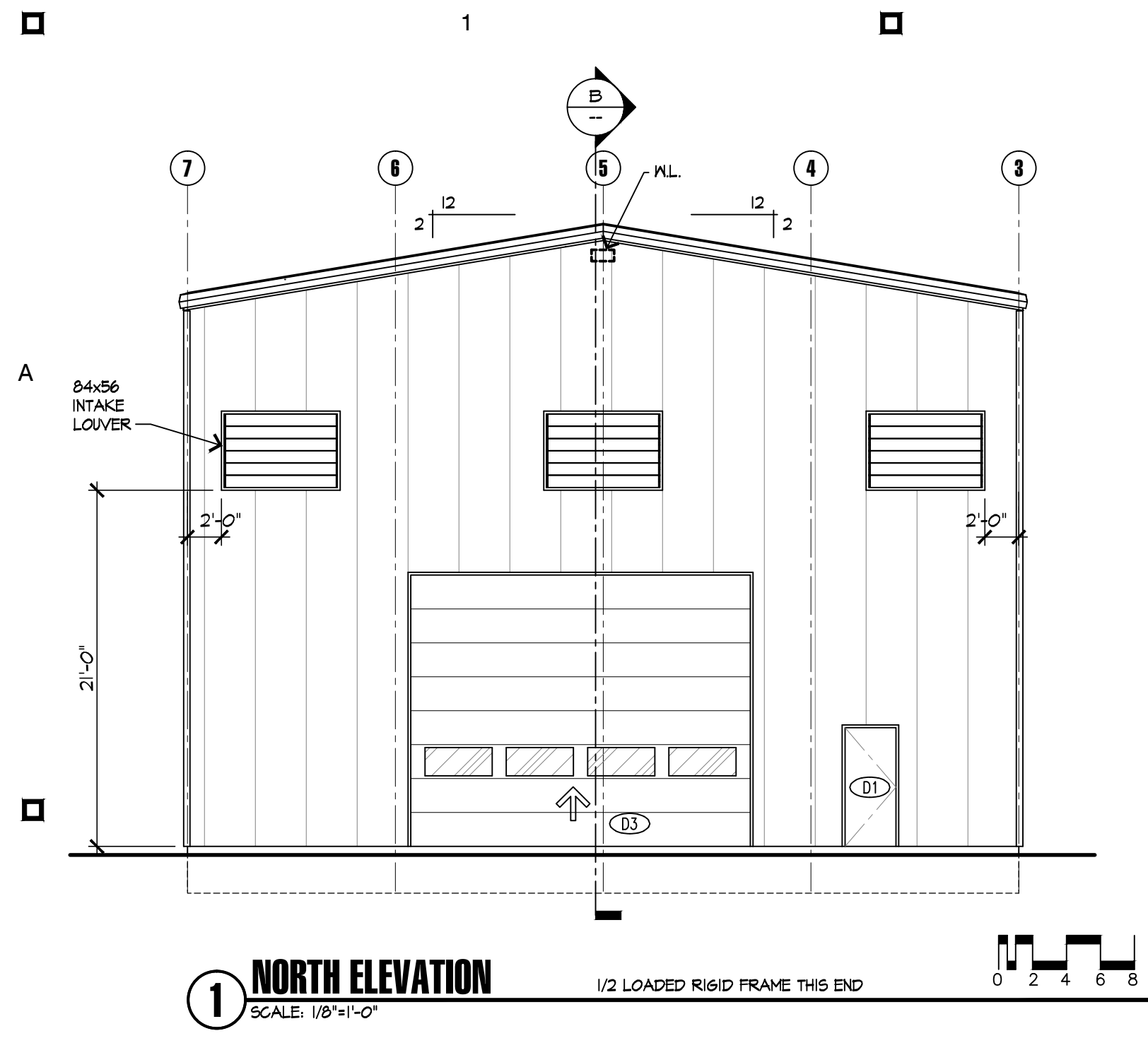
A NEW GEOTHERMAL POWER PLANT
 Project Location: 3201 Campus Drive, Klamath Falls, Oregon 97601
 Map & Taxlot Reference: 38 09 20 - 4900
 CLIENT: Oregon TECH
 3201 Campus Drive, Klamath Falls, Oregon 97601
 Contact: Mr. David Ebsen (541) 865-1000

MARK	DATE	DESCRIPTION

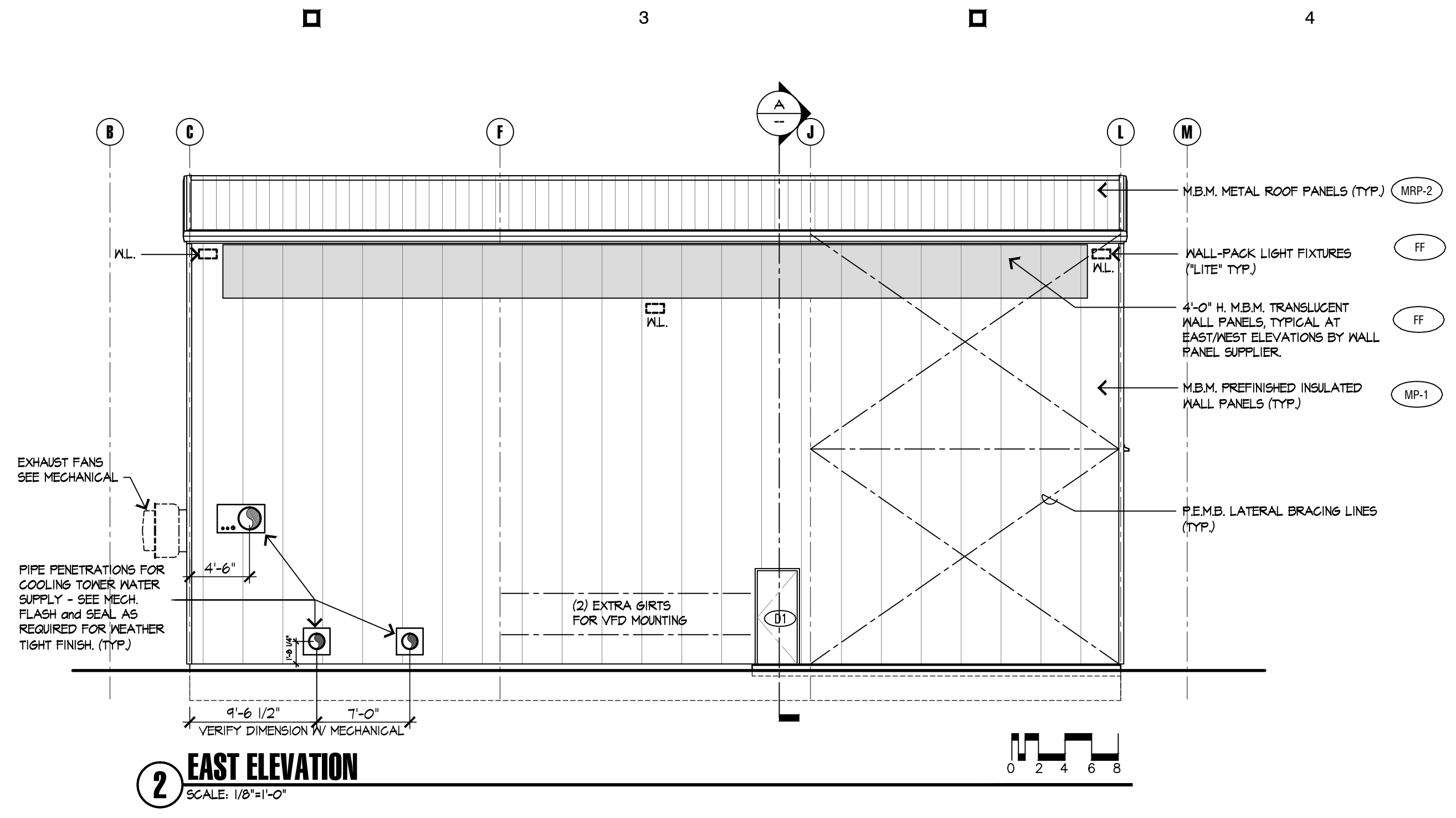
ISSUE:
 PROJECT NO: 6422-12
 DRAWN BY: BJA
 CHECKED BY:

APPROVED FOR THE OWNER DATE
 SHEET TITLE:
SLAB LAYOUT PLAN
 PLOT DATE: 10/26/2012 10:41 PM

A2.3
 BID SET - ISSUED 10-26-12

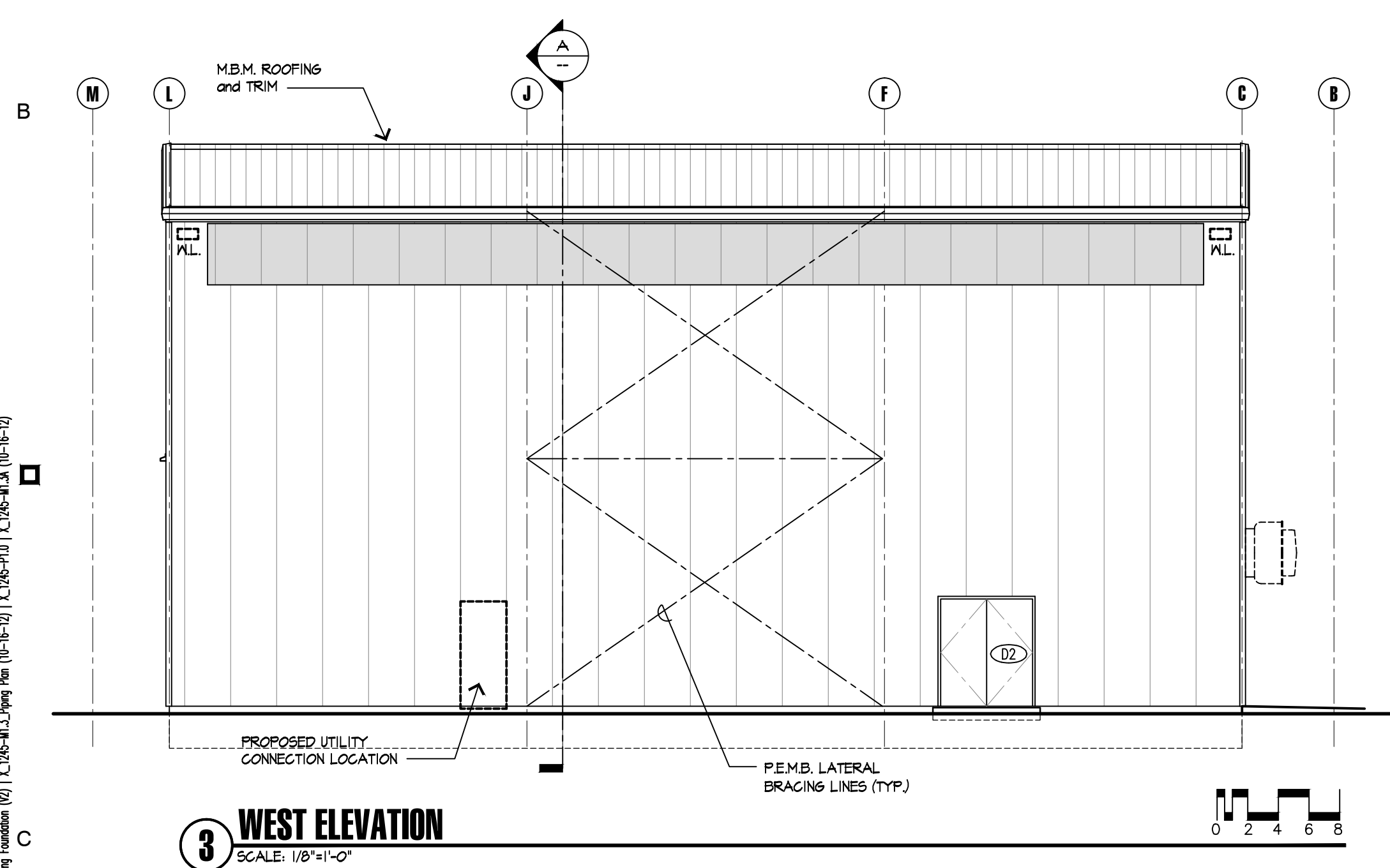


1 NORTH ELEVATION
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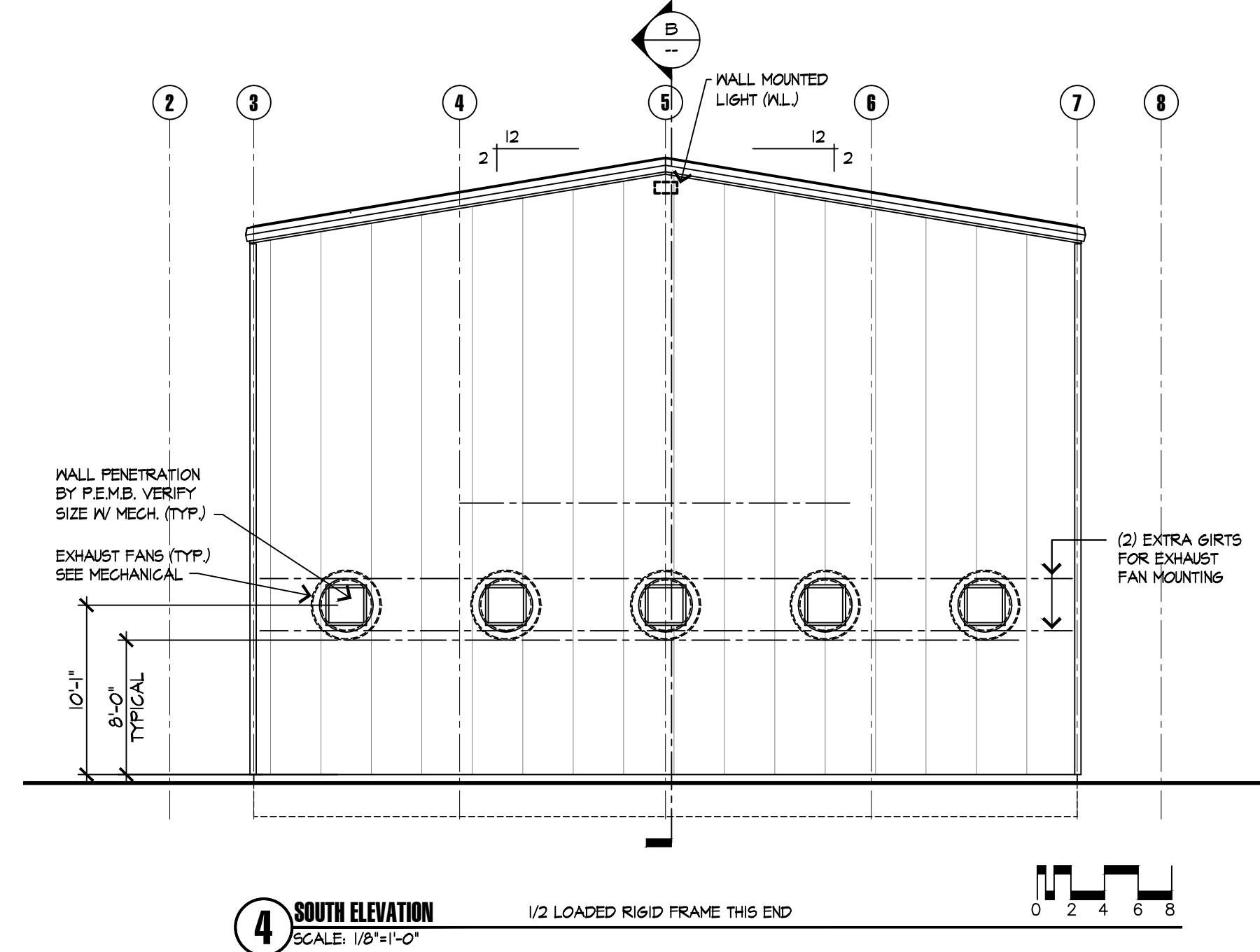


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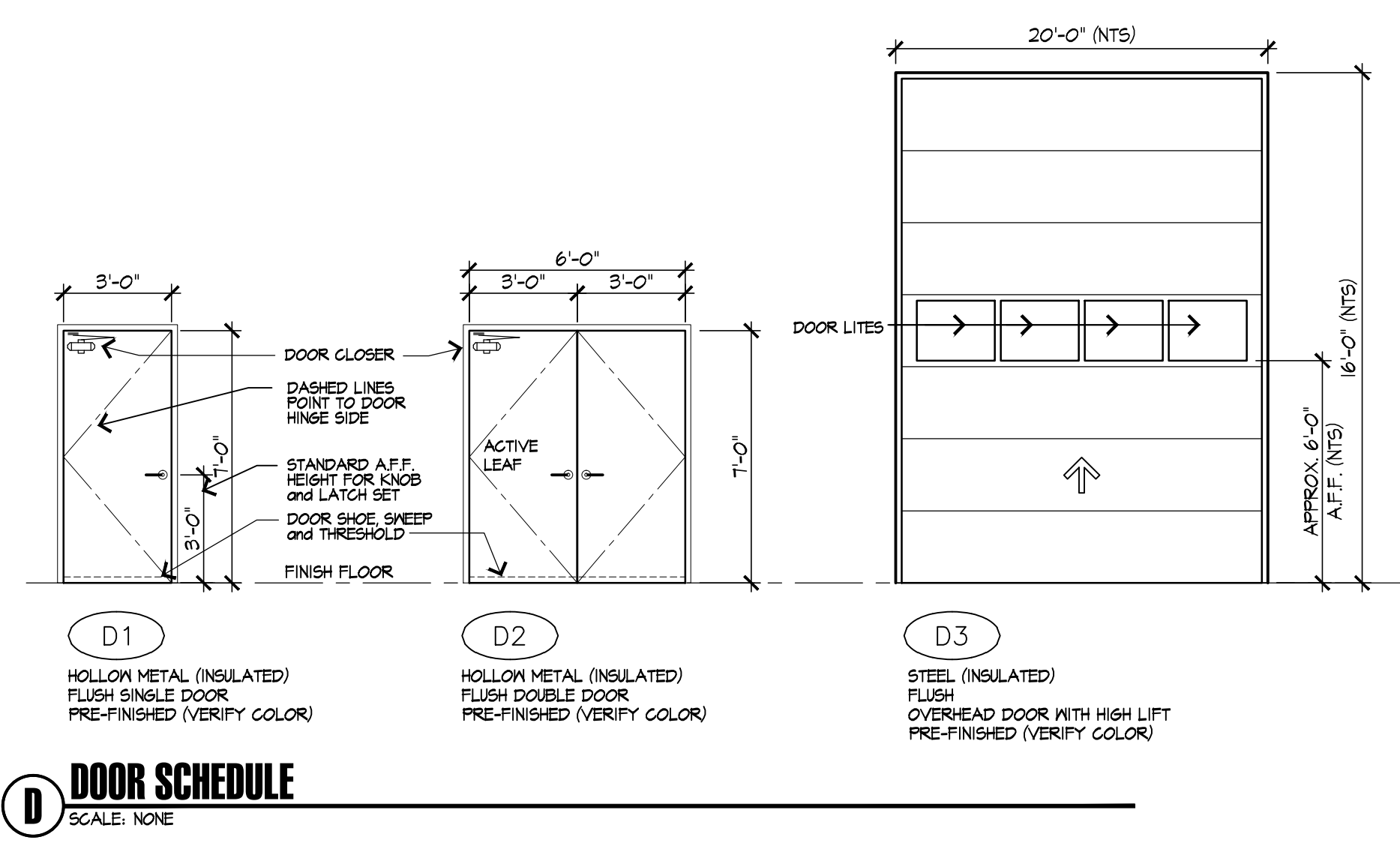
EXTERIOR FINISH & COLOR SCHEDULE			
SYMBOL	FINISH	COLOR	PRODUCT
MP-1	FACTORY FINISH	-	-
MRP-2	FACTORY FINISH	-	-
P-3	FACTORY FINISH	-	-
FF	FACTORY FINISH	VARIES WITH PRODUCT	-



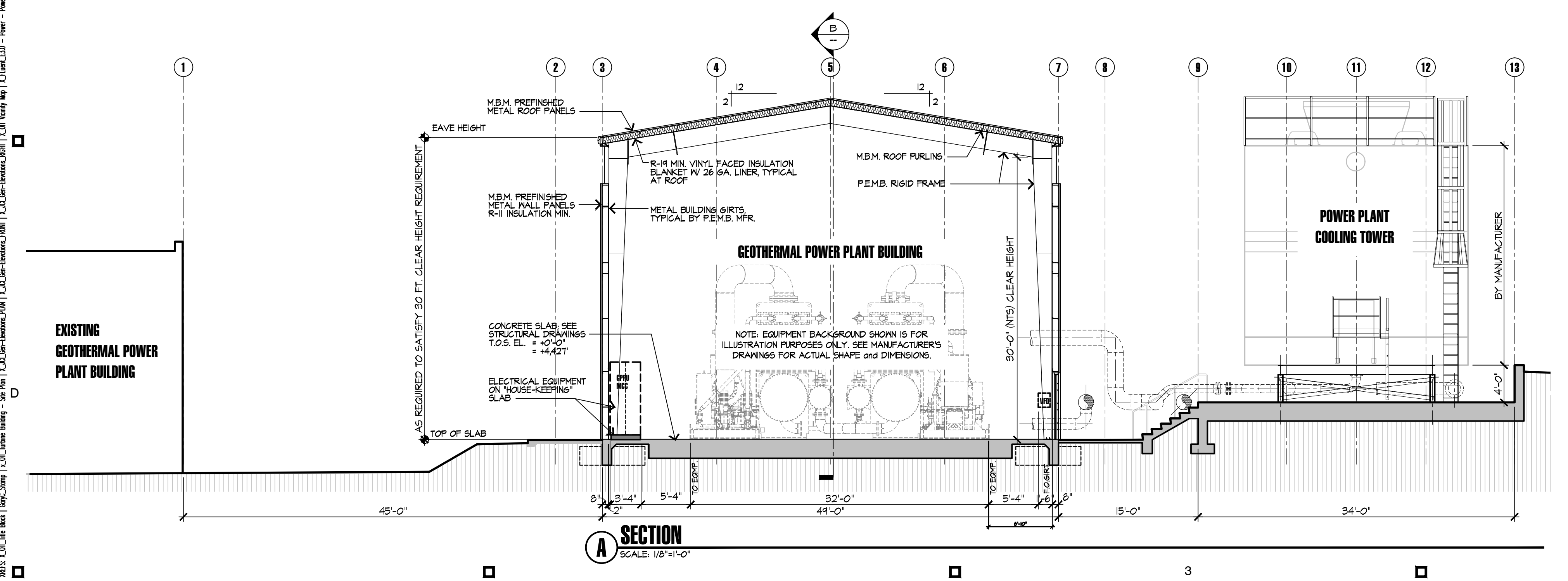
3 WEST ELEVATION
SCALE: 1/8"=1'-0"



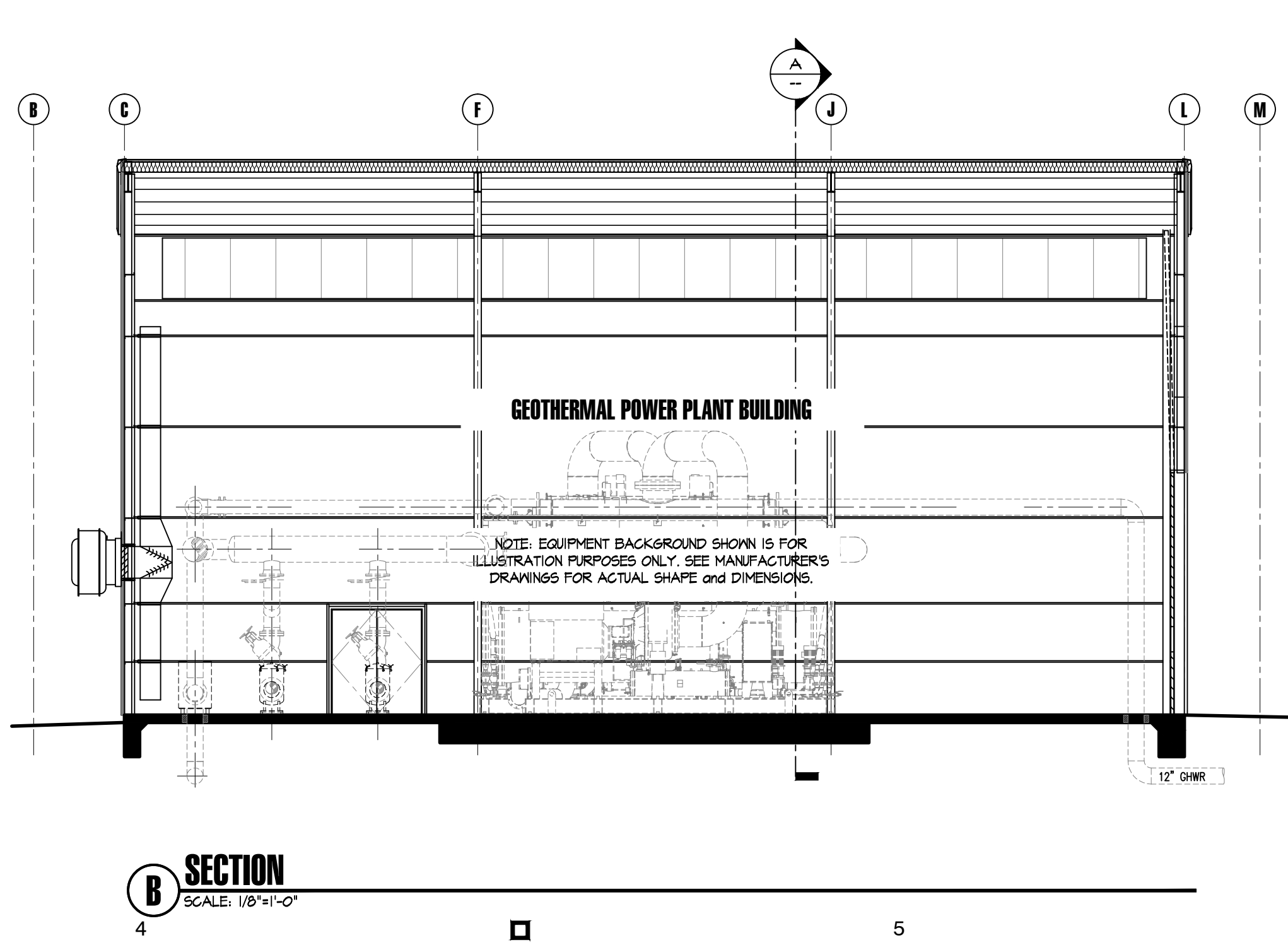
4 SOUTH ELEVATION
SCALE: 1/8"=1'-0"
1/2 LOADED RIGID FRAME THIS END



D DOOR SCHEDULE
SCALE: NONE



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



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

GARY R. CAPERNA ARCHITECT
architecture planning
190 North Ross Lane, Medford, Oregon
Post Office Box 4460 97501
541.773.7553 Fax: 541.773.6523
Email: garycaperna@charter.net
Oregon Architect License 5247
Arizona Architect License
Member American Institute Of Architects

STAMP
REGISTERED ARCHITECT
GARY R. CAPERNA
STATE OF OREGON
5247

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A NEW GEOTHERMAL POWER PLANT
Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4900
CLIENT:
Oregon TECH 3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

PROJECT:

MARK	DATE	DESCRIPTION

ISSUE:
PROJECT NO: 4622-12
DRAWN BY: BJA
CHECKED BY:

APPROVED FOR THE OWNER: DATE

SHEET TITLE:
EXTERIOR ELEVATIONS, SECTIONS AND EXTERIOR DETAILS

PLOT DATE: 10/26/2012 1:03 PM

A3.1
BID SET - ISSUED 10-26-12

Login Name: Bruce
 Plot Date: Friday, October 26, 2012, 1:03:17 PM
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 Printer: HP DesignJet 5000 Series
 Plot Style: 3201 Campus Drive.ctb
 Plot Device: HP DesignJet 5000 Series
 Scale: 1/8"=1'-0"
 Sheet: 1 of 1
 Title: EXTERIOR ELEVATIONS, SECTIONS AND EXTERIOR DETAILS

STRUCTURAL GENERAL NOTES APPLICABLE TO ALL CONSTRUCTION UNLESS OTHERWISE NOTED ON THE PLANS

A. GENERAL REQUIREMENT:

- Scope of service provided by PSE is limited to foundation design according to the loads given by the metal building manufacturer dated 22-AUG-12.
- Steel columns, posts, walls etc. shown on PSE drawings are schematic only. Verify actual size locations and details from drawing provided by the metal building manufacturer.
- Furnish all labor, materials, and equipment necessary to complete the work shown or inferred by these drawings.
- Where construction details are not shown or noted for any part of the work, such details shall be the same as for similar work shown on the drawings.
- Notes and details on the drawings take precedence over the general notes and typical details in case of conflict.
- Provide manufacturer's approved product evaluation reports (CBO reports) and a list of all proposed substitutions to the Engineer for review and written approval before fabrication.
- Pipes, ducts, sleeves, chases etc. shall not be placed in slabs, beams, or walls unless specifically shown or noted nor shall any structural member be cut for pipe, ducts, etc., unless specifically shown. Obtain prior written approval for installation of any additional holes, ducts, etc.
- Locate and protect underground or concealed conduit, plumbing or other utilities where new work is being performed.
- The contract drawings and specifications represent the finished structure and do not indicate methods, procedures or sequence of construction. The contractor shall take necessary precautions to maintain and insure the integrity of the new and any existing structures during construction. The design stresses shall not be exceeded during construction based on the age of each element. Neither the owner nor Architect/Engineer will enforce safety measure regulations. Contractor shall design, construct and maintain all safety devices, including shoring and bracing for the new and any existing structures and shall be solely responsible for conforming to all local, state and federal safety and health standards, laws and regulations.
- Obtain prior written approval for any changes to the drawings.
- The contractor shall review and compare the PSE structural drawings with all other Construction Documents, such as metal building manufacturer drawings, Architectural, Mechanical and Electrical drawings, specifications, etc.. The contractor shall verify dimensions, elevations and all information. Report, in writing, any inconsistencies, errors, or omissions to the Architect/Engineer of record before proceeding with the work.
- All existing constructions, if any, are shown schematic only. Contractor is responsible to verify actual conditions and allow for them in his bid. Notify the Architect/Engineer, in writing, in case of any discrepancy between actual conditions and what is shown on the structural drawings before proceeding with the work.
- See Architectural, Mechanical, Electrical and other drawings for embedded items.
- Shop drawings: Shop drawings shall be submitted to the Architect/Engineer prior to fabrication and construction regarding all structural items including concrete and masonry reinforcement, drawings shall conform to ACI 315 and ACI 318.
- Submit structural drawings signed and sealed by a professional Engineer licensed in the State where the project is located for any structural member needed for this project that is not designed by the Engineer of Record.
- Any substitutions for structural members, hardware or details shall be reviewed by the Architect and Structural Engineer. Such review will be billed on a time and materials basis to the General Contractor with no guarantee that the substitution will be allowed.
- All communications shall be in writing no verbal communication shall be validated.

B. CODE:

- All material and construction work for this project shall conform to the 2010 Oregon Structural Specialty Code.

C. INSPECTION:

1. All construction shall be inspected by the building officials according to the above Code.
2. The owner shall employ Precision Structural Engineering or other qualified inspectors to provide inspections during construction in accordance with section 1701 of the above code. he inspector shall be certified by the building official to perform the type of inspection specified. Inspection shall be provided for:
 - Reinforcement placement, prior to closing the forms and delivery of concrete per PSE drawing.
 - Structural steel per manufacturers drawing.

D. FOUNDATION:

1. A foundation investigation and soils report was prepared by Applied Geotechnical Engineering & Geologic Consulting, 1314-B Center Drive #452, Medford, OR 97501. The contractor shall read and follow the recommendations in this report. Contractor shall keep a copy of this report on site at all times during construction.
2. If the stated bearing capacity, is not encountered, the contractor shall notify the Engineer, in writing.
3. Footing shall bear on natural soil or compacted engineering fill capable of supporting the above or the required bearing capacity.
4. Soft soil shall be removed and replaced with competent material approved by the Engineer.
5. Natural soil or engineering fill shall be profiled and/or compacted to minimum of 95% under slab-on-grade and to minimum of 98% under footing of their maximum dry density, as determined by ASTM Test Method D-698 (standard Proctor).
6. Use light weight equipment to compact the soil within 2 feet around foundation/basement wall.
7. Excavation shall be properly backfilled.
8. Footings shall be 24 inches minimum, below undisturbed soil.

E. CONCRETE:

1. All concrete work shall conform to the American Concrete Institute's Standard Building Code Requirements for Structural Concrete, ACI 318, in the above Code. Place concrete in accordance with ACI 301.
2. Materials shall comply with:
 - Cement, ASTM C150 Type I or II.
 - Aggregate, ASTM C33.
 - Water, Potable.
 - Anchor bolts ASTM A-307 headed machine bolts.
3. Concrete shall develop 28-days minimum compressive strengths of 5000 PSI.
4. All exposed exterior concrete shall contain the proper admixtures to obtain 3% to 7% Air Entrainment. All interior concrete work shall contain 2% to 4% Air Entrainment.
5. Reinforcing Steel:
 - All reinforcing steel shall be ASTM A615 Grade 60.
 - Where welding of rebar is required by these drawings, steel shall be pre-heated or steel grade 60-W, ASTM A706 shall be used.
 - Bars marked continuous and all vertical steel shall be lapped 55 bar diameters at splices UON on the drawings.
 - Vertical bars shall be doweled to supporting members with the same size and spacing of reinforcement shown in the drawing or general notes.
 - All reinforcing in grade beams shall be continuous. Lap top steel at midspan. Lap bottom steel at supports.
 - All reinforcing bars shall be in the correct place, tied and secured prior to concrete placement. Use chairs, spacers and sand plates as required.
6. Execution:
 - All concrete is reinforced concrete unless specifically called out as "Unreinforced". Reinforce all concrete not otherwise shown with same steel as in similar sections or areas.
7. Standard concrete cover of bars unless otherwise noted shall be:
 - Where earth formed: 3 inches.
 - Board formed then permanently exposed to earth or weather: 2 inches.
 - Slabs not exposed to earth or weather: 1 inch.
 - Beams and columns not exposed to earth or weather: 1-1/2 inches.
 - Others: 2 inches.
8. Slump shall not be more than 4 inches.
9. Water/Cement ratio shall not exceed 0.45.
10. All concrete shall be consolidated with mechanical vibrators.
11. The unit of pour for foundation walls and footings shall not exceed 80 linear feet in any one direction. Construction joints shall be doweled and keyed.
12. Construction joints in beams, slabs, and grade beams shall occur at middle one third of the span. Provide (1) 2X4 inch horizontal key per foot of depth at construction joint. Location of joints to be reviewed by the Engineer. Wait 48 hours between placements.
13. No Aluminum or galvanized steel items shall be in contact with the reinforcing steel.
14. All exposed edges not in contact with masonry mortar shall be beveled 3/4 inch.
15. All concrete work shall be cured and maintained above 50 degrees Fahrenheit for at least seven days according to the Standard Practice for Curing Concrete, ACI 308, ACI 318 and as approved by the Engineer.
16. When air temperature is above 80 degrees Fahrenheit, Hot Weather Concreting, ACI 305R shall apply. When the average air temperature is below 40 degree Fahrenheit, Cold Weather Concreting, ACI 306R shall apply.

F. STRUCTURAL STEEL:

1. All structural steel shall be ASTM A-36, for items not provided by the building manufacturer.

G. CODE AND LOADS:

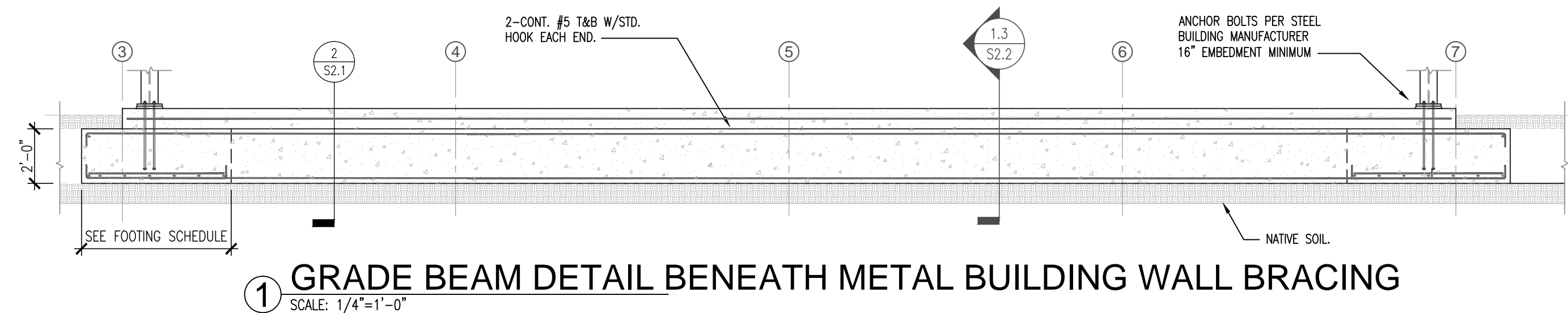
1. All design, material, and construction work for this project shall conform to the 2010 Oregon Specialty Code (OSC) based on the 2009 International Building Code (IBC).
2. The 2009 International Building Code design parameters.
 - Floor Live Load = 100 psf.
 - Floor Dead Load = 15 psf.
 - Roof Live Load = n/a
 - Roof dead load 15 psf.
 - Roof Colateral load = 10 psf
 - Ground Snow Load, Pg = 37 psf.
 - Snow Exposure Factor, Ce = 1.0
 - Flat Roof snow load = 25 psf.
 - Snow Load Importance Factor, I = 1.0
 - Thermal Factor, Ct = 1.0
 - Basic Wind Speed (3 second gust) = 95 mph
 - Wind Importance Factor, Iw = 1.15
 - Wind Exposure = C
 - Seismic Importance Factor, Ie = 1.5
 - Ss = 0.692
 - Site Class = B
 - Seismic Design Category = D

H. TESTING:

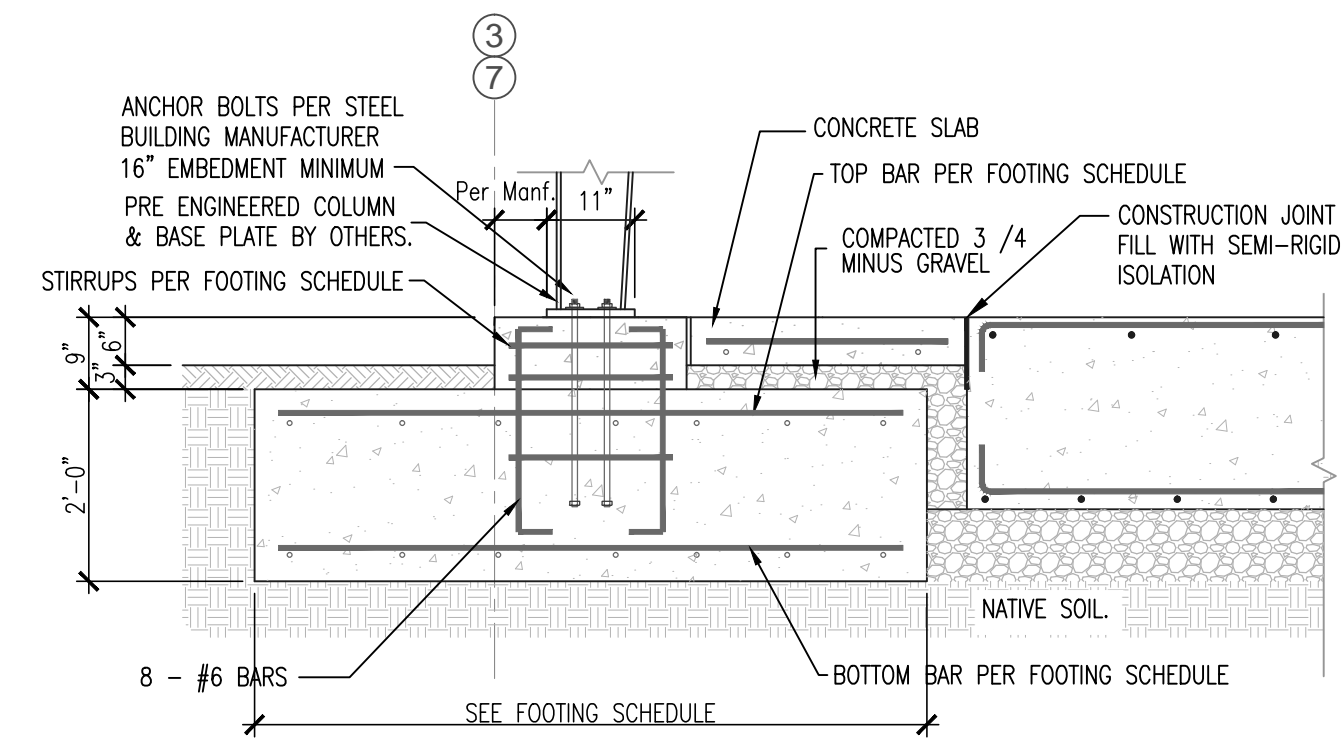
- The owner/contractor shall retain an independent testing laboratory to test the quality of:
- Soil or fill material supporting footings and slab-on-grade.
 - Concrete.
 - All other material used in this project as required by the Engineer.
 - A copy of test results shall be sent to the Engineer of Record.

I. ABBREVIATIONS:

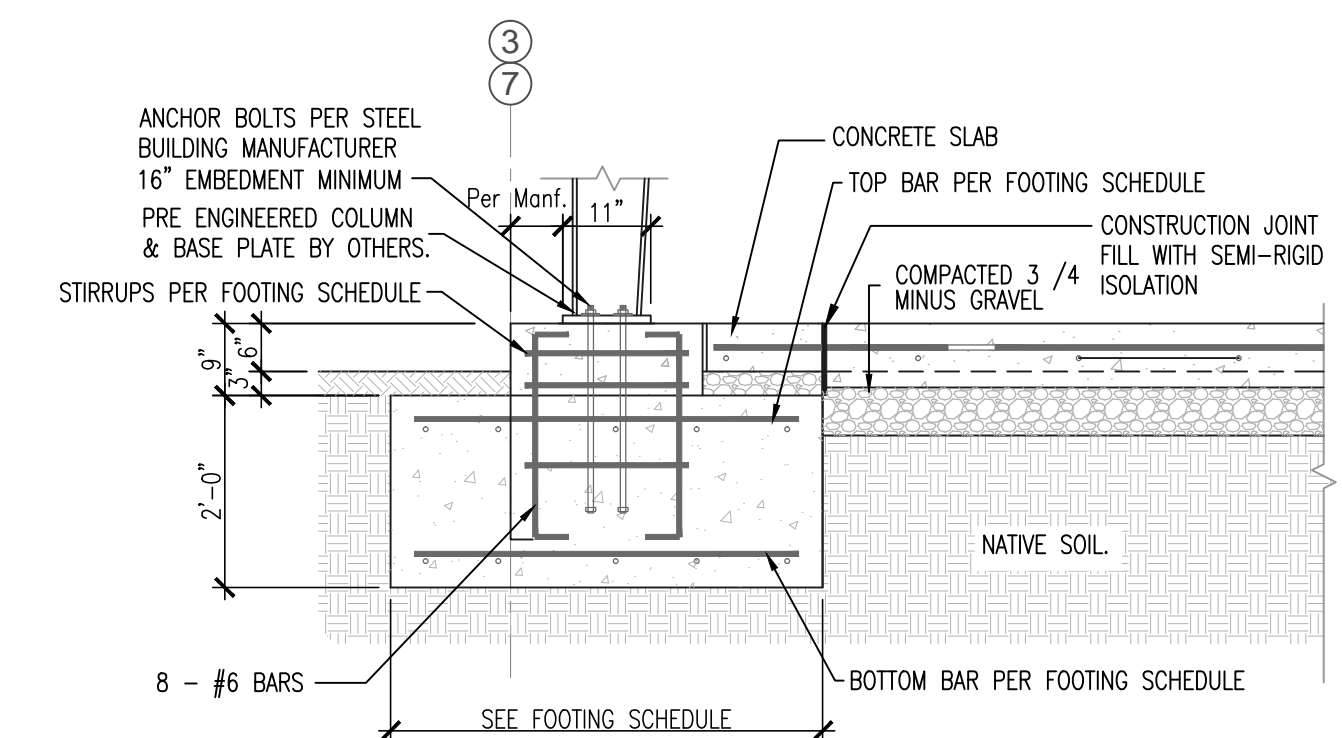
AB ANCHOR BOLT	EN EDGE NAIL	LDGR LEDGER	REF REFERENCE
ADL ADDITIONAL	EOR ENGINEER OF RECORD	LL LIVE LOAD	REN ROOF EDGE NAILING
ALT ALTERNATE	EQ EQUAL	MATL MATERIAL	REINF REINFORCEMENT
APA AMERICAN PLYWOOD ASSOCIATION	ES EACH SIDE	MAX MAXIMUM	RFT RAFTERS
ARCH ARCHITECTURAL	EW EACH WAY	MB MACHINE BOLT	SGN STRUCTURAL GENERAL NOTES
B BLKG BOTTOM	FA FRAMING ANCHOR	MFR MANUFACTURER	SEP SEPARATION
BN BOUNDARY NAIL	FF FLOOR EDGE NAILING	MIN. MINIMUM	SIM SIMILAR
BOF BOTTOM OF FOOTING	FEN FINISHED FLOOR	MTL METAL	SN SHEAR NAIL
CJ CONSTRUCTION JOINT OR CONTROL JOINT	FN FIELD/INTERMEDIATE NAILING	NO. NUMBER	SNL SNOW LOAD
CLR CLEAR	FS FAR SIDE	NTS NOT TO SCALE	SPEC SPECIFICATION
CONN CONNECTION	FTG FOOTING	OC ON CENTER	STD STANDARD
CONT CONTINUOUS	GALV GALVANIZED	OD OUTSIDE DIAMETER	STGR STIFFENERS
DBL DOUBLE	GC GENERAL CONTRACTOR	OFDSC OREGON ONE & TWO FAMILY DWELLING SPECIALTY CODE	T TOP
DIM DIMENSION	GIR GEOTECHNICAL INVESTIGATION REPORT	OH OPPOSITE HAND	TB TOP & BOTTOM
DL DEAD LOAD	GLB GLUED LAMINATED BEAM	OSB ORIENTED STRAND BOARD	TD TYPICAL DETAILS
DO DO (REPEAT)	GR GRADE	OSSC OREGON STRUCTURAL SPECIALTY CODE	TG TONGUE & GROOVE THICKNESS/THICK
DWG DRAWING	HDR HEADER	OSV ON SITE VERIFY	THK THICKNESS/THICK
DOG DRAWING (REPEAT)	HGR HANGER	OTOB OUT TO OUT OF BEARING	TOB TOP OF BEAM
DWL DWEL	HORIZ HORIZONTAL	PL PLATE	TOP TOP OF FOOTING
E EXISTING	HSH HORIZONTAL SLOTTED HOLES	PLF POUND PER LINEAR FOOT	TOW TOP OF WALL
EA EACH	ICBO INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS	PSE PRECISION STRUCTURAL ENGINEERING	TYP TYPICAL
EF EACH FACE	ID INSIDE DIAMETER	PT INTERIOR	UBC UNIFORM BUILDING CODE UNLESS OTHERWISE NOTED
EL ELEVATION	INT INTERIOR	PW PLATE WASHER	UON UNLESS OTHERWISE NOTED
EMBED EMBEDMENT	JT JOINT		VERT VERTICAL



1 GRADE BEAM DETAIL BENEATH METAL BUILDING WALL BRACING
SCALE: 1/4"=1'-0"



2 ENDWALL FOOTING DETAIL, F1
SCALE: 1/2" = 1'-0"



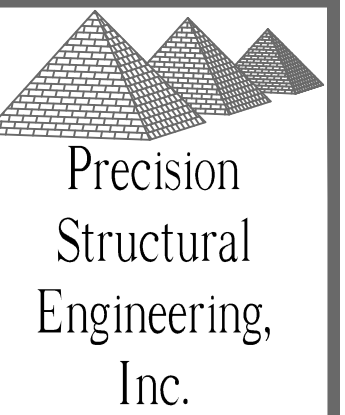
3 CORNER FOOTING DETAIL, F2
SCALE: 1/2" = 1'-0"

MARK	FOUNDATION				PEDESTAL				DETAIL NO./REMARKS			
	LENGTH A	WIDTH B	DEPTH D	REINFORCEMENT	LENGTH a	WIDTH b	MIN. DEPTH c	REINFORCEMENT				
F1	7'-0"	5'-0"	2'-0"	12-#5	9-#5	7-#5	5-#5	2'-6"	2'-0"	9"	8 - #6	
F2	5'-6"	4'-0"	2'-0"	6-#5	4-#5	6-#5	4-#5	2'-6"	2'-0"	9"	6 - #6	3-#4 @ 3" O.C. AT TOP THEN #4 @9" O.C.
F3	1'-8"	4'-6"	2'-0"	3-#5	9-#5	3-#5	5-#5	1'-8"	1'-0"	9"	6 - #5	

4 FOOTING SCHEDULE

SHEET INDEX

S1.0	STRUCTURAL GENERAL NOTES
S2.0	POWER PLANT BUILDING & COOLING TOWER FOUNDATION PLAN
S2.1	FOUNDATION DETAILS
S2.2	FOUNDATION SECTIONS
S3.0	COOLING TOWER SUPPORT FRAMING PLAN
S3.1	COOLING TOWER SUPPORT FRAMING DETAILS



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Fax: (541) 850-6233
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Contact:
David Elson
541-855-1600

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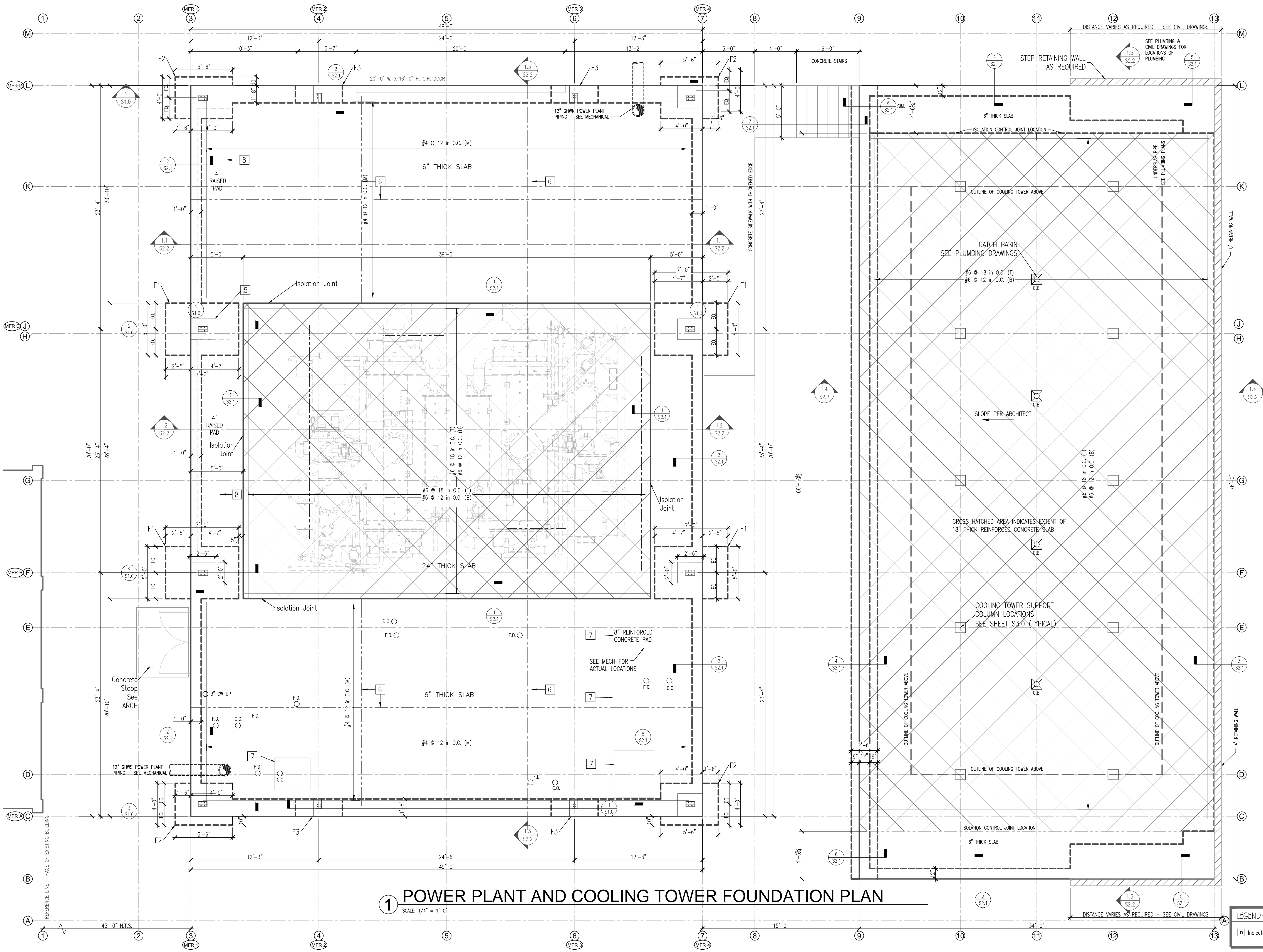
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GENERAL NOTES

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1 POWER PLANT AND COOLING TOWER FOUNDATION PLAN
 SCALE: 1/4" = 1'-0"

LEGEND:
 [n] Indicates sheet notes. Refer to S2.1

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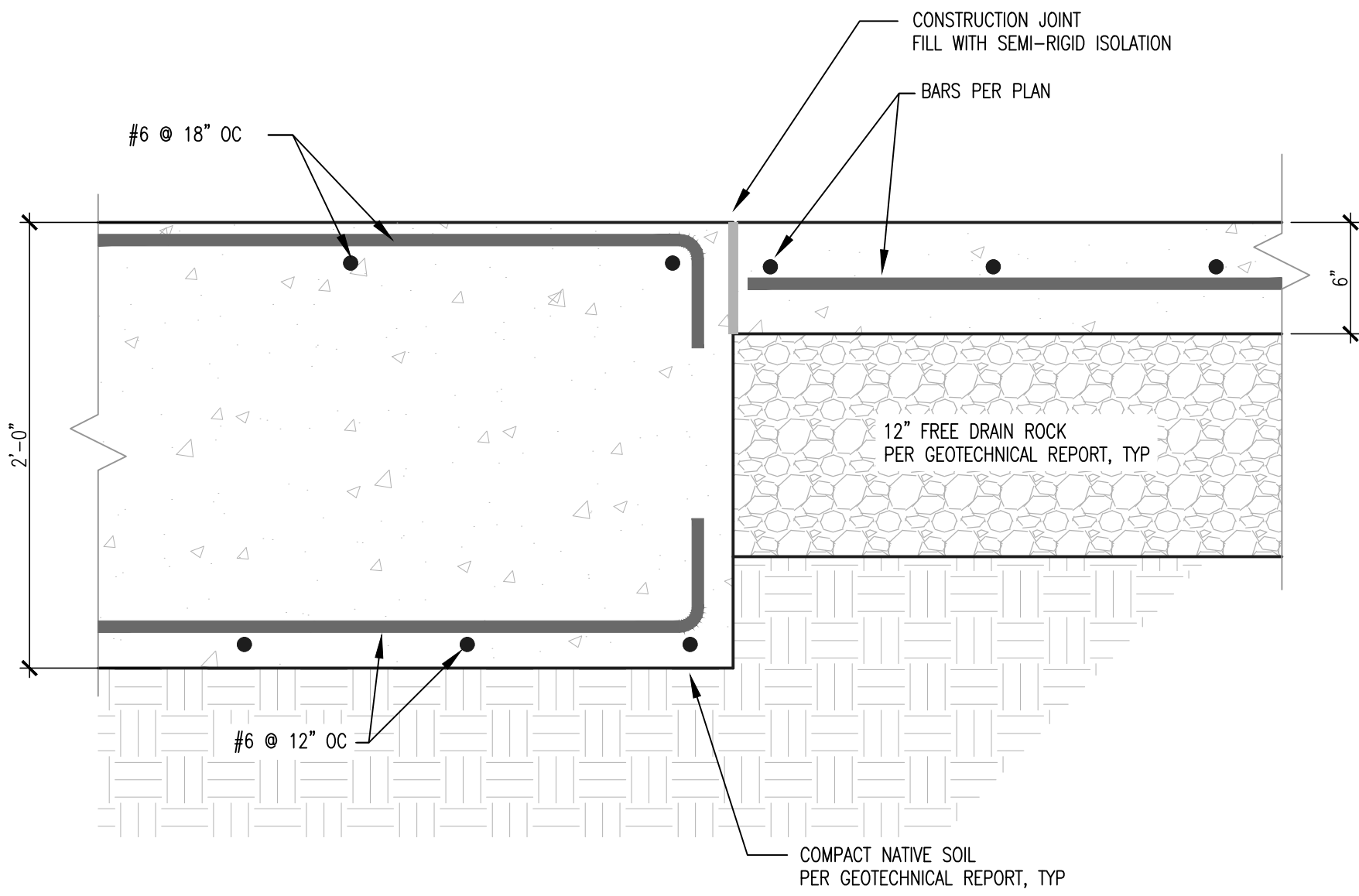
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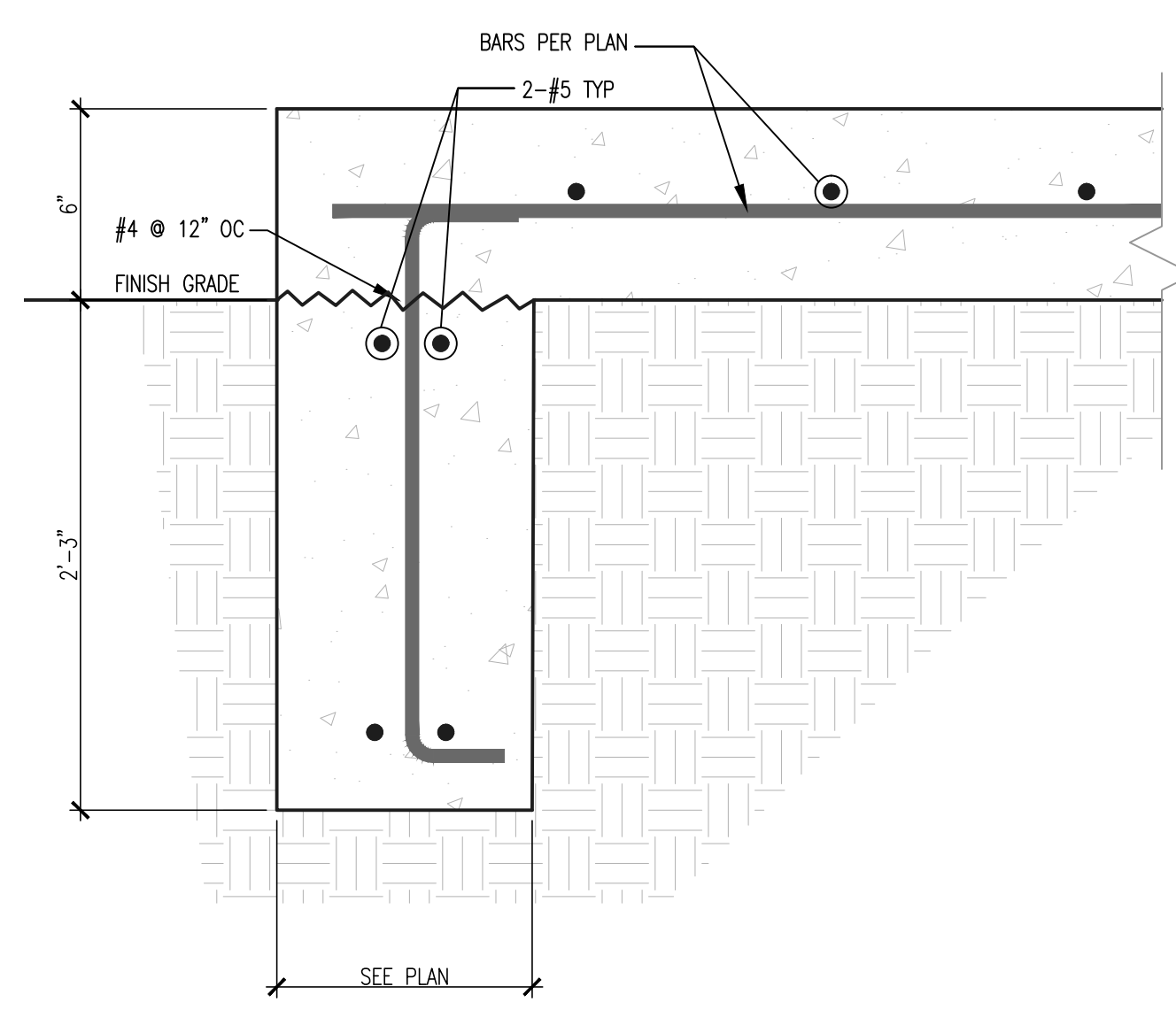
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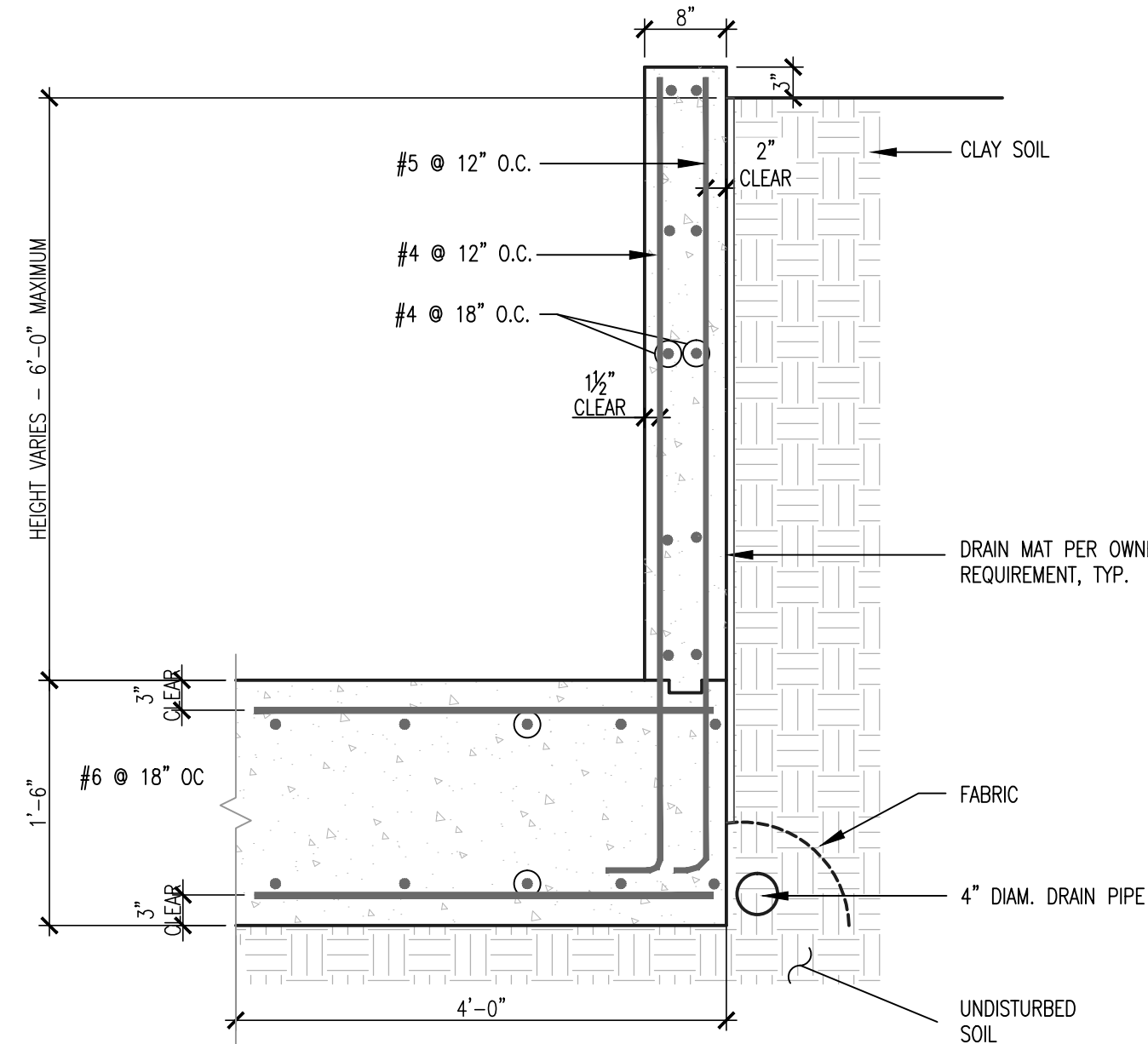
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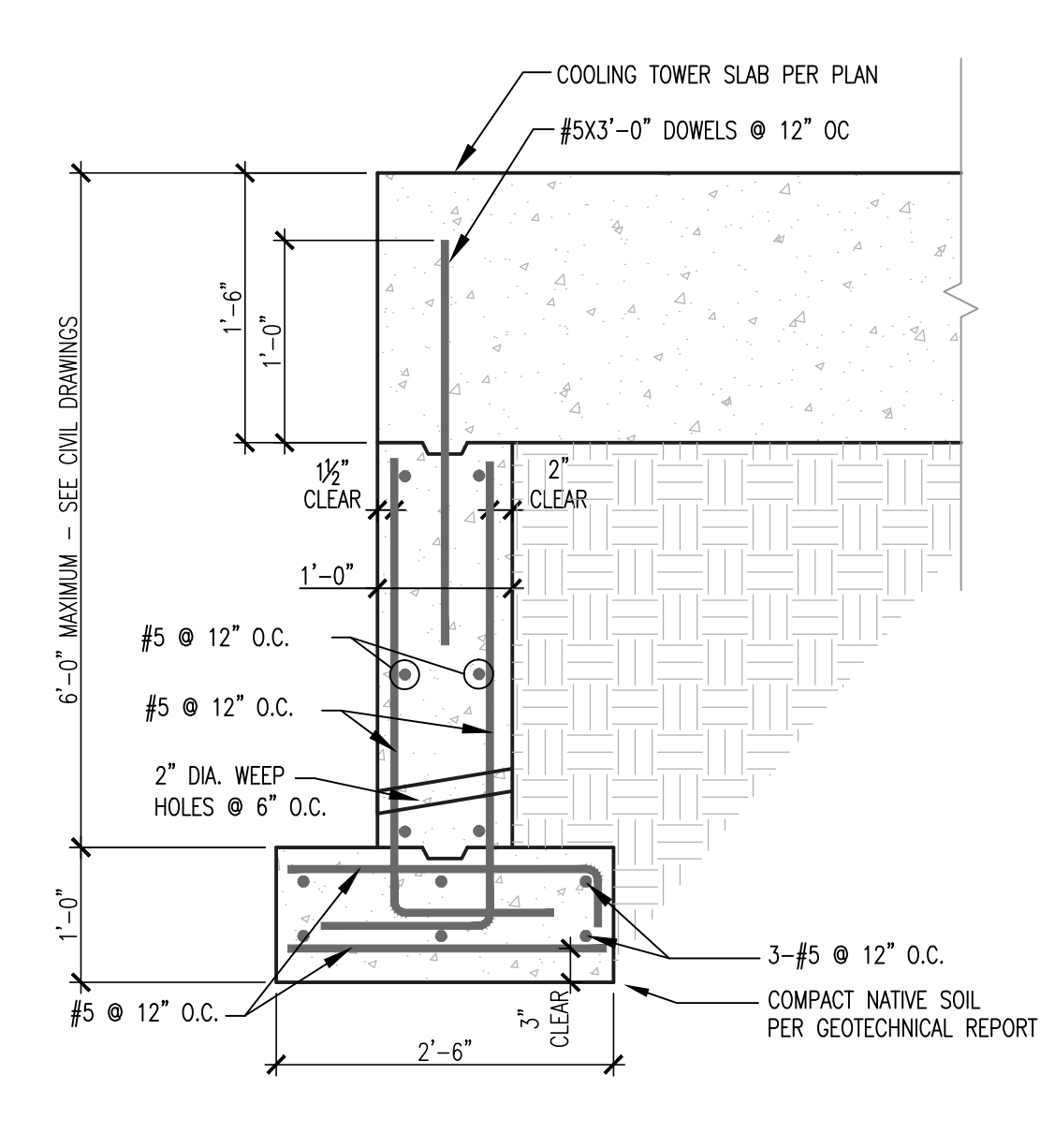
1 SLAB SECTION
SCALE: 1-1/2"=1'-0"



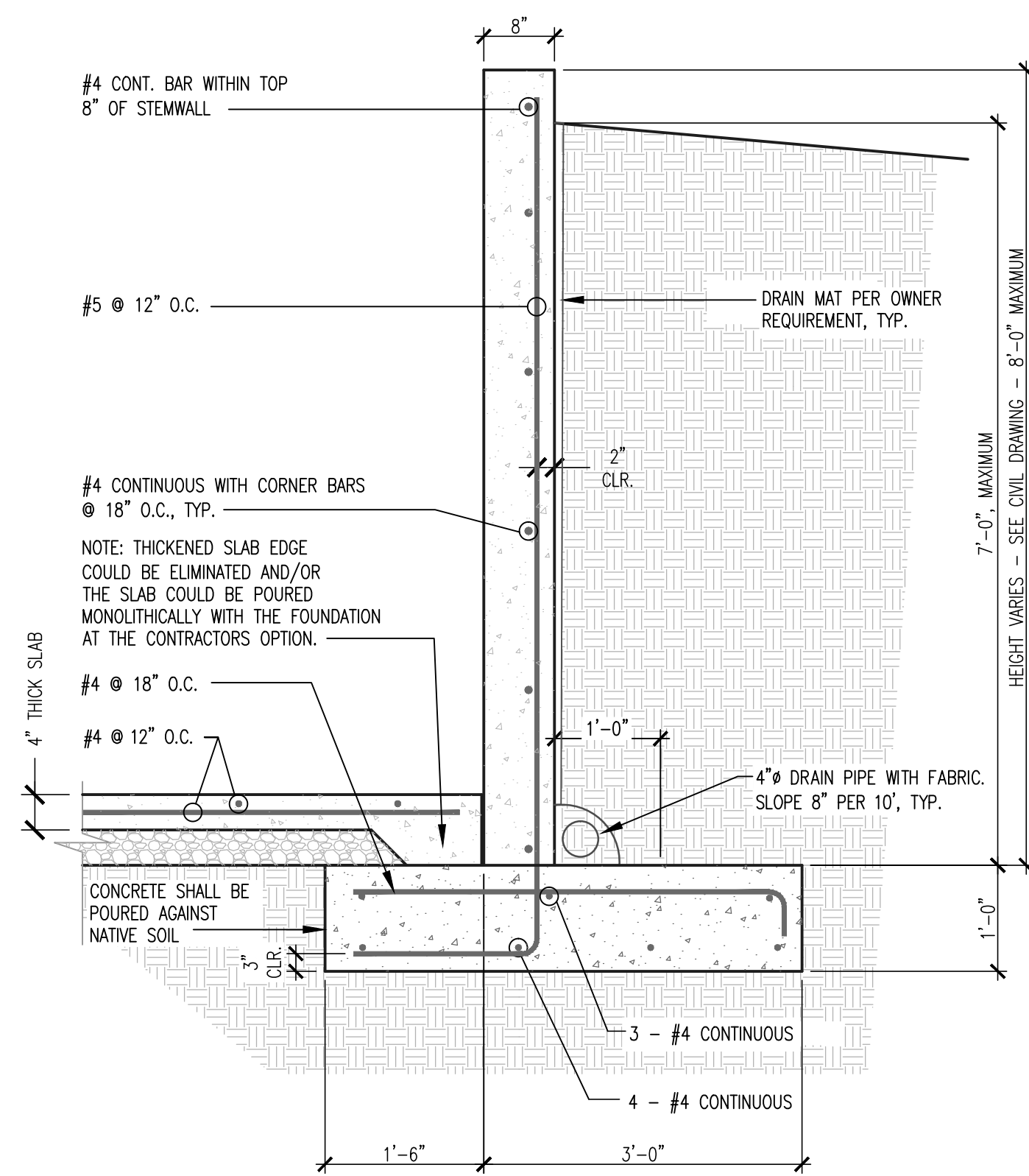
2 SLAB FOOTING
APPROX. SCALE: 1-1/2"=1'-0" DO NOT SCALE



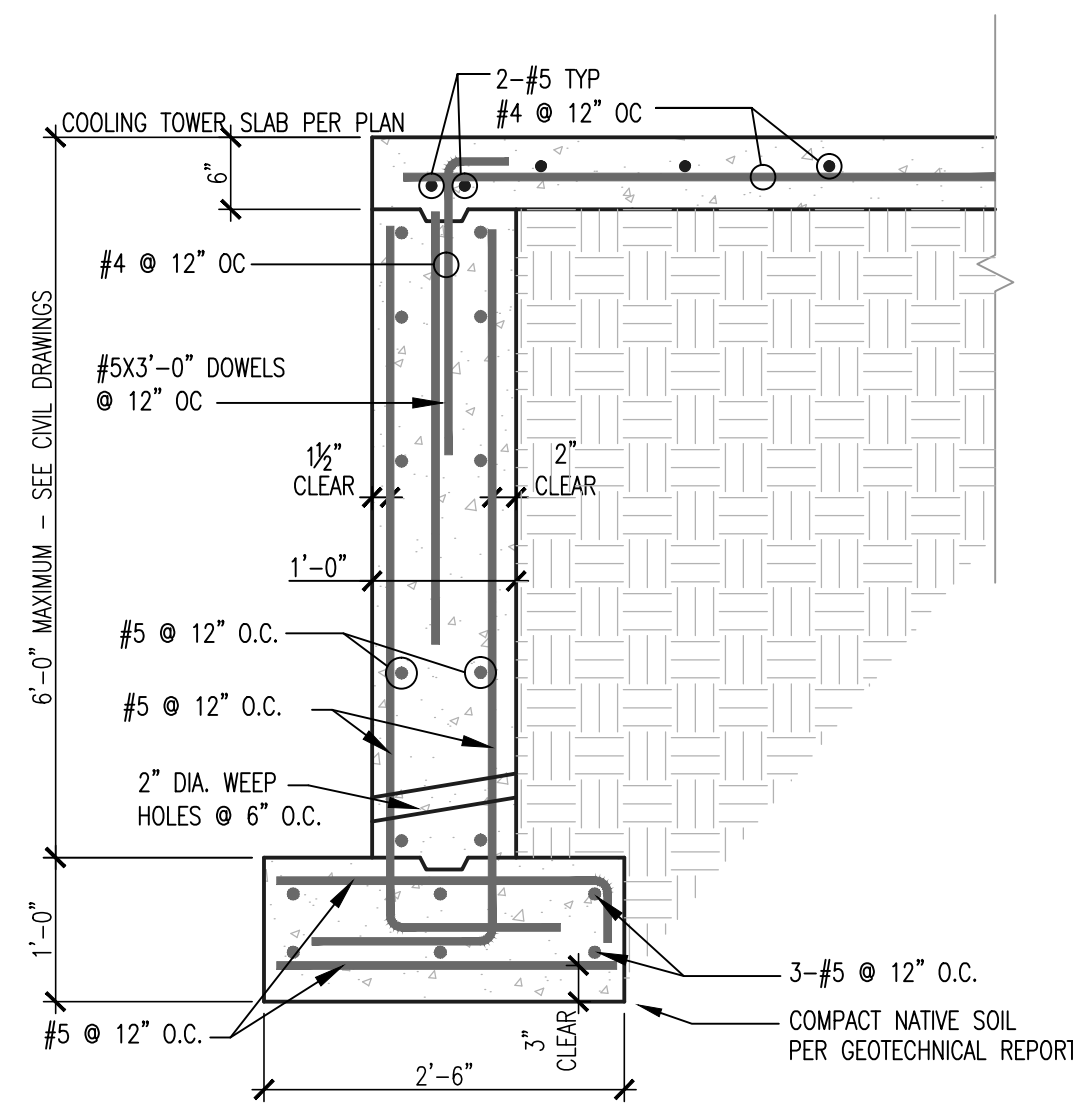
3 RETAINING WALL
APPROX. SCALE: 3/4"=1'-0" DO NOT SCALE



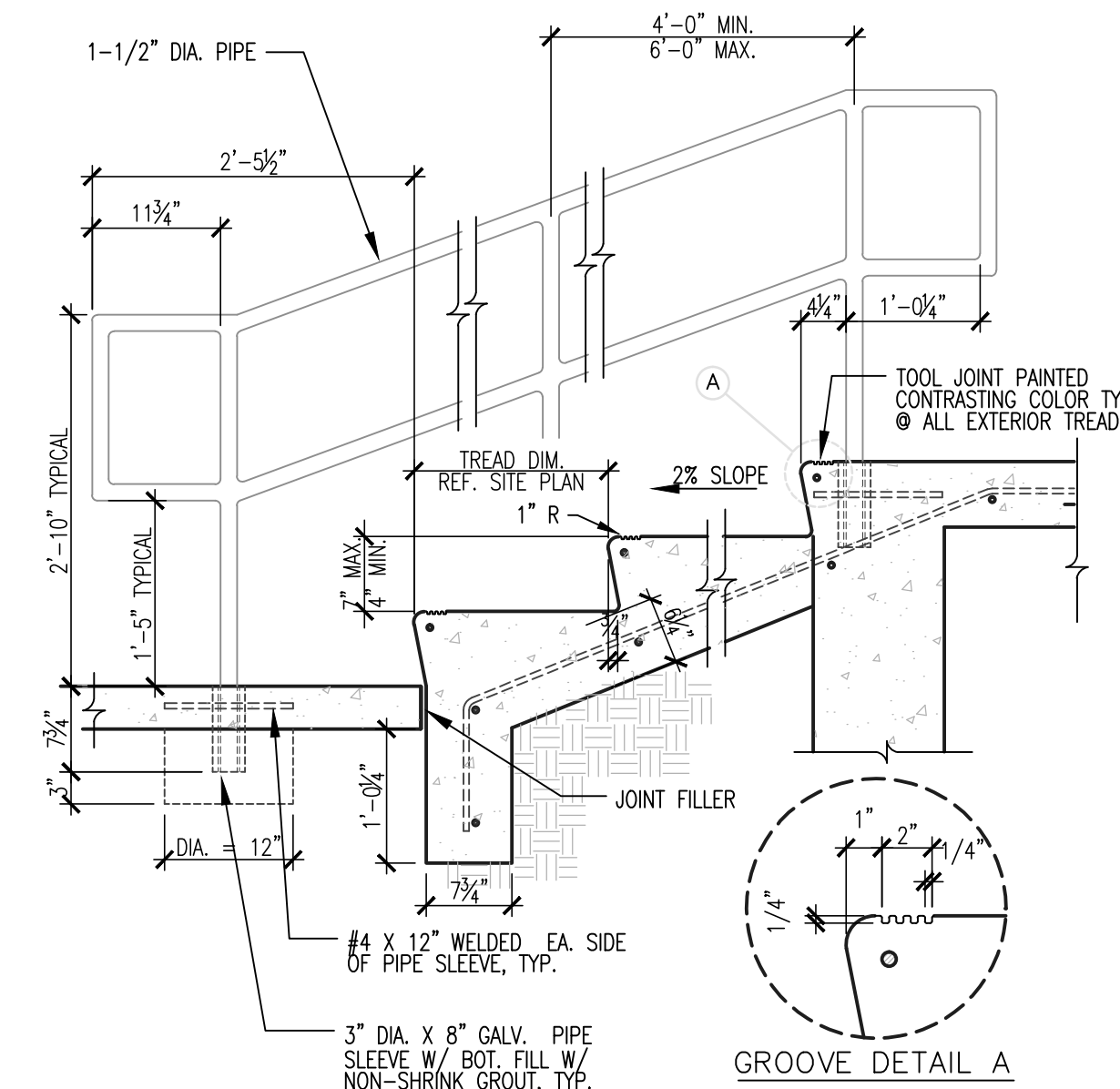
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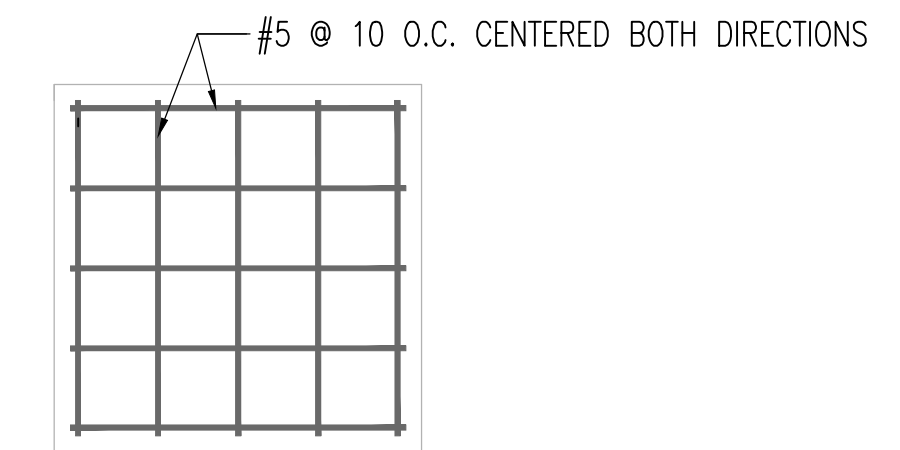
5 WALL SECTION
Scale: N.T.S.



6 RETAINING WALL
SCALE: 3/4"=1'-0"



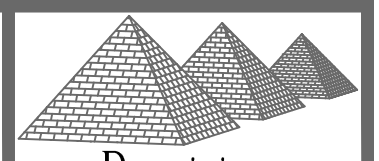
7 TYPICAL SITE STAIR & HANDRAIL DETAIL
SCALE: 3/4"=1'-0"



8 EQUIPMENT PAD DETAIL
SCALE: 1/2"=1'

SHEET NOTES:

- 1 REFER TO S1 FOR STRUCTURAL GENERAL NOTES AND TO FIRST FLOOR DETAIL SHEETS CONSTRUCTION DETAILS.
- 2 VERIFY ALL DIMENSIONS WITH THE ARCHITECTURAL AND BUILDING MANUFACTURER DRAWINGS. DO NOT SCALE DRAWINGS.
- 3 USE LIGHT WEIGHT EQUIPMENT TO COMPACT THE SOIL WITHIN 2 FEET AROUND FOUNDATION.
- 4 ALL BASE PLATES AND ANCHOR BOLTS SHALL BE LOCATED PER THE BUILDING MANUFACTURER'S PLANS.
- 5 PEDESTAL PER FOOTING SCHEDULE
- 6 CONTROL JOINT
- 7 8" THICK REINFORCED EQUIPMENT PAD PER 8/S2.1 - SEE ARCH AND MESH DRAWINGS FOR EXACT SIZE AND LOCATIONS
- 8 4" THICK REINFORCED CONCRETE HOUSEKEEPING PAD FOR ELECTRICAL EQUIPMENT - SEE ARCH DRAWINGS FOR EXACT LOCATIONS



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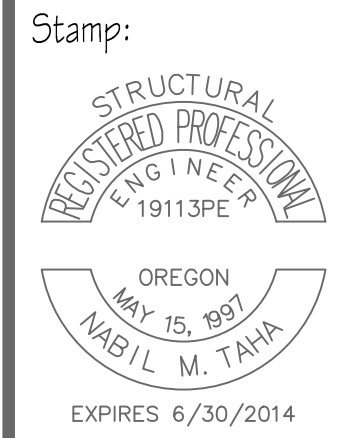
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541-855-1600



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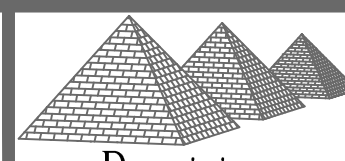
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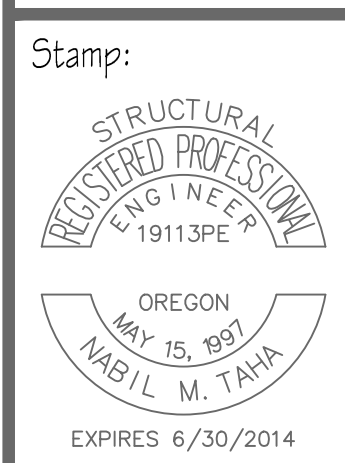
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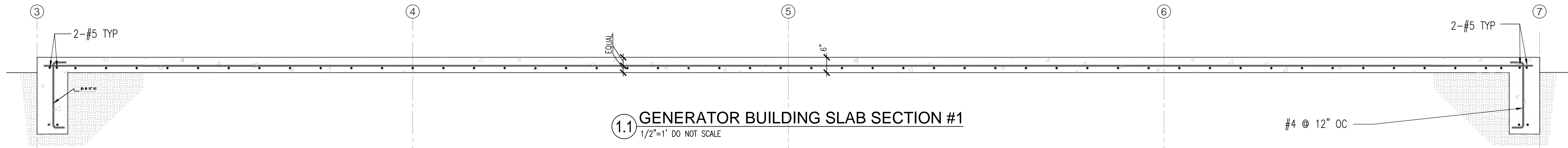
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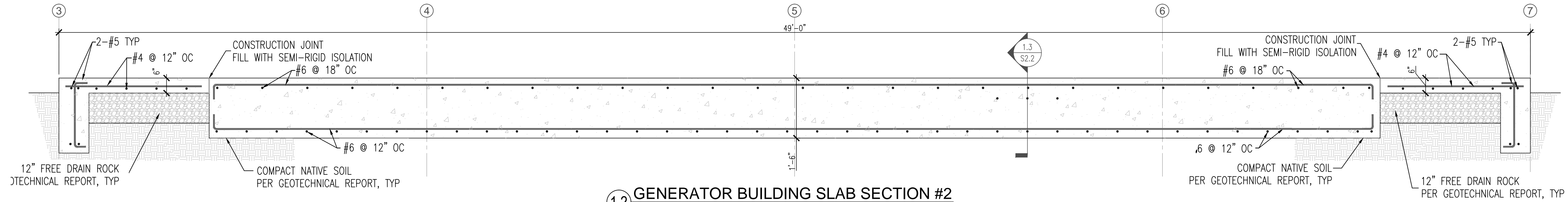
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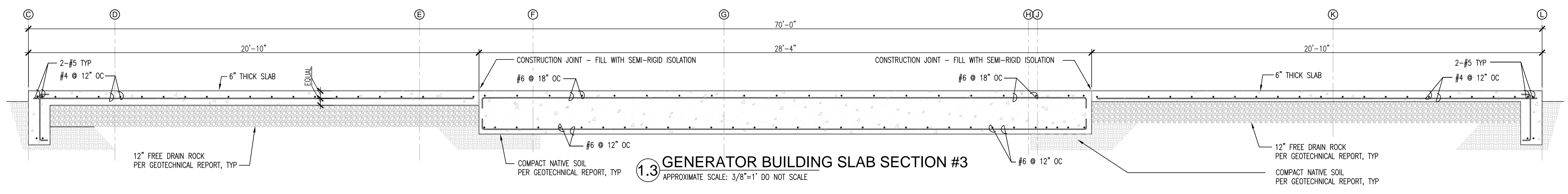
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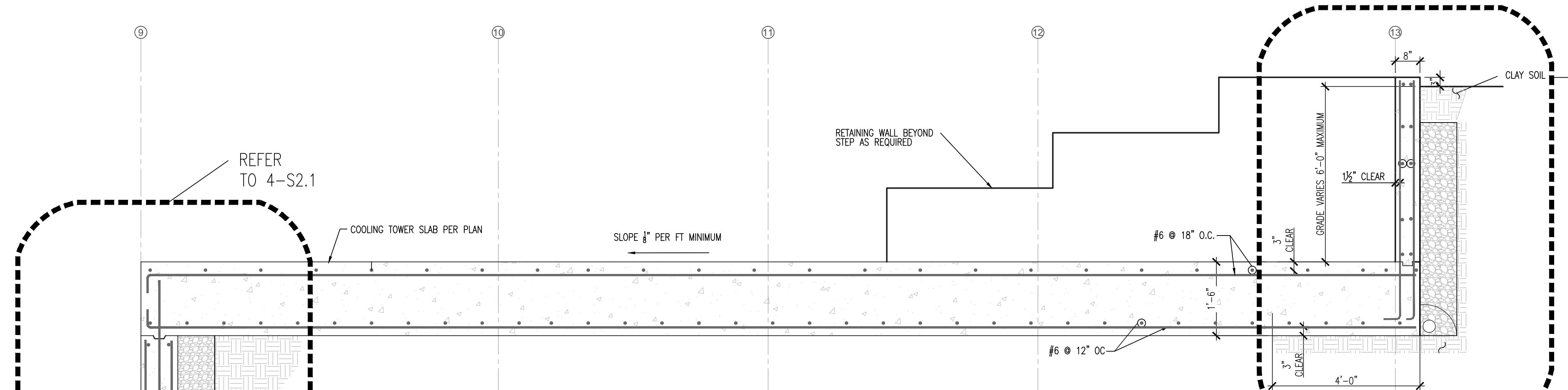
1.1 GENERATOR BUILDING SLAB SECTION #1
 1/2"=1' DO NOT SCALE



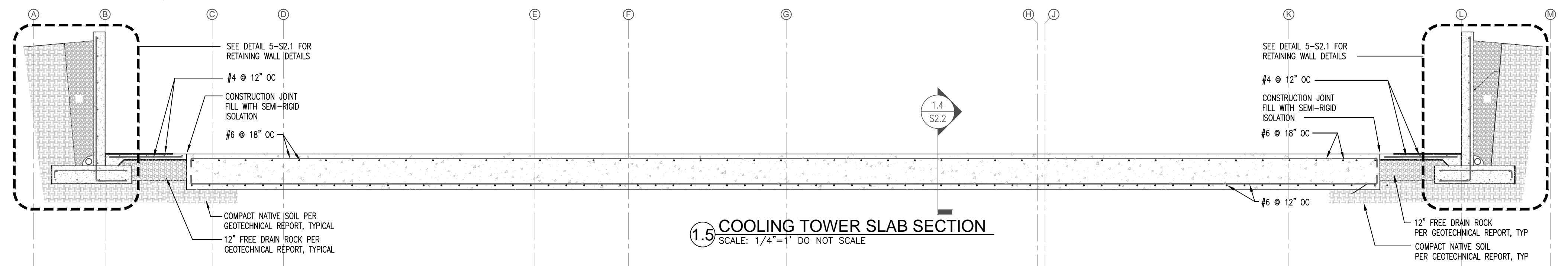
1.2 GENERATOR BUILDING SLAB SECTION #2
 SCALE: 1/2"=1'-0" DO NOT SCALE



1.3 GENERATOR BUILDING SLAB SECTION #3
 APPROXIMATE SCALE: 3/8"=1' DO NOT SCALE

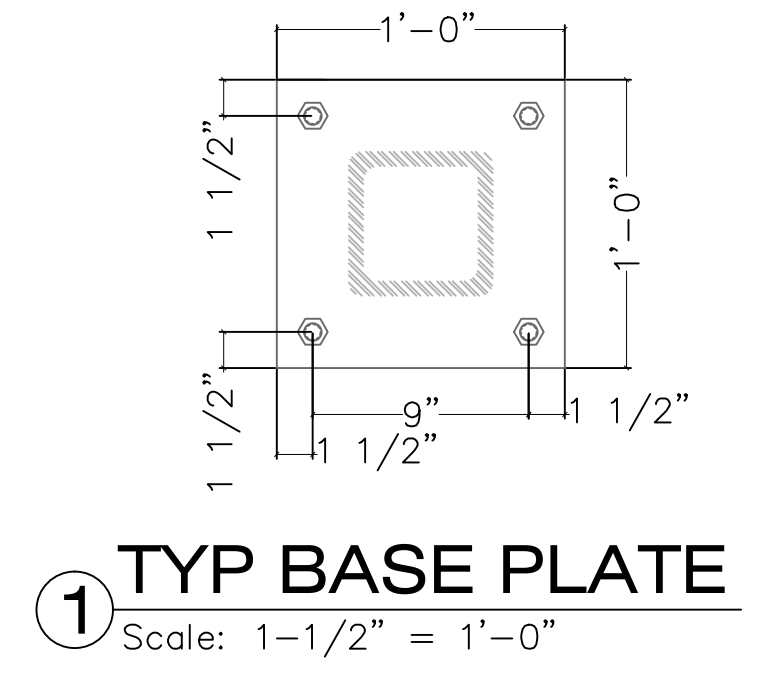
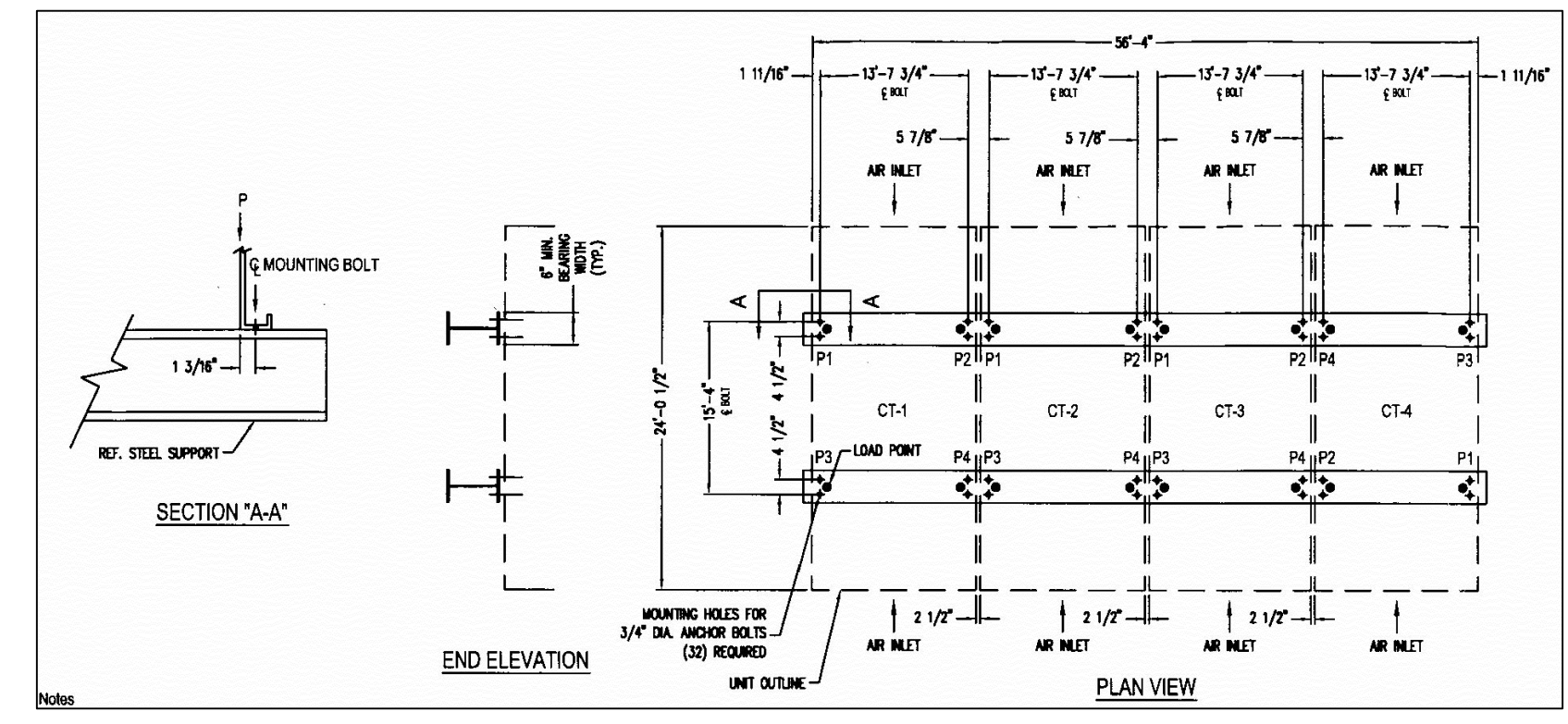
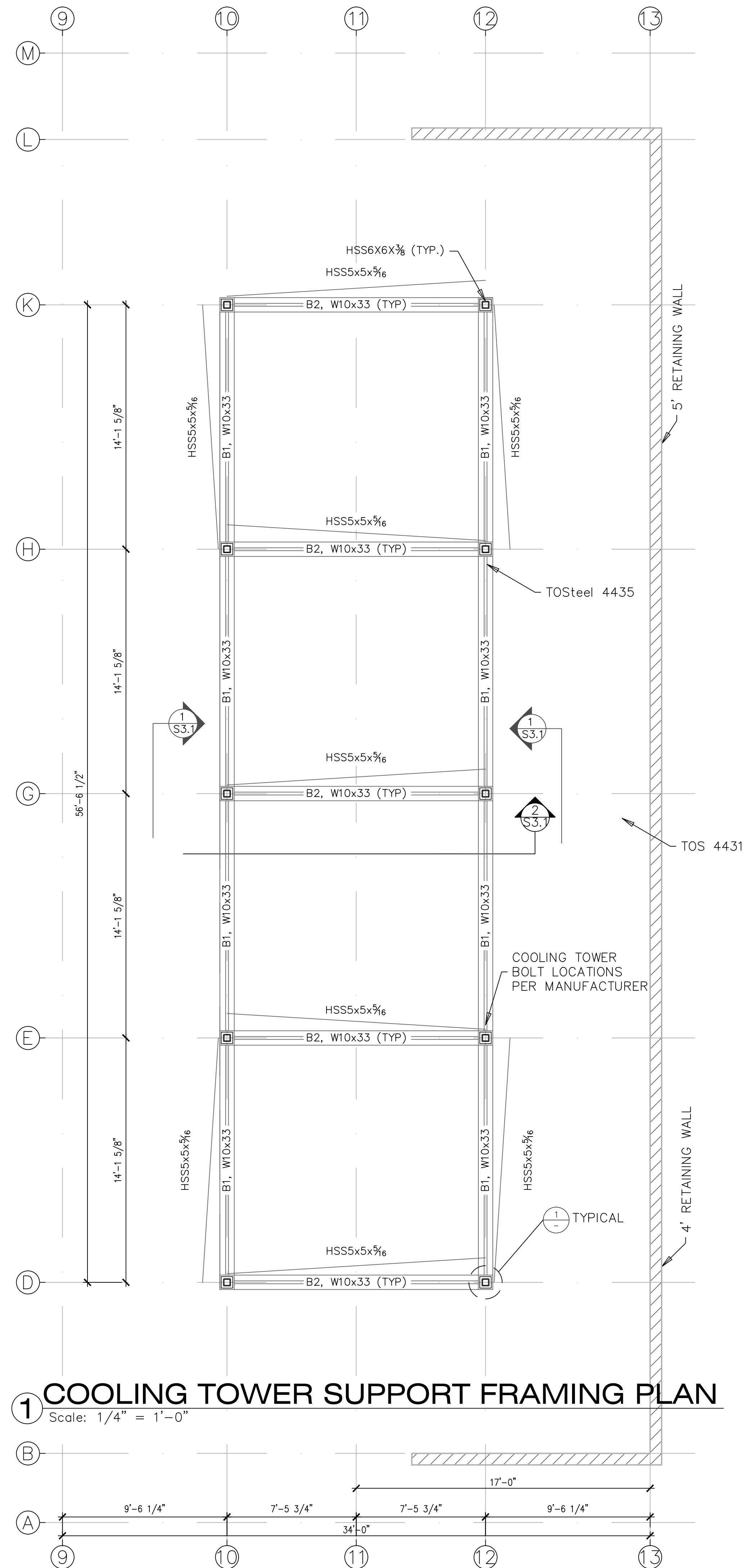


1.4 COOLING TOWER SLAB SECTION
 1/2"=1' DO NOT SCALE



1.5 COOLING TOWER SLAB SECTION
 SCALE: 1/4"=1' DO NOT SCALE

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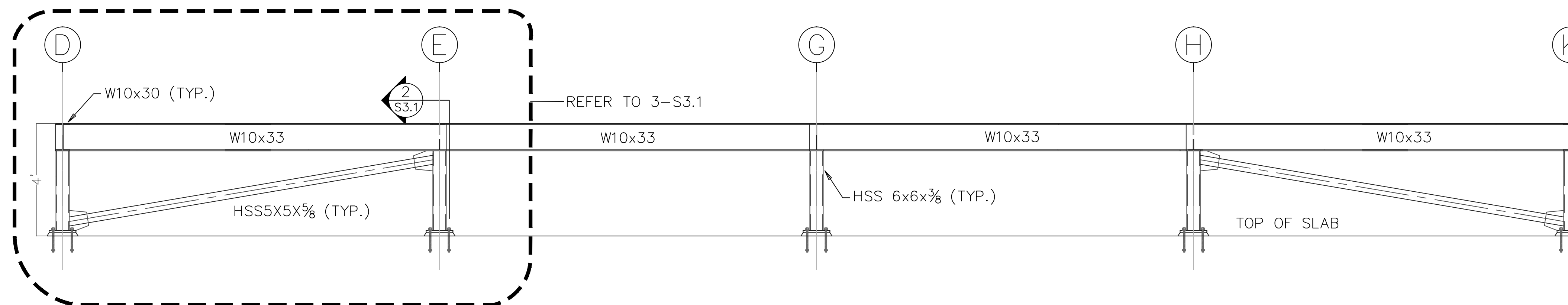
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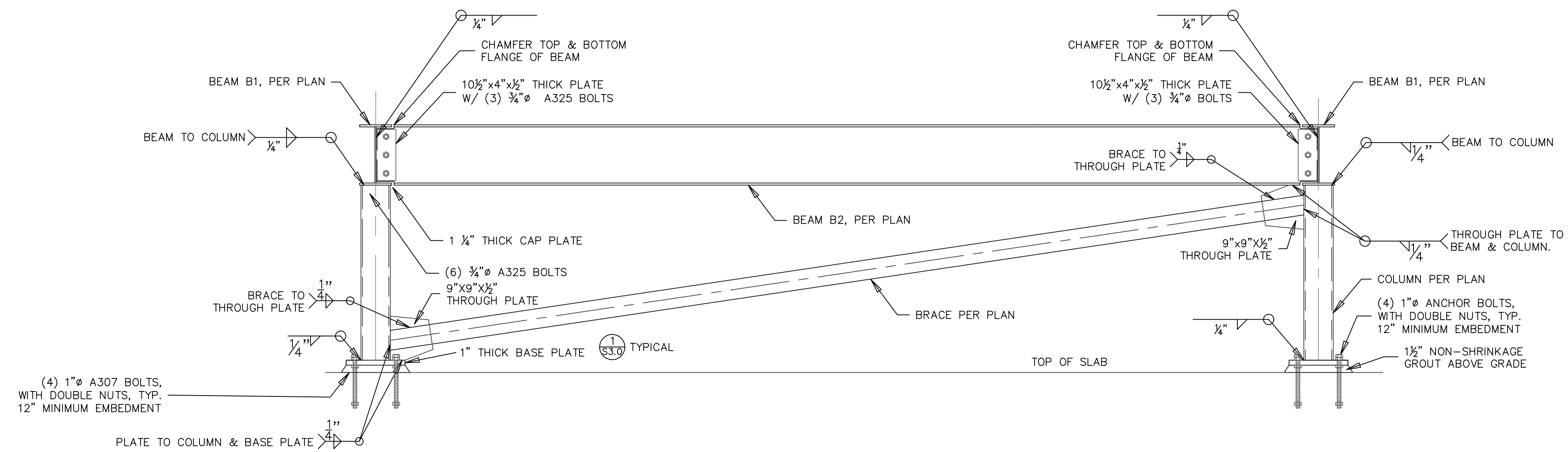
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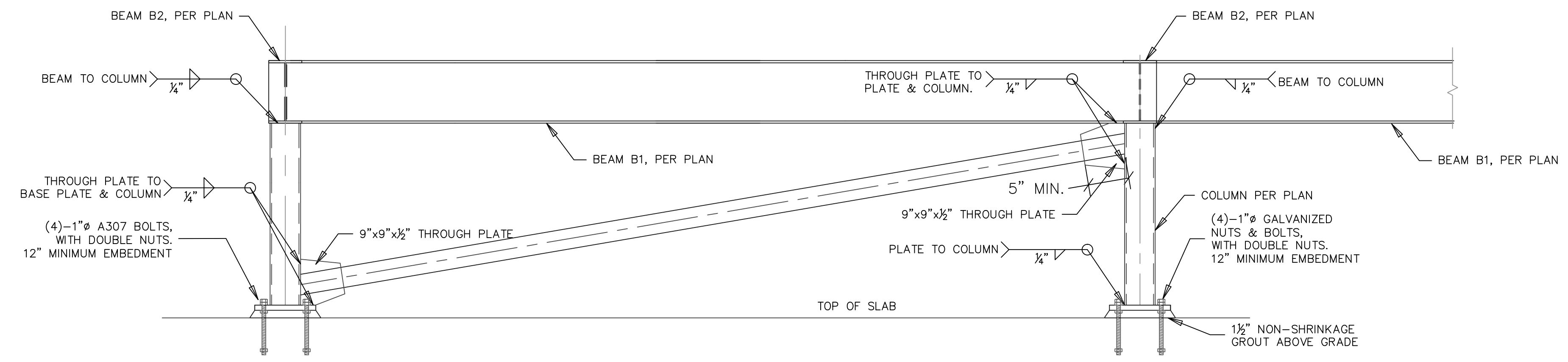
1 COOLING TOWER FRAMING ELEVATION

Approximate Scale: 3/8" = 1'-0" DO NOT SCALE



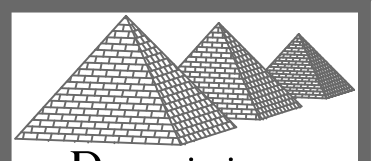
2 TRANVERSE SECTION

Approximate Scale: 3/4" = 1'-0" DO NOT SCALE



3 ENLARGED FRAMING ELEVATION

Approximate Scale: 3/4" = 1'-0" DO NOT SCALE



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HVAC ABBREVIATIONS

ACFM	ACTUAL AIR — CUBIC FEET PER MINUTE
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AP	ACCESS PANEL
ARCH	ARCHITECT OR ARCHITECTURAL
ATD	AIR TRANSFER DUCT
BD	BACKDRAFT DAMPER
BLDG	BUILDING
BM	BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STEEL
BTU	BRITISH THERMAL UNIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CONSTR	CONSTRUCTION
CV	CONSTRAINT VOLUME
CW	CITY WATER
DB	DRY BULB
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
DX	DIRECT EXPANSION (REFRIGERATION)
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
ELEV	ELEVATION
ERA	ECONOMIZER RELIEF AIR
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
F	FAHRENHEIT
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FLR	FLOOR
FLT	FILTER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FFM	FEET PER MINUTE
FSD	COMBINATION FIRE / SMOKE DAMPER
FWR	FILTER WATER RETURN
FWS	FILTER WATER SUPPLY
GALV	GALVANIZED STEEL
GC	GENERAL CONTRACTOR
GHWR	GEOTHERMAL HOT WATER RETURN
GHWS	GEOTHERMAL HOT WATER SUPPLY
GM	GAS METER
GPM	GALLONS PER MINUTE
GRD	GRILLES, REGISTERS, DIFFUSERS
H	HUMIDISTAT
HDPE	HIGH-DENSITY POLYETHYLENE
HP	MOTOR HORSEPOWER
HVAC	HEATING, VENTING, AND CONDITIONING
HPW	HEAT PUMP WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LB(S)	POUND, POUNDS
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MU	MAKEUP WATER
NC	NORMALLY CLOSED
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OA or OSA	OUTSIDE AIR
OMSC	2010 OREGON MECHANICAL SPECIALTY CODE
OSSC	2010 OREGON STRUCTURAL SPECIALTY CODE
PBD	PARALLEL BLADE DAMPER
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE / TEMPERATURE PLUG
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RECT	RECTANGULAR
RED	REDUCER
RPM	REVOLUTIONS PER MINUTE
REQ'D	REQUIRED
SA	SUPPLY AIR
SCFM	STANDARD AIR — CUBIC FEET PER MINUTE
SEC	SECTION
SF or SQ FT	SQUARE FEET
SIM	SIMILAR
SM	SHEET METAL
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SP	STATIC PRESSURE
SPEC	SPECIFICATION OR SPECIFIED
SS	STAINLESS STEEL
SSF	SIDE STREAM FILTER
STD	STANDARD
T	THERMOSTAT
TC	TEMPERATURE CONTROLS
TEMP	TEMPERATURE
TOS	TOP OF STEEL
TWCR	COOLING TOWER WATER RETURN
TWCS	COOLING TOWER WATER SUPPLY
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
WB	WET BULB
W/	WITH
WG	WATER GAUGE

DUCT & FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		SUPPLY AIR
		RETURN AIR
		OUTSIDE AIR
		EXHAUST AIR
		RECTANGULAR DUCT SIZE FIRST NUMBER INDICATES VISIBLE DIMENSION AND SECOND NUMBER INDICATES HIDDEN DIMENSION. ALL DIMENSIONS ARE INCHES. SA IS SUPPLY AIR DUCT. RA IS RETURN AIR DUCT.
		ROUND DUCT DIAMETER
		FLAT OVAL DUCT
		SUPPLY DUCT UP OR SECTION
		SUPPLY DUCT DOWN OR SECTION AWAY
		RETURN OR OSA DUCT UP OR SECTION
		RETURN OR OSA DUCT DOWN OR SECTION
		EXHAUST DUCT UP OR SECTION
		EXHAUST DUCT DOWN OR SECTION
		TRANSITION
		SQUARE TO ROUND TRANSITION
		FLANGED TAKEOFF (RECTANGULAR DUCT)
		LATERAL HIGH EFFICIENCY TAKE-OFF FITTING W / VD (SQR TO RND TAKEOFF FROM RECTANGULAR MAIN)
		CONICAL SPIN-IN FITTING WITH VOLUME DAMPER (ROUND BRANCH TAKEOFF FROM RECTANGULAR MAIN)
		STRAIGHT SPIN-IN FITTING WITH VOLUME DAMPER (ROUND BRANCH TAKEOFF FROM RECTANGULAR MAIN)
		CONICAL 90° TAKE-OFF (ROUND / OVAL DUCT)
		45° LATERAL TAKE-OFF (ROUND / OVAL DUCT)
		DUCT SLOPE UP (RISE)
		DUCT SLOPE DOWN (DROP)
		END CAP
		RECTANGULAR MITERED ELBOW W/ TURNING VANES
		RECTANGULAR TEE — 90° MITERED ELBOWS W/ TURNING VANES
		90° OR 45° LONG RADIUS ELBOW, R=1.5 DIA OR WIDTH (ROUND OR RECTANGULAR DUCT)

HVAC SYMBOLS & ABBREVIATIONS

	DUCT WITH INTERNAL ACOUSTICAL INSULATION
	ACCESS DOOR
	VOLUME DAMPER
	MOTORIZED DAMPER
	BACKDRAFT DAMPER
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER
	FLEXIBLE DUCT CONNECTION
	DIRECTION OF AIRFLOW
	ZONE CONTROL DAMPER
	FILTER
	CEILING ACCESS DOOR
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	OUTLET / INLET TAG
	AIRFLOW, CFM
	PREFIX (F) INDICATES A FIRE RATED GRILLE, REGISTER, OR DIFFUSER
	THERMOSTAT OR TEMP SENSOR

NOTE: ABBREVIATIONS AND SYMBOLS ARE ARCSINE ENGINEERING STANDARDIZED SYMBOL LEGENDS. AS SUCH, ALL SYMBOLS SHOWN MAY NOT APPEAR ON OR WITHIN THIS SET OF CONTRACT DOCUMENTS.

PIPE SYMBOLS

	GEOTHERMAL HOT WATER SUPPLY
	GEOTHERMAL HOT WATER RETURN
	HOT WATER SUPPLY
	HOT WATER RETURN
	COOLING TOWER WATER SUPPLY
	COOLING TOWER WATER RETURN
	COOLING TOWER FILTERED WATER SUPPLY
	COOLING TOWER FILTERED WATER RETURN
	AUTOMATIC AIR VENT
	DIRECTION OF FLOW
	CHANGE IN SIZE
	PIPE DOWN
	PIPE UP
	TEE DOWN
	TEE UP
	ELBOW
	TEE
	CAP
	PIPE UNION
	GATE VALVE
	BALL VALVE
	BUTTERFLY VALVE (MANUAL)
	BUTTERFLY VALVE (MOTORIZED)
	PRESSURE GAUGE
	TEMPERATURE GAUGE
	MOTORIZED DAMPER ACTUATOR
	PRESSURE REDUCING VALVE
	PRESSURE & TEMPERATURE GAUGE PORT.
	BALANCING VALVE
	PUMP
	GLOBE VALVE
	CHECK VALVE
	DOUBLE CHECK VALVE
	SAFETY RELIEF VALVE
	TWO WAY CONTROL VALVE
	THREE WAY CONTROL VALVE
	STRAINER
	STEAM CONDENSATE TRAP

GENERAL SYMBOLS

	CAP FOR FUTURE
	POINT OF NEW CONNECTION
	REVISION NUMBER
	POINT OF CONTINUATION
	EQUIPMENT TAG EQUIPMENT NUMBER
	SECTION (LETTER) OR DETAIL (NUMERICAL) DESIGNATION SHEET NUMBER
	SECTION DESIGNATION SHEET NUMBER
	PIPE SIZE AND FLOW TAG
	GENERAL BREAK
	LINE BREAK
	ON DEMOLITION PLANS, INDICATES ITEMS TO BE REMOVED
	KEYED NOTES
	EXISTING
	FUTURE

GENERAL NOTES

- CONTRACTOR TO SECURE, MAINTAIN, AND PAY FOR ALL REQUIRED LICENSES AND INSPECTIONS FOR DURATION OF WORK UNLESS DIRECTED OTHERWISE.
- ALL DUCTWORK SHALL BE GALVANIZED STEEL, ROUND OR RECTANGULAR. SUPPORT PER SMACNA DUCT CONSTRUCTION STANDARDS AND INSTALL IN CONFORMANCE TO MECHANICAL CODES. SUPPLY AIR DUCTS SHALL BE CONSTRUCTED TO +2" PRESSURE STANDARD. RETURN AIR DUCTS SHALL BE CONSTRUCTED TO -1" PRESSURE STANDARD. SEAL ALL DUCTS TO CLASS "B" STANDARDS.
- PROVIDE TURNING VANES FOR ALL SUPPLY AIR AND RETURN AIR RECTANGULAR ELBOWS.
- SHEET METAL DUCT SIZES SHOWN ARE NET CLEAR INSIDE DIMENSIONS. WHEN INTERNAL INSULATION IS REQUIRED, DUCT SIZE SHALL BE INCREASED TO PROVIDE NET CLEAR DIMENSIONS INDICATED.
- EXPOSED EXHAUST AIR DUCTWORK WITHIN CONDITIONED SPACES NEED NOT BE INSULATED UNLESS NOTED OTHERWISE. CONTRACTOR SHALL INSTALL EXPOSED DUCTWORK IN A NEAT AND CLEAN MANNER.
- MOTORIZED OUTDOOR AIR DAMPERS SHALL HAVE A MAXIMUM LEAKAGE RATE OF 4 CFM / SF AT 1.0" W.G.
- TEST THE OPERATION OF MECHANICAL SYSTEMS AND EQUIPMENT FOR COMPLIANCE WITH CONTRACT CONDITIONS. MEASURE AIR QUANTITIES WITH CALIBRATED DEVICES CAPABLE OF MEASURING AIR QUANTITIES ON A CONTINUOUS BASIS AND DISPLAYING THAT QUANTITY ON A READILY ACCESSIBLE DISPLAY DEVICE. ADJUST ALL DAMPERS, DRIVES, MOTORS, AND OTHER ADJUSTABLE ITEMS TO DELIVER DESIGN QUANTITIES IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS (2005) OR AABC NATIONAL STANDARDS (2002). PROVIDE ALL NECESSARY BELTS, SHEAVES, ETC. PROVIDE BALANCE REPORT TO OWNER AND ENGINEER.
- CONTRACTOR SHALL SUPPLY ALL REQUIRED STARTERS, DISCONNECTS AND POWER WIRING BY ELECTRICAL CONTRACTOR.
- ALL EXHAUST AIR FANS SHALL BE CONTROLLED FROM 1 THERMOSTAT FOR EACH SYSTEM LOCATED WITHIN THE CONTROLLED SPACE.
- ALL WORK REQUIREMENTS SHOWN ON MECHANICAL DRAWINGS SHALL BE DONE IN CONJUNCTION WITH WRITTEN MECHANICAL SPECIFICATIONS. DO NOT PROCEED WITH WORK WITHOUT FULL KNOWLEDGE OF REQUIREMENTS LISTED IN THE PROJECT SPECIFICATIONS.

ArcSine engineering
 A full-spectrum engineering company
 999 Executive Way | Redding, CA 96002 | (530)222-7904
 1208 Oak Drive | Medford, OR 97501 | (541)842-4188
 402 North Main | Portland, OR 97201 | (503)222-7904
 www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
 10000
 ORT CON
 FEB. 09, 1991
 DANIEL J. WEHAGE
 EXPIRES: 06/30/14

BATZER
CONSTRUCTION

P.O. Box 4460, 190 North Ross Lane
 Medford, Oregon 97501
 Office: 541.773.7553 Fax: 541.773.6523
 CCB No. 132902
 Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT

Project Location:
 3201 Campus Drive, Klamath Falls, Oregon 97601
 Map & Tabled Reference: 38 09 20 - 4800

CLIENT:
Oregon TECH
 3201 Campus Drive, Klamath Falls, Oregon 97601
 Contact: Mr. David Ebsen (541) 885-1600

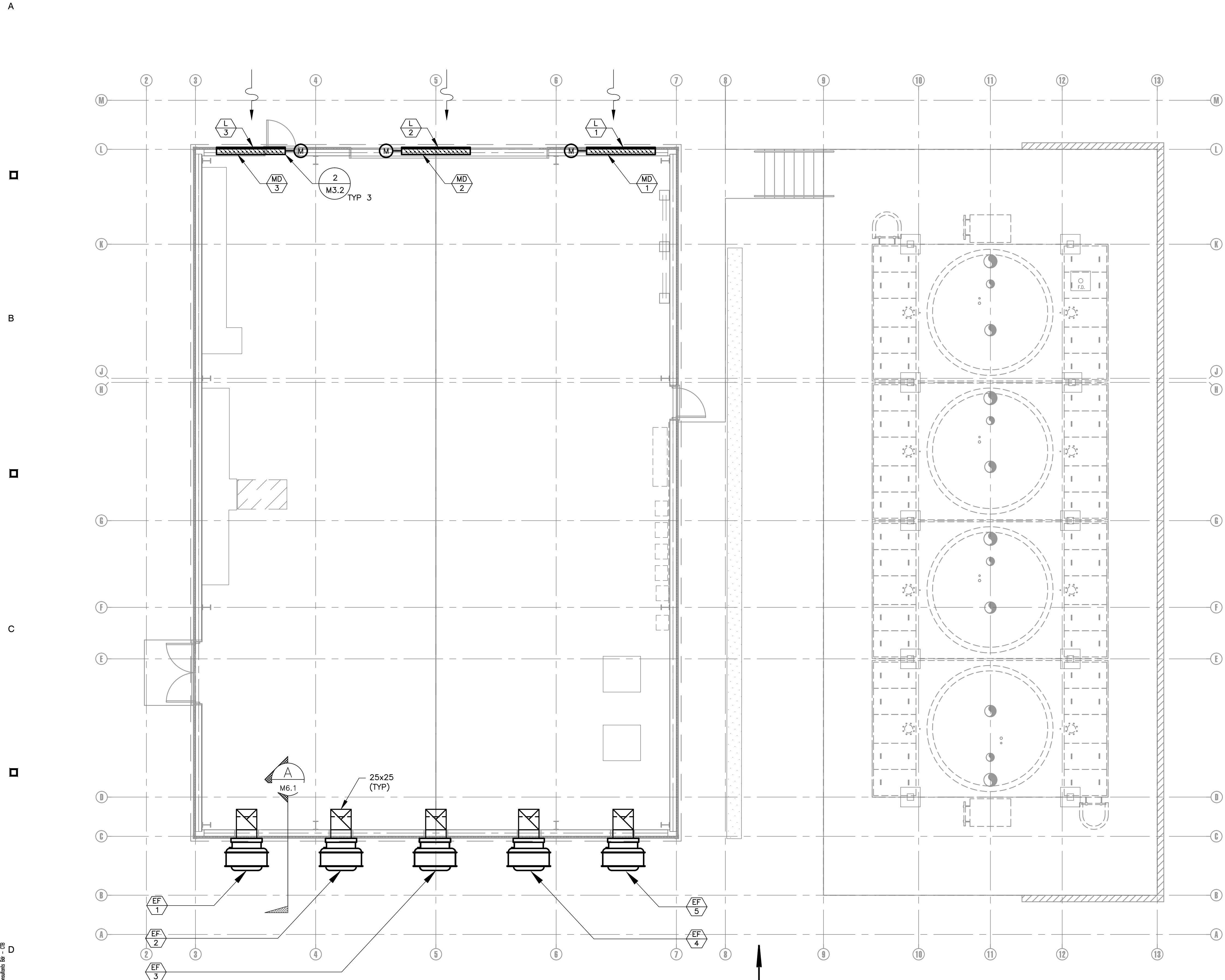
MARK	DATE	DESCRIPTION
	10/19/12	ISSUED FOR PERMIT
	09/17/12	ISSUED FOR OWNER REVIEW

ISSUE: 09/17/12
 PROJECT NO: 1245
 DRAWN BY: J. JONES
 CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE _____

SHEET TITLE:
MECHANICAL SYMBOLS AND ABBREVIATIONS

PLT DATE: 10/17/2012 4:08 PM



GENERAL NOTES

A. SEQUENCE OF OPERATION

- REFRIGERATION SENSOR SHALL BE LOCATED WITHIN 48" OF GROUND LEVEL NEAR THE POWER GENERATION EQUIPMENT AND REFRIGERATION STORAGE CYLINDERS
- WHEN REFRIGERATION SENSORS INDICATE THE PRESENCE OF REFRIGERANT, LOUVER L-1 SHALL OPEN AND EXHAUST FAN EF-1 SHALL START. THE METSYSYS CONTROL SYSTEM SHALL INDICATE AN ALARM FOR A REFRIGERANT LEAK.
- SPACE TEMPERATURE CONTROL:
 - AN INDOOR TEMPERATURE SENSOR SHALL BE SET AT 75°F (ADJUSTABLE). EXHAUST FANS EF-1, 2, 3, 4 & 5 SHALL BE STAGED TO TURN ON WHEN THE AMBIENT TEMPERATURE IN THE BUILDING INCREASES 3°F (ADJUSTABLE) ABOVE THE PREVIOUS FAN ACTUATION. WHEN THE SPACE TEMPERATURE FALLS 3°F BELOW THE PREVIOUS CONDITION, THE LAST FAN SHALL TURN OFF. LOUVERS L-1, L-2 & L-3 SHALL BE STAGED AS FOLLOWS:

LOUVER	# FANS OPERATING
L-1	1 OR 2
L-3	3 OR 4
L-2	5

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 1228 Oak Drive / Medford, OR 97501 | (541)842-4188
 225 North Main Street / Astoria, OR 97103 | (503)325-7284
 www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
 10/08
 DANIEL J. WEHAGE
 EXPIRES: 06/30/14

BATZER CONSTRUCTION
 P.O. Box 4460, 190 North Ross Lane
 Medford, Oregon 97501
 Office: 541.773.7553 Fax: 541.773.6523
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PROJECT:
A NEW GEOTHERMAL POWER PLANT

Project Location:
 3201 Campus Drive, Klamath Falls, Oregon 97601
 Map & Taxlot Reference: 38 09 20 - 4800

CLIENT:
Oregon TECH
 3201 Campus Drive, Klamath Falls, Oregon 97601
 Contact: Mr. David Ebsen (541) 885-1600

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ISSUE: 09/17/12
 PROJECT NO: 1245
 DRAWN BY: J. JONES
 CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE _____

SHEET TITLE:
MECHANICAL HVAC FLOOR PLAN

PLOT DATE: 10/17/2012 4:09 PM

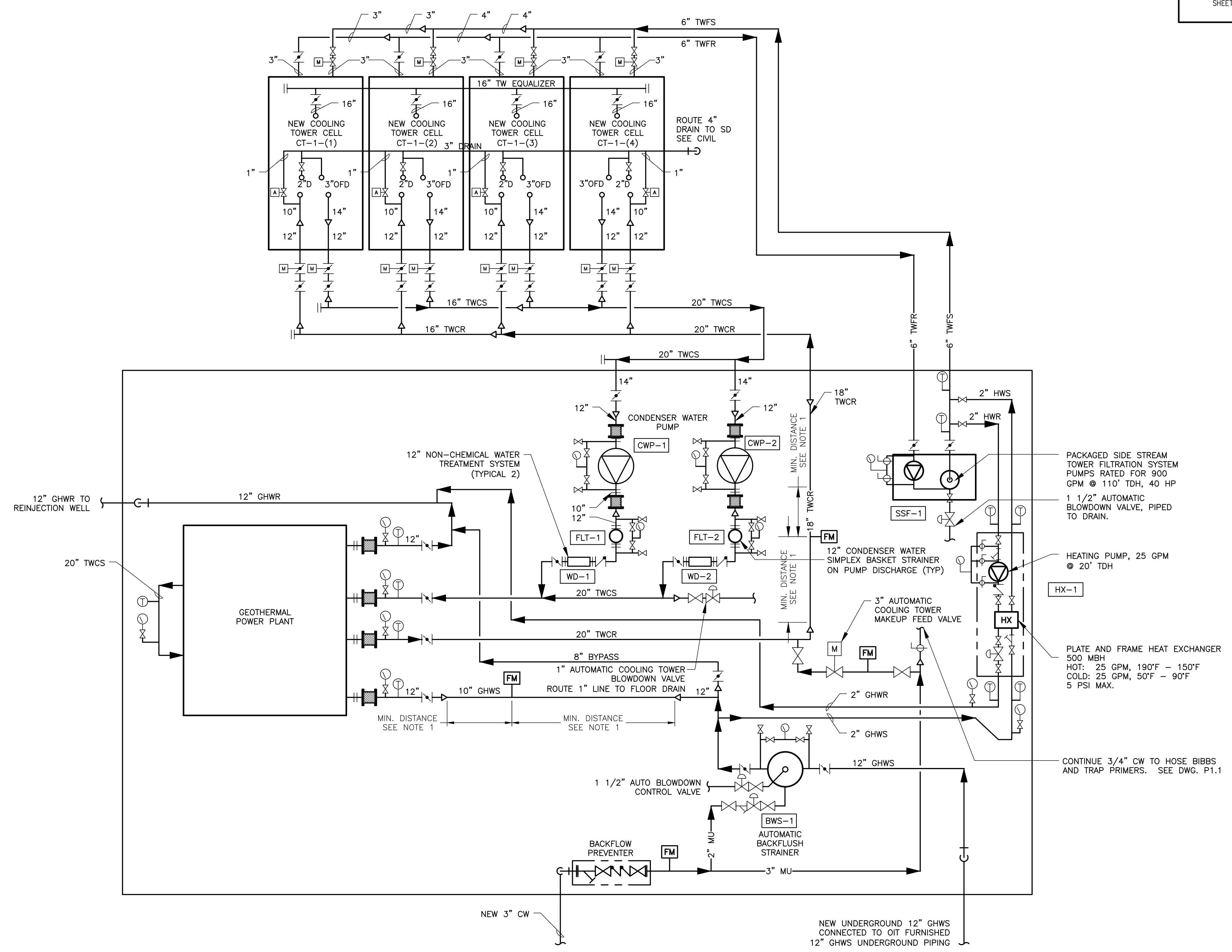
M1.1

User: jones, October 17, 2012 4:09:16 PM
 Plot Date: Wednesday, October 17, 2012 4:09:16 PM
 File Name: M:\Projects\1245 - GE Geothermal Plant\Design\Drawings\M1.1.dwg
 User: jones, Plot Date: Wednesday, October 17, 2012 4:09:16 PM

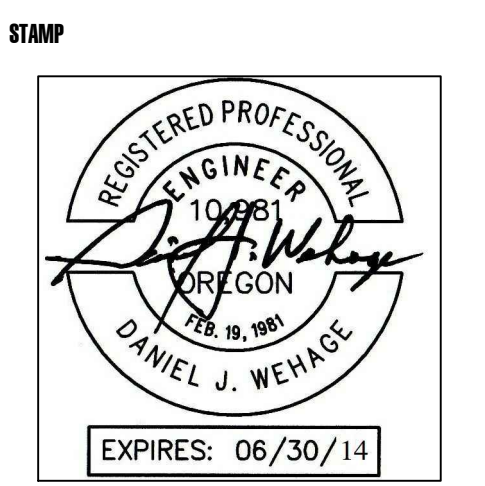
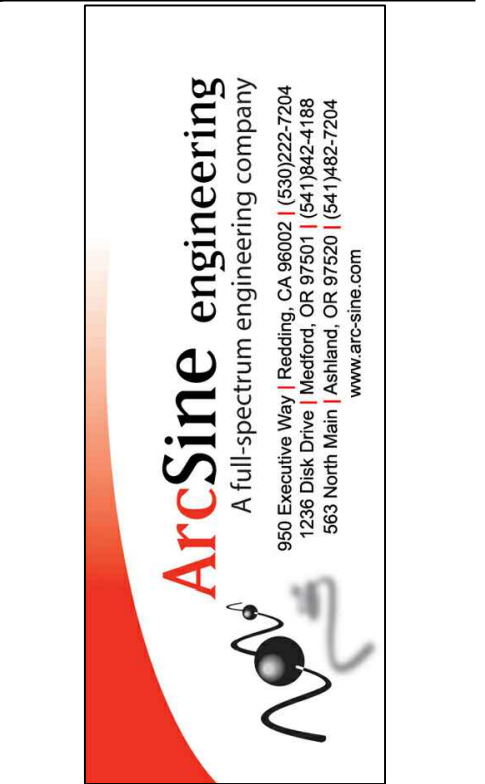
1 HVAC FLOOR PLAN
 SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. FOR MINIMUM DISTANCES LEAD IN AND LEAD OUT FOR FLOWMETER, REFER TO MANUFACTURERS INFORMATION SHEETS.



1 PIPING FLOW DIAGRAM
SCALE: NTS



P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
CCB No. 132902
Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT

Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4800

CLIENT:
Oregon TECH

CONTACT:
Mr. David Ebsen (541) 885-1600

MARK	DATE	DESCRIPTION
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ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. MEHAGE

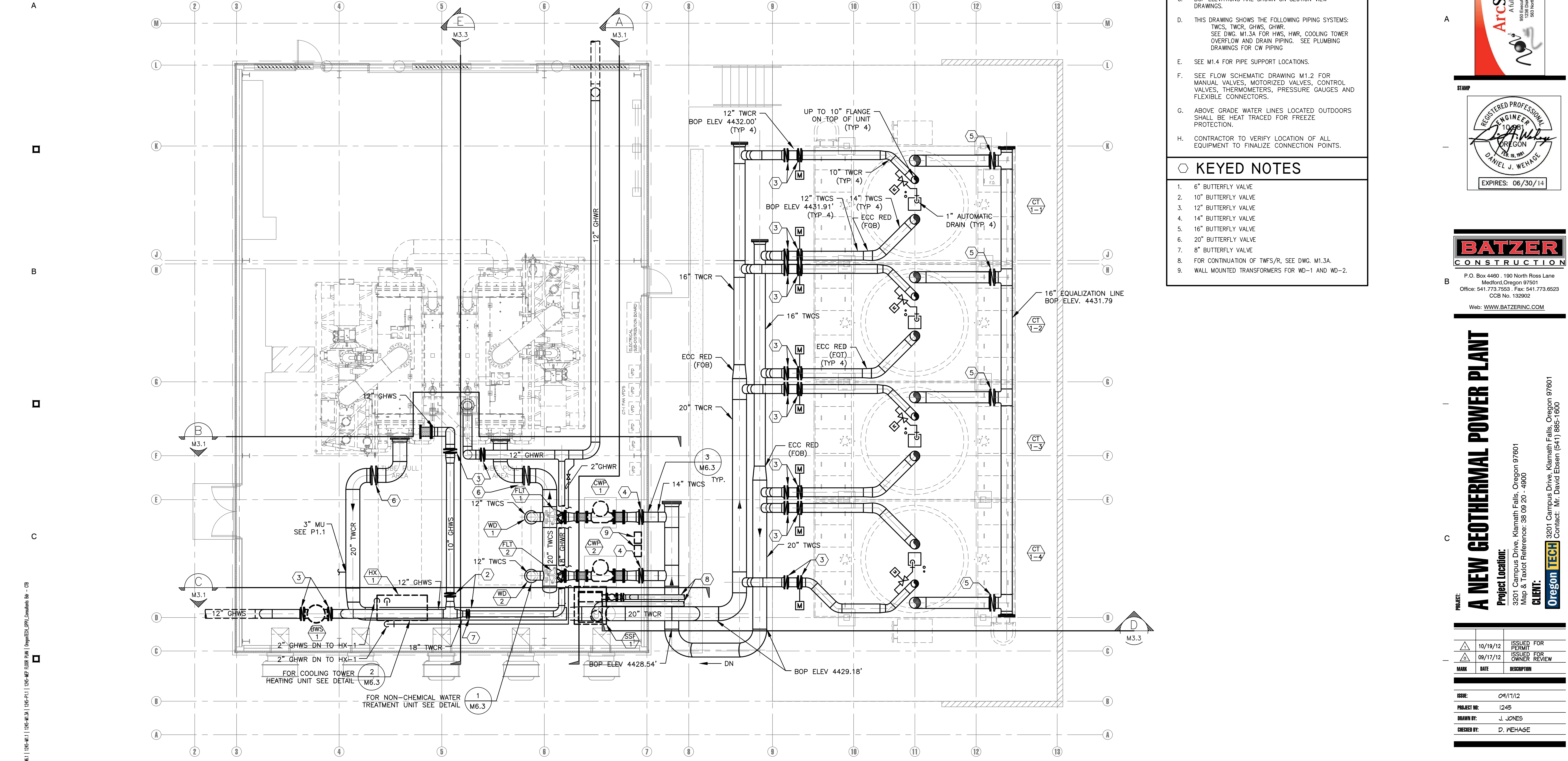
APPROVED FOR THE OWNER DATE _____

SHEET TITLE:
MECHANICAL PIPING FLOW DIAGRAM

PLOT DATE: 10/17/2012 4:10 PM

M1.2

User Name: jones
 Plot Date: Wednesday, October 17, 2012 4:10:15 PM
 Plot Name: M1\Projects\1245 - New Geothermal Plant\Drawings\M1.2.dwg
 User: jones
 Project: 1245 - New Geothermal Plant



GENERAL NOTES

- A. BUILDING FINISHED FLOOR ELEVATION IS +0'-0" (+4427')
- B. COOLING TOWER FLOOR SLAB ELEVATION IS +4'-0" (+4431').
- C. BOP ELEVATIONS ARE SHOWN ON SECTION VIEW DRAWINGS.
- D. THIS DRAWING SHOWS THE FOLLOWING PIPING SYSTEMS: TWCS, TWCR, GHWS, GHWR. SEE DWG. M1.3A FOR HWS, HWR, COOLING TOWER OVERFLOW AND DRAIN PIPING. SEE PLUMBING DRAWINGS FOR CW PIPING.
- E. SEE M1.4 FOR PIPE SUPPORT LOCATIONS.
- F. SEE FLOW SCHEMATIC DRAWING M1.2 FOR MANUAL VALVES, MOTORIZED VALVES, CONTROL VALVES, THERMOMETERS, PRESSURE GAUGES AND FLEXIBLE CONNECTORS.
- G. ABOVE GRADE WATER LINES LOCATED OUTDOORS SHALL BE HEAT TRACED FOR FREEZE PROTECTION.
- H. CONTRACTOR TO VERIFY LOCATION OF ALL EQUIPMENT TO FINALIZE CONNECTION POINTS.

KEYED NOTES

- 1. 6" BUTTERFLY VALVE
- 2. 10" BUTTERFLY VALVE
- 3. 12" BUTTERFLY VALVE
- 4. 14" BUTTERFLY VALVE
- 5. 16" BUTTERFLY VALVE
- 6. 20" BUTTERFLY VALVE
- 7. 8" BUTTERFLY VALVE
- 8. FOR CONTINUATION OF TWFS/R, SEE DWG. M1.3A.
- 9. WALL MOUNTED TRANSFORMERS FOR WD-1 AND WD-2.

1 PIPING FLOOR PLAN
SCALE: 3/16" = 1'-0"

User: Name: Jones
 Plot Date: Wednesday, October 17, 2012 4:11:20 PM
 File Name: M:\Projects\1735-01 Geothermal Plant\Drawings\1735-M1.3.dwg
 Plot Path: C:\Program Files\Autodesk\AutoCAD 2012\Plot\AutoCAD.ctb
 Plot Device: HP DesignJet 5000 Series
 Plot Scale: 3/16" = 1'-0"

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 A full-spectrum engineering company
 999 Enclave Way | Redding, CA 96002 | (530)222-7904
 1228 Oak Drive | Medford, OR 97501 | (541)842-4188
 222 North Main | Astoria, OR 97103 | (503)325-7284
 www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
 10081
 DANIEL J. WEHAGE
 1981
 EXPIRES: 06/30/14

BATZER CONSTRUCTION
 P.O. Box 4460, 190 North Ross Lane
 Medford, Oregon 97501
 Office: 541.773.7553 Fax: 541.773.6523
 CCB No. 132902
 Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT

Project Location:
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 Map & Taxlot Reference: 38 09 20 - 4800

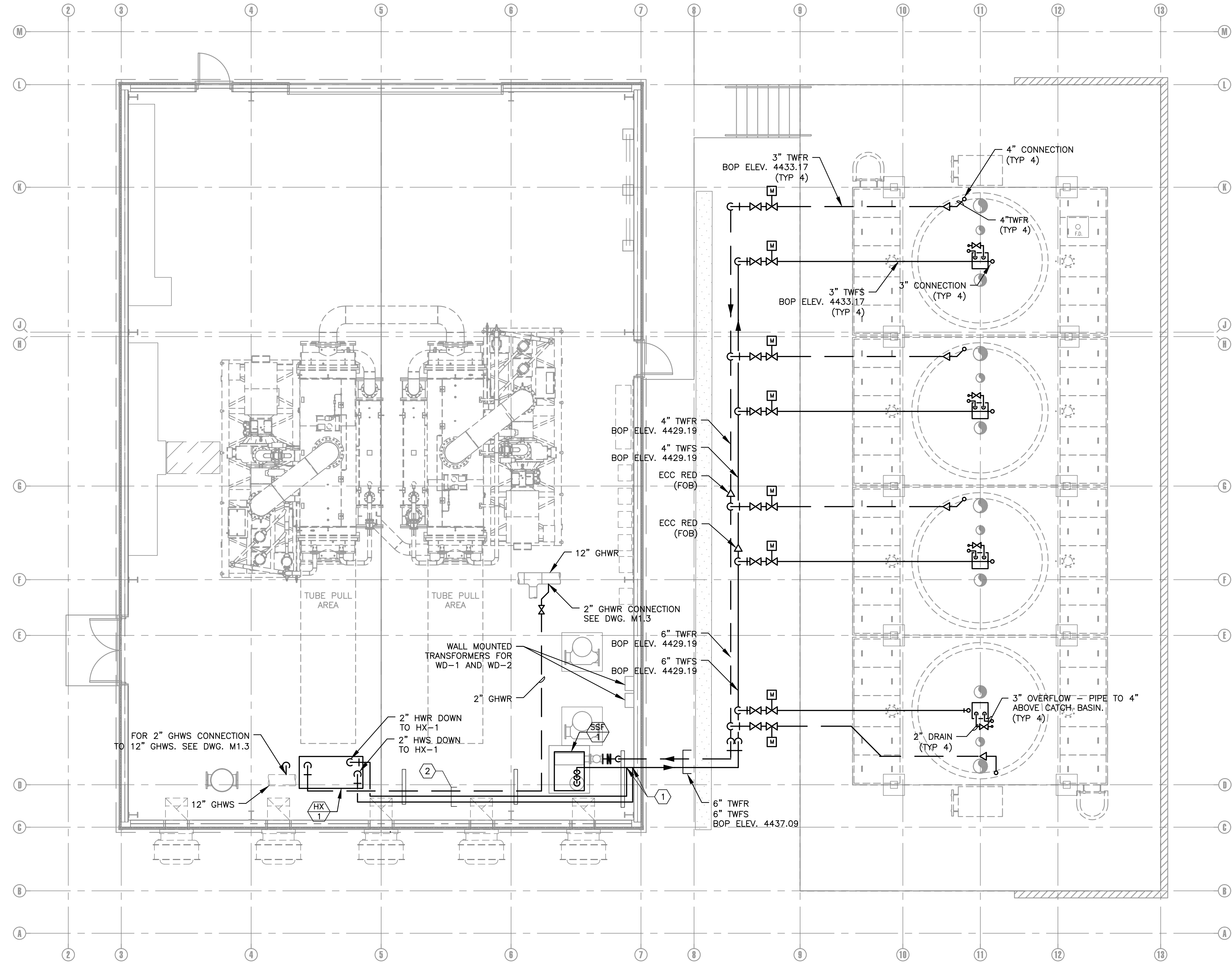
CLIENT:
Oregon TECH
 3201 Campus Drive, Klamath Falls, Oregon 97601
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MARK	DATE	DESCRIPTION
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ISSUE: 09/17/12
 PROJECT NO: 1245
 DRAWN BY: J. JONES
 CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE: _____
 SHEET TITLE:
MECHANICAL PIPING FLOOR PLAN
 PLOT DATE: 10/17/2012 4:11 PM

M1.3



GENERAL NOTES

- BUILDING FINISHED FLOOR ELEVATION IS +0'-0" (+4427')
- COOLING TOWER FLOOR SLAB ELEVATION IS +4'-0" (+4431').
- BOP ELEVATIONS ARE SHOWN ON SECTION VIEW DRAWINGS.
- THIS DRAWING SHOWS THE FOLLOWING PIPING SYSTEMS: HWS, HWR, COOLING TOWER OVERFLOW AND DRAIN PIPING. SEE DWG. M1.3A FOR TWCS, TWCR, GHWS, GHWR. SEE PLUMBING DRAWINGS FOR CW PIPING.
- SEE M1.4 FOR PIPE SUPPORT LOCATIONS.
- SEE FLOW SCHEMATIC DRAWING M1.2 FOR MANUAL VALVES, MOTORIZED VALVES, CONTROL VALVES, THERMOMETERS, PRESSURE GAUGES AND FLEXIBLE CONNECTORS.
- ALL ABOVE GRADE WATER LINES LOCATED OUTDOORS SHALL BE HEAT TRACED FOR FREEZE PROTECTION.
- CONTRACTOR TO VERIFY LOCATIONS OF ALL EQUIPMENT TO FINALIZE CONNECTION POINTS.

KEYED NOTES

- 2" HWS/R CONNECTION TO FILTERED WATER SUPPLY.
- SUPPORT HOT WATER LINES ON PRIMARY AND INTERMEDIATE PIPE SUPPORTS. SEE DETAIL 6/P6.1.

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 1208 Oak Drive | Medford, OR 97501 | (541)842-4188
 200 North Main Street | Portland, OR 97201 | (503)742-7204
 www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
 10083
 DANIEL J. WEHASE
 7.6.19.1981
 OREGON
 EXPIRES: 06/30/14

BATZER CONSTRUCTION
 P.O. Box 4460, 190 North Ross Lane
 Medford, Oregon 97501
 Office: 541.773.7553 Fax: 541.773.6523
 CCB No. 132902
 Web: WWW.BATZERINC.COM

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ISSUE: 09/17/12
 PROJECT NO: 1245
 DRAWN BY: J. JONES
 CHECKED BY: D. WEHASE

APPROVED FOR THE OWNER DATE _____

SHEET TITLE:
MECHANICAL PIPING FLOOR PLAN

PLT DATE: 10/17/2012 4:12 PM

M1.3A

User Name: jones
 Plot Date: Wednesday, October 17, 2012 4:12:11 PM
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 User: jones
 Plot From: Plot 1
 Plot Scale: 1/8"=1'-0"
 Plot Date: 10/17/2012 4:12:11 PM
 Plot Path: M:\Projects\1245 OF Geothermal Plant\Design\Drawings\1245-M1.3A.dwg

1 PIPING FLOOR PLAN
 SCALE: 3/16" = 1'-0"



PIPE SUPPORT SCHEDULE							
PIPE SUPPORT	TOP PIPE BOP ELEVATION	TYPE SUPPORT	DETAIL	SECOND PIPE BOP ELEVATION	TYPE SUPPORT	DETAIL	PIPE SUPPORT MIN. WIDTH
1	4427.92'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
2	4427.92'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
3	4440.28	ROLLER	1/M6.4	X	X	X	X
4	4440.20'	ROLLER	1/M6.4	4437.09'	ROLLER	1/M1.4	SUPPORT WIDTH
5	4437.09'	ROLLER	1/M6.4	X	X	X	X
6	4440.20'	ROLLER	1/M6.4	4437.09'	ROLLER	1/M1.4	SUPPORT WIDTH
7	NOT USED						
8	NOT USED						
9	4440.20'	ROLLER	1/M6.4	4437.09'	ROLLER	1/M1.4	SUPPORT WIDTH
10	4440.20'	ROLLER	1/M6.4	4437.09'	ROLLER	1/M1.4	SUPPORT WIDTH
11	NOT USED						
12	4437.01'	ROLLER	1/M6.4	X	X	X	X
13	4440.20	ROLLER	1/M6.4	X	X	X	X
14	4440.06'	ROLLER	1/M6.4	X	X	X	X
15	4437.01'	ROLLER	1/M6.4	X	X	X	X
16	4437.01'	ROLLER	1/M6.4	X	X	X	X
17	4437.01'	ROLLER	3/M6.4	X	X	X	X
18	4437.01'	ROLLER	3/M6.4	X	X	X	X
19	4437.01'	ROLLER	3/M6.4	X	X	X	X
20	4437.01'	ROLLER	3/M6.4	X	X	X	X
21	4428.79'	ROLLER	5/M6.4	X	X	X	X
22	4428.79'	ROLLER	5/M6.4	X	X	X	X
23	4428.52	ROLLER	1/M6.4	X	X	X	X
24	4428.52	ROLLER	1/M6.4	X	X	X	X
25	4430.19	ROLLER	4/M6.4	X	X	X	X
26	4430.19	ROLLER	4/M6.4	X	X	X	X
27	4430.19	ROLLER	4/M6.4	X	X	X	X
28	4430.19	ROLLER	4/M6.4	X	X	X	X
29	4430.19	ROLLER	4/M6.4	X	X	X	X
30	4430.19	ROLLER	4/M6.4	X	X	X	X
31	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
32	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
33	NOT USED						
34	NOT USED						
35	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
36	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
37	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
38	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
39	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
40	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
41	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
42	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
43	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
44	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
45	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
46	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
47	NOT USED						
48	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
49	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
50	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
51	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
52	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
53	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
54	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
55	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
56	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
57	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
58	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
59	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
60	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
61	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
62	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
63	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
64	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
65	4432.79'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
66	4433.02'	ROLLER	5/M6.4	X	X	X	1-5/8" UNISTRUT
67	NOT USED						
68	NOT USED						
69	NOT USED						
70	4437.09'	ROLLER	3/M6.4	X	X	X	X
71	NOT USED						

NOTE:

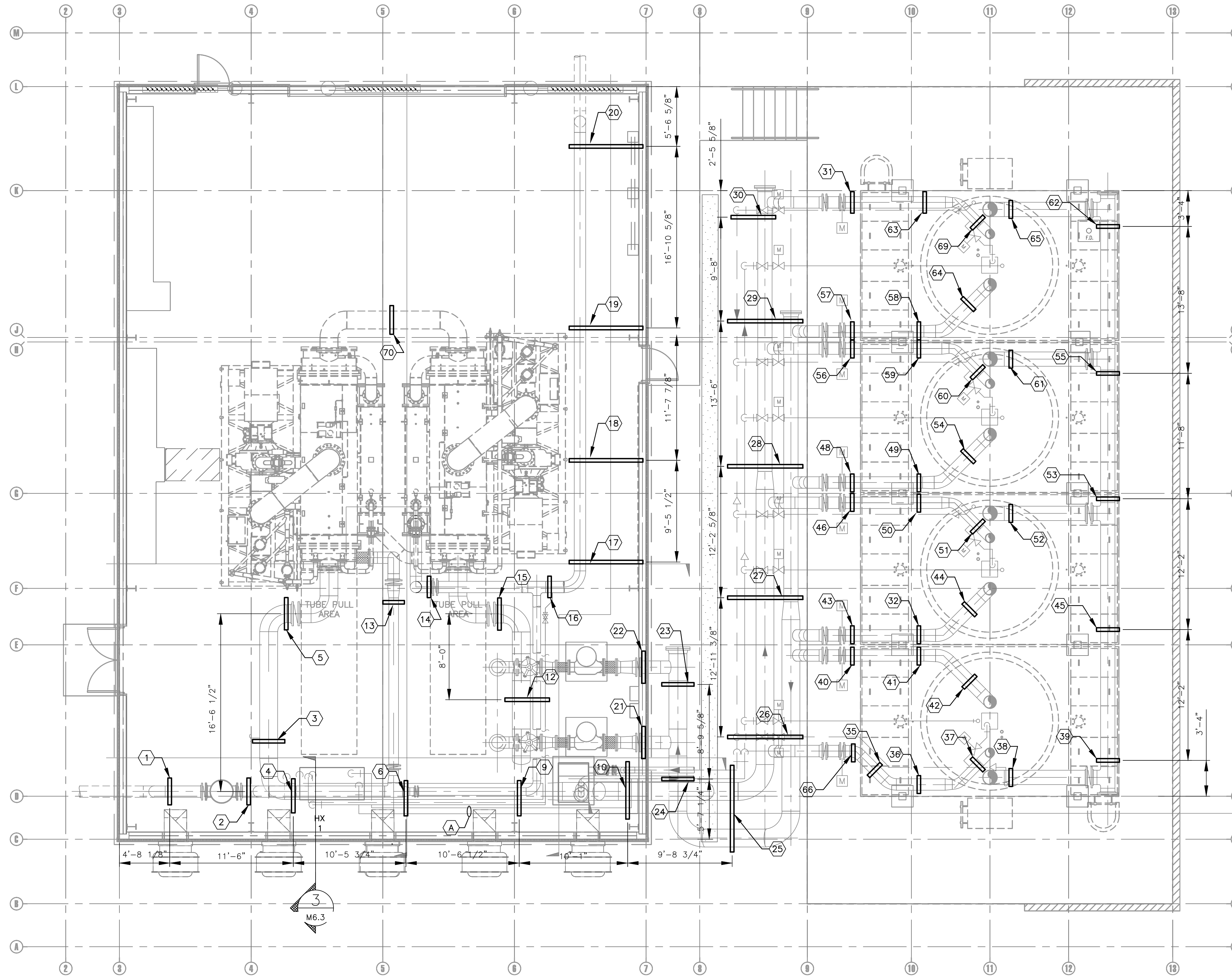
- SEE STRUCTURAL ENGINEERS DRAWINGS FOR PIPE SUPPORT COMPONENTS. PIPE SUPPORTS IDENTIFIED AS UNISTRUT SHALL BE BY MECHANICAL CONTRACTOR.

GENERAL NOTES

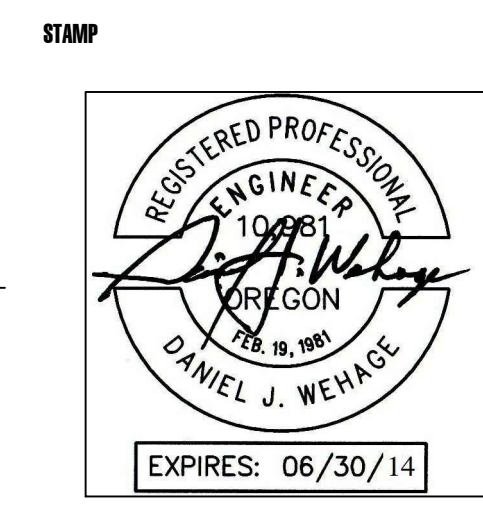
- BUILDING FINISHED FLOOR ELEVATION IS +0'-0" (+4427')
- COOLING TOWER FLOOR SLAB ELEVATION IS +4'-0" (+4431')
- BOP ELEVATIONS ARE SHOWN ON SECTION VIEW DRAWINGS.
- SEE FLOW SCHEMATIC DRAWING M1.2 FOR MANUAL VALVES, MOTORIZED VALVES, CONTROL VALVES, THERMOMETERS, PRESSURE GAUGES AND FLEXIBLE CONNECTORS.

KEYED NOTES

- SUPPORT 2"HWS AND 2"HWR WITH TRAPEZE SUPPORT FROM SUPPORT NUMBERS 6 & 9.



1 PIPING SUPPORT PLAN
SCALE: 3/16" = 1'-0"



A NEW GEOTHERMAL POWER PLANT

Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Tactel Reference: 38 09 20 - 4800

CLIENT:
Oregon TECH
3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

MARK	DATE	DESCRIPTION
△	10/19/12	ISSUED FOR PERMIT
△	09/17/12	ISSUED FOR OWNER REVIEW

ISSUE: 4/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

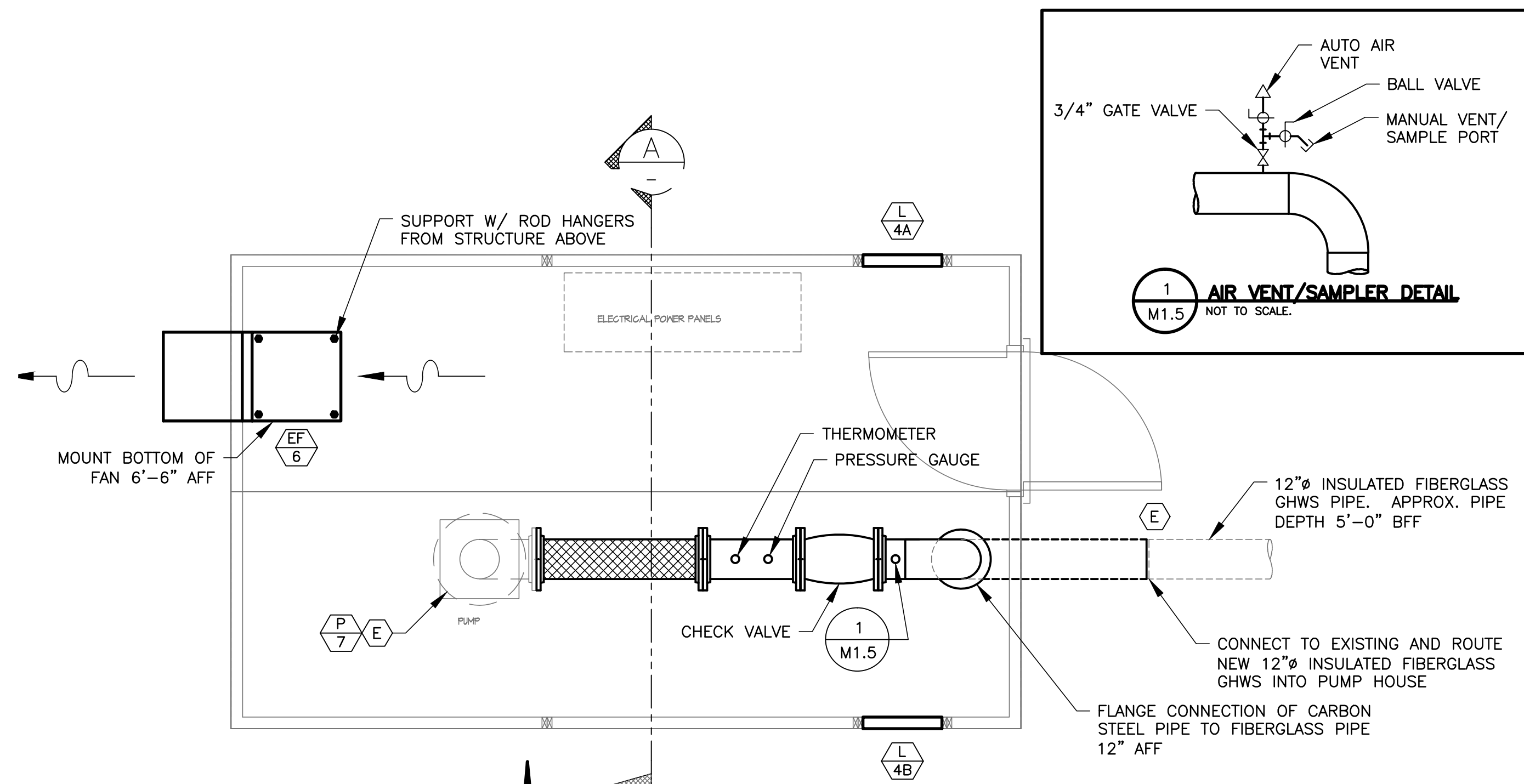
APPROVED FOR THE OWNER DATE: _____

SHEET TITLE:
MECHANICAL PIPING SUPPORT PLAN

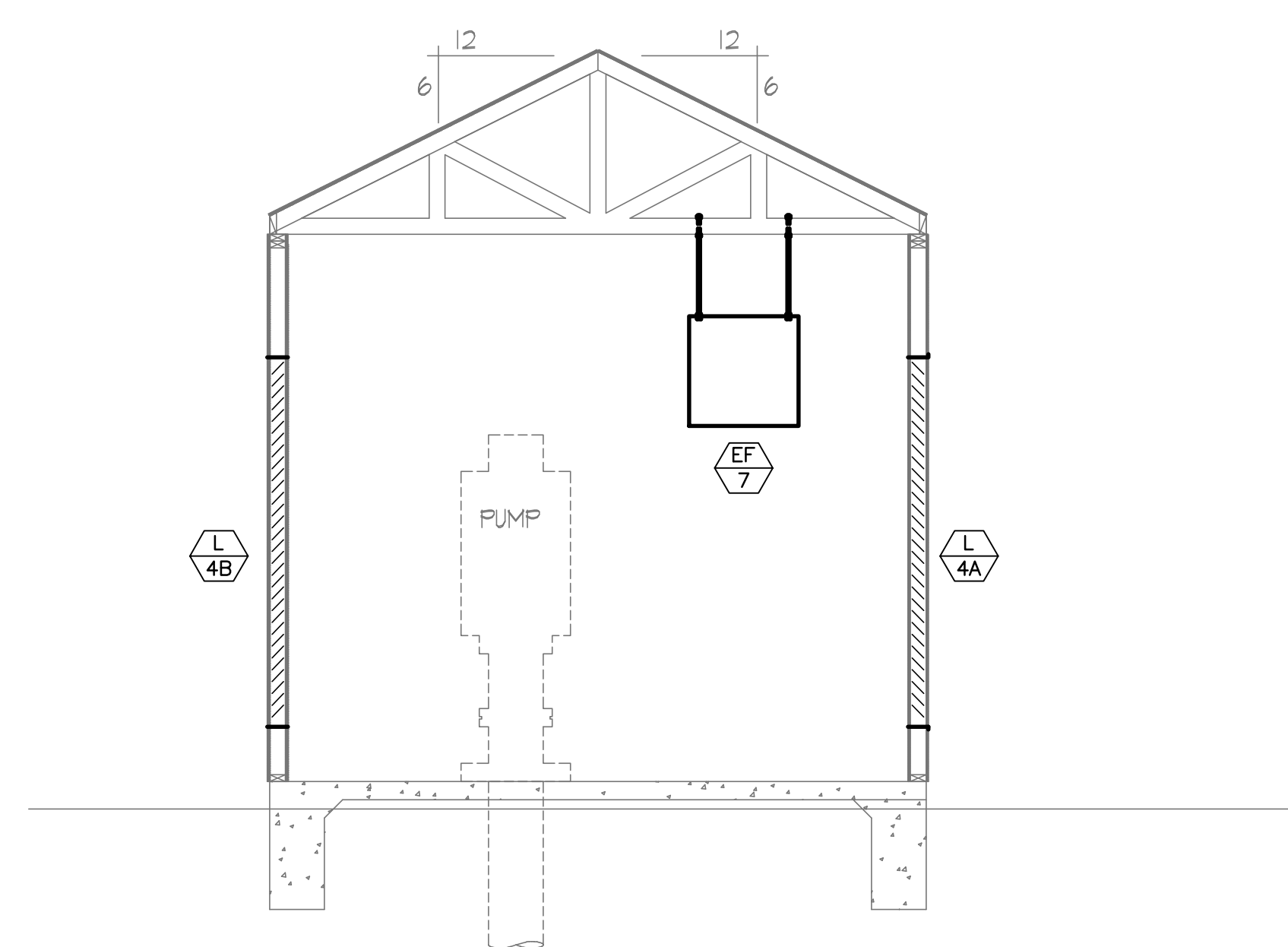
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M1.4

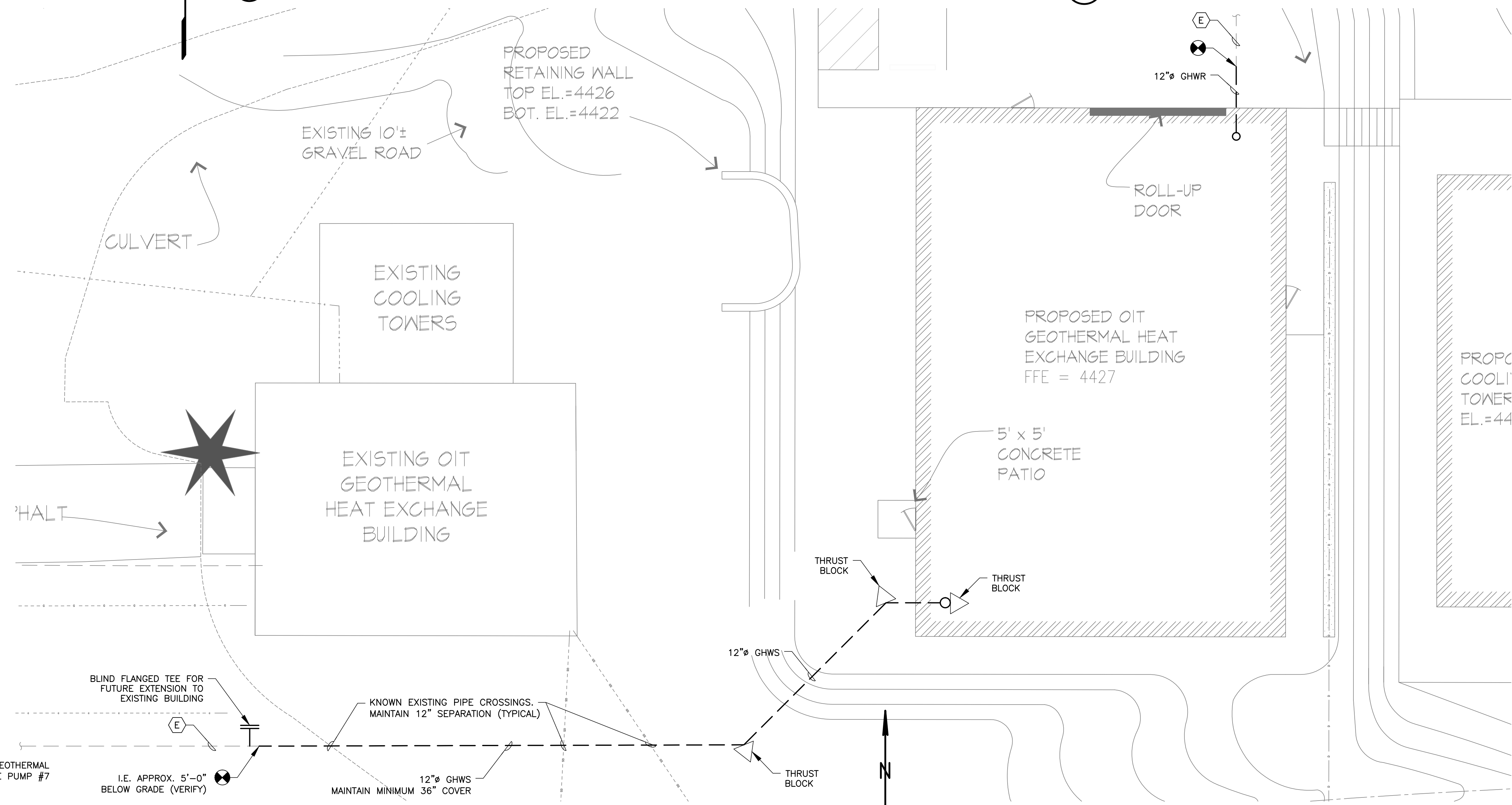
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 Plot Date: Wednesday, October 17, 2012 4:12:24 PM



1 PUMPHOUSE #7 FLOOR PLAN
SCALE: 3/8" = 1'-0"



A PUMPHOUSE SECTION
SCALE: 3/8" = 1'-0"



2 SITE PLAN
SCALE: 1/8" = 1'-0"

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1208 Dale Drive | Medford, OR 97501 | (541)842-4188
200 North Main Street | Prineville, OR 97671 | (541)762-7204
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STAMP
REGISTERED PROFESSIONAL ENGINEER
109831
DANIEL J. WEHAGE
EXPIRES: 06/30/14

BATZER CONSTRUCTION
P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
CCB No. 132902
Web: WWW.BATZERINC.COM

PROJECT: **A NEW GEOTHERMAL POWER PLANT**
Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4800
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3201 Campus Drive, Klamath Falls, Oregon 97601
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ISSUE: 04/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE
SHEET TITLE:
MECHANICAL HVAC PUMPHOUSE FLOOR PLAN & SECTION
PLOT DATE: 10/17/2012 4:15 PM

M1.5

User Name: jones
 Plot Date: Wednesday, October 17, 2012 4:15:10 PM
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 User: jones
 Plot Device: HP DesignJet 5000 Series
 Plot Path: M:\Projects\1245 OIT Geothermal Plant\Design\Drawings\1245-M1.5.dwg

1

2

3

4

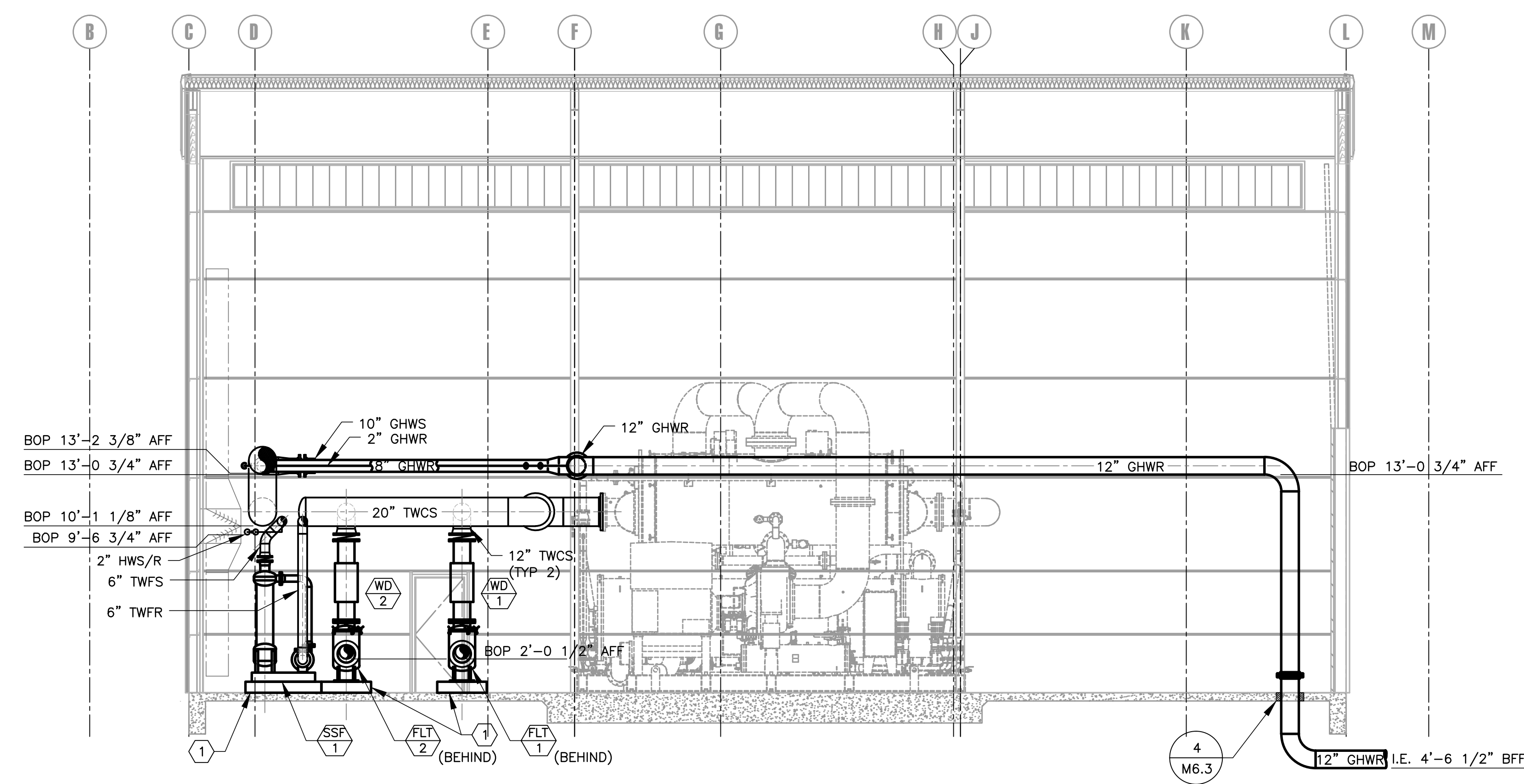
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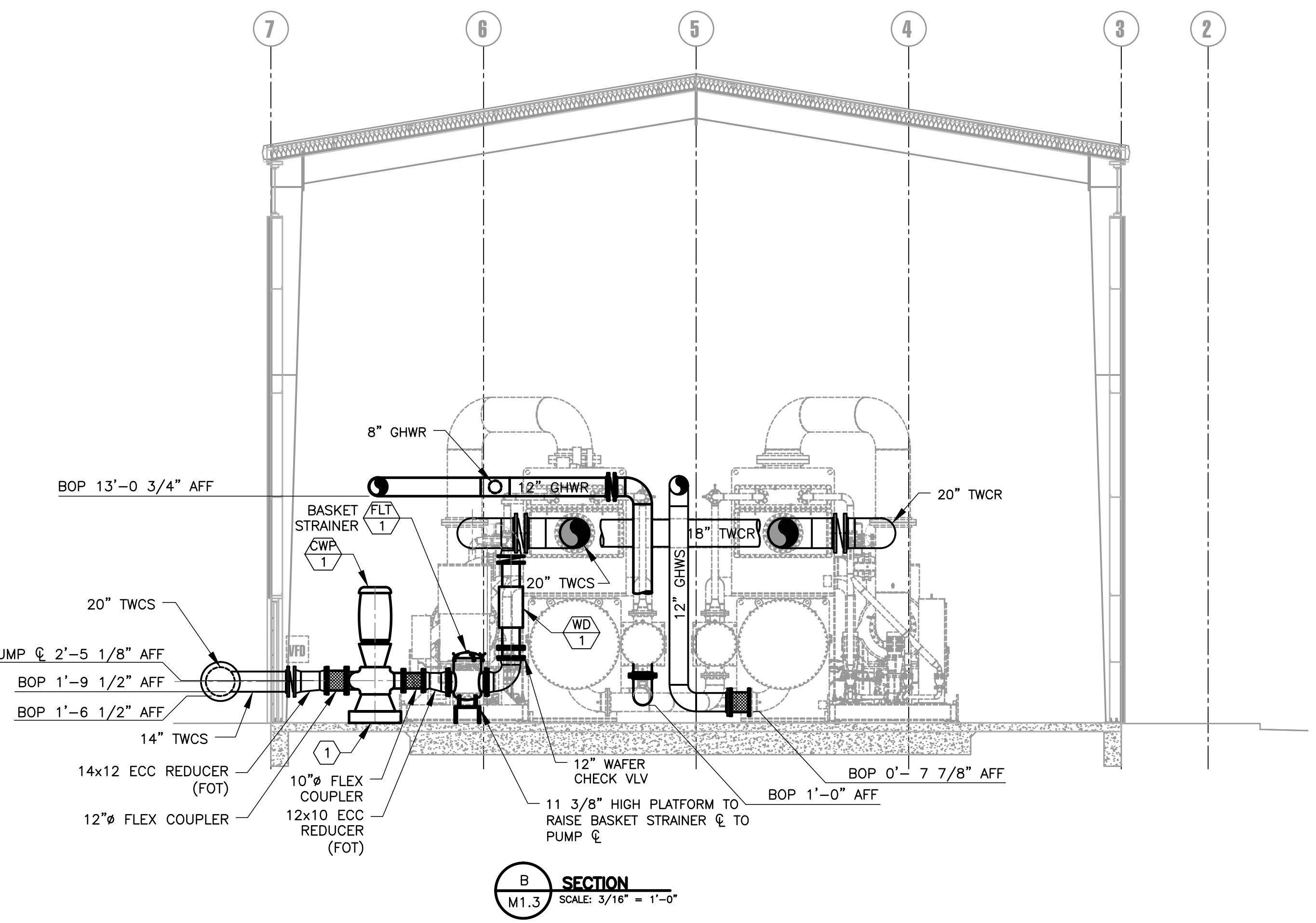
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C

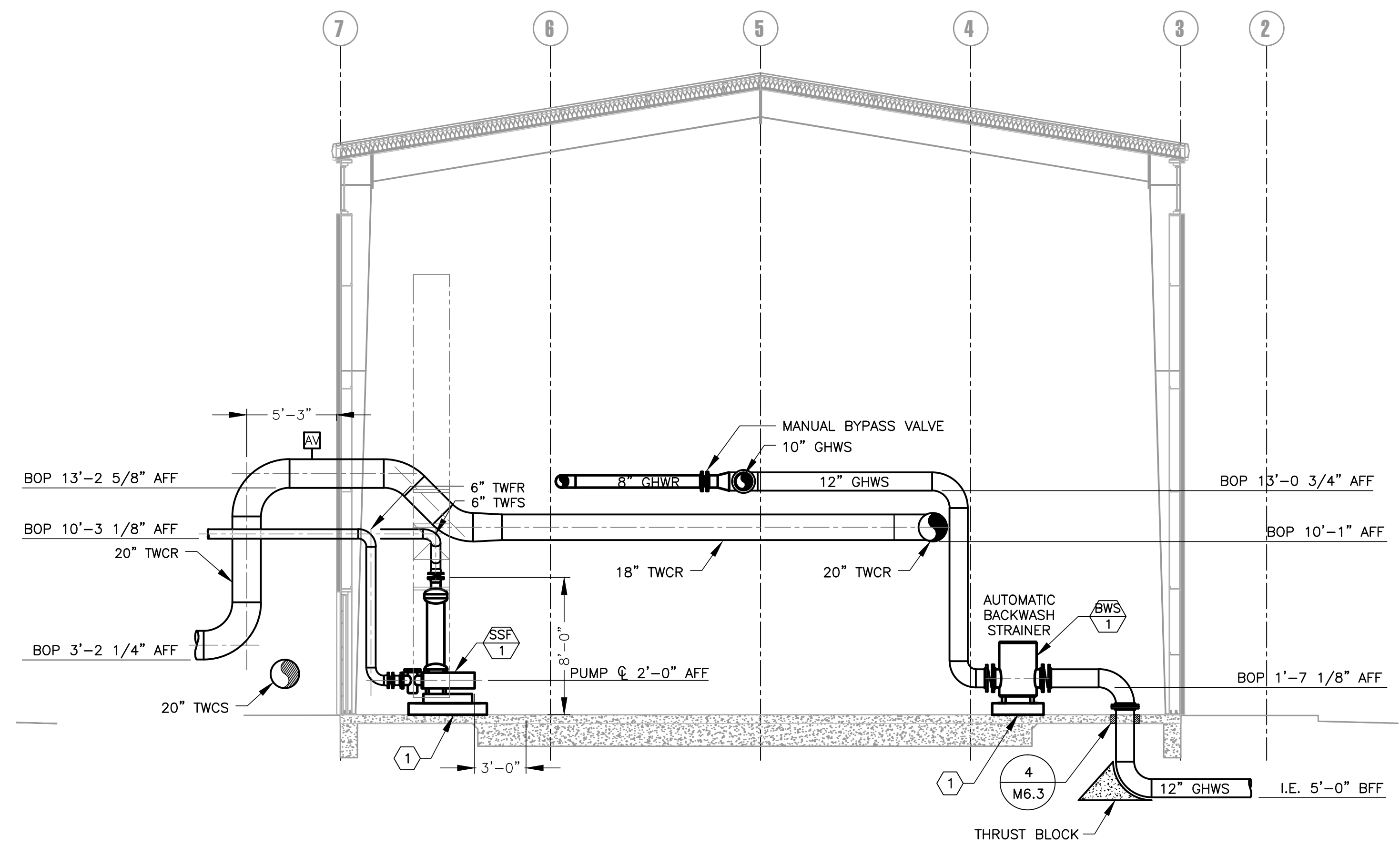
D



A SECTION
M1.3 SCALE: 3/16" = 1'-0"



B SECTION
M1.3 SCALE: 3/16" = 1'-0"



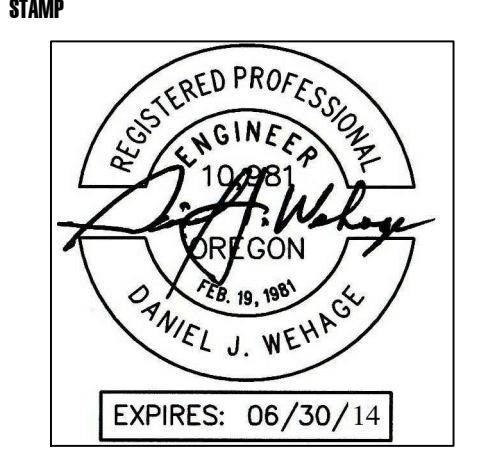
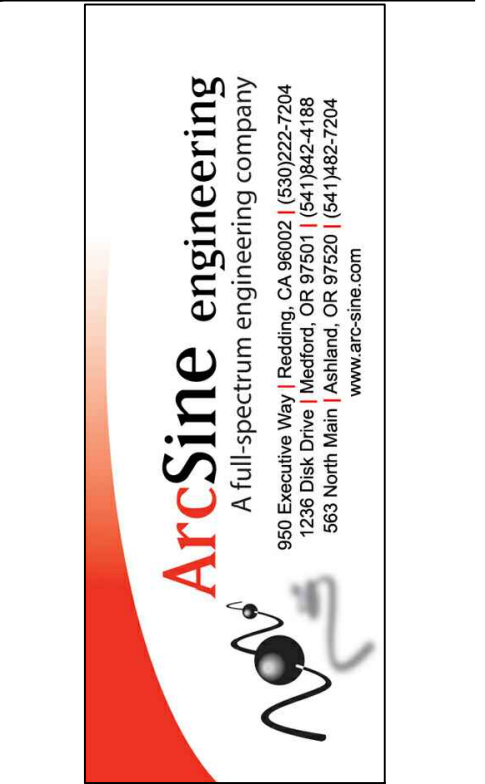
C SECTION
M1.3 SCALE: 3/16" = 1'-0"

GENERAL NOTES

- BUILDING FINISHED FLOOR ELEVATION IS +0'-0" (+4427')
- COOLING TOWER FLOOR SLAB ELEVATION IS +4'-0" (+4431')
- SEE FLOW SCHEMATIC DRAWING M1.2 FOR MANUAL VALVES, MOTORIZED VALVES, CONTROL VALVES, THERMOMETERS, PRESSURE GAUGES AND FLEXIBLE CONNECTORS.
- CONTRACTOR TO VERIFY LOCATIONS OF ALL EQUIPMENT TO FINALIZE CONNECTION POINTS.

KEYED NOTES

- 8" CONCRETE HOUSEKEEPING PAD UNDER ALL MECHANICAL EQUIPMENT.



PROJECT:
A NEW GEOTHERMAL POWER PLANT
Project Location:
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ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHASE

APPROVED FOR THE OWNER DATE: _____
SHEET TITLE:
MECHANICAL SECTIONS
PLOT DATE: 10/17/2012 4:16 PM

M3.1

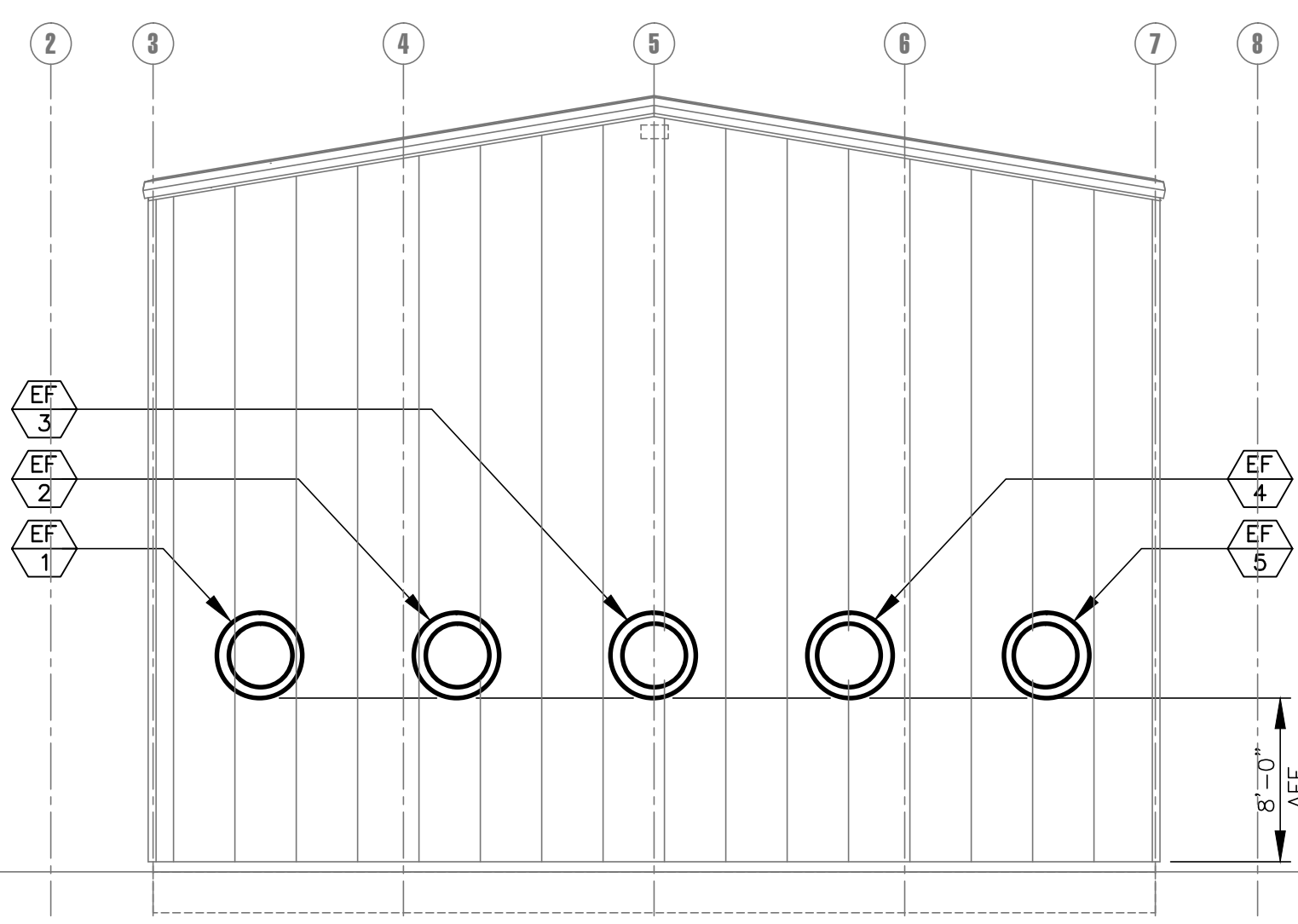
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Pld Status: P3
Pld Comment: P3

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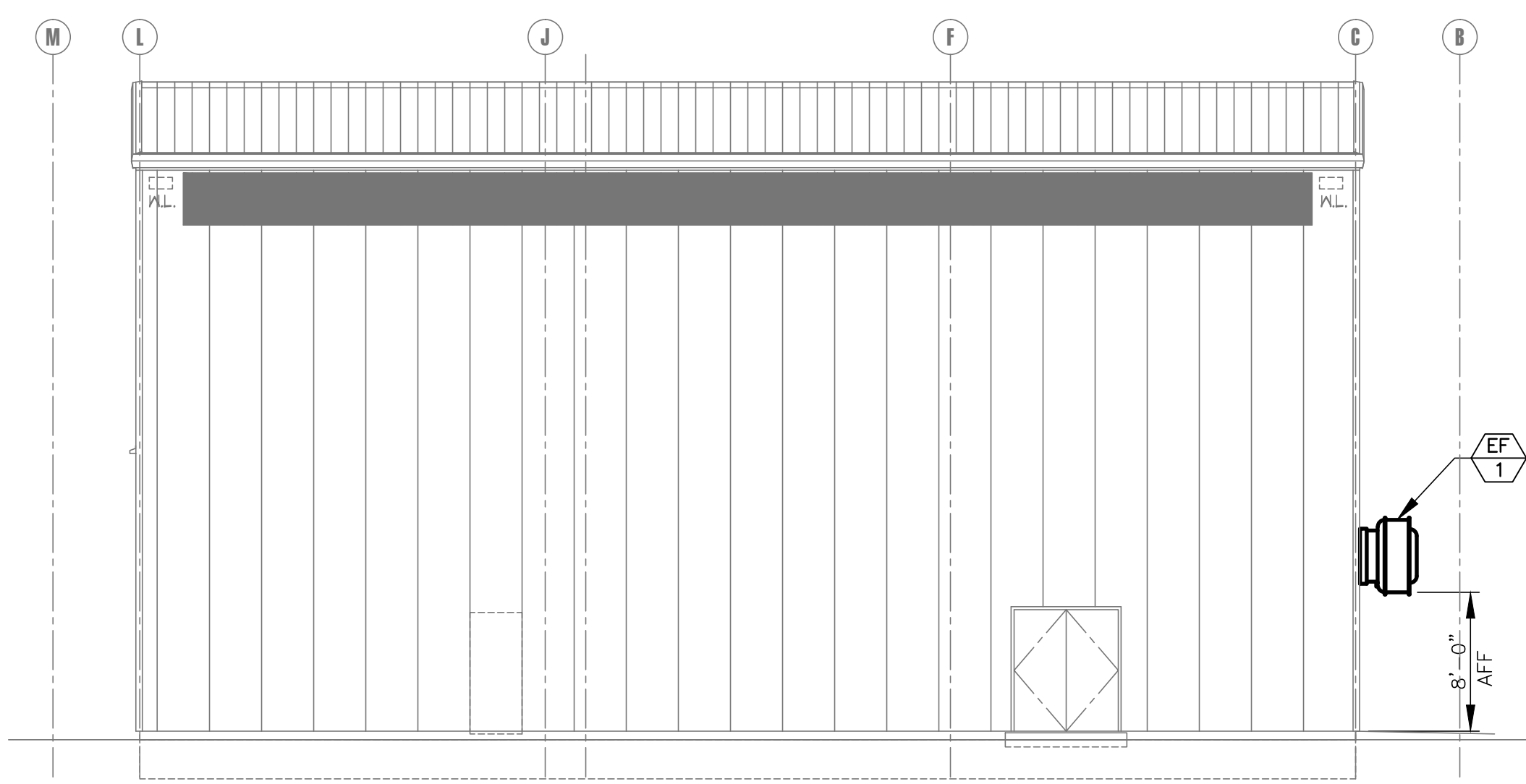
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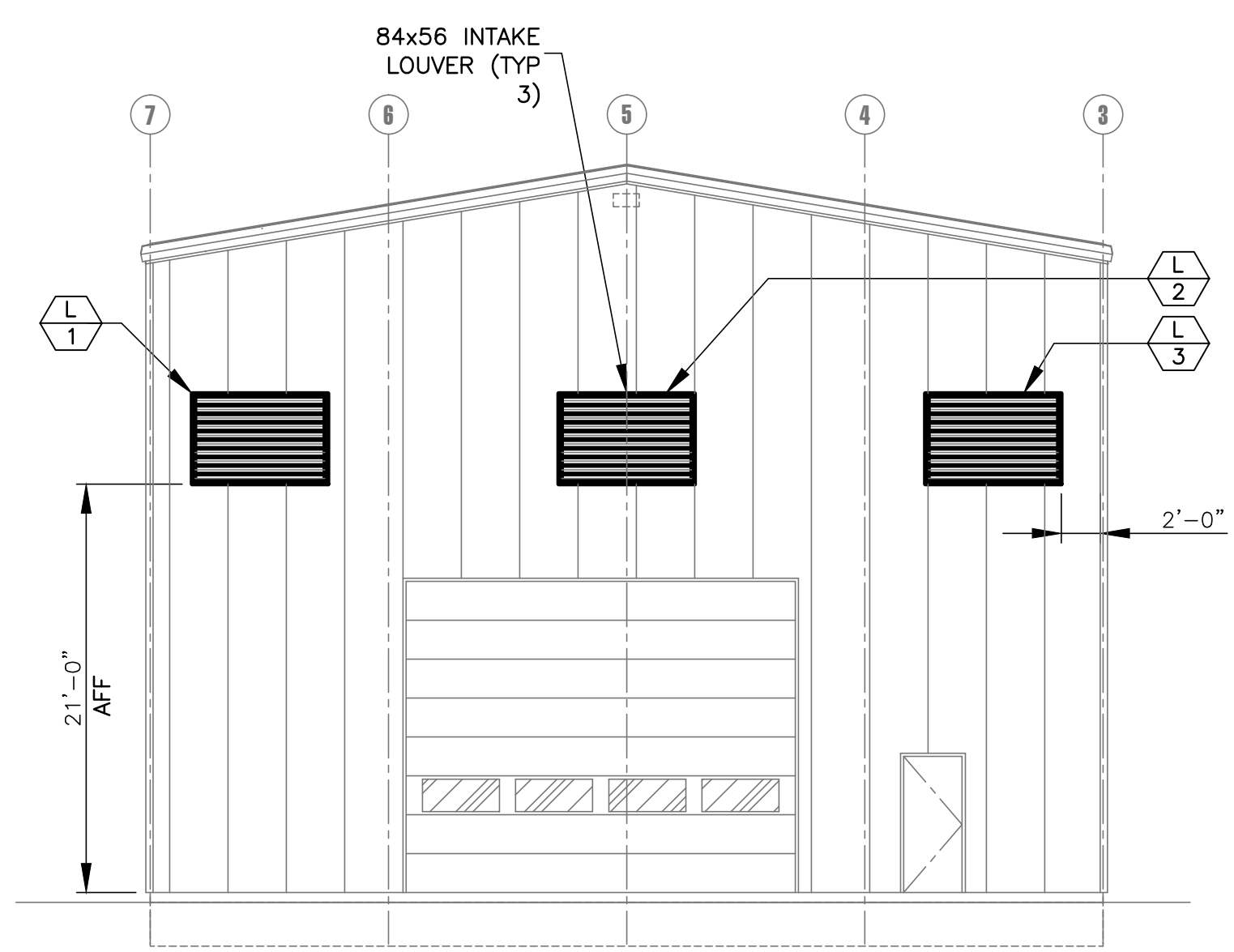
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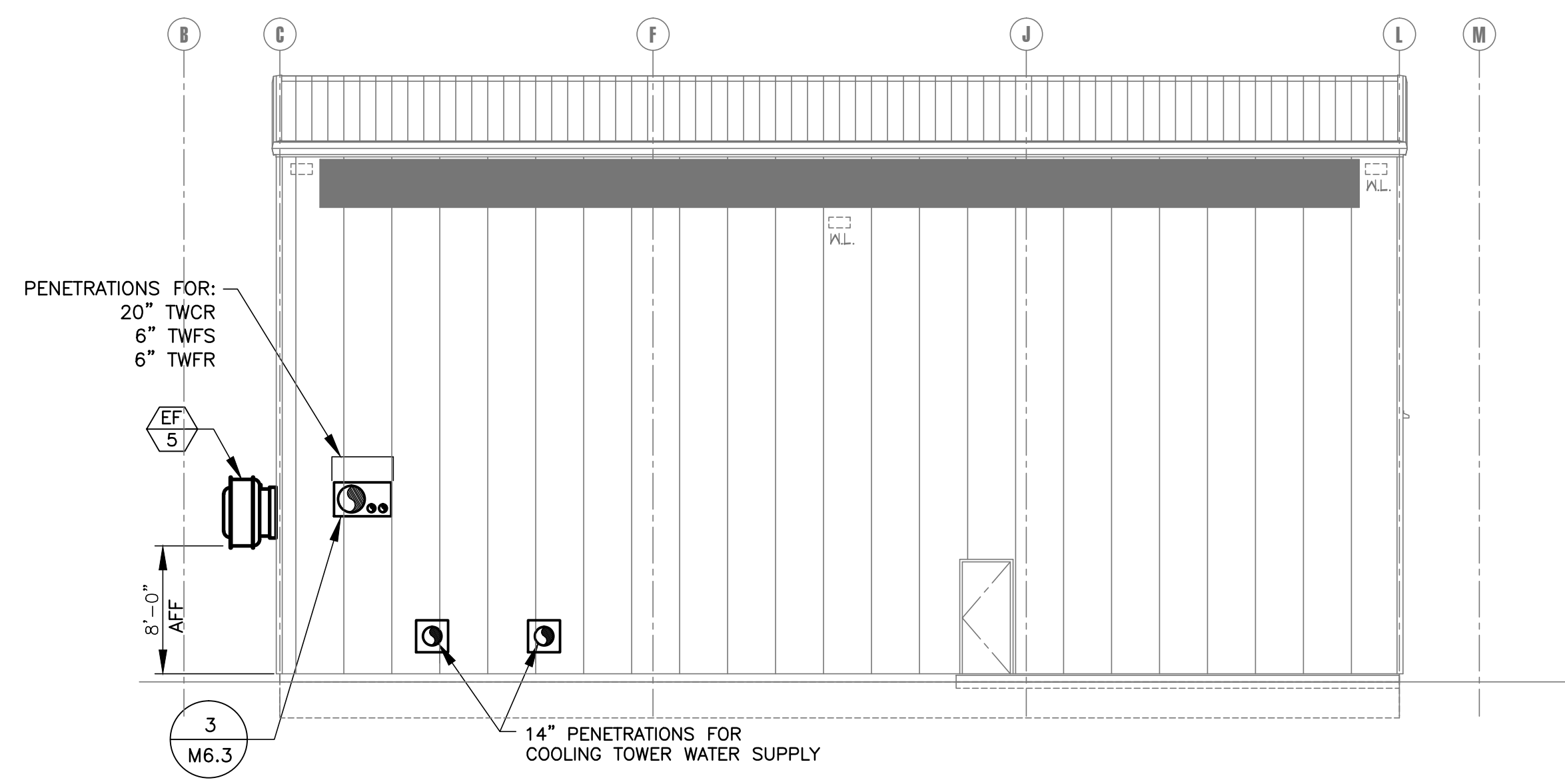
1 SOUTH ELEVATION
SCALE: 1/8"=1'-0"



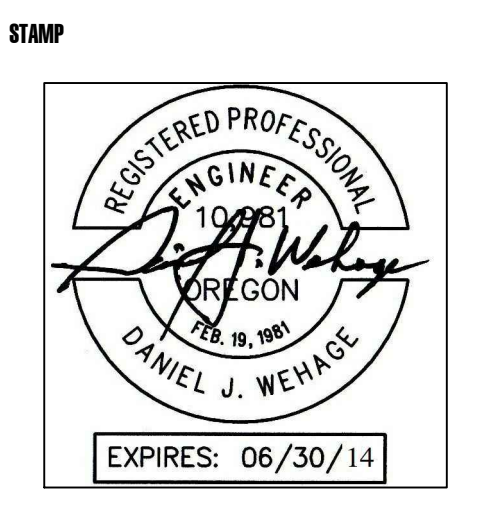
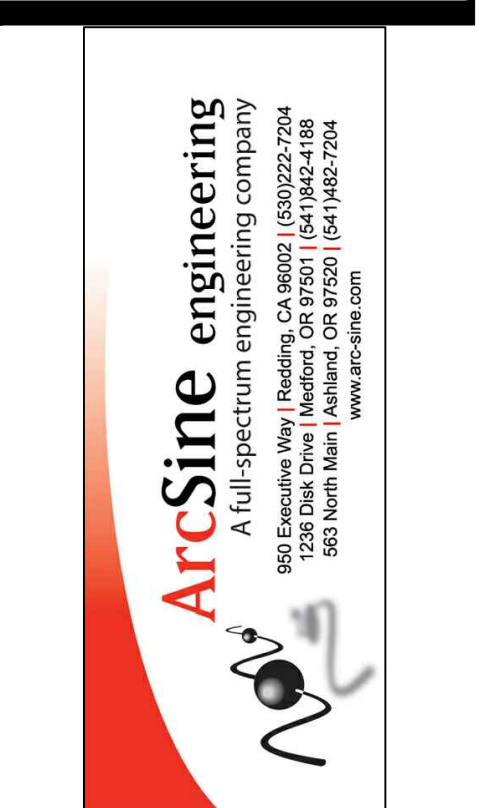
3 WEST ELEVATION
SCALE: 1/8"=1'-0"



2 NORTH ELEVATION
SCALE: 1/8"=1'-0"



4 EAST ELEVATION
SCALE: 1/8"=1'-0"



P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
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ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE
SHEET TITLE:
MECHANICAL HVAC ELEVATIONS
PLOT DATE: 10/17/2012 4:18 PM

M3.2

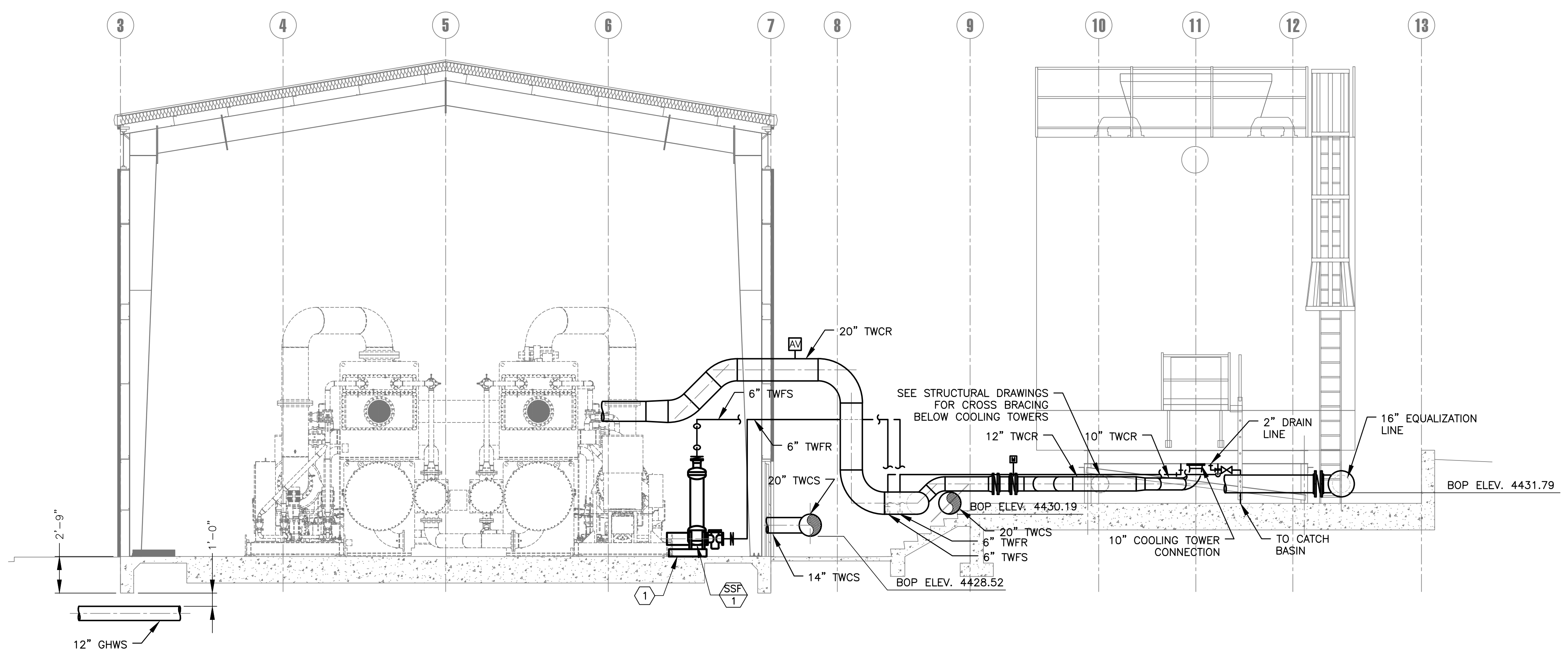
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User: J. Jones
Printer: J. Jones

GENERAL NOTES

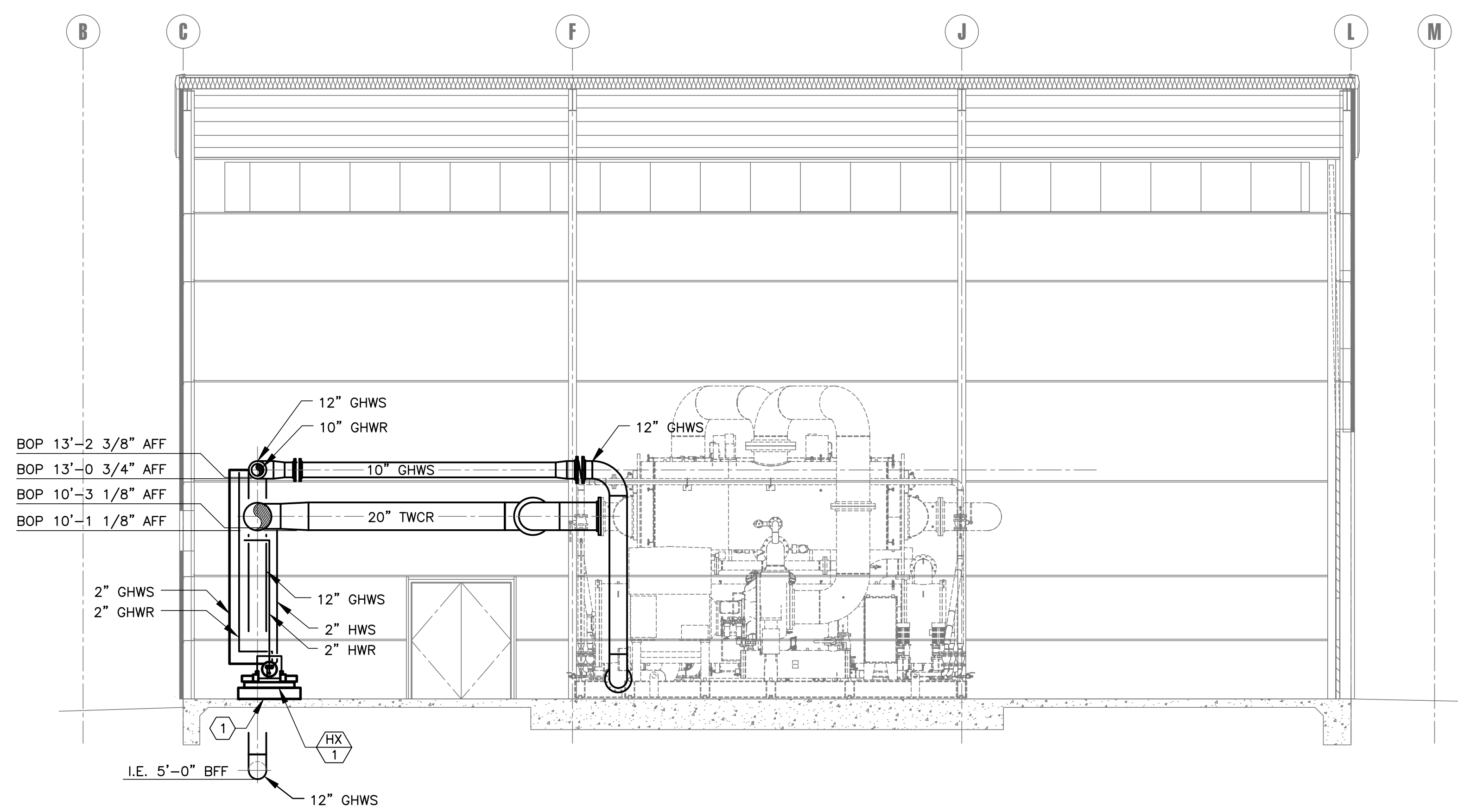
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- BOP ELEVATIONS ARE SHOWN ON SECTION VIEW DRAWINGS.
- SEE M1.4 FOR PIPE SUPPORT LOCATIONS.
- SEE FLOW SCHEMATIC DRAWING M1.2 FOR MANUAL VALVES, MOTORIZED VALVES, CONTROL VALVES, THERMOMETERS, PRESSURE GAUGES AND FLEXIBLE CONNECTORS.
- CONTRACTOR TO VERIFY LOCATIONS OF ALL EQUIPMENT TO FINALIZE CONNECTION POINTS.

KEYED NOTES

- 8" CONCRETE HOUSEKEEPING PAD UNDER ALL MECHANICAL EQUIPMENT.



D SECTION
M1.3 SCALE: 3/16" = 1'-0"



E SECTION
M1.3 SCALE: 3/16" = 1'-0"

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www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
10,000
OREGON
DANIEL J. WEHAGE
Feb. 8, 1981
EXPIRES: 06/30/14

BATZER CONSTRUCTION
P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
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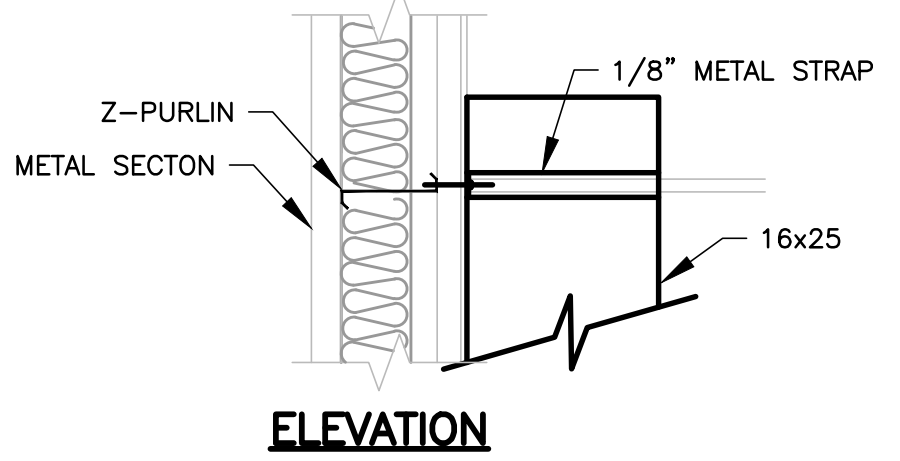
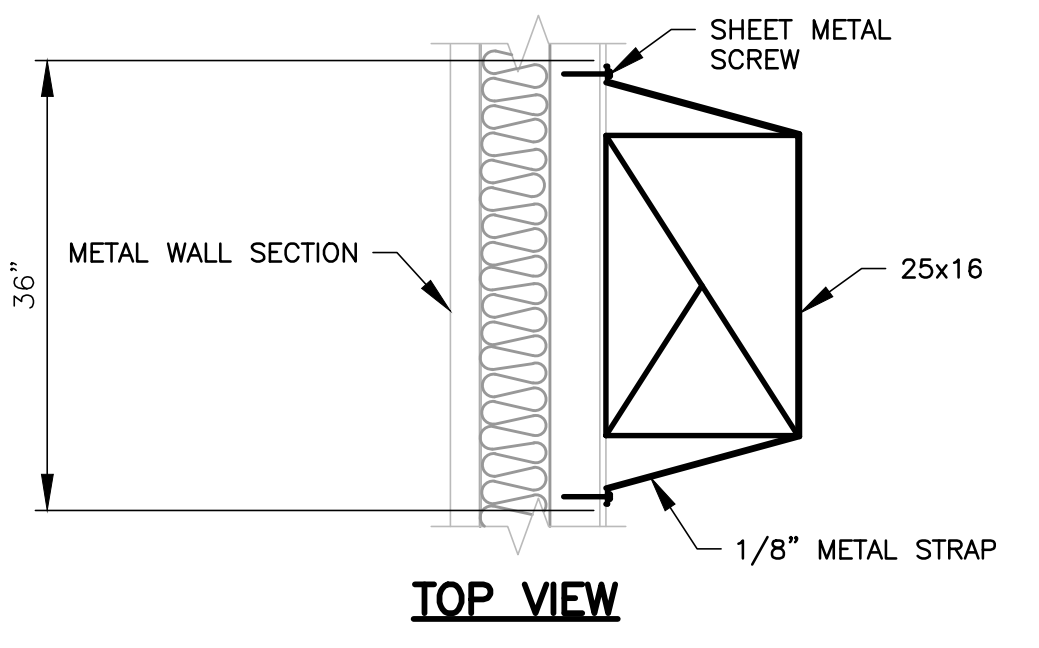
ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE
SHEET TITLE:
MECHANICAL SECTIONS
PLOT DATE: 10/17/2012 4:20 PM

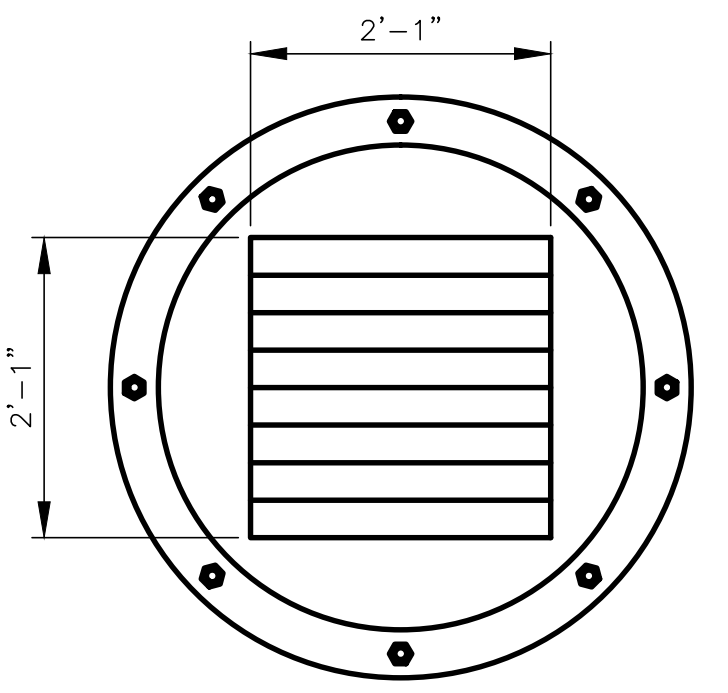
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 Plot Device: HP DesignJet 5000 Series PCL6
 Plot Path: C:\Users\jones\AppData\Local\Temp\1245-M3.3.dwg
 Plot Scale: 1/16" = 1'-0"
 Plot Size: 11.00 x 17.00
 Plot Orientation: Landscape
 Plot Range: All
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 Plot Date: 10/17/2012 4:20:44 PM
 Plot User: jones

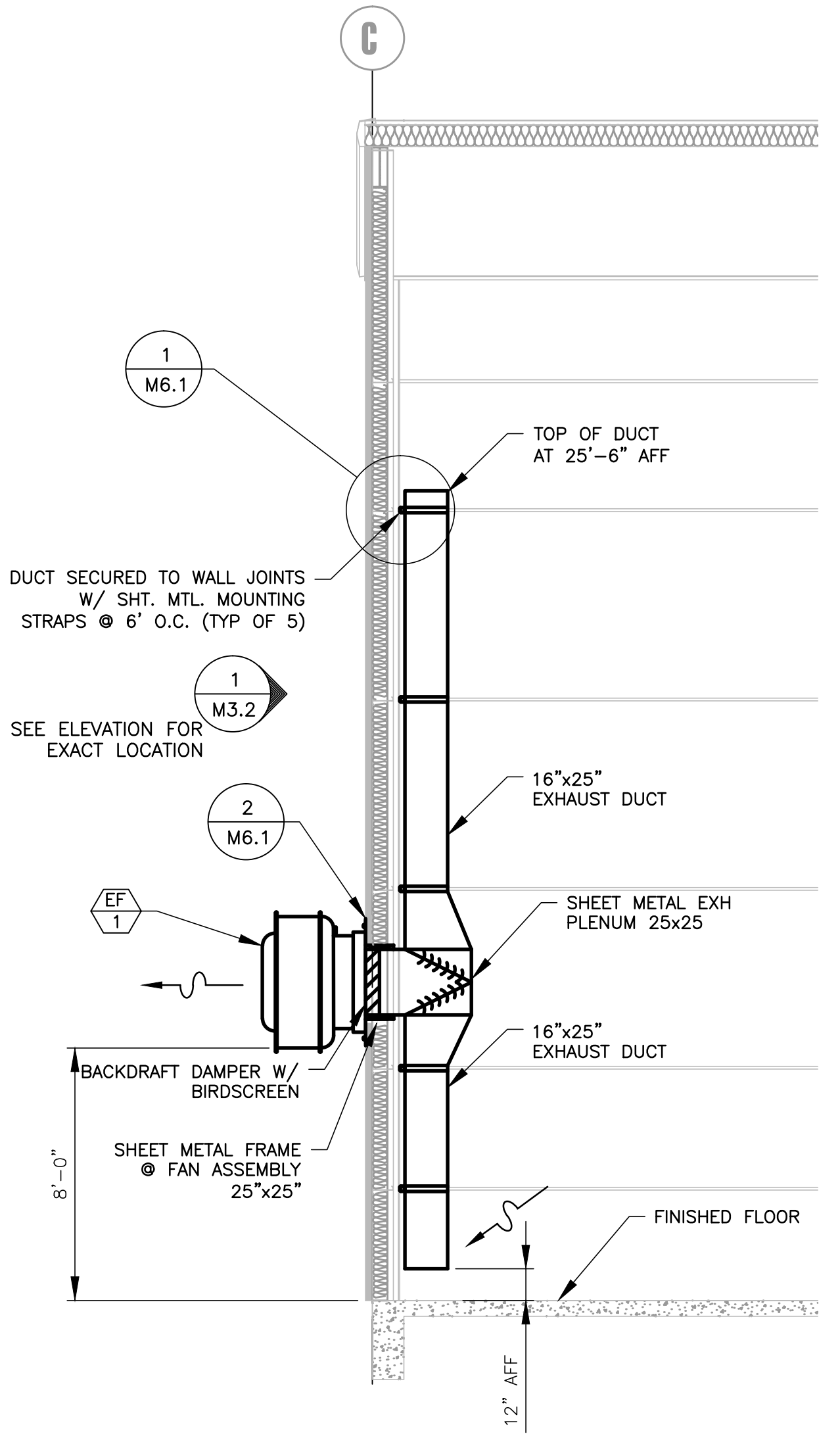
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Pdt Date: Wednesday, October 17, 2012 4:21:44 PM
0002 Name: jones
Pdt Date: Wednesday, October 17, 2012 4:21:44 PM
0003 Name: jones
Pdt Date: Wednesday, October 17, 2012 4:21:44 PM



1 DUCT DETAIL
SCALE: 3/4" = 1'-0"



2 FAN MOUNTING DETAIL
SCALE: 3/4" = 1'-0"

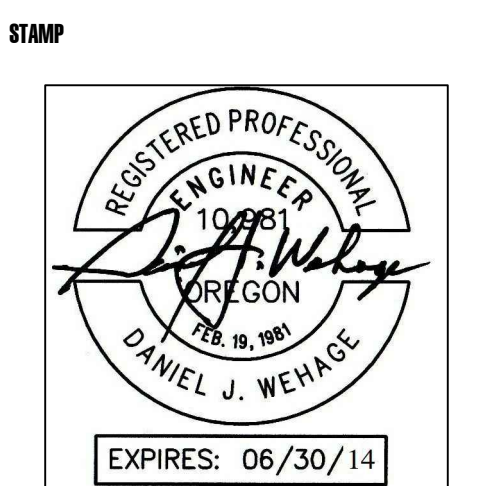
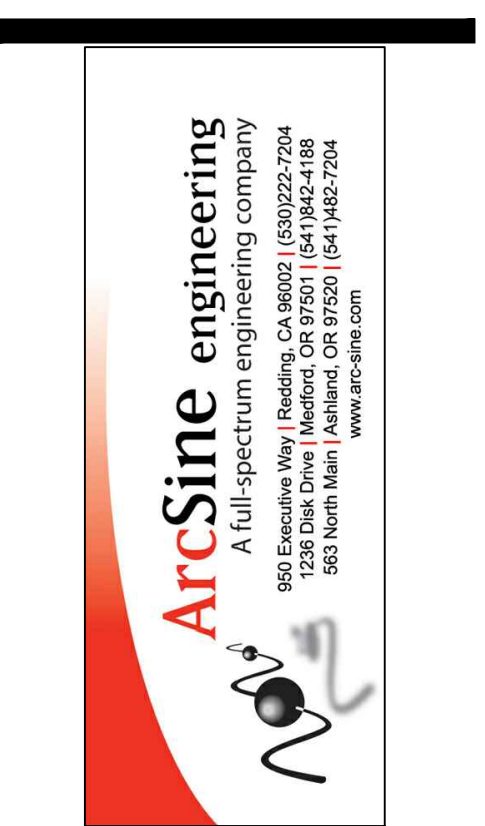


A SECTION
SCALE: 1/4" = 1'-0"

DUCT SECURED TO WALL JOINTS
W/ SHT. MTL. MOUNTING
STRAPS @ 6' O.C. (TYP OF 5)

SEE ELEVATION FOR
EXACT LOCATION

- NOTE:**
1. CONTRACTOR TO FRAME TO SUPPORT 225 LB. FAN.
 2. MECHANICAL CONTRACTOR SHALL COORDINATE WITH METAL BUILDING SUPPLIER FOR FAN MOUNTING ATTACHMENT TO METAL BUILDING. SUBFRAME BY METAL BUILDING MANUFACTURER. SEE GREENHECK INSTALLATION BULLETIN #PN457691. SUBMIT SHOP DRAWING FOR APPROVAL.



P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
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ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

APPROVED FOR THE OWNER DATE _____
SHEET TITLE:
MECHANICAL HVAC SCHEDULES & DETAILS
PLOT DATE: 10/17/2012 4:21 PM

M6.1

PUMP SCHEDULE (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	SERVICE	PUMP			CONDITIONS			MOTOR			OPR. WT. (LB.)	NOTES
		MFGR MODEL	SIZE	TYPE	FLOW GPM	HEAD (FT)	PUMP RPM	MAX BHP	MOTOR H.P.	VOLTS/PHASE		
CWP-1	COND. WATER	PACO 1015-3/4KVP	10x12x15	VERT. SPLIT CASE	3950	64	1187	77	75	460/3 VFD		
CWP-2	COND. WATER	PACO 1015-3/4KVP	10x12x15	VERT. SPLIT CASE	3950	64	1187	77	75	460/3 VFD		
FP-1	FILTRATION UNIT	ARMSTRONG SERIES 4280	6x5x11.5	END SUCTION MTR. MOUNT	900	110	1800	77	35	460/3 VFD		
HWP-1	HX-1 TO TOWER HEATING	GRUNDFOS UPS50-60 DEG	-	CIRCULATOR	25	18.0	-	77	-	115/1		

HEAT EXCHANGER SCHEDULE (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	SERVICE	MFGR MODEL	TYPE	GEOTHERMAL				TOWER HEATING				OPR. WT. (LB.)	NOTES
				FLOW GPM	WATER TEMP IN	WATER TEMP OUT	PRESSURE DROP (PSI)	FLOW GPM	TEMP IN	TEMP OUT	PRESSURE DROP (PSI)		
HX-1	TOWER SUMP HEATING	-	SHELL & TUBE	25	194°F	178°F	4	40	90°F	100°F	4		

COOLING TOWER SCHEDULE (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	SERVICE	TOWER			TEMPERATURES °F			FAN MOTOR			OPR. WT. (LB.)	NOTES
		MFGR MODEL	FLOW/CELL (GPM)	MAX P.D. FT. WATER	AIR WB	TEMP IN	TEMP OUT	VFD	MOTOR HP/CELL	VOLTS/PHASE		
CT-1,2,3,4 (4 CELLS)	COOLING TOWER	BALTIMORE AIRCOIL 31213C-PM	7900	21	40	60°F	50°F	YES	40.0	460/3	43530/CELL	SPECIFIED ENTERING WB@40°F
CT-1,2,3,4 (4 CELLS)	COOLING TOWER	BALTIMORE AIRCOIL 31213C-PM	7900	21	63	78.35°F	68.35°F	YES	40.0	460/3	43530/CELL	SUMMER DESIGN WB@63°F

STRAINER/FILTER SCHEDULE (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	SERVICE	MFGR MODEL	TYPE	SIZE	MOTOR H.P.	VOLTS/PHASE	OPR. WT. (LB.)	FLOW RATE (GPM)	WATER PRESS. DROP (FT)	NOTES
FLT-1,2	TWCS	EATON SIMPLEX MODEL 73	STRAIGHT FLOW	12"	-	-	550	4000	3.6	

NON-CHEMICAL WATER TREATMENT SYSTEM (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	SIZE	MFGR	MODEL	ELECTRICAL	NOTES
WT-1	12"φ	CLEARWATER	DOLPHIN SERIES 3000	115/230-1-60	
WT-2	12"φ	CLEARWATER	DOLPHIN SERIES 3000	115/230-1-60	

NOTE: PROVIDE W/ TRANSFORMER PANEL

SOLIDS FROM LIQUIDS SEPARATOR (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	FLOW RATE (GPM)	PUMP MOTOR		MFGR	MODEL	NOTES
		HP	ELECTRICAL			
SSF-1	800	20.0	460/3	PURIFLUX	PF-64-060A	1-9

NOTES:

- SEPARATOR ASSEMBLY FROM CARBON STEEL.
- CAST IRON PRE-STRAINER W/ STAINLESS STEEL BASKET.
- NEMA 4X POLYCARBONATE CONTROL PANEL W/ DOOR MOUNTED DISCONNECT.
- PUMP MOTOR STARTER INCLUDED
- PURGE TIMER CONTROLS INCLUDED
- SHORT CIRCUIT AND OVERLOAD PROTECTION INCLUDED
- STEP-DOWN TRANSFORMER INCLUDED
- PROVIDE WITH "HAND-OFF-AUTO" SELECTOR SWITCH
- PROVIDE ALL COMPONENTS ON FACTORY MOUNTED SKID

EXHAUST FAN SCHEDULE (FURNISHED BY JCI-INSTALLED BY CONTRACTOR)

TAG	SERVICE	FAN			CAPACITY				MOTOR			OPR. WT. (LB.)	NOTES
		MFGR MODEL	SIZE	TYPE	FLOW CFM	TSP IN. W.G.	FAN RPM	BHP	HP	ELECTRICAL	VFD		
EF-1	REFRIGERANT LEAK PURGE	GREENHECK CWB 300-15	30x30	WALL MOUNTED	9000	0.25	610		1.5	460/60/3	YES	225	

NOTE: 1. PERFORMANCE DATA LISTED INCLUDES AIR DENSITY CORRECTION FOR SITE ELEVATION OF 4427 FEET ABOVE SEA LEVEL

EXHAUST FAN SCHEDULE (FURNISHED AND INSTALLED BY CONTRACTOR)

TAG	SERVICE	FAN			CAPACITY				MOTOR			OPR. WT. (LB.)	NOTES
		MFGR	MODEL	TYPE	CFM	S.P. (IN.)	FAN RPM	BHP	HP	ELECTRICAL	VFD		
EF-2	SPACE COOLING	GREENHECK	CWB-15	SIDEWALL MOUNT	9000	0.25	610	1.28	1.5	460/60/3	NO	225	1
EF-3	SPACE COOLING	GREENHECK	CWB-15	SIDEWALL MOUNT	9000	0.25	610	1.28	1.5	460/60/3	NO	225	1
EF-4	SPACE COOLING	GREENHECK	CWB-15	SIDEWALL MOUNT	9000	0.25	610	1.28	1.5	460/60/3	NO	225	1
EF-5	SPACE COOLING	GREENHECK	CWB-15	SIDEWALL MOUNT	9000	0.25	610	1.28	1.5	460/60/3	NO	225	1
EF-6	SPACE COOLING	GREENHECK	SEI-18-429-A7	SIDEWALL MOUNT	4354	0.30	1750	0.70	0.75	460/60/3	YES	100	1, 2

NOTES:

- PERFORMANCE DATA LISTED INCLUDES AIR DENSITY CORRECTION FOR SITE ELEVATION OF 4427 FEET ABOVE SEA LEVEL
- PROVIDE W/ ABB VARIABLE FREQUENCY DRIVE. MOTOR SPEED CONTROLLED FROM ROOM THERMOSTAT.

LOUVER SCHEDULE (FURNISHED AND INSTALLED BY CONTRACTOR)

TAG	SIZE (WxHxD)	MFGR	MODEL	USE	CFM	PRESSURE DROP	VELOCITY (FT/MIN)	MIN. FREE AREA (FT²)	NOTES
L-1	84x56x4	GREENHECK	EDJ-430	INTAKE	15,000	0.086	848	17.69	1, 2, 3
L-2	84x56x4	GREENHECK	EDJ-430	INTAKE	15,000	0.086	848	17.69	1, 2, 3
L-3	84x56x4	GREENHECK	EDJ-430	INTAKE	15,000	0.086	848	17.69	1, 2, 3
L-4A	27x80x4	GREENHECK	ESJ-401	INTAKE	3,863	0.05	490	7.89	2, 3
L-4B	27x80x4	GREENHECK	ESJ-401	INTAKE	3,863	0.05	490	7.89	2, 3

NOTE:

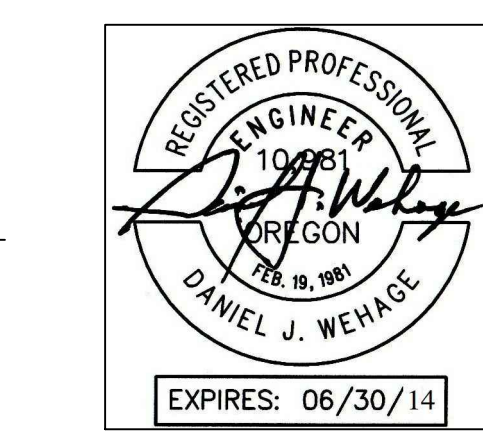
- PROVIDE MOTORIZED DAMPER ON INSIDE SURFACE.
- LOUVER FINISH TO MATCH BUILDING. SUBMIT COLOR CHART TO ARCHITECT FOR APPROVAL.
- FLANGE ON 4-SIDES.

WELL PUMP #7 VARIABLE FREQUENCY DRIVE (FURNISHED AND INSTALLED BY CONTRACTOR)

TAG	MFGR	MODEL	MOTOR HP	MOTOR VOLTAGE	DRIVE VOLTAGE	DRIVE OUTPUT AMPS
VFD-P7	ABB	ACS 800-37-0510-5+C129+H350+H352	450	460	480	571

NOTES:

- INPUT DISCONNECTING MEANS: FUSIBLE DISCONNECT SWITCH.
- BYPASS: NONE
- INPUT IMPEDANCE: 10% LCL HIGH FREQUENCY FILTER
- COMMUNICATIONS PROTOCOLS: JOHNSON CONTROLS INC. (JCI) METASYS N2.
- OTHER OPTIONS: COMMON MODE FILTER - INCLUDED, EMC/RFI FILTER 2ND ENVIR. - INCLUDED, COATED BOARDS - INCLUDED, 115 VAC AUX CTRL VOLTAGE, US CONDUIT PLATE, LOAD SWITCH, FUSES, TOP ENTRY & EXIT-UL APPROVED - INCLUDED, BOTTOM ENTRY, BOTTOM EXIT.



P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
CCB No. 132902
Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT

PROJECT Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & TxDOT Reference: 38 09 20 - 4800

CLIENT:
Oregon TECH
3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

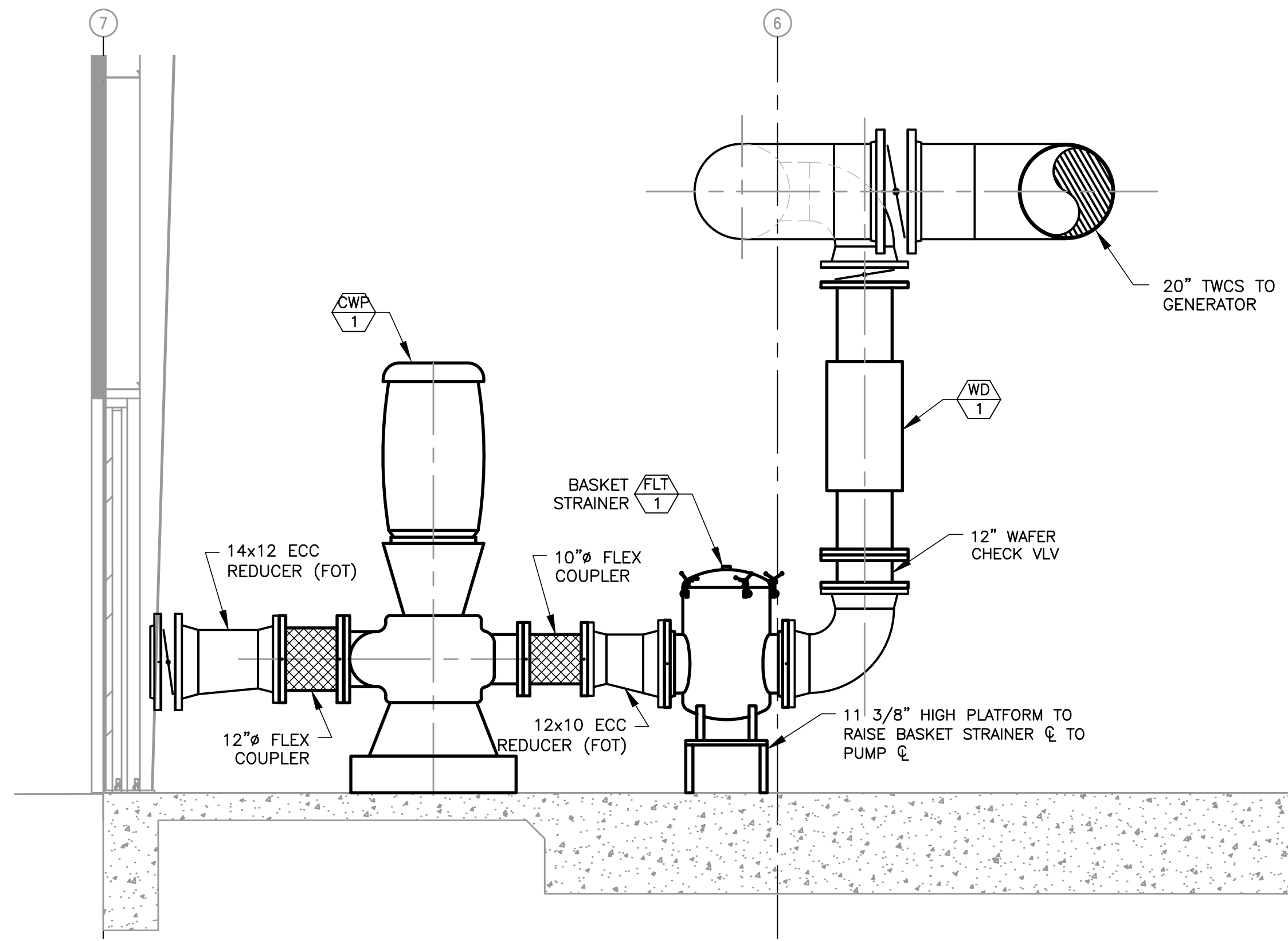
MARK	DATE	DESCRIPTION
△	10/19/12	ISSUED FOR PERMIT
△	09/17/12	ISSUED FOR OWNER REVIEW

ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

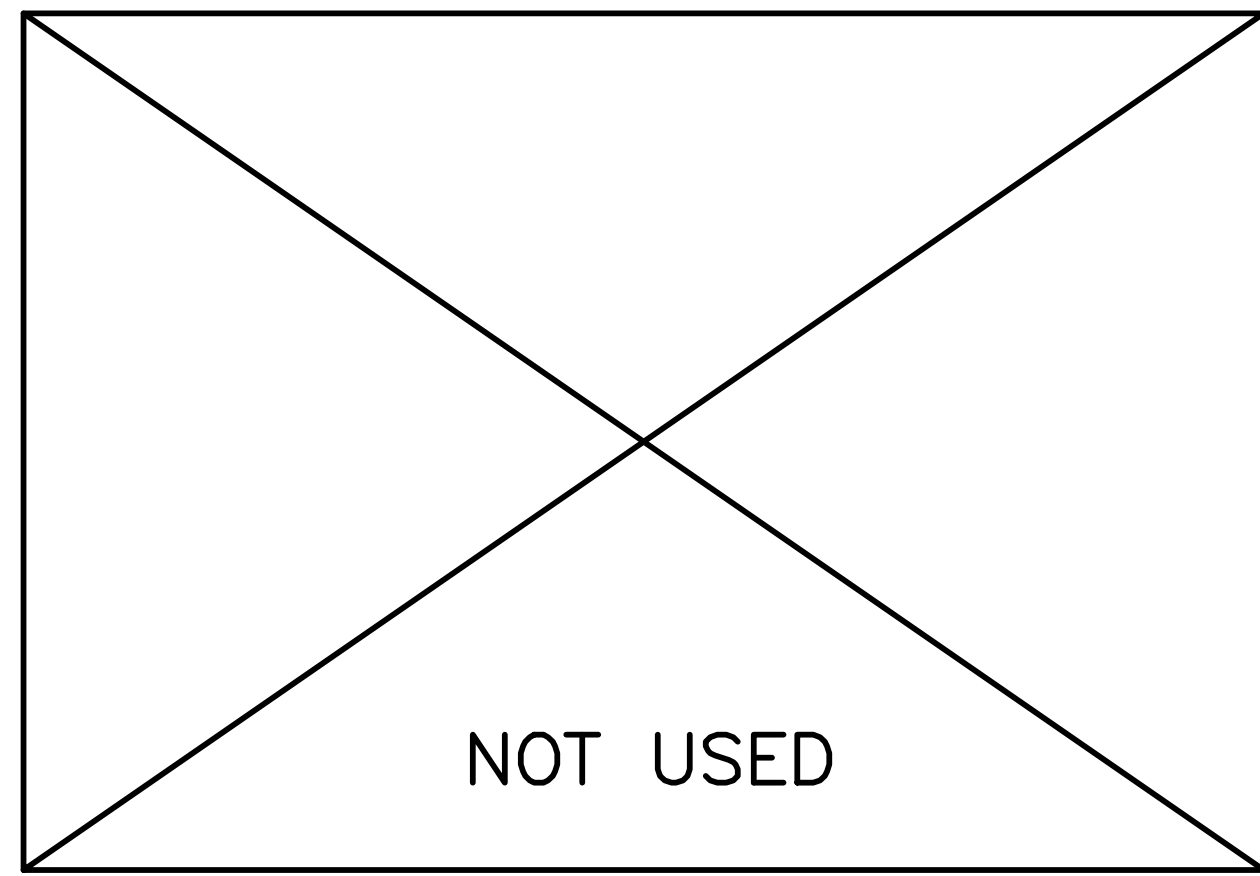
APPROVED FOR THE OWNER DATE _____

SHEET TITLE:
MECHANICAL EQUIPMENT SCHEDULES

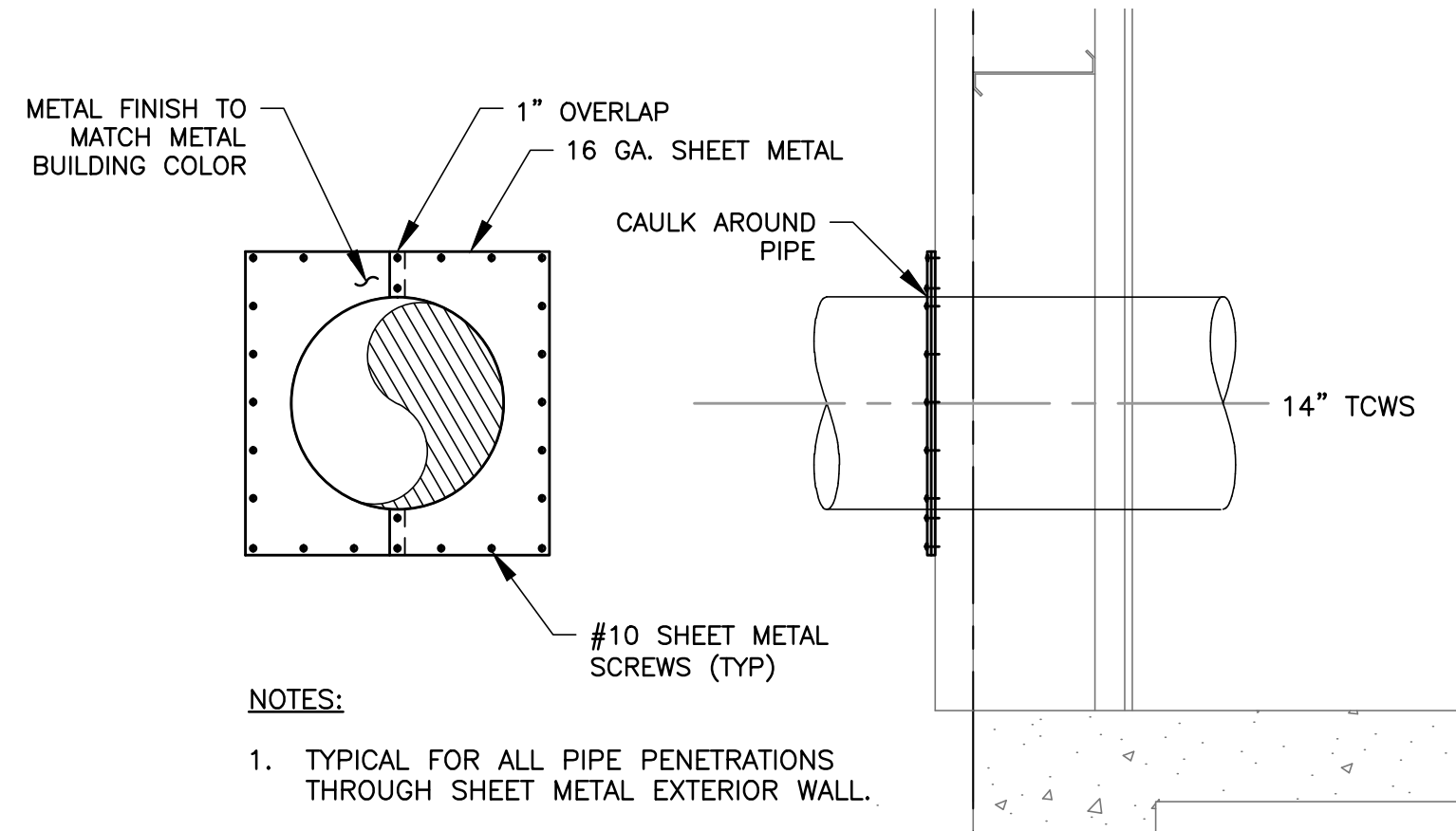
PLT DATE: 10/17/2012 4:22 PM



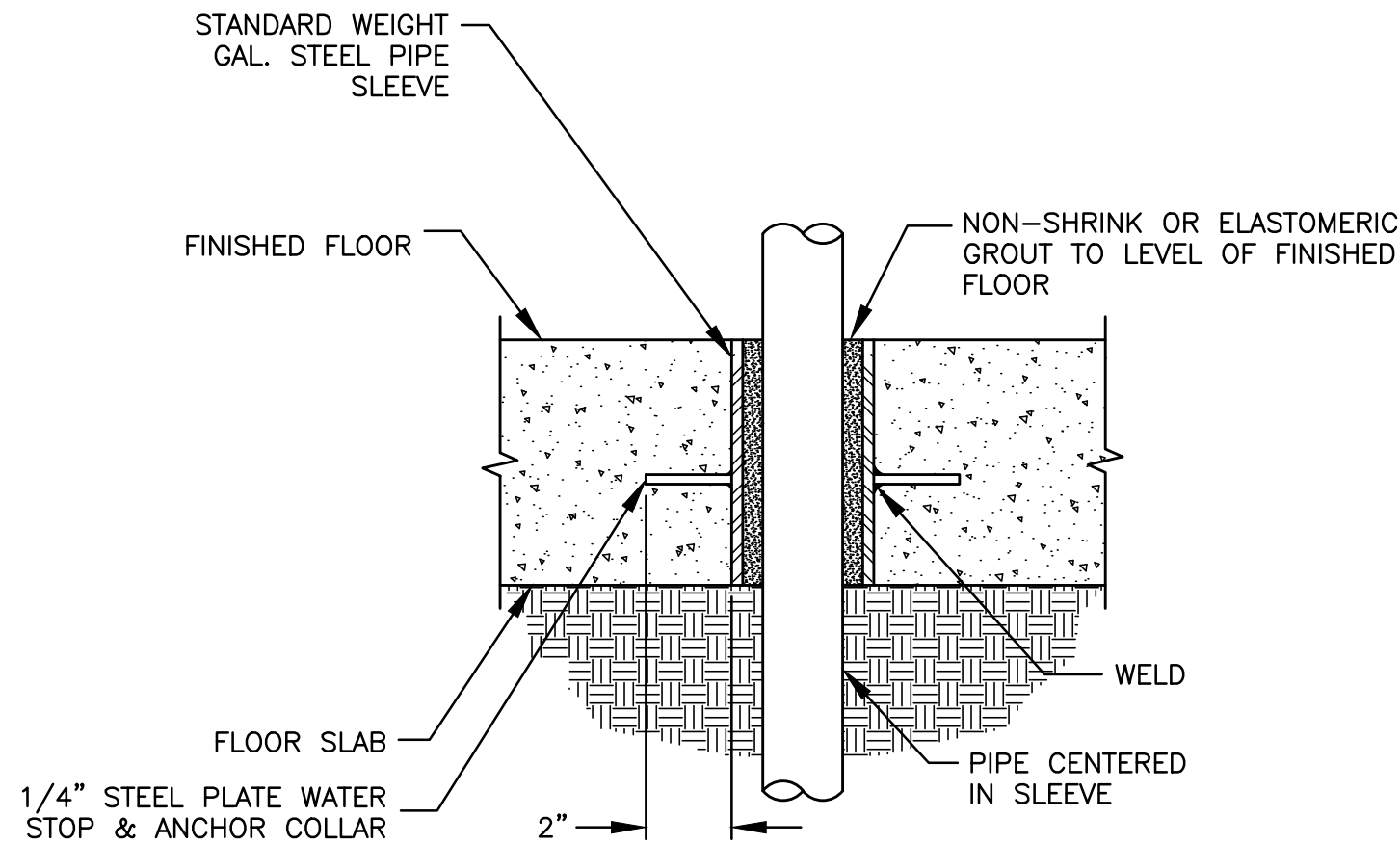
1 ELEVATION
M1.3 SCALE: 1/2" = 1'-0"



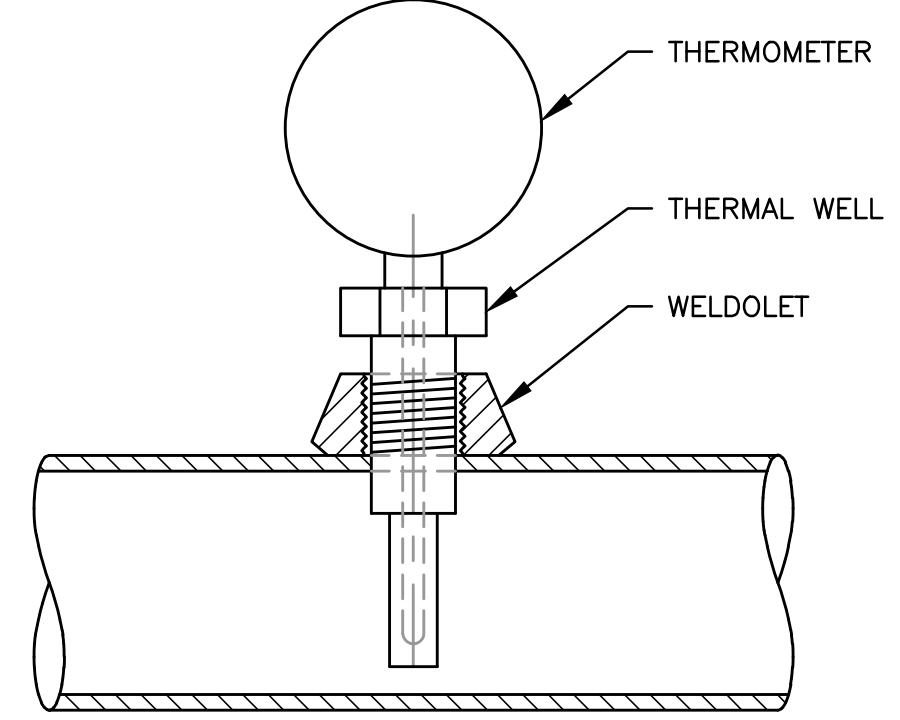
2 HX-1 DETAIL
M1.3 SCALE: NTS



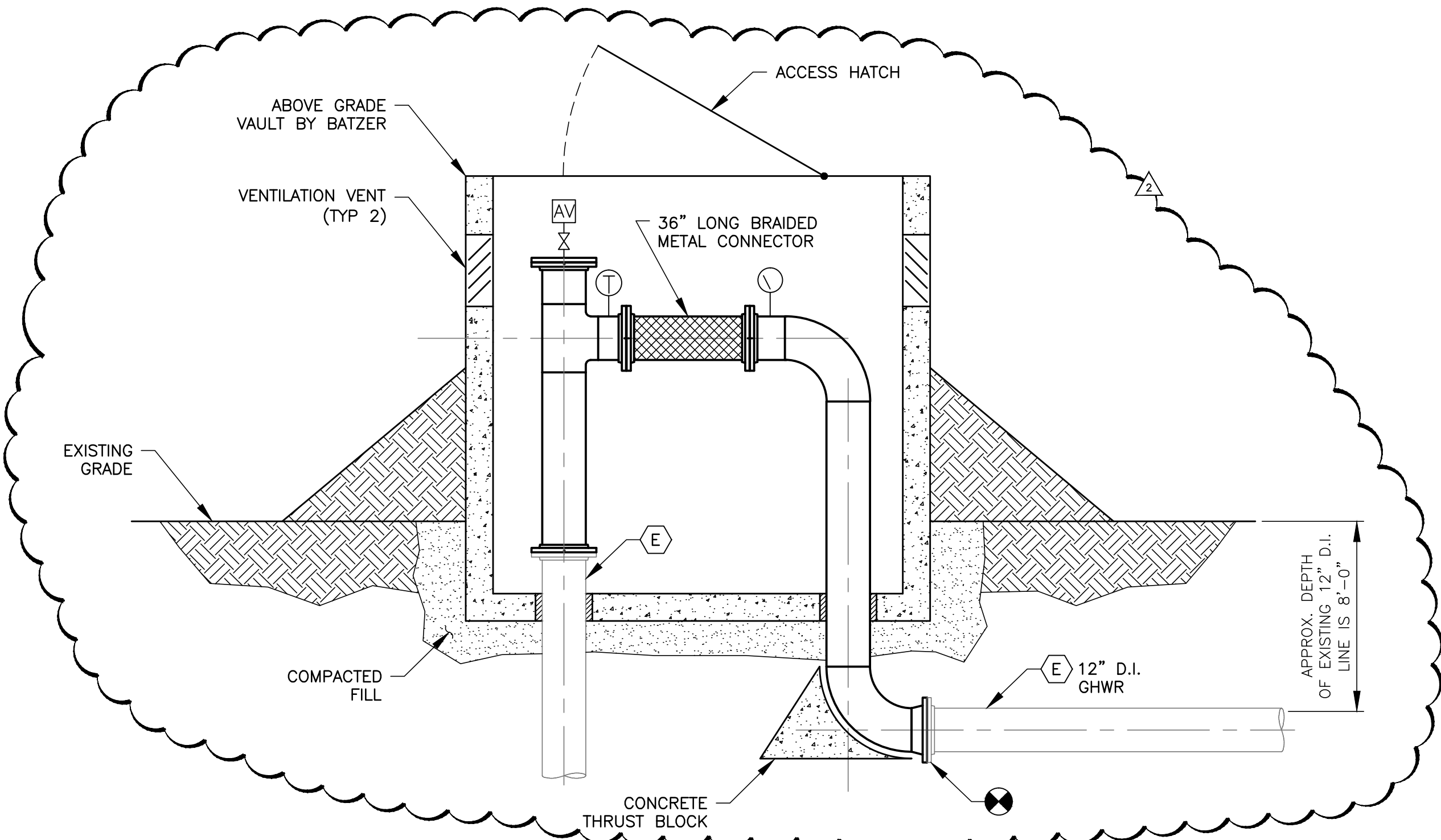
3 PIPE PENETRATION THROUGH EXTERIOR WALLS
M1.3 NOT TO SCALE



4 PIPE PENETRATIONS THROUGH FLOOR
M1.3 NOT TO SCALE



5 THERMOMETER WITH THERMAL WELL
M1.3 NOT TO SCALE



6 RE-INJECTION WELL #3 WELL HEAD PIPE CONNECTIONS
M1.3 NOT TO SCALE

ArcSine engineering
A full-spectrum engineering company
899 Enclave Way / Redding, CA 96002 (530)222-7904
1208 Oak Drive / Medford, OR 97501 (541)842-4188
202 North Main Street / Portland, OR 97201 (503)462-7284
www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
109931
OREGON
7.8.18.1981
DANIEL J. WEHAGE
EXPIRES: 06/30/14

BATZER CONSTRUCTION
P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
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CCB No. 132902
Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT

Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4800

CLIENT:
Oregon TECH
3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

MARK	DATE	DESCRIPTION
△	10/23/12	GENERAL REVISIONS
△	10/19/12	ISSUED FOR PERMIT
△	09/17/12	ISSUED FOR OWNER REVIEW

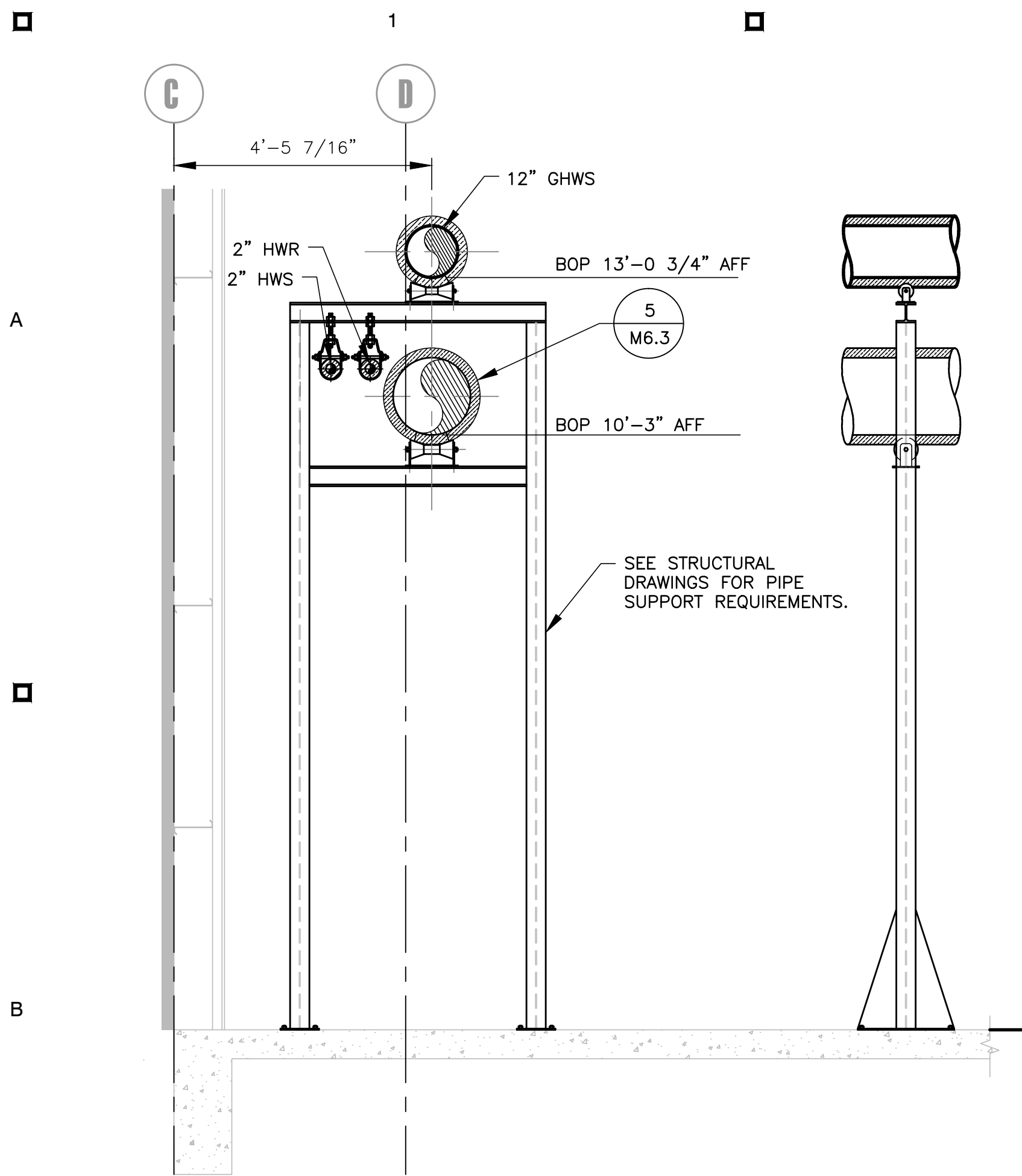
ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. MEHAGE

APPROVED FOR THE OWNER DATE _____
SHEET TITLE:
MECHANICAL PIPING DETAILS
PLOT DATE: 10/24/2012 3:08 PM

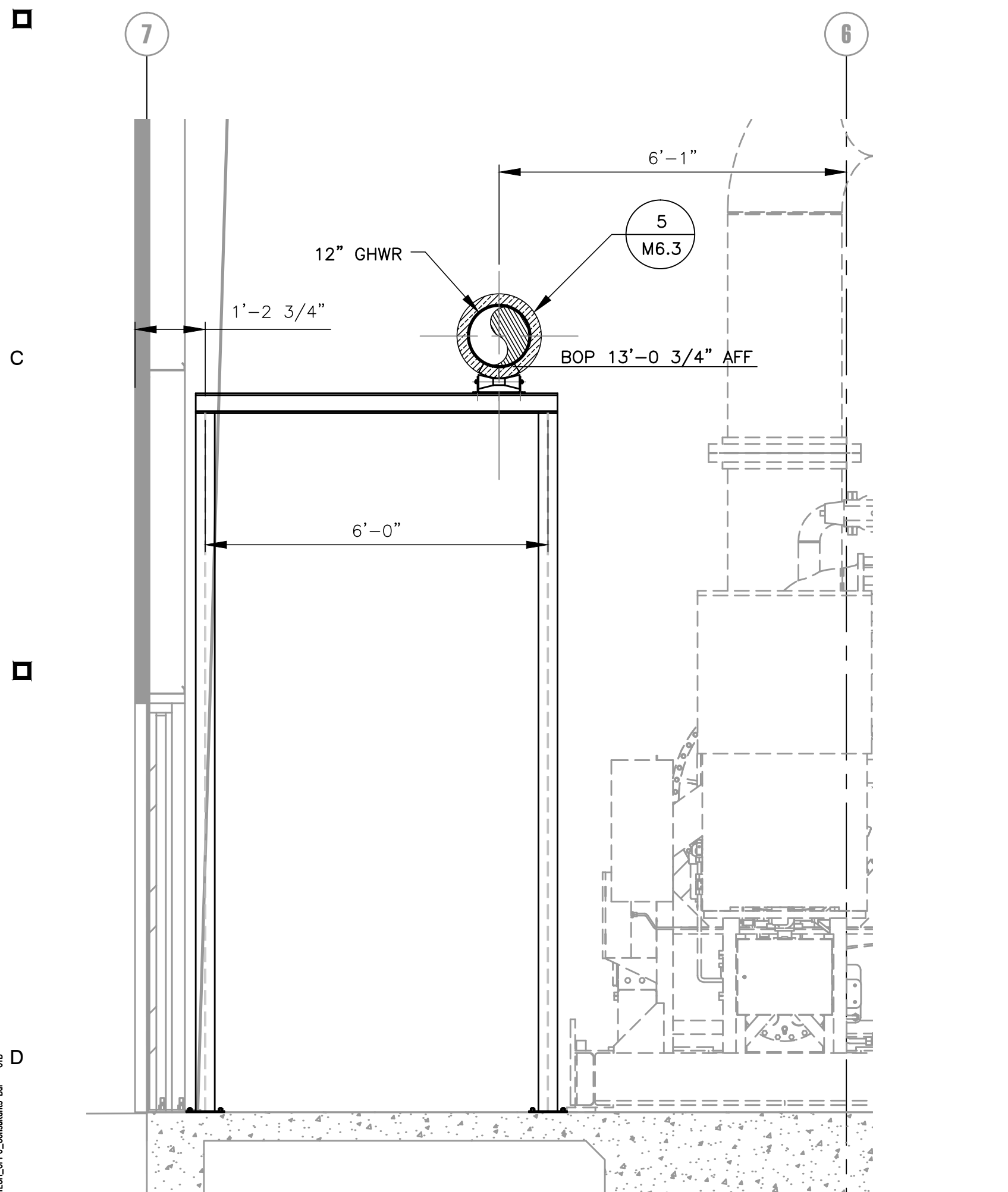
M6.3

Loop Name: Jones
Plot Date: Wednesday, October 24, 2012 3:08:17 PM
File Name: M:\Projects\1245 - GE Geothermal Plant\Design Drawings\1245-M6.3.dwg
User: jones (192.168.1.100) [ComputerName: JONES-001]

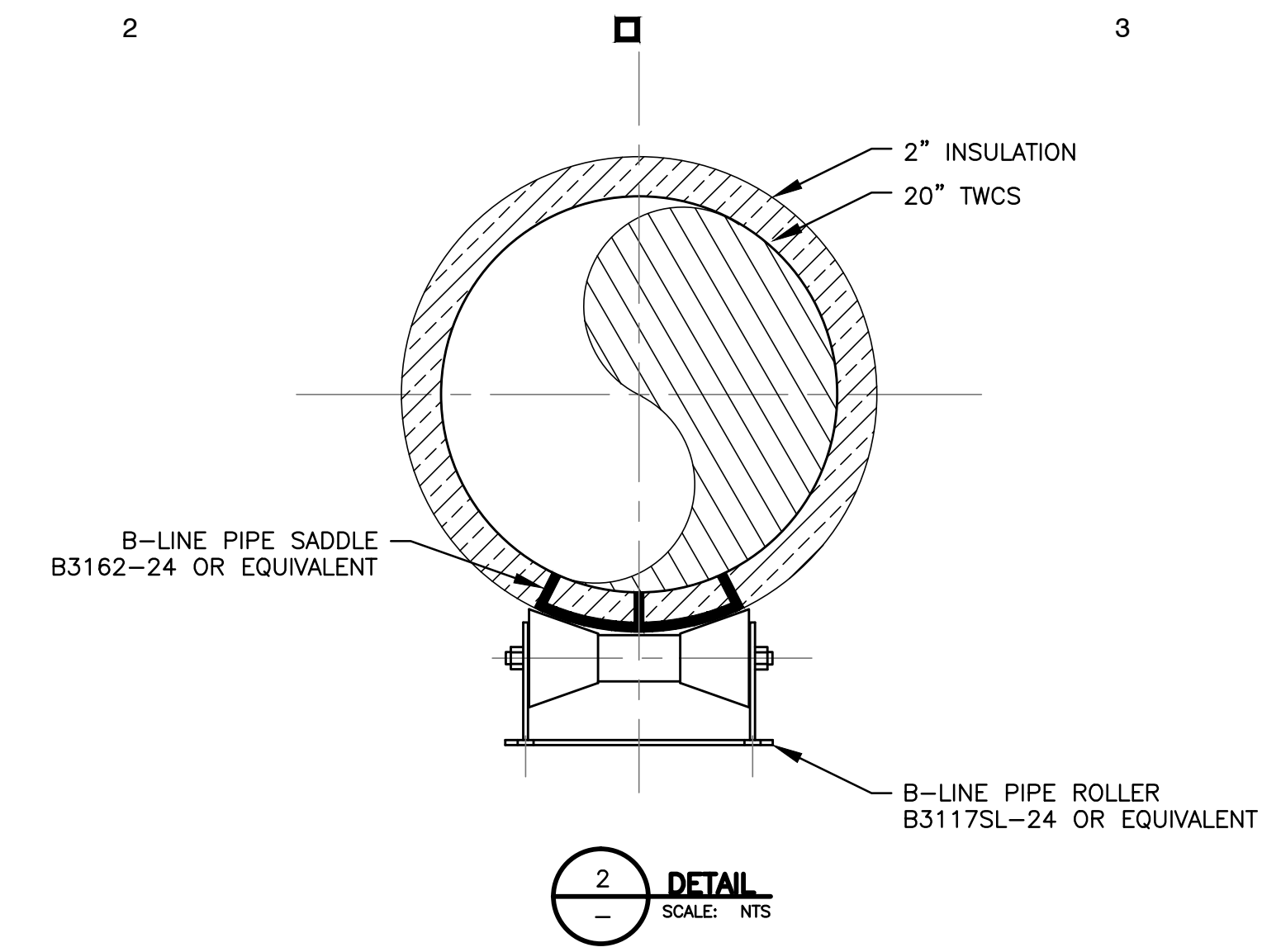
User Name: jones
 Print Date: Wednesday, October 17, 2012 4:26:00 PM
 File Name: M:\Projects\1745 - Mt. Geothermal Plant\Design Drawings\1745-M6.4.dwg
 User: jones
 Plot Device: HP DesignJet 5000 Series



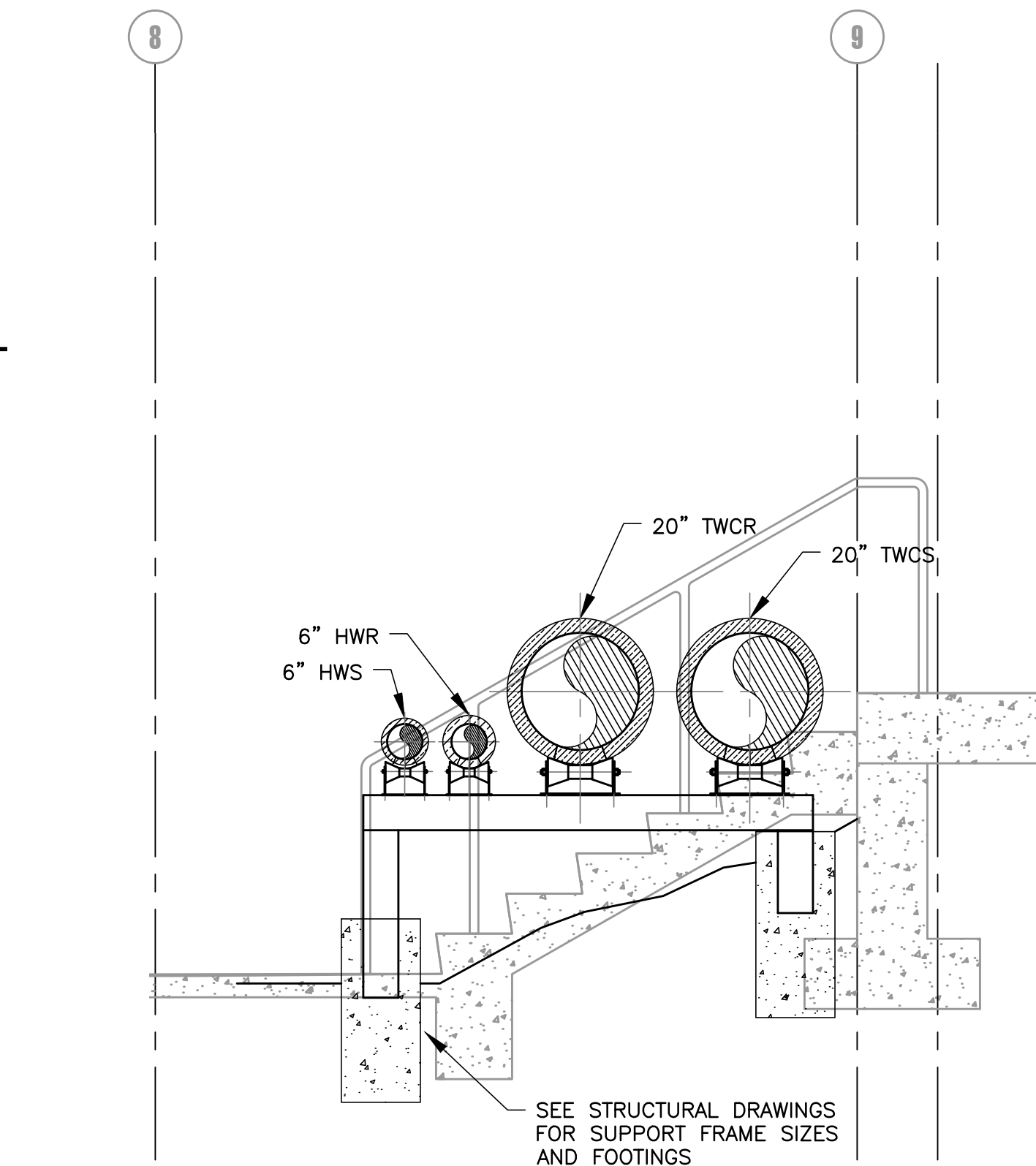
1 PIPE SUPPORT
M1.4 SCALE: 1/2" = 1'-0"



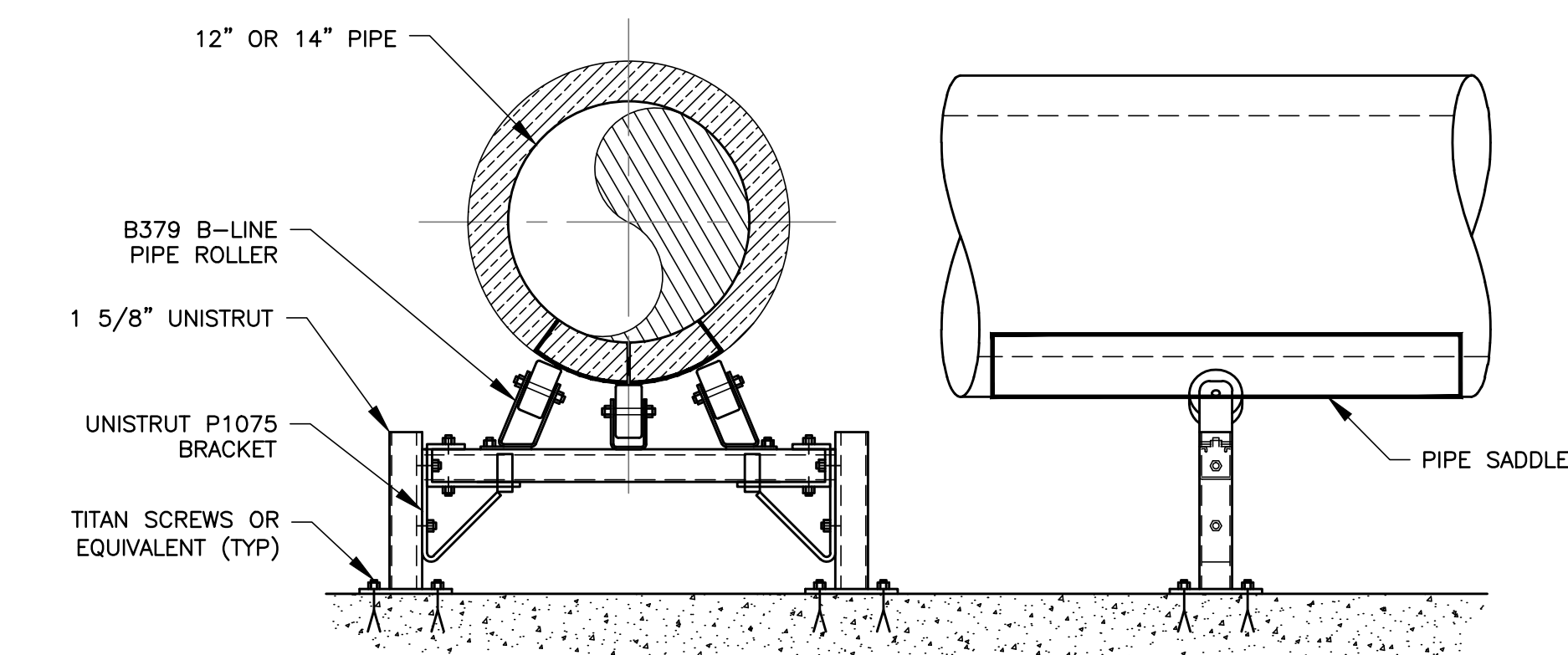
3 PIPE SUPPORT
M1.4 SCALE: 1/2" = 1'-0"



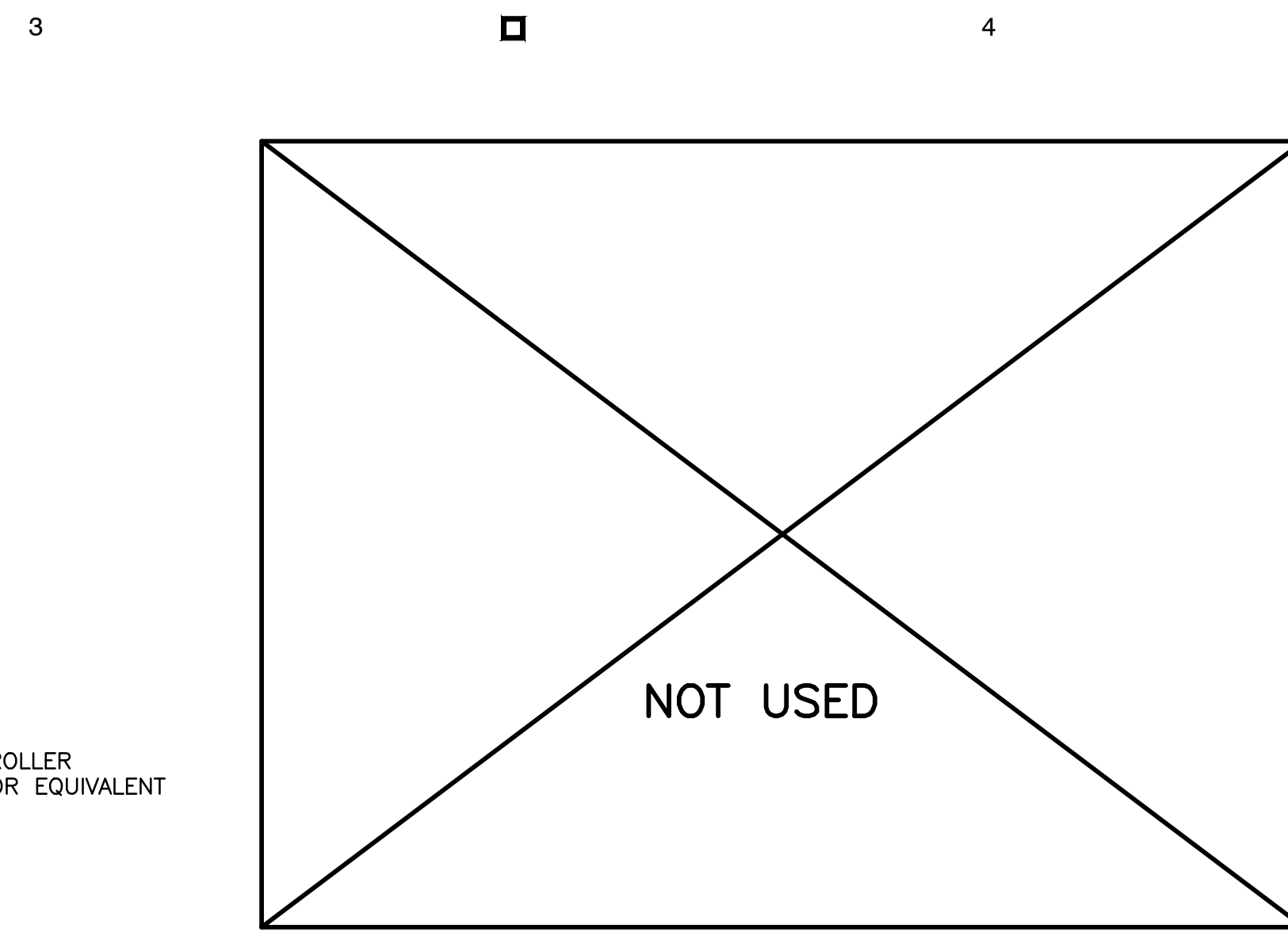
2 DETAIL
SCALE: NTS



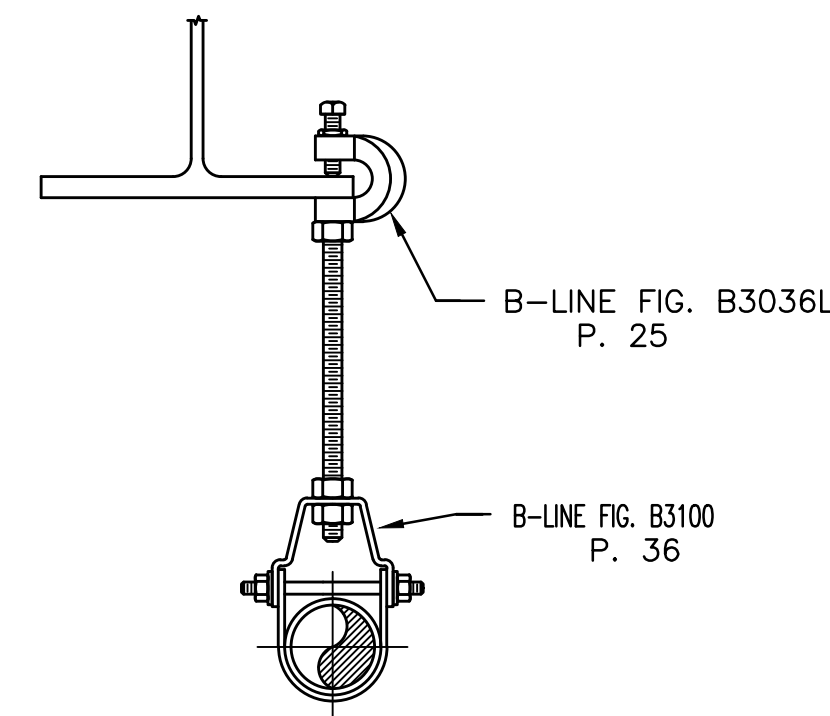
4 PIPE SUPPORT
M1.4 SCALE: 1/2" = 1'-0"



5 PIPE SUPPORT
M1.4 SCALE: 1/2" = 1'-0"



6 PIPE SUPPORT
M1.4 SCALE: 1 1/2" = 1'-0"



NOTES:
1. SIZE HANGER AND CLAMP TO ADEQUATELY SUPPORT LOAD (REFER TO B-LINE HANGER CATALOG).

7 PIPE SUPPORT
M1.4 SCALE: 1 1/2" = 1'-0"

1
2
3
4
5

ArcSine engineering
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1208 Oak Drive | Medford, OR 97501 | (541)842-4188
425 North Main Street | Portland, OR 97201 | (503)742-7264
www.arcsine.com

REGISTERED PROFESSIONAL ENGINEER
10083
DANIEL J. WEVAGE
7/28/19, 1991
EXPIRES: 06/30/14

BATZER CONSTRUCTION
P.O. Box 4460, 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
CCB No. 132902
Web: WWW.BATZERINC.COM

A NEW GEOTHERMAL POWER PLANT
Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Taxlot Reference: 38 09 20 - 4800
CLIENT:
Oregon TECH
3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1600

MARK	DATE	DESCRIPTION
△	10/19/12	ISSUED FOR PERMIT
△	09/17/12	ISSUED FOR OWNER REVIEW

ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEVAGE

APPROVED FOR THE OWNER DATE: _____
SHEET TITLE:
MECHANICAL PIPING DETAILS
PLOT DATE: 10/17/2012 4:26 PM

M6.4

3
4
5

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"	33	1		1	43
10"	21				21
12"	108	10	4	5	183
14"					0
16"					0
18"					0
20"					0
22"					0
TOTAL	162	11	4	6	247

GHWS-r - INDOOR

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"	56		4		66
18"					0
20"	46	2	4		62
22"					0
TOTAL	0	0	0	0	0

TCWS-r - CT HEADER

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"	132	12		16	280
14"					0
16"					0
18"					0
20"					0
22"					0
TOTAL	132	12	0	16	280

TCWS-r - CT BRANCH

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"	200	36	4		318
14"					0
16"					0
18"					0
20"					0
22"					0
TOTAL	200	36	4	0	318

TCWS-r - CT

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"					0
18"					0
20"	40	2	4		56
22"					0
TOTAL	0	0	0	0	0

TCWS-r CWP HEADER

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"	16	2		2	36
14"	10			2	24
16"					0
18"					0
20"					0
22"					0
TOTAL	26	2	0	4	60

TCWS-r CWP

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"					0
18"					0
20"	8	2		2	28
22"					0
TOTAL	0	0	0	0	0

TCWS-r GPP

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"					0
18"	24				24
20"	34	5			49
22"					0
TOTAL	0	0	0	0	0

TCWS-r

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"					0
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"	70	4	5	4	122.5
18"					0
20"					0
22"					0
TOTAL	0	0	0	0	0

TW EQUAL

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"	20	4		4	60
1-1/4"					0
1-1/2"					0
2"	20	4			32
2-1/2"					0
3"	80	5	12	4	153
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"					0
18"					0
20"					0
22"					0
TOTAL	120	13	12	8	243

CT OVERFLOW

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"	10	4		2	36
2"	10	4		3	43
2-1/2"					0
3"	40	8	1	3	87.5
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"					0
18"					0
20"					0
22"					0
TOTAL	60	16	1	8	167

MAKE-UP

Job Name: OIT Geothermal Power Plant
Estimate Number: 12-159

Insulation (All - Service Jacket)	Pipe Qty	90s	Tees	Valves	Equiv. Feet
1/2"					0
3/4"					0
1"					0
1-1/4"					0
1-1/2"					0
2"					0
2-1/2"	125	4	2	9	205
3"					0
4"					0
5"					0
6"					0
8"					0
10"					0
12"					0
14"					0
16"					0
18"					0
20"					0
22"					0
TOTAL	125	4	2	9	205

HWS-r

12-159 OIT Geo Power Plant INSULATION

Company: PMCG
Job Name: OIT - Geothermal 17-17-12 12-159 (7-17-12)
Material Set: Factor #1
Labor Set: Factor #1 (MCAA)
Run Date: 07-17-2012 @ 14:43:03
Sort Key: By Mat Group

Mat Group	Qty	Size	Description
Bolt Valves	4	1/2"	600 Thd Bolt Valve
	4	1	600 Thd Bolt Valve
	1	2	600 Thd Bolt Valve
	1	1 1/2"	600 Thd Bolt Valve
	2	2	600 Swt Bolt Valve
	2	3	600 Swt Bolt Valve
	46		(SUBTOTAL)
Bolts	84	3/8"	Hex Head Bolt w/ Nut
	64	8	Hex Head Bolt w/ Nut
	16	8	Hex Head Bolt w/ Nut
	48	10	Hex Head Bolt w/ Nut
	696	12	Hex Head Bolt w/ Nut
	96	14	Hex Head Bolt w/ Nut
	320	16	Hex Head Bolt w/ Nut
	240	20	Hex Head Bolt w/ Nut
	8	3	Cap Plated Hex Head Bolt w/ Nut
	1572		(SUBTOTAL)
Bronze & Iron Valves	3	2	128 Brz Thd BrzDsc Check Valve
	12		(SUBTOTAL)
Butterfly Valves	4	3	200 DI Lug Bfly Vlv BrzDsc Lever
	3	6	200 DI Lug Bfly Vlv BrzDsc Lever
	1	8	200 DI Lug Bfly Vlv BrzDsc Gear
	13	12	200 DI Lug Bfly Vlv BrzDsc Gear
	21		(SUBTOTAL)
Butterfly Valves	2	14	150# CI Lug Bfly Valve EPDM w/Gea
	4	16	150# CI Lug Bfly Valve EPDM w/Gea
	20	20	150# CI Lug Bfly Valve EPDM w/Gea
	9		(SUBTOTAL)</

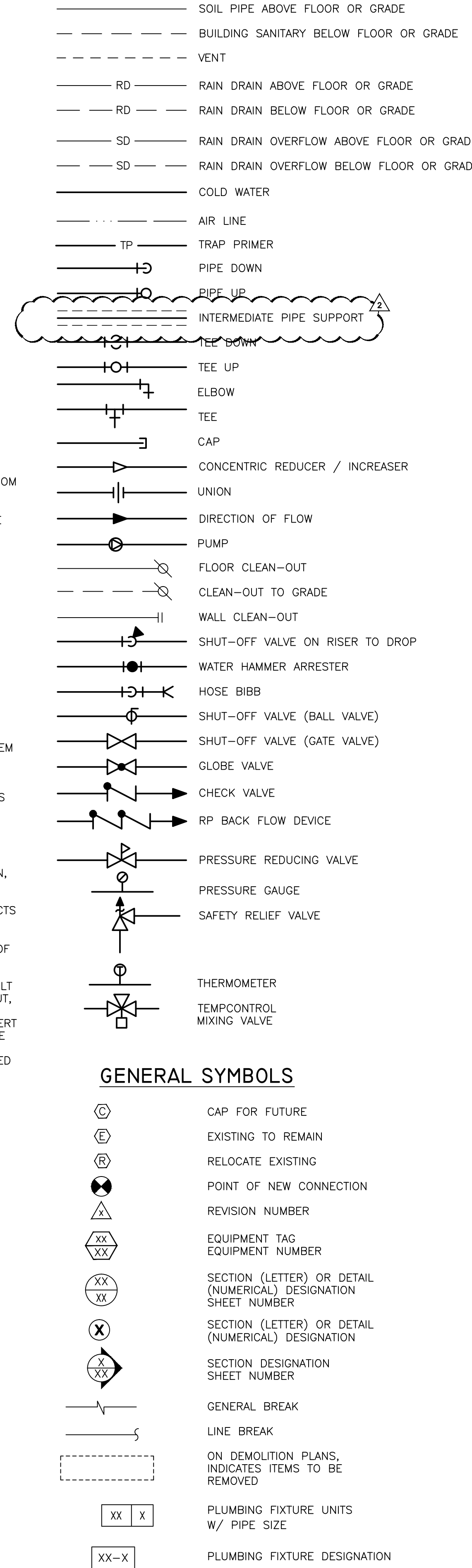
PLUMBING FIXTURE SCHEDULE

Table with columns: TAG, DESCRIPTION, MINIMUM CONNECTION SIZE (WASTE, VENT, CW, HW), REMARKS. Rows include CATCH BASIN, FLOOR DRAIN, FLOOR SINK, HOSE BIBB, TRAP PRIMER.

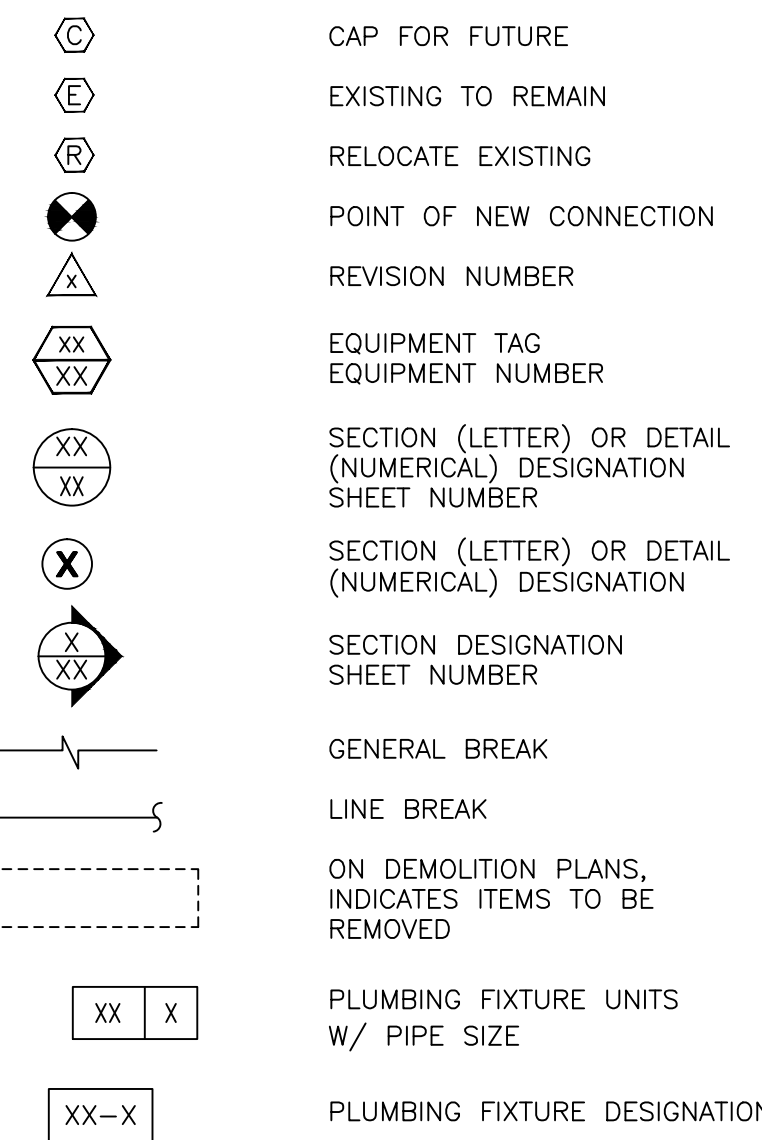
GENERAL NOTES

- 1. PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO CONSTRUCT A COMPLETE, OPERATIONAL PLUMBING SYSTEM FOR THE ENTIRE PROJECT AS SHOWN ON THESE DRAWINGS... 12. PREPARE 6 COPIES OF SUBMITTALS IN AN INDEXED, LABELED FOLDER...

PIPING SYMBOLS



GENERAL SYMBOLS



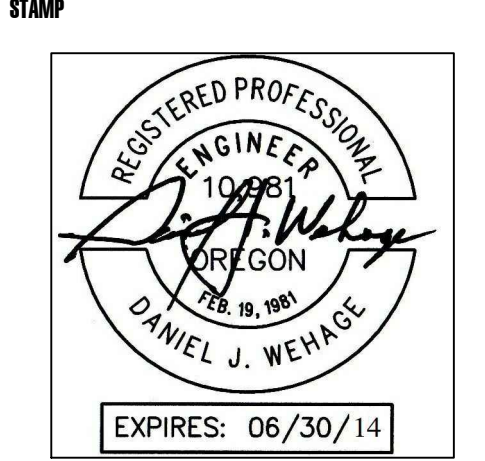
PLUMBING ABBREVIATIONS

Table listing plumbing abbreviations such as AD (ACCESS DOOR), AFF (ABOVE FINISH FLOOR), ARCH (ARCHITECT OR ARCHITECTURAL), BFG (BELOW FINISHED GRADE), BLDG (BUILDING), BM (BEAM), BOD (BOTTOM OF DUCT), BOP (BOTTOM OF PIPE), BOS (BOTTOM OF STEEL), BTU (BRITISH THERMAL UNIT), CA (COMPRESSED AIR), CLG (CEILING), CO (CLEAN OUT), CTG (CLEAN OUT TO GRADE), CONSTR (CONSTRUCTION), CW (COLD WATER (POTABLE)), D (COOLING TOWER DRAIN), DF (DRINKING FOUNTAIN), DIA (DIAMETER), DN (DOWN), DWG (DRAWING), ELEV (ELEVATION), EWT (ENTERING WATER TEMPERATURE), FC (FLEXIBLE CONNECTION), FLA (FULL LOAD AMPS), FLR (FLOOR), FUT (FUTURE WORK TO BE DONE), GC (GENERAL CONTRACTOR), GPM (GALLONS PER MINUTE), HB (HOSE BIBB), HP (HORSEPOWER), HR (HOUR), HW (HOT WATER (POTABLE)), I.E. (INVERT ELEVATION), INT (INITIAL WORK TO BE DONE), LB(S) (POUND, POUNDS), MBH (THOUSAND BTU PER HOUR), MC (MECHANICAL CONTRACTOR), MCA (MINIMUM CIRCUIT CAPACITY), MECH (MECHANICAL), MFR (MANUFACTURER), MIN (MINIMUM), MOC (MAXIMUM OVERCURRENT PROTECTION), MU (MAKEUP WATER), NC (NORMALLY CLOSED), NIC (NOT IN CONTRACT), NO (NORMALLY OPEN), NTS (NOT TO SCALE), OC (ON CENTER), OA (OUTSIDE AIR), OMS (OREGON MECHANICAL SPECIALTY CODE), OPSC (OREGON PLUMBING SPECIALTY CODE), OSSC (OREGON STRUCTURAL SPECIALTY CODE), PRV (PRESSURE RELIEF VALVE), PT (PRESSURE TANK), PSI (POUNDS PER SQUARE INCH), PVC (PRESSURE / TEMPERATURE PLUG POLYVINYL CHLORIDE), RECT (RECTANGULAR), REQ'D (REQUIRED), RPM (REVOLUTIONS PER MINUTE), SAN (SANITARY DRAIN LINE), SD (STORM DRAIN), SF (SQ FT), SIM (SIMILAR), SPEC (SPECIFICATION OR SPECIFIED), SRV (SAFETY RELIEF VALVE), SS (STAINLESS STEEL), STD (STANDARD), TOS (TOP OF STEEL), TP (TRAP PRIMER), TYP (TYPICAL), UNO (UNLESS NOTED OTHERWISE), V (VENT), W/ (WITH), WCO (WALL CLEAN OUT), WH (WATER HEATER), WHA (WATER HAMMER ARRESTER).

NOTE: ABBREVIATIONS AND SYMBOLS ARE ARCSINE ENGINEERING STANDARDIZED SYMBOL LEGENDS. AS SUCH, ALL SYMBOLS SHOWN MAY NOT APPEAR ON OR WITHIN THIS SET OF CONTRACT DOCUMENTS.

SHEET LEGEND

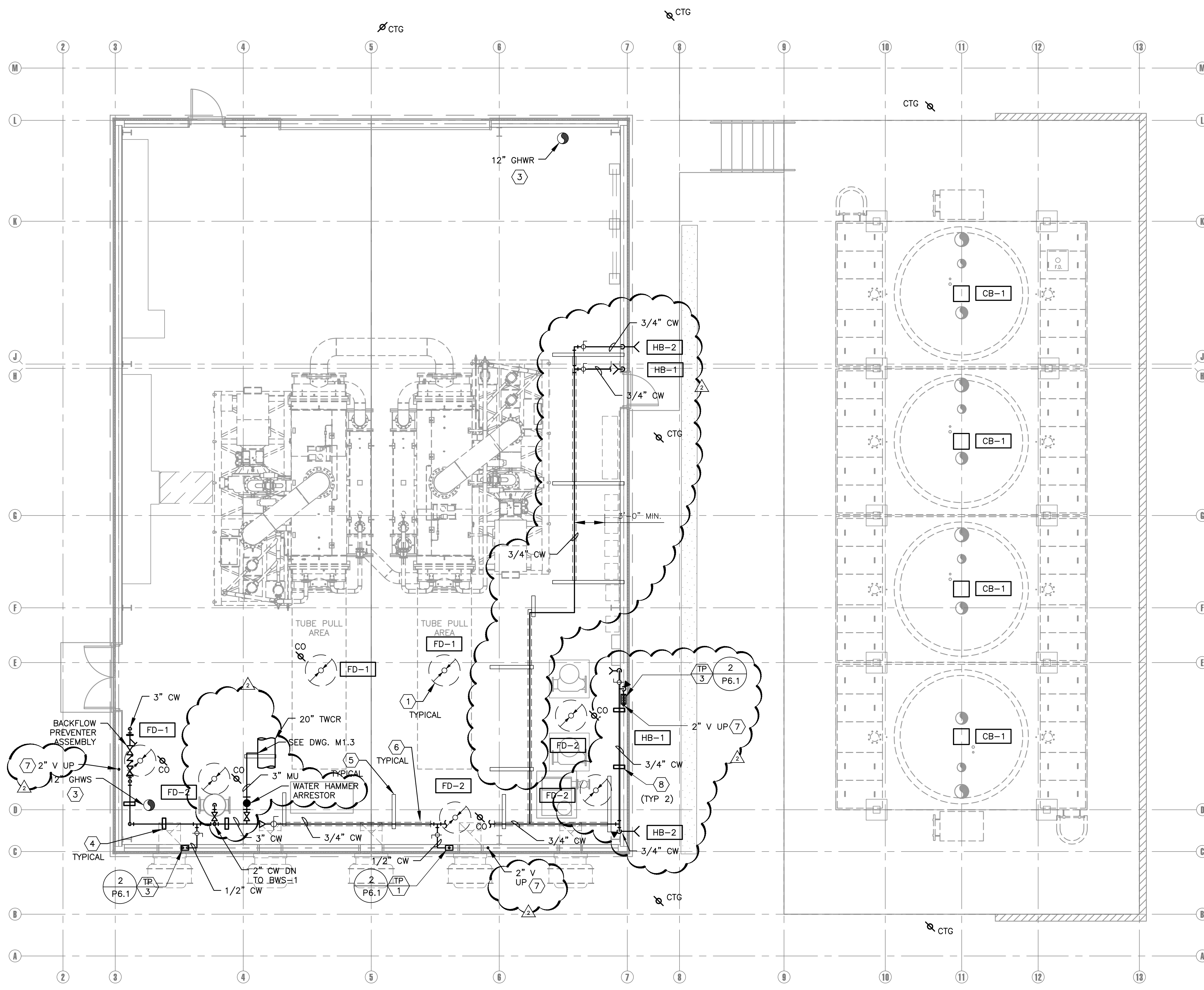
Table with columns: PO, PLUMBING NOTES, SYMBOLS & ABBREVIATIONS, PLUMBING UNDERGROUND PLAN, PLUMBING FIRST FLOOR PLAN, PLUMBING SCHEDULE AND DETAILS.



A NEW GEOTHERMAL POWER PLANT
Project Location: 3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Tabled Reference: 38 09 20 - 4800
CLIENT: Oregon TECH
Contact: Mr. David Ebsen (541) 885-1800

Table with columns: MARK, DATE, DESCRIPTION. Includes revision history for general revisions, issued for permit, issued for owner review.

APPROVED FOR THE OWNER DATE
SHEET TITLE: PLUMBING NOTES, SYMBOLS AND ABBREVIATIONS
PLOT DATE: 10/24/2012 2:48 PM



GENERAL NOTES

- A. BUILDING FINISHED FLOOR ELEVATION IS +0'-0" (+4427')
- B. COOLING TOWER FLOOR SLAB ELEVATION IS +4'-0" (+4431').
- C. SET FINISH ELEVATION OF ALL FLOOR DRAINS 3/8" BELOW GENERAL FLOOR ELEVATION. SLOPE FLOORS TO DRAIN FROM 1.5 FOOT RADIUS OUT, AT A SLOPE OF 1/4" PER FOOT.
- D. SEE FLOW SCHEMATIC DRAWING M1.2 FOR MANUAL VALVES, MOTORIZED VALVES, CONTROL VALVES, THERMOMETERS, PRESSURE GAUGES AND FLEXIBLE CONNECTORS.

KEYED NOTES

- 1. 3 FOOT DIAMETER. SLOPE TO FLOOR DRAIN AT 1/4"/FT.
- 2. 1 1/2" MAKEUP WATER LINE. ATTACH TO COOLING TOWER AT CONNECTION POINT PROVIDED.
- 3. SHOWN FOR REFERENCE ONLY. SEE MECHANICAL DRAWINGS FOR GHWS AND GHWR PIPING.
- 4. NOT USED
- 5. PRIMARY PIPE SUPPORT. SEE DWG. M1.4 FOR PRIMARY LOCATIONS.
- 6. INTERMEDIATE SUPPORT. SEE DETAIL 6/P6.1
- 7. EXTEND VENT VERTICALLY UP THROUGH ROOF, 24" ABOVE ROOF SURFACE.
- 8. UNISTRUT PIPE SUPPORT. SEE DETAIL 7/P6.1

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REGISTERED PROFESSIONAL ENGINEER
 Daniel J. Wehage
 Oregon
 7/28/19/1980
 EXPIRES: 06/30/14

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A NEW GEOTHERMAL POWER PLANT
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Oregon TECH
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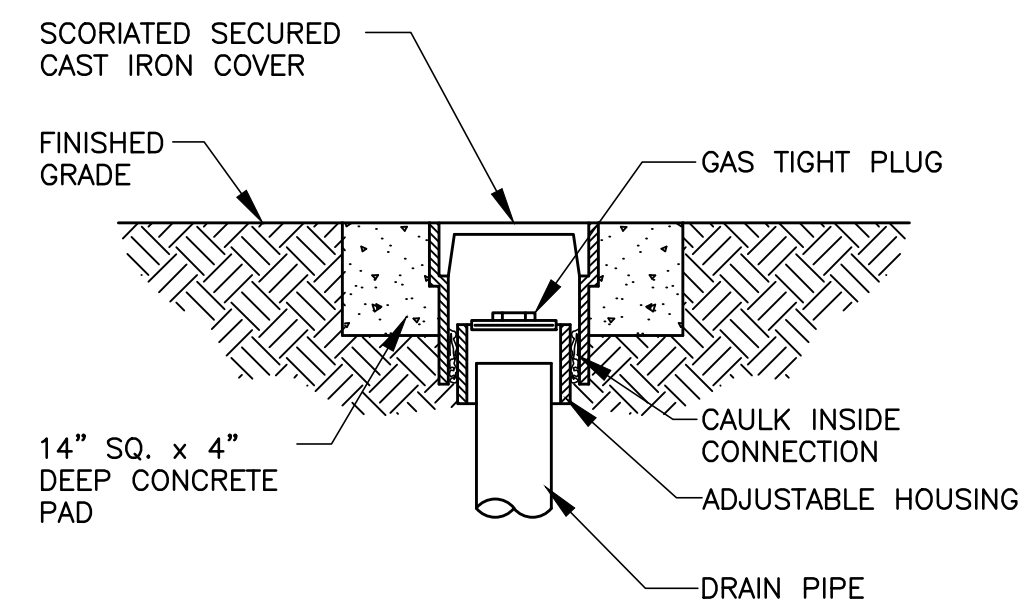
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△	10/19/12	ISSUED FOR PERMIT
△	09/17/12	ISSUED FOR OWNER REVIEW

APPROVED FOR THE OWNER: DATE _____
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PLUMBING FLOOR PLAN
 PLOT DATE: 10/24/2012 2:53 PM

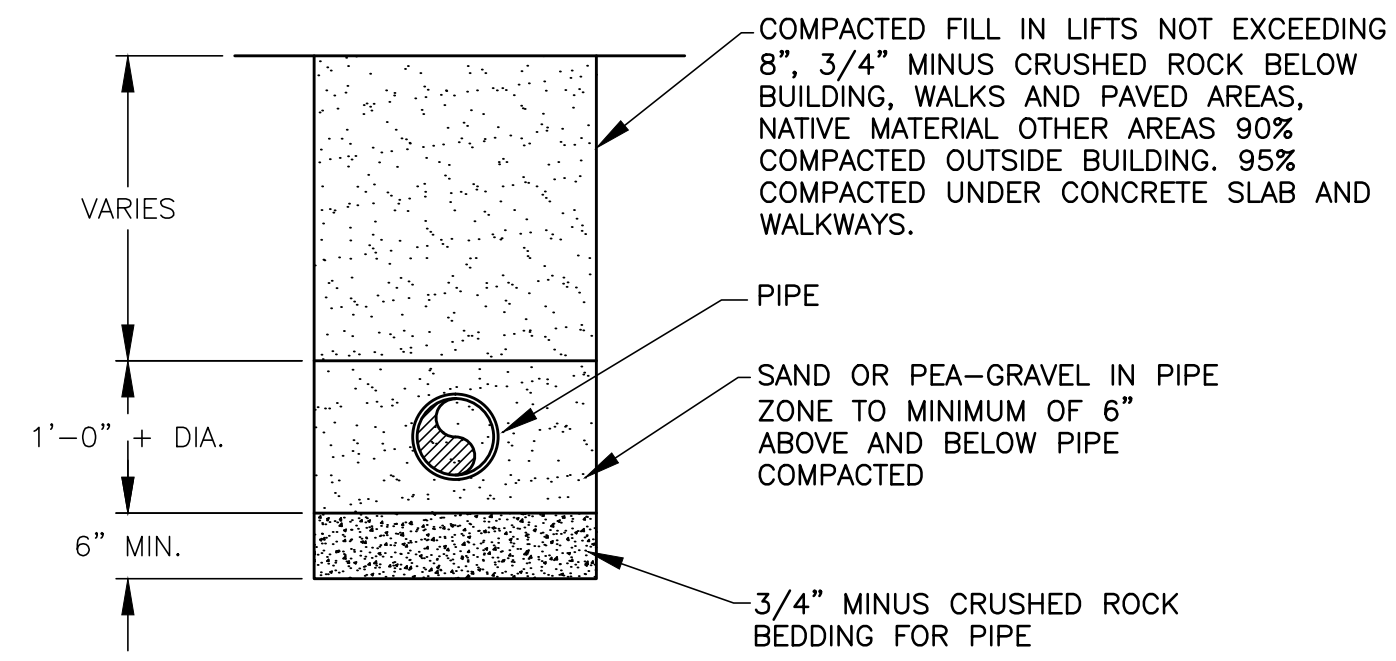
P1.1

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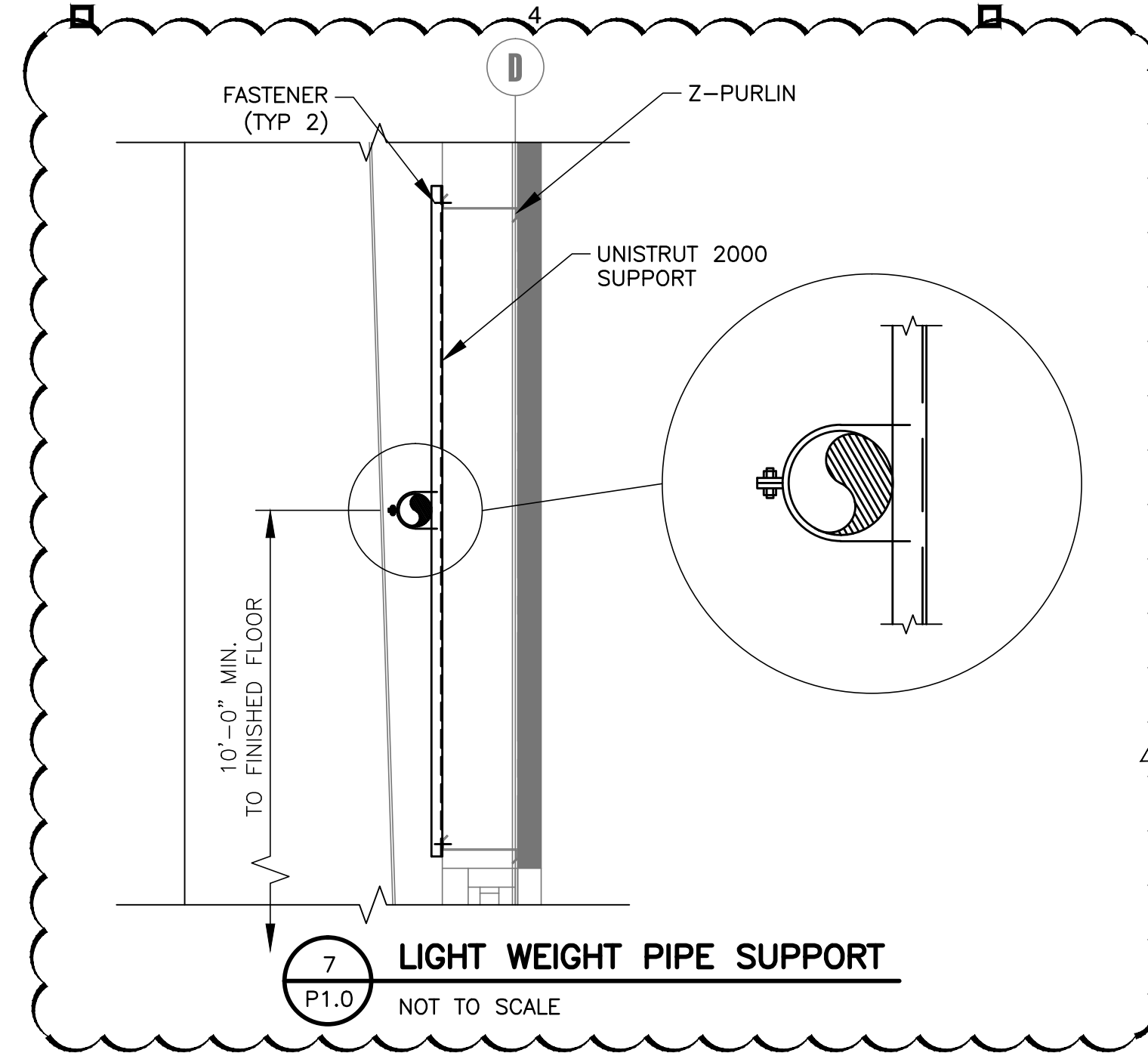
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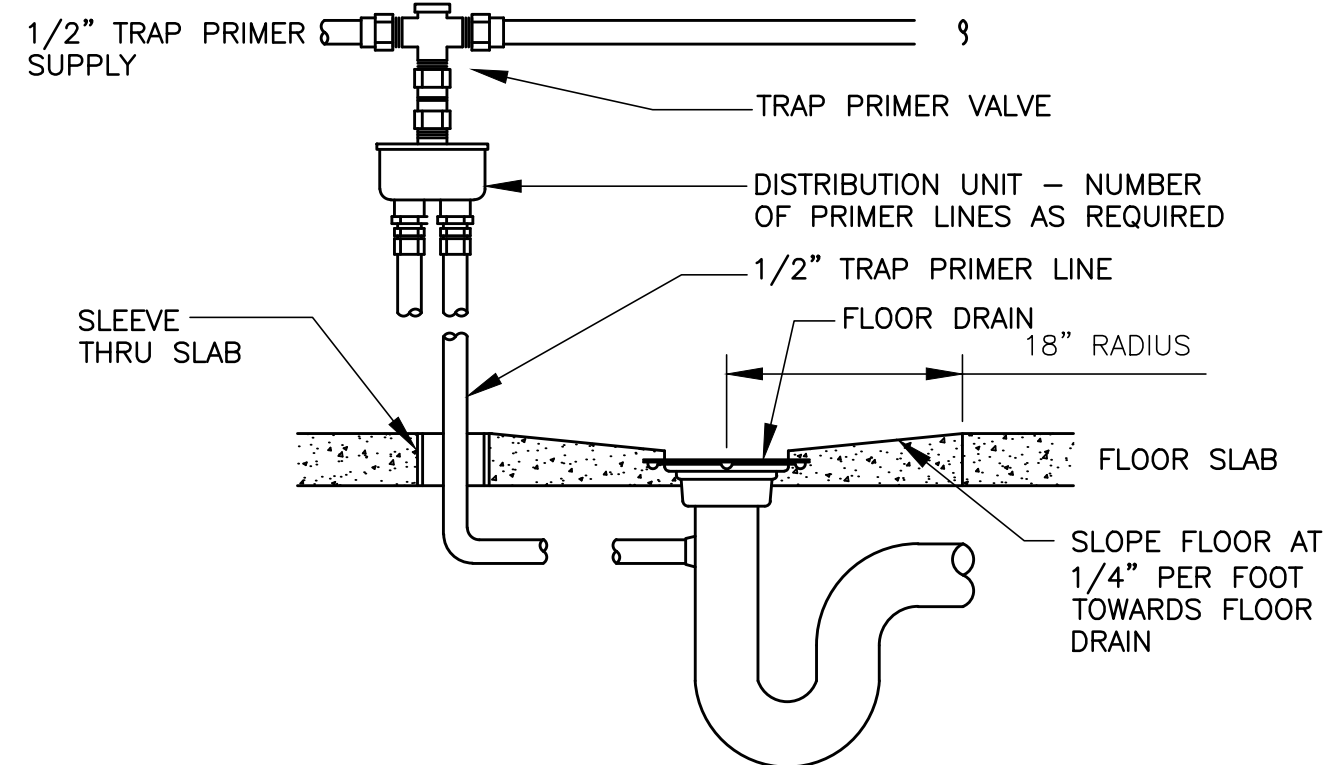
1 CLEANOUT TO GRADE
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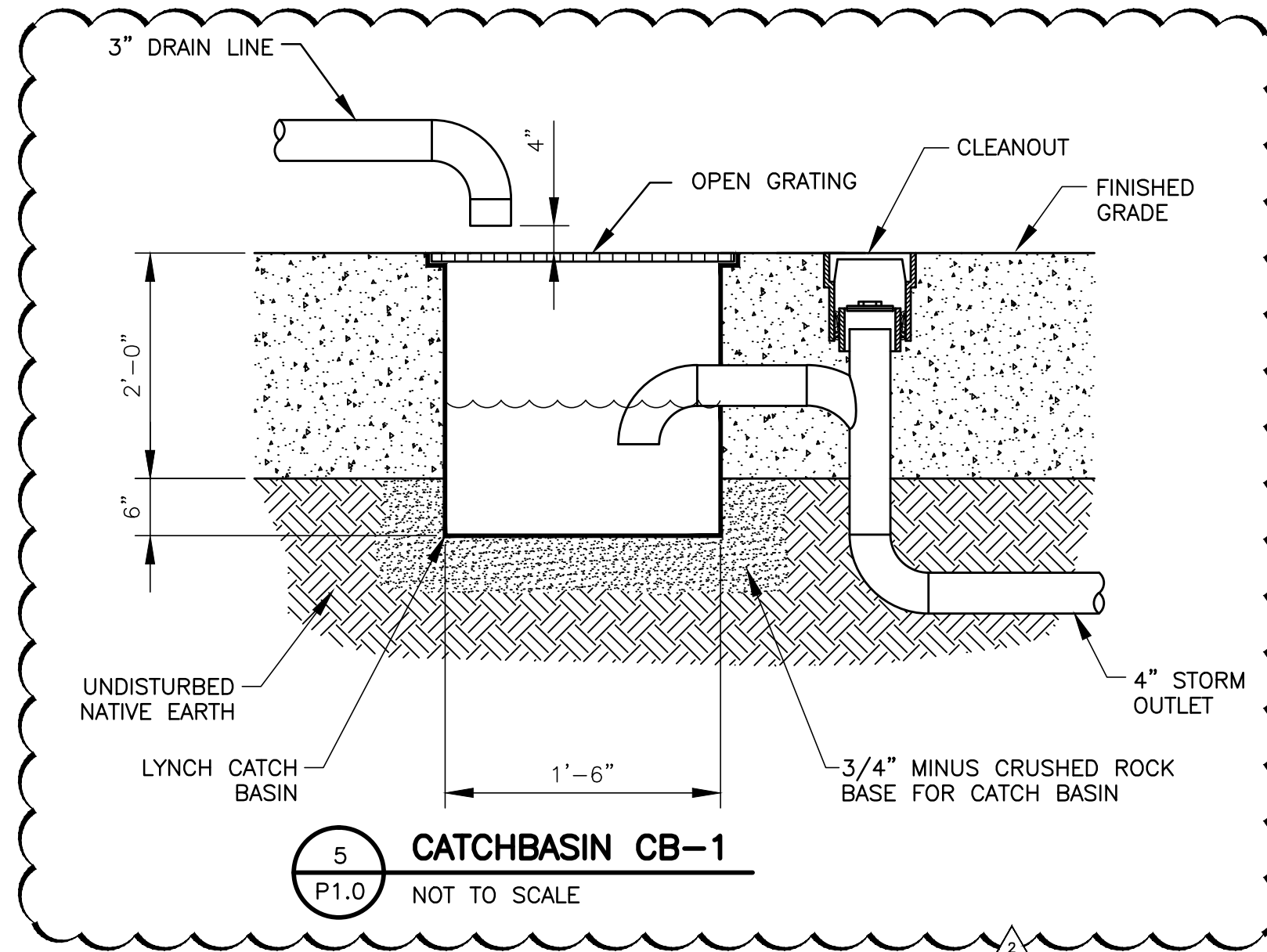
4 BELOW GRADE PIPE INSTALLATION
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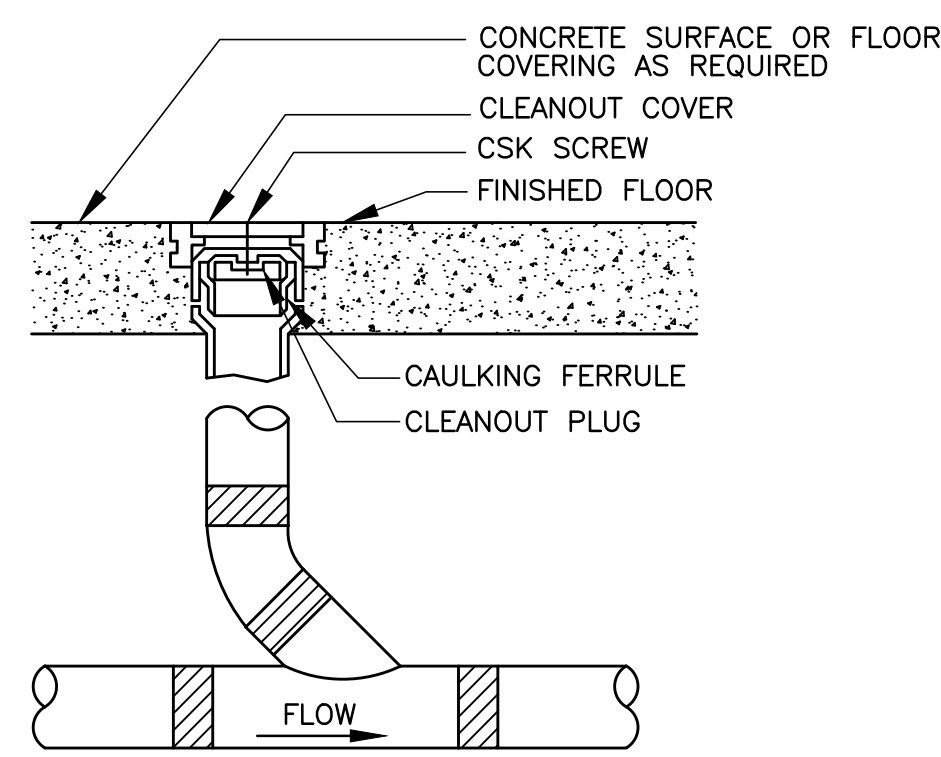
7 LIGHT WEIGHT PIPE SUPPORT
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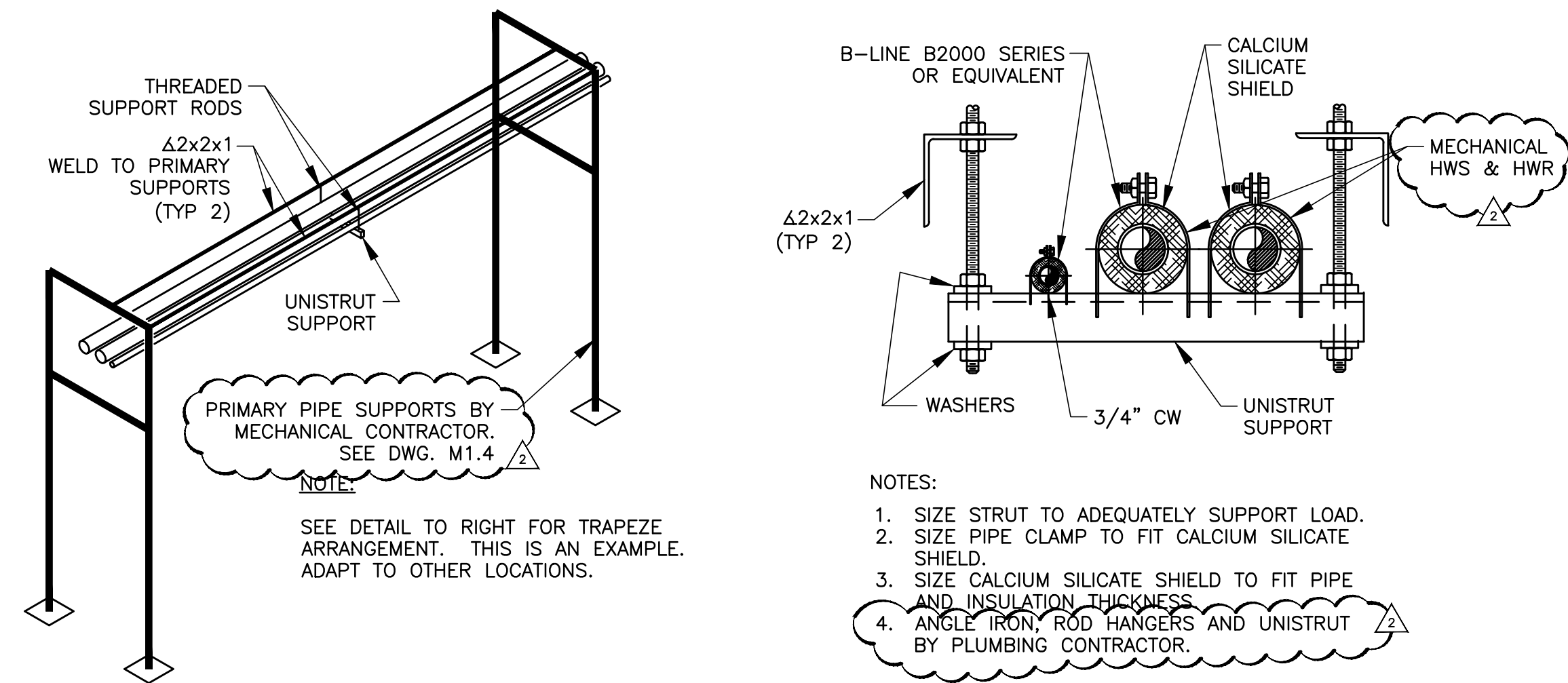
2 TRAP PRIMER - MULTIPLE FEEDS
P1.0 NOT TO SCALE



5 CATCHBASIN CB-1
P1.0 NOT TO SCALE



3 FLOOR CLEANOUT
P1.0 NOT TO SCALE



6 INTERMEDIATE PIPE SUPPORT
P1.0 NOT TO SCALE

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ISSUE: 09/17/12
PROJECT NO: 1245
DRAWN BY: J. JONES
CHECKED BY: D. WEHAGE

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SHEET TITLE:
PLUMBING SCHEDULES & DETAILS
PLOT DATE: 10/24/2012 2:57 PM

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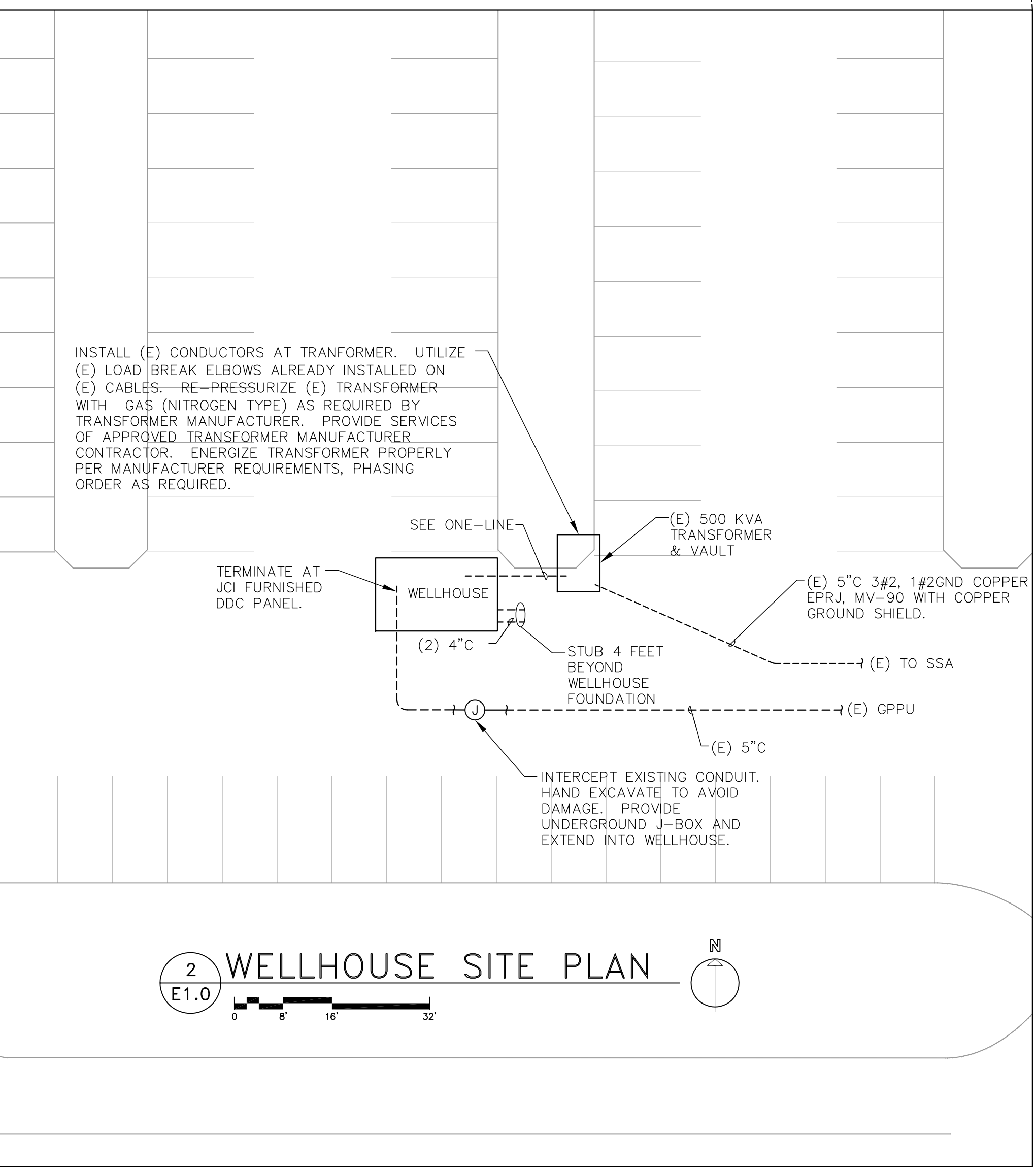
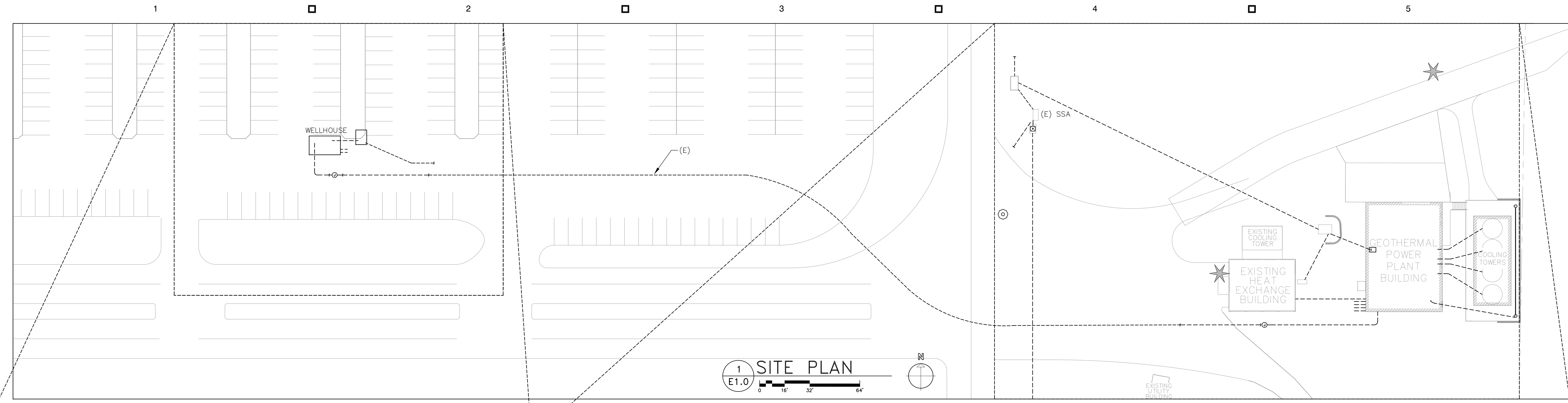
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 PROJECT NO: 12132
 DRAWN BY: DS/AD/JH
 CHECKED BY: MJC

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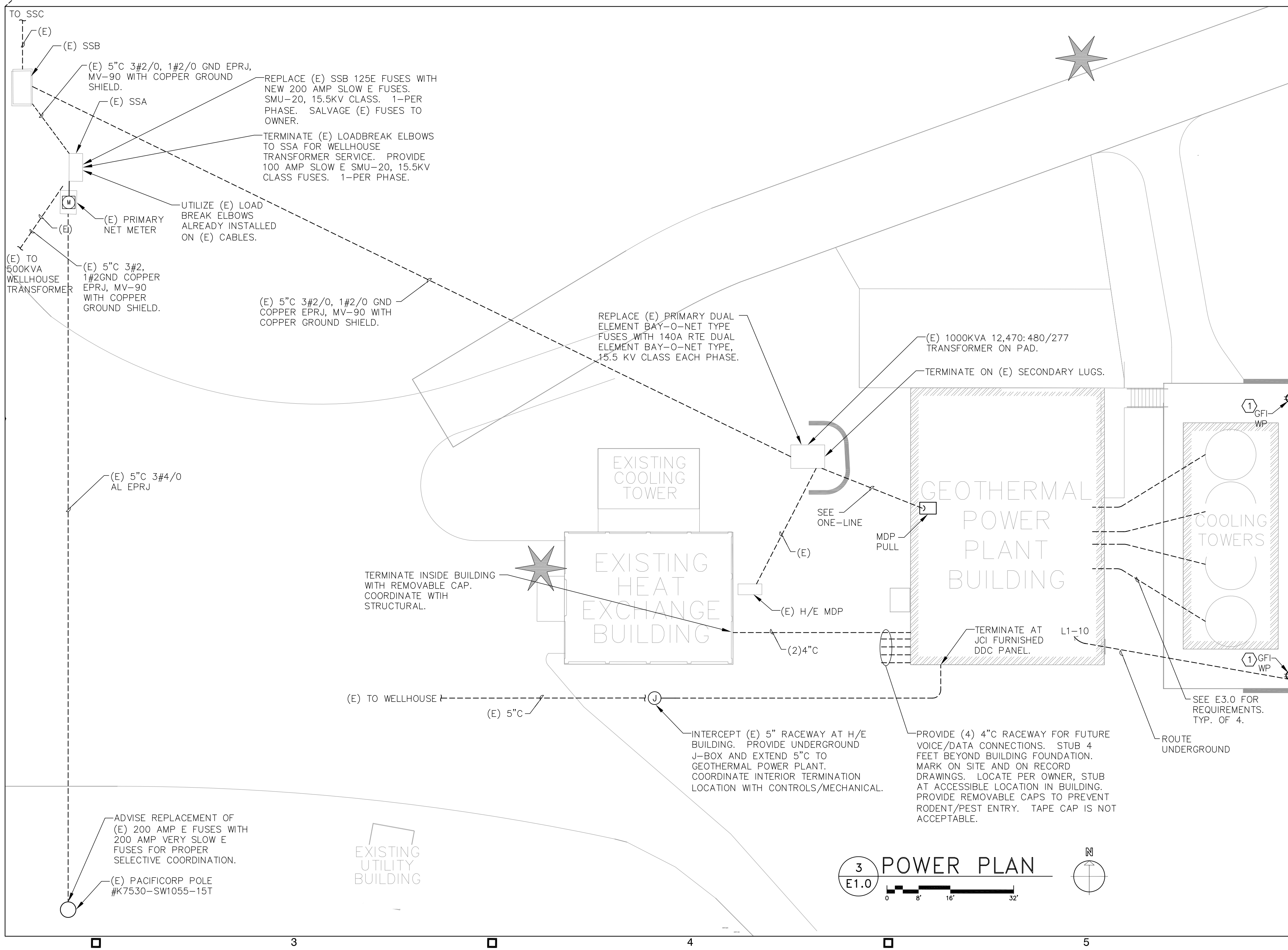
SITE PLAN
 PLOT DATE: 10/10/2012 12:47 PM

E1.0



SHEET NOTES

- 1 SURFACE MOUNT
- PROVIDE BUILDING RACEWAY PENETRATION SEALS AT EACH PENETRATION LOCATION. LINK-SEAL OR APPROVED. SEE SPECIFICATIONS.
- LOCATION OF UTILITIES SHOWN ARE APPROXIMATE. SEE SURVEY FOR LOCATION AND OTHER EQUIPMENT NOT SHOWN
- SEE E3.0, E4.0 FOR ADDITIONAL EXTERIOR LIGHTING AND RECEPTACLE REQUIREMENTS.



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 Plot Date: Wednesday, October 10, 2012 12:47:53 PM
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A

B

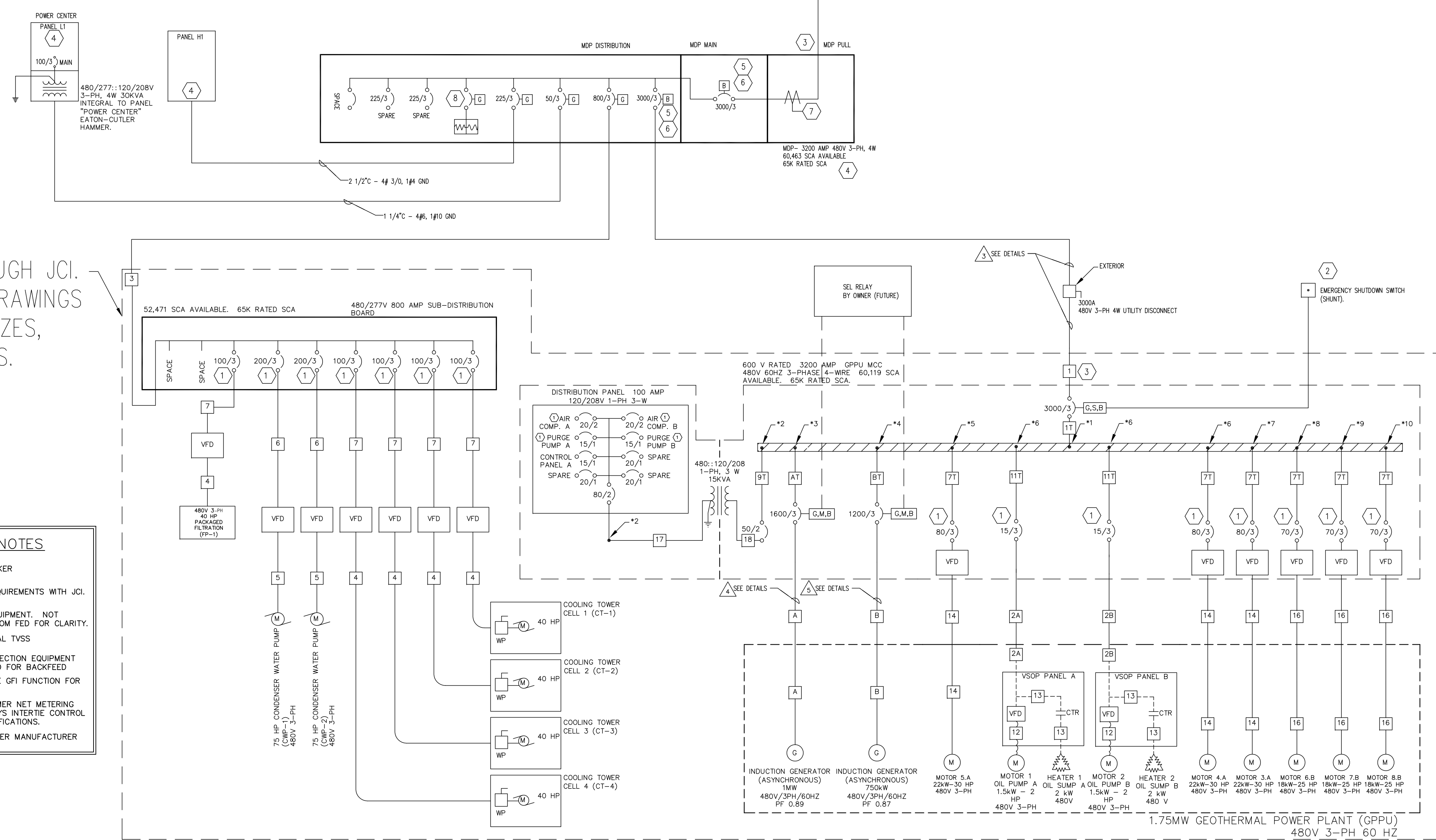
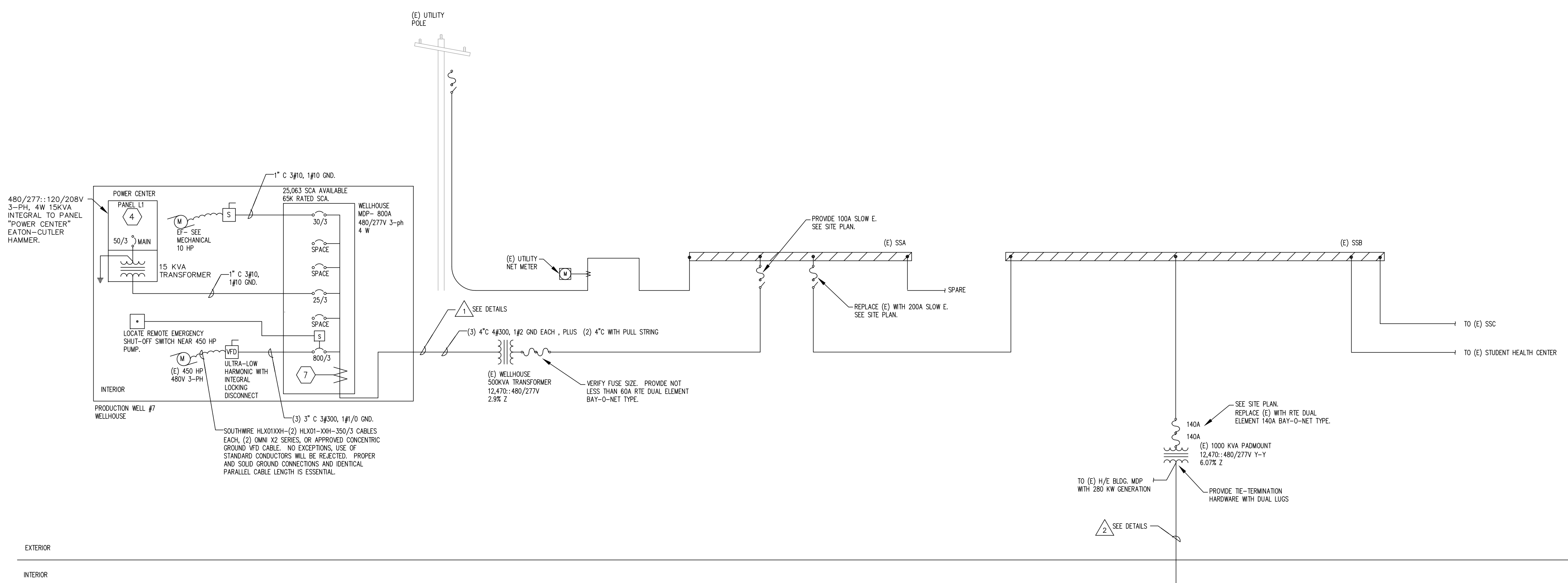
B

C

C

D

D



EQUIPMENT FURNISHED BY OWNER THROUGH JCI. INSTALLED BY CONTRACTOR. SEE JCI DRAWINGS E1.0, E2.0, AND E3.0 FOR EQUIPMENT SIZES, RATINGS, AND ADDITIONAL REQUIREMENTS.

- SHEET NOTES**
- 1 LOCKABLE BREAKER
 - 2 COORDINATE REQUIREMENTS WITH JCI.
 - 3 BOTTOM FED EQUIPMENT. NOT SHOWN AS BOTTOM FED FOR CLARITY.
 - 4 INCLUDE INTEGRAL TVSS
 - 5 CUSTOMER PROTECTION EQUIPMENT SHALL BE RATED FOR BACKFEED
 - 6 DO NOT PROVIDE GFI FUNCTION FOR THIS BREAKER.
 - 7 PROVIDE CUSTOMER NET METERING WITH JCI METASTYS INTERIE CONTROL LINK. SEE SPECIFICATIONS.
 - 8 SIZE BREAKER PER MANUFACTURER SPECIFICATION.

REFER TO PLANS FOR FEED ARRANGEMENT (TOP FEED, BOTTOM FEED, ETC).

Log Name: Office User
 Date: 10/10/2012 12:49 PM
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SHEET TITLE:

ONE-LINE

PLOT DATE: 10/10/2012 12:49 PM

1 ONE-LINE
 E2.0 NOT TO SCALE

E2.0

Job Name: Office User
 Pk Date: Wednesday, October 10, 2012 9:25:50 AM
 Pk Name: R:\Vault\Engineering\Projects\Bater\Power Plant Infrastructure_12132\Drawings\Power Plant Infrastructure - Power - GPPU - Final.dwg

- GPPU MCC LEGEND**
- *1 MAIN BREAKER
 - *2 100 A PANELBOARD & DIST. TRANSFORM.
 - *3 1600 A FEEDER BREAKER (1 MW GEN.)
 - *4 1200 A FEEDER BREAKER (750 KW GEN.)
 - *5 MCC POWER & REFRIG. PUMP 5.A
 - *6 VSOP A & B & REFRIG. PUMP 4.A
 - *7 AIR COMPRESSORS & REFRIG. PUMP 3.A
 - *8 DOOR (FUTURE) & REFRIG. PUMP 6.B
 - *9 DOOR (FUTURE) & REFRIG. PUMP 7.B
 - *10 DOOR (FUTURE) & REFRIG. PUMP 8.B

- SHEET NOTES**
- 1 PROVIDE CIRCUIT TO ELECTRICAL SUB-DISTRIBUTION BOARD, CONNECT AS SHOWN ON ONE-LINE. SEAL RACEWAY TO PREVENT WATER PENETRATION.
 - 2 BOLLARD. SEE ARCHITECT FOR CONFIGURATION.
 - 3 ROUTE ALONG SKID UNDER REFRIGERANT PIPING TO MOTOR CONNECTION. ROUTE AWAY FROM MECHANICAL LINES.
 - 4 PROVIDE FLEXIBLE RACEWAY BETWEEN GENERATOR AND UNDERGROUND RACEWAY CONNECTION. SECURELY MOUNT TO SKID. SEE DETAILS.
 - 5 SEE MECHANICAL FOR LOCATION.
 - 6 LOCATE DISCONNECTS AT ~56" AFF.
 - 7 PROVIDE IN - USE METALLIC COVER FOR PROTECTION. USE COVER SPECIFIED FOR "WP" APPLICATIONS.
 - 8 COORDINATE EXACT ELECTRICAL CONNECTION LOCATION WITH EQUIPMENT PROVIDED.
 - 9 PULL AND TERMINATE CONDUCTORS PRIOR TO MACHINE INSTALLATION.
 - 10 FURNISHED BY OWNER THROUGH JCI. MOUNTED AND INSTALLED BY CONTRACTOR. REFER TO JCI DRAWINGS E1.0, E2.0, AND E3.0 FOR SIZES AND ADDITIONAL REQUIREMENTS.
 - 11 PROVIDE 6 INCH CABLE TRAY. COORDINATE LOCATION ROUTES PER JCI CONTROL DRAWINGS/REQUIREMENTS. ADJUST AS REQUIRED. CABLE TRAY TO SERVE AS JCI FEEDER SCHEDULE 20 REQUIREMENT. COORDINATE MOUNTING HEIGHT WITH JCI AND OWNER.
 - 12 PROVIDE 4" EMT RACEWAY STUBBED TO CABLE TRAY. TOP FEED FROM EQUIPMENT OR WALL MOUNT TO EQUIPMENT AS SHOWN.

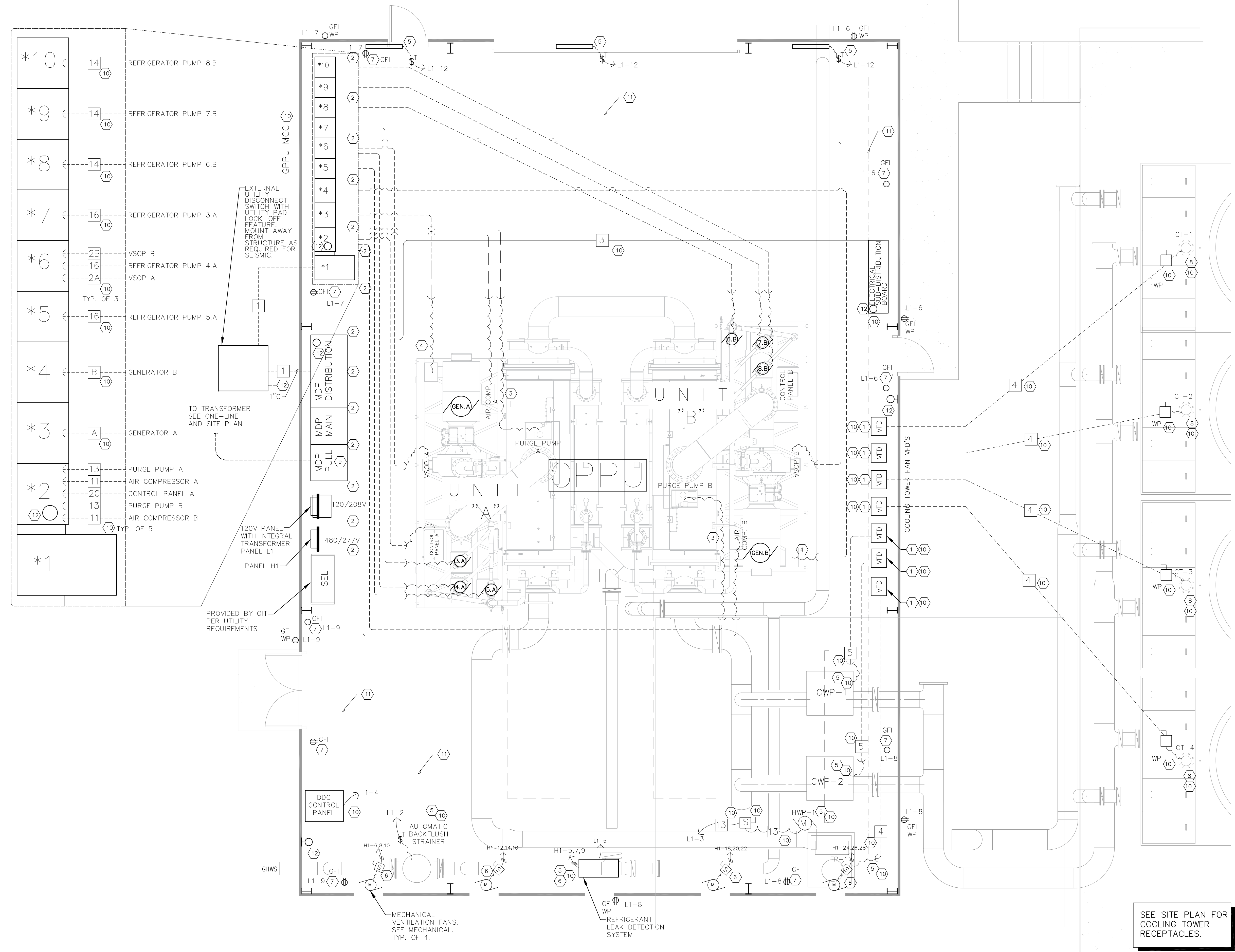
SPACE IS UNFINISHED, SURFACE MOUNT ELECTRICAL EQUIPMENT UNLESS SHOWN ROUTED UNDERGROUND.

DO NOT INSTALL GPPU PRIOR TO MDP CONDUCTOR PULL.

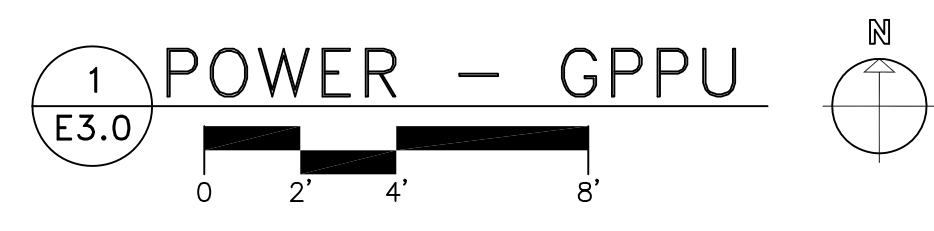
ROUTE INTERIOR POWER CONNECTIONS IN SLAB TO THE POINT WHERE CONNECTION MEETS GPPU REINFORCED SLAB. CONNECT TO GPPU AFF. PROVIDE PAINTED GRC IN EVERY LOCATION AFF INCLUDING RISER AND BENDS OUT OF SLAB. ROUTE EXTERIOR POWER CONNECTIONS UNDERGROUND.

DO NOT ROUTE CONDUCTORS THROUGH STRUCTURAL GPPU SUPPORT SLAB.

MDP AND UTILITY DISCONNECT ARE NOT PROVIDED BY OWNER OR JCI, INCLUDE IN BID.



SEE SITE PLAN FOR COOLING TOWER RECEPTACLES.



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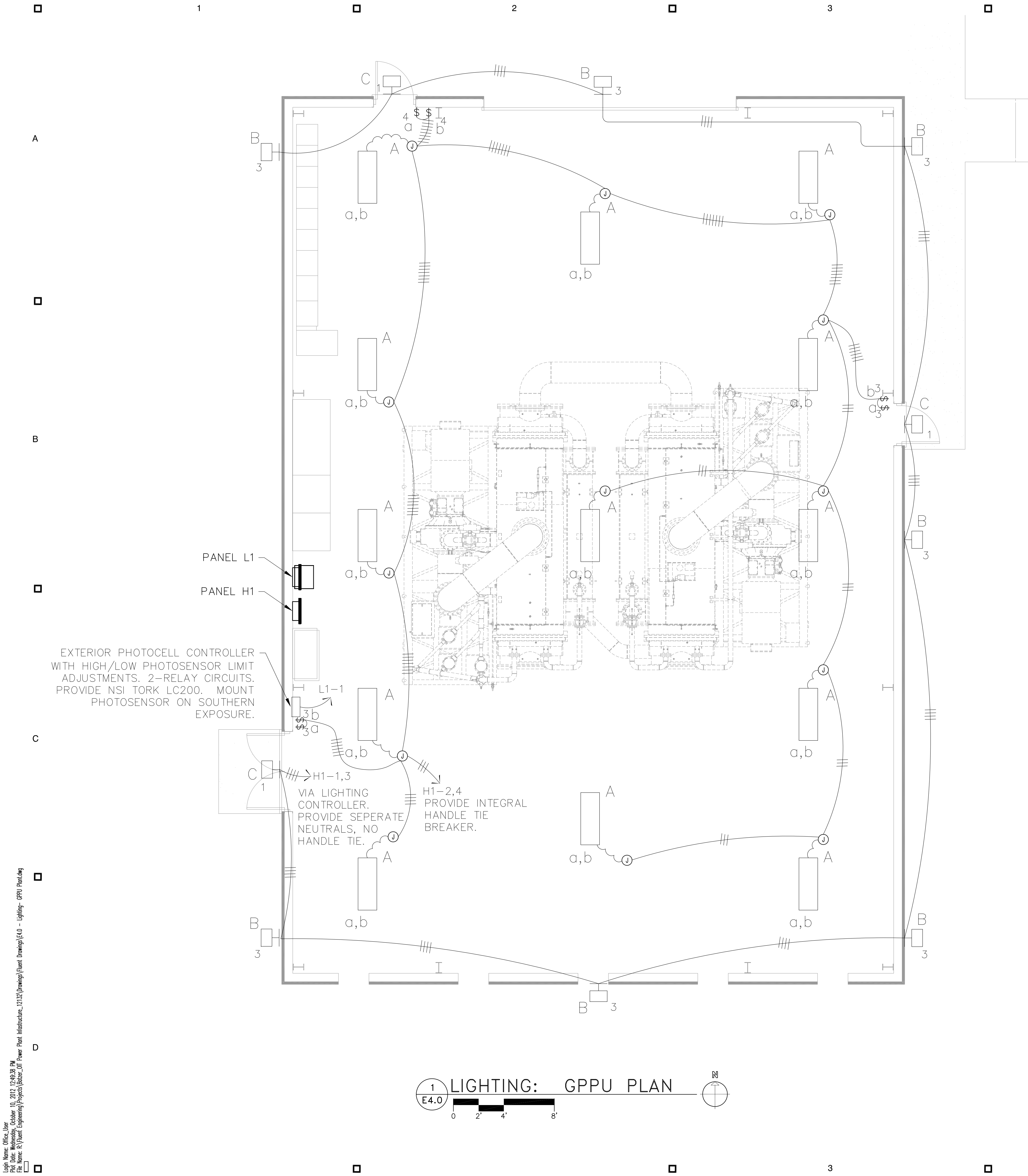
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SHEET TITLE:
POWER: GPPU
 PLOT DATE: 10/10/2012 9:25 AM

E3.0



1 LIGHTING: GPPU PLAN
E4.0

LIGHTING FIXTURE SCHEDULE- GPPU

DESIGNATION	DESCRIPTION	MANUFACTURER (OR APPROVED)	LAMPS (OR APPROVED)
A	ADJUSTABLE AIRCRAFT CABLE IN TRIANGLE CONFIGURATION HIGH OUTPUT MEDIUM/HIGH BAY SUSPENDED WITH SPECULAR ALUMINUM REFLECTORS AND WIREGUARDS. DUAL CIRCUIT 3 LAMP/3 LAMP SWITCHING. THERMALLY PROTECTED, RESETTNG, CLASS P, A+ SOUND RATED ELECTRONIC BALLAST. UL 1598 AND CSA 250.0-08 CERTIFIED FOR 131 DEGREES FAHRENHEIT (55 DEGREES CELSIUS). SUITABLE FOR DAMP LOCATIONS. 277V. PROVIDE TRIANGLE TYPE MOUNTING CABLE TO PREVENT FIXTURE "SWING" FROM AIR MOVEMENT.	HOLOPHANE HFZ 654 WD WGX I8AC120 M20. MOUNTING HEIGHT: 30' AFF	(6) F54T5HO 4 FOOT FLUORESCENT 4100K
B	EXTERIOR WALL PACK WITH 7" DEPTH, ANODIZED ALUMINUM REFLECTOR, THERMAL SHOCK RESISTANT GLASS LENS WATER SPRAY TESTED, INTEGRAL HID BALLAST, DIE CAST ALUMINUM HOUSING, WIRE GUARD, AND COATED METAL HALIDE LAMPING. UL LISTED FOR WET LOCATIONS. 277V.	HOLOPHANE W4 70DMH 27 S G G. MOUNTING HEIGHT: 32' AFG	(1) 150W COATED METAL HALIDE
C	EXTERIOR WALL PACK WITH 7" DEPTH, ANODIZED ALUMINUM REFLECTOR, THERMAL SHOCK RESISTANT GLASS LENS WATER SPRAY TESTED, INTEGRAL HID BALLAST, DIE CAST ALUMINUM HOUSING, WIRE GUARD, AND COMPACT FLUORESCENT LAMPING. UL LISTED FOR WET LOCATIONS. 277V.	HOLOPHANE W4 42CFL 27 S G G. MOUNTING HEIGHT: 10' AFG	(1) 42W CW CFL

LIGHTING NOTES:

- 1) LABELS FOR FUTURE LIGHTING CONNECTION SHALL INCLUDE PANEL BOARD DESIGNATION, CIRCUIT NUMBER, AND VOLTAGE
- 2) EVERY FLUORESCENT LAMP INCLUDING COMPACT FLUORSCENT LAMPS SHALL BE KELVIN TEMPERATURE 4100K.
- 3) FLUORESCENT LAMPS TO HAVE CRI OF 84 OR HIGHER (NOT LESS THAN 85 FOR T8).
- 4) NEW FIXTURES SHALL MEET LAMP AND BALLAST SPECIFICATIONS INDEPENDENT OF STANDARD FACTORY BALLAST / LAMP OPTIONS.
- 5) PROVIDE COATED METAL HALIDE LAMPS WHERE SPECIFIED ABOVE, NO EXCEPTIONS.

2 GPPU LIGHTING FIXTURE SCHEDULE
E4.0

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 Date: October 10, 2012 12:43:38 PM
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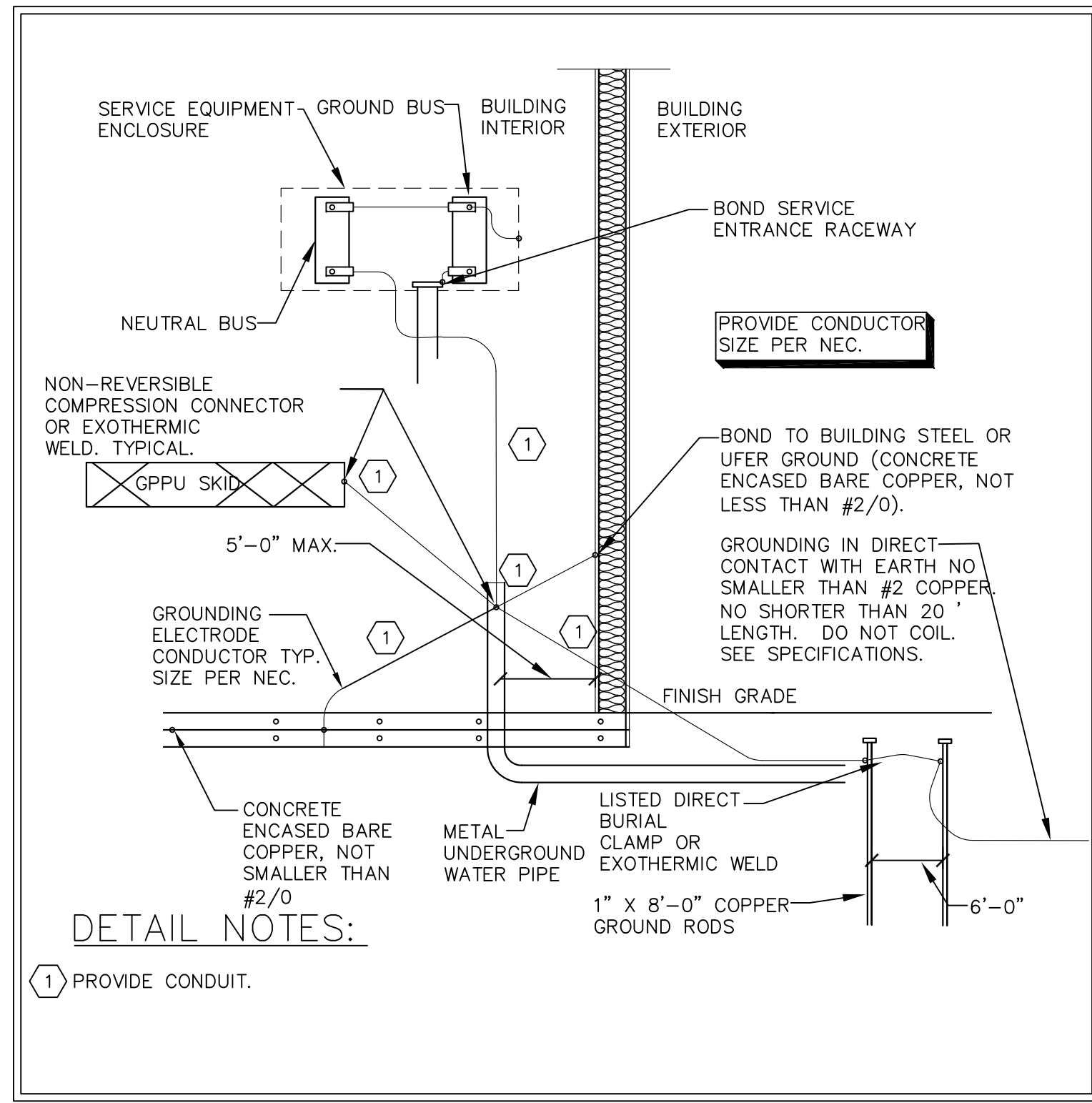
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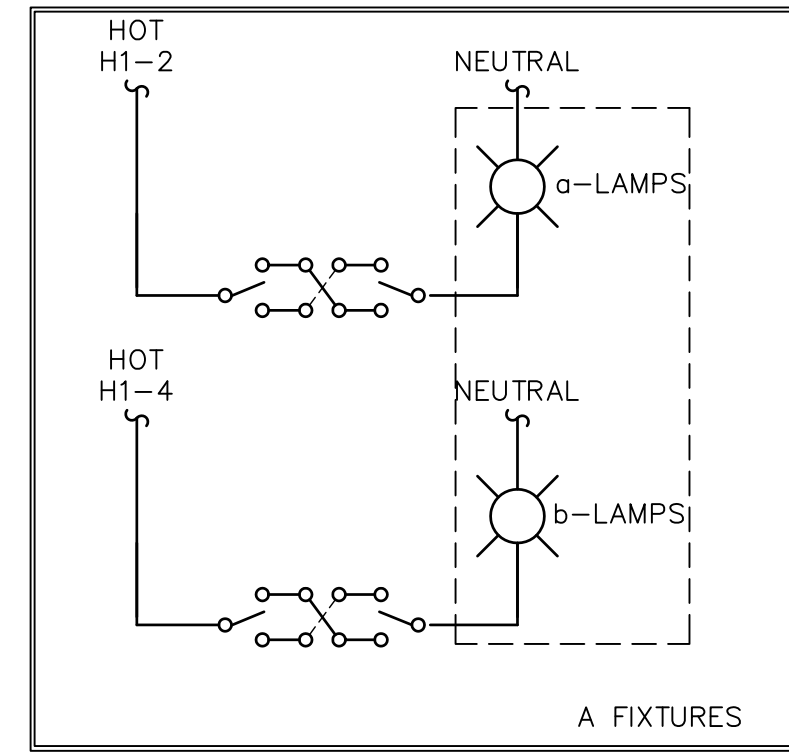
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**LIGHTING:
 GPPU**
 PLOT DATE: 10/10/2012 12:49 PM

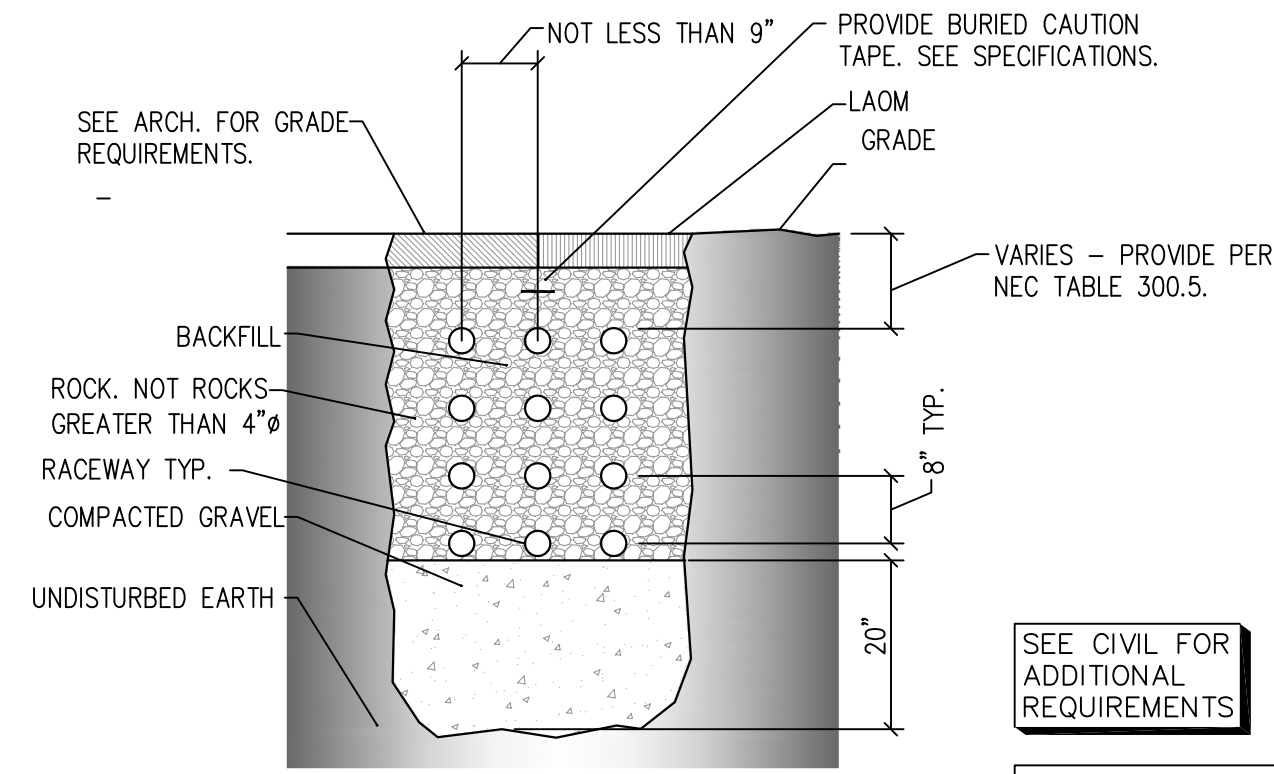
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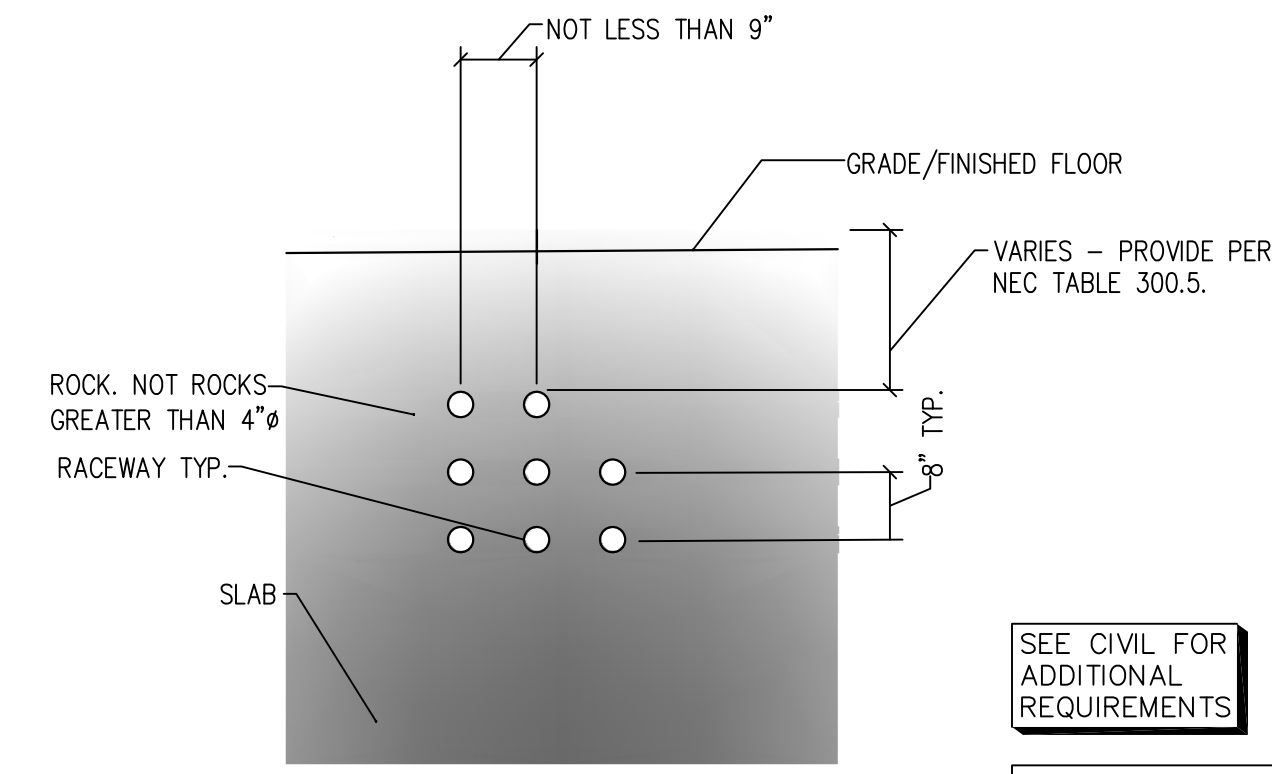
3 BUILDING SERVICE GROUND DETAIL
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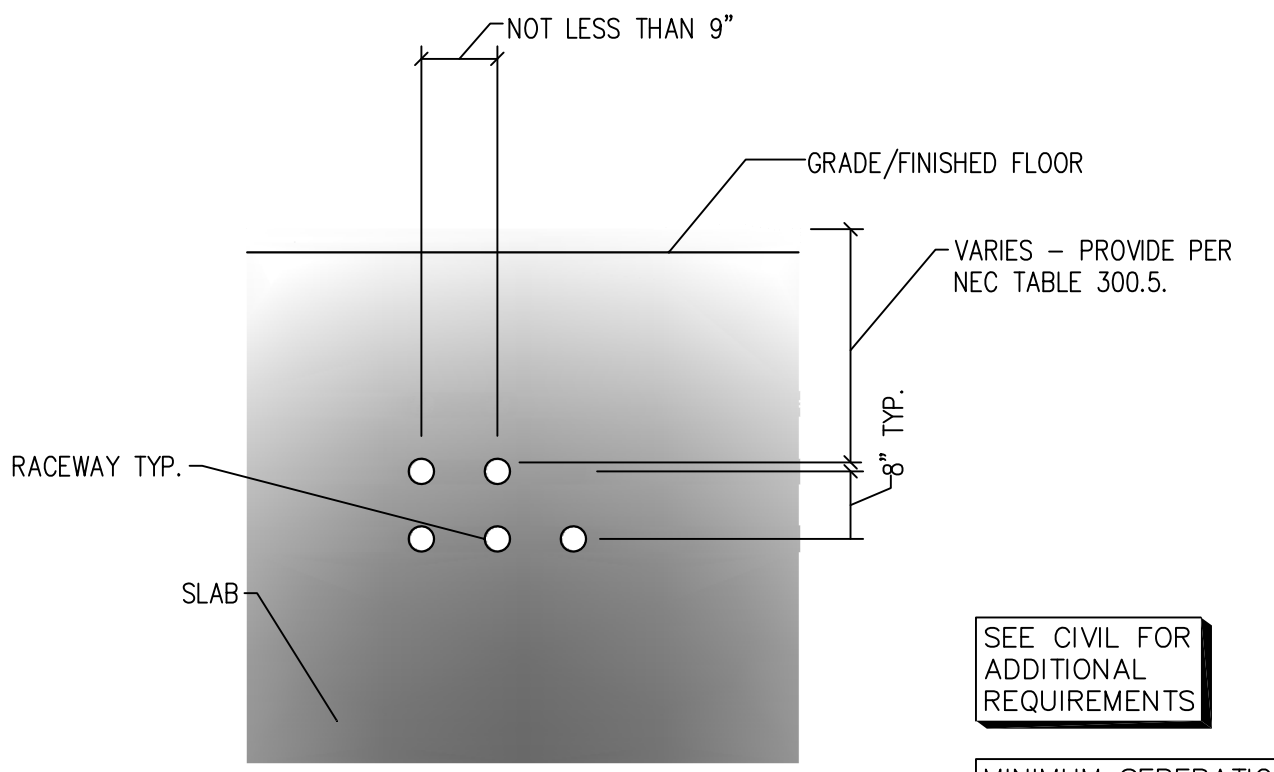
4 GPPU SWITCHING DETAIL
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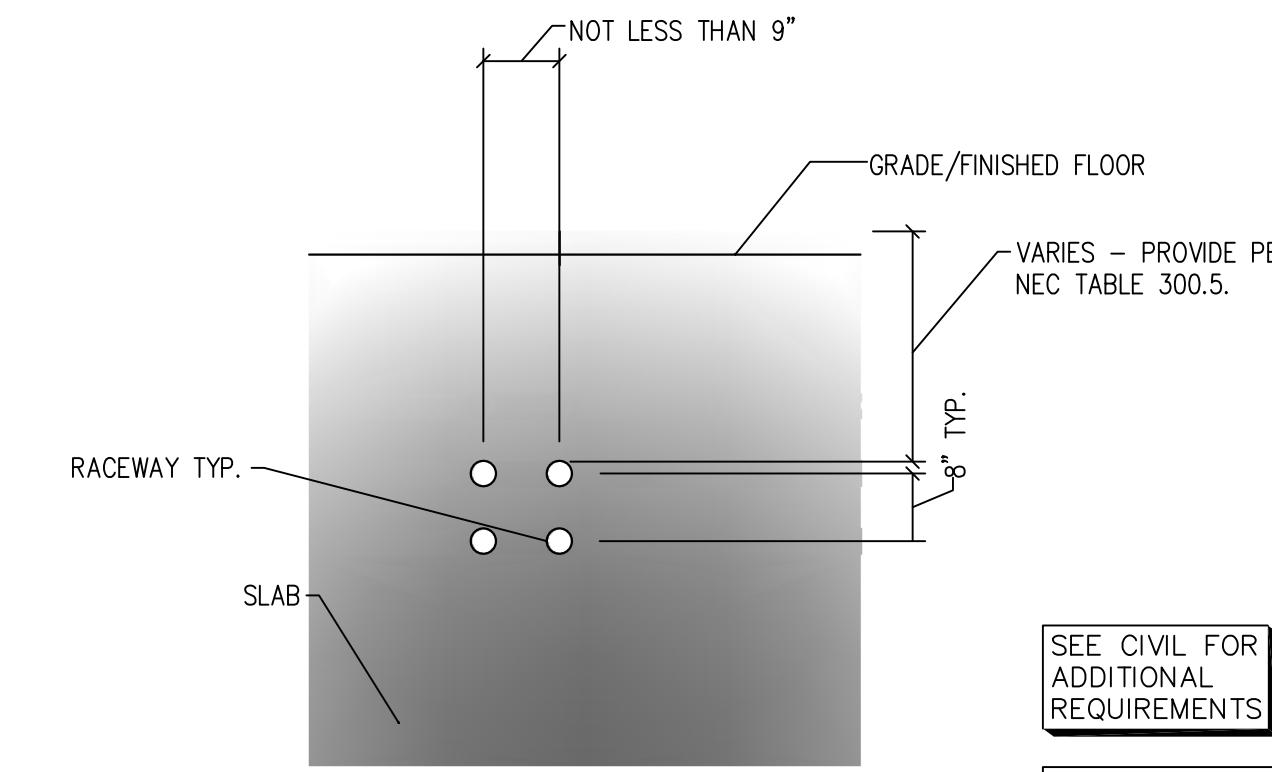
2 CONDUIT DUCT BANK DETAIL
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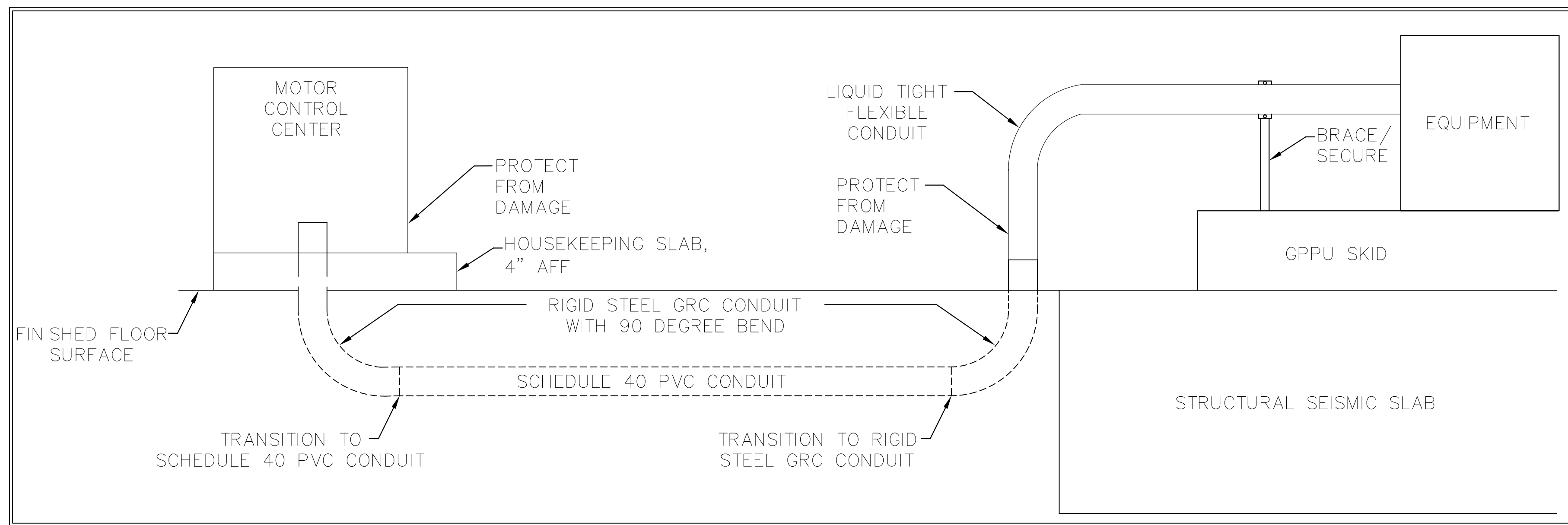
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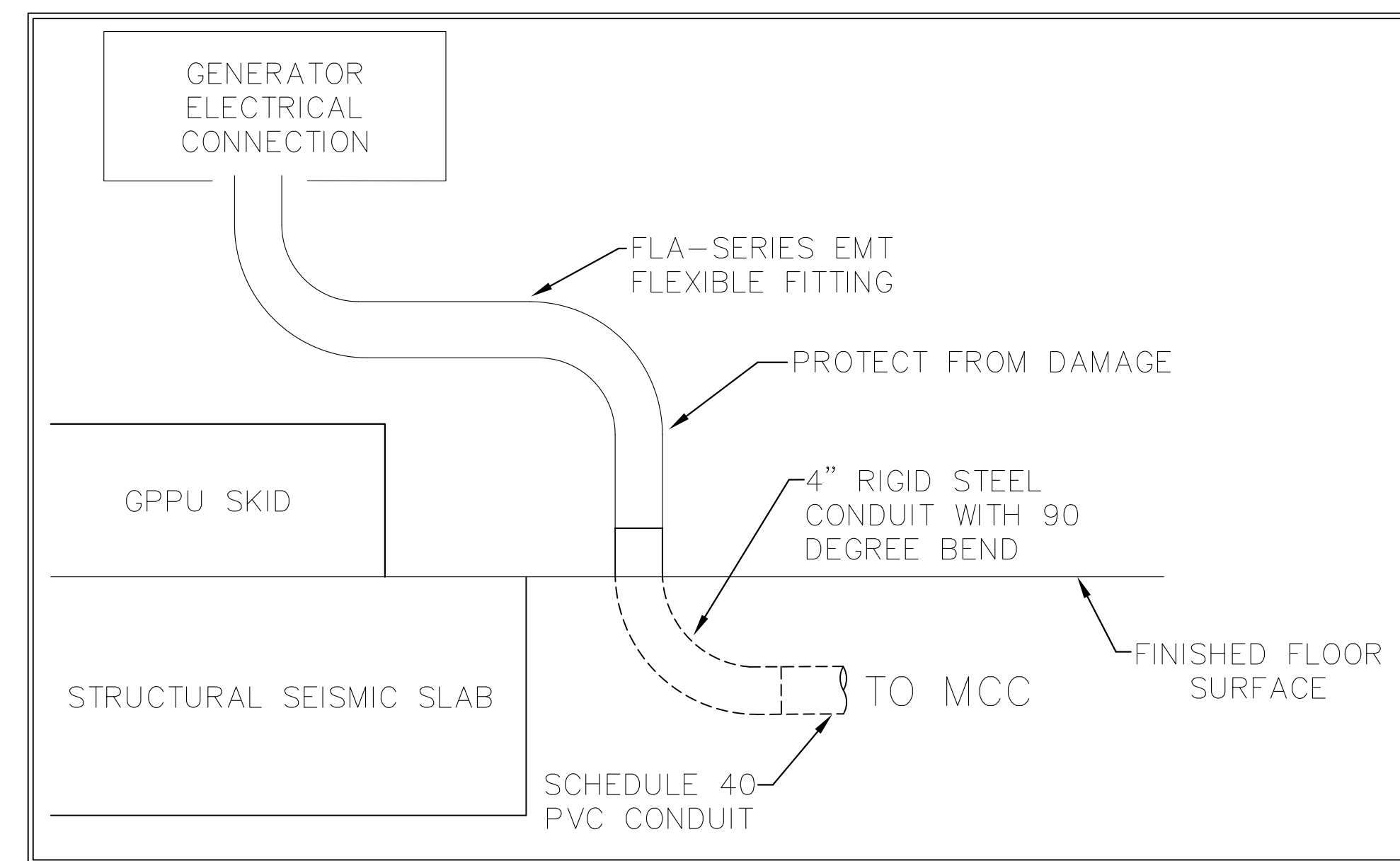
4 CONDUIT DUCT BANK DETAIL
NOT TO SCALE



5 CONDUIT DUCT BANK DETAIL
NOT TO SCALE



2 GPPU CONNECTION DETAIL
E5.0 NOT TO SCALE



1 GPPU GENERATOR CONNECTION DETAIL
E5.0 NOT TO SCALE

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PLOT DATE: 10/10/2012 12:51 PM

E5.0

Log: Name: Office: User: Date: 10, 2012 12:51:46 PM
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1 EXTERIOR LIGHTING
E5.1 NOT TO SCALE

PANEL SCHEDULE PANEL L1 SURFACE MOUNTED									
18,798 SCA AVAILABLE					120/208 VOLTS				
100 AMP BUS					3 PHASE 100/3 MAIN BREAKER				
SERVICE	LOAD BREAKER (AMP)	CIRCUIT (A/P)	BREAKER LOAD (# & Ø)	BREAKER LOAD (AMP)	SERVICE	LOAD BREAKER (AMP)	CIRCUIT (A/P)	BREAKER LOAD (# & Ø)	BREAKER LOAD (AMP)
LIGHTING CONTROLLER	3.0	20/1	1 A 2	15/1 5.8	CT BASIN HEATER PUMP	3.0	20/1	1 A 2	15/1 5.8
BACKFLOW STRAINER	5.8	15/1	3 B 4	20/1 5.0	DIC CONTROL PANEL	5.8	15/1	3 B 4	20/1 5.0
REFRIG LEAK DETECTION	3.0	20/1	5 C	6 20/1 6.0	NORTH EAST RECPTS	3.0	20/1	5 C	6 20/1 6.0
NORTH WEST RECPTS	4.5	20/1	7 A	8 20/1 6.0	SOUTH EAST RECPTS	4.5	20/1	7 A	8 20/1 6.0
SOUTH WEST RECPTS	6.0	20/1	9 B	10 20/1 3.0	COOLING TOWER RECPTS	6.0	20/1	9 B	10 20/1 3.0
SPARE	0.0	20/1	11 C	12 15/1 3.0	MECHANICAL LOUVERS	0.0	20/1	11 C	12 15/1 3.0
SPARE	0.0	20/1	13 A	14 20/1 12.0	* HEAT TAPE-SEE MECH	0.0	20/1	13 A	14 20/1 12.0
SPARE	0.0	20/1	15 B	16 (GFI SPACE)		0.0	20/1	15 B	16 (GFI SPACE)
SPARE	0.0	20/1	17 C	18 20/1 12.0	* HEAT TAPE-SEE MECH	0.0	20/1	17 C	18 20/1 12.0
SPARE	0.0	20/1	19 A	20 20/1 12.0	* HEAT TAPE-SEE MECH	0.0	20/1	19 A	20 20/1 12.0
SPARE	0.0	20/1	21 B	22 20/1 12.0	* HEAT TAPE-SEE MECH	0.0	20/1	21 B	22 20/1 12.0
SPARE	0.0	20/1	23 C	24 (GFI SPACE)		0.0	20/1	23 C	24 (GFI SPACE)
SPARE	25	A 28	25 A 28	20/1 12.0	* HEAT TAPE-SEE MECH	25	A 28	25 A 28	20/1 12.0
SPARE	27	B 28	27 B 28	(GFI SPACE)		27	B 28	27 B 28	(GFI SPACE)
SPARE	29	C 30	29 C 30	20/1 12.0	* HEAT TAPE-SEE MECH	29	C 30	29 C 30	20/1 12.0
SPARE	31	A 30	31 A 30	(GFI SPACE)		31	A 30	31 A 30	(GFI SPACE)
SPARE	33	B 34	33 B 34	20/1 12.0	* HEAT TAPE-SEE MECH	33	B 34	33 B 34	20/1 12.0
SPARE	35	C 36	35 C 36	(GFI SPACE)		35	C 36	35 C 36	(GFI SPACE)
SPARE	37	A 38	37 A 38	20/1 12.0	* HEAT TAPE-SEE MECH	37	A 38	37 A 38	20/1 12.0
SPARE	39	B 40	39 B 40	(GFI SPACE)		39	B 40	39 B 40	(GFI SPACE)
SPARE	41	C 42	41 C 42	20/1 5.0	INTEGRAL TVSS	41	C 42	41 C 42	20/1 5.0

NOTES: PROVIDE INTEGRAL TVSS
* PROVIDE GFI BREAKER

SUMMARY (AMPS):			
	A	B	C
CONNECTED DEMAND	55.3	43.8	41.0
DEMAND LOAD			55.3
CONTINUOUS LOAD			0.0
SPARE LOAD			8.3
TOTAL LOAD FUTURE			63.6
			6.4
			70.0 DESIGN LOAD

3 PANEL L1
E5.1 NOT TO SCALE

PANEL SCHEDULE PANEL H1 SURFACE MOUNTED									
23,265 SCA AVAILABLE					480/277 VOLTS				
225 AMP BUS					3 PHASE 255 AMP LUGS				
SERVICE	LOAD BREAKER (AMP)	CIRCUIT (A/P)	BREAKER LOAD (# & Ø)	BREAKER LOAD (AMP)	SERVICE	LOAD BREAKER (AMP)	CIRCUIT (A/P)	BREAKER LOAD (# & Ø)	BREAKER LOAD (AMP)
EXT. DOOR LIGHTS	0.6	20/1	1 A 2	20/2 9.1	INTERIOR LIGHTS	0.6	20/1	1 A 2	20/2 9.1
EXTERIOR LIGHTS	4.5	20/1	3 B 4	4.5	20/1	3 B 4	4.5	20/1	3 B 4
REFRIG. EMERG. EXHAUST FAN	3.4	15/3	5 C	6 15/3 3.0	EXHAUST FAN 2	3.4	15/3	5 C	6 15/3 3.0
REFRIG. EMERG. EXHAUST FAN	3.4	7 A 8	7 A 8	3.0	EXHAUST FAN 2	3.4	7 A 8	7 A 8	3.0
REFRIG. EMERG. EXHAUST FAN	3.4	9 B 10	9 B 10	3.0	EXHAUST FAN 2	3.4	9 B 10	9 B 10	3.0
SPARE	0.0	20/3	11 C 12	15/3 3.0	EXHAUST FAN 3	0.0	20/3	11 C 12	15/3 3.0
SPARE	0.0	13 A 14	13 A 14	3.0	EXHAUST FAN 3	0.0	13 A 14	13 A 14	3.0
SPARE	0.0	15 B 16	15 B 16	3.0	EXHAUST FAN 3	0.0	15 B 16	15 B 16	3.0
SPARE	0.0	20/3	17 C 18	15/3 3.0	EXHAUST FAN 4	0.0	20/3	17 C 18	15/3 3.0
SPARE	0.0	19 A 20	19 A 20	3.0	EXHAUST FAN 4	0.0	19 A 20	19 A 20	3.0
SPARE	0.0	21 B 22	21 B 22	3.0	EXHAUST FAN 4	0.0	21 B 22	21 B 22	3.0
SPARE	0.0	23 C 24	23 C 24	15/3 3.0	EXHAUST FAN 5	0.0	23 C 24	23 C 24	15/3 3.0
SPARE	25	A 28	25 A 28	3.0	EXHAUST FAN 5	25	A 28	25 A 28	3.0
SPARE	27	B 28	27 B 28	3.0	EXHAUST FAN 5	27	B 28	27 B 28	3.0
SPARE	29	C 30	29 C 30	20/3 0.0	SPARE	29	C 30	29 C 30	20/3 0.0
SPARE	31	A 32	31 A 32	0.0	SPARE	31	A 32	31 A 32	0.0
SPARE	33	B 34	33 B 34	0.0	SPARE	33	B 34	33 B 34	0.0
SPARE	35	C 36	35 C 36	20/3 0.0	SPARE	35	C 36	35 C 36	20/3 0.0
SPARE	37	A 38	37 A 38	0.0	SPARE	37	A 38	37 A 38	0.0
SPARE	39	B 40	39 B 40	0.0	SPARE	39	B 40	39 B 40	0.0
SPARE	41	C 42	41 C 42	20/1 5.0	INTEGRAL TVSS	41	C 42	41 C 42	20/1 5.0

NOTES: PROVIDE INTEGRAL TVSS

SUMMARY (AMPS):			
	A	B	C
CONNECTED DEMAND	25.1	29.0	20.4
DEMAND LOAD			29.0
CONTINUOUS LOAD			1.9
SPARE LOAD			36.3
TOTAL LOAD FUTURE			67.2
			84.0
			151.2 DESIGN LOAD

4 PANEL H1
E5.1 NOT TO SCALE

STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Project Site	+	0.2 fc	6.0 fc	0.0 fc	N / A	N / A
Property Line	+	0.0 fc	0.1 fc	0.0 fc	N / A	N / A

COMcheck Software Version 3.9.1
Interior Lighting Compliance Certificate

2010 Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: New Construction Project Title: CIT Power Plant	Owner/Agent: David Ebsen Oregon Tech 3201 Campus Dr. Klamath Falls, OR 97601	Designer/Contractor: Matthew Cash Fluent Engineering, Inc. 695 Commercial St. SE Suite 3 SALEM, OR 97301 503-447-5030
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Section 2: Interior Lighting and Power Calculation

Power Plant (Manufacturing Facility)	A	B	C	D	E
	Area	Power Area	Allowed Watts/F2	Assumed Watts/F2	Assumed Watts
	5000	121	470	470	470
		Total Allowed Watts =			470

Section 3: Interior Lighting Fixture Schedule

Fixture ID	Description / Lamp / Wattage Per Lamp / Ballast	Lamp/ Fixture	# of Fixtures	Power (C X D)
	Linear Fluorescent 1 - A, T8-0 High Bay / Other / Electronic	B	13	224
				Total Proposed Watts = 4212

Section 4: Requirements Checklist

- In the following requirements, the relevant code section reference is shown in [] - denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or exempt from compliance. Plans reference page/section identifies where in the package the requirement can be verified as being satisfied.
- Lighting Wattage:**
- 1) [905.1-1] Total proposed watts must be less than or equal to total allowed watts. Allowed Wattage: 4216 Proposed Wattage: 4212 Complex: YES
- Mandatory Requirements:**
- 2) [905.4] Exit signs, internally illuminated exit signs shall not exceed 5 watts per sign. Plans reference page/section: Exit signage not required.
 - 3) [905.2.2.3 + 1] Daylight zone control. All daylight zones are provided with individual controls that control the lights independent of general area lighting in the non-daylight zone. In all individual daylight zones larger than 300 sq. ft., automatic daylight controls are provided. Automatic daylight controls reduce the light output of the controlled luminaires at least 50 percent, and provide an automatic OFF control, while maintaining a uniform level of illumination. Continuous daylight zones adjacent to vertical fenestration may be controlled by a single controlling device provided that they do not include zones being more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under skylights shall be controlled separately from daylight zones adjacent to vertical fenestration. Exception(s):

Project Title: CIT Power Plant
Data Reference: R:\Fluent Engineering\Projects\Bater_CIT Power Plant Infrastructure_12132\Lighting\Power Plant\COMcheck\COMcheck_TSH02.sxd
Report date: 10/03/12
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COMcheck Software Version 3.9.1
Exterior Lighting Compliance Certificate

2010 Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: New Construction Project Title: CIT Power Plant Exterior Lighting Zone: 3 (Other)	Owner/Agent: David Ebsen Oregon Tech 3201 Campus Dr. Klamath Falls, OR 97601	Designer/Contractor: Matthew Cash Fluent Engineering, Inc. 695 Commercial St. SE Suite 3 SALEM, OR 97301 503-447-5030
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Section 2: Exterior Lighting Area/Surface Power Calculation

Exterior Area/Surface	Quantity	Allowed Watts	C	D	E	F	Proposed Watts
			Area	Wattage	Wattage	Wattage	
Main Entry (Main entry)	3 ft of door width	30	Yes	90	90	48	
All other doors (Other door (not main entry))	20 ft of door width	20	Yes	580	99		
Building (Illuminated area of facade wall or surface)	9830 ft ²	0.15	No	1474.5	1474.5		
		Total Allowable Watts* =		670	144		
		Total Proposed Watts* =		1990	1990		
		** Total Allowed Supplemental Watts** =		790			

*Wattage tradeoffs are only allowed between tradeable areas/surfaces.
** A support fixture allowed equal to 750 watts may be applied toward compliance of both non-tradeable and tradeable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

Fixture ID	Description / Lamp / Wattage Per Lamp / Ballast	Lamp/ Fixture	# of Fixtures	Power (C X D)
	Main Entry (Main entry) 3 ft of door width: Tradeable Wattage		1	48
	Compact Fluorescent 1 - C, Triple 4-pin 42W / Electronic		1	48
	All other doors (Other door (not main entry)) 20 ft of door width: Tradeable Wattage		2	48
	Compact Fluorescent 2 - C, Triple 4-pin 42W / Electronic		1	24
	Building (Illuminated area of facade wall or surface 9830 ft ²): Non-tradeable Wattage		1	1474.5
	LED 2 - B, Instantaneous 150W / Pulse start		1	144
		Total Allowable Watts =		144

Section 4: Requirements Checklist

- In the following requirements, the relevant code section reference is shown in [] - denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or exempt from compliance. Plans reference page/section identifies where in the package the requirement can be verified as being satisfied.
- Lighting Wattage:**
- 1) [905.6-1] Value each non-tradeable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradeable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.

Project Title: CIT Power Plant
Data Reference: R:\Fluent Engineering\Projects\Bater_CIT Power Plant Infrastructure_12132\Lighting\Power Plant\COMcheck\COMcheck_TSH02.sxd
Report date: 10/03/12
Page: 5 of 6

COMcheck Software Version 3.9.1
Exterior Lighting Compliance Certificate

2010 Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: New Construction Project Title: CIT Power Plant Exterior Lighting Zone: 3 (Other)	Owner/Agent: David Ebsen Oregon Tech 3201 Campus Dr. Klamath Falls, OR 97601	Designer/Contractor: Matthew Cash Fluent Engineering, Inc. 695 Commercial St. SE Suite 3 SALEM, OR 97301 503-447-5030
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Section 2: Exterior Lighting Area/Surface Power Calculation

Exterior Area/Surface	Quantity	Allowed Watts	C	D	E	F	Proposed Watts
			Area	Wattage	Wattage	Wattage	
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All other doors (Other door (not main entry))	20 ft of door width	20	Yes	580	99		
Building (Illuminated area of facade wall or surface)	9830 ft ²	0.15	No	1474.5	1474.5		
		Total Allowable Watts* =		670	144		
		Total Proposed Watts* =		1990	1990		
		** Total Allowed Supplemental Watts** =		790			

*Wattage tradeoffs are only allowed between tradeable areas/surfaces.
** A support fixture allowed equal to 750 watts may be applied toward compliance of both non-tradeable and tradeable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

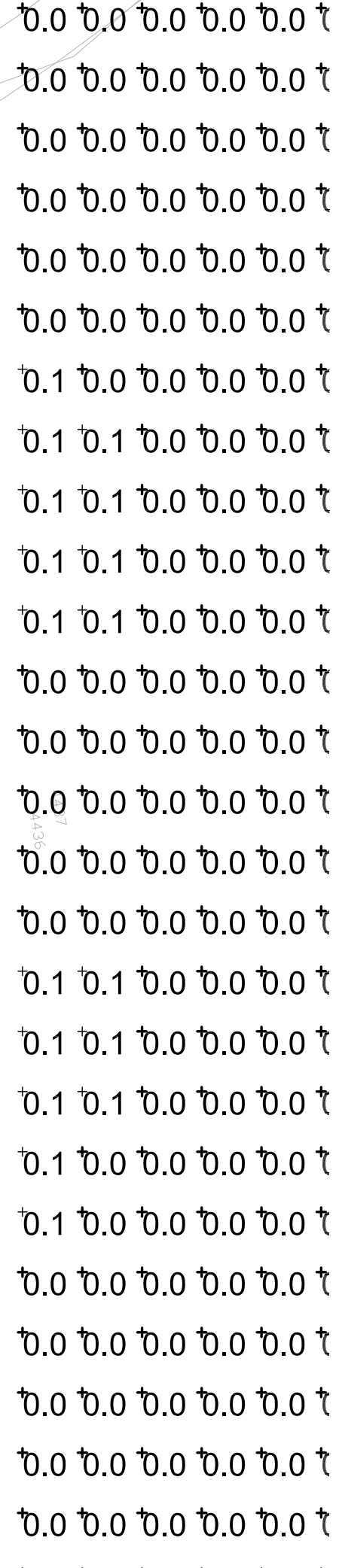
Fixture ID	Description / Lamp / Wattage Per Lamp / Ballast	Lamp/ Fixture	# of Fixtures	Power (C X D)
	Main Entry (Main entry) 3 ft of door width: Tradeable Wattage		1	48
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	All other doors (Other door (not main entry)) 20 ft of door width: Tradeable Wattage		2	48
	Compact Fluorescent 2 - C, Triple 4-pin 42W / Electronic		1	24
	Building (Illuminated area of facade wall or surface 9830 ft ²): Non-tradeable Wattage		1	1474.5
	LED 2 - B, Instantaneous 150W / Pulse start		1	144
		Total Allowable Watts =		144

Section 4: Requirements Checklist

- In the following requirements, the relevant code section reference is shown in [] - denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or exempt from compliance. Plans reference page/section identifies where in the package the requirement can be verified as being satisfied.
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Project Title: CIT Power Plant
Data Reference: R:\Fluent Engineering\Projects\Bater_CIT Power Plant Infrastructure_12132\Lighting\Power Plant\COMcheck\COMcheck_TSH02.sxd
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2 COMCHECK REPORTS
E5.1 NOT TO SCALE



STAMP

PRELIMINARY
NOT FOR
CONSTRUCTION

BATZER
CONSTRUCTION
P.O. Box 4460 - 190 North Ross Lane
Medford, Oregon 97501
Office: 541.773.7553 Fax: 541.773.6523
CGB No. 132902
Web: WWW.BATZERINC.COM

PROJECT: A NEW GEOTHERMAL POWER PLANT
Project Location:
3201 Campus Drive, Klamath Falls, Oregon 97601
Map & Trench Reference: 38 09 20 - 4900
CLIENT: TECH
3201 Campus Drive, Klamath Falls, Oregon 97601
Contact: Mr. David Ebsen (541) 885-1800

MARK	DATE	DESCRIPTION

ISSUE: October 9, 2012
PROJECT NO: 12132
DRAWN BY: DS/BD/JH
CHECKED BY: MJC

APPROVED FOR THE OWNER DATE

SHEET TITLE:

DETAILS

PLOT DATE: 10/10/2012 12:54 PM

E5.1