Appendix D2
Drawings

- 00 General
- 01 Freshwater Arizona
- 02 Freshwater California
- 03 TCS Recirculation Loop
- 04 NTH IRZ
- 05 Inner Recirculation Loop
- 06 MW20 Bench
- 07 Pipeline
- 08 Transwestern Bench
- 09 Compressor Station Ponds
- 10 TCS Facilities
- 11 Influent Tanks
- 12 Remedy-produced Water Conditioning System
- 13 Contingent Freshwater Pre-injection Treatment System
- 14 Conditioned Water Tanks
- 15 Moabi Regional Park Facilities
- 16 Monitoring Wells

Topock Groundwater Remediation Project

PG&E Topock Compressor Station

Needles, California

Pre-Final (90%) Plans

September 2014



Source: Aerial from Google Earth Pro © 2012. Modified by CH2M HILL. ES071612182658BAO_Topock_SiteLocMap_COP_v2.indd 01-04-13 dash

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Emeryville, CA 94608
(510) 652-1164

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/08/14	PRE-FINAL (90%) DESIGN SUBMITTAL					

REVISIONS

APPROVED BY		
	SO	
	SUPV	
	DSGN	PC
	DWN	PC
	CHKD	PT
	OK	PT
	DATE	04/05/13
	SCALES	NTS

TOPOCK GROUNDWATER REMEDIATION PROJECT

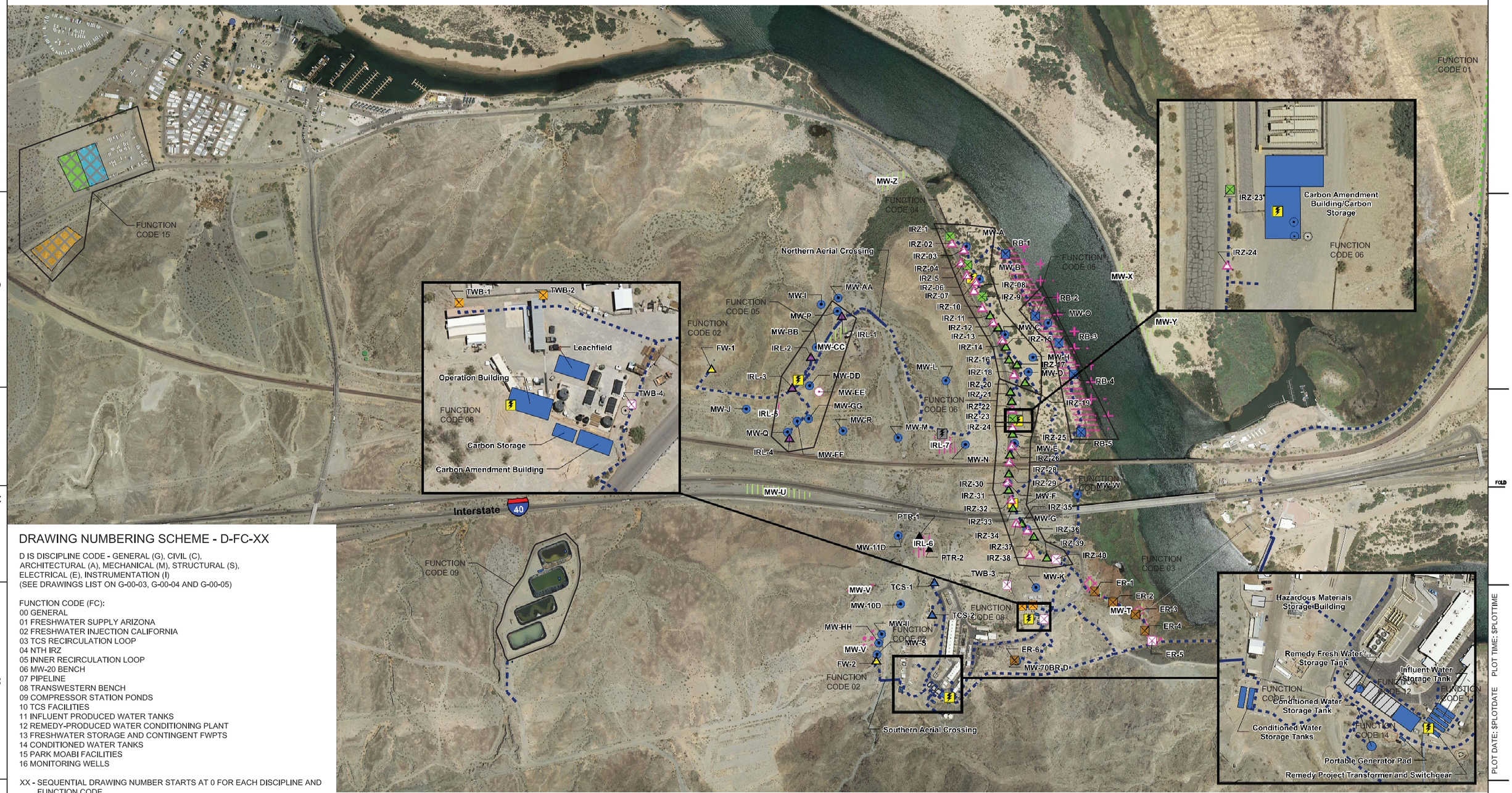
TITLE SHEET, VICINITY MAP & LOCATION MAP

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
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DRAWING NUMBERING SCHEME - D-FC-XX

D IS DISCIPLINE CODE - GENERAL (G), CIVIL (C), ARCHITECTURAL (A), MECHANICAL (M), STRUCTURAL (S), ELECTRICAL (E), INSTRUMENTATION (I)
(SEE DRAWINGS LIST ON G-00-03, G-00-04 AND G-00-05)

FUNCTION CODE (FC):
00 GENERAL
01 FRESHWATER SUPPLY ARIZONA
02 FRESHWATER INJECTION CALIFORNIA
03 TCS RECIRCULATION LOOP
04 NTH IRZ
05 INNER RECIRCULATION LOOP
06 MW-20 BENCH
07 PIPELINE
08 TRANSWESTERN BENCH
09 COMPRESSOR STATION PONDS
10 TCS FACILITIES
11 INFLUENT PRODUCED WATER TANKS
12 REMEDY-PRODUCED WATER CONDITIONING PLANT
13 FRESHWATER STORAGE AND CONTINGENT FWPTS
14 CONDITIONED WATER TANKS
15 PARK MOABI FACILITIES
16 MONITORING WELLS

XX - SEQUENTIAL DRAWING NUMBER STARTS AT 0 FOR EACH DISCIPLINE AND FUNCTION CODE.

FOR PIPELINE DRAWINGS (FUNCTION CODE 07) SEE THE PIPELINE DRAWINGS KEY MAP C-07-01 AND PIPELINE SEGMENT MAP C-07-02

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
2	9/8/14	PRE-FINAL (90%) DESIGN	9/8/14	JM	JP	JP	CH
1	4/5/13	INTERMEDIATE (60%) DESIGN	4/5/13	JM	JP	JP	CH
0	11/11/11	PRELIMINARY (30%) DESIGN	11/11/11	JM	JP	JP	CH

REVISIONS

APPROVED BY		
	SO	
	SUPV	
	DSGN	PC
	DWN	PC
	CHKD	PT
	OK	CH
	DATE	9/08/14
	SCALES	N-A

TOPOCK GROUNDWATER REMEDIATION PROJECT

DRAWINGS KEY MAP

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
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DRAWING INDEX

00 - GENERAL SHEETS

DRAWING NUMBER	DRAWING TITLE
G-00-01	TITLE SHEET, VICINITY MAP & LOCATION MAP
G-00-02	DRAWINGS KEY MAP
G-00-03	DRAWING INDEX 1
G-00-04	DRAWING INDEX 2
G-00-05	DRAWING INDEX 3
G-00-06	ABBREVIATIONS
G-00-07	GENERAL LEGENDS AND SYMBOLS
G-00-08	PROCESS SCHEMATIC FOR FRESH WATER INJECTION AND REMEDY-PRODUCED WATER
C-00-01	GENERAL CIVIL NOTES
C-00-02	WELL LOCATION MAP
C-00-03	WELL SCHEDULE
C-00-04	OVERALL CIVIL SITE PLAN
C-00-05	CIVIL DETAILS
C-00-06	CHAIN LINK FENCE AND GATE
C-00-07	CHAIN LINK FENCE AND GATE DETAILS
A-00-00	ARCHITECTURAL LEGENDS AND ABBREVIATIONS
S-00-01	GENERAL STRUCTURAL NOTES
S-00-02	GENERAL STRUCTURAL DETAILS
S-00-03	GENERAL STRUCTURAL DETAILS
S-00-04	GENERAL STRUCTURAL DETAILS
S-00-05	WELL VAULT SCHEDULE
S-00-06	WELL VAULT TOP SLAB DETAILS
M-00-01	MECHANICAL STANDARD DETAILS
M-00-02	MECHANICAL STANDARD DETAILS
M-00-03	MECHANICAL STANDARD DETAILS
M-00-04	MISCELLANEOUS STANDARD DETAILS
M-00-05	WELL CONSTRUCTION SCHEDULE
F-00-01	FIRE PROTECTION GENERAL NOTES CARBON AMENDMENT BUILDINGS
E-00-01	ELECTRICAL SYMBOLS AND ABBREVIATIONS
E-00-02	GROUNDWATER REMEDY OVERALL ELECTRICAL SITE PLAN
E-00-03	TCS ELECTRICAL AREA PLAN
E-00-04	TRANSWESTERN BENCH AREA PLAN
E-00-05	MW-20 BENCH AREA PLAN
E-00-06	NORTH RIVERBANK AREA PLAN
E-00-07	NORTHERN BAT CAVE WASH AREA PLAN
E-00-08	UPLANDS AREA PLAN
E-00-09	TYPICAL NODE SITE PLAN
E-00-10	GROUNDWATER REMEDY ONE-LINE DIAGRAM
E-00-11	ELECTRICAL LOAD SCHEDULES
E-00-12	CONDUIT & CABLE SCHEDULES
E-00-13	CONDUIT & CABLE SCHEDULES
E-00-14	CONDUIT & CABLE SCHEDULES
E-00-15	TRANSWESTERN BENCH SWITCHBOARD ONE-LINE DIAGRAM (NODE 1)
E-00-16	ONE-LINE DIAGRAM NODE 1
E-00-17	ONE-LINE DIAGRAM NODE 2
E-00-18	ONE-LINE DIAGRAM NODE 3
E-00-19	ONE-LINE DIAGRAM NODE 3
E-00-20	ONE-LINE DIAGRAM NODE 4
E-00-21	TRANSWESTERN BENCH SWITCHBOARD ONE-LINE DIAGRAM (NODE 5)
E-00-22	REMEDY SCADA SYSTEM BLOCK DIAGRAM
E-00-23	TRANSWESTERN BENCH COMMUNICATION PANEL 1 ELEVATION & LAYOUT
E-00-24	TRANSWESTERN BENCH COMMUNICATION PANEL 1 SCHEMATIC 1
E-00-25	TRANSWESTERN BENCH COMMUNICATION PANEL 1 SCHEMATIC 2
E-00-26	REMOTE WELL COMMUNICATION PANEL 2 ELEVATION & LAYOUT
E-00-27	REMOTE WELL COMMUNICATION PANEL 2 SCHEMATIC
E-00-28	REMOTE WELL COMMUNICATION PANEL 3 ELEVATION & LAYOUT
E-00-29	REMOTE WELL COMMUNICATION PANEL 3 SCHEMATIC
E-00-30	REMOTE WELL COMMUNICATION PANEL 4 ELEVATION & LAYOUT
E-00-31	REMOTE WELL COMMUNICATION PANEL 4 SCHEMATIC
E-00-32	REMOTE WELL COMMUNICATION PANEL 5 ELEVATION & LAYOUT
E-00-33	REMOTE WELL COMMUNICATION PANEL 5 SCHEMATIC
E-00-34	ENERGY USE CALCULATIONS
E-00-35	LOAD CALCULATIONS
E-00-36	ELECTRICAL PANEL FABRICATION NOTES
E-00-37	MOTOR ELECTRICAL PANEL EP1
E-00-38	MOTOR ELECTRICAL PANEL EP2
E-00-39	MOTOR ELECTRICAL PANEL EP3
E-00-40	VAULT ELECTRICAL PANEL FABRICATION NOTES
E-00-41	VAULT ELECTRICAL PANEL W1
E-00-42	VAULT ELECTRICAL PANEL W2
E-00-43	VAULT ELECTRICAL PANEL W2A
E-00-44	VAULT ELECTRICAL PANEL W2B
E-00-45	VAULT ELECTRICAL PANEL W10
E-00-46	VAULT ELECTRICAL PANEL W20
E-00-47	VAULT ELECTRICAL PANEL W30
E-00-48 TO -50	RESERVED
E-00-51	ELECTRICAL DETAILS 1
E-00-52	ELECTRICAL DETAILS 2
E-00-53	ELECTRICAL DETAILS 3
E-00-54	ELECTRICAL DETAILS 4
E-00-55	ELECTRICAL DETAILS 5
E-00-56	ELECTRICAL DETAILS 6
E-00-57	ELECTRICAL DETAILS 7
E-00-58	ELECTRICAL DETAILS 8

00 - GENERAL SHEETS

DRAWING NUMBER	DRAWING TITLE
I-00-01	P&ID INSTRUMENTATION SYMBOLS AND ABBREVIATIONS 1
I-00-02	P&ID INSTRUMENTATION SYMBOLS AND ABBREVIATIONS 2
I-00-03	REMEDY WELL ID SCHEDULE

01 - FRESHWATER SUPPLY ARIZONA

DRAWING NUMBER	DRAWING TITLE
C-01-01	HNWR FRESH WATER SUPPLY WELL SITE PLAN
C-01-02	FRESH WATER SUPPLY WELL SITE B - SITE PLAN
S-01-01	HNWR-1A FRESHWATER SUPPLY WELL FOUNDATION PLAN AND SECTION
S-01-02	HNWR-1A FRESHWATER SUPPLY WELL ELECTRICAL PAD FLOOR & ROOF PLAN AND SECTIONS
S-01-03	HNWR-1A FRESHWATER SUPPLY WELL ELECTRICAL PAD SECTIONS AND DETAILS
S-01-04	FRESHWATER WELL SITE B FOUNDATION PLAN AND SECTION
S-01-05	FRESHWATER WELL SITE B ELECTRICAL PAD FLOOR & ROOF PLAN AND SECTION
S-01-06	FRESHWATER WELL SITE B ELECTRICAL PAD SECTIONS AND DETAILS
S-01-07	FRESHWATER WELL SAND COLLECTION SYSTEM PLAN, SECTIONS AND DETAILS
S-01-08	FRESHWATER WELL SAND COLLECTION SYSTEM SECTIONS AND DETAILS
M-01-01	HNWR-1A WELL HEAD PIPING PLAN AND SECTIONS
M-01-02	SITE B WELL HEAD PIPING PLAN AND SECTIONS
E-01-01	FRESHWATER WELL (HNWR-1A) ELECTRICAL SITE PLAN
E-01-02	FRESHWATER WELL (HNWR-1A) PLC CONTROL PANEL ELEVATION & BACKPAN LAYOUT
E-01-03	FRESHWATER WELL (HNWR-1A) CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
E-01-04	FRESHWATER WELL (HNWR-1A) PUMP ELEMENTARY DIAGRAM
E-01-05	FRESHWATER WELL (SITE B) ELECTRICAL SITE PLAN
E-01-06	FRESHWATER WELL (SITE B) PLC CONTROL PANEL ELEVATION & BACKPAN LAYOUT
E-01-07	FRESHWATER WELL (SITE B) CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
E-01-08	FRESHWATER WELL (SITE B) PUMP ELEMENTARY DIAGRAM
I-01-01	P&ID FRESHWATER SUPPLY WELLS

02 - FRESHWATER INJECTION CALIFORNIA

DRAWING NUMBER	DRAWING TITLE
C-02-01	FRESHWATER INJECTION WELL FW-1 - SITE PLAN
C-02-02	FRESHWATER INJECTION WELL FW-2 - SITE PLAN
S-02-01	INJECTION WELL METER & VALVE VAULT TOP & BOTTOM PLANS
S-02-02	INJECTION WELL METER & VALVE VAULT SECTIONS
S-02-03	REMEDY FRESHWATER STORAGE TANK MECHANICAL PLAN AND DETAILS
S-02-04	REMEDY FRESH WATER STORAGE TANK SECTIONS AND DETAILS
M-02-01	FRESHWATER INJECTION WELL AND METER VAULT PLAN AND SECTIONS
M-02-02	FRESHWATER INJECTION WELL CONSTRUCTION DETAILS
E-02-01	TYPICAL INJECTION WELL WELL AND METER VAULTS ELECTRICAL PLAN (TYPICAL)
E-02-02	FRESHWATER INJECTION WELL FW-1 PLC CONTROL PANEL ELEVATION & BACKPAN LAYOUT
E-02-03	FRESHWATER INJECTION WELL FW-1 CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
E-02-04	FRESHWATER INJECTION WELL FW-1 PUMP ELEMENTARY DIAGRAM
E-02-05	FRESHWATER INJECTION WELL FW-2 PLC CONTROL PANEL ELEVATION & BACKPAN LAYOUT
E-02-06	FRESHWATER INJECTION WELL FW-2 CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
E-02-07	FRESHWATER INJECTION WELL FW-2 SSS PUMP ELEMENTARY DIAGRAM
E-02-08	FRESHWATER INJECTION WELL FW-2 FVNR PUMP ELEMENTARY DIAGRAM
E-02-09	FRESH WATER INJECTION WELL FW-1 SITE PLAN
E-02-10	FRESH WATER INJECTION WELL FW-2 SITE PLAN
I-02-01	P&ID FRESH WATER TANK
I-02-02	P&ID INJECTION WELL

03 - TCS RECIRCULATION LOOP

DRAWING NUMBER	DRAWING TITLE
G-03-01	TCS LOOP PROCESS FLOW DIAGRAM
S-03-01	TCS LOOP EXTRACTION WELL VAULTS - TYPE 2 - PLAN
S-03-02	TCS LOOP EXTRACTION WELL VAULTS - FOUNDATION PLAN
S-03-03	TCS LOOP EXTRACTION WELL VAULTS - SECTIONS
S-03-04	TCS LOOP INJECTION WELL VAULTS - TYPE 1 - PLAN
S-03-05	TCS LOOP INJECTION WELL VAULTS - TYPE 2 - PLAN
S-03-06	TCS LOOP INJECTION WELL VAULTS - FOUNDATION PLAN
S-03-07	TCS LOOP INJECTION WELL VAULTS - SECTIONS SHEET 1 OF 2
S-03-08	TCS LOOP INJECTION WELL VAULTS - SECTIONS
M-03-01	TCS LOOP EXTRACTION WELL CONSTRUCTION DETAILS
M-03-02	TCS LOOP INJECTION WELL CONSTRUCTION DETAILS
M-03-03	TCS LOOP EXTRACTION WELL VAULTS MECHANICAL DETAILS
M-03-04	TCS LOOP INJECTION WELL VAULTS MECHANICAL DETAILS
M-03-05	TCS LOOP INJECTION VAULTS MECHANICAL DETAILS
E-03-01	TCS LOOP EAST RAVINE EXTRACTION WELL ELECTRICAL PLAN
E-03-02	TCS LOOP TRANSWESTERN BENCH EXTRACTION WELL ELECTRICAL PLAN
E-03-03	TCS LOOP INJECTION WELL ELECTRICAL PLAN
I-03-01	TCS LOOP EAST RAVINE EXTRACTION WELLS P&ID
I-03-02	TCS LOOP TRANSWESTERN BENCH EXTRACTION WELLS P&ID
I-03-03	TCS LOOP INJECTION WELLS P&ID

04 - NTH IRZ

DRAWING NUMBER	DRAWING TITLE
G-04-01	IRZ EXTRACTION WELL PROCESS FLOW DIAGRAM
G-04-02	IRZ INJECTION WELL PROCESS FLOW DIAGRAM
C-04-01	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 10+00 TO STA 13+50
C-04-02	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 13+50 TO STA 19+00
C-04-03	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 19+00 TO STA 24+50
C-04-04	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 24+50 TO STA 30+00
C-04-05	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 30+00 TO STA 35+50
C-04-06	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 35+50 TO STA 39+50
C-04-07	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 10+00 TO STA 12+02
C-04-08	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 10+00 TO STA 14+50
C-04-09	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 14+50 TO STA 17+50
C-04-10	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "C" STA 10+00 TO STA 14+58
C-04-11	ACCESS ROAD - TYPICAL ROAD SECTION
S-04-01	IRZ EXTRACTION WELL VAULTS - TYPE 1 - PLAN
S-04-02	IRZ EXTRACTION WELL VAULTS - TYPE 2 - PLAN
S-04-03	IRZ EXTRACTION WELL VAULTS - FOUNDATION PLAN
S-04-04	IRZ EXTRACTION WELL VAULTS - SECTIONS SHEET 1 OF 2
S-04-05	IRZ EXTRACTION WELL VAULTS - SECTIONS SHEET 2 OF 2
S-04-06	IRZ INJECTION WELL VAULTS - TYPE 1 - PLAN
S-04-07	IRZ INJECTION WELL VAULTS - TYPE 2 - PLAN
S-04-08	IRZ INJECTION WELL VAULTS - FOUNDATION PLAN
S-04-09	IRZ INJECTION WELL VAULTS - SECTIONS SHEET 1 OF 2
S-04-10	IRZ INJECTION WELL VAULTS - SECTIONS SHEET 2 OF 2
M-04-01	IRZ EXTRACTION WELL CONSTRUCTION DETAILS
M-04-02	IRZ INJECTION WELL CONSTRUCTION DETAILS
M-04-03	IRZ SINGLE SCREEN EXTRACTION WELL VAULTS MECHANICAL DETAILS
M-04-04	IRZ DUAL SCREEN EXTRACTION WELL VAULTS MECHANICAL DETAILS
M-04-05	IRZ SINGLE SCREEN INJECTION WELL VAULTS MECHANICAL DETAILS
M-04-06	IRZ DUAL SCREEN INJECTION WELL VAULTS MECHANICAL DETAILS
M-04-07	IRZ DUAL SCREEN INJECTION WELL VAULTS MECHANICAL SECTIONS
M-04-08	IRZ DUAL SCREEN CLUSTER INJECTION WELL VAULTS MECHANICAL DETAILS
M-04-09	IRZ DUAL SCREEN CLUSTER INJECTION WELL VAULTS MECHANICAL SECTIONS
E-04-01	IRZ SINGLE SCREEN EXTRACTION WELL ELECTRICAL PLAN
E-04-02	IRZ DUAL SCREEN EXTRACTION WELL ELECTRICAL PLAN
E-04-03	NTH IRZ SINGLE SCREEN INJECTION WELL ELECTRICAL PLAN
E-04-04	IRZ DUAL SCREEN INJECTION WELL ELECTRICAL PLAN
E-04-05	IRZ DUAL SCREEN CLUSTER INJECTION WELL ELECTRICAL PLAN
I-04-01	IRZ SINGLE SCREEN EXTRACTION WELLS P&ID
I-04-02	IRZ DUAL SCREEN EXTRACTION WELLS P&ID
I-04-03	IRZ SINGLE SCREEN INJECTION WELLS P&ID
I-04-04	IRZ DUAL SCREEN INJECTION WELLS P&ID
I-04-05	IRZ DUAL SCREEN CLUSTER INJECTION WELLS P&ID SHEET 1 OF 2
I-04-06	IRZ DUAL SCREEN CLUSTER INJECTION WELLS P&ID SHEET 2 OF 2
I-04-07	NODE 03 FIBER OPTIC NETWORK
I-04-08	NODE 03 PLC PANELS INSTRUMENTATION CONNECTION SHEET 1 OF 4
I-04-09	NODE 03 PLC PANELS INSTRUMENTATION CONNECTION SHEET 2 OF 4
I-04-10	NODE 03 PLC PANELS INSTRUMENTATION CONNECTION SHEET 3 OF 4
I-04-11	NODE 03 PLC PANELS 03 INSTRUMENTATION CONNECTION SHEET 4 OF 4
I-04-12	NODE 04 FIBER OPTIC NETWORK
I-04-13	NODE 04 PLC PANELS INSTRUMENTATION CONNECTION SHEET 1 OF 3
I-04-14	NODE 04 PLC PANELS INSTRUMENTATION CONNECTION SHEET 2 OF 3
I-04-15	NODE 04 PLC PANELS INSTRUMENTATION CONNECTION SHEET 3 OF 3

05 - INNER RECIRCULATION LOOP

DRAWING NUMBER	DRAWING TITLE
G-05-01	INNER RECIRCULATION LOOP PROCESS FLOW DIAGRAM
C-05-01	IRL-4 ACCESS ROAD SITE PLAN
C-05-02	IRL-4 ACCESS ROAD - SECTIONS
C-05-03	IRL-2 ACCESS ROAD PLAN AND SECTION
C-05-04	INNER RECIRCULATION LOOP INJECTION WELL IRL-1 SITE PLAN
C-05-05	INNER RECIRCULATION LOOP INJECTION WELL IRL-2 SITE PLAN
C-05-06	INNER RECIRCULATION LOOP INJECTION WELL IRL-3 SITE PLAN
C-05-07	INNER RECIRCULATION LOOP INJECTION WELL IRL-4 SITE PLAN
C-05-08	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "G" STA 10+00 TO STA 13+50
C-05-09	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "G" STA 13+50 TO STA 19+00
C-05-10	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "G" STA 19+00 TO STA 24+50
C-05-11	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "G" STA 24+50 TO STA 29+50
C-05-12	ACCESS ROAD - PLAN AND PROFILE - PIPELINE "G" STA 29+50 TO STA 33+17
C-05-13	ACCESS ROAD - TYPICAL ROAD SECTION
S-05-01	INNER RECIRCULATION LOOP EXTRACTION WELL VAULTS TYPE 1 - PLAN
S-05-02	INNER RECIRCULATION LOOP EXTRACTION WELL VAULTS - FOUNDATION PLAN
S-05-03	INNER RECIRCULATION LOOP EXTRACTION WELL VAULTS - SECTIONS
S-05-04	INNER RECIRCULATION LOOP INJECTION WELL VAULTS - TYPE 1 - PLAN
S-05-05	INNER RECIRCULATION LOOP INJECTION WELL VAULTS - TYPE 2 - PLAN
S-05-06	INNER RECIRCULATION LOOP INJECTION WELL VAULTS - FOUNDATION PLAN
S-05-07	INNER RECIRCULATION LOOP INJECTION WELL VAULTS - SECTIONS SHEET 1 OF 2
S-05-08	INNER RECIRCULATION LOOP INJECTION WELL VAULTS - SECTIONS SHEET 2 OF 2

05 - INNER RECIRCULATION LOOP

DRAWING NUMBER	DRAWING TITLE
M-05-01	INNER RECIRCULATION LOOP EXTRACTION WELL CONSTRUCTION DETAILS
M-05-02	INNER RECIRCULATION LOOP TYPE 1 INJECTION WELL CONSTRUCTION DETAILS
M-05-03	INNER RECIRCULATION LOOP TYPE 2 INJECTION WELL CONSTRUCTION DETAILS
M-05-04	INNER RECIRCULATION LOOP EXTRACTION WELL VAULT MECHANICAL DETAILS
M-05-05	INNER RECIRCULATION LOOP INJECTION WELL VAULTS TYPE 1 MECHANICAL DETAILS
M-05-06	INNER RECIRCULATION LOOP INJECTION WELL VAULT TYPE 1 MECHANICAL SECTIONS
M-05-07	INNER RECIRCULATION LOOP INJECTION WELL VAULTS TYPE 2 MECHANICAL DETAILS
M-05-08	INNER RECIRCULATION LOOP INJECTION WELL VAULT TYPE 2 MECHANICAL SECTIONS
E-05-01	INNER RECIRCULATION LOOP INJECTION WELL IRL-1 SITE PLAN
E-05-02	INNER RECIRCULATION LOOP INJECTION WELL IRL-2 SITE PLAN
E-05-03	INNER RECIRCULATION LOOP INJECTION WELL IRL-3 SITE PLAN
E-05-04	INNER RECIRCULATION LOOP INJECTION WELL IRL-4 SITE PLAN
E-05-05	INNER RECIRCULATION LOOP INJECTION DUAL SCREEN INJECTION WELL ELECTRICAL PLAN
E-05-06	INNER RECIRCULATION LOOP DUAL SCREEN INJECTION WELL TYPE 1 ELECTRICAL PLAN
E-05-07	INNER RECIRCULATION LOOP DUAL SCREEN INJECTION WELL TYPE 2 ELECTRICAL PLAN
E-05-08	INNER RECIRCULATION LOOP IRL-1,2,3 CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
E-05-09	INNER RECIRCULATION LOOP IRL-1,2,3 PUMP ELEMENTARY DIAGRAM
E-05-10	INNER RECIRCULATION LOOP IRL-4 PLC CONTROL PANEL ELEVATION & BACKPAN LAYOUT
E-05-11	INNER RECIRCULATION LOOP IRL-4 CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
E-05-12	INNER RECIRCULATION LOOP IRL-4 SSS PUMP ELEMENTARY DIAGRAM
E-05-13	INNER RECIRCULATION LOOP IRL-4 FVNR PUMP ELEMENTARY DIAGRAM
I-05-01	INNER RECIRCULATION LOOP EXTRACTION WELLS P&ID
I-05-02	INNER RECIRCULATION LOOP TYPE 1 INJECTION WELLS P&ID
I-05-03	INNER RECIRCULATION LOOP TYPE 2 INJECTION WELLS P&ID
I-05-04	NODE 05 FIBER OPTIC NETWORK
I-05-05	NODE 05 PLC PANEL INSTRUMENTATION CONNECTION SHEET 1 OF 2
I-05-06	NODE 05 PLC PANELS INSTRUMENTATION CONNECTION SHEET 2 OF 2

06 - MW-20 BENCH

DRAWING NUMBER	DRAWING TITLE
G-06-01	MW-20 BENCH PROCESS FLOW DIAGRAM
C-06-01	MW-20 BENCH AREA PLAN
C-06-02	MW-20 BENCH GRADING PLAN
C-06-03	MW-20 BENCH YARD PIPING PLAN
C-06-04	SECURITY AND ELECTRICAL PLAN
S-06-01	MW-20 BENCH CARBON SUBSTRATE STORAGE TANK FOUNDATION
S-06-02	RESERVED
S-06-03	MW-20 BENCH UNLOADING PAD
S-06-04	MW-20 BENCH CARBON AMENDMENT BUILDING GENERAL NOTES
S-06-05	MW-20 BENCH CARBON AMENDMENT BUILDING AXONOMETRIC VIEWS
S-06-06	MW-20 BENCH CARBON AMENDMENT BUILDING ELEVATIONS (1 OF 2)
S-06-07	MW-20 BENCH CARBON AMENDMENT BUILDING ELEVATIONS (2 OF 2)
S-06-08	MW-20 BENCH CARBON AMENDMENT BUILDING FOUNDATION PLAN
S-06-09	MW-20 BENCH CARBON AMENDMENT BUILDING FINISH FLOOR PLAN
S-06-10	MW-20 BENCH CARBON AMENDMENT BUILDING SECTION - TYPICAL FRAME
S-06-11	MW-20 BENCH CARBON AMENDMENT BUILDING SECTION
S-06-12	MW-20 BENCH CARBON AMENDMENT BUILDING SECTIONS & DETAILS
S-06-13	MW-20 BENCH CARBON AMENDMENT BUILDING TYPICAL DETAILS 1 OF 2
S-06-14	MW-20 BENCH CARBON AMENDMENT BUILDING TYPICAL DETAILS 2 OF 2
M-06-01	MW-20 BENCH CARBON AMENDMENT BUILDING MECHANICAL LAYOUT
M-06-02	MW-20 BENCH CARBON AMENDMENT BUILDING SECTIONS AND DETAILS SHEET 1 OF 2
M-06-03	MW-20 BENCH CARBON AMENDMENT BUILDING SECTIONS AND DETAILS SHEET 2 OF 2
M-06-04	IRZ CARBON SUBSTRATE STORAGE TANK MECHANICAL DETAILS
M-06-05	IRZ CARBON AMENDMENT BUILDING HVAC LAYOUT AND DETAILS
M-06-06	MW-20 BENCH FRAC TANK BASIN PIPE RACK DETAILS
M-06-07	MW-20 BENCH UNLOADING PAD PIPE RACK DETAILS
F-06-01	FIRE PROTECTION MW-20 BENCH CARBON AMENDMENT BUILDING
E-06-01	MW-20 BENCH CARBON AMENDMENT BUILDING ELECTRICAL PLAN
E-06-02	MW-20 BENCH CARBON AMENDMENT BUILDING LIGHTING PLAN
E-06-03	NOT USED
E-06-04	MW-20 BENCH CARBON AMENDMENT BUILDING ELECTRICAL SCHEDULES
I-06-01	MW-20 BENCH CARBON AMENDMENT BUILDING P&ID SHEET 1 OF 4
I-06-02	MW-20 BENCH CARBON AMENDMENT BUILDING P&ID SHEET 2 OF 4
I-06-03	MW-20 BENCH CARBON AMENDMENT BUILDING P&ID SHEET 3 OF 4
I-06-04	MW-20 BENCH CARBON AMENDMENT BUILDING P&ID SHEET 4 OF 4
I-06-05	NODE 02 FIBER OPTIC NETWORK
I-06-06	NODE 02 PLC PANELS INSTRUMENTATION CONNECTION SHEET 1 OF 2
I-06-07	NODE 02 PLC PANELS INSTRUMENTATION CONNECTION SHEET 2 OF 2

DRAFT
NOT FOR
CONSTRUCTION

MICROFILM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
2	9/8/14	PRE-FINAL (90%) DESIGN		JU	JP	CH	CH
1	4/5/13	INTERMEDIATE (60%) DESIGN		JU	JP	CH	CH
0	11/18/11	PRELIMINARY (30%) DESIGN		JU	JP	CH	CH

REVISIONS

APPROVED BY	
NB	SO
	SUPV
	DSGN JP
	DWN JU
	CHKD JU
	OK CH
	DATE 9/08/14
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

GENERAL
DRAWING INDEX 1

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
G-00-03	REV 2

PLOT DATE: 20140908 PLOT TIME: 5:51:35 PM

FILENAME: CH-G-00-003.dgn

N1808

FILENAME: .DGN - -04

07 - PIPELINE

DRAWING NUMBER	DRAWING TITLE
G-07-01	HYDRAULIC PROFILE FRESHWATER INJECTION SYSTEM
G-07-02	HYDRAULIC PROFILE REMEDY-PRODUCED WATER SYSTEM
C-07-01	PIPELINE KEY MAP
C-07-02	PIPELINE SEGMENT MAP
C-07-03	PIPE SCHEDULE
C-07-04 TO -06	RESERVED
C-07-07	COMBINATION AIR RELIEF AND VACUUM VALVE DETAILS
C-07-08	BLOW OFF DETAILS
C-07-09	PIPELINE DETAILS
C-07-10 TO -19	RESERVED
C-07-20	PLAN AND PROFILE PIPELINE "A" STA 12+50 TO STA 20+50
C-07-21	PLAN AND PROFILE PIPELINE "A" STA 20+50 TO STA 28+75
C-07-22	PLAN AND PROFILE PIPELINE "A" STA 28+75 TO STA 36+50
C-07-23	PLAN AND PROFILE PIPELINE "A" STA 36+50 TO STA 45+00
C-07-24	PLAN AND PROFILE PIPELINE "A" STA 45+50 TO STA 54+93.36
C-07-25	PLAN AND PROFILE PIPELINE "H" STA 10+00 TO STA 15+33
C-07-26	PLAN AND PROFILE PIPELINE "B" STA 3+05 TO STA 13+50
C-07-27	PLAN AND PROFILE PIPELINE "B" STA 13+50 TO STA 21+00
C-07-28	PLAN AND PROFILE PIPELINE "B" STA 21+00 TO STA 30+50
C-07-29	PLAN AND PROFILE PIPELINE "B" STA 30+50 TO STA 40+18.83
C-07-30	PLAN AND PROFILE PIPELINE "B" STA 40+18.83 TO STA 45+50
C-07-31	PLAN AND PROFILE PIPELINE "B" STA 49+50 TO STA 59+15
C-07-32	PLAN AND PROFILE PIPELINE "B" STA 59+15 TO STA 69+00
C-07-33	PLAN AND PROFILE PIPELINE "B" STA 69+00 TO STA 78+00
C-07-34	PLAN AND PROFILE PIPELINE "B" STA 78+00 TO STA 86+50
C-07-35	PLAN AND PROFILE PIPELINE "B" STA 86+50 TO STA 96+50
C-07-36	PLAN AND PROFILE PIPELINE "B" STA 96+50 TO STA 106+50
C-07-37	PLAN AND PROFILE PIPELINE "B" - STA 106+50 TO STA 112+52.69
C-07-38	NOT USED
C-07-39	PIPELINE - PLAN AND PROFILE PIPELINE "C1", "C2", & "C3" STA 10+00 TO STA 13+50
C-07-40	PIPELINE - PLAN AND PROFILE PIPELINE "C2" STA 13+50 TO STA 19+60
C-07-41	PIPELINE - PLAN AND PROFILE PIPELINE "C3", "C4", & "C6" STA 19+60 TO STA 25+79
C-07-42	PIPELINE - PLAN AND PROFILE PIPELINE "C13" STA 10+00 TO STA 12+38
C-07-43	PIPELINE - PLAN AND PROFILE PIPELINE "C5" STA 10+00 TO STA 15+50
C-07-44	PIPELINE - PLAN AND PROFILE PIPELINE "C5","C7" & "C8" STA 15+50 TO STA 21+50
C-07-45	PIPELINE - PLAN AND PROFILE PIPELINE "C8" STA 21+50 TO STA 26+00
C-07-46	PIPELINE - PLAN AND PROFILE PIPELINE "C8" & "C9" STA 26+00 TO STA 29+49
C-07-47	PIPELINE - PLAN AND PROFILE PIPELINE "C10" & "C11" STA 29+49 TO STA 34+50
C-07-48	PIPELINE - PLAN AND PROFILE PIPELINE "C11" STA 34+50 TO STA 38+93
C-07-49	PIPELINE - PLAN AND PROFILE PIPELINE "C14" STA 10+00 TO STA 14+56
C-07-50	PIPELINE - PLAN AND PROFILE PIPELINE "C15" & "C16" STA 10+00 TO STA 15+73
C-07-51	PIPELINE - PLAN AND PROFILE PIPELINE "C17" STA 10+00 TO STA 12+28
C-07-52	PIPELINE - PLAN AND PROFILE PIPELINE "F" STA 10+00 TO STA 16+11
C-07-53	NOT USED
C-07-54	PIPELINE - PLAN AND PROFILE PIPELINE "G1" STA 10+00 TO STA 13+50
C-07-55	PIPELINE - PLAN AND PROFILE PIPELINE "G2" & "G3" STA 13+50 TO STA 19+00
C-07-56	PIPELINE - PLAN AND PROFILE PIPELINE "G2", "G3", & "G4" STA 19+50 TO STA 24+50
C-07-57	PIPELINE - PLAN AND PROFILE PIPELINE "G4" & "G5" STA 24+50 TO STA 29+50
C-07-58	PIPELINE - PLAN AND PROFILE PIPELINE "G5" & "G6" STA 29+50 TO STA 33+21
C-07-59	PIPELINE - PLAN AND PROFILE PIPELINE "C18" STA 10+00 TO STA 16+55
C-07-60 TO -67	RESERVED
C-07-68	PIPELINE - PLAN AND PROFILE STA 8+31 TO STA 10+00 PIPELINE "J"
C-07-69	PLAN AND PROFILE PIPELINE "J" STA 10+04 TO STA 15+83
C-07-70	PLAN AND PROFILE PIPELINE "F" STA 15+30 TO STA 18+00
C-07-71	PLAN AND PROFILE PIPELINE "F"STA 18+00 TO STA 23+00
C-07-72	PLAN AND PROFILE PIPELINE "F" STA 23+00 TO STA 26+25
C-07-73	PLAN AND PROFILE PIPELINE "K" STA 90+00 TO STA 91+11
C-07-74	PLAN AND PROFILE PIPELINE "L" STA 80+00 TO STA 83+90
C-07-75	PLAN AND PROFILE PIPELINE "M" STA 60+00 TO STA 65+60
C-07-76	PLAN AND PROFILE PIPELINE "M" STA 65+00 TO STA 70+30
C-07-77	PLAN AND PROFILE PIPELINE "N" STA 85+00 TO STA 86+38
C-07-78	PLAN AND PROFILE PIPELINE "I" STA 8+00 TO STA 14+60
C-07-79	PLAN AND PROFILE PIPELINE "D" STA 75+00 TO STA 77+75
C-07-80	PLAN AND PROFILE - PIPELINE "P" - STA 50+00 TO STA 51+42
C-07-81	PLAN AND PROFILE - PIPELINE "T" - STA 60+00 TO STA 60+85
C-07-82	STRUCTURE - PLAN SECTION LOCATION - 12" WATER LINE TOPOCK L300-A ARCH BRIDGE
C-07-83	STRUCTURE - SECTIONS SUPPORT - 12" WATER LINE TOPOCK L300-A ARCH BRIDGE
C-07-84	STRUCTURE - SECTIONS SUPPORT - 12" WATER LINE TOPOCK L300-A ARCH BRIDGE
C-07-85	PIPE SUPPORT DETAILS
C-07-86 TO -99	RESERVED
C-07-100	TRENCH SECTIONS
C-07-101	TRENCH SECTIONS
C-07-102	PIPELINE SECTIONS
C-07-103	PIPELINE SECTIONS
C-07-103A	PIPELINE SECTIONS
C-07-104	PIPELINE SECTIONS
C-07-105	PIPELINE SECTIONS
C-07-106	PIPELINE SECTIONS
C-07-107	PIPELINE SECTIONS
C-07-108	TRENCH SECTIONS
C-07-109	TRENCH SECTIONS
C-07-110	TRENCH SECTIONS
C-07-111	TRENCH SECTIONS
C-07-112	INTERSECTION DETAILS
C-07-113	INTERSECTION DETAILS
C-07-114	INTERSECTION DETAILS
C-07-115	INTERSECTION DETAILS
C-07-116	INTERSECTION DETAILS
C-07-117	INTERSECTION DETAILS

07 - PIPELINE

DRAWING NUMBER	DRAWING TITLE
C-07-118	INTERSECTION DETAILS
C-07-119	INTERSECTION DETAILS
C-07-120	ELECTRICAL TRENCH SECTIONS
C-07-121	ELECTRICAL TRENCH SECTIONS
C-07-122	ELECTRICAL TRENCH SECTIONS
C-07-123	INTERSECTION DETAILS
C-07-124	INTERSECTION DETAILS
C-07-125	INTERSECTION DETAILS
C-07-126	CROSSING DETAILS
C-07-127	MW-20 BENCH AREA TRENCH SECTIONS SHEET 1 OF 2
C-07-128	MW-20 BENCH AREA TRENCH SECTIONS SHEET 1 OF 2
C-07-129 TO -199	RESERVED
C-07-200	TEMPORARY CONSTRUCTION WATERLINE SYSTEM
C-07-201	PIPELINE ROADWAY DRAINAGE IMPROVEMENTS
C-07-202	PIPELINE ROADWAY DRAINAGE IMPROVEMENTS
C-07-203	PIPELINE PROFILE
C-07-204	PIPELINE TYPICAL SECTIONS
C-07-205	PIPELINE TYPICAL SECTIONS
C-07-206	PIPELINE CULVERT PIPE CROSSING DETAIL
S-07-01	AERIAL CROSSING PIPELINE "A"
S-07-02	AERIAL CROSSING PIPELINE "A" ABUTMENT - PLAN, SECTIONS AND DETAILS
S-07-03	AERIAL CROSSING PIPELINE "A" PLANS AND ELEVATION
S-07-04	AERIAL CROSSING PIPELINE "A" SECTIONS AND DETAILS
S-07-05	AERIAL CROSSING PIPELINE "A" SECTIONS AND DETAILS
S-07-06	AERIAL CROSSING PIPELINE "A" PIPE SUPPORT AND LOCATIONS
S-07-07	AERIAL CROSSING PIPELINE "A" SECTIONS AND DETAILS
S-07-08	AERIAL CROSSING PIPELINE "A" SECTIONS AND DETAILS
S-07-09	AERIAL CROSSING PIPELINE "I"
S-07-10	AERIAL CROSSING PIPELINE "A" ABUTMENT - PLANS, SECTIONS AND DETAILS
S-07-11	AERIAL CROSSING PIPELINE "I" PLANS AND ELEVATION
S-07-12	AERIAL CROSSING PIPELINE "I" SECTIONS AND DETAILS
S-07-13	AERIAL CROSSING PIPELINE "A" SECTIONS AND DETAILS
S-07-14	AERIAL CROSSING PIPELINE "I" PIPE SUPPORT AND LOCATIONS
S-07-15	AERIAL CROSSING PIPELINE "I" SECTIONS AND DETAILS

08 - TRANSWESTERN BENCH

DRAWING NUMBER	DRAWING TITLE
C-08-00	TRANSWESTERN BENCH CIVIL LEGEND NOTES AND ABBREVIATIONS
C-08-01	TRANSWESTERN BENCH SITE DEMOLITION PLAN
C-08-02	TRANSWESTERN BENCH SITE IMPROVMENTS PLAN
C-08-03	TRANSWESTERN BENCH SITE UTILITIES PLAN
C-08-04	TRANSWESTERN BENCH STORM DRAINAGE PLAN
C-08-05	TRANSWESTERN BENCH SITE GRADING PLAN
C-08-06	TRANSWESTERN BENCH CIVIL DETAIL SHEET
C-08-07	TRANSWESTERN BENCH CIVIL DETAIL SHEET
C-08-08	TRANSWESTERN BENCH CIVIL DETAIL SHEET
C-08-09	TRANSWESTERN BENCH STORM DRAINAGE PROFILE
C-08-10	TRANSWESTERN BENCH RETAINING WALL PROFILE
C-08-11	TRANSWESTERN BENCH 30% SCHEMATIC SITE PLAN NEW ACCESS ROAD
C-08-12	TRANSWESTERN BENCH ERROSION AND SEDIMENT CONTROL PLAN
C-08-13 TO -19	RESERVED
C-08-20	TW BENCH SEPTIC TANK SYSTEM
A-08-01	ARCHITECTURAL CODE SITE PLAN
A-08-02	OPERATIONS BUILDING CODE SUMMARY SHEET
A-08-03	OPERATIONS BUILDING FLOOR PLAN
A-08-04	OPERATIONS BUILDING ROOF PLAN
A-08-05	OPERATIONS BUILDING CEILING PLAN
A-08-06	OPERATIONS BUILDING EXTERIOR ELEVATIONS
A-08-07	OPERATIONS BUILDING INTERIOR ELEVATIONS
A-08-08	OPERATIONS BUILDING SECTIONS
A-08-09	OPERATIONS BUILDING WALL TYPES & SECTIONS
A-08-10	OPERATIONS BUILDING DETAILS
A-08-11	OPERATIONS BUILDING SCHEDULES
A-08-12	CARBON AMENDMENT BUILDING CODE SUMMARY SHEET
A-08-13	CARBON AMENDMENT BUILDING PLANS AND SECTIONS
A-08-14	CARBON AMENDMENT BUILDING EXTERIOR ELEVATIONS AND SECTIONS
S-08-01	STRUCTURAL GENERAL NOTES
S-08-02	STRUCTURAL GENERAL NOTES CONT.
S-08-03	STRUCTURAL QA & SPECIAL INSPECTIONS
S-08-04	OPERATIONS BUILDING FOUNDATION PLAN
S-08-05	OPERATIONS BUILDING LOWER ROOF FRAMING PLAN
S-08-06	OPERATIONS BUILDING HIGH ROOF FRAMING PLAN
S-08-07	OPERATIONS BUILDING ELEVATIONS
S-08-08	CARBON AMENDMENT BUILDING SECTION AND PLANS
S-08-09	STRUCTURAL DETAILS
S-08-10	STRUCTURAL DETAILS
S-08-11	TRANSWESTERN BENCH STORAGE TANK FOUNDATION
M-08-01	TWB CARBON AMENDMENT BUILDING MECHANICAL LAYOUT
M-08-02	TWB CARBON AMENDMENT BUILDING SECTIONS AND DETAILS SHEET 1 OF 2
M-08-03	TWB CARBON AMENDMENT BUILDING SECTIONS AND DETAILS SHEET 2 OF 2
M-08-04	TW BENCH CARBON SUBSTRATE STORAGE TANK MECHANICAL DETAILS
M-08-05	MECHANICAL AND PLUMBING LEGEND & ABBREVIATIONS
M-08-06	TRANSWESTERN BENCH OPERATIONS BUILDING MECHANICAL T24 FORMS
M-08-07	TRANSWESTERN BENCH OPERATIONS BUILDING MECHANICAL T24 FORMS
M-08-08	TRANSWESTERN BENCH OPERATIONS BUILDING HVAC PLAN

08 - TRANSWESTERN BENCH

DRAWING NUMBER	DRAWING TITLE
M-08-09	TRANSWESTERN BENCH OPERATIONS BUILDING HVAC SECTIONS
P-08-01	TRANSWESTERN BENCH OPERATIONS BUILDING WATER AND SANITARY SEWER
F-08-01	TRANSWESTERN BENCH OPERATIONS BUILDING FIRE SPRINKLER PIPING PLAN
E-08-01	TRANSWESTERN BENCH ELECTRICAL SITE PLAN
E-08-02	TRANSWESTERN BENCH PARTIAL ELECTRICAL SITE PLAN
E-08-03	TRANSWESTERN BENCH BUILDING POWER PLAN
E-08-04	TRANSWESTERN BENCH OPERATIONS BUILDING LIGHTING & RECEPTACLE PLAN
E-08-05	TRANSWESTERN BENCH SECURITY PLAN
E-08-06	TRANSWESTERN BENCH PANELBOARD SCHEDULES
E-08-07	RESERVED
E-08-08	TW BENCH CARBON AMENDMENT BUILDING ELECTRICAL PLAN
E-08-09	TW BENCH CARBON AMENDMENT BUILDING LIGHTING PLAN
E-08-10	RESERVED
E-08-11	TRANSWESTERN BENCH CARBON AMENDMENT BUILDING ELECTRICAL SCHEDULES
I-08-01	TRANSWESTERN BENCH CARBON AMENDMENT BUILDING P&ID SHEET 1 OF 2
I-08-02	TRANSWESTERN BENCH CARBON AMENDMENT BUILDING P&ID SHEET 2 OF 2
I-08-03	NODE 01 FIBER OPTIC NETWORK
I-08-04	NODE 01 PLC PANELS INSTRUMENTATION CONNECTION SHEET 1 OF 3
I-08-05	NODE 01 PLC PANELS INSTRUMENTATION CONNECTION SHEET 2 OF 3
I-08-06	NODE 01 PLC PANELS INSTRUMENTATION CONNECTION SHEET 3 OF 3

09 - COMPRESSOR STATION PONDS

DRAWING NUMBER	DRAWING TITLE
G-09-01	COMPRESSOR STATION PONDS UPGRADES GENERAL NOTES
C-09-01	COMPRESSOR STATION PONDS UPGRADES TRENCH DETAILS
C-09-02	COMPRESSOR STATION PONDS UPGRADES TRENCH SECTIONS
C-09-03	COMPRESSOR STATION PONDS UPGRADES CONCRETE DETAILS
C-09-04	COMPRESSOR STATION PONDS UPGRADES CONDUIT DETAILS
C-09-05	COMPRESSOR STATION PONDS UPGRADES POLE AND GUY ANCHORING
A-09-01	COMPRESSOR STATION PONDS UPGRADES POND LAYOUT
A-09-02	COMPRESSOR STATION PONDS UPGRADES BUILDING
M-09-01	COMPRESSOR STATION PONDS UPGRADES GAS SUPPLY TAP PLAN AND DETAILS
M-09-02	COMPRESSOR STATION PONDS UPGRADES AUXILARY EQUIPMENT
M-09-03	COMPRESSOR STATION PONDS UPGRADES MECHANICAL SITE PLAN
M-09-04	COMPRESSOR STATION PONDS UPGRADES PONTOON PLAN AND DETAILS
M-09-05	COMPRESSOR STATION PONDS UPGRADES PONTOON ELEVATIONS
M-09-06	COMPRESSOR STATION PONDS UPGRADES PONTOON PUMP AND VALVES
E-09-01	COMPRESSOR STATION PONDS UPGRADES ELECTRICAL NOTES
E-09-02	COMPRESSOR STATION PONDS UPGRADES ELECTRICAL SINGLE LINE DIAGRAM
E-09-03	COMPRESSOR STATION PONDS UPGRADES COMMUNICATION BLOCK DIAGRAM
E-09-04	COMPRESSOR STATION PONDS UPGRADES COMMUNICATIONS PANEL DETAILS
E-09-05	COMPRESSOR STATION PONDS UPGRADES AUX. EQUIPMENT DETAILS
E-09-06	COMPRESSOR STATION PONDS UPGRADES ELECTRICAL DISTRIBUTION PANEL

10 - TCS FACILITIES

DRAWING NUMBER	DRAWING TITLE
G-10-01	PROCESS SCHEMATIC SECONDARY CONTAINMENT FOR TCS/REMEDY PRODUCED WATER
C-10-01	TCS AREA GENERAL SITE PLAN
C-10-02	TCS AREA KEY MAP
C-10-03	TCS AREA 1 - FINISH GRADING AND PAVING PLAN
C-10-04	TCS AREA 2 - FINISH GRADING AND PAVING PLAN
C-10-05	TCS AREA 3 - FINISH GRADING AND PAVING PLAN
C-10-06	TCS AREA 4 - FINISH GRADING AND PAVING PLAN
C-10-07 TO -10	RESERVED
C-10-11	PIPE LAYOUT SHEET 1 OF 4
C-10-12	PIPE LAYOUT SHEET 2 OF 4
C-10-13	PIPE LAYOUT SHEET 3 OF 4
C-10-14	PIPE LAYOUT SHEET 4 OF 4
E-10-01	TCS AREA 2 ELECTRICAL SITE PLAN
E-10-02	TCS AREA 1 ELECTRICAL SITE PLAN
E-10-03	TCS AREA 4 ELECTRICAL SITE PLAN
E-10-04	TCS AREA 3 ELECTRICAL SITE PLAN
I-10-01	P&ID POWER DISTRIBUTION

11 - INFLUENT PRODUCED WATER TANKS

DRAWING NUMBER	DRAWING TITLE
S-11-01	INFLUENT TANK FARM FOUNDATION PLAN
S-11-02	INFLUENT TANK FARM FLOOR PLAN
S-11-03	INFLUENT TANK FARM CANOPY PLAN AND SECTION
S-11-04	INFLUENT TANK FARM SECTIONS AND DETAILS
S-11-05	INFLUENT TANK FARM CANOPY SECTIONS AND DETAILS
M-11-01	INFLUENT TANK FARM PLAN
M-11-02	INFLUENT TANK FARM SECTIONS AND DETAILS 1
M-11-03	INFLUENT TANK FARM SECTIONS AND DETAILS 2
M-11-04	INFLUENT TANK FARM SECTIONS AND DETAILS 3
E-11-01	INFLUENT TANK FARM ELECTRICAL PLAN
E-11-02	INFLUENT TANK 1 SECTIONS ELECTRICAL PLAN
I-11-01	P&ID INFLUENT TANK 1
I-11-02	P&ID INFLUENT TANK 2
I-11-03	P&ID INFLUENT TANK 3
I-11-04	P&ID INFLUENT TANK 4

12 - REMEDY-PRODUCED WATER CONDITIONING PLANT

DRAWING NUMBER	DRAWING TITLE
G-12-01	PROCESS FLOW DIAGRAM REMEDY PRODUCED WATER CONDITIONING PLANT
G-12-02	REMEDY PRODUCED WATER MASS BALANCE
A-12-01	REMEDY PRODUCED WATER CONDITIONING PLANT CODE SUMMARY SHEET
A-12-02	REMEDY PRODUCED WATER CONDITIONING PLANT FLOOR PLANS
A-12-03	REMEDY PRODUCED WATER CONDITIONING PLANT ROOF PLAN & REFLECTED CEILING PLAN
A-12-04	REMEDY PRODUCED WATER CONDITIONING PLANT EXTERIOR ELEVATIONS
A-12-05	REMEDY PRODUCED WATER CONDITIONING PLANT BUILDING SECTIONS
A-12-06	REMEDY PRODUCED WATER CONDITIONING PLANT WALL SECTIONS
A-12-07	REMEDY PRODUCED WATER CONDITIONING PLANT ENLARGED PLANS & ELEVATIONS
A-12-08	REMEDY PRODUCED WATER CONDITIONING PLANT STAIR & DETAILS
A-12-09	REMEDY PRODUCED WATER CONDITIONING PLANT DETAILS
A-12-10	REMEDY PRODUCED WATER CONDITIONING PLANT SCHEDULES
S-12-01	REMEDY - PRODUCED WATER CONDITIONING PLANT FOUNDATION PLAN
S-12-02	REMEDY - PRODUCED WATER CONDITIONING PLANT FIRST FLOOR PLAN
S-12-03	REMEDY - PRODUCED WATER CONDITIONING PLANT SECOND FLOOR PLAN
S-12-04	REMEDY - PRODUCED WATER CONDITIONING PLANT ROOF FRAMING PLAN
S-12-05	REMEDY - PRODUCED WATER CONDITIONING PLANT WALL FRAMING ELEVATIONS
S-12-06	REMEDY - PRODUCED WATER CONDITIONING PLANT WALL FRAMING ELEVATIONS
S-12-07	REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTION
S-12-08	REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTION
S-12-09	REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTION
S-12-10	REMEDY - PRODUCED WATER CONDITIONING PLANT SECTIONS AND DETAILS
S-12-11	REMEDY - PRODUCED WATER CONDITIONING PLANT SECTIONS AND DETAILS
S-12-12	REMEDY - PRODUCED WATER CONDITIONING PLANT SECTIONS AND DETAILS
S-12-13	REMEDY - PRODUCED WATER CONDITIONING PLANT SECTIONS AND DETAILS
S-12-14	REMEDY - PRODUCED WATER CONDITIONING PLANT SECTIONS AND DETAILS
S-12-15	REMEDY - PRODUCED WATER CONDITIONING PLANT BEAM AND PILASTER SCHEDULE
S-12-16	REMEDY - PRODUCED WATER CONDITIONING PLANT BEAM AND PILASTER SCHEDULE
S-12-17	REMEDY - PRODUCED WATER CONDITIONING PLANT PLAN, SECTIONS AND DETAILS
S-12-18	REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING REINFORCING PLAN
S-12-19	REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTIONS AND DETAILS
S-12-20	REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTIONS AND DETAILS
S-12-21	REMEDY - PRODUCED WATER CONDITIONING PLANT EQUIP. PAD - PLAN, SECTIONS AND DETAILS
S-12-22	SWITCH GEAR CANOPY PLANS
S-12-23	SWITCH GEAR CANOPY FRAMING ELEVATIONS
S-12-24	SWITCH GEAR CANOPY SECTIONS
S-12-25	SWITCH GEAR CANOPY SECTIONS AND DETAILS
M-12-01	REMEDY - PRODUCED WATER CONDITIONING PLANT FIRST FLOOR PLAN
M-12-02	REMEDY - PRODUCED WATER CONDITIONING PLANT SECOND FLOOR PLAN
M-12-03	REMEDY - PRODUCED WATER CONDITIONING PLANT SECTIONS
M-12-04	REMEDY - PRODUCED WATER CONDITIONING PLANT HVAC & PLUMBING DETAILS
M-12-05	REMEDY - PRODUCED WATER CONDITIONING PLANT HVAC & PLUMBING 1ST FLOOR PLAN
M-12-06	REMEDY - PRODUCED WATER CONDITIONING PLANT HVAC & PLUMBING 2ND FLOOR PLAN
M-12-07	REMEDY - PRODUCED WATER CONDITIONING PLANT POTABLE WATER
E-12-01	REMEDY PRODUCED WATER CONDITIONING PLANT MCC ONE-LINE & ELEVATION
E-12-02	REMEDY PRODUCED WATER CONDITIONING PLANT FVNR ELEMENTARY DIAGRAM
E-12-03	REMEDY PRODUCED WATER CONDITIONING PLANT VFD ELEMENTARY DIAGRAM
E-12-04	REMEDY PRODUCED WATER CONDITIONING PLANT CONTROL PANEL ELEVATION
E-12-05	REMEDY PRODUCED WATER CONDITIONING PLANT CONTROL PANEL BACKPAN LAYOUT
E-12-06	REMEDY PRODUCED WATER CONDITIONING PLANT POWER DISTRIBUTION DIAGRAM
E-12-07	REMEDY PRODUCED WATER CONDITIONING PLANT EXAMPLE PLC I/O WIRING DIAGRAMS
E-12-08	REMEDY PRODUCED WATER COMMUNICATION PANEL ELEVATION & LAYOUT
E-12-09	REMEDY PRODUCED WATER COMMUNICATION PANEL SCHEMATIC
E-12-10	REMEDY PRODUCED WATER RADIO COMMUNICATION PANEL ELEVATION AND LAYOUT

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2	9/8/14	PRE-FINAL (90%) DESIGN		JU	JP	CH	CH
1	4/5/13	INTERMEDIATE (60%) DESIGN		JU	JP	CH	CH
0	11/18/11	PRELIMINARY (30%) DESIGN		JU	JP	CH	CH

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DSGN	JP
DWN	JU
CHKD	JU
OK	CH
DATE	9/08/14
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TOPOCK GROUNDWATER REMEDIATION PROJECT
GENERAL
DRAWING INDEX 2
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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12 - REMEDY-PRODUCED WATER CONDITIONING PLANT

DRAWING NUMBER	DRAWING TITLE
E-12-11	REMEDY PRODUCED WATER CONDITIONING PLANT PANELBOARD SCHEDULES
E-12-12 TO -19	RESERVED
E-12-20	REMEDY PRODUCED WATER CONDITIONING PLANT 1st FLOOR POWER & CONTROL PLAN
E-12-21	REMEDY PRODUCED WATER CONDITIONING PLANT 1st FLOOR LIGHTING AND RECEPTACLE PLAN
E-12-22	REMEDY PRODUCED WATER CONDITIONING PLANT 2nd FLOOR POWER & CONTROL PLAN
E-12-23	REMEDY PRODUCED WATER CONDITIONING PLANT 2nd FLOOR LIGHTING AND RECEPTACLE PLAN
E-12-24	TCS EXISTING WATER STORAGE TANK AREA PLAN
I-12-01	P&ID FILTER SYSTEM A SIDE
I-12-02	P&ID FILTER SYSTEM B SIDE
I-12-03	P&ID CAUSTIC AND COAGULANT SYSTEM
I-12-04	P&ID ACID AND DEWATERING AID SYSTEMS
I-12-05	P&ID LIQUID PHASE SEPARATOR & AIR COMPRESSOR

13 - FRESHWATER STORAGE AND CONTINGENT FWPTS

DRAWING NUMBER	DRAWING TITLE
G-13-01	PROCESS SCHEMATIC FOR FRESH WATER PRE-INIECTION TREATMENT SYSTEM
G-13-02	MASS BALANCE FRESH WATER PRE-INJECTION TREATMENT SYSTEM
A-13-01	FRESHWATER PRE-INJECTION TREATMENT SYSTEM CODE SUMMARY SHEET
A-13-02	FRESHWATER PRE-INJECTION TREATMENT SYSTEM FLOOR PLANS
A-13-03	FRESHWATER PRE-INJECTION TREATMENT SYSTEM ROOF PLAN
A-13-04	FRESHWATER PRE-INJECTION TREATMENT SYSTEM EXTERIOR ELEVATIONS
A-13-05	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING SECTIONS
S-13-01	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - FOUNDATION PLAN
S-13-02	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - FIRST FLOOR PLAN
S-13-03	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECOND FLOOR FRAMING PLAN # EL. 639.50
S-13-04	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECOND FLOOR PLAN
S-13-05	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - ROOF PLAN
S-13-06	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECTION
S-13-07	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECTIONS AND DETAILS
S-13-08	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECTIONS AND DETAILS
S-13-09	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECTIONS AND DETAILS
S-13-10	FRESHWATER PRE-INJECTION TREATMENT SYSTEM BUILDING - SECTIONS AND DETAILS
S-13-11	CHEMICAL STORAGE AREA - FOUNDATION , FLOOR AND ROOF PLAN
S-13-12	CHEMICAL STORAGE AREA - SECTIONS AND DETAILS
S-13-13	CHEMICAL STORAGE AREA - SECTIONS AND DETAILS
S-13-14	BACKWASH AND TREATED WATER STORAGE TANKS - PLAN
S-13-15	BACKWASH AND TREATED WATER STORAGE TANKS - SECTIONS AND DETAILS
M-13-00	FRESHWATER PRE-INJECTION TREATMENT SYSTEM EQUIPMENT GENERAL ARRANGEMENT
M-13-01	FRESHWATER PRE-INJECTION TREATMENT MEDIA VESSEL SYSTEM LOWER PLAN
M-13-02	FRESHWATER PRE-INJECTION TREATMENT MEDIA VESSEL SYSTEM UPPER PLAN
M-13-03	FRESHWATER PRE-INJECTION TREATMENT MEDIA VESSEL SYSTEM SECTIONS
M-13-04	FRESHWATER PRE-INJECTION TREATMENT MEDIA SYSTEM ISOMETRIC
M-13-05	RESERVED
M-13-06	FRESHWATER PRE-INJECTION TREATMENT CHEMICAL SYSTEMS PLAN
M-13-07	FRESHWATER PRE-INJECTION TREATMENT CHEMICAL SYSTEMS SECTIONS
M-13-08	FRESHWATER PRE-INJECTION TREATMENT PROCESS TANKS PLAN
M-13-09	FRESHWATER PRE-INJECTION TREATMENT PROCESS TANKS ELEVATION & SECTIONS
E-13-01	FRESHWATER PRE-INJECTION TREATMENT SYSTEM MCC ONE-LINE AND ELEVATION
E-13-02	FRESHWATER PRE-INJECTION TREATMENT SYSTEM FVNR ELEMENTRY DIAGRAM
E-13-03	FRESHWATER PRE-INJECTION TREATMENT SYSTEM VFD ELEMENTARY DIAGRAM
E-13-04	FRESHWATER PRE-INJECTION TREATMENT SYSTEM CONTROL PANEL ELEVATION
E-13-05	FRESHWATER PRE-INJECTION TREATMENT SYSTEM CONTROL PANEL BACKPAN LAYOUT
I-13-01	P&ID FWPI TREATMENT SYSTEM PRE-FILTERS
I-13-02	P&ID FWPI TREATMENT SYSTEM MEDIA VESSELS
I-13-03	P&ID FWPI TREATMENT SYSTEM CHEMICAL STORAGE 1
I-13-04	P&ID FWPI TREATMENT SYSTEM CHEMICAL STORAGE 2
I-13-05	P&ID FWPI TREATMENT SYSTEM BACKWASH SYSTEM
I-13-06	P&ID FWPI TREATMENT SYSTEM TREATED WATER

14 - CONDITIONED WATER TANKS

DRAWING NUMBER	DRAWING TITLE
S-14-01	CONDITIONED WATER STORAGE TANK MECHANICAL PLAN AND DETAILS
S-14-02	CONDITIONED WATER STORAGE TANK SECTIONS AND DETAILS
S-14-03	CONDITIONED WATER STORAGE TANK SECTIONS AND DETAILS
S-14-04	CONDITIONED WATER STORAGE TANK SECTIONS AND DETAILS
S-14-05	CONDITIONED WATER STORAGE TANK SECTIONS AND DETAILS
S-14-06	CONDITIONED WATER STORAGE TANK CATHODIC PROTECTION
S-14-07	CONDITIONED WATER STORAGE TANK CATHODIC PROTECTION
S-14-08	CONDITIONED WATER STORAGE TANK - RETAINING WALL - PLAN AND SECTIONS
S-14-09	CONDITIONED WATER STORAGE TANK - RETAINING WALL - ELEVATION
S-14-10	CONDITIONED WATER STORAGE TANK FARM - FOUNDATION AND FLOOR PLANS
S-14-11	CONDITIONED WATER STORAGE TANK FARM - CANOPY PLAN AND SECTIONS
S-14-12	CONDITIONED WATER STORAGE TANK FARM - SECTIONS AND DETAILS
S-14-13	CONDITIONED WATER STORAGE TANK FARM - SECTIONS AND DETAILS
M-14-01	CONDITIONED WATER STORAGE TANK FARM PLAN
M-14-02	CONDITIONED WATER STORAGE TANK FARM SECTIONS
M-14-03	CONDITIONED WATER STORAGE TANK FARM SECTIONS AND DETAILS
E-14-01	CONDITIONED WATER TANK FARM ELECTRICAL PLAN
E-14-02	CONDITIONED WATER STORAGE TANK ELECTRICAL PLAN
I-14-01	P&ID CONDITIONED WATER STORAGE TANK FARM A SIDE
I-14-02	P&ID CONDITIONED WATER B SIDE

15 - PARK MOABI FACILITIES (To be provided at final [100%] design)

DRAWING NUMBER	DRAWING TITLE
C-15-01	CONSTRUCTION HEADQUARTERS GENERAL ARRANGEMENT PLAN
C-15-02	CONSTRUCTION HEADQUARTERS YARD PLAN
C-15-03	CONSTRUCTION HEADQUARTERS GRADING PLAN
C-15-04	SOIL PROCESSING YARD GENERAL ARRANGEMENT PLAN
C-15-05	SOIL PROCESSING YARD GRADING PLAN
C-15-06	SOIL STORAGE YARD GENERAL ARRANGEMENT PLAN
C-15-07	SOIL STORAGE YARD GRADING PLAN
S-15-01	CONSTRUCTION HEADQUARTERS DECONTAMINATION PAD PLAN
S-15-02	CONSTRUCTION HEADQUARTERS DECONTAMINATION PAD DETAILS
M-15-01	CONSTRUCTION HEADQUARTERS MECHANICAL PIPING PLAN
M-15-02	CONSTRUCTION HEADQUARTERS MECHANICAL DETAILS
E-15-01	CONSTRUCTION HEADQUARTERS LOAD SCHEDULE
E-15-02	CONSTRUCTION HEADQUARTERS SINGLE LINE DIAGRAM
E-15-03	CONSTRUCTION HEADQUARTERS ELECTRICAL PLAN

16 - MONITORING WELLS

DRAWING NUMBER	DRAWING TITLE
C-16-01	MONITORING WELLS WELL DESIGNS
C-16-02	MONITORING WELLS PROPRIETARY MULTI-LEVEL WELL DESIGNS
C-16-03	MONITORING WELLS WELL HEAD DESIGNS
E-16-01	MONITORING WELLS DATA COLLECTION STATIONS SITE PLAN
E-16-02	DATA COLLECTION PANEL MONITORING WELL ELEVATION (TYPICAL)
E-16-03	DATA COLLECTION PANEL RADIO MONITORING WELL ELEVATION (TYPICAL)
E-16-04	MONITORING WELL DATA COLLECTION SYSTEM SHEET 1
E-16-05	MONITORING WELL DATA COLLECTION SYSTEM SHEET 2
E-16-06	MONITORING WELL DATA COLLECTION SYSTEM SHEET 3
E-16-07	MONITORING WELL DATA COLLECTION SYSTEM SHEET 4
E-16-08	MONITORING WELL DATA COLLECTION SYSTEM SHEET 5
E-16-09	MONITORING WELL DATA COLLECTION SYSTEM SHEET 6
E-16-10	MONITORING WELL DATA COLLECTION SYSTEM SHEET 7
E-16-11	MONITORING WELL DATA COLLECTION SYSTEM SHEET 8
E-16-12	MONITORING WELL DATA COLLECTION SYSTEM SHEET 9
E-16-13	MONITORING WELL DATA COLLECTION SYSTEM SHEET 10
E-16-14	MONITORING WELL DATA COLLECTION SYSTEM SHEET 11
E-16-15	MONITORING WELL DATA COLLECTION SYSTEM SHEET 12
E-16-16	MONITORING WELL DATA COLLECTION SYSTEM SHEET 13
E-16-17	MONITORING WELL DATA COLLECTION SYSTEM SHEET 14
E-16-18	MONITORING WELL DATA COLLECTION SYSTEM SHEET 15
E-16-19	MONITORING WELL DATA COLLECTION SYSTEM SHEET 16
E-16-20	MONITORING WELL DATA COLLECTION SYSTEM SHEET 17
E-16-21	MONITORING WELL DATA COLLECTION SYSTEM SHEET 18
E-16-22	MONITORING WELL DATA COLLECTION SYSTEM SHEET 19
E-16-23	MONITORING WELL DATA COLLECTION SYSTEM SHEET 20
E-16-24	MONITORING WELL DATA COLLECTION SYSTEM SHEET 21
E-16-25	MONITORING WELL DATA COLLECTION SYSTEM SHEET 22

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TOPOCK GROUNDWATER REMEDIATION PROJECT
GENERAL
DRAWING INDEX 3
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
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STANDARD ABBREVIATIONS

<	ANGLE
@	AT
AB	ANCHOR BOLT
ABDN	ABANDONED
ABS	ACRYLONITRILE-BUTADIENE-STYRENE
AC	ASBESTOS CEMENT, ASPHALTIC CONCRETE
ACBD	ACOUSTICAL BOARD
ACI	AMERICAN CONCRETE INSTITUTE
ACST	ACOUSTICAL TILE
ACT	ACOUSTICAL
ACU	AIR CONDITIONING UNIT
AD	AREA DRAIN
ADDL	ADDITIONAL
ADJ	ADJACENT, ADJUSTABLE
ADPTR	ADAPTER
AG	ABOVE GROUND
AGGR	AGGREGATE
AHR	ANCHOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AL	ALUMINUM
ALTN	ALTERNATE
ANDZ	ANODIZE
AP	ANGLE POINT
APPROX	APPROXIMATE
APVD	APPROVED
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ASSY	ASSEMBLY
ASU	AIR SUPPLY UNIT
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
BA	BRIDGE ATTACHMENT
BC	BEGIN CURVE
BCW	BAT CAVE WASH
BETW	BETWEEN
BF	BOTTOM FACE, BLIND FLANGE
BJ	BORE AND JACK
BLDG	BUILDING
BM	BENCH MARK, BEAM
BNSF	BURLINGTON NORTHERN SANTA FE
BOP	BOTTOM OF PIPE
BOL	BOTTOM OF LINE
BOT	BOTTOM
BR	BROMINE
BRG	BEARING
BSMT	BASEMENT
BVC	BEGINNING OF VERTICAL CURVE
BW	BACKWASH
C	CHANNEL BEAM
C TO C	CENTER TO CENTER
	CENTER ANGLE
°C	DEGREE CELSIUS
CA	CARBON AMENDED, CARBON AMENDMENT
CARV	COMBINATION AIR RELEASE VALVE
CAV	COMBINATION AIR RELEASE VALVE
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CEM PLAS	CEMENT PLASTER
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
C.G.	CENTER GRADE
C & G	CURB & GUTTER
CHAN	CHANNEL
CHEM	CHEMICAL
CHKD	CHECKERED
CI	CAST IRON
CIMJ	CAST IRON MECHANICAL JOINT
CIP	CLEAN IN PLACE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL	CENTERLINE
CLDI	CEMENT LINED DUCTILE IRON
CLG	CEILING
CLO	CLOSET
CLP	CLAY PIPE
CLR	CLEAR, CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMC	CEMENT MORTAR COATING
CML	CEMENT MORTAR LINING
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
COMP	COMPRESSOR STATION
CONC	CONCRETE
CONN	CONNECTION, CONNECT
CONST	CONSTRUCTION
CONT	CONTINUOUS, CONTINUE
CONTR	CONTRACTOR
COORD	COORDINATE
COP	COPPER
COR	CORNER
CORR	CORRUGATED
CP	CONCRETE PIPE, CONTROL PANEL, CONTROL POINT
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CRS	COLD ROLLED STEEL
CTR	CENTER
CTRD	CENTERED
CTSK	COUNTERSUNK
CU	CUBIC
CU FT	CUBIC FOOT
CU IN	CUBIC INCH
CU YD	CUBIC YARD
CULV	CULVERT
CYL	CYLINDER
d	PENNY (NAIL SIZE)
DB	DISTRIBUTION BOX
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DECHLOR	DECHLORINATION
DET	DETAIL
DF	DOUGLAS FIR
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DIAG	DIAGONAL
DIL	DILUTE
DIM	DIMENSION
DIMJ	DUCTILE IRON MECHANICAL JOINT
DIMJGL	DUCTILE IRON MECHANICAL JOINT, GLASS LINED
DIP	DUCTILE IRON PIPE
DIPFGL	DUCTILE IRON PIPE, FLANGED, GLASS LINED
DIR	DIRECTION
DISCH	DISCHARGE
DISCH	DISCHARGE
DMU	DRAINAGE MANAGEMENT UNIT
DML	DRAINWATER MAINLINE
DR	DRAIN
DRWR	DRAWER
DS	DOWNSPOUT
DW	DRAIN WATER
DWG	DRAWING
DWL	DOWEL
E	EAST, ELECTRICAL
EA	EACH
EC	END CURVE
ECC	ECCENTRIC
EF	EACH FACE, EXHAUST FAN
EFL	EFFLUENT
EIR	ENVIRONMENTAL IMPACT REPORT
EL	ELEVATION
ELB	ELBOW
ELC	ELECTRICAL LOAD CENTER
ELEC	ELECTRIC, ELECTRICAL
EMBED	ELECTRIC, ELECTRICAL
ENGR	ENGINEER
EOH	ELECTRICAL OVERHEAD
EQL	EQUAL
EQL SP	EQUALLY SPACED
EQPT	EQUIPMENT
EQUIV	EQUIVALENT
ETOH	ETHANOL
EVC	END OF VERTICAL CURVE
EW	EACH WAY, EXTRACTION WELL
EX	EXTRACTION
EXH	EXHAUST
EXP	EXPOSED, EXPANSION
EXP JT	EXPANSION JOINT
EXST	EXISTING
EXT	EXTERIOR, EXTERNAL
F FL EL	FINISHED FLOOR ELEVATION
°F	DEGREE FAHRENHEIT
FAB	FABRICATION, FABRICATE
FACIL	FACILITY
FBDR	FILTER BACKWASH DRAIN
FC	FLEXIBLE COUPLING
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN
FDA	FLOOR DRAIN W/INTEGRAL TRAP
FDN	FOUNDATION
FEXT	FIRE EXTINGUISHER
FF	FINISH FLOOR
FG	FINISH GRADE
FHT	FEMALE HOSE THREAD
FHY	FIRE HYDRANT
FIG	FIGURE
FIN	FINISH
FIPT	FEMALE IRON PIPE THREAD
FLEX	FLEXIBLE
FLG	FLANGE
FLH	FLAT HEAD
FLL	FLOW LINE ELEVATION
FLR	FLOOR
FLTR	FILTER
FNPT	FEMALE NATIONAL PIPE THREAD
FNSH	FINISH
FOC	FIBER OPTIC CONDUIT
FP	FIXED POINT, FLAT PANEL
FPW	FIRE PROTECTION WATER
FRP	FIBERGLASS REINFORCED FLOODPLAIN PLASTIC
FS	FINISH SLAB, FERTIGATION SOLUTION
FT	FOOT OR FEET
FTG	FOOTING
FW	FRESH WATER
FWD	FORWARD
G	GAS
GA	GAGE, GAUGE
GAL	GALLON
GALV	GALVANIZED
GALVI	GALVANIZED IRON
GALVS	GALVANIZED (HOT DIP) STEEL
GB	GRAB BAR, GRADE BREAK
GC	GROOVED COUPLING
GCF	GROOVED COUPLING FITTING
GL	GLASS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSP	GALVANIZED STEEL PIPE
GVL	GRAVEL
GWD	GYPSUM WALLBOARD
GYP	GYPSUM
GYP PLAS	GYPSUM PLASTER
H.A.S.	HEADED ANCHOR STUD
HB	HOSE BIB
HD	HUB DRAIN
HDNR	HARDENER
HDPE	HIGH DENSITY POLYETHYLENE
HDR	HEADER
HDW	HARDWARE
HGT	HEIGHT
HK	HOOK
HLA	HIGH LEVEL ALARM
HM	HOLLOW METAL
HNWR	HAVASU NATIONAL WILDLIFE REFUGE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HR	HOSE RACK, HOUR
HT	HEAT TRACE
HV	HOSE VALVE
HWL	HIGH WATER LEVEL
HWS	HIGH WATER SURFACE
HWY	HIGHWAY
I & C	INSTRUMENTATION AND CONTROL
ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCH
INFL	INFLUENT
INJ	INJECTION
INSTL	INSTALL
INSTM	INSTRUMENTATION
INSUL	INSULATION
INVT	INVERT
IPS	IRON PIPE SIZE
IRZ	IN-SITU REACTIVE ZONE
ITG	INSULATED TEMPERED GLASS
IW	IRRIGATION WATER
JAN	JANITOR
JT	JOINT
KIP	THOUSAND POUNDS
KW	KILOWATT
L	LENGTH OF CURVE
LAB	LABORATORY
LAT	LATERAL DRAIN LINE
LAV	LAVATORY
LB	POUNDS
LB/CU FT	POUNDS PER CUBIC FOOT
LB/D	POUNDS PER DAY
LF	LINEAR FEET
LG	LONG
LLDPE	LINEAR LOW DENSITY POLYETHYLENE
LLV	LONG LEG VERTICAL
LNTL	LINTEL
LOC	LIMIT OF CONSTRUCTION
LONG	LONGITUDINAL
LP	LOCAL PANEL
LR	LONG RADIUS
LT	LIGHT, LEFT
LWL	LOW WATER LEVEL
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MG/L	MILLIGRAMS PER LITER
MH	MAINTENANCE HOLE
MHT	MALE HOSE THREAD
MIN	MINIMUM
MIPT	MALE IRON PIPE THREAD
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
MLVSS	
MNPT	MALE NATIONAL PIPE THREAD
MO	MASONRY OPENING
MON	MONUMENT
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTRG	METERING
MTS	MILL TYPE STEEL
MW	MONITORING WELL
MWS	MAXIMUM WATER SURFACE
N	NORTH
N/A	NOT APPLICABLE
NE	NORTHEAST
NIC	NOT IN CONTRACT
NO.	NUMBER
NOM	NOMINAL
NORM	NORMAL
NTH	NATIONAL TRAILS HIGHWAY
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
O TO O	OUT TO OUT
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OF	OUTSIDE FACE, OVERFLOW
O/H	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OSD	OPEN SITE DRAIN
OVFL	OVERFLOW
OZ	OUNCE
P	PILASTER
PBD	PARTICLE BOARD
P & ID	PROCESS AND INSTRUMENTATION DIAGRAM
PC	POINT OF CURVE
PCC	PORTLAND CEMENT CONCRETE
PE	PLAIN END, POLYETHYLENE
PEN	PENETRATE
PERF	PERFORATED
PERP	PERPENDICULAR
PF	PARTIAL FLUME
PI	POINT OF INTERSECTION
PIP	PLASTIC IRRIGATION PIPE
PJF	PREMOLDED JOINT FILLER
PKG	PACKAGE
PL	PLATE (STEEL)
PLAM	PLASTIC LAMINATE
PLYWD	PLYWOOD
PMP	PLANT MONITORING PANEL, PUMP
PNL	PANEL
POC	POINT ON CURVE
POT	POINT ON TANGENT
PP	POLYPROPYLENE
PPL	POLYPROPYLENE LINED
PR	PAIR
PRCST	PRECAST
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARE
PRESS	PRESSURE
PRI	PRIMARY
PROP	PROPERTY
PS	PUMP STATION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH, ABSOLUTE
PSIG	POUNDS PER SQUARE INCH, GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE, POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENCY
PWR	POWER
QUAD	QUADRANT
R	RISER
R	R-VALUE (INSULATION)
RA	RETURN AIR
RAD	RADIUS
RAV	RAVINE
RB	RIVERBANK
RC	RELATIVE COMPACTION
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RDCR	REDUCER
RDW	REDWOOD
REF	REFER OR REFERENCE
REFR	REFRIGERATOR
REHAB	REHABILITATION
REINF	REINFORCED, REINFORCING, REINFORCE
RELOC	RELOCATE
REQD	REQUIRED
REV	REVISE
RESIL	RESILIENT
RGS	RIGID GALVANIZED STEEL CONDUIT
RH	RODHOLE
RL	RAIN LEADER
RLS	RUBBER LINED STEEL
RM	ROOM
RO	ROUGH OPENING
RST	REINFORCING STEEL
RT	RIGHT
RTN	RETURN
RV	ROOF VENT
RW	REMEDY WATER
R/W	RIGHT-OF-WAY
S	SOUTH, SLOPE
SAT	SUSPENDED ACOUSTICAL TILE
SC	SOLID CORE
SCFM	STANDARD CUBIC FEET PER MINUTE
SCHED	SCHEDULE
SD	STORM DRAIN, SOAP DISPENSER
SDR	STANDARD DIMENSION RATIO
SDWK	SIDEWALK
SEC	SECONDARY
SECT	SECTION
SEW	SEWAGE
SF	SHALLOW FLOOD
SG	SAFETY GLASS
SH	SHEET, SODIUM HYPOCHLORITE
SHLD	SHOULDER
SHS	SOLIDS HANDLING SYSTEM
SHTG	SHEETING
SIM	SIMILAR
SIP	STATE IMPLEMENTATION PLAN
SLP	SLOPE
SLV	SHORT LEG VERTICAL
S.O.	SHUTOFF
SOC	SOCKET
SOLN	SOLUTION
SP	SPACE OR SPACES
SPEC	SPECIFICATIONS
SPECD	SPECIFIED
SPG	SPACING
SPIG	SPIGOT
SPLY	SUPPLY
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SS	STAINLESS STEEL, SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STIF	STIFFENER
STL	STEEL
STOR	STORAGE
STR	STRAIGHT
STRL	STRUCTURAL
STRUCT	STRUCTURE
SUSP	SUSPEND
SUPP	SUPPLEMENTAL
SYMM	SYMMETRICAL
SW	SETTLED WATER
T	TANGENT LENGTH, TREAD, TELEPHONE, TURNOUT, THICKNESS
TAN	TANGENT
T & B	TOP AND BOTTOM
TBG	TUBING
TC	TOP OF CONCRETE, CURB
TCS	TOPOCK COMPRESSOR STATION
TDH	TOTAL DYNAMIC HEAD
TECH	TECHNICAL
TEMP	TEMPERATURE, TEMPORARY
TF	TOP FACE
TG	TEMPERED GLASS
THD	THREAD
THK	THICKNESS, THICK
THRD	THREADED
THRU	THROUGH
T.O.	TOP OF, TURNOUT
TOH	TELEPHONE OVERHEAD
TP	TURNING POINT
TPD	TONS PER DAY
TPI	TURNOUT POINT OF INTERSECTION
TRANSV	TRANSVERSE
TRL	THRUST RESTRAINED LENGTH
TRW	TREATED WATER
TSS	TOTAL SUSPENDED SOLIDS
TST	TOP OF STEEL
TT	THRUST TIE, TEFLON TUBING
TW	TOP OF WALL, TAILWATER, CONDITIONED WATER, TRANSWESTERN
TWPS	TAILWATER PUMP STATION
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
ULT	ULTIMATE
UC	UNDERCOAT
UPGRAD	UPGRADIENT
UT	UNDERGROUND TRENCH
UV	ULTRAVIOLET
V	VENT, VOLT
VAC	VACUUM
VAT	VINYL ASBESTOS TILE
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VTR	VENT THRU ROOF
VWC	VINYL WALL COVERING
W	WIDE FLANGE (BEAM), WATTS, WEST
W SH ST	WEATHERING SHEET STEEL
WD	WOOD
W/F	WATTS PER FOOT
WG	WIRE GLASS
WH	WATER HEATER
WK	WEEK
WR	WASTE RECEPTACLE
WR GWB	WATER RESISTANT GYPSUM WALLBOARD
WS	WATER STOP OR WATER SURFACE
WSTL	WELDED STEEL
WSP	WELDED STEEL PIPE
WT	WEIGHT
WTR	WATER
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
W/	WITH
W/O	WITHOUT
"WG	INCHES WATER GAGE
XFMR	TRANSFORMER
YD	YARD
YR	YEAR

NOTES:

1. STANDARD ABBREVIATIONS ARE SHOWN. THEREFORE, SOME ABBREVIATIONS MAY NOT BE USED ON THE DRAWINGS. FOR ABBREVIATIONS NOT LISTED, SEE "ABBREVIATIONS FOR USE ON DRAWINGS AND TEXT", PUBLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI).

2. ADDITIONAL ABBREVIATIONS FOR SPECIALIZED WORK DIVISIONS (ELECTRICAL, ETC.) ARE SHOWN ON OTHER LEGEND SHEETS.

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SO	
SUPV	
DSGN	JU
DWN	CW
CHKD	JP
OK	JP
DATE	9/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

ABBREVIATIONS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	

G-00-06 REV 2

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GENERAL SYMBOLS

(NOTE: SEE ABBREVIATIONS FOR PIPE LABELS)

- DIRT ROAD
- AGGREGATE BASE
- CONCRETE ROAD
- ASPHALTIC CONCRETE PAVING
- GRAVEL
- NEW CONCRETE
- MASONRY OR CONCRETE BLOCK
- GRATING
- CHECKERED PLATE
- STEEL
- ALUMINUM
- OPENING OR DEPRESSION IN SLAB OR WALL
- SURVEYED POINT (1095 / 5.46 / EG)
- FINISH GRADE SPOT ELEVATION (× 5.46 / EG)
- EXISTING CONTOUR (5)
- GROUND LINE
- BUSHES OR TREE LINE
- TREE WITH TRUNK DIA. (26")
- TREE TO BE REMOVED (12")
- CAR
- VAN
- PROPERTY LINE (PL)
- EXISTING CYCLONE FENCE
- EXISTING FENCE
- NEW FENCE
- FENCE TO BE REMOVED
- TO BE DEMOLISHED
- TO BE ABANDONED
- BLOWOFF STATION
- COMBINATION AIR RELEASE VALVE
- WELL LOCATION (FW-INJ-XX)

- CENTER LINE
- DIAMETER (ø)
- ANGLE
- AT (@)
- TRAFFIC SIGNAL
- NUMBER (#)
- EXISTING CATCH BASIN OR INLET (C.B.)
- NEW CATCH BASIN OR INLET (C.B.)
- TEST BORINGS (SB OR B), DRILL HOLE (DH) (SB-1)
- PAVEMENT BENCH MARK OR SURVEY MONUMENT (B.M.)
- WATER METER (W.M.)
- GAS METER (G.M.)
- SERVICE WYE
- SERVICE WYE AND LATERAL
- CLEAN OUT (C.O.)
- VALVES (EXIST. UTILITIES)
- TELEPHONE, POWER OR LIGHT POLE (J.P.)
- GUY WIRE (GUY)
- GATE VALVE
- GLOBE VALVE
- PLUG VALVE
- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- ANGLE VALVE
- PRESSURE REDUCING VALVE W/ EXTERNAL PRESSURE TAP
- PRESSURE REDUCING VALVE, SELF CONTAINED
- PRESSURE SAFETY VALVE

- SLIDE OR STOP GATE
- ORIFICE VALVE
- S OR M — S = SOLENOID OPERATED VALVE; M = MOTOR OPERATED VALVE
- PISTON OPERATED VALVE
- DIAPHRAGM OPERATED VALVE
- TELESCOPING VALVE
- STRAINER
- COMBINATION AIR VALVE
- EXISTING UNDERGROUND LINE
- NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- NEW ABOVE GROUND LINE
- EXISTING BORE AND JACK
- NEW BORE AND JACK
- EXISTING BRIDGE ATTACHMENT
- NEW BRIDGE ATTACHMENT

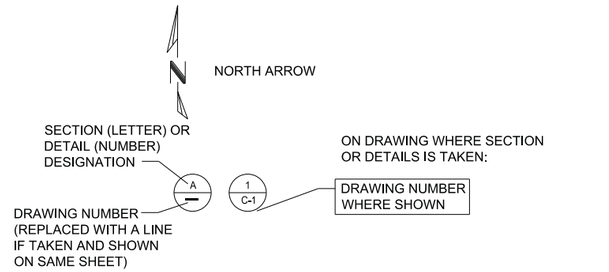
CIVIL LEGEND

- 10+00 — TRENCH ALIGNMENT AND STATIONING
- NEW INJECTION WELL
- FUTURE INJECTION WELL
- NEW EXTRACTION WELL
- EXISTING EXTRACTION WELL
- FUTURE EXTRACTION WELL
- IN-SITU REDUCTION ZONE WELL
- FUTURE IN-SITU REDUCTION ZONE WELL
- MONITORING WELL
- OFFSET PIPE AND TRENCH TO IRZ WELL
- CAPPED OFFSET PIPE (FUTURE CONNECTION)
- CONCRETE VAULT BOX (SEE NOTE 1)
- XFMR 004 — TRANSFORMER (APPROX. LOCATION)
- BURY TRENCH AND ELECTRIC HAND HOLE
- P1-1 — ELECTRICAL NODE AND SECTION (SEE NOTE 2)

UTILITY KEY:

- FOUND LAND MONUMENT
- E — ELECTRIC
- G — GAS
- T(OH) — TELECOMM
- T — TELECOMM (UNDERGROUND)
- W — WATER

SECTION / DETAIL DESIGNATIONS



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SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

GENERAL LEGENDS AND SYMBOLS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
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LEGEND

- FRESH WATER LINE (NEW)
- REMEDY PRODUCED WATER (NEW)
- FRESH WATER LINE (EXISTING)
- PUMP
- PUMP (EXISTING)
- WELL
- WELL (EXISITING)
- CONTROL VALVE
- STORAGE TANK (NEW)
- STORAGE TANK (EXISTING)

IRL-1
IRL-2
IRL-3
IRL-4
FW-1
TCS-1
TCS-2
IRZ-11
IRZ-13, 15
IRZ-16, 17, 19, 20, 21
IRZ-25, 27
IRZ-29, 31
IRZ-33, 35, 37
IRZ-39
CLEAN-IN-PLACE FRAC TANK
CARBON AMENDMENT FACILITIES AT MW-20 (SEE SHEETS G-05-01 AND G-06-01)
TO CARBON AMENDMENT FACILITIES AT TRANS-WESTERN BENCH (SEE SHEET G-03-01)
NEW FRESHWATER STORAGE TANK (10,000GAL)
TO TCS
FW-2
TO REMEDY- PRODUCED WATER CONDITIONING PLANT(SEE SHEET G-12-01)
COLORADO RIVER
CALIFORNIA
ARIZONA
SITE B WELL
CONTINGENT THIS PIPELINE AND WELL MAY BE CONSTRUCTED
HNWR-1A WELL
HNWR-1 WELL

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CHKD	VMB
OK	VMB
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TOPOCK GROUNDWATER REMEDIATION PROJECT

PROCESS SCHEMATIC FOR FRESH WATER INJECTION AND REMEDY - PRODUCED WATER

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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BILL OF MATL	
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GEN ERAL NOTES

1. THE PROJECT AREA IS ELIGIBLE FOR LISTING ON THE NATIONAL REGISTER AS A TRADITIONAL CULTURAL PROPERTY AND/OR CONSIDERED A SACRED PLACE BY AREA AMERICAN INDIAN TRIBES; ALL WORKERS ARE SUBJECT TO SENSITIVITY TRAINING BEFORE WORKING IN THE FIELD.

2. LOCATION OF UTILITIES HAS BEEN DETERMINED FROM BEST AVAILABLE INFORMATION. HOWEVER, ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN IS NOT GUARANTEED. FIELD VERIFY THE LOCATION OF UTILITIES PRIOR TO CONSTRUCTION (BY POTHOLING WITH SOFT DIG METHODS). UTILITIES SHOWN ON THE DRAWINGS ARE UNDERGROUND UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL CONTACT THE FOLLOWING RESPECTIVE PARTIES FOR LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS IN ADVANCE OF INTRUSIVE FIELD WORK :
   a. UNDERGROUND SERVICE ALERT (USA) (800) 643-2444
   b. PACIFIC GAS AND ELECTRIC (PG&E) (800) 743-5000
   c. ARIZONA BLUE STAKE (800) 782-5348

3. ANY DAMAGE TO EXISTING PIPELINES AND OTHER IMPROVEMENTS NOT SCHEDULED FOR REPLACEMENT AS PART OF THIS WORK, DUE TO CONSTRUCTION ACTIVITIES, SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER

4. MANAGEMENT OF DISPLACED SOILS SHALL BE IN ACCORDANCE WITH THE SOIL MANAGEMENT PLAN AND PROTOCOL FOR HANDLING AND DISPOSITION OF DISPLACED SITE MATERIALS (INCLUDED AS APPENDIX TO THE CONSTRUCTION/REMEDIAL WORK PLAN).

5. PERFORM POT-HOLING UNDER THE PRESENCE AND SUPERVISION OF THE OWNER'S REPRESENTATIVE AND RESPECTIVE UTILITY REPRESENTATIVES. HAND DIGGING MAY BE REQUIRED IN AREAS WHERE BURIED FACILITIES ARE LOCATED. COMPRESSOR STATION PROTOCOL REQUIRES ALL INTRUSIVE WORK INSIDE THE STATION FENCE LINE BE PERFORMED BY HYDRO VACUUM OR HAND EXCAVATION METHODS.

6. WHERE TEMPORARY OR PERMANENT RELOCATION OF EXISTING UNDERGROUND OR OVERHEAD UTILITIES IS REQUIRED, TAKE NECESSARY STEPS TO ENSURE THAT CONTINUOUS SERVICE IS MAINTAINED IN A MANNER APPROVED BY THE AFFECTED UTILITY AND IN ACCORDANCE WITH APPLICABLE COUNTY AND STATE PUBLIC HEALTH REGULATIONS. BEAR ALL COSTS ASSOCIATED WITH RELOCATION AND MAINTENANCE OF SERVICE, EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS OR SPECIFICATIONS.

7. THE OWNER HAS ACQUIRED ACCESS FOR CONSTRUCTION SEE THE SPECIFICATIONS, FOR ANY REQUIREMENTS PERTAINING TO ACCESS. IFADDITIONAL ACCESS FOR STORAGE OR CONSTRUCTION OPERATIONS ARE REQUIRED OR DESIRED, CONTACT PG&E REPRESENTATIVE.

8. PLACE EROSION AND SILTATION CONTROL MEASURES PRIOR TO OR AS FIRST STEP IN GRADING.

9. DURING CONSTRUCTION, PROTECT EXISTING STORM SEWER AND DRAIN INLETS AND NEWLY CONSTRUCTED MANHOLES AND UNDERGROUND VAULTS BY SILT TRAPS. MAINTAIN AND MODIFY PROTECTIVE MEASURES AS CONSTRUCTION PROGRESSES.

10. RESTORE EXISTING NATURAL DRAINAGE DITCHES AND STREAM BANKS DISTURBED DURING CONSTRUCTION TO ORIGINAL ALIGNMENT, GRADE AND INVERT, EXCEPT WHERE OTHERWISE INDICATED. EMPLOY EROSION CONTROL MEASURES AS SPECIFIED.

11. PROVIDE 3 FEET MINIMUM COVER OVER TOP OF PIPE UNLESS OTHERWISE SPECIFICALLY SHOWN ON THE PIPELINE DRAWINGS

12. RESTRAINED (WELDED OR MECHANICALLY JOINED) PIPE JOINTS ARE USED FOR RESISTANCE TO THRUST AT PIPE BENDS AND FOR PROTECTION OF PARALLEL WATER MAINS. MINIMUM LIMITS OF RESTRAINED JOINTS ARE SHOWN ON THE DRAWINGS. SHOULD A CHANGE IN ALIGNMENT OCCUR THAT RESULTS IN CHANGED OR ADDED PIPE BENDS OR RW/TW PIPELINE TO BE CLOSER THAN 5 FEET TO A PARALLEL WATER MAIN, PROVIDE ADDITIONAL WELDED PIPE JOINTS AS REQUIRED AND DIRECTED BY OWNER.

13. WHERE PIPELINE CROSSES WATER MAINS, AVOID IF POSSIBLE INSTALLING PIPE JOINT WITHIN 10 FOOT DISTANCE OF EACH SIDE OF CROSSING WATER MAIN. IF A JOINT IN THIS ZONE IS UNAVOIDABLE, INSTALL WELDED JOINT ONLY. REPLACE ALL SEVERED OR DAMAGED MAINS CROSSING CONSTRUCTION TRENCHES UNDER INSPECTION OF THE ENTITY HAVING JURISDICTION. PERFORM EXCAVATION, PIPE INSTALLATION, BACKFILL COMPACTION AND RESTORATION WORK NECESSARY FOR REPLACEMENT AT NO ADDITIONAL EXPENSE TO THE OWNER.

14. VERTICAL CONTROL: PIPE CENTERLINE IS INDICATED ON THE DRAWINGS. IT IS THE INTENT OF THESE DRAWINGS THAT PIPE CENTERLINE ELEVATIONS SHOWN AT VERTICAL ANGLE POINTS EXCEPT WHERE A FITTING IS SPECIFICALLY INDICATED, ARE FOR THE PURPOSE OF ESTABLISHING A P.I. FOR VERTICAL CURVES USING JOINT DEFLECTION. WHERE THE VERTICAL P.I. SHOWN WOULD CREATE A CONFLICT WITH THE STATED MINIMUM COVER, THE MINIMUM COVER HAS PRECEDENCE. PIPE SLOPES SHOWN ARE FOR INFORMATION ONLY, INVERT ELEVATIONS NOTE CONTROL.

15. UNLESS OTHERWISE NOTED, ELEVATIONS SHOWN ON THE SE DRAWINGS ARE BASED ON NAVD88, DATA SHEETS EU1248 AND EU0763 IN US SURVEY FEET

16. HORIZONTAL CONTROL. THE BEARINGS AND DISTANCES SHOWN ARE BASED UPON 1983 STATE PLANE GROUND COORDINATES, ZONE 5 (NAD1983, STATE PLANE, CALIFORNIA V, FIPS, 0405) STANDARD TRAN SVERSE MERCATOR PROJECTION. GRID ADJUSTMENT FACTOR OF 1.000123 FOR X=0.0000 AND Y= 0.0000

17. HORIZONTAL CONTROL POINTS ARE INDICATED ON THE DRAWINGS FOR THE PURPOSE OF DEFINING A SPECIFIC, REQUIRED ALIGNMENT. WHERE PERMITTED ON A CASE -BY -CASE BASIS, THE HORIZONTAL CONTROL POINTS MAY BE USED AS A P.I. FOR HORIZONTAL CURVES PROVIDED THE RESULTING PIPELINE ALIGNMENT DOES NOT COME CLOSER THAN 5 FEET FROM ANY PARALLEL WATER MAIN EXCEPT AS OTHERWISE NOTED. CONSTRUCT HORIZONTAL CURVES BY DEFLECTING PIPE JOINTS PRIOR TO WELDING. DO NOT EXCEED MAXIMUM ALLOWABLE JOINT DEFLECTION SHOWN IN SPECIFICATIONS.

18. REPLACE ALL ROAD SURFACE, BERMS AND FENCING DAMAGED DURING CONSTRUCTION, AS PER SPECIFICATIONS AND DRAWINGS.

19. LOCATE COMBINATION AIR RELEASE AND VACUUM VALVE ASSEMBLIES AND AIR RELEASE ASSEMBLIES AT HIGH POINTS IN PIPING AS SHOWN ON THE DRAWINGS. INSTALL PIPE TO SLOPE CONTINUOUSLY AWAY (DOWN) FROM THE STATION MARK FOR THE VALVE INSTALLATION FROM BOTH SIDES. LOCATE BLOW OFF -ASSEMBLIES, WHERE SHOWN ON THE DRAWINGS, AT LOW POINTS IN THE PIPING. INSTALL PIPE TO SLOPE CONTINUOUSLY TOWARD THE VALVE INSTALLATION FROM BOTH SIDES. OBTAIN OWNER VERIFICATION IN FIELD LOCATING OF ALL VALVE ASSEMBLIES BEFORE INSTALLING.

20. STORAGE OF PIPE OR OTHER MATERIALS ON PUBLIC RIGHTS-OF-WAY OR PR IVATE PROPERTY DURING NON WORKING HOURS WILL NOT BE PERMITTED EXCEPT WHERE AND WHEN SPECIFICALLY APPROVED BY THE OWNER.

21. EXISTING CONCRETE THRUST BLOCKS AND ANCHORS AT VALVES AND FITTINGS ON EXISTING UTILITIES ARE NOT SHOWN. REMOVE OR WORK AROUND, AS DETER MINED BY THE OWNER OR RESPECTIVE UTILITY, THRUST BLOCKS AND ANCHORS WHICH INTERFERE WITH THE WORK. INCLUDE ALL COSTS FOR SUCH WORK IN PROPOSAL.

22. REFER TO SPECIFICATIONS AND DRAWINGS FOR SPECIFIC PAVING REQUIREMENTS. IN CONJUNCTION WITH THE FINAL PAVING OPERATIONS:
    i. RESTORE SURVEY MONUMENTS DAMAGED AS A CONSEQUENCE OF CONSTRUCTION OPERATIONS.
    ii. RAISE TO FINISHED GRADE ALL METAL WORK (MANHOLE FRAME AND COVERS, VALVE BOXES, ETC.) EXISTING AND NEW, LOCATED IN AREAS PAVED AS PART OF THIS CONTRACT.
    iii. COMPLY WITH ALL THE GENERAL REQUIREMENTS AND REQUIREMENTS OF THE SPECIFICATION, REGARDING PROTECTION OF EXISTING IMPROVEMENTS.

23. MAINTAIN REQUIRED TRAFFIC CONTROL, INCLUDING SIGNAGE AND FLAGMEN, AT POINTS OF EGRESS FROM CONSTRUCTION SITE TO PUBLIC ROADS. COMPLY WITH SPECIFIED HAUL ROUTES.

24. WORK AND DISTURB GROUND ONLY WITHIN LIMITS SHOWN, SPECIFIED AND APPROVED BY OWNER. PRESERVE, PROTECT AND DO NOT ENTER AREAS OUTSIDE THOSE LIMITS. DO NOT DISTURB MORE GROUND OR VEGETATION THAN IS REQUIRED TO COMPLETE WORK.

25. VEHICLE BEDS, BOWLS OR BUCKETS MUST BE COVERED WHEN TRANSPORTING EARTHEN MATERIALS ON PAVED PUBLIC ROADS.

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0	11/18/11	PRELIMINARY (30%) DESIGN		PC	PT	PT	VMB

REVISIONS

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DSGN	PT
DWN	MD
CHKD	VMB
OK	VMB
DATE	09/08/14
SCALES	NTS

TOPOCK GROUNDWATER REMEDIATION PROJECT

GENERAL CIVIL NOTES

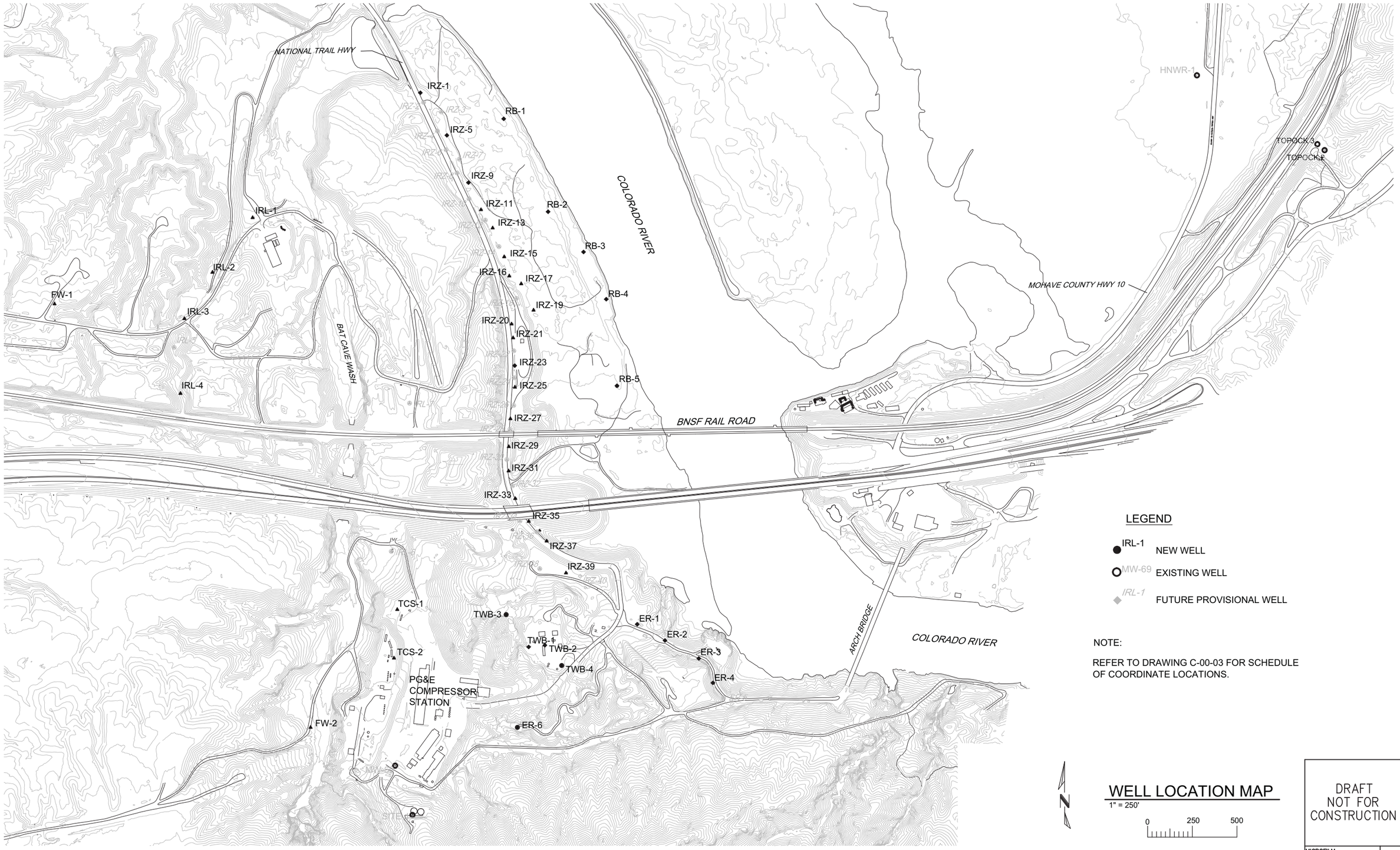
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
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LEGEND

- IRL-1 — NEW WELL
- MW-69 — EXISTING WELL
- IRL-1 — FUTURE PROVISIONAL WELL

NOTE:

REFER TO DRAWING C-00-03 FOR SCHEDULE OF COORDINATE LOCATIONS.

WELL LOCATION MAP

1" = 250'

0 250 500

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DATE	09/08/14
SCALES	1" = 250'

TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL LOCATION MAP

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
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SHEET NO. of	SHEETS
C-00-02	REV 2

N1808

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Inner Recirculation Loop

Well Location ID	Figure Coordinates		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well Count
	X	Y	Nominal	Minimum	Maximum		
River Bank Extraction Wells							
RB-1	7615764	2103918	25	25	170	1	0
RB-2	7616012	2103398	0	25	170	1	0
RB-3	7616211	2103173	50	25	170	1	0
RB-4	7616338	2102909	50	25	170	1	0
RB-5	7616398	2102424	25	25	170	1	0
Inner Recirculation Loop							
IRL-1	7614358	2103365	75	35	200	1	0
IRIL-2	7614133	2103058	75	35	200	1	0
IRL-3	7613976	2102799	100	35	200	1	0
IRL-4	7613954	2102381	200	35	200	1	0
IRL-5	*TBD*	*TBD*	*0*	*35*	*200*	*0*	*1*
IRL-6	*TBD*	*TBD*	*0*	*35*	*200*	*0*	*1*
IRL-7	*TBD*	*TBD*	*0*	*35*	*200*	*0*	*1*
					Total New Well Count	**9**	**3**

Freshwater Supply/Injection Wells

Well Location ID	Figure Coordinates		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well
	X	Y	Nominal	Minimum	Maximum		
Freshwater Injection Wells							
FW-1	7613249	2102882	100	50	200	1	0
FW-2	7614683	2100512	50	25	100	1	0
Freshwater Supply Wells							
HNWR-1 (existing well)	7619644	2104162		700		0	0
HNWR-1A	7619656	2104263		700		1	0
Site B	7619599	2107503		700		0	1
					Total New Well Count	**3**	**1**

TCS Recirculation Loop

Well Location ID	Figure Coordinates		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well
	X	Y	Nominal	Minimum	Maximum		
Transwestern Bench Extraction Wells							
TWB-1	7615903	2100962	13	1	15	1	0
TWB-2	7615994	2100972	9	1	15	1	0
TWB-3	*7615777*	*2101143*	*0*	*1*	*15*	*0*	*1*
TWB-4	*7616088*	*2100859*	*0*	*1*	*15*	*0*	*1*
East Ravine Extraction Wells							
ER-1	7616511	2101089	0.5			1	0
ER-2	7616666	2100999	0.5			1	0
ER-3	7616855	2100898	0.5	2 total	4 total	1	0
ER-4	7616935	2100761	0.5			1	0
ER-5	*7616995*	*2100678*	*0*	*1*	*1*	*0*	*1*
ER-6	7615840	2100512	3	1	5	1	0
TCS Injection Wells							
TCS-1	7615168	2101171	13.5	4	40	1	0
TCS-2	7615149	2100900	13.5	4	40	1	0
					Total New Well Count	**9**	**3**

National Trails Highway In-Situ Reactive Zone

Well Location ID	Figure Coordinates		Intermediate Injection/Extraction Rates (gpm)			Intermediate New Well Count	Intermediate Future Provisional Well Count
	X	Y	Nominal	Minimum	Maximum		
NTH IRZ Wells							
IRZ-1 (Extraction)	7615297	2104064	40	40	160	1	0
IRZ-2	*7615315*	*2104010*	*0*	*0*	*24*	*0*	*2*
IRZ-3	*7615416*	*2103957*	*0*	*0*	*24*	*0*	*2*
IRZ-4	*7615392*	*2103849*	*0*	*0*	*24*	*0*	*2*
IRZ-5 (Extraction)	7615445	2103826	80	40	160	1	0
IRZ-6	*7615441*	*2103745*	*0*	*0*	*24*	*0*	*2*
IRZ-7	*7615515*	*2103692*	*0*	*0*	*24*	*0*	*2*
IRZ-8	*7615502*	*2103615*	*0*	*0*	*24*	*0*	*2*
IRZ-9 (Extraction)	7615566	2103561	80	40	160	1	0
IRZ-10	*7615569*	*2103470*	*0*	*0*	*24*	*0*	*2*
IRZ-11	7615636	2103409	40	0	80	2	0
IRZ-12	*7615660*	*2103351*	*0*	*0*	*24*	*0*	*2*
IRZ-13	7615702	2103307	36	0	80	2	0
IRZ-14	*7615737*	*2103203*	*0*	*0*	*24*	*0*	*2*
IRZ-15	7615766	2103146	28	0	60	2	0
IRZ-16	7615794	2103038	24	0	60	2	0
IRZ-17	7615861	2102994	28	0	60	2	0
IRZ-18	*7615834*	*2102912*	*0*	*0*	*24*	*0*	*2*
IRZ-19	7615830	2102847	28	0	52	2	0
IRZ-20	7615808	2102769	16	0	52	2	0
IRZ-21	7615816	2102692	20	0	40	2	0
IRZ-22	*7615820*	*2102619*	*0*	*0*	*24*	*0*	*2*
IRZ-23 (Extraction)	7615825	2102535	100	40	160	1	0
IRZ-24	*7615822*	*2102468*	*0*	*0*	*26*	*0*	*1*
IRZ-25	7615826	2102416	16	0	36	1	0
IRZ-26	*7615819*	*2102314*	*0*	*0*	*26*	*0*	*1*
IRZ-27	7615801	2102239	16	0	36	1	0
IRZ-28	*7615798*	*2102180*	*0*	*0*	*26*	*0*	*1*
IRZ-29	7615792	2102083	14	0	30	1	0
IRZ-30	*7615781*	*2102011*	*0*	*0*	*26*	*0*	*1*
IRZ-31	7615791	2101947	12	0	26	1	0
IRZ-32	*7615813*	*2101863*	*0*	*0*	*26*	*0*	*1*
IRZ-33	7615828	2101793	8	0	26	1	0
IRZ-34	*7615854*	*2101667*	*0*	*0*	*26*	*0*	*1*
IRZ-35	7615904	2101665	6	0	15	1	0
IRZ-36	*7615949*	*2101606*	*0*	*0*	*25*	*0*	*1*
IRZ-37	7616004	2101555	4	0	10	1	0
IRZ-38	*7615965*	*2101400*	*0*	*0*	*25*	*0*	*1*
IRZ-39	7616112	2101376	4	0	5	1	0
IRZ-40 (Extraction)	*7616192*	*2101358*	*0*	*0*	*25*	*0*	*1*
Extraction Total			**300**	**200**	**400**	**4**	**1**
Injection Total			**300**	**200**	**400**	**24**	**30**
					Total New Well Count	**28**	**31**

Total Intermediate New Well Count for the Groundwater Remedy (excludes new monitoring well	**49**
Total Intermediate Future Provisional Well Count (excludes monitoring wells)	**38**

Future provisional wells are shown in italics

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Emeryville, CA 94608
(510) 652-1164

CH2MHILL.

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
2	9/8/14	PRE-FINAL (90%) DESIGN	PH	PT	PT	PT	VMB
1	4/5/13	INTERMEDIATE (60%) DESIGN	PC/EE	PT	PT	PT	VMB
0	11/18/11	PRELIMINARY (30%) DESIGN	EE	PT	PT	PT	VMB

REVISIONS

APPROVED BY	
SO	
SUPV	VMB
DSGN	PT
DWN	PC
CHKD	VMB
OK	VMB
DATE	09/08/14
SCALES	NTS

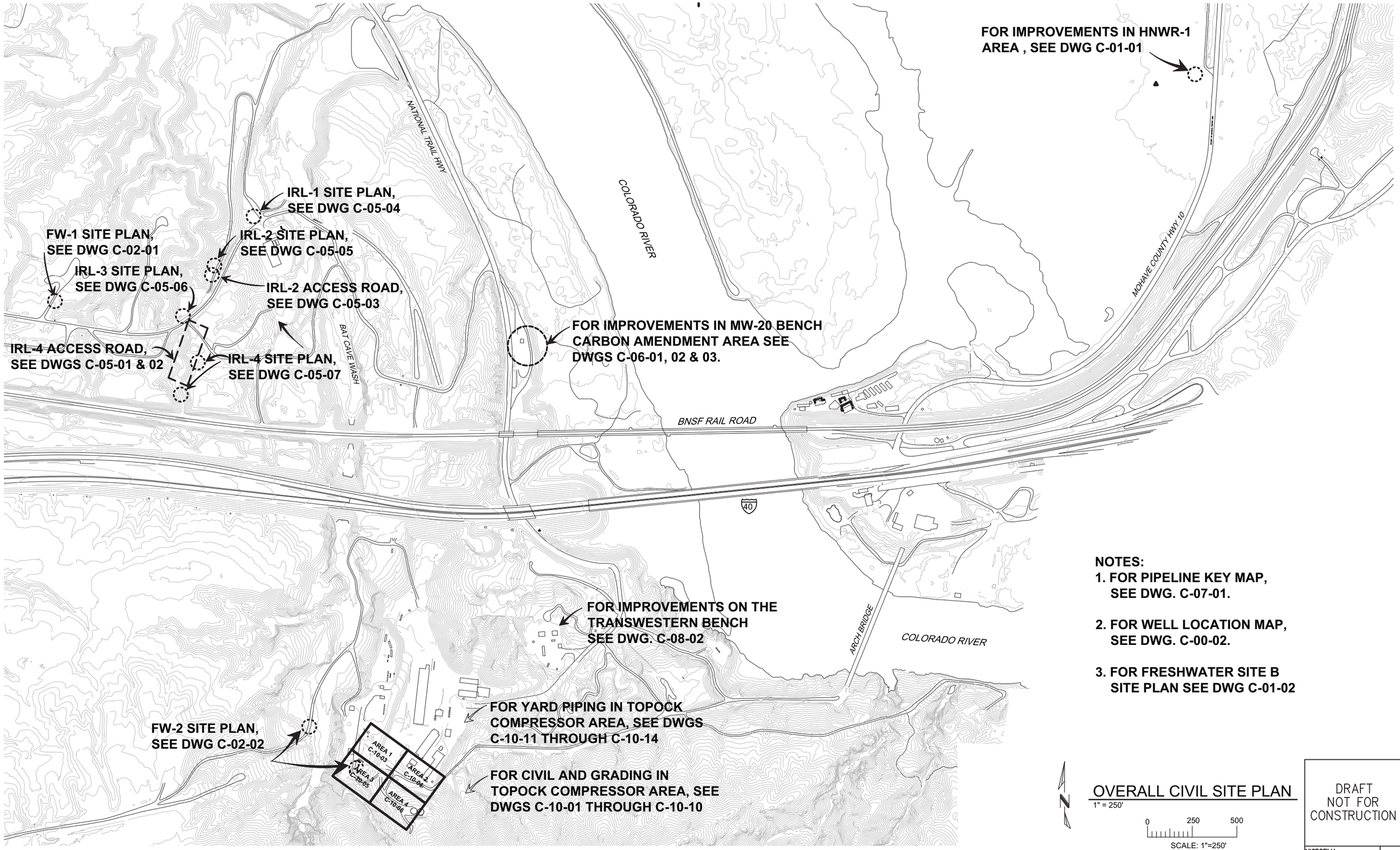
TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL SCHEDULE

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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BILL OF MATL	
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NOTES:

1. FOR PIPELINE KEY MAP, SEE DWG. C-07-01.
2. FOR WELL LOCATION MAP, SEE DWG. C-00-02.
3. FOR FRESHWATER SITE B SITE PLAN SEE DWG C-01-02

N

OVERALL CIVIL SITE PLAN

1" = 250'

0 250 500

SCALE: 1"=250'

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1	4/5/13	INTERMEDIATE (60%) DESIGN		PC/EE	VMB	VMB	VMB
0	11/18/11	PRELIMINARY (30%) DESIGN		EE	VMB	VMB	VMB

REVISIONS

APPROVED BY	
SO	
SUPV	VMB
DSGN	PT
DWN	PH
CHKD	VMB
OK	VMB
DATE	09/08/14
SCALES	1"=250'

TOPOCK GROUNDWATER REMEDIATION PROJECT

OVERALL CIVIL SITE PLAN

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

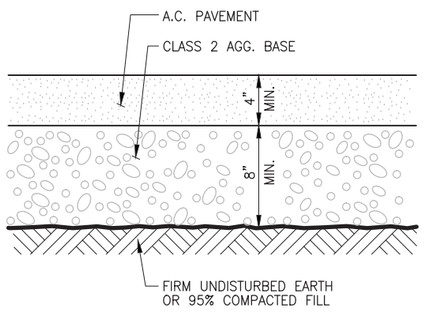
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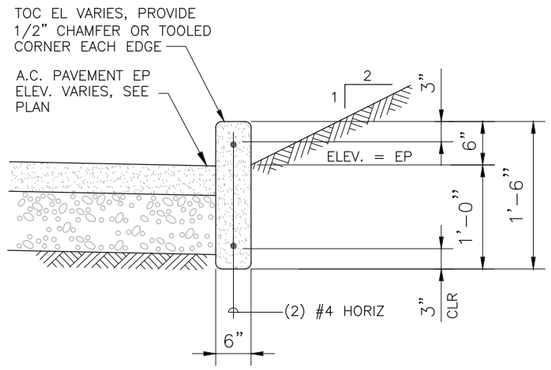
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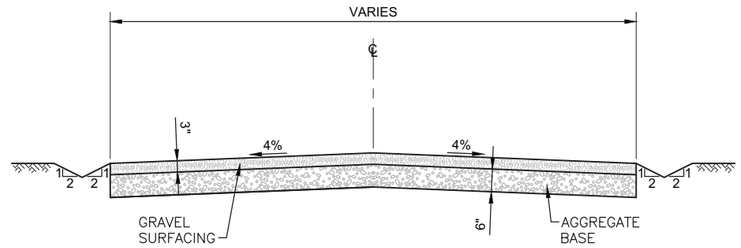
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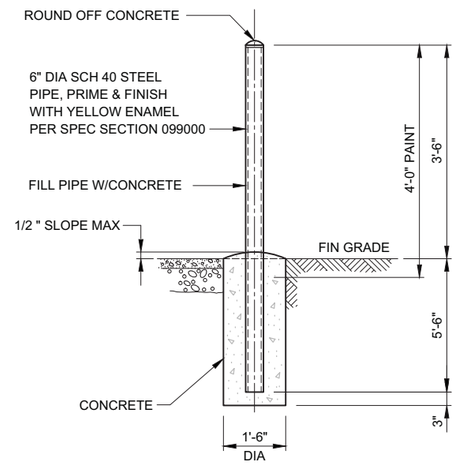
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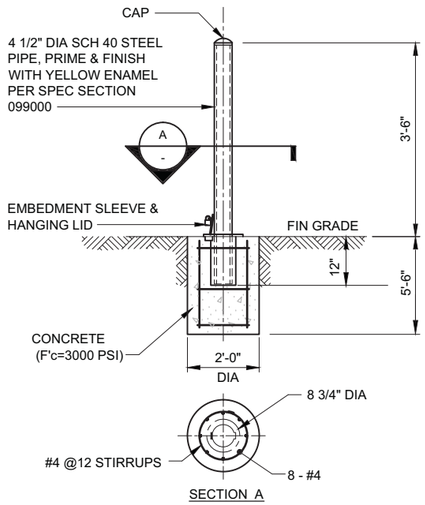
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3 GRAVEL ENTRANCE ROAD SECTION
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4 FIXED GUARD POST DETAIL
N.T.S.



5 REMOVABLE GUARD POST DETAIL
N.T.S.

TO BE ADDED LATER

6 TERMINATION DETAIL FOR PIPELINE B
N.T.S.

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0	9/8/14	PRE-FINAL (90%) DESIGN		PH	PT	PT	VMB

REVISIONS

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	SO	
	SUPV	VMB
	DSGN	PT
	DWN	PH
	CHKD	VMB
	OK	VMB
	DATE	09/08/14
	SCALES	NTS

TOPOCK GROUNDWATER REMEDIATION PROJECT
CIVIL DETAILS

GAS TRANSMISSION & DISTRIBUTION
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MICROFILM	
BILL OF MATL	
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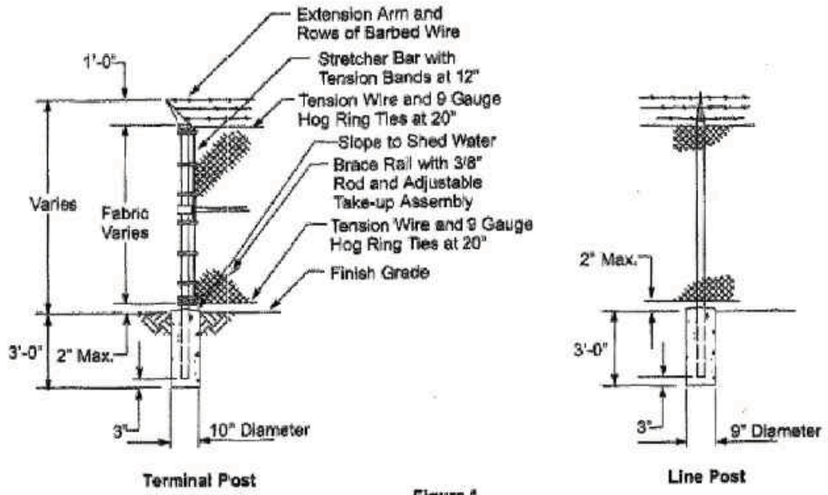


Figure 1
Chain-link Fabric Fence

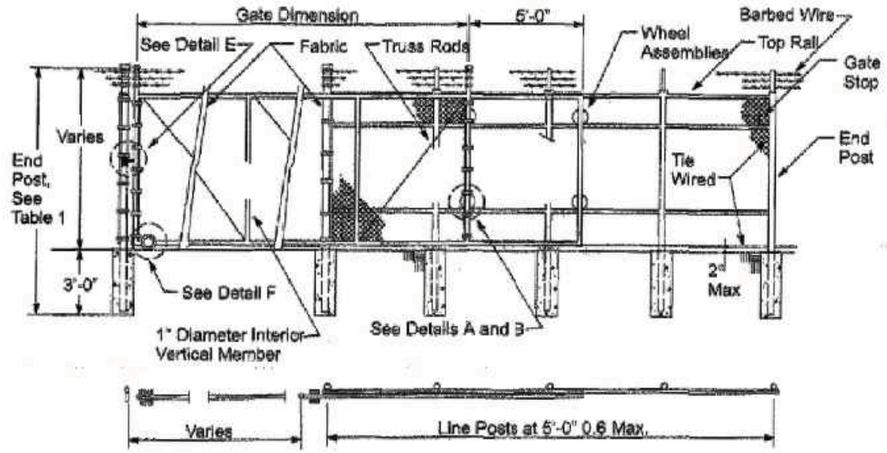


Figure 2
Sliding Gate (Plan) and Elevation

NOTE: THE FENCE AND GATES SHALL COMPLY WITH PG&E STANDARD L-50

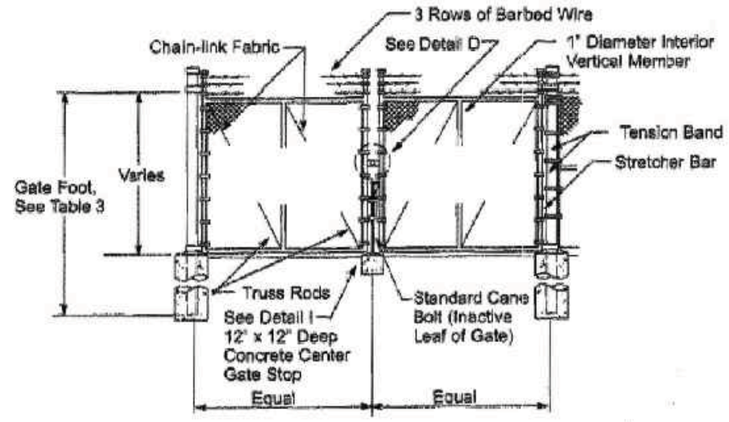


Figure 3
Standard Swing Gate (Elevation)

Table 3 8'-0" High Gate-Minimum Gate Posts and Gate Footings

Table of Gate Face Material	Gate Leaf	Post Size (Outside Diameter)	Footing	
			Diameter of Footings	Depth of Footings
Chain-link Fabric	Up To and Including 6'-0" Wide	3"	12"	48"
	Over 6'-0" and Up To and Including 13'-0" Wide	4"	14"	48"
Chain-link Fabric with Redwood Pickets	Up To and Including 6'-0" Wide	4"	12"	48"
	Over 6'-0" and Up To and Including 13'-0" Wide	6-5/8"	18"	48"

Table 1 Fence Posts and Braces

Galvanized Chain-link Fabric; Aluminum-coated Chain-link Fabric; and Plastic-coated, Galvanized Chain-link Fabric				
Fabric Height	Fence Framing	Posts		Braces
		Line	Terminal	
6' - 0" 7' - 0" and 8' - 0"	Standard Weight Pipe	2-3/8" O.D. 3.65 Lbs./Ft.	2-7/8" O.D. 5.79Lbs-/Ft.	1-5/8" O.D. 2.27 Lbs./Ft.
	Roll Form Section	1-7/8" x 1-5/8" 2.28 Lbs./Ft.	3-1/2" Square 4.85 Lbs./Ft.	1-5/8" x 1-1/4" 1.35 Lbs./Ft.
	Aluminum Shapes	2-1/2" O.D. Schedule 40	2-1/2" Square 2.98 Lbs./Ft.	2" O.D. Schedule 40

Table 2 Fence Posts and Rails

Galvanized Chain-link Fabric; Aluminum-coated Chain-link Fabric; and Plastic-coated, Galvanized Chain-link Fabric				
Fabric Height	Fence Framing	Posts		Rails and Braces
		Line	Terminal	
6' - 0" 7' - 0" and 8' - 0" 6' - 0" 7' - 0" and 8' - 0"	Standard Weight Pipe	2-7/8" O.D. 5.79 Lbs./Ft.	2-7/8" O.D. 5.79 Lbs./Ft.	1-5/8" O.D. 2.27 Lbs./Ft.
	Roll Form Section	2-1/4" x 1-5/8" 2.64 Lbs./Ft.	3-1/2" x 3-1/2" 4.85 Lbs./Ft.	1-5/8" x 1-1/4" 1.35 Lbs./Ft.
	Aluminum Shapes	2-1/2" Square 2.9 Lbs./Ft.	2-1/2" Square 2.9 Lbs./Ft.	2" O.D. Schedule 40

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0	4/5/13	INTERMEDIATE (60%) DESIGN	PC/EE	PT	PT	PT	VMB

REVISIONS

APPROVED BY: SO
SUPV VMB
DSGN PT
DWN PC
CHKD VMB
OK VMB
DATE 09/08/14
SCALES AS SHOWN

TOPOCK GROUNDWATER PROJECT

CHAIN LINK FENCE AND GATE

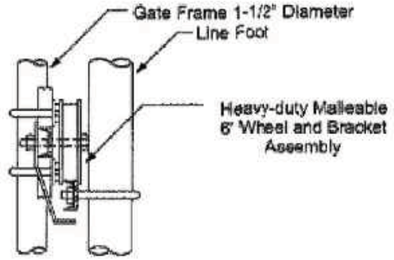
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PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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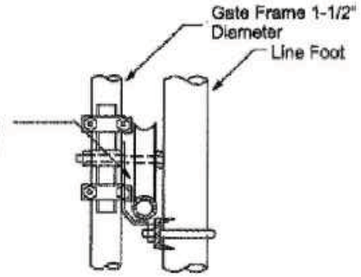
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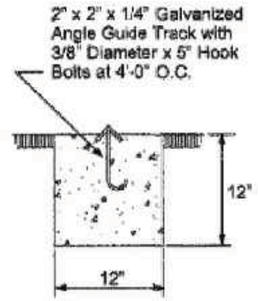
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Detail A
Rear Wheels for Channel Track,
Scale: 3" = 1'-0"

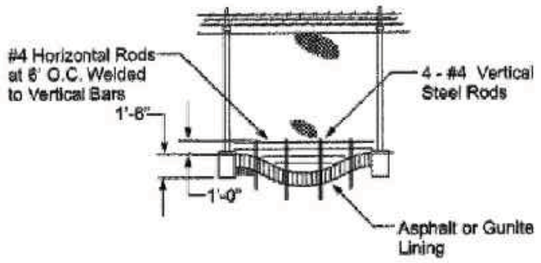


Detail B
Rear Wheels for Pipe Track,
Scale: 3" = 1'-0"

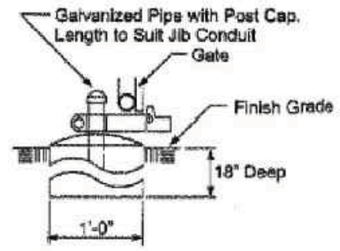


Note: Angle Track to be 1'-0" Longer than Gate Opening.

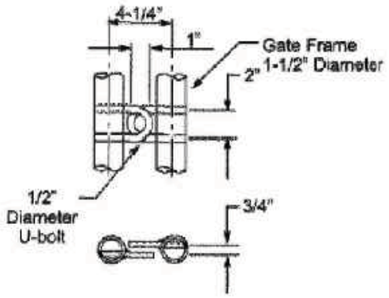
Detail G
Rolling Gate Guide Track



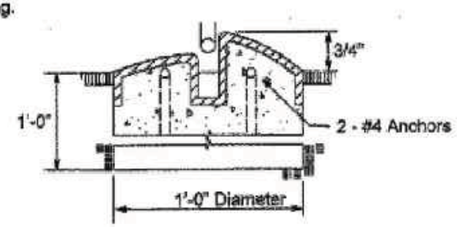
Detail H
Drainage Trench Detail



Detail C
Gate Keeper,
Scale: 1-1/2" = 1'-0"

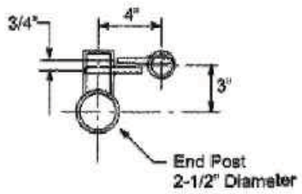


Detail D
Padlock for Standard Swinging Gate

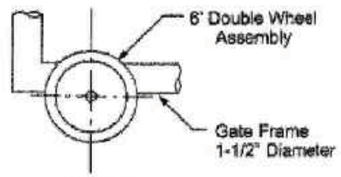


Note: Stop to be Supplied by PG&E and Installed by Contractor.

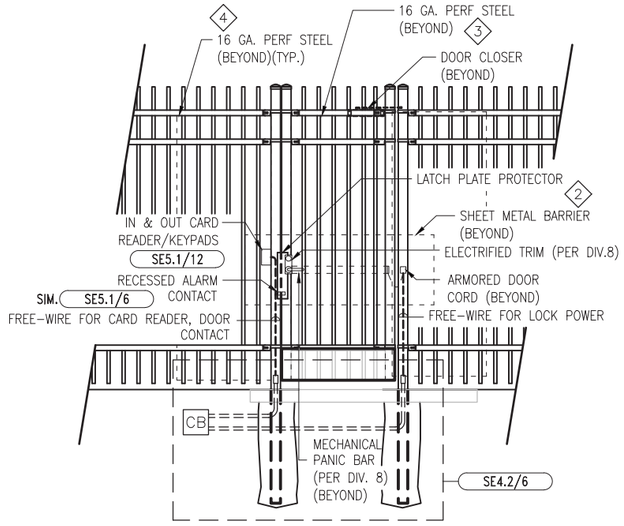
Detail I
Center Gate Stop Detail For Ornamental Swing Gate or Rustic Gate, For Chain Fabric Gate, Use Masters No. 15911 Stock.
NOTE: THE FENCE AND GATES SHALL COMPLY WITH PG&E STANDARD L-50.



Detail E
Padlock for Rolling Gate,
Scale: 3" = 1'-0"



Detail F
Front Wheels for Rolling Gate,
Scale: 3" = 1'-0"



1 DETAIL
NTS

DRAFT
NOT FOR
CONSTRUCTION

E2 Consulting Engineers, Inc.
1900 Powell Street, Ste. 250
Emeryville, CA 94608
(510) 652-1164

CH2MHILL.

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		PH	PT	PT	VMB
0	4/5/13	INTERMEDIATE (60%) DESIGN		PC/EE	PT	PT	VMB

REVISIONS

APPROVED BY		
	SO	
	SUPV	VMB
	DSGN	PT
	DWN	PH
	CHKD	VMB
	OK	VMB
	DATE	09/08/14
	SCALES	NTS

TOPOCK GROUNDWATER PROJECT

CHAIN LINK FENCE AND GATE DETAILS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
C-00-07	REV 1

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: e2-c-xxx-0007ad.dwg

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N1808

GENERAL NOTES

GENERAL

A ALL DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE.

B PENETRATIONS AND VOIDS THROUGH FIRE-RATED ASSEMBLIES TO BE FIRESTOPPED, SEE SPECIFICATION SECTION XX XX XX.

C FOR ELEVATIONS ABOVE FINISH FLOOR OF WALL MOUNTED SPECIALTIES, SWITCHES, ELECTRICAL OUTLETS, ETC., SEE SHEET NVA-0002.

D FOR MOUNTING LOCATION OF MECHANICAL, ELECTRICAL, LIFE SAFETY AND TELECOM EQUIPMENT AT WALLS, SEE SHEET NVA-0002.

E SUPPLY AND INSTALLATION CONTRACTORS SHALL VERIFY DIMENSIONS AND CONNECTION POINTS PRIOR TO FABRICATION OF NEW CONSTRUCTION.

F ALL PENETRATIONS THROUGH EXTERIOR CLADDING SYSTEMS SHALL BE SEALED WATER TIGHT

FLOOR PLANS

A FOR WALL TYPES, SEE SHEET CH-A-XXX-1204AD.

B FOR DOOR SCHEDULE, SEE SPECIFICATION SECTION XX XX XX.

C DOORS LOCATED 5" OFF ADJACENT WALL UNLESS NOTED OTHERWISE.

D PROVIDE 18" MINIMUM CLEAR ON PULL SIDE OF DOOR AND 12" MINIMUM CLEAR ON PUSH SIDE OF DOOR FROM FACE OF WALL, CABINET, OR EQUIPMENT TO DOOR OPENING FOR ADA COMPLIANCE.

REFLECTED CEILING PLANS

A FOR LIGHTING TYPE SEE ELECTRICAL DRAWINGS. ARCHITECTURAL REFLECTED CEILING PLANS.

B FOR DIFFUSER LOCATION, SEE MECHANICAL DRAWINGS

ROOF PLAN

A FOR ELEVATIONS AND MATERIAL OF ROOF DECK, SEE STRUCTURAL DRAWINGS.

B VERIFY QUANTITY AND LOCATION OF PLUMBING VENTS AND MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS.

FINISH PLAN

A FOR FINISH SCHEDULE, SEE DRAWINGS A-08-11.

INTERIOR ELEVATIONS

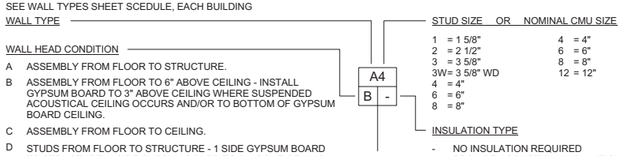
A SEE SHEET A-08-11 FOR STANDARD MOUNTING HEIGHTS.

EXTERIOR ELEVATIONS

A PROVIDE REINFORCEMENT IN METAL WALL PANELS TO ACCEPT SURFACE MOUNTED FIXTURES.

WALL TYPE SYMBOL

SEE WALL TYPES SHEET SCEDULE, EACH BUILDING



WALL HEAD CONDITION

A ASSEMBLY FROM FLOOR TO STRUCTURE.

B ASSEMBLY FROM FLOOR TO 6" ABOVE CEILING - INSTALL GYPSUM BOARD TO 3" ABOVE CEILING WHERE SUSPENDED ACOUSTICAL CEILING OCCURS AND/OR TO BOTTOM OF GYPSUM BOARD CEILING.

C ASSEMBLY FROM FLOOR TO CEILING.

D STUDS FROM FLOOR TO STRUCTURE - 1 SIDE GYPSUM BOARD TO STRUCTURE, 1 SIDE GYPSUM BOARD TO 3" ABOVE CEILING WHERE SUSPENDED ACOUSTICAL CEILING OCCURS AND/OR TO BOTTOM OF GYPSUM BOARD CEILING.

E PLUMBING CHASE WALL - 1 SIDE GYPSUM WALL BOARD TO CEILING.

NOTE: METAL STUDS UNLESS NOTED OTHERWISE

ARCHITECTURAL ABBREVIATIONS

AAF	ABOVE ACCESS FLOOR
ACP	ALUMINUM COMPOSITE PANEL
ACT	ACOUSTICAL CEILING TILE
ACU	AIR CONDITION UNIT
ADA	AMERICANS WITH DISABILITIES ACT
AF-(#)	ACCESS FLOOR
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
ALT	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP-#	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AT	ACOUSTICAL TILE
AV	AUDIO VISUAL
AWT	ACOUSTICAL WALL TREATMENT
L	ANGLE
@	AT
BD	BOARD
BLKG	BLOCKING
BLDG	BUILDING
BM	BEAM
BOB	BOTTOM OF BRICK
B/	BOTTOM OF
CA	COMPRESSED AIR
CB-(#)	CHALKBOARD
CG-(#)	CORNER GUARD
CH-(#)	COAT HOOK
CHK	CHECKERED
CHT-(#)	CHART HOLDER
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL-(#)	CLOCK
CLF	CHAIN LINK FENCE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
COORD	COORDINATE
CPT-(#)	CARPET
CR-(#)	CRASH RAIL
CRC	CHEMICAL RESISTANT COATING
CT-(#)	CERAMIC TILE
CTR	CENTER
CW	COLD WATER
℄	CENTERLINE
DAT	DATUM
DF	DRINKING FOUNTAIN
DI	DISTILLED WATER
DIA OR ∕O	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DRP-(#)	DRAPERY
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
EA	EACH
EIFS	EXTERIOR INSULATION FINISH SYSTEM
ELEC	ELECTRIC
EL/ELEV	ELEVATION
EM-(#)	ENTRY MAT
EMERG	EMERGENCY
EQ	EQUAL
EQIUP	EQUIPMENT
EJ	EXPANSION JOINT
EW	EYE WASH
EW	EYE WASH W/ DRENCH HOSE
EXP	EXPOSED
EXT	EXTERIOR
(E)	EXISTING
FACT	FACTORY
FE-(#)	FIRE EXTINGUISHER
FXF-(#)	FLEXIFRAME
FF	FINISH FLOOR
FG	FINISH GRADE
FHC	FIRE HOSE CABINET
FIN	FINISH
FLG	FLASHING
FLR	FLOOR
FM	FACTORY MUTUAL
FO	FACE OF
FOB	FACE OF BRICK
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOP	FACE OF PANEL
FOS	FACE OF STUD
FRP	FIBERGLASS REINFORCED PLASTIC
FSS-(#)	FOLDING SEAT, SHOWER
FT	FOOT/FEET
FVC-(#)	FIRE VALVE CABINET
GA	GAUGE
GAF	GLAZED ALUMINUM FRAMING
GALV	GALVANIZED
GCB-(#)	GAS CYLINDER BRACKET W/ MANIFOLD
GCB-(#)	GAS CYLINDER BRACKET
GCR-(#)	GAS CYLINDER RACK
GB	GRAB BAR
G	GLASS
GR	GRILLE
GR-(#)	SUSPENDED ACOUSTIC CEILING GRID
GT-(#)	GROMMET
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
H	HYDROGEN
HB	HOSE BIBB
HC	HOLLOW CORE
HCM	HOT COLD MIXING
H/C	HANDICAP
He	HELIUM
HDBD	HARDBOARD
HDWR	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HPC	HIGH PERFORMANCE COATING
HR	HOUR
HT	HEIGHT
IN	INCH/INCHES
INSUL	INSULATION
INT	INTERIOR
JT	JOINT
KEC	KITCHEN EQUIPMENT CONSULTANT
LAM	LAMINATED
LB-(#)	LOUVER BLIND
LF	LINOLEUM FLOORING
MAS	MASONRY
MATL	MATERIAL
MB-(#)	MARKER BOARD
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH-(#)	MOP HOLDER
MIN	MINIMUM
MIR-(#)	MIRROR
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MS	MOP SINK
MTL	METAL
MULL	MULLION
N2	NITROGEN
NA	NOT APPLICABLE
ND-(#)	NAPKIN DISPOSAL
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NV-(#)	NAPKIN VENDER
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OHC	OVERHEAD COILING DOOR
OPP	OPPOSITE
OSC-(#)	OVERHEAD SERVICE CARRIER
OTO	OUT TO OUT
P-(#)	PAINT
PB-(#)	PEGBOARD
PL	PLATE
PLAM-(#)	PLASTIC LAMINATE
PLYWD	PLYWOOD
PMP	PROFILED METAL PANEL
PNL	PANEL
PR	PAIR
PREFAB	PREFABRICATED
PT-(#)	PORCELEIN TILE
PTD-(#)	PAPER TOWEL DISPENSER
PTWR-(#)	PAPER TOWEL DISPENSER/ RECEPTACLE
R	RISER
RB-(#)	RESILIENT BASE
RD	ROOF DRAIN
REF	REFERENCE
REQD	REQUIRED
RF-(#)	RESILIENT FLOORING
RM	ROOM
RO	ROUGH OPENING
ROW	REVERSE OSMOSIS WATER
SAT-(#)	SUSPENDED ACOUSTICAL TILE
SCD	SEAT COVER DISPENSER
SCR-(#)	SHOWER CURTAIN ROD
SD-(#)	SOAP DISPENSER
SDF-(#)	STATIC DISSIPATIVE FLOORING
SDH-(#)	SOAP DISH
SDR-(#)	SOAP DISPENSER
SECT	SECTION
SHT	SHEET
SIB	STRUCTURAL ISOLATION BREAK
SIM	SIMILAR
SN-(#)	SNORKEL
SND-(#)	SANITARY NAPKIN DISPOSAL
SP-(#)	SERVICE PANEL
SPF-(#)	RESINOUS FLOORING
SS	STAINLESS STEEL
SSG	STRUCTURAL SILICONE GLAZED
SSM	SOLID SURFACE MATERIAL
ST-(#)	STONE TILE
STC	SOUND TRANSMISSION COEFFICIENT
STD	STANDARD
STL	STEEL
STN	STONE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
TB-(#)	TACK BOARD
TBD	TO BE DETERMINED
TEMP	TEMPERED
THR	THRESHOLD
TOB	TOP OF BRICK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TP- (#)	TOILET COMPARTMENTS
TPD	TOILET PAPER DISPENSER
TR	TREAD
TS	TUBE STEEL
TTD-(#)	TOILET TISSUE DISPENSER
TYP	TYPICAL
T/	TOP OF
UG-(#)	UNDER LAVATORY GUIDE
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
V	VACUUM
VDB-(#)	VISUAL DISPLAY BOARD
VIEW-(#)	IMAGING FILM VIEWER
VR	VAPOR RETARDER
VERT	VERTICAL
VP	VENT PIPE
WC-(#)	WALLCOVERING
WD	WOOD
WP-(#)	WALL PROTECTION
WPL-(#)	WALL PANEL
WPS	POINT OF USE WATER PURIFER SYSTEM
WR-(#)	WASTE RECEPTACLE
WS-(#)	WALL SHELF
WT	WEIGHT
W/	WITH
W/O	WITHOUT
ZA	ZERO AIR

MATERIAL LEGEND

EARTHWORKS
EARTH
GRAVEL

CONCRETE
CONCRETE
SAND

MASONRY
BRICK
MASONRY

METAL
ALUMINUM
STEEL

WOOD
FINISH
ROUGH
BLOCKING
PLYWOOD
ENGINEERED WOOD PRODUCT

INSULATION
BATT/LOOSE FILL
RIGID

FINISHES
ACOUSTIC WALL PANEL
MDF WALL PANEL
MARKER BOARD
GYPSUM BOARD

ELEVATION INDICATIONS
BRICK
TILE
GLASS

PLAN INDICATIONS
GRATE

ANNOTATION LEGEND

SYMBOLS
COLUMN GRID BUBBLE
DETAIL CALLOUT
SECTION CALLOUT
ELEVATION CALLOUT
REVISION TRIANGLE
ELEVATION DATUM
INTERIOR ELEVATION CALLOUT

TAGS
ROOM TAG (ROOM NAME, XTA01: ROOM NUMBER, BUILDING SECTOR, BUILDING LEVEL, BUILDING CODE)
DOOR TAG (XX1-01A: DOOR NUMBER, ROOM NUMBER, BUILDING SECTOR, BUILDING LEVEL, BUILDING CODE)
WALL TYPE TAG (WALL TYPE, STUD OR NOMINAL CMU SIZE, INSULATION TYPE, WALL HEAD CONDITION)
STOREFRONT TAG (XXA: STOREFRONT TYPE, BUILDING CODE)
WINDOW TAG
FINISH TAG (XX / XXX)
KEYNOTE TAG (XX.XX)
EQUIPMENT TAG (EQ XXXX)

BUILDING SYSTEM LEGEND

DOOR TYPES
SINGLE
SINGLE W/ SIDE LITE
SINGLE (180 DEGREES)
SINGLE (TWO WAY)
SINGLE POCKET
DOUBLE
DOUBLE (180 DEGREES)
DOUBLE (TWO WAY)
DOUBLE POCKET
SLIDING
SLIDING (BREAKAWAY)
REVOLVING
OVERHEAD SECTIONAL
OVERHEAD COILING
FLEXIBLE
FOLDING
SINGLE (FUTURE)

WINDOW TYPES
FIXED
SLIDING
CURTAIN WALL/ STORE FRONT

STRUCTURAL
TUBE STEEL COLUMN
STEEL PIPE COLUMN
WIDE FLANGE COLUMN
SQUARE CONCRETE COLUMN
ROUND CONCRETE COLUMN
STEEL BEAM OR GIRDER
CONCRETE BEAM OR GIRDER
STEEL DECKING
CONCRETE & STEEL DECKING
JOIST OR GIRDER(ELEVATION)
STEEL CHANNEL
STEEL ANGLE
C - METAL STUD
METAL STUD RUNNER
SHAFTWALL STUD
FURRING HAT CHANNEL
FURRING ZEE CHANNEL
UNISTRUT FRAMING
CMU BLOCK (PLAN)
CMU BLOCK (SECTION)
CMU BOND BEAM (SECTION)
BRICKS (SECTION)

WALL SYSTEMS
GWB/METAL STUD WALL
METAL PANEL/STUD WALL
CONCRETE WALL
1 HOUR RATED WALL
2 HOUR RATED WALL
FENCING
FUTURE
EXISTING

PLUMBING
GRAB BARS
WATER CLOSET (WALL MOUNTED)
URINAL (WALL MOUNTED)
LAVATORY (WALL MOUNTED)
COUNTER LAVATORY
SERVICE SINK
CLINIC SINK
FLOOR DRAIN
FLOOR CLEANOUT
DRINKING FOUNTAIN
MOP SINK
EYE WASH

LAB EQUIPMENT

TAG	SYMBOL	DESCRIPTION
		BIOLOGICAL SAFETY CABINET; SEE FIXED EQUIPMENT SCHEDULE
		CUP SINK; SEE FIXED EQUIPMENT SCHEDULE
		FUME HOOD W/ CUP SINK; SEE FIXED EQUIPMENT SCHEDULE
GCR-(#)		GAS CYLINDER RACK, NUMBER OF CYLINDERS AS SHOWN.
GCB-(#)		GAS CYLINDER BRACKET, NUMBER OF CYLINDERS AS SHOWN.
GT-(#)		GROMMET
SD-(#)	⊗ OR	SERVICE DROP
		EPOXY RESIN SINGLE SINK; SEE SINK SCHEDULE
		EPOXY RESIN DOUBLE SINK SEE SINK SCHEDULE
FXF-(#)		FRAME ROD SUPPORT SYSTEM
		RECESSED MOUNTED, ACCESSIBLE, EMERGENCY EYE/WASH WITH SAFETY SHOWER COMBINATION
PB-(#)		PEGBOARD
OSC-(#)		OVERHEAD SERVICE CARRIER
	+	DECK MOUNTED PIPE UTILITY
	⊥ ×	WALL MOUNTED PIPE UTILITY

CEILING SYSTEMS
GYPSUM BOARD CEILING
2' x 4' SUSPENDED ACOUSTICAL CEILING SYSTEM
2' x 4' MYLAR FACED SUSPENDED ACOUSTICAL CEILING SYSTEM
2' x 4' SUSPENDED ACOUSTICAL CEILING SYSTEM W/ 2' SCORED PATTERN
2' x 2' SUSPENDED ACOUSTICAL CEILING SYSTEM
ALUMINUM COMPOSITE PANEL

FIXTURES RECESSED IN SUSPENDED CEILING GRID
1' x 4' FLUORESCENT LUMINAIRE
2' x 2' FLUORESCENT LUMINAIRE
2' x 4' FLUORESCENT LUMINAIRE
RECESSED CAN DOWNLIGHT
SUPPLY REGISTER (REGULAR)
SUPPLY REGISTER (STRIP)
RETURN AIR GRILLE (REGULAR)
RETURN AIR GRILLE (STRIP)
ACCESS PANEL

FIXTURES RECESSED IN GYPSUM BOARD CEILING
1' x 4' FLUORESCENT LIGHT
2' x 2' FLUORESCENT LIGHT
2' x 4' FLUORESCENT LIGHT
RECESSED CAN DOWNLIGHT
SUPPLY REGISTER (REGULAR)
SUPPLY REGISTER (STRIP)
RETURN AIR GRILLE (REGULAR)
RETURN AIR GRILLE (STRIP)
ACCESS PANEL

FIXTURES SUSPENDED
1' x 4' FLUORESCENT LUMINAIRE
LINEAR FLUORESCENT LUMINAIRE
2' x 4' FLUORESCENT LUMINAIRE

MISC. ARCHITECTURAL
CG CORNER GUARD
THERMOSTAT
SPEAKER
CLOCK
VENT
DRAPERY
ARROW AT STAIR PLANS INDICATES DIRECTION OF TRAVEL
SLOPE ARROW AT ROOF PLANS INDICATES CRICKET SLOPE DOWN DIRECTION
OVERHANG/ELEMENT ABOVE
CR CARD READER
PB PUSH BUTTON FOR DOOR OPERATOR

FIRE PROTECTION
H HEAT DETECTOR
SMOKE DETECTOR
SPRINKLER
FIRE HOSE CABINET
FE-# FIRE EXTINGUISHER IN FULLY RECESSED CABINET
FE-# FIRE EXTINGUISHER IN CABINET, SURFACE MOUNTED
FE-# FIRE EXTINGUISHER SURFACE MOUNTED

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/8/14	PRE-FINAL (90%) DESIGN		RV	RD	CH	AV

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN AV
	DWN RV
	CHKD RD
	OK -
	DATE 09/08/14
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
ARCHITECTURAL

LEGENDS AND ABBREVIATIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-00-00	REV 0

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME FILENAME:

N1808

GENERAL STRUCTURAL NOTES

GENERAL

GOVERNING CODES

CALIFORNIA BUILDING CODE (CBC), 2013 AS AMENDED BY SAN BERNARDINO COUNTY
ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURE
AWWA STANDARD D-100 (2011)

INTENT OF GENERAL STRUCTURAL NOTES

THE INTENT OF THESE GENERAL STRUCTURAL NOTES IS TO DEFINE DESIGN PARAMETERS (LOADS AND ALLOWABLE STRESSES) FOR ALL STRUCTURES AND MATERIALS USED. SPECIFICATIONS CONTAINING MATERIALS AND INSTALLATION ARE A PART OF THIS JOB AND ARE CONTAINED ELSEWHERE.

DESIGN

THE STRUCTURES ARE DESIGNED TO BE STABLE AND SELF- SUPPORTING WHEN ERECTED AND FULLY COMPLETED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE ERECTION PROCEDURE, INCLUDING SEQUENCE OF CONSTRUCTION, AND TO INSURE THE SAFETY OF THE STRUCTURES DURING THE CONSTRUCTION PHASE, INCLUDING THE DESIGN AND SAFETY OF ANY TEMPORARY BRACING OR OTHER MEASURES WHICH MAY BE NECESSARY TO FACILITATE AND COMPLETE CONSTRUCTION.

LIVE LOADS

DESIGN LIVE LOADS FOR THE STRUCTURES ARE AS FOLLOWS:

STAIRS	- 100 PSF
CONCRETE FLOOR ON GRADE	- 500 PSF OR H20 TRUCK
ELEVATED CONCRETE FLOOR	- 200 PSF OR 4 KIPS FORKLIFT
ROOF	- 20 PSF
CAT WALK @ AERIAL CROSSING	=25 PSF

WIND LOADS

DESIGN HORIZONTAL WIND LOADS ON VERTICAL SURFACES:

20 PSF (MINIMUM)
WIND SPEED: 100 MPH
IMPORTANCE FACTOR: 1.25

SEISMIC LOADS

CBC, 2013 SITE CLASS: D
SEISMIC DESIGN CATEGORY: D

S_s = 0.230
S_1 = 0.120
S_{MS} = 0.368
S_M = 0.279
S_{DS} = 0.245
S_{DI} = 0.168
IMPORTANCE FACTOR: 1.25

FOUNDATION

DESIGN SHALL BE BASED ON: GEOTECHNICAL INVESTIGATION REPORT, TOPOCK COMPRESSOR STATION BY CH2M HILL, 2004
FINAL WORKPLAN FOR TIME CRITICAL REMOVAL ACTION AT AOC4 DEBRIS RAVINE, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CA BY CH2M HILL DEC,18, 2009

A) MAT FOUNDATION
ALLOW. SOIL BEARING PRESSURE = 4000 PSF

B) SPREAD FOUNDATION ALLOWABLE SOIL BEARING PRESSURE = 4,000 PSF

GROUND WATER ELEVATION

STRUCTURES ARE DESIGNED FOR A HIGH GROUND WATER LEVEL AT EL. 465.30.

COORDINATION OF WORK

MECHANICAL FRAMING, OPENINGS AND SUPPORTS FOR EQUIPMENT OR OTHER PROCESS ITEMS ARE SHOWN FOR BIDDING PURPOSES ONLY. THE EXACT SIZE AND LOCATION OF SUCH ITEMS SHALL BE VERIFIED FROM MANUFACTURER'S APPROVED SHOP DRAWINGS AND BY COORDINATION OF SUCH WORK WITH THE PERTINENT TRADE.

MISCELLANEOUS

FOR LOCATIONS AND DETAIL OF PIPES, CONDUITS, DUCTS, AND OTHER OPENINGS IN SLABS AND WALLS, SEE SITEWORK, MECHANICAL, PLUMBING, HVAC, AND ELECTRICAL DRAWINGS.

CONCRETE

CONCRETE DESIGN DATA

CODE	- ACI 318-11 AND 350/350R-06 BUILDING CODES FOR REINFORCED CONCRETE
STRENGTH	- F_C' = 5,000 PSI UNLESS NOTED (SPEC. SECT. S-033000)
REINFORCING	- ASTM A615, GRADE 60
WELDED STEEL WIRE FABRIC	- ASTM A185 OR ASTM 497
DESIGN	- STRENGTH DESIGN METHOD OR ALTERNATE DESIGN METHOD
DETAILING	- ACI SP-66(04) ACI DETAILING MANUAL

STANDARD HOOKS

UNLESS OTHERWISE SHOWN OR NOTED, ALL 90-, 135- AND 180-DEGREE HOOKS FOR REINFORCING SHALL BE IN ACCORDANCE WITH THE STANDARD HOOK DETAILS SHOWN IN ACI SP-66(04).

REINFORCING BAR DEVELOPMENT

UNLESS OTHERWISE INDICATED ON THE DRAWINGS, REINFORCING BARS SHALL BE DEVELOPED AND/OR SPLICED IN ACCORDANCE WITH THE FOLLOWING TABLE:

BAR SIZE	Ld DEVELOPMENT LENGTH	TENSION LAP LAP SLICES * TOP BARS	OTHER BARS
4	2'-1"	2'-5"	2'-1"
5	2'-7"	3'-4"	2'-7"
6	3'-1"	4'-0"	3'-1"
7	4'-6"	5'-10"	4'-6"
8	5'-2"	6'-8"	5'-2"
9	5'-10"	7'-7"	5'-10"

*HORIZONTAL BARS SO PLACED THAT MORE THAN 12 IN. OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.

CONCRETE PROTECTION FOR REINFORCEMENT

UNLESS NOTED OTHERWISE, THE CONCRETE COVER FOR REINFORCING BARS PLACED IN SURFACES EXPOSED TO WATER SHALL BE 2 INCHES. ALL OTHER MINIMUM COVER REQUIREMENTS SHALL BE AS PER ACI 318-11.

CONCRETE COATING SYSTEM

CONCRETE COATING SYSTEM IS NOT SHOWN ON DRAWINGS. FOR COATING SYSTEM REQUIREMENTS SEE SPECIFICATION SECTIONS 09 9000, 09 9005, 09 9635 AND 09 9726.

UTILITY VAULTS

UTILITY VAULTS WILL BE PRECAST CONCRETE SECTIONS CONFORMING TO PG&E STANDARD K-35.

STRUCTURAL STEEL

(SPEC. SECT. 055000)

DESIGN DATA

SPECIFICATIONS	- AISC MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, 13th EDITION
DESIGN	- AISC TYPE "2 SIMPLE

FRAMING CONSTRUCTION

WIDE FLANGE SHAPES	- ASTM A992 (fy = 50KSI)
CHANNELS, PLATES & ANGLES	- ASTM A36 (fy=36 KSI)
STRUCTURAL PIPES	- ASTM A53, GRADE B
STRUCTURAL TUBES	- ASTM A500, GRADE B (46 KSI)
WELDING	- AWS E70 ELECTRODES
HIGH STRENGTH BOLTS	- ASTM A325-SC CLASS A, 3/4 INCH DIAMETER UNLESS OTHERWISE NOTED. SUFFIX SC FOLLOWING ASTM DESIGNATION DENOTES A SLIP-CRITICAL CONNECTION
COMMON BOLTS	- ASTM A307, UNLESS OTHERWISE INDICATED
ANCHOR BOLTS	- A36 UNLESS OTHERWISE INDICATED
CHEMICAL ANCHORS (DBD)	- DBD (DIFFERED BOLTING DEVICES) S.S. TYPE 316, HILTI HVA ADHESIVE
EXPANSION ANCHORS	- HILTI S.S. KWIK-BOLT S.S. TYPE 316 ANCHORS OR APPROVED EQUAL. BOLTS, NUTS & WASHERS

STAINLESS STEEL

DESIGN DATA

SPECIFICATION	- ALLOY TYPES CONFORM TO ASTM A-167 & ASTM A-276
PLATES & SHAPES	- TYPE 316 UNLESS OTHERWISE NOTED
BOLTS, NUTS, & WASHERS	- TYPE 316

COMPOSITE FLOOR

TOTAL THICKNESS MINMUM 6 INCHES UNLESS OTHERWISE NOTED.

STEEL DECK: MINMUM 18 GAGE, 1 1/2 INCH DEEP x 36 INCH WIDE PANELS. RIBS SPACING @ 6" C/C (UNLESS OTHERWISE NOTED)

I + = 0.27 IN $^4/_{FT}$ S+ = 0.312 IN $^3/_{FT}$
I - = 0.28 IN $^4/_{FT}$ S- = 0.316 IN $^3/_{FT}$

CONCRETE: NORMAL WEIGHT CONCRETE WITH MINMUM f'c = 4,000 PSI UNLESS NOTED OTHERWISE

ALUMINUM

DESIGN DATA

CODES	- CALIFORNIA BUILDING CODE, 2013
SPECIFICATION	- ASTM - 6061-T6 ALLOY, UNLESS OTHERWISE NOTED.

MASONRY

DESIGN DATA

CODE - CALIFORNIA BUILDING CODE (2013)

HOLLOW LOAD BEARING - ASTM C90
F'M - COMPRESSIVE STRENGTH OF MASONRY AT 28 DAYS = 1,900 PSI

MORTAR - ASTM C270, CONFORM WITH CBC-2013, TYPE M, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS = 2,500 PSI

GROUT - ASTM 476, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS = 3,000 PSI

REINFORCING - ASTM 615, GRADE 60

COLD-DRAWN STEEL WIRE - ASTM 482

METAL ROOF

GALVANIZED, 18 GAGE 1 1/2" DEEP x 36" WIDE, RIBS @ 6" C/C

I = 0.29 IN $^3/_{LF}$

S+ = 0.315 IN $^3/_{LF}$

S- = 0.316 IN $^3/_{LF}$

METAL SIDING

GALVANIZED, 24 GAGE, 3/4-INCH HIGH x 36" WIDE, RIBS @ 6" C/C

I (+) = 0.0323 IN $^4/_{LF}$

I (-) = 0.0220 IN $^4/_{LF}$

S+ = 0.592 IN $^3/_{LF}$

S- = 0.0538 IN $^3/_{LF}$

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E2 Consulting Engineers, Inc.
1900 Powell Street, Ste. 250
Emeryville, CA 94608
(510) 652-1164

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MD			
0	04/05/13	INTERMEDIATE (60%) DESGIN		MD	KJ	VMB	VMB

REVISIONS

APPROVED BY		
SO		
SUPV	VMB	
DSGN	KDD	
DWN	WTH	
CHKD	VMB	
OK	VMB	
DATE	6/30/14	
SCALES	NA	

TOPOCK GROUNDWATER REMEDIATION PROJECT

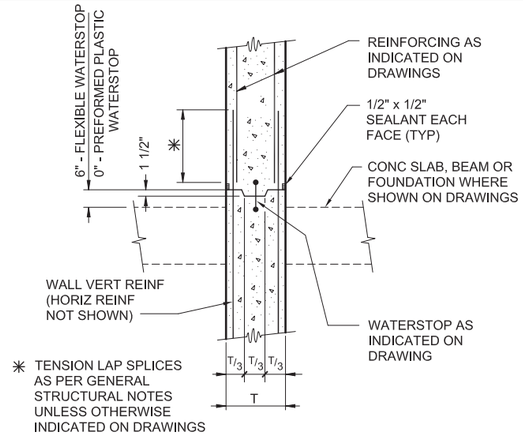
GENERAL STRUCTURAL NOTES

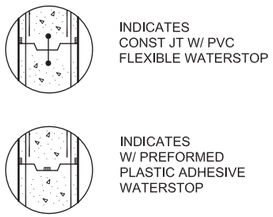
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-00-01	REV 1

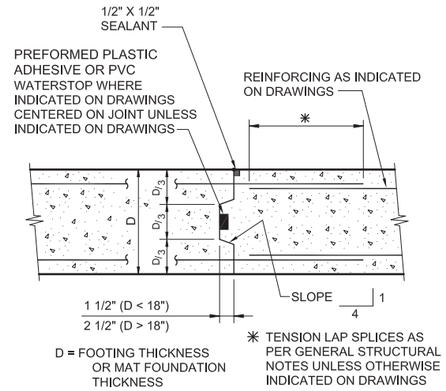
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FILENAME: INAL (90%) DESIGN

N1808

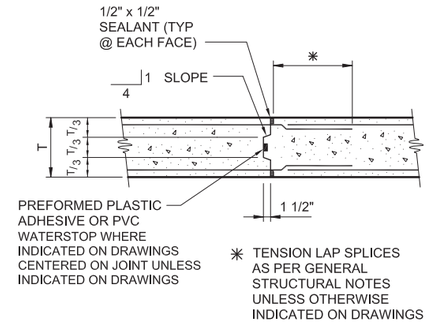




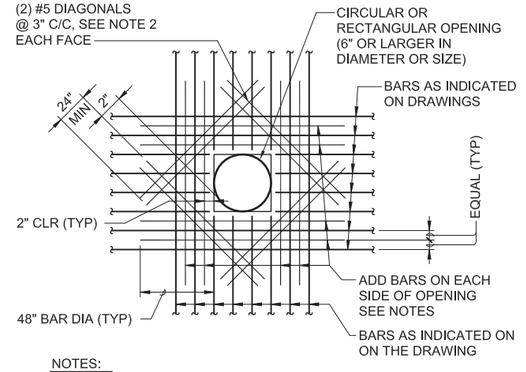
1 WALL HORIZONTAL CONSTRUCTION JOINT
TYP — NTS



2 FOUNDATION OR BASE SLAB CONSTRUCTION JOINT
TYP — NTS



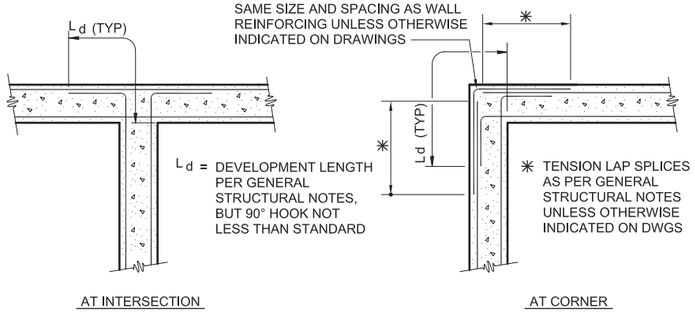
3 WALL VERTICAL CONSTRUCTION JOINT
TYP — NTS

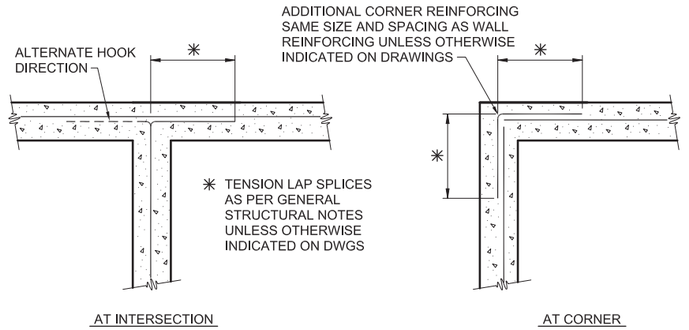


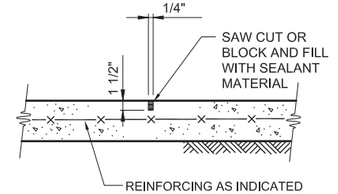
NOTES:

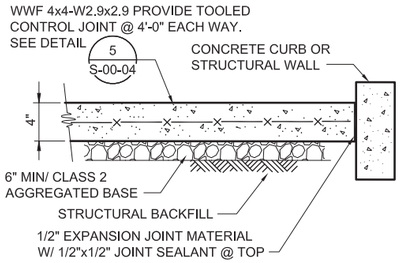
1. AREA OF ADDED BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL BE AT LEAST 1/2 THE CROSS SECTIONAL AREA OF THE INTERRUPTED BARS.
2. PROVIDE STANDARD ACI HOOKS ON BARS IF STRAIGHT EXTENSION PAST THE OPENING CANNOT BE OBTAINED.
3. PLACE ADD BARS IN SAME PLANES AS INDICATED REINFORCING.

4 OPENING REINFORCEMENT DETAIL
TYP — NTS

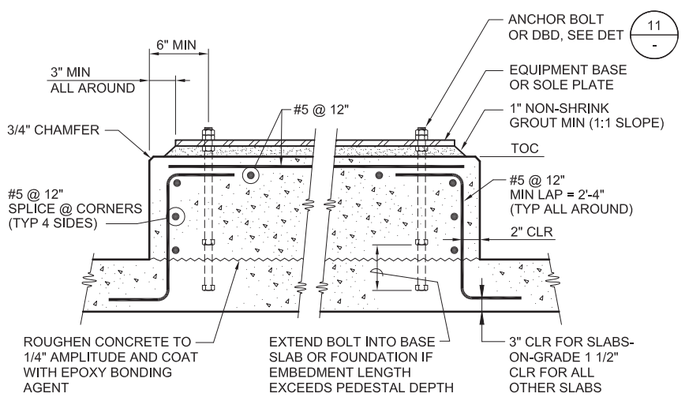




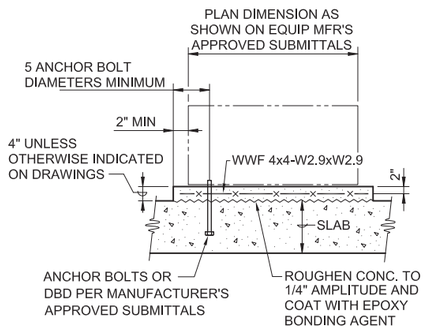




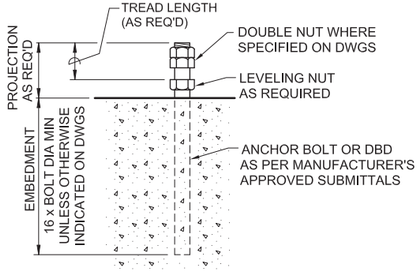
5 DOUBLE REINFORCING WALL DETAIL
TYP — NTS



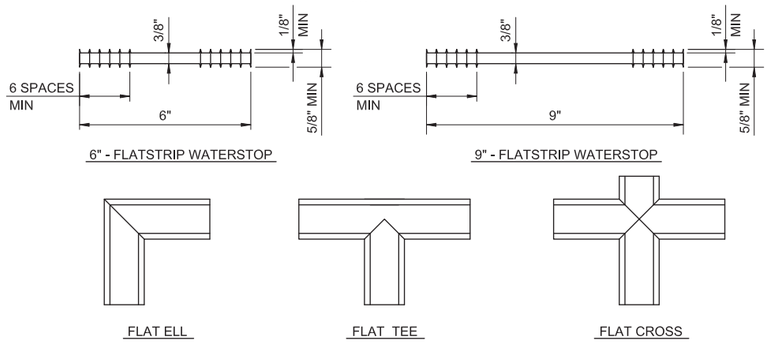
6 SINGLE REINFORCING WALL DETAIL
TYP — NTS



7 CONTROL JOINT DETAIL
TYP — NTS



8 CONCRETE WALKWAY DETAIL
TYP — NTS



9 EQUIPMENT FOUNDATION DETAIL
TYP — NTS

10 EQUIPMENT PAD DETAIL
TYP — NTS

11 ANCHOR BOLT DETAIL
TYP — NTS

12 PREFABRICATED WATERSTOP JOINT DETAIL
TYP — NTS

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Emeryville, CA 94608
(510) 652-1164

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/13	PRE-FINAL (90%) DESIGN		MD	KJ	VMB	VMB
0	04/13/14	INTERMEDIATE (60%) DESIGN		MD	KJ	VMB	VMB

REVISIONS

APPROVED BY		
	SO	
	SUPV	VMB
	DSGN	KDD
	DWN	WTH
	CHKD	VMB
	OK	VMB
	DATE	6/30/14
	SCALES	NA

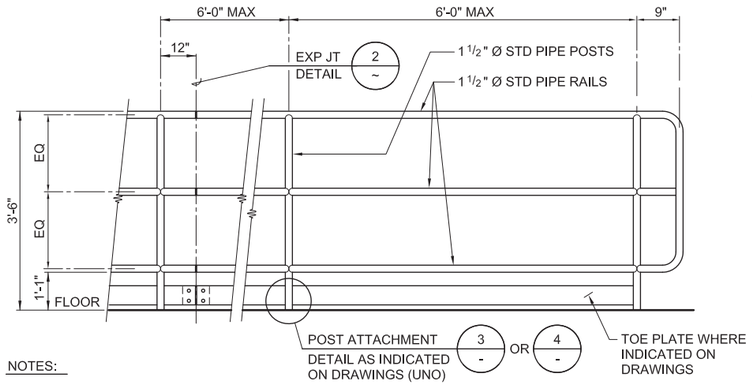
TOPOCK GROUNDWATER REMEDIATION PROJECT

GENERAL STRUCTURAL DETAILS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-00-02	REV 1

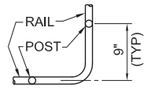
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N1808



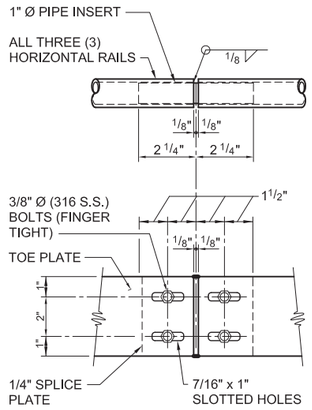
NOTES:

1. ALL MATERIAL TO BE ALUMINUM 6061-T6.

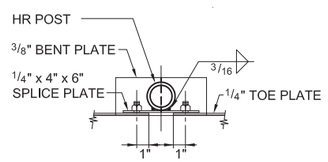
1 HANDRAIL DETAIL
NTS
TYP



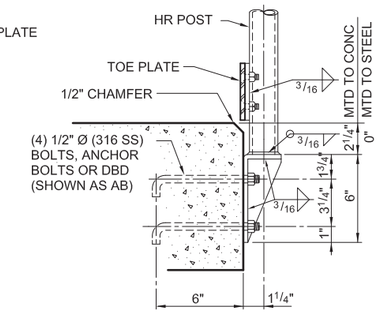
CORNER PLAN



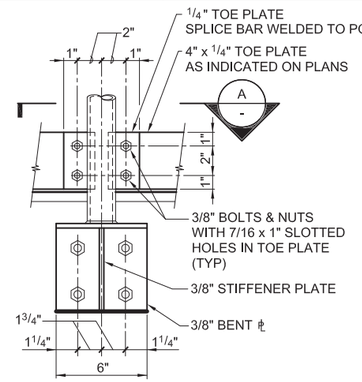
2 HANDRAIL EXPANSION JT. DETAIL
NTS



A SECTION
NTS



SIDE ELEVATION

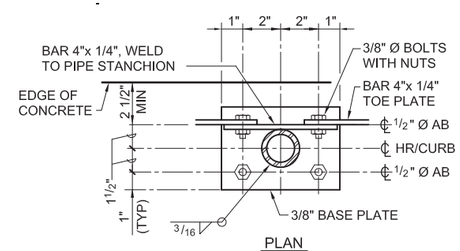


FRONT ELEVATION

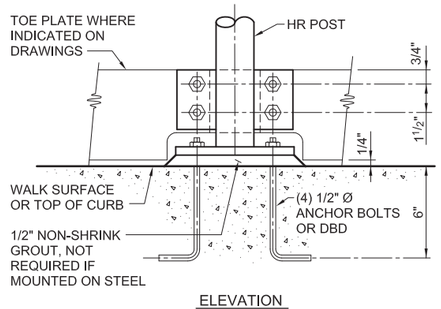
NOTES:

1. ALL CONNECTION ANGLES, PLATES, STIFFENER PLATES AND TOE PLATES SHALL BE OF ALUMINUM 6061-T6 AND ALL FASTENERS SHALL BE TYPE 316 SS.
2. COAT ALUMINUM SURFACES IN CONTACT WITH CONCRETE PER SPECIFICATIONS.
3. OPTIONAL TO USE APPROVED MFR's SUPPORT ASSEMBLY.
4. FOR ATTACHMENT TO STEEL MEMBERS USE TYPE 316 SS BOLTS IN LIEU OF DBD AND PROVIDE NEOPRENE GASKET BETWEEN STEEL AND ALUMINUM SURFACES.

3 SIDE MOUNTED POST ATTACHMENT DETAIL
NTS



PLAN

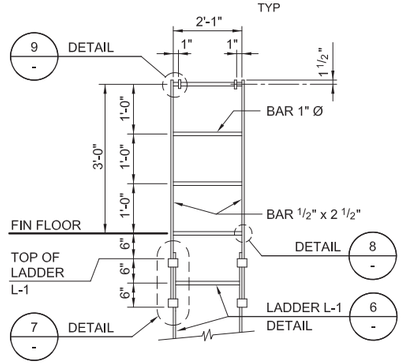


ELEVATION

NOTES:

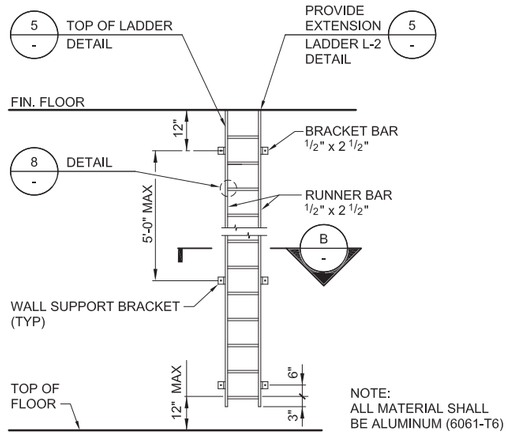
1. ALL CONNECTION ANGLES, PLATES, STIFFENER PLATES AND TOE PLATES SHALL BE OF ALUMINUM 6061-T6 AND ALL FASTENERS SHALL BE TYPE 316 SS.
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4. FOR ATTACHMENT TO STEEL MEMBERS USE TYPE 316 SS BOLTS IN LIEU OF DBD AND PROVIDE NEOPRENE GASKET BETWEEN STEEL AND ALUMINUM SURFACES.

4 TOP MOUNTED POST ATTACHMENT DETAIL
NTS



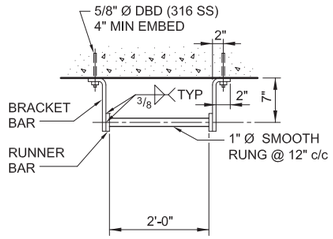
NOTE: ALL MATERIAL SHALL BE ALUMINUM (6061-T6)

5 EXTENSION LADDER L-2 DETAIL
NTS
TYP

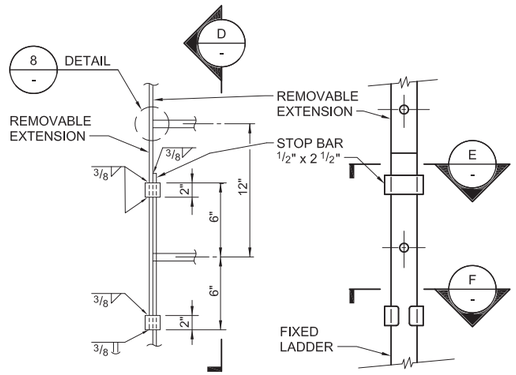


NOTE:
ALL MATERIAL SHALL BE ALUMINUM (6061-T6)

6 LADDER L-1 DETAIL
NTS
TYP

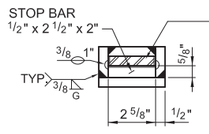


B SECTION
NTS

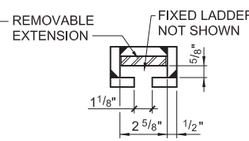


7 DETAIL
NTS

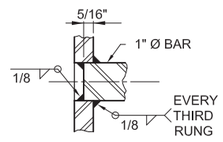
D SECTION
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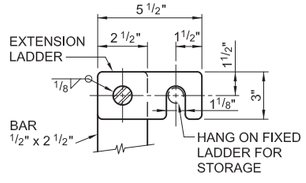
E SECTION
NTS



F SECTION
NTS



8 DETAIL
NTS



9 DETAIL
NTS

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Emeryville, CA 94608
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REVISIONS

APPROVED BY	
SO	
SUPV	VMB
DSGN	KDD
DWN	WTH
CHKD	VMB
OK	PT
DATE	6/30/14
SCALES	NA

TOPOCK GROUNDWATER REMEDIATION PROJECT

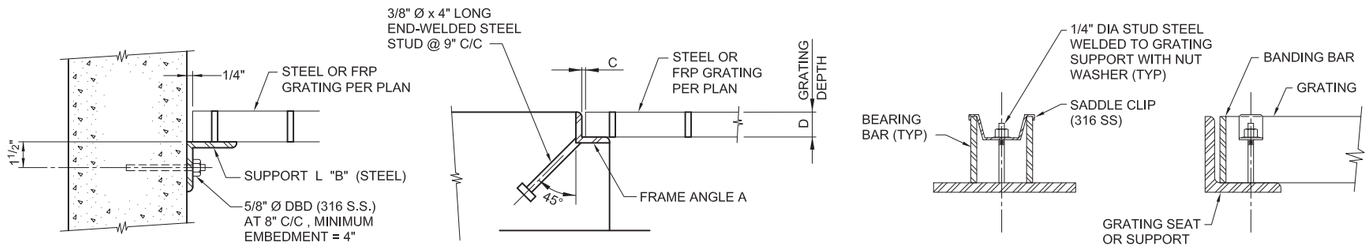
GENERAL STRUCTURAL DETAILS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-00-03	REV 1

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N1808

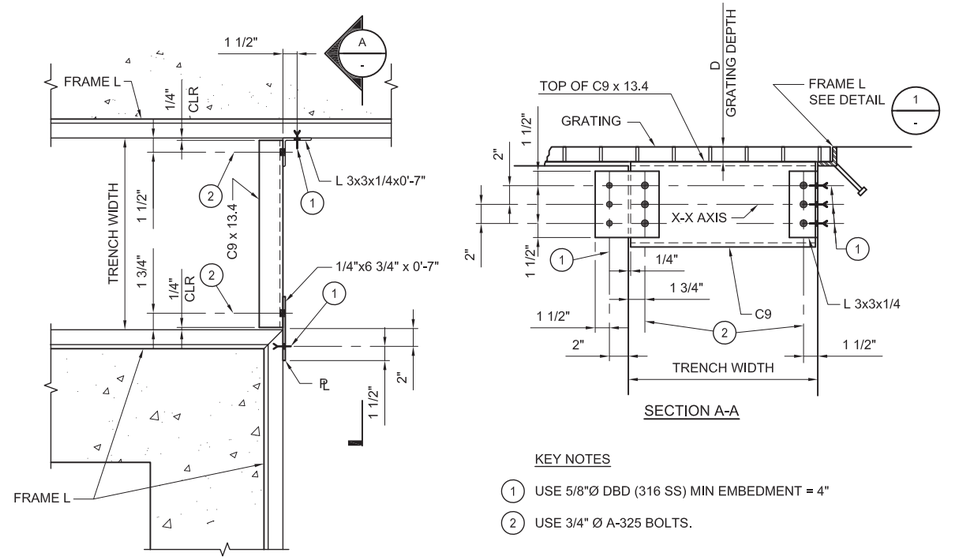


GRATING DEPTH = D IN	FRAME L 'A'	SUPPORT L 'B'	DIM 'C'
3"	L 3 1/2 x 3 1/2" x 1/2"	L 3 x 3 x 1/2"	3/8"
2"	L 2 1/2 x 2 1/2" x 1/2"	L 3 x 3 x 1/2"	3/16"
1 1/2"	L 1 3/4 x 1 3/4 x 1/4"	L 3 x 3 x 1/2"	1/4"

NOTES:

1. PROVIDE 4 CLIPS PER GRATING PANEL APPROXIMATELY 4 INCHES FROM PANEL CORNERS. MAXIMUN CLIP SPACING = 36 INCHES OC.

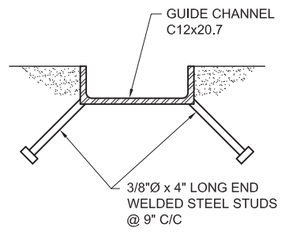
1 TYP — GRATING SUPPORT DETAIL
NTS



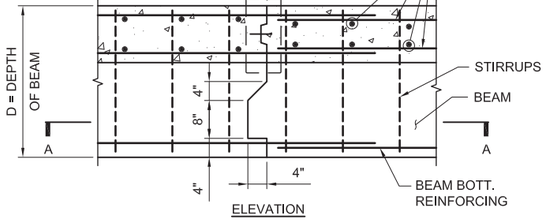
KEY NOTES

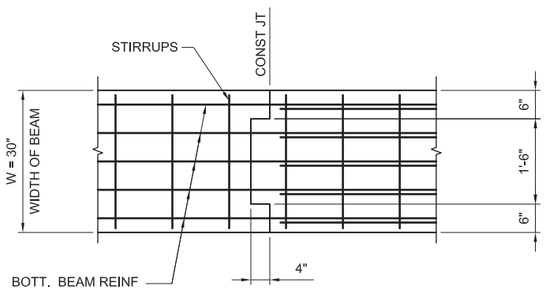
1. USE 5/8"Ø DBD (316 SS) MIN EMBEDMENT = 4"
2. USE 3/4" Ø A-325 BOLTS.

2 — GRATING SUPPORT CHANNEL DETAIL
1 1/2" = 1'-0"

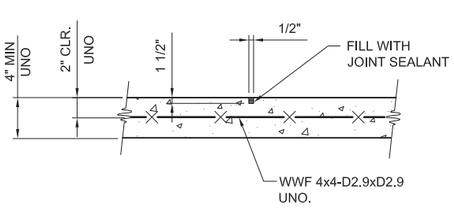


3 TYP — GUIDE CHANNEL DETAIL
3" = 1'-0"

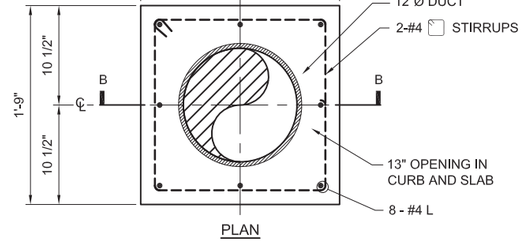


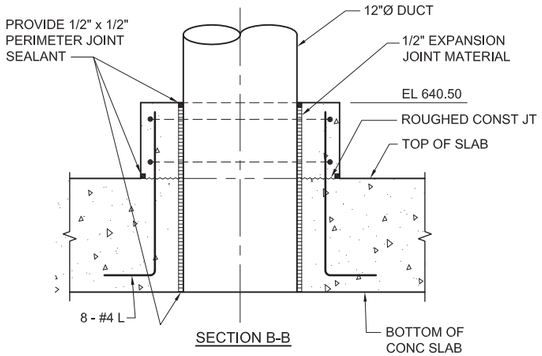


4 S-12-03 — DETAIL
3/4" = 1'-0"



5 S-12-03 — WALKWAY CONTROL JOINT DETAIL
3/4" = 1'-0"





6 — DETAIL
1 1/2" = 1'-0"

DRAFT
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CONSTRUCTION

E2 Consulting Engineers, Inc.
1900 Powell Street, Ste. 250
Emeryville, CA 94608
(510) 652-1164

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/-8/14	PRE-FINAL (90%) DESIGN		MD	KJ	VMB	VMB
0	04/08/13	INTERMEDIATE (60%) DESIGN		MD	KJ	VMB	VMB

REVISIONS

APPROVED BY		
	SO	
	SUPV	VMB
	DSGN	KDD
	DWN	MD
	CHKD	KJ
	OK	VMB
	DATE	6/30/14
	SCALES	NA

TOPOCK GROUNDWATER REMEDIATION PROJECT

GENERAL STRUCTURAL DETAILS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-00-04	REV 1

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0004.dwg

Vault Schedule, Topock Compressor Station San Bernardino County, California

Location	Well Number/ Physical Well ID	Interior Dimension Size (L X W)[1]	Depth	Quantity	Vault Type	Vault Access Door/Hatch Load Rating[2, 3, 4]	Vault Access Door[3, 4]	Reference Sheet(s)
NTH IRZ Wells								
IRZ Extraction Well Meter Vault (New)	IRZ-23	6'-0" X 4'-0"	4'-0"	1	1	Off-street traffic rated (HS20)	Yes	S-04-01, S-04-03 and S-04-04
IRZ Extraction Well Meter Vault (New)	IRZ-5 IRZ-9	8'-0" X 4'-0"	4'-0"	2	1	Parkway rated	Yes	S-04-01, S-04-03 and S-04-04
IRZ Extraction Well Meter Vault (New)	IRZ-1	8'-0" X 4'-0"	4'-0"	1	2	Highway rated (HS20-44)	No	S-04-02, S-04-03 and S-04-05
IRZ Injection Well Meter Vault (New)	IRZ-20 IRZ-27 IRZ-29 IRZ-31 IRZ-33 IRZ-35 IRZ-37	8'-0" X 4'-0"	4'-0"	7	2	Highway rated (HS20-44)	No	S-04-07, S-04-08 and S-04-10
IRZ Injection Well Meter Vault (New)	IRZ-16 IRZ-21 IRZ-25 IRZ-39	8'-0" X 4'-0"	4'-0"	4	1	Off-street traffic rated (HS20)	Yes	S-04-06, S-04-08 and S-04-09
IRZ Injection Well Meter Vault (New)	IRZ-11 IRZ-13 IRZ-15 IRZ-17 IRZ-19	8'-0" X 4'-0"	4'-0"	5	1	Parkway rated	Yes	S-04-06, S-04-08 and S-04-09
IRZ Injection Well Vault (New)	IRZ20-A IRZ20-B IRZ27-A IRZ29-A IRZ31-A IRZ33-A IRZ35-A IRZ37-A	5'-0" X 4'-0"	4'-0"	8	2	Highway rated (HS20-44)	No	S-04-07, S-04-08 and S-04-10
IRZ Injection Well Vault (New)	IRZ16-A IRZ16-B IRZ21-A IRZ21-B IRZ25-A	5'-0" X 4'-0"	4'-0"	6	1	Off-street traffic rated (HS20)	Yes	S-04-06, S-04-08 and S-04-09
IRZ Injection Well Vault (New)	IRZ11-A IRZ11-B IRZ13-A IRZ13-B IRZ15-A IRZ15-B IRZ17-A IRZ17-B IRZ19-A IRZ19-B	5'-0" X 4'-0"	4'-0"	10	1	Parkway rated	Yes	S-04-06, S-04-08 and S-04-09

Location	Well Number/ Physical Well ID	Interior Dimension Size (L X W)[1]	Depth	Quantity	Vault Type	Vault Access Door/Hatch Load Rating[2, 3, 4]	Vault Access Door[3, 4]	Reference Sheet(s)
INNER RECIRCULATION LOOP								
Extraction Well Meter Vault (New)	RB-1 RB-2 RB-3 RB-4 RB-5	8'-0" X 4'-0"	4'-0"	5	1	Parkway rated	Yes	S-05-01, S-05-02 and S-05-03
Injection Well Meter Vault (New)	IRL-1 IRL-2 IRL-4	8'-0" X 4'-0"	4'-0"	3	1	Off-street traffic rated (HS20)	Yes	S-05-04, S-05-06 and S-05-07
Injection Well Meter Vault (New)	IRL-3	8'-0" X 4'-0"	4'-0"	1	2	Highway rated (HS20-44)	No	S-05-05, S-05-06 and S-05-08
Injection Well Vault (New)	IRL01-A IRL02-A IRL04-A	5'-0" X 4'-0"	4'-0"	3	1	Off-street traffic rated (HS20)	Yes	S-05-04, S-05-06 and S-05-07
Injection Well Vault (New)	IRL03-A	5'-0" X 4'-0"	4'-0"	1	2	Highway rated (HS20-44)	No	S-05-05, S-05-06 and S-05-08
TCS LOOP								
Extraction Well Meter Vault (New)	ER-1 ER-2 ER-3 ER-4 ER-6	6'-0" X 4'-0"	4'-0"	5	2	Highway rated (HS20-44)	No	S-03-01, S-03-02 and S-03-03
Extraction Well Meter Vault (New)	TWB-1 TWB-2	6'-0" X 4'-0"	4'-0"	2	2	Highway rated (HS20-44)	No	S-03-01, S-03-02 and S-03-03
Injection Well Meter Vault	TCS-1	6'-0" X 4'-0"	4'-0"	1	2	Highway rated (HS20-44)	No	S-03-05, S-03-06 and S-03-08
Injection Well Meter Vault	TCS-2	6'-0" X 4'-0"	4'-0"	1	1	Off-street traffic rated (HS20)	Yes	S-03-04, S-03-06 and S-03-07
Injection Well Vault	TCS01-A	5'-0" X 4'-0"	4'-0"	1	2	Highway rated (HS20-44)	No	S-03-05, S-03-06 and S-03-08
Injection Well Vault	TCS02-A	5'-0" X 4'-0"	4'-0"	1	1	Off-street traffic rated (HS20)	Yes	S-03-04, S-03-06 and S-03-07

Notes:
1. Vault sizes are based on Jensen Precast standard sizes.
2. Types of covers: Highway rated (HS20-44) - intended for highway traffic; Off-street traffic (HS-20) - intended for occasional traffic; Parkway - intended for pedestrian traffic.
3. Well meter vault covers that are highway rated shall be typical 2' diameter manholes.
4. Well vaults that are highway rated shall be typical 3'(min) square traffic lids.

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		GWE	MSL	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN MSL
DWN GWE
CHKD JPB
OK JEF
DATE 09/08/14
SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL VAULT SCHEDULE

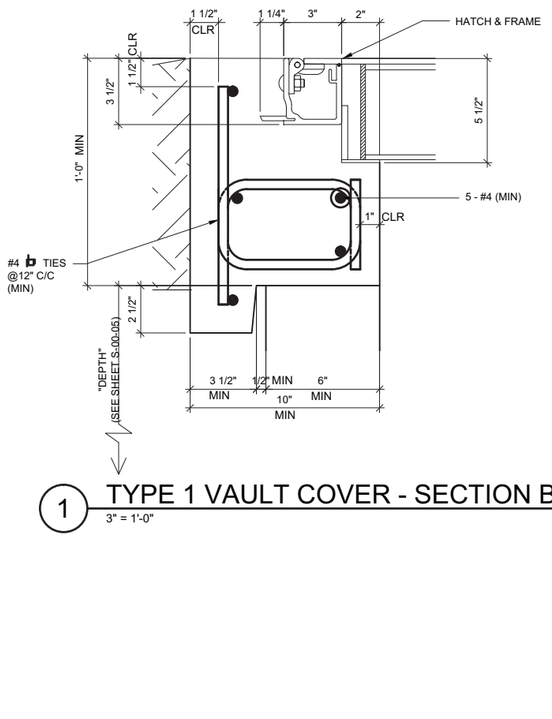
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

- DRAFT - NOT FOR CONSTRUCTION

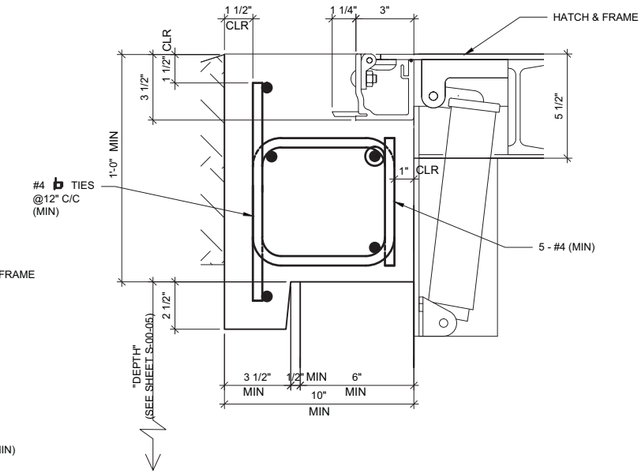
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BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. S-00-05 of SHEETS
REV 1

N1808

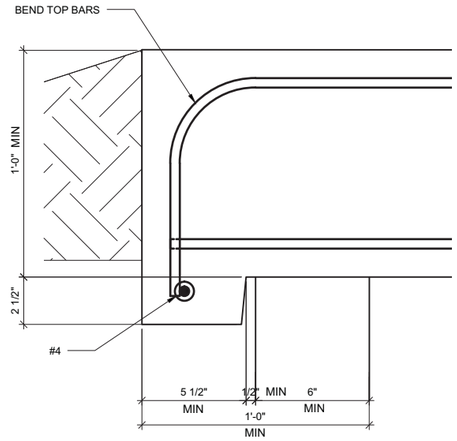
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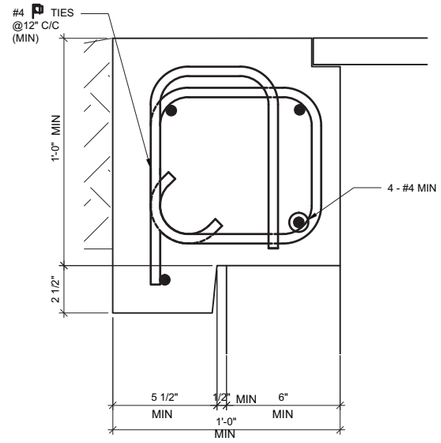
1 TYPE 1 VAULT COVER - SECTION B&C DETAIL
3" = 1'-0"



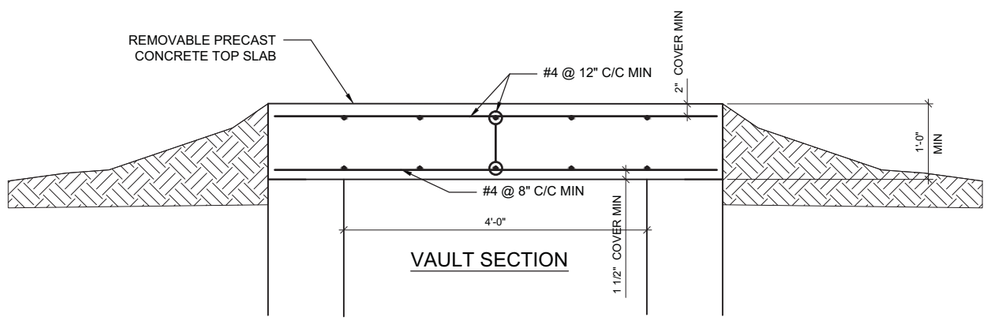
2 TYPE 1 VAULT COVER - SECTION A DETAIL
3" = 1'-0"



3 TYPE 2 VAULT COVER - SECTION A DETAIL
3" = 1'-0"

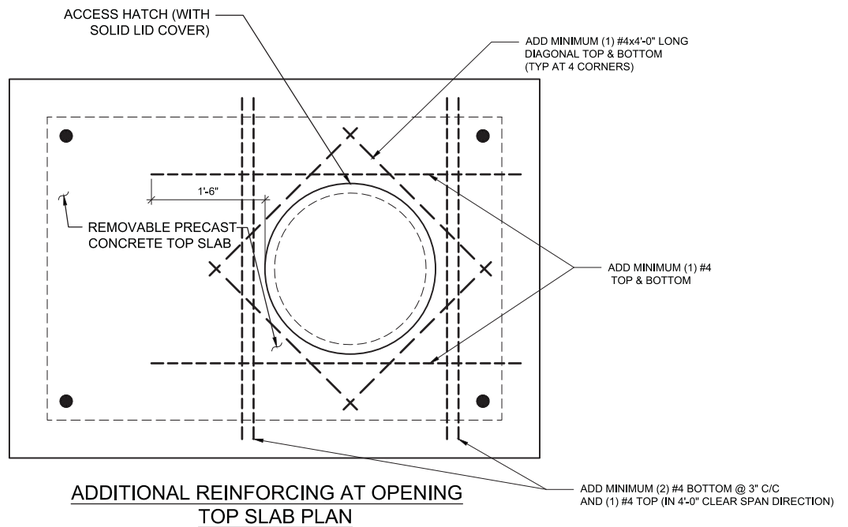


4 TYPE 2 VAULT COVER - SECTION C DETAIL
3" = 1'-0"



VAULT SECTION

WELL METER & WELL VAULT TYPE 2 - TYPICAL SECTION



ADDITIONAL REINFORCING AT OPENING
TOP SLAB PLAN

0 1' 2' 3'
SCALE: 1"=1'-0"

NOTES:
1. PRECAST CONCRETE VAULT COMPONENTS SHALL BE DESIGNED WITH LOADING IN ACCORDANCE WITH AASHTO HS20-44.
2. CONCRETE SHALL BE 5,000 P.S.I. COMPRESSIVE STRENGTH @ 28 DAYS. REINFORCING STEEL SHALL BE ASTM A-615.
3. ALL PIPING AND CONDUIT SHALL BE SECURED TO THE WALLS OR BASE SLAB OF THE CONCRETE VAULTS WITH ANCHOR BOLTS, UNISTRUT, OR CONCRETE PIPE SUPPORTS. CONTRACTOR SHALL INSTALL SUPPORTS WHEREVER NECESSARY TO PROPERLY SUPPORT PIPING AND CONDUIT PER SPECIFICATION 40 05 15.
4. CONTRACTOR RESPONSIBLE FOR LOCATING AND VERIFYING LOCATION OF ALL UTILITIES LOCATED WITHIN AREAS TO BE AFFECTED BY CONSTRUCTION.
5. ALL PIPE PENETRATIONS SHALL BE LINK SEALED IN ACCORDANCE WITH SPECIFICATIONS.
6. SEE MECHANICAL DRAWINGS FOR ALL PIPE PENETRATIONS.

- DRAFT -
NOT FOR CONSTRUCTION

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN	GWE	MSL	JPB	JEF	
0	04/05/13	INTERMEDIATE (60%) DESIGN	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS SHOWN

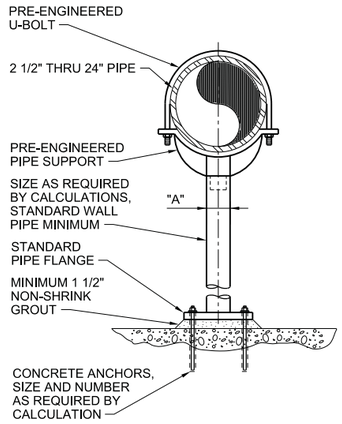
TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL VAULT TOP SLAB DETAILS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-00-06	REV 1

N1808

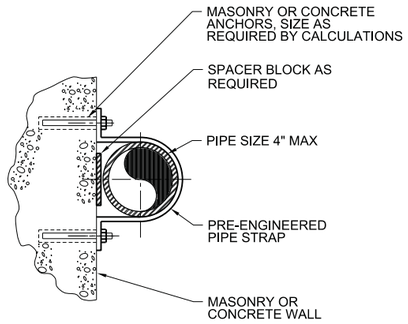


DIMENSION TABLE	
PIPE SIZE	"A" MINIMUM NOMINAL PIPE SIZE
2-1/2"	2-1/2"
3"	2-1/2"
4"	3"
6"	3"
8"	3"
10"	3"
12"	3"
14"	3"
16"	3"
20"	4"
24"	4"

NOTE:
SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

PIPE SUPPORT
SADDLE SUPPORT PEDESTAL TYPE - NON-ADJUSTABLE
NTS

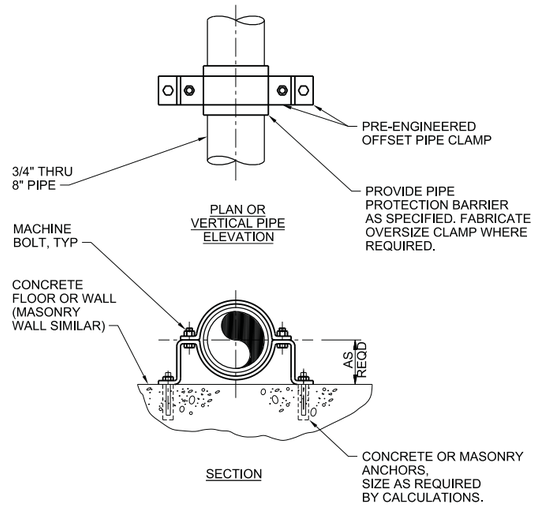
4005-501



NOTES:
1. ONLY FOR VERTICAL PIPES.
2. NOT FOR USE ON CEILINGS OR BOTTOMS OF BEAMS.
3. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED. FABRICATE OVERSIZE STRAP WHERE REQUIRED.
4. SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

PIPE SUPPORT - WALL MOUNT
NTS

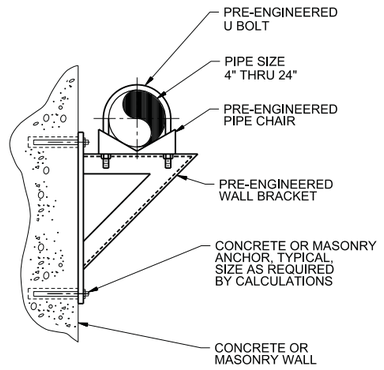
4005-503



NOTES:
1. ONLY FOR VERTICAL OR FLOOR MOUNTED PIPES.
2. SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

PIPE SUPPORT - WALL MOUNTED
NTS

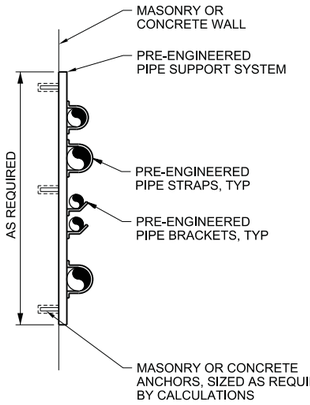
4005-505



NOTES:
1. WALL BRACKET SHALL BE MEDIUM HEAVY DUTY AS REQUIRED BY CALCULATIONS.
2. SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

PIPE SUPPORT - WALL MOUNTED MEDIUM
NTS

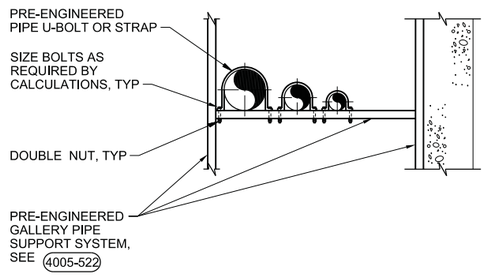
4005-508



NOTES:
1. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED.
2. SUBMIT FINAL DESIGN DRAWINGS AND CALCULATIONS OF SUPPORTS AND ANCHORAGES AS SPECIFIED.

STACKED PIPE WALL SYSTEM
NTS

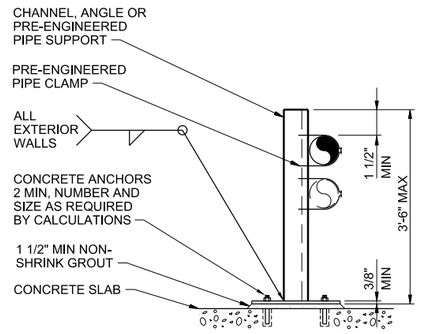
4005-521



NOTES:
1. SUBMIT FINAL DESIGN DRAWINGS AND CALCULATIONS OF SUPPORTS AND ANCHORAGES AS SPECIFIED.
2. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED.

GALLERY PIPE SUPPORT ATTACHMENT
NTS

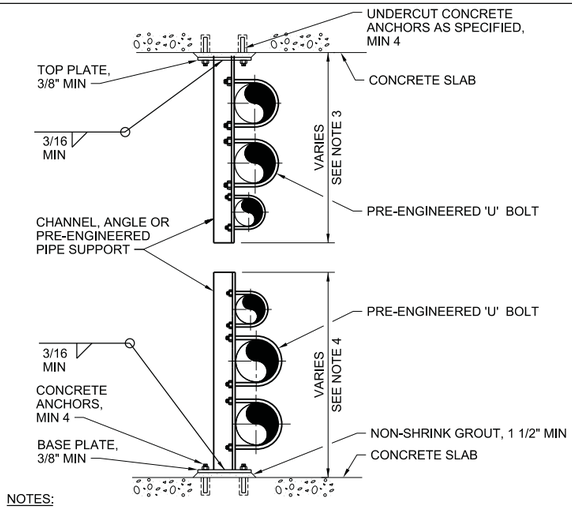
4005-523



NOTES:
1. SUBMIT FINAL DESIGN DRAWINGS AND CALCULATIONS OF SUPPORTS AND ANCHORAGES AS SPECIFIED.
2. MAXIMUM PIPE SIZE: 2" DIAMETER.
3. MATERIAL TYPE SHALL BE AS SHOWN ON DRAWINGS OR AS SPECIFIED.
4. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED.

FLOOR PIPE SUPPORT
NTS

4005-524



NOTES:
1. SUBMIT FINAL DESIGN DRAWINGS AND CALCULATIONS OF SUPPORTS AND ANCHORAGES AS SPECIFIED.
2. MAXIMUM PIPE SIZE: 4" DIAMETER WITHOUT LATERAL BRACING.
3. BRACE BOTTOM OF SUPPORT FOR LENGTHS EXCEEDING 2'-0".
4. BRACE TOP OF SUPPORT FOR LENGTHS EXCEEDING 4'-0".
5. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED.

OVERHEAD AND FLOOR PIPE SUPPORT
NTS

4005-525

DRAFT
NOT FOR
CONSTRUCTION

MICROFILM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2014	PRE-FINAL (90%) DESIGN		DS			JP

REVISIONS

APPROVED BY		
	SO	
	SUPV	
	DSGN	JP
	DWN	DS
	CHKD	ML
	OK	
	DATE	9/08/14
	SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
MECHANICAL
STANDARD DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

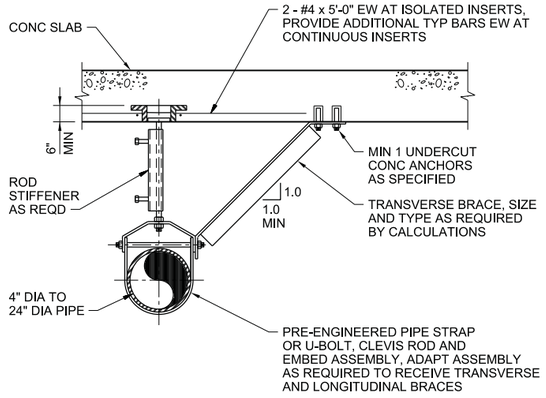
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
M-00-01
REV 1

N1808

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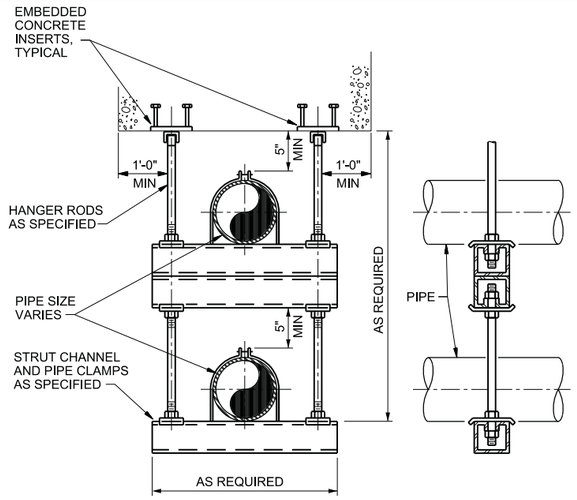
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NOTES:
1. SUBMIT FINAL DESIGN DRAWINGS AND CALCULATIONS OF SUPPORTS AND ANCHORS AS SPECIFIED.
2. LONGITUDINAL BRACE BEYOND (NOT SHOWN) AS REQUIRED BY CALCULATIONS, SEE (4005-5XX)

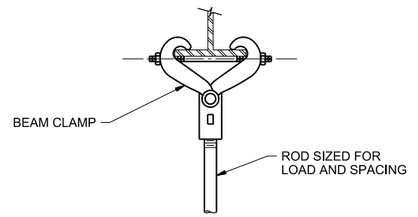
OVERHEAD PIPE HANGER
NTS

4005-550



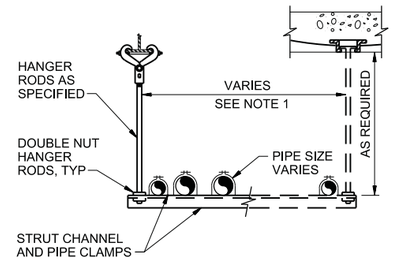
STACKED TRAPEZE PIPE HANGER
NTS

4005-555



BEAM CLAMP
NTS

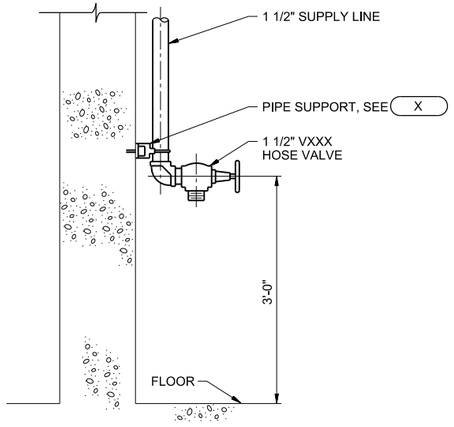
4005-556



NOTES:
1. LENGTH VARIES WITH NUMBER OF PIPES TO BE SUPPORTED, AND SPACING BETWEEN PIPES.

TRAPEZE PIPE HANGER
NTS

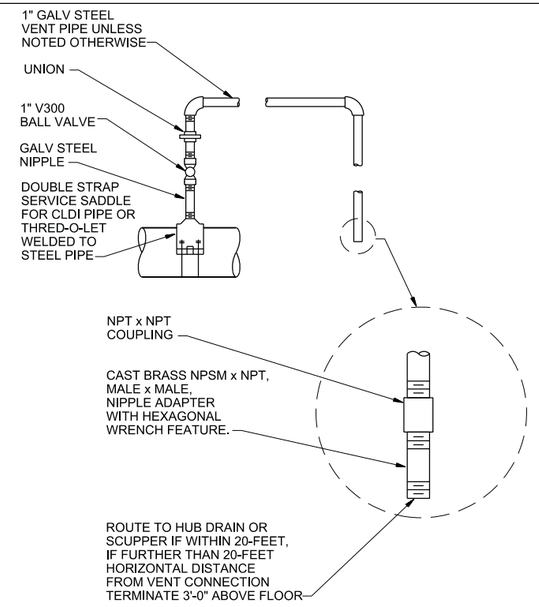
4005-558



NOTES:
1. ROTATE HOSE VALVE 30° OFF WALL.

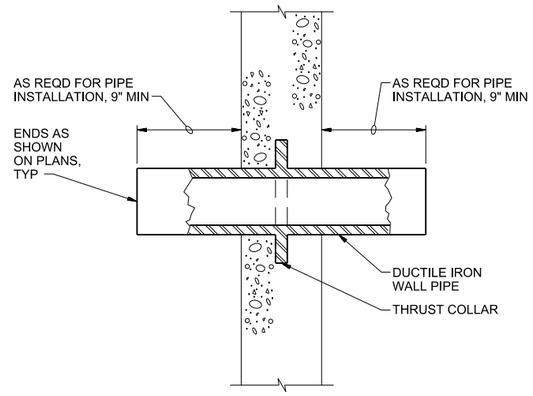
INTERIOR HOSE VALVE
NTS

4027-164



PIPE HIGH POINT VENT
NTS

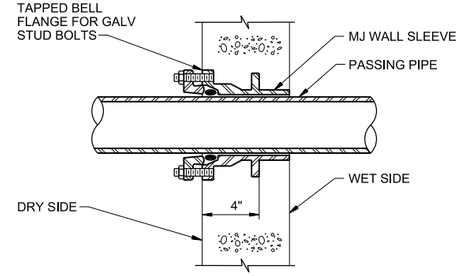
4027-205



NOTES:
1. COAT WALL PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO CONCRETE PLACEMENT.

DUCTILE IRON WALL PIPE
NTS

4027-600



NOTES:
1. COAT PIPE SLEEVE WITHSPECIFIED PAINT SYSTEM BEFORE CONCRETE PLACEMENT.

TYPE A PIPE SLEEVE
NTS

4027-603

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2014	PRE-FINAL (90%) DESIGN		DS			JP DS

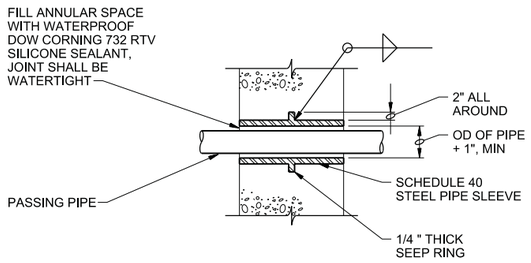
REVISIONS

APPROVED BY		
	SO	
	SUPV	
	DSGN	JP
	DWN	DS
	CHKD	ML
	OK	
	DATE	9/08/14
	SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
MECHANICAL
STANDARD DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
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SHEET NO. of SHEETS
M-00-02
REV 1

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N1808



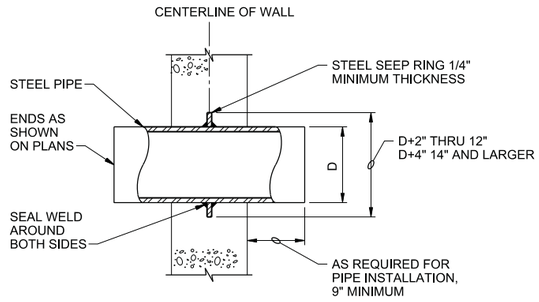
NOTES:

1. DO NOT USE WHERE SUBJECT TO HYDROSTATIC PRESSURE. PAINT ENTIRE SLEEVE AND SEEP RING AS SPECIFIED.

TYPE B PIPE SLEEVE

NTS

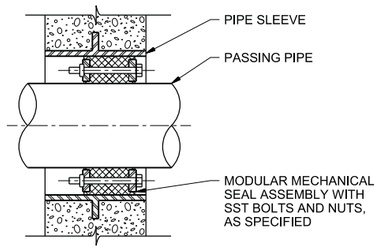
4027-604



STEEL WALL PIPE

NTS

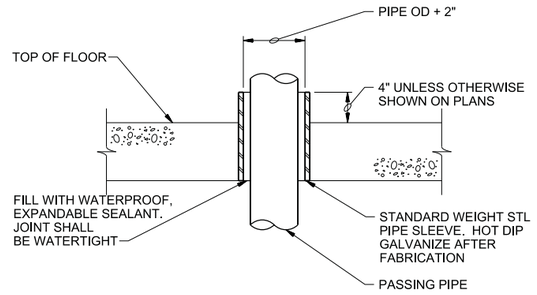
4027-605



WALL PIPE PENETRATION SEAL

NTS

4027-607



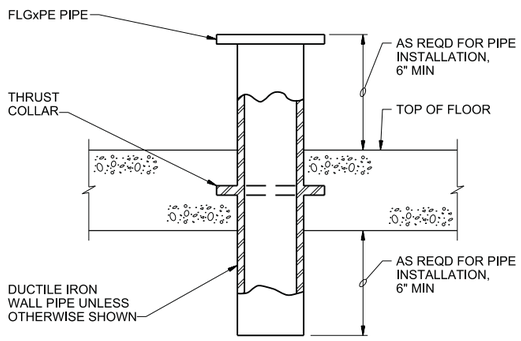
NOTES:

1. COAT FLOOR SLEEVE WITH SPECIFIED PAINT SYSTEM BEFORE CONCRETE PLACEMENT.

FLOOR SLEEVE

NTS

4027-620



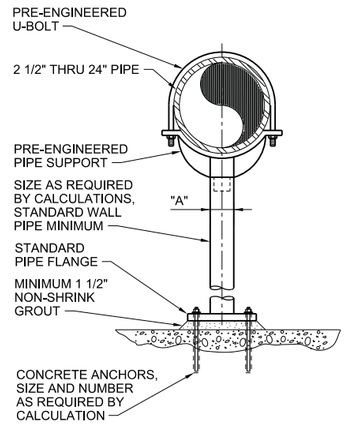
NOTES:

1. COAT FLOOR PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO CONCRETE PLACEMENT.

FLOOR PIPE

NTS

4027-622



DIMENSION TABLE	
PIPE SIZE	"A" MINIMUM NOMINAL PIPE SIZE
2-1/2"	2-1/2"
3"	2-1/2"
4"	3"
6"	3"
8"	3"
10"	3"
12"	3"
14"	3"
16"	3"
20"	4"
24"	4"

NOTE:
SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

PIPE SUPPORT SADDLE SUPPORT PEDESTAL TYPE - NON-ADJUSTABLE

NTS

4005-502

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2014	PRE-FINAL (90%) DESIGN		DS			JP

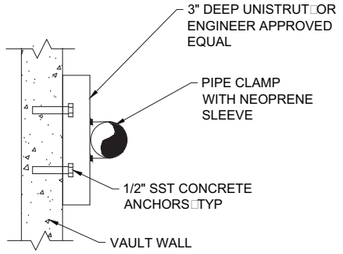
REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	JP
DWN	DS
CHKD	ML
OK	
DATE	9/08/14
SCALES	

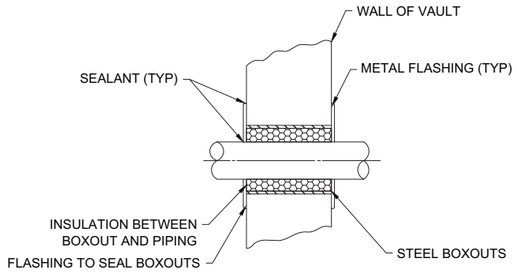
TOPOCK GROUNDWATER REMEDIATION PROJECT
MECHANICAL
STANDARD DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
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SHEET NO. of SHEETS
M-00-03
REV 1

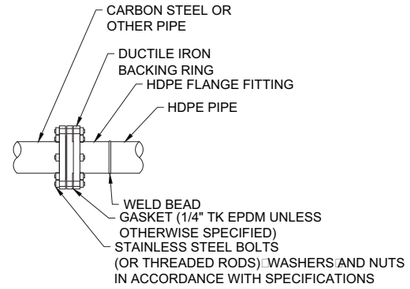
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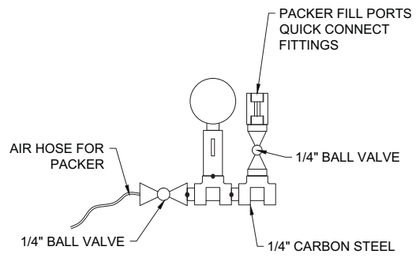
A WELL VAULT PIPE SUPPORT DETAIL
NOT TO SCALE



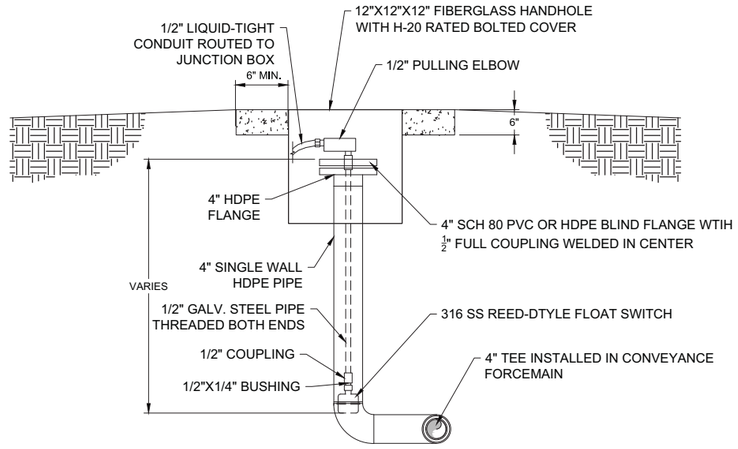
B CONCRETE WALL PENETRATION DETAIL (TYP)
NOT TO SCALE



C MATERIAL TRANSITION DETAIL (TYP)
NOT TO SCALE



D WELL PACKER FILL ASSEMBLY DETAIL
NOT TO SCALE



E DOUBLE CONTAINED LEAK DETECTION DETAIL (TYP)
NOT TO SCALE

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		AJW	BEH	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		AJW	BEH	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	BEH
DWN	AJW
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

MISCELLANEOUS STANDARD DETAILS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

- DRAFT -
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CONSTRUCTION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
M-00-04	REV 1

N1808

INJECTION WELLS

IRZ																			
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
IRZ-11		1	7615636	2103409															
IRZ-11		2	7615636	2103409															
IRZ-11		3	7615636	2103409															
IRZ-11		4	7615636	2103409															
IRZ-13		1	7615702	2103307															
IRZ-13		2	7615702	2103307															
IRZ-13		3	7615702	2103307															
IRZ-13		4	7615702	2103307															
IRZ-15		1	7615766	2103146															
IRZ-15		2	7615766	2103146															
IRZ-15		3	7615766	2103146															
IRZ-15		4	7615766	2103146															
IRZ-16		1	7615794	2103038															
IRZ-16		2	7615794	2103038															
IRZ-16		3	7615794	2103038															
IRZ-16		4	7615794	2103038															
IRZ-17		1	7615861	2102994															
IRZ-17		2	7615861	2102994															
IRZ-17		3	7615861	2102994															
IRZ-17		4	7615861	2102994															
IRZ-19		1	7615930	2102847															
IRZ-19		2	7615930	2102847															
IRZ-19		3	7615930	2102847															
IRZ-19		4	7615930	2102847															
IRZ-20		1	7615808	2102769															
IRZ-20		2	7615808	2102769															
IRZ-20		3	7615808	2102769															
IRZ-20		4	7615808	2102769															
IRZ-21		1	7615816	2102692															
IRZ-21		2	7615816	2102692															
IRZ-21		3	7615816	2102692															
IRZ-21		4	7615816	2102692															
IRZ-25		1	7615826	2102416															
IRZ-25		3	7615826	2102416															
IRZ-27		1	7615801	2102239															
IRZ-27		3	7615801	2102239															
IRZ-29		1	7615792	2102083															
IRZ-29		3	7615792	2102083															
IRZ-31		1	7615791	2101947															
IRZ-31		3	7615791	2101947															
IRZ-33		1	7615828	2101793															
IRZ-33		3	7615828	2101793															
IRZ-35		1	7615904	2101665															
IRZ-37		1	7616004	2101555															
IRZ-39		1	7616112	2101376															

TCS AREA																		
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
TCS-1		1	7615168	2101171															
TCS-2		3	7615168	2101171															
TCS-2		1	7615149	2100900															
TCS-2		3	7615149	2100900															

INNER RECIRCULATION LOOP																		
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H	I	J	K	L	M
IRL-1		1	7614358	2103365														
IRL-2		1	7614133	2103058														
IRL-3		1	7613976	2102799														
IRL-4		1	7613954	2102381														

EXTRACTION WELLS

IRZ																		
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H	I	J	K	L	M
IRZ-1		1	7615297	2104064			456			410								
IRZ-5		1	7615445	2103825			456			380								
IRZ-9		1	7615566	2103560			456			405								
IRZ-23		1	7615825	2102535			456			430								

RIVERBANK																		
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H	I	J	K	L	M
RB-1		1	7615764	2103918			456								185	145		
RB-2		1	7616012	2103398			456								262	222		
RB-3		1	7616211	2103173			456								327	297		
RB-4		1	7616338	2102909			456								343	323		
RB-5		1	7616398	2102424			456								394	384		

TRANSWESTERN BENCH													
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H
TWB-1		1	7615955	2100973			456			433	423		
TWB-2		1	7616024	2100966			456			441	431		

EAST RAVINE													
WELL NUMBER	WELL DIAMETER	WELL SCREEN INTERVAL	X COORDINATE	Y COORDINATE	GROUND SURFACE ELEVATION	A	B	C	D	E	F	G	H
ER-1		1	7616511	2101089									
ER-2		1	7616666	2100999									
ER-3		1	7616855	2100898									
ER-4		1	7616935	2100761									
ER-6		1	7615840	2100513									

NOTE
1. COORDINATES AND ELEVATION DATA TO BE DETERMINED AS THE DESIGN ADVANCES.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		BEH	JPB	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		BEH	JPB	JPB	JEF

REVISIONS

APPROVED BY JEF

SO
SUPV JPB
DSGN JPB
DWN BEH
CHKD JPB
OK JEF
DATE 09/08/14
SCALES AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL CONSTRUCTION SCHEDULE

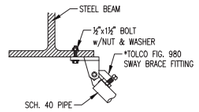
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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DWG LIST
SUPSDS
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SHEET NO. of SHEETS

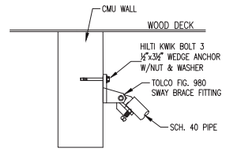
M-00-05 | REV 1

N1808

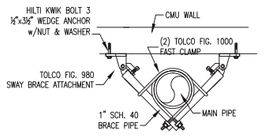
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DETAIL S1
*PARALLEL OR PERPENDICULAR TO BEAM



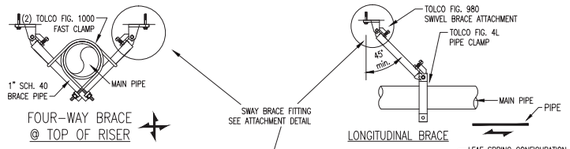
ORIENTATION – E
DETAIL C3



FOUR-WAY BRACE
@ TOP OF RISER

ALLOWABLE LOADS PER ICC REPORT ESR-1385:
MIN. DISTANCE FROM EDGE OF WALL = 4":
½" TENSION = 314 lbs ½" SHEAR = 830 lbs

ALLOWABLE LOADS PER ICC REPORT ESR-1385:
MIN. DISTANCE FROM EDGE OF WALL = 12":
½" TENSION = 333 lbs ½" SHEAR = 1464 lbs



FOUR-WAY BRACE
@ TOP OF RISER

LATERAL BRACE

SEISMIC BRACING
SCALE: NONE

EARTHQUAKE BRACING NOTES

1. EARTHQUAKE BRACING SHALL BE PROVIDED PER NFPA 13, 2013 ed., SECTION 9.3.5.
2. LOADS ARE DETERMINED BY ANALYSIS PER 9.3.5.5.3 (SEE ANNEX E & CALCULATIONS).
3. LONGITUDINAL BRACES SHALL BE ALLOWED TO ACT AS LATERAL BRACES WHERE THEY ARE INSTALLED WITHIN 24" OF PIPING WHICH IS BRACED LATERALLY AND VICE VERSA PER 9.3.5.6.27 & 9.3.5.5.8.
4. EACH RUN OF PIPE BETWEEN A CHANGE IN DIRECTION SHALL BE PROVIDED WITH BOTH LATERAL AND LONGITUDINAL BRACING. EXCEPTION: PIPE RUNS LESS THAN 12 ft. PER 9.3.5.7.2.
5. WHERE THERE IS A CHANGE IN DIRECTION, THE CUMULATIVE DISTANCE BETWEEN LATERAL SWAY BRACES SHALL NOT EXCEED THE MAXIMUM PERMITTED DISTANCE IN ACCORDANCE WITH 9.3.5.5.2.2 (40 FT).

BRANCH LINE RESTRAINT NOTES
(FOR PIPE HUNG w/ROD LONGER THAN 6")

1. BRANCH LINE RESTRAINT SHALL BE PROVIDED BY THE USE OF ONE OF THE FOLLOWING (PER NFPA 13, 2013 ed., SECTION 9.3.6):
   - 1.1. Listed sway brace assembly (see seismic bracing details).
   - 1.2. Wraparound U-hook satisfying the requirements of 9.3.5.5.11
   - 1.3. No. 12, 440 lb wire installed at least 45° from the vertical plane and anchored on both sides of the pipe. (wire restraint shall be located within 24" of a hanger which is of a type that will prevent upward movement per 9.3.6.2.
   - 1.4. CPVC hangers utilizing two points of attachment.
   - 1.5. Hanger not less than 45° from vertical installed within 6" of the vertical hanger arranged for restraint against upward movement, provided it is utilized such that l/r does not exceed 400, where the rod shall extend to the pipe or have a surge clip installed. MAX LENGTH OF ⅜" ROD @ l/r of 400 = 30"
2. THE END SPRINKLER ON A LINE SHALL BE RESTRAINED. PER 9.3.6.3.
3. BRANCH LINES SHALL BE LATERALLY RESTRAINED AT INTERVALS NOT EXCEEDING THOSE SPECIFIED IN TABLE 9.3.6.4(a) BASED ON BRANCH LINE DIAMETER AND THE VALUE OF Cp. (PER 9.3.5.9.3, Cp = .35)
4. WHERE BRANCH LINES ARE SUPPORTED BY RODS LESS THAN 6" LONG MEASURED BETWEEN THE TOP OF THE PIPE AND THE POINT OF ATTACHMENT TO THE BUILDING STRUCTURE, THE REQUIREMENTS OF 9.3.6.1 THROUGH 9.3.6.4 SHALL NOT APPLY AND ADDITIONAL RESTRAINT SHALL NOT BE REQUIRED. (PER 9.3.6.5.)
5. SPRIGS 4 FT OR LONGER SHALL BE RESTRAINED AGAINST LATERAL MOVEMENT. (9.3.6.6)
6. DROPS AND ARMOVERS SHALL NOT REQUIRE RESTRAINT. (9.3.6.7)

Cp value per NFPA 13 – 2013 table 9.3.5.9.3

Ss		Cp
0.23	=	0.35

SEISMIC COEFFICIENT
ASCE 7 Standard

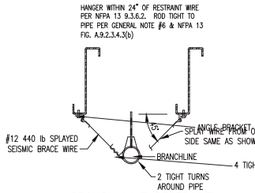
Latitude = 34.84806 Longitude = -114.614131

Spectral Response Accelerations Ss and S1
Ss and S1 = Mapped Spectral Acceleration Values
Site Class B – Fa = 1.0 ,Fv = 1.0
Data are based on a 0.01 deg grid spacing

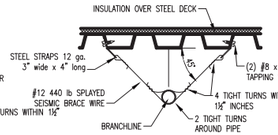
Period (sec)	Sa (g)
0.2	0.226 (Ss, Site Class B)
1.0	0.135 (S1, Site Class B)

MAX SPACING OF STEEL BRANCHLINE RESTRAINTS PER NFPA Table 9.3.6.4(a)

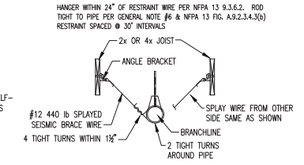
	SEISMIC COEFFICIENT (Cp)			
PIPE (IN.)	Cp≤0.50	0.5<Cp≤0.71	Cp>0.71	
1"	43	36	26	
1¼"	46	39	27	
1½"	49	41	29	
2"	53	45	31	



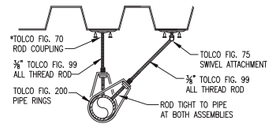
BRANCH LINE RESTRAINT
(FOR PIPE HUNG w/ROD LONGER THAN 6")



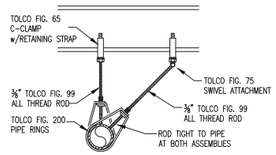
BRANCH LINE RESTRAINT
(FOR PIPE HUNG w/ROD LONGER THAN 6")
RESTRAINT TO BE INSTALLED WITHIN 24" OF HANGER PER NFPA 13. ROD TO BE RUN DOWN TIGHT TO PIPE PER NFPA 13.



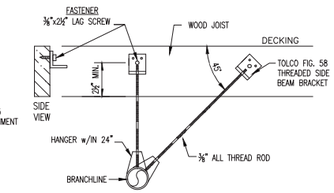
TYPICAL BRANCHLINE RESTRAINT
(FOR PIPE HUNG w/ROD LONGER THAN 6")



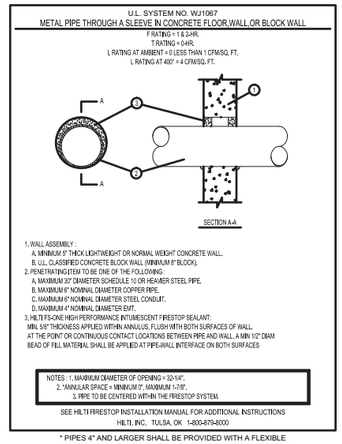
TYPICAL BRANCH LINE RESTRAINT
(FOR PIPE HUNG w/ROD LONGER THAN 6")
HANGER WITHIN 6" OF RESTRAINT WIRE PER NFPA 13 9.3.6.2. ROD TIGHT TO PIPE PER GENERAL NOTE #6 & NFPA 13 FIG. A.9.2.3.4.3(b)



TYPICAL BRANCH LINE RESTRAINT
(FOR PIPE HUNG w/ROD LONGER THAN 6")
HANGER WITHIN 6" OF RESTRAINT WIRE PER NFPA 13 9.3.6.2. ROD TIGHT TO PIPE PER GENERAL NOTE #6 & NFPA 13 FIG. A.9.2.3.4.3(b)



TYPICAL BRANCH LINE RESTRAINT
(FOR PIPE HUNG w/ROD LONGER THAN 6")
HANGER WITHIN 6" OF RESTRAINT WIRE PER NFPA 13 9.3.6.2. ROD TIGHT TO PIPE PER GENERAL NOTE #6 & NFPA 13 FIG. A.9.2.3.4.3(b)



* PIPES 4" AND LARGER SHALL BE PROVIDED WITH A FLEXIBLE COUPLING WITHIN 12" OF EACH SIDE OF PENETRATION.(NFPA 13)

PENETRATION DETAIL

GENERAL NOTES

1. THE AUTOMATIC SPRINKLER SYSTEM SHALL CONFORM TO THE REQUIREMENTS OF THE 2013 EDITION OF NFPA 13.
2. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE STOPPED. (SEE DETAIL)
3. ALL ELECTRICAL WIRING TO BE PERFORMED BY OTHERS.
4. ARMOVERS LONGER THAN 24" SHALL BE PROVIDED WITH A HANGER.
5. THE NEW SYSTEM IS HYDRAULICALLY CALCULATED. (SEE PIPING PLAN)
6. NEW PIPING SHALL BE SUPPLIED FROM NEW UNDERGROUND.
7. UPON COMPLETION, THE OVERHEAD SYSTEM SHALL BE TESTED AT 200 PSI FOR TWO (2) HOURS. (BEFORE TIE-IN)
8. BUILDING CONSTRUCTION IS OF NON-COMBUSTIBLE CONSTRUCTION.
9. OWNER:
10. FOR INSPECTION CALL:
11. EXCLUSIONS (WORK BY OTHERS):
    1. Installation of Systems.
    2. Wiring of Fire Alarm Systems.
    3. All Underground Fire Line and Hydrant Design (By Civil).
    4. Structural Calculations.
    5. Plan Review, Permit and Water Dept. Flow Fees

KEY

- ⟷ – 2-WAY EARTHQUAKE BRACE
- ⟷ – 4-WAY EARTHQUAKE BRACE
- FLEX – FLEXIBLE GROOVED COUPLING
- – RIGID "O-FLEX" GRVD COUPLING
- – GROOVED CAP
- – HANGER No.
- – APPROX. HANGER LOCATION
- (XX) – HYDRAULIC REFERENCE NODE
- – SYSTEM RISER
- – PIPE ELEVATION
- 410°0" – CEILING HEIGHT
- ℄ – CENTER LINE
- AFF – ABOVE FINISH FLOOR
- UNO – UNLESS NOTED OTHERWISE
- BOB – BOTTOM OF BEAM
- BOD – BOTTOM OF DECK
- BOF – BOTTOM OF FRAMING
- COJ – CUT ON JOB
- TOE – THREAD ONE END
- GOE – GROOVE ONE END
- GxG – GROOVE x GROOVE
- TxG – THREAD x GROOVE
- FxG – FLANGE x GROOVE
- TOR – TOP OF RISER
- BOR – BOTTOM OF RISER
- MC – MALLEABLE COUPLING
- UG – UNDERGROUND
- OH – OVERHEAD
- RN – RISER NIPPLE
- SU – SPRIG UP
- DR – DROP TO SPRINKLER
- (E) – EXISTING
- (N) – NEW
- (R) – RELOCATE

- DRAFT - NOT FOR CONSTRUCTION

MARQUEE
FIRE PROTECTION
710 W. Stadium Lane
Sacramento, CA. 95834–1130
TEL. 916. 641–7997 / 707. 642–7905
FAX. 916. 641–0775
CA. LIC. 570970 C–16

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD	BY
1	09/08/14	PRE-FINAL (90%) DESIGN		AJW	MWM	JPB	JEF	
0	04/05/13	INTERMEDIATE (60%) DESIGN		AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

FIRE PROTECTION GENERAL NOTES CARBON AMENDMENT BUILDINGS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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BILL OF MATL
DWG LIST
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SHEET NO. of SHEETS

F-00-01 REV 1

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COMPONENTS

SYMBOL	DESCRIPTION
RES	RESISTOR
SV	SOLENOID COIL
HTR	HEATER
	CAPACITOR
	DIODE
	DIODE, ZENER
MOV	METAL OXIDE VARISTOR
	AUDIBLE ALARM
?	3 PHASE MOTOR ? = MOTOR HP
M	3 PHASE MOTOR
M	SINGLE PHASE MOTOR
	TRANSFORMER SIZE AND VOLTAGE AS SHOWN
M	UTILITY POWER METER
	UFER GROUND
	GROUND ROD
	CURRENT TRANSFORMER RATIO AS NOTED

SWITCHES - PROCESS

SYMBOL	DESCRIPTION
FS	FLOW SWITCH - CLOSES UPON INCREASING FLOW
FS	FLOW SWITCH - OPENS UPON INCREASING FLOW
LS	LEVEL SWITCH - CLOSES UPON INCREASING LEVEL
LS	LEVEL SWITCH - OPENS UPON INCREASING LEVEL
PS	PRESSURE SWITCH - CLOSES UPON INCREASING PRESSURE (DECREASING VACUUM)
PS	PRESSURE SWITCH - OPENS UPON INCREASING PRESSURE (DECREASING VACUUM)
TS	TEMPERATURE SWITCH - CLOSES UPON INCREASING TEMPERATURE
TS	TEMPERATURE SWITCH - OPENS UPON INCREASING TEMPERATURE
ZS	LIMIT SWITCH - CLOSES AT SET LIMIT
ZS	LIMIT SWITCH - OPENS AT SET LIMIT
WS	TORQUE SWITCH - CLOSES UPON INCREASING TORQUE
WS	TORQUE SWITCH - OPENS UPON INCREASING TORQUE

DEVICES - RELAY

SYMBOL	DESCRIPTION
M 1	CONTACTOR OR STARTER M1
CR 1	CONTROL RELAY CR1
TR 2	TIME DELAY RELAY TR2 - ADJUSTABLE TIME DELAY RANGE & SETTING AS SHOWN
TDOE TDOD	TIME DELAY ON ENERGIZATION TIME DELAY ON DE-ENERGIZATION
107, 121	REFERENCED RELAY WITH N.O. CONTACT ON LINE 107 N.C. CONTACT ON LINE 121
CR1 (105)	NORMALLY OPEN, RELAY CONTACT - ACTUATED BY RELAY CR1 COIL LOCATED ON LINE 105
CR1	NORMALLY CLOSED, RELAY CONTACT - ACTUATED BY RELAY CR1
TR2	NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT CLOSES AFTER TR2 IS ENERGIZED
TR2	NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS ENERGIZED
TR2	NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS DE-ENERGIZED
TR2	NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT CLOSES AFTER TR2 IS DE-ENERGIZED
TR2	CONTACT OPENS AND CLOSES IN A TIMED REPEAT CYCLE

WIRING - CONNECTIONS

SYMBOL	DESCRIPTION
	PANEL OR EQUIPMENT WIRING
	FIELD WIRING
	CONDUCTORS - NOT CONNECTED
	CONDUCTORS - CONNECTED
	GROUND CONNECTION
	PLUG AND RECEPTACLE
	INCOMING LINE
123 123 123	TERMINAL BLOCKS WITH TERMINAL NUMBER AS SHOWN
	TERMINAL BLOCKS WITH TERMINAL NUMBER DETERMINED BY SUBMITTAL
SHIELD CONDUCTOR	SHIELDED CABLE

PLAN - SYMBOLS

	CONDUIT, EXPOSED
	CONDUIT, IN SLAB OR BELOW GRADE
	CONDUIT, CONCEALED IN WALL OR CEILING
	CONDUIT STUBBED OUT & CAPPED
	CONDUIT BENDS TOWARD OBSERVER
	CONDUIT BENDS AWAY FROM OBSERVER
	CONDUIT ENDS
J	FLEXIBLE CONDUIT CONNECTION FROM J-BOX TO EQUIPMENT
	CONDUIT CHANGE IN ELEVATION
G	BARE COPPER GROUND WIRE
G	GROUND CONNECTION BOLTED TYPE
G	GROUND CONNECTION EXOTHERMIC WELD TYPE
	DISCONNECT SWITCH
	FIELD MOUNTED DEVICE
	SPECIAL RECEPTACLE
	TELEPHONE/DATA RECEPTACLE 2 PORT TA568A, 2 CAT 6 CABLES
#	CONDUIT REFERENCE TO SCHEDULE
T	THERMOSTAT
E	EYS SEAL
J	JUNCTION BOX
	PULL BOX OF SIZE SHOWN (CHRISTY BOX SIZE MINIMUM)
A a #	LIGHTING FIXTURE # - CIRCUIT BREAKER NUMBER A - FIXTURE SCHEDULE REF. a - CONTROL SWITCH REFERENCE
WP #7 WP	DUPLEX RECEPTACLE # - CIRCUIT BREAKER NUMBER WP - WEATHERPROOF (IF SHOWN) GFI - GROUND FAULT TYPE
a M	TOGGLE SWITCH a - FIXTURES CONTROLLED 3 - 3 WAY M = MOTION DETECTOR T = TIMER SWITCH

SWITCHES - OPERATOR

SYMBOL	DESCRIPTION
SW	TOGGLE OR DISCONNECT SWITCH
PB	PUSHBUTTON - NORMALLY OPEN, MOMENTARY ACTION
PB	PUSHBUTTON - NORMALLY CLOSED, MOMENTARY UNLESS LOS (LOCK OUT STOP) WHERE MECHANICALLY HELD
PB	PUSHBUTTON, MECHANICALLY CONNECTED, DOUBLE CIRCUIT - NORMALLY CLOSED AND NORMALLY OPEN
HAND OFF AUTO	SELECTOR SWITCH, 3 POSITION - CONTACT STATUS SHOWN EXISTS I.E. AT POSITION OF HAND, OFF, OR AUTO
	SELECTOR SWITCH, 2 POSITION - MIDDLE POSITION IS DELETED
	POTENTIOMETER

DEVICES - FRONT PANEL

SYMBOL	DESCRIPTION
X	INDICATING LIGHT, LETTER "X" INDICATES COLOR: R=RED G=GREEN, A=AMBER, W=WHITE Y=YELLOW, B=BLUE
PTT X	INDICATING LIGHT, PUSH TO TEST
ETM	ELAPSED TIME METER

DEVICES - PROTECTIVE

SYMBOL	DESCRIPTION
Y xA xP xT	LOW VOLTAGE MOLDED CASE, INSULATED CASE OR POWER CIRCUIT BREAKER, RATINGS AS SHOWN IN DRAWINGS AND AS DEFINED BELOW: xA: CIRCUIT BREAKER AMERAGE xAT: AMPERAGE TRIP xAF: AMPERAGE FRAME xP: NUMBER OF POLES xT: TRIP PROTECTION MCP: MOTOR CIRCUIT PROTECTION TM: THERMAL MAGNETIC L: LONG TIME DELAY S: SHORT TIME DELAY I: INSTANTANEOUS TRIP G: GROUND FAULT A: ARC FLASH PROTECTION 100% DUTY RATED y: BREAKER FEATURES / OPTIONS
100% S K M E	- SHUNT TRIP - KIRK-KEY INTERLOCK - MOTORIZED OPERATION - ELECTRICALLY CHARGED PUSHBUTTON OPERATION
OL	THERMAL OVERLOAD CONTACT
	THERMAL OVERLOAD ELEMENT
	FUSE MEDIUM VOLTAGE CIRCUIT BREAKER
52	TRIP FUNCTIONS PER DRAWINGS AND SPECIFICATIONS
MFR	MULTIFUNCTION RELAY PER SPECIFICATIONS

MISCELLANEOUS ABBREVIATIONS

&	AND	MTR	MOTOR
@	AT	MUX	MULTIPLEXER
A	AMBER, AMPERES	MV	MERCURY VAPOR, MEDIUM VOLTAGE
AC	ALTERNATING CURRENT	N	NEUTRAL
ACK	ACKNOWLEDGE	NC	NORMALLY CLOSED
AFF	ABOVE FINISHED FLOOR	NHC	NORMALLY HELD CLOSED
AH	AMP HOUR	NHO	NORMALLY HELD OPEN
AI	ANALOG INPUT	NIC	NOT IN CONTRACT
AIC	AMP INTERRUPTING CAPACITY SYMMETRICAL	NL	NIGHT LIGHT
AM	AMP METER	NO	NORMALLY OPEN
AO	ANALOG OUTPUT	NTS	NOT TO SCALE
AWG	AMERICAN WIRE GUAGE	(N)	NEW
ATS	AUTOMATIC TRANSFER SWITCH	OC	ON CENTER
BATT	BATTERY	OI	OPERATOR INTERFACE
(B)	PROVIDED BY OWNER - INSTALLED BY CONTRACTOR	OL	OVERLOAD
BFC	BELOW FINISHED CEILING	ORP	OXIDATION REDUCTION POTENTIAL
BOD	BIOCHEMICAL OXYGEN DEMAND	P	POLE
BPF	BAND PASS FILTER	PB	PUSHBUTTON
BYP	BYPASS	PBX	PULL BOX
C	CONDUIT	PF	POWER FACTOR
CAP	CAPACITOR	PFR	POWER FAIL RELAY
CB	CIRCUIT BREAKER	PH	HYDROGEN ION CONCENTRATION
CKT	CIRCUIT	PLC	PROGRAMMABLE LOGIC CONTROLLER
COAX	COAXIAL CABLE	PM	POWER MONITOR
COMM	COMMUNICATION	PNL	PANEL
CR	CONTROL RELAY	POT	POTENTIOMETER
CT	CURRENT TRANSFORMER	PRESS	PRESSURE
CS	CONSTANT SPEED	PR	PAIR, TWISTED AND SHIELDED
CU	COPPER	PRI	PRIMARY
DC	DIRECT CURRENT	PROVIDE	FURNISH, INSTALL, AND CONNECT
DET	DETAIL	PS	PRESSURE SWITCH
DI	DIGITAL INPUT	PT	POTENTIAL TRANSFORMER
DISC	DISCONNECT	PTT	PUSH TO TEST
DO	DIGITAL OUTPUT	PVC	POLYVINYLCHLORIDE
DPDT	DOUBLE POLE DOUBLE THROW	PWR	POWER
DWG	DRAWING	REF	REFERENCE
E-DTL	ELECTRICAL DRAWING DETAIL	RFI	RADIO FREQUENCY INTERFERENCE
ELEV	ELEVATION	RMS	ROOT MEAN SQUARE
ENET	ETHERNET	RTD	RESISTANCE TEMPERATURE DETECTOR
ETM	ELAPSED TIME METER	RST	RESET
ESW	ETHERNET SWITCH	RVAT	REDUCE VOLTAGE AUTO TRANSFORMER
(E)	EXISTING	RTU	REMOTE TERMINAL UNIT
FCS	FIELD CONTROL STATION	(R)	REWIRE, RELOCATE, REVISE, REUSE
FLA	FULL LOAD AMPS	SCH	SCHEDULE
FLEX	FLEXIBLE LIQUID TIGHT CONDUIT	SEC	SECONDARY, SECOND
FRP	FIBERGLASS REINFORCED PLASTIC	SECS	SECONDS
FS	FULL SPEED	SEL	SELECTOR
FVNR	FULL VOLTAGE NON-REVERSING	SFA	SERVICE FACTOR AMPS
FVR	FULL VOLTAGE REVERSING	SPEC	SPECIFICATION
FWD	FORWARD	SS	STAINLESS STEEL
(F)	FUTURE	SSRC	STAINLESS STEEL RIGID CONDUIT
GALV	GALVANIZED	SSS	SOLID STATE STARTER
GFI	GROUND FAULT INTERRUPTER	STT	START
GND	GROUND	STP	STOP
GRS	GALVANIZED RIGID STEEL CONDUIT	SV	SOLENOID VALVE
GRS-PVC	PVC COATED GRS CONDUIT	SW	SWITCH
HI	HIGH	SWBD	SWITCHBOARD
HIM	HUMAN INTERFACE MODULE	SYMM	SYMMETRICAL
HOA	HAND OFF AUTO	TB	TERMINAL BLOCK
HP	HORSE POWER	TC	TIME CLOCK
HPS	HIGH PRESSURE SODIUM	TDOD	TIME DELAY ON DE-ENERGIZATION
HS	HAND SWITCH	TDOE	TIME DELAY ON ENERGIZATION
HTR	HEATER	TELCO	TELEPHONE COMPANY
HZ	HERTZ	TM	THERMAL MAGNETIC
HZD	HAZARD	TEMP	TEMPERATURE
I	INTERLOCK	TR	TIME DELAY RELAY
I-DTL	INSTRUMENTATION DRAWING DETAIL	TRIAD	TWISTED AND SHIELDED 3 CONDUCTOR
I/O	INPUT/OUTPUT	TS	TEMPERATURE SWITCH
INST	INSTANTANEOUS	TSPR	TWISTED AND SHIELDED PAIR
ISR	INTRINSICALLY SAFE RELAY	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
IS	INTRINSICALLY SAFE	TYP	TYPICAL
J	JUNCTION BOX	UG	UNDERGROUND
K	KILO, PREFIX	ULH	ULTRA LOW HARMONIC
LA	LIGHTNING ARRESTOR	UON	UNLESS OTHERWISE NOTED
LC	LIGHTING CONTACTOR	UPS	UNINTERRUPTIBLE POWER SUPPLY
LEL	LOWER EXPLOSION LIMIT	V	VOLTAGE
LO	LOW	VA	VOLT AMPS
LOS	LOCK OUT STOP	VAR	VOLT AMPS REACTIVE
LR	LATCHING RELAY	VFD	VARIABLE FREQUENCY DRIVE
LS	LIMIT SWITCH	VLV	VALVE
M	MOTOR CONTACTOR	VM	VOLTMETER
MAG	MAGNETIC FLOWMETER	VMR	VOLTAGE MONITOR RELAY
MAX	MAXIMUM	VR	VOLTAGE RELAY
MCM	THOUSAND CIRCULAR MILS	W	WATTS
MCP	MOTOR CIRCUIT PROTECTOR	WP	WEATHER PROOF, NEMA 3R
MCS	MOLDED CASE SWITCH	WTP	WATER TREATMENT PLANT
MH	MANHOLE	WWTP	WASTE WATER TREATMENT PLANT
MIN	MINIMUM, MINUTE	XFMR	TRANSFORMER
MODEM	MODEM	Z	IMPEDANCE
MOV	MOTOR OPERATED VALVE	ZS	LIMIT SWITCH

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CONSULTING ELECTRICAL ENGINEERS
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FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL SYMBOLS AND ABBREVIATIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

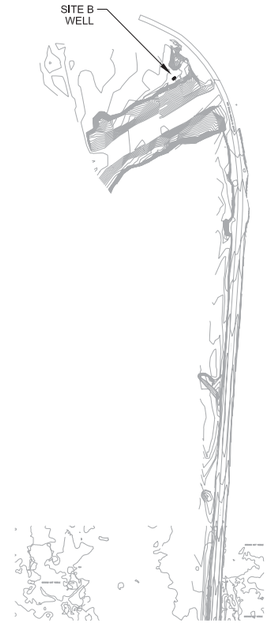
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DWG LIST	
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SHEET NO. of SHEETS	
E-00-01	REV 1

PLOT DATE: Aug 25, 2014
PLOT TIME: 4:22:16pm
FILENAME: FE-E-XXX-0001AD.dwg

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OVERALL ELECTRICAL SITE PLAN



INSET
CONTINUED FROM LEFT

LEGEND

- △ TRANSFORMER, POWER DISTRIBUTION, AND FIBER OPTIC BREAKOUT LOCATION (APPROX)
- UNDERGROUND 12KV DISTRIBUTION

ELECTRICAL PLAN NOTES:

1. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES. GROUT, CAULK, AND PAINT ANY PENETRATIONS INTO STRUCTURES FOR WATERTIGHT SEAL.
2. INSTALL NON-UTILITY CONDUITS PER DRAWING DETAILS E-00-52/DET 4 AND SPECIFICATIONS SECTION XXXXX.
3. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH CIVIL/MECH PLANS.
4. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, E-XX-XX.
5. CONDUIT TYPE IN CONDUIT SHEDULE IS TYPICAL FOR UNDERGROUND HORIZONTAL PORTIONS OF RUN. IF ENTIRE RUN OF CONDUIT IS EXPOSED, THEN TYPE SHALL BE PER AREA CLASSIFICATION AS DEFINED IN SPECIFICATIONS SECTION 26 05 33ST.
6. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL E-00-52/DET 5.
7. EXPOSED CONDUIT TYPE TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
8. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
9. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.
10. RECEPTACLES TO BE GROUND FAULT INTERRUPTER (GFI) TYPE AND WEATHERPROOF (WP) WHERE SHOWN.
11. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITIONS.
12. ALL WORK SHALL CONFORM TO LOCAL CODES AND NATIONAL ELECTRIC CODE.
13. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

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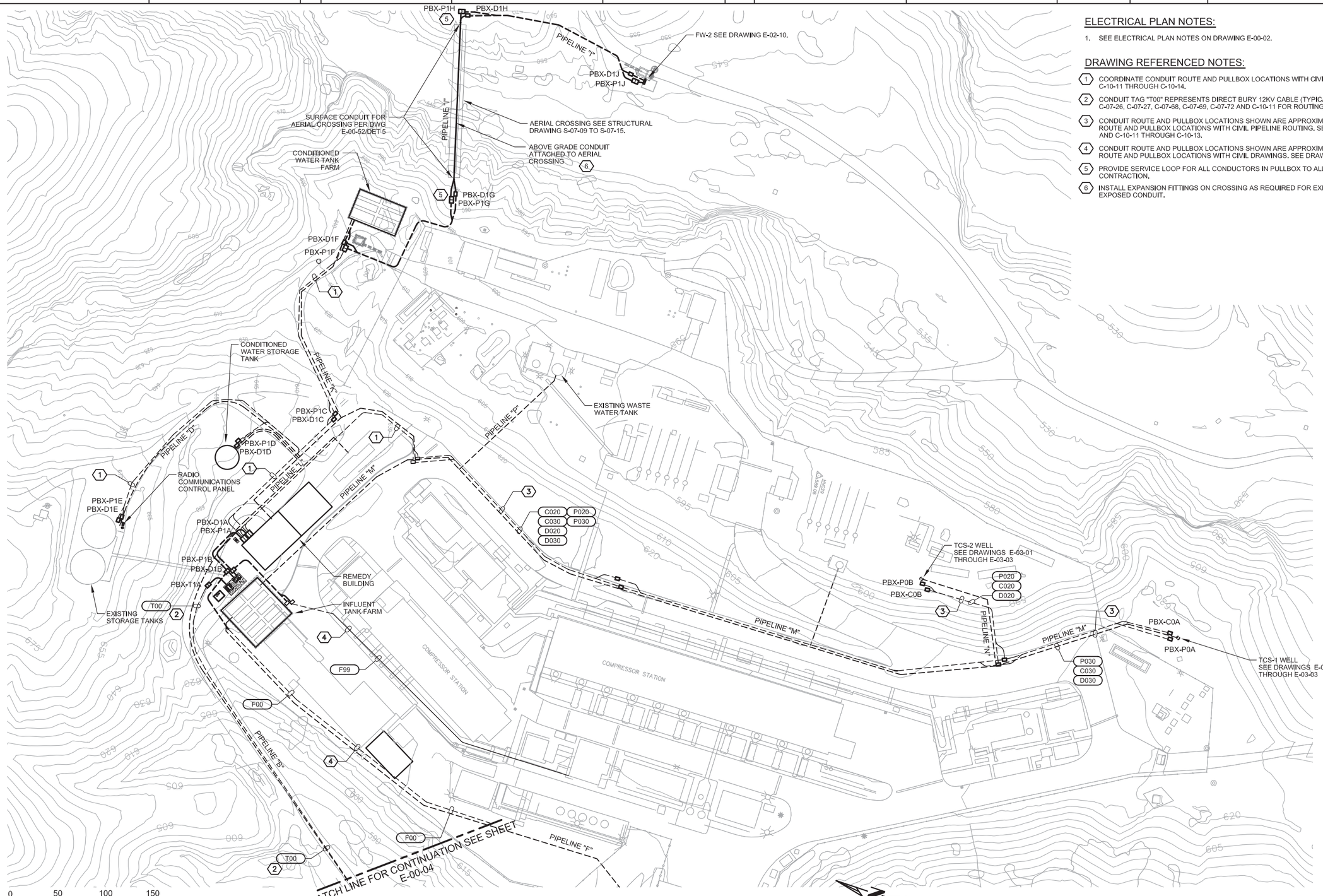
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
GROUNDWATER REMEDY
OVERALL ELECTRICAL SITEPLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
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SHEET NO.	of SHEETS
E-00-02	REV 1

FILENAME: FE-E-XXX-0002AD.dwg
PLOT DATE: Aug 26, 2014 PLOT TIME: 2:28:31pm
N1808



ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL PLAN NOTES ON DRAWING E-00-02.

DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL DRAWINGS. SEE DRAWINGS C-10-11 THROUGH C-10-14.
2. CONDUIT TAG "T00" REPRESENTS DIRECT BURY 12KV CABLE (TYPICAL). SEE CIVIL DRAWINGS C-07-26, C-07-27, C-07-68, C-07-69, C-07-72 AND C-10-11 FOR ROUTING.
3. CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL PIPELINE ROUTING. SEE DRAWINGS C-07-75, C-07-76 AND C-10-11 THROUGH C-10-13.
4. CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL DRAWINGS. SEE DRAWING C-10-14.
5. PROVIDE SERVICE LOOP FOR ALL CONDUCTORS IN PULLBOX TO ALLOW FOR EXPANSION & CONTRACTION.
6. INSTALL EXPANSION FITTINGS ON CROSSING AS REQUIRED FOR EXPANSION AND CONTRACTION OF EXPOSED CONDUIT.

COMPRESSOR STATION AREA PLAN

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1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
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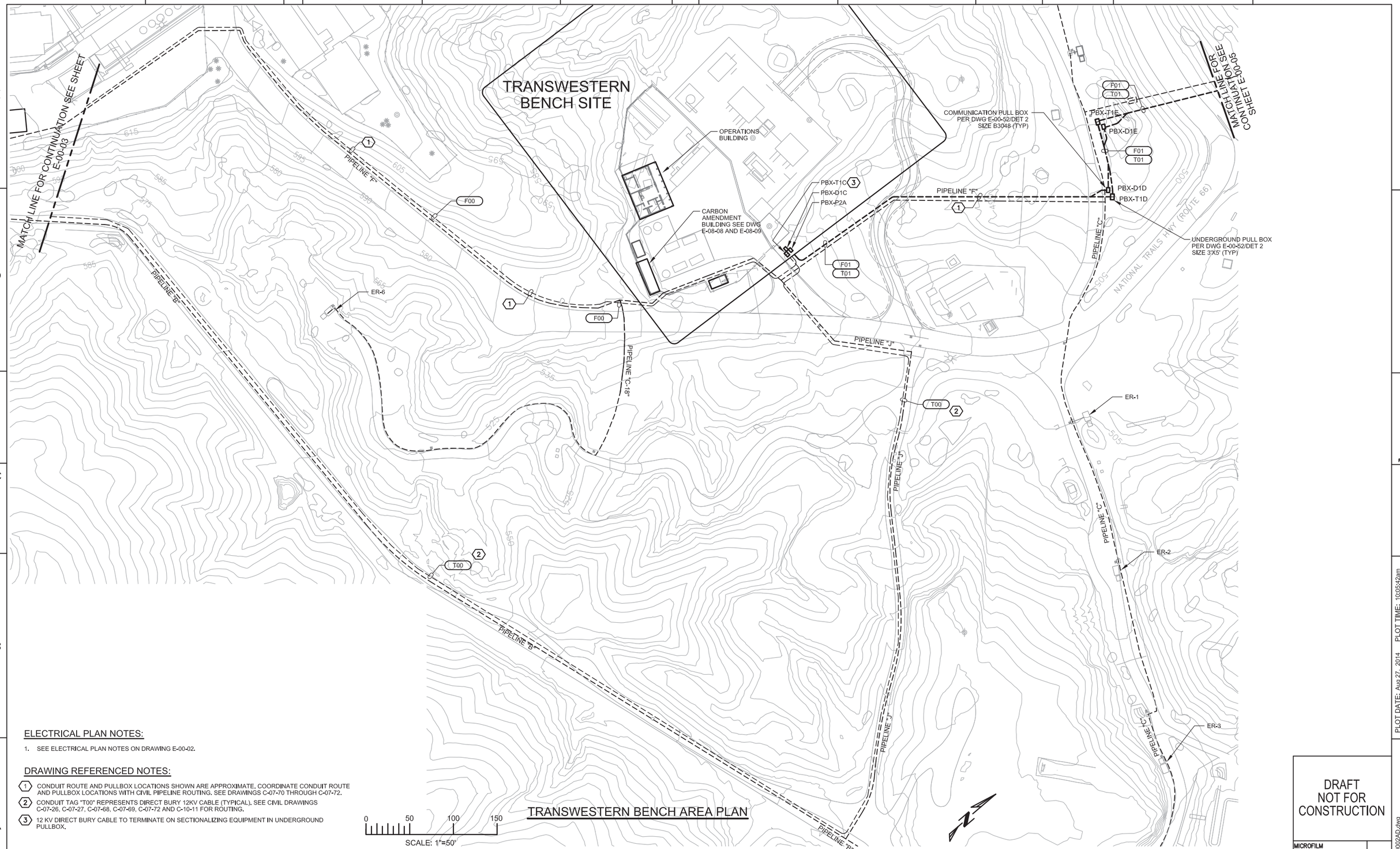
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS ELECTRICAL AREA PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-03	REV 1

PLOT DATE: Sep 05, 2014 PLOT TIME: 8:32:13am
FILENAME: FE-E-XXX-0002AD.dwg
N1808



ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL PLAN NOTES ON DRAWING E-00-02.

DRAWING REFERENCED NOTES:

1. CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL PIPELINE ROUTING. SEE DRAWINGS C-07-70 THROUGH C-07-72.
2. CONDUIT TAG "T00" REPRESENTS DIRECT BURY 12KV CABLE (TYPICAL). SEE CIVIL DRAWINGS C-07-26, C-07-27, C-07-68, C-07-69, C-07-72 AND C-10-11 FOR ROUTING.
3. 12 KV DIRECT BURY CABLE TO TERMINATE ON SECTIONALIZING EQUIPMENT IN UNDERGROUND PULLBOX.

0 50 100 150
SCALE: 1"=50'

TRANSWESTERN BENCH AREA PLAN

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	DWN MBY, NC
	CHKD MF
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TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN BENCH
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SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-04	REV 1

PLOT DATE: Aug 27, 2014 PLOT TIME: 10:05:42am
FILENAME: FE-E-XXX-0002AD.dwg

N1808

ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL PLAN NOTES ON DRAWING E-00-02.

DRAWING REFERENCED NOTES:

(1) CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL TRENCH AND PIPELINE ROUTING.

PIPELINE "G"
COMMUNICATION PULL BOX PER DWG E-00-51/DET 2 SIZE B3048 (TYP)
UNDERGROUND PULL BOX PER DWG E-00-52/DET 2 SIZE 3'X5' (TYP)
PBX-D2C
PBX-T2C
PIPELINE "C"
F03
T01
F04
T02
P300
POWER AND COMMUNICATIONS NODE 3 LOCATED IN BUILDING, SEE (DWGS C-06-01 THROUGH C--6-03 AND E-06-01 THROUGH E-06-05)
NATIONAL TRAILS HWY (ROUTE 66)
PBX-D4C
PBX-T4C
GROUND NOT VISIBLE
SECTIONALIZING PULL BOX PER DWG E-00-51/DET 2 SIZE 3'X5'
PBX-D2B
PBX-T2B
PBX-T1F
PBX-D1F
F01
T01
DENSE TREES
INTERSTATE FWY 40
HVCT3
5036.5
PBX-D2A
PBX-P2D
PBX-T2A
P400
POWER AND COMMUNICATIONS NODE 2, SEE TYPICAL NODE SITE PLAN E-00-09
MATCH LINE FOR CONTINUATION SEE SHEET E-00-06
MATCH LINE FOR CONTINUATION SEE SHEET E-00-04

0 50 100 150
SCALE: 1"=50'

(1) MW-20 BENCH AREA PLAN

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CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY	SO
TPF	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
MW-20 BENCH AREA PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-05	REV 1

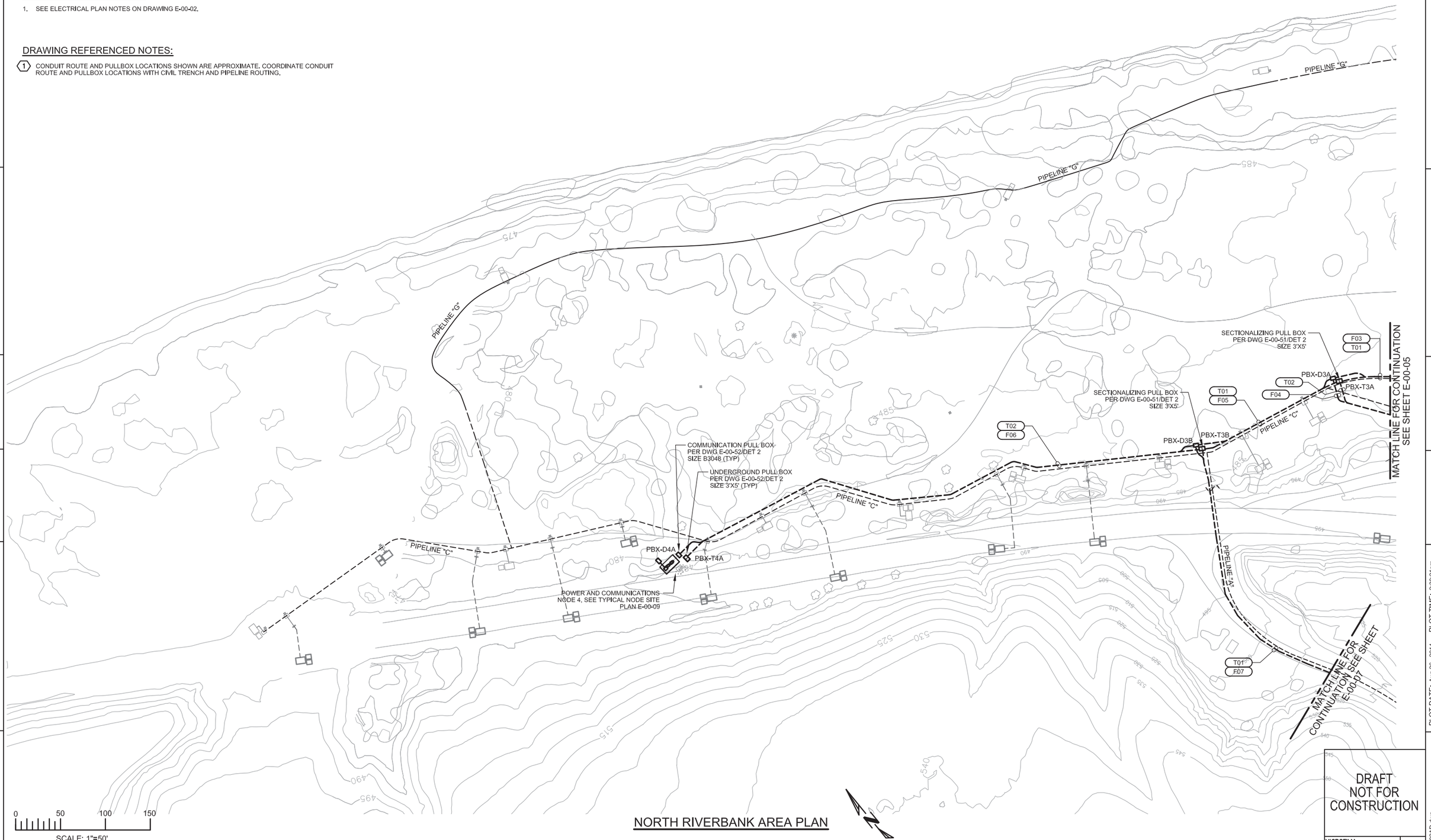
PLOT DATE: Aug 27, 2014 PLOT TIME: 9:51:25am
FILENAME: FE-E-XXX-0002AD.dwg
N1808

ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL PLAN NOTES ON DRAWING E-00-02.

DRAWING REFERENCED NOTES:

(1) CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL TRENCH AND PIPELINE ROUTING.



NORTH RIVERBANK AREA PLAN

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FOLSOM, CA 95630
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WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

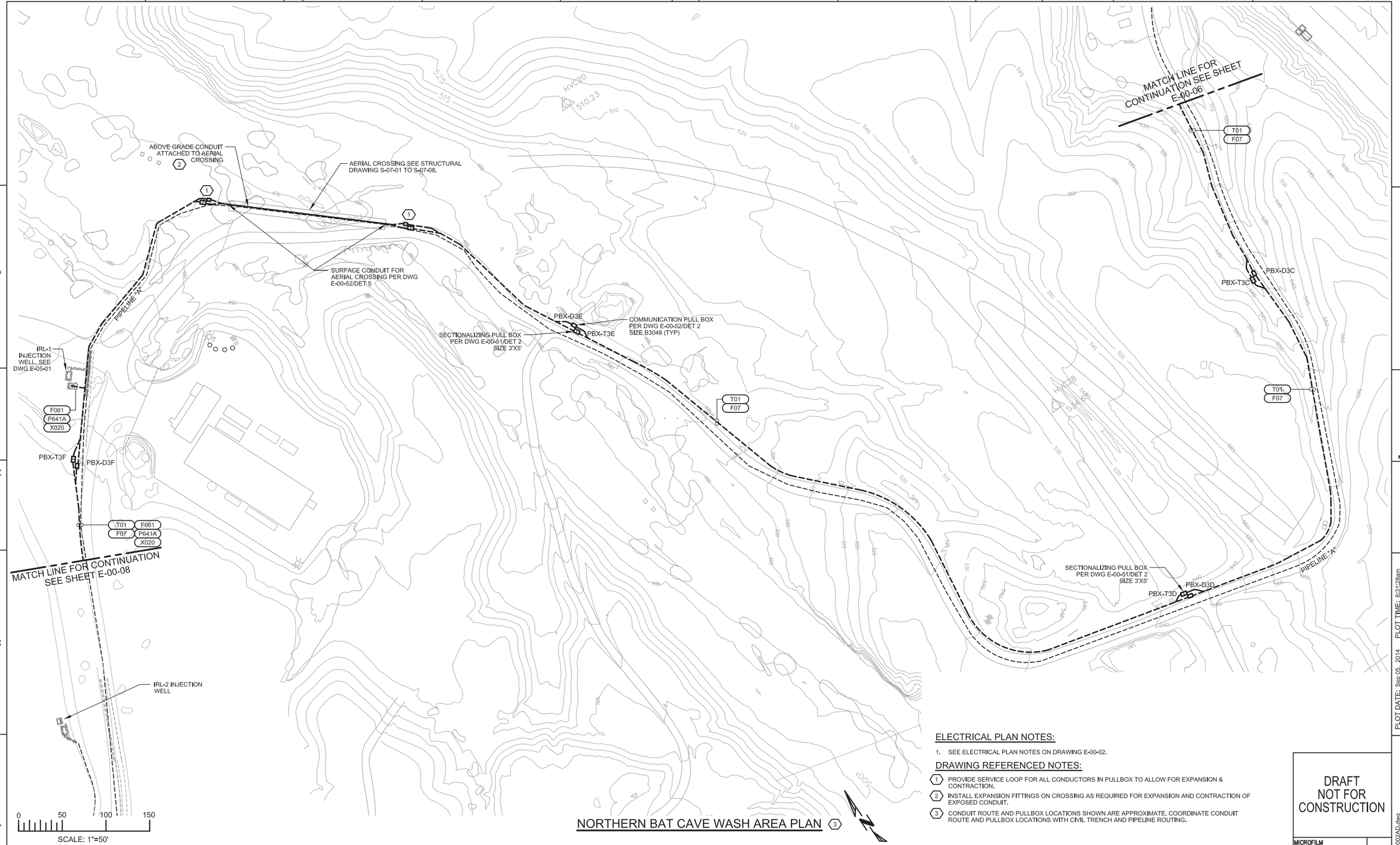
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
NORTH RIVERBANK AREA PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-06	REV 1

PLOT DATE: Aug 26, 2014 PLOT TIME: 2:30:21pm
FILENAME: FE-E-XXX-0002AD.dwg
N1808



NORTHERN BAT CAVE WASH AREA PLAN 3

ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL PLAN NOTES ON DRAWING E-00-02.

DRAWING REFERENCED NOTES:

1. PROVIDE SERVICE LOOP FOR ALL CONDUCTORS IN PULLBOX TO ALLOW FOR EXPANSION & CONTRACTION.
2. INSTALL EXPANSION FITTINGS ON CROSSING AS REQUIRED FOR EXPANSION AND CONTRACTION OF EXPOSED CONDUIT.
3. CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL TRENCH AND PIPELINE ROUTING.

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FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

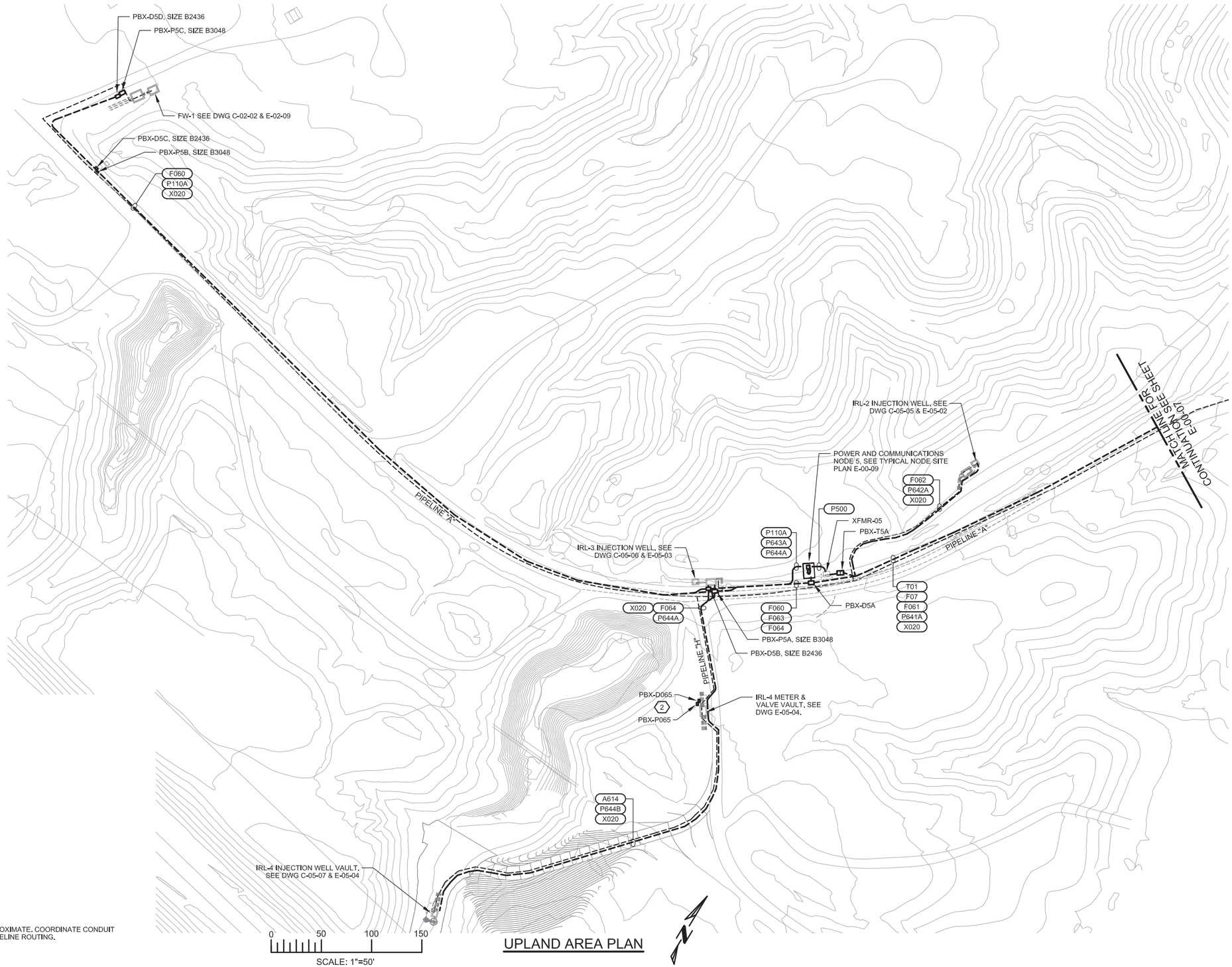
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
NORTHERN BAT CAVE WASH AREA PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-07	REV 1

PLOT DATE: Sep 05, 2014 PLOT TIME: 8:31:28am
FILENAME: FE-E-XXX-0002AD.dwg
N1808



0 50 100 150

SCALE: 1"=50'

UPLAND AREA PLAN

ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL PLAN NOTES ON DRAWING E-00-02.

DRAWING REFERENCED NOTES:

1. CONDUIT ROUTE AND PULLBOX LOCATIONS SHOWN ARE APPROXIMATE. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH CIVIL TRENCH AND PIPELINE ROUTING.
2. PROVISIONS FOR FUTURE WELL IRL-5.

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CONSTRUCTION

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PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

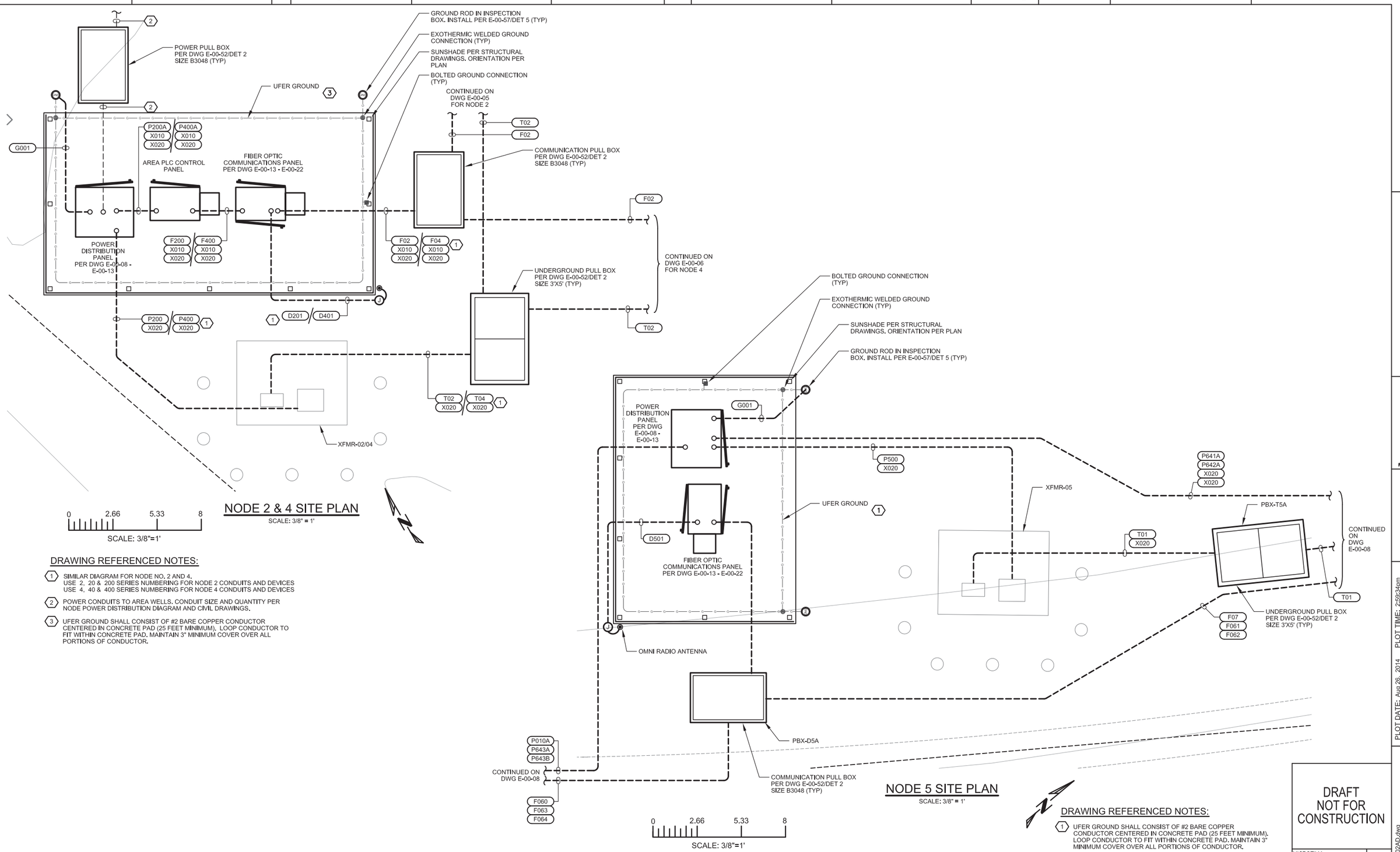
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
UPLANDS
AREA PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-08	REV 1

PLOT DATE: Sep 05, 2014 PLOT TIME: 8:29:36am
FILENAME: FE-E-XXX-0002AD.dwg
N1808



DRAWING REFERENCED NOTES:

1. SIMILAR DIAGRAM FOR NODE NO. 2 AND 4. USE 2, 20 & 200 SERIES NUMBERING FOR NODE 2 CONDUITS AND DEVICES USE 4, 40 & 400 SERIES NUMBERING FOR NODE 4 CONDUITS AND DEVICES
2. POWER CONDUITS TO AREA WELLS. CONDUIT SIZE AND QUANTITY PER NODE POWER DISTRIBUTION DIAGRAM AND CIVIL DRAWINGS.
3. UFER GROUND SHALL CONSIST OF #2 BARE COPPER CONDUCTOR CENTERED IN CONCRETE PAD (25 FEET MINIMUM). LOOP CONDUCTOR TO FIT WITHIN CONCRETE PAD. MAINTAIN 3" MINIMUM COVER OVER ALL PORTIONS OF CONDUCTOR.

DRAWING REFERENCED NOTES:

1. UFER GROUND SHALL CONSIST OF #2 BARE COPPER CONDUCTOR CENTERED IN CONCRETE PAD (25 FEET MINIMUM). LOOP CONDUCTOR TO FIT WITHIN CONCRETE PAD. MAINTAIN 3" MINIMUM COVER OVER ALL PORTIONS OF CONDUCTOR.

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CONSTRUCTION

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13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

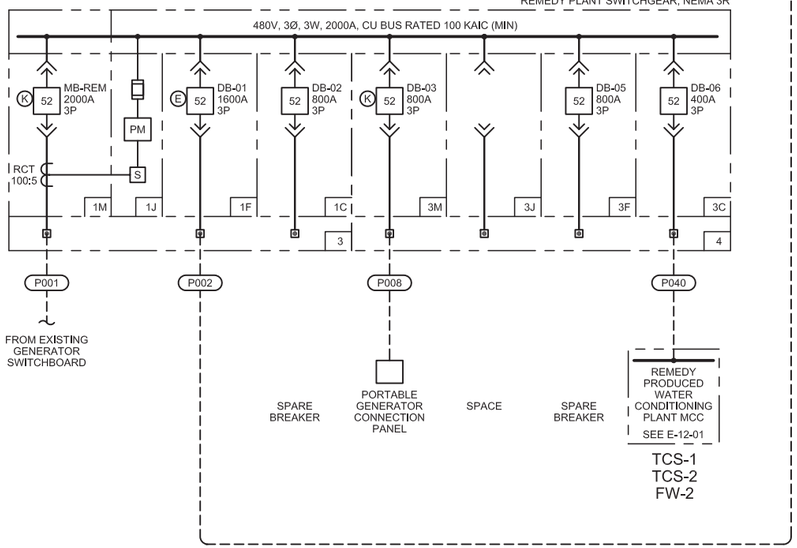
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

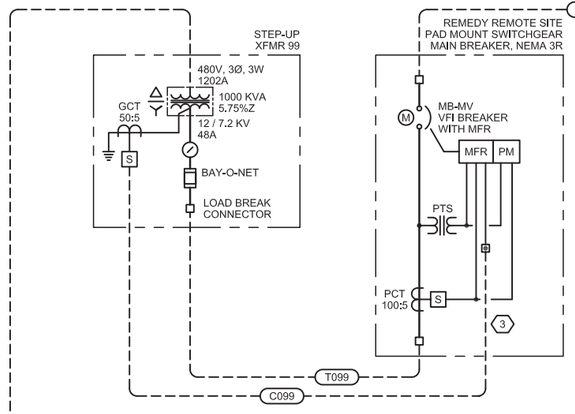
TOPOCK GROUNDWATER REMEDIATION PROJECT
TYPICAL NODE SITEPLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-09	REV 1

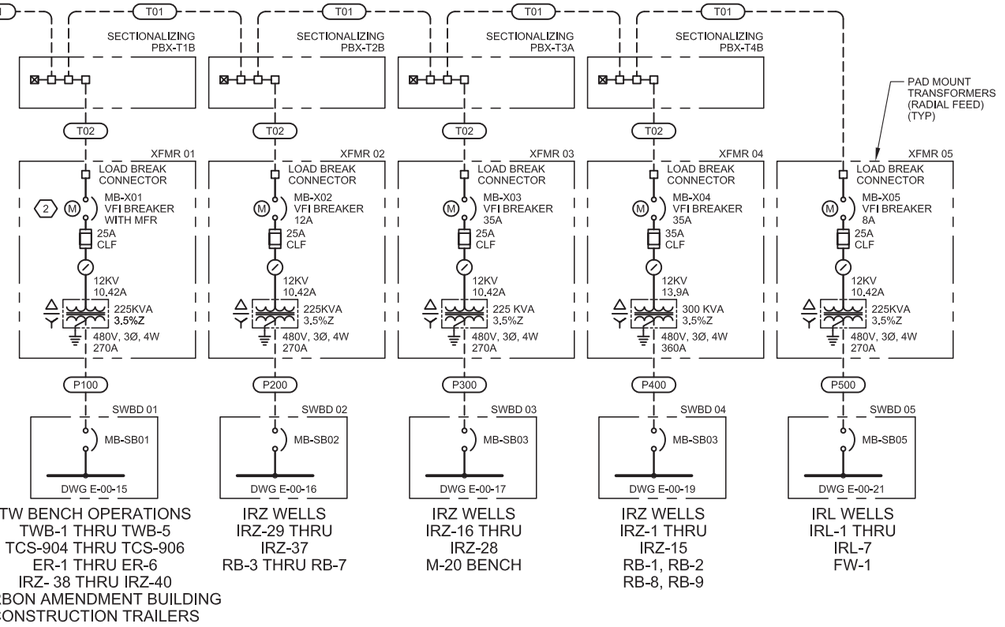
PLOT DATE: Aug 26, 2014 PLOT TIME: 2:59:34pm
FILENAME: FE-E-XXX-0002AD.dwg
N1808



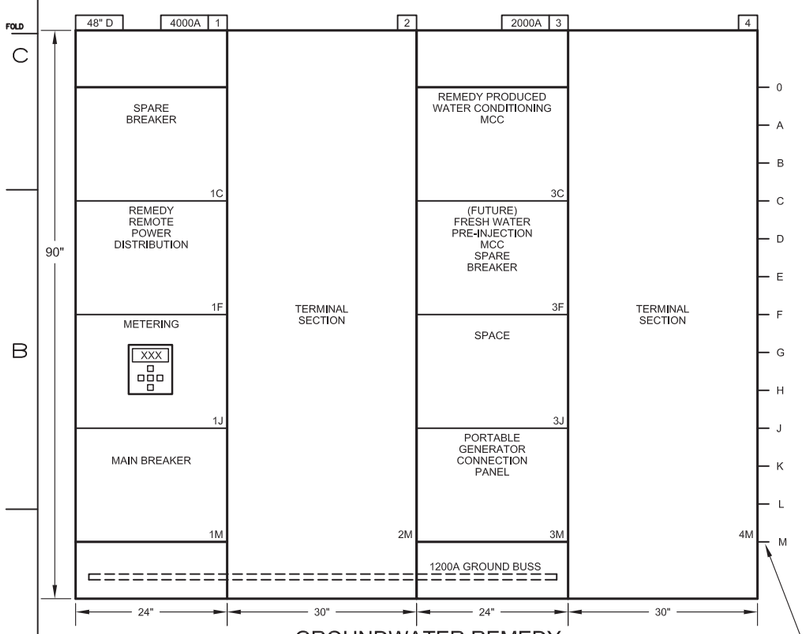
GROUNDWATER REMEDY
480V SWITCHGEAR ONE-LINE DIAGRAM



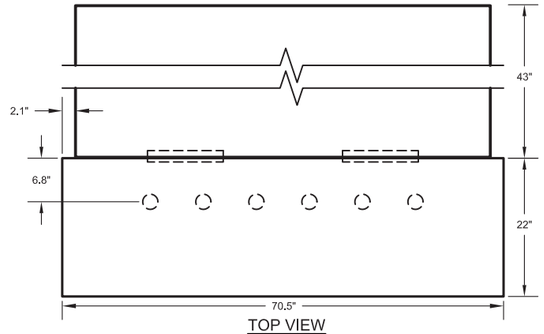
GROUNDWATER REMEDY REMOTE SITE
12KV PAD MOUNT SWITCHGEAR ONE-LINE DIAGRAM



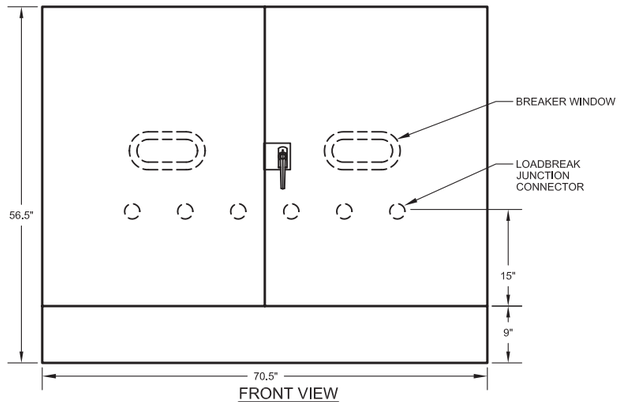
REMEDY REMOTE SITE POWER DISTRIBUTION ONE-LINE DIAGRAM



GROUNDWATER REMEDY
480V SWITCHGEAR ELEVATION
(NEMA 3R)



TOP VIEW
NOT TO SCALE



FRONT VIEW
REMEDY REMOTE SITE
12KV PAD MOUNT SWITCHGEAR
(NEMA 3R)

LEGEND

- MFR — MULTI-FUNCTION PROTECTIVE RELAY
- PM — POWER MONITOR
- S — CT SHORTING TERMINAL BLOCK
- PTS — POTENTIAL TRANSFORMER, 120 / 69 V SECONDARY
- FUSE, CLF = CURRENT LIMITING FUSE
- TAP CHANGER
- (M) MOTORIZED OPERATOR
- (E) ELECTRICALLY OPERATED
- (K) KIRK-KEY INTERLOCK
- TRANSFORMER, 2 WINDING COILS
- FEED-THROUGH SECTIONALIZING RECEPTACLE
- SPARE SECTIONALIZING RECEPTACLE (1)
- DEAD FRONT RECEPTACLE, HOT STICK OPERABLE,
- TERMINATION LUGS, CABLE TO BUSS TRANSITION

DRAWING REFERENCED NOTES:

1. CAP UNUSED (SPARE) SECTIONALIZING RECEPTACLES.
2. MOTORIZED OPERATOR. OPERATOR SHALL OPEN ON LOSS OF VOLTAGE, CLOSE ON VOLTAGE RETURN WITH VARIABLE TIME DELAY. RELAY TO BE LOCATED WITHIN TERMINATION COMPARTMENT.
3. FURNISH SEPARATE 50/51 RELAY FOR GROUND FAULT DETECTION AS NEEDED. RELAY TO REPORT SUPERVISORY TRIP TO MULTI-FUNCTION RELAY. RELAY TO BE BASLER BE1-50/51M-204 OR EQUAL. RELAY TO BE ACCESSIBLE OUTSIDE OF TERMINATION COMPARTMENT.

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13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN	MBY			TPF	
0	4/5/13	INTERMEDIATE (60%) DESIGN	MBY			TPF	

REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
GROUNDWATER REMEDY
ONE-LINE DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-10	REV 1

PLOT DATE: Aug 28, 2014 PLOT TIME: 8:39:09am
FILENAME: FE-E-XXX-0010AD.DWG
N1808

NODE 1 TW BENCH CARBON AMENDMENT BUILDING LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	NOMINAL HP	MAXIMUM HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	NOMINAL CASE			MAXIMUM CASE		
							CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
PMP-TCS00940	480	3	0.75	0.75	100%	20	1.60	1.60	1.33	4.80	4.80	3.99
PMP-TCS00941	480	3	0.75	0.75	100%	20	1.60	1.60	1.33	4.80	4.80	3.99
PMP-TCS00942	480	3	0.75	0.75	0.0%	20	1.60	0.00	0.00	4.80	0.00	0.00
PMP-TCS00944	480	3	4.0	4.0	0.0%	15	7.00	0.00	0.00	1.10	0.00	0.00
PMP-TCS00945	480	3	4.0	4.0	0.0%	15	7.00	0.00	0.00	1.10	0.00	0.00
45 kVA TRANSFORMER	480	3	---	---	80%	70	54.13	43.30	36.00	54.13	43.30	36.00
MCC-1 CONTROLS	480	3	---	---	75%	5	0.80	0.60	0.50	0.80	0.60	0.50
TOTAL 10 KVA WELLS CPT/120VAC	480	3	---	---	75.0%	---	9.62	7.22	6.00	9.62	7.22	6.00
						TOTALS :	83	54	45	81	61	50

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.

XFMR 003 (NODE 3), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	NOMINAL HP	MAXIMUM HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	NOMINAL CASE			MAXIMUM CASE		
							CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
PMP-IRZ16546	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ16547	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ16548	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ16549	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ17546	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ17547	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ17548	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ17549	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ19546	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ19547	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ19548	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ19549	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ20546	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ20547	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ20548	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ20549	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ21546	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ21547	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ21548	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ21549	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ23540	480	3	15.0	20.0	100%	50	21.00	21.00	17.46	27.00	27.00	22.45
PMP-IRZ25544	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ25545	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ27544	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ27545	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ18546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ18547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ18548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ18549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ22546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ22547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ22548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ22549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ24544 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ24545 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ26544 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ26545 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ28544 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ28545 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ00740	480	3	0.75	0.75	100.0%	20	1.60	1.60	1.33	4.80	4.80	3.99
PMP-IRZ00741	480	3	0.75	0.75	100.0%	20	1.60	1.60	1.33	4.80	4.80	3.99
PMP-IRZ00742	480	3	0.75	0.75	100.0%	20	1.60	1.60	1.33	4.80	4.80	3.99
PMP-IRZ00743	480	3	0.75	0.75	0.0%	20	1.60	0.00	0.00	4.80	0.00	0.00
PMP-IRZ00744	480	3	10.0	10.0	100%	35	14.00	14.00	11.64	21.0	21.00	17.46
PMP-IRZ00745	480	3	25.0	25.0	0.0%	70	34.00	0.00	0.00	21.0	0.00	0.00
PMP-IRZ00746	480	3	0.5	0.5	100%	3	1.10	1.10	0.91	1.10	1.10	0.91
PMP-IRZ00747	480	3	0.5	0.5	0.0%	3	1.10	0.00	0.00	1.10	0.00	0.00
PMP-IRZ00748	480	3	5.0	5.0	100.0%	20	7.60	7.60	6.32	1.10	1.10	0.91
45 kVA TRANSFORMER	480	3		---	80.0%	70	54.13	43.30	36.00	54.13	43.30	36.00
TOTAL 15 KVA WELLS CPT/120VAC	480	3		---	75.0%	---	14.43	10.83	9.00	14.43	10.83	9.00
						TOTALS :	269	122	101	449	149.1	124

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) FOR SIZING PURPOSES, A MAXIMUM OF FOUR (4) BACKWASH PUMPS WILL BE IN OPERATION SIMULTANEOUSLY.
UNDER THE NOMINAL OPERATIONAL SCENARIO, ONLY ONE (1) BACKWASH PUMP WILL BE IN OPERATION AT ANY GIVEN TIME.
THE BACKWASH PROGRAM WILL OPERATE THE BACKWASH PUMPS IN SEQUENCE, FOR 30 MINUTES EACH WEEK.
(3) FOR ENERGY USE CALCULATION PURPOSES, A MAXIMUM OF THREE (3) RB WELL PUMPS WILL BE IN OPERATION SIMULTANEOUSLY
UNDER THE MAXIMUM DESIGN CONDITION.

PANEL: LP-1 | LOCATION: TW BENCH CARBON AMENDMENT BUILDING | CABINET MOUNTING: SURFACE
VOLTS: 208Y/120V | PHASE: 3 | WIRE: 4 | ENCLOSURE: NEMA TYPE 1 | RATING: 10 KAIC
FEED: BOTTOM, 175A MAIN C/B | NEUTRAL: 100% | NOTE:

LOAD SERVED	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	BREAKER AMP	BREAKER POLE	CKT	PH	CKT	BREAKER AMP	BREAKER POLE	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	LOAD SERVED
RECEPTACLES--CARBON ROOM	0.4			20	1	1	A	2	20	1	0.4			RECEPTACLES--CARBON ROOM, EXTERIOR
RECEPTACLES--REAGENT ROOM, EXTERIOR		0.4		20	1	3	B	4	20	1		0.6		RECEPTACLES--REAGENT ROOM
LIGHTING--REAGEANT ROOM, CARBON ROOM			0.5	20	1	5	C	6	20	1			0.1	LIGHTING--EXTERIOR
SPARE				20	1	7	A	8	20	1				SPARE
SPARE				20	1	9	B	10	20	1				SPARE
SPARE				20	1	11	C	12	20	1				SPARE
SPARE				20	1	13	A	14	20	1				SPARE
SPARE				20	1	15	B	16	20	1				SPARE
SPARE				20	1	17	C	18	20	1				SPARE
SPARE				20	1	19	A	20	20	1				SPARE
SPACE						21	B	22						SPACE
SPACE						23	C	24						SPACE
SPACE						25	A	26						SPACE
SPACE						27	B	28						SPACE
SPACE						29	C	30						SPACE
SPACE						31	A	32						SPACE
SPACE						33	B	34						SPACE
SPACE						35	C	36						SPACE
SPACE						37	A	38						SPACE
SPACE						39	B	40						SPACE
SPACE						41	C	42						SPACE
SUB-TOTAL CONNECTED KVA	0.4	0.4	0.5								0.4	0.6	0.1	0.8 1.0 0.6
														TOTAL CONNECTED KVA 2.4

XFMR 002 (NODE 2), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	NOMINAL HP	MAXIMUM HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	NOMINAL CASE			MAXIMUM CASE		
							CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
RB03-640	480	3	10.0	30.0	100%	30	14.00	14.00	11.64	40.00	40.00	33.26
RB04-640	480	3	10.0	30.0	100%	30	14.00	14.00	11.64	40.00	40.00	33.26
RB05-640	480	3	7.5	30.0	100%	30	11.00	11.00	9.15	40.00	40.00	33.26
RB06-640	480	3	-	30.0	0%	30	0.00	0.00	0.00	40.00	0.00	0.00
RB07-640	480	3	-	30.0	0%	30	0.00	0.00	0.00	40.00	0.00	0.00
PMP-IRZ29544	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ29545	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ31544	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ31545	480	3	3.0	5.0	100%	7	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ33544	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ33545	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ35543	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ37543	480	3	3.0	5.0	0.0%	7	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ30544 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ30545 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ32544 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ32545 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ34544 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ34545 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ36543 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
TOTAL 10 KVA WELLS CPT/120VAC	480	3		---	75.0%	---	9.62	7.22	6.00	9.62	7.22	6.00
						TOTALS :	87	65	54	324	158	131

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) FOR SIZING PURPOSES, A MAXIMUM OF FOUR (4) BACKWASH PUMPS WILL BE IN OPERATION SIMULTANEOUSLY.
UNDER THE NOMINAL OPERATIONAL SCENARIO, ONLY ONE (1) BACKWASH PUMP WILL BE IN OPERATION AT ANY GIVEN TIME.
THE BACKWASH PROGRAM WILL OPERATE THE BACKWASH PUMPS IN SEQUENCE, FOR 30 MINUTES EACH WEEK.
(3) FOR ENERGY USE CALCULATION PURPOSES, A MAXIMUM OF THREE (3) RB WELL PUMPS WILL BE IN OPERATION SIMULTANEOUSLY
UNDER THE MAXIMUM DESIGN CONDITION.

XFMR 004 (NODE 4), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	NOMINAL HP	MAXIMUM HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	NOMINAL CASE			MAXIMUM CASE		
							CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
PMP-RB01640	480	3	7.5	30.0	100%	15	11.00	11.00	9.15	40.00	40.00	33.26
PMP-RB02640	480	3	-	30.0	100%	-	0.00	0.00	0.00	40.00	40.00	33.26
PMP-RB08640	480	3	-	30.0	0%	30	0.00	0.00	0.00	40.00	0.00	0.00
PMP-RB09640	480	3	-	30.0	0%	30	0.00	0.00	0.00	40.00	0.00	0.00
PMP-IRZ01541	480	3	5.0	15.0	100%	15	7.60	7.60	6.32	21.00	21.00	17.46
PMP-IRZ01542	480	3	5.0	15.0	100%	15	7.60	7.60	6.32	21.00	21.00	17.46
PMP-IRZ05541	480	3	7.5	15.0	100%	15	11.00	11.00	9.15	21.00	21.00	17.46
PMP-IRZ05542	480	3	7.5	15.0	100%	15	11.00	11.00	9.15	21.00	21.00	17.46
PMP-IRZ09541	480	3	7.5	15.0	100%	15	11.00	11.00	9.15	21.00	21.00	17.46
PMP-IRZ09542	480	3	7.5	15.0	100%	15	11.00	11.00	9.15	21.00	21.00	17.46
PMP-IRZ11546	480	3	3.0	5.0	100%	15	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ11547	480	3	3.0	5.0	100%	15	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ11548	480	3	3.0	5.0	100%	15	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ11549	480	3	3.0	5.0	100%	15	4.80	4.80	3.99	7.60	7.60	6.32
PMP-IRZ13546	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ13547	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ13548	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ13549	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ15546	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ15547	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ15548	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ15549	480	3	3.0	5.0	0.0%	15	4.80	0.00	0.00	7.60	0.00	0.00
PMP-IRZ02546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ02547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ02548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ02549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ03546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ03547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ03548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ03549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ04546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ04547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ04548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ04549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ06546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ06547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ06548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ06549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ07546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ07547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ07548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ07549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ08546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ08547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ08548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ08549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ10546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ10547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ10548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ10549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ12546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ12547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ12548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ12549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ14546 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ14547 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ14548 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
PMP-IRZ14549 [Future Provisional]	480	3	-	5.0	0.0%	15	0.00	0.00	0.00	7.60	0.00	0.00
TOTAL 15 KVA WELLS CPT/120VAC	480	3		---	75%	---	14.43	10.83	9.00	14.43	10.83	9.00
						TOTALS :	142	100	83	665	247	206

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) FOR SIZING PURPOSES, A MAXIMUM OF FOUR (4) BACKWASH PUMPS WILL BE IN OPERATION SIMULTANEOUSLY.
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UNDER THE MAXIMUM DESIGN CONDITION.

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD	BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF	
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

ELECTRICAL LOAD SCHEDULES

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-11	REV 1

N1808

08/27/2014, 11:17, G:\Graphics\ART\TOPOCK-01\Post 90%\OneLineLoadSchedules.dwg, Tab: E-00-11

NODE 01 CONDUIT & CABLE SCHEDULE						
CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P1-3	A	2"	PBX-P2A	HH1-3	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-3A
P1-3	B	2"	PBX-P2A	HH1-3	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-3B
P1-3	C	2"	PBX-P2A	HH1-3	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-3D
P1-3	D	2"	PBX-P2A	HH1-3	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-3C
P1-3	E	2"	PBX-P2A	HH1-3	(3) #8, (1) #8 G.	
P1-3	F	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	G	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	H	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	I	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	J	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	K	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	L	2"	PBX-P2A	HH1-3	N/A	SPARE W/ PULL LINE
P1-4	A	2"	HH1-3	HH1-4	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-4A
P1-4	B	2"	HH1-3	HH1-4	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-4B
P1-4	C	2"	HH1-3	HH1-4	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-4D
P1-4	D	2"	HH1-3	HH1-4	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-4C
P1-4	E	2"	HH1-3	HH1-4	(3) #8, (1) #8 G.	
P1-4	F	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	G	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	H	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	I	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	J	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	K	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	L	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-5	A	2"	HH1-4	HH1-5	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-5A
P1-5	B	2"	HH1-4	HH1-5	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-5B
P1-5	C	2"	HH1-4	HH1-5	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-5D
P1-5	D	2"	HH1-4	HH1-5	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-5C
P1-5	F	2"	HH1-4	HH1-5	N/A	SPARE W/ PULL LINE
P1-5	G	2"	HH1-4	HH1-5	N/A	SPARE W/ PULL LINE
P1-5	H	2"	HH1-4	HH1-5	N/A	SPARE W/ PULL LINE
P1-5	I	2"	HH1-4	HH1-5	N/A	SPARE W/ PULL LINE
P1-6	A	2"	HH1-5	HH1-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-6A
P1-6	B	2"	HH1-5	HH1-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-6B
P1-6	C	2"	HH1-5	HH1-6	(3) #8, (1) #8 G.	
P1-6	F	2"	HH1-5	HH1-6	N/A	SPARE W/ PULL LINE
P1-6	G	2"	HH1-5	HH1-6	N/A	SPARE W/ PULL LINE
P1-6	H	2"	HH1-5	HH1-6	N/A	SPARE W/ PULL LINE
P1-6	I	2"	HH1-5	HH1-6	N/A	SPARE W/ PULL LINE
P1-7	A	2"	HH1-6	HH1-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-7A
P1-7	B	2"	HH1-6	HH1-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-7B
P1-7	F	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-7	G	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-7	H	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-8	A	2"	HH1-7	HH1-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-8A
P1-8	B	2"	HH1-7	HH1-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-8B
P1-8	F	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-8	G	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-8	H	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-9	A	2"	HH1-7	HH1-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-9A
P1-9	B	2"	HH1-7	HH1-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P1-9B
P1-9	F	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-9	G	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-9	H	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-10	A	2"	HH1-7	HH1-8	(3) #8, (1) #8 G.	
P1-10	F	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-10	G	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-10	H	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1---	G	2"	HH1-7	CONDUIT STUB	N/A	SPARE STUB W/ PULL LINE, CAP
P1---	H	2"	HH1-7	CONDUIT STUB	N/A	SPARE STUB W/ PULL LINE, CAP
P1---	E	2"	HH1-4	HH1-11	(3) #8, (1) #8 G.	
P1---	J	2"	HH1-4	HH1-11	N/A	SPARE W/ PULL LINE
P1---	K	2"	HH1-4	HH1-11	N/A	SPARE W/ PULL LINE
P1---	L	2"	HH1-4	HH1-11	N/A	SPARE W/ PULL LINE
P1---	E	2"	HH1-11	HH1-12	(3) #8, (1) #8 G.	
P1---	J	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1---	K	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1---	L	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1---	E	2"	HH1-12	HH1-13	(3) #8, (1) #8 G.	
P1---	J	2"	HH1-12	HH1-13	N/A	SPARE W/ PULL LINE
P1---	K	2"	HH1-12	HH1-13	N/A	SPARE W/ PULL LINE
P1---	L	2"	HH1-12	HH1-13	N/A	SPARE W/ PULL LINE
P1---	E	2"	HH1-13	HH1-14	N/A	SPARE W/ PULL LINE
P1---	J	2"	HH1-13	HH1-14	N/A	SPARE W/ PULL LINE

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NODE 01 CONTINUED

P1-19	M	2"	PBX-P2C	HH-19	(3) #8, (1) #8 G.	
P1-19	N	2"	PBX-P2C	HH-19	N/A	SPARE W/ PULL LINE
P1-19	O	2"	PBX-P2C	HH-19	N/A	SPARE W/ PULL LINE
P1-20	M	2"	HH-19	HH-20	(3) #8, (1) #8 G.	
P1-20	N	2"	HH-19	HH-20	N/A	SPARE W/ PULL LINE
P1-20	O	2"	HH-19	HH-20	N/A	SPARE W/ PULL LINE
P1-21	M	2"	HH-20	HH-21	(3) #8, (1) #8 G.	
P1-21	N	2"	HH-20	HH-21	N/A	SPARE W/ PULL LINE
P1-21	O	2"	HH-20	HH-21	N/A	SPARE W/ PULL LINE
P1-22	M	2"	HH-21	HH-22	(3) #8, (1) #8 G.	
P1-22	N	2"	HH-21	HH-22	N/A	SPARE W/ PULL LINE
P1-22	O	2"	HH-21	HH-22	N/A	SPARE W/ PULL LINE
P1-23	M	2"	HH-22	HH-23	(3) #8, (1) #8 G.	
P1-23	N	2"	HH-22	HH-23	N/A	SPARE W/ PULL LINE
P1-23	O	2"	HH-22	HH-23	N/A	SPARE W/ PULL LINE
P1-24	M	2"	HH-23	HH-24	(3) #8, (1) #8 G.	
P1-24	N	2"	HH-23	HH-24	N/A	SPARE W/ PULL LINE
P1-24	O	2"	HH-23	HH-24	N/A	SPARE W/ PULL LINE

P=power, F=fiber optic, C=controls
ALL POWER CONDUCTORS ARE AWG XHHW UNLESS OTHERWISE NOTED

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

CONDUIT & CABLE SCHEDULES

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM

BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS

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NODE 02 CONDUIT & CABLE SCHEDULE

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P2-1	A	3"	PNL-2A	HH2-1	(3) #2/0, (1) #3 G.	
P2-1	B	3"	PNL-2A	HH2-1	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-1B
P2-1	C	3"	PNL-2A	HH2-1	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-1C
P2-1	D	2"	PNL-2A	HH2-1	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-1E
P2-1	E	2"	PNL-2A	HH2-1	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-1D
P2-1	F	3"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	G	3"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	H	3"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	I	3"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	J	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	K	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	L	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-2	A	3"	HH2-1	HH2-2	(3) #2/0, (1) #3 G.	
P2-2	B	3"	HH2-1	HH2-2	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-2B
P2-2	C	3"	HH2-1	HH2-2	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-2C
P2-2	D	2"	HH2-1	HH2-2	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-2E
P2-2	E	2"	HH2-1	HH2-2	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-2D
P2-2	F	3"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	G	3"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	H	3"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	I	3"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	J	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	K	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	L	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-3	D	2"	HH2-2	HH2-3	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-3E
P2-3	E	2"	HH2-2	HH2-3	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-3D
P2-3	J	2"	HH2-2	HH2-3	N/A	SPARE W/ PULL LINE
P2-3	K	2"	HH2-2	HH2-3	N/A	SPARE W/ PULL LINE
P2-3	L	2"	HH2-2	HH2-3	N/A	SPARE W/ PULL LINE
P2-4	D	2"	HH2-3	HH2-4	(3) #8, (1) #8 G.	
P2-4	J	2"	HH2-3	HH2-4	N/A	SPARE W/ PULL LINE
P2-4	K	2"	HH2-3	HH2-4	N/A	SPARE W/ PULL LINE
P2-4	L	2"	HH2-3	HH2-4	N/A	SPARE W/ PULL LINE
P2-5	D	2"	HH2-4	HH2-5	(3) #8, (1) #8 G.	
P2-5	J	2"	HH2-4	HH2-5	N/A	SPARE W/ PULL LINE
P2-6	M	2"	PNL-2A	HH2-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-6N,O
P2-6	N	2"	PNL-2A	HH2-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-6M,O
P2-6	O	2"	PNL-2A	HH2-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-6M,N
P2-6	P	2"	PNL-2A	HH2-6	N/A	SPARE W/ PULL LINE
P2-6	Q	2"	PNL-2A	HH2-6	N/A	SPARE W/ PULL LINE
P2-6	R	2"	PNL-2A	HH2-6	N/A	SPARE W/ PULL LINE
P2-7	M	2"	HH2-6	HH2-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7N
P2-7	N	2"	HH2-6	HH2-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7M
P2-7	P	2"	HH2-6	HH2-7	N/A	SPARE W/ PULL LINE
P2-7	Q	2"	HH2-6	HH2-7	N/A	SPARE W/ PULL LINE
P2-7	R	2"	HH2-6	HH2-7	N/A	SPARE W/ PULL LINE
P2-8	M	2"	HH2-7	HH2-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7N
P2-8	N	2"	HH2-7	HH2-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7M
P2-8	P	2"	HH2-7	HH2-8	N/A	SPARE W/ PULL LINE
P2-8	Q	2"	HH2-7	HH2-8	N/A	SPARE W/ PULL LINE
P2-8	R	2"	HH2-7	HH2-8	N/A	SPARE W/ PULL LINE
P2-9	M	2"	HH2-8	HH2-9	(3) #8, (1) #8 G.	
P2-9	P	2"	HH2-8	HH2-9	N/A	SPARE W/ PULL LINE
P2-9	Q	2"	HH2-8	HH2-9	N/A	SPARE W/ PULL LINE
P2-9	R	2"	HH2-8	HH2-9	N/A	SPARE W/ PULL LINE
P2-10	M	2"	HH2-9	HH2-10	(3) #8, (1) #8 G.	
P2-10	Q	2"	HH2-9	HH2-10	N/A	SPARE W/ PULL LINE
P2-11	A	3"	H2-1	HH2-11	(3) #2/0, (1) #3 G.	
P2-11	B	3"	H2-1	HH2-11	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-11B
P2-11	C	3"	H2-1	HH2-11	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-11C
P2-11	F	3"	H2-1	HH2-11	N/A	SPARE W/ PULL LINE
P2-11	G	3"	H2-1	HH2-11	N/A	SPARE W/ PULL LINE
P2-11	H	3"	H2-1	HH2-11	N/A	SPARE W/ PULL LINE
P2-11	I	3"	H2-1	HH2-11	N/A	SPARE W/ PULL LINE
P2-12	A	3"	HH2-11	HH2-12	(3) #2/0, (1) #3 G.	
P2-12	B	3"	HH2-11	HH2-12	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-12B
P2-12	C	3"	HH2-11	HH2-12	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-12C
P2-12	F	3"	HH2-11	HH2-12	N/A	SPARE W/ PULL LINE
P2-12	G	3"	HH2-11	HH2-12	N/A	SPARE W/ PULL LINE
P2-12	H	3"	HH2-11	HH2-12	N/A	SPARE W/ PULL LINE
P2-12	I	3"	HH2-11	HH2-12	N/A	SPARE W/ PULL LINE
P2-13	A	3"	HH2-12	HH2-13	(3) #2/0, (1) #3 G.	
P2-13	B	3"	HH2-12	HH2-13	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-13B
P2-13	C	3"	HH2-12	HH2-13	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-13C
P2-13	F	3"	HH2-12	HH2-13	N/A	SPARE W/ PULL LINE
P2-13	G	3"	HH2-12	HH2-13	N/A	SPARE W/ PULL LINE
P2-13	H	3"	HH2-12	HH2-13	N/A	SPARE W/ PULL LINE
P2-13	I	3"	HH2-12	HH2-13	N/A	SPARE W/ PULL LINE
P2-14	A	3"	HH2-13	HH2-14	(3) #2/0, (1) #3 G.	
P2-14	B	3"	HH2-13	HH2-14	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-14B
P2-14	C	3"	HH2-13	HH2-14	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-14C
P2-14	F	3"	HH2-13	HH2-14	N/A	SPARE W/ PULL LINE
P2-14	G	3"	HH2-13	HH2-14	N/A	SPARE W/ PULL LINE
P2-14	H	3"	HH2-13	HH2-14	N/A	SPARE W/ PULL LINE
P2-14	I	3"	HH2-13	HH2-14	N/A	SPARE W/ PULL LINE

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NODE 02 CONTINUED

P2-15	A	3"	HH2-14	HH2-15	(3) #2/0, (1) #3 G.	
P2-15	B	3"	HH2-14	HH2-15	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-15B
P2-15	C	3"	HH2-14	HH2-15	(3) #2/0, (1) #3 G.	COMMON CONDUIT W/ P2-15C
P2-15	F	3"	HH2-14	HH2-15	N/A	SPARE W/ PULL LINE
P2-15	G	3"	HH2-14	HH2-15	N/A	SPARE W/ PULL LINE
P2-15	H	3"	HH2-14	HH2-15	N/A	SPARE W/ PULL LINE
P2-15	I	3"	HH2-14	HH2-15	N/A	SPARE W/ PULL LINE
P2-16	A	3"	HH2-15	HH2-16	(3) #2/0, (1) #3 G.	
P2-16	B	3"	HH2-15	HH2-16	(3) #2/0, (1) #3 G.	
P2-16	F	3"	HH2-15	HH2-16	N/A	SPARE W/ PULL LINE
P2-16	G	3"	HH2-15	HH2-16	N/A	SPARE W/ PULL LINE
P2-16	H	3"	HH2-15	HH2-16	N/A	SPARE W/ PULL LINE
P2-16	I	3"	HH2-15	HH2-16	N/A	SPARE W/ PULL LINE
P2-17	A	3"	HH2-16	HH2-17	(3) #2/0, (1) #3 G.	
P2-17	B	3"	HH2-16	HH2-17	(3) #2/0, (1) #3 G.	
P2-17	F	3"	HH2-16	HH2-17	N/A	SPARE W/ PULL LINE
P2-17	G	3"	HH2-16	HH2-17	N/A	SPARE W/ PULL LINE
P2-17	H	3"	HH2-16	HH2-17	N/A	SPARE W/ PULL LINE
P2-17	I	3"	HH2-16	HH2-17	N/A	SPARE W/ PULL LINE
P2-18	A	3"	HH2-17	HH2-18	(3) #2/0, (1) #3 G.	
P2-18	F	3"	HH2-17	HH2-18	N/A	SPARE W/ PULL LINE
P2-18	G	3"	HH2-17	HH2-18	N/A	SPARE W/ PULL LINE
P2-18	H	3"	HH2-17	HH2-18	N/A	SPARE W/ PULL LINE
P2-19	A	3"	HH2-18	HH2-19	(3) #2/0, (1) #3 G.	
P2-19	F	3"	HH2-18	HH2-19	N/A	SPARE W/ PULL LINE
P2-19	G	3"	HH2-18	HH2-19	N/A	SPARE W/ PULL LINE
P2-19	H	3"	HH2-18	HH2-19	N/A	SPARE W/ PULL LINE

P=power, F=fiber optic, C=controls
ALL POWER CONDUCTORS ARE AWG XHHW UNLESS OTHERWISE NOTED

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

CONDUIT & CABLE SCHEDULES

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
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NODE 03 CONDUIT & CABLE SCHEDULE

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P3-1	A	2"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1B
P3-1	B	2"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1A
P3-1	C	3"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1D,E
P3-1	D	3"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1C,E
P3-1	E	3"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1C,D
P3-1	F	2"	PNL-3A	HH3-1	N/A	SPARE W/ PULL LINE
P3-1	G	2"	PNL-3A	HH3-1	N/A	SPARE W/ PULL LINE
P3-1	H	2"	PNL-3A	HH3-1	N/A	SPARE W/ PULL LINE
P3-1	I	2"	PNL-3A	HH3-1	N/A	SPARE W/ PULL LINE
P3-1	J	2"	PNL-3A	HH3-1	N/A	SPARE W/ PULL LINE
P3-2	A	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-2B
P3-2	B	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-2A
P3-2	C	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-2D
P3-2	D	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-2C
P3-2	F	2"	HH3-1	HH3-2	N/A	SPARE W/ PULL LINE
P3-2	G	2"	HH3-1	HH3-2	N/A	SPARE W/ PULL LINE
P3-2	H	2"	HH3-1	HH3-2	N/A	SPARE W/ PULL LINE
P3-2	I	2"	HH3-1	HH3-2	N/A	SPARE W/ PULL LINE
P3-2	J	2"	HH3-1	HH3-2	N/A	SPARE W/ PULL LINE
P3-3	A	2"	HH3-2	HH3-3	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-3B
P3-3	B	2"	HH3-2	HH3-3	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-3A
P3-3	C	2"	HH3-2	HH3-3	(3) #4, (1) #6 G.	
P3-3	F	2"	HH3-2	HH3-3	N/A	SPARE W/ PULL LINE
P3-3	G	2"	HH3-2	HH3-3	N/A	SPARE W/ PULL LINE
P3-3	H	2"	HH3-2	HH3-3	N/A	SPARE W/ PULL LINE
P3-3	I	2"	HH3-2	HH3-3	N/A	SPARE W/ PULL LINE
P3-4	A	2"	HH3-3	HH3-4A	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-4B
P3-4	B	2"	HH3-3	HH3-4A	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-4A
P3-3	C	2"	HH3-3	HH3-4A	(3) #4, (1) #6 G.	
P3-4	G	2"	HH3-3	HH3-4A	N/A	SPARE W/ PULL LINE
P3-4	H	2"	HH3-3	HH3-4A	N/A	SPARE W/ PULL LINE
P3-5	A	2"	HH3-4A	HH3-4	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-5B
P3-5	B	2"	HH3-4A	HH3-4	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-5A
P3-5	G	2"	HH3-4A	HH3-4	N/A	SPARE W/ PULL LINE
P3-5	H	2"	HH3-4A	HH3-4	N/A	SPARE W/ PULL LINE
P3-6	A	2"	HH3-4	HH3-5	(3) #4, (1) #6 G.	
P3-6	G	2"	HH3-4	HH3-5	N/A	SPARE W/ PULL LINE
P3-8	K	2"	PNL-3A	HH3-7	(3) #1, (1) #6 G.	
P3-8	L	2"	PNL-3A	HH3-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-8M
P3-8	M	2"	PNL-3A	HH3-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-8L
P3-8	N	2"	PNL-3A	HH3-7	N/A	SPARE W/ PULL LINE
P3-8	O	2"	PNL-3A	HH3-7	N/A	SPARE W/ PULL LINE
P3-8	P	2"	PNL-3A	HH3-7	N/A	SPARE W/ PULL LINE
P3-9	L	2"	HH3-7	HH3-7A	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-9M
P3-9	M	2"	HH3-7	HH3-7A	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-9L
P3-9	N	2"	HH3-7	HH3-7A	N/A	SPARE W/ PULL LINE
P3-9	O	2"	HH3-7	HH3-7A	N/A	SPARE W/ PULL LINE
P3-9	P	2"	HH3-7	HH3-7A	N/A	SPARE W/ PULL LINE
P3-10	L	2"	HH3-7A	HH3-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-10M
P3-10	M	2"	HH3-7A	HH3-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-10L
P3-10	N	2"	HH3-7A	HH3-8	N/A	SPARE W/ PULL LINE
P3-10	O	2"	HH3-7A	HH3-8	N/A	SPARE W/ PULL LINE
P3-10	P	2"	HH3-7A	HH3-8	N/A	SPARE W/ PULL LINE
P3-11	M	2"	HH3-8	HH3-9	(3) #8, (1) #8 G.	
P3-11	N	2"	HH3-8	HH3-9	N/A	SPARE W/ PULL LINE
P3-11	O	2"	HH3-8	HH3-9	N/A	SPARE W/ PULL LINE
P3-11	P	2"	HH3-8	HH3-9	N/A	SPARE W/ PULL LINE
P3-12	M	2"	HH3-9	HH3-10	(3) #8, (1) #8 G.	
P3-12	N	2"	HH3-9	HH3-10	N/A	SPARE W/ PULL LINE
P3-12	O	2"	HH3-9	HH3-10	N/A	SPARE W/ PULL LINE
P3-12	P	2"	HH3-9	HH3-10	N/A	SPARE W/ PULL LINE
P3-13	M	2"	HH3-10	HH3-11	(3) #8, (1) #8 G.	
P3-13	N	2"	HH3-10	HH3-11	N/A	SPARE W/ PULL LINE
P3-13	O	2"	HH3-10	HH3-11	N/A	SPARE W/ PULL LINE
P3-13	P	2"	HH3-10	HH3-11	N/A	SPARE W/ PULL LINE
P3-14	N	2"	HH3-11	CONDUIT STUB	N/A	SPARE STUB W/ PULL LINE, CAP
P3-14	O	2"	HH3-11	CONDUIT STUB	N/A	SPARE STUB W/ PULL LINE, CAP

P=power, F=fiber optic, C=controls
ALL POWER CONDUCTORS ARE AWG XHHW UNLESS OTHERWISE NOTED

NODE 04 CONDUIT & CABLE SCHEDULE

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P4-1	A	2"	PNL-4	HH4-1	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-1B
P4-1	B	2"	PNL-4	HH4-1	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-1A
P4-1	C	3"	PNL-4	HH4-1	(3) #2/0, (1) #3 G.	
P4-1	D	2"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-1	E	2"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-1	F	2"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-1	G	2"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-1	H	2"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-1	I	3"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-1	J	3"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
P4-2	A	2"	HH4-1	HH4-2	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-2B
P4-2	B	2"	HH4-1	HH4-2	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-2A
P4-2	C	3"	HH4-1	HH4-2	(3) #2/0, (1) #3 G.	
P4-2	D	2"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-2	E	2"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-2	F	2"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-1	G	2"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-1	H	2"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-2	I	3"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-2	J	3"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
P4-3	A	2"	HH4-2	HH4-16	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-3B
P4-3	B	2"	HH4-2	HH4-16	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-3A
P4-3	C	3"	HH4-2	HH4-16	(3) #2/0, (1) #3 G.	
P4-3	D	2"	HH4-2	HH4-16	N/A	SPARE W/ PULL LINE
P4-3	E	2"	HH4-2	HH4-16	N/A	SPARE W/ PULL LINE
P4-3	F	2"	HH4-2	HH4-16	N/A	SPARE W/ PULL LINE
P4-3	I	3"	HH4-2	HH4-16	N/A	SPARE W/ PULL LINE
P4-3	J	3"	HH4-2	HH4-16	N/A	SPARE W/ PULL LINE
P4-4	A	2"	HH4-16	HH4-3	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-4B
P4-4	B	2"	HH4-16	HH4-3	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-4A
P4-4	D	2"	HH4-16	HH4-3	N/A	SPARE W/ PULL LINE
P4-4	E	2"	HH4-16	HH4-3	N/A	SPARE W/ PULL LINE
P4-4	F	2"	HH4-16	HH4-3	N/A	SPARE W/ PULL LINE
P4-5	A	2"	HH4-3	HH4-4	(3) #1, (1) #6 G.	
P4-5	D	2"	HH4-3	HH4-4	N/A	SPARE W/ PULL LINE
P4-5	E	2"	HH4-3	HH4-4	N/A	SPARE W/ PULL LINE
P4-5	F	2"	HH4-3	HH4-4	N/A	SPARE W/ PULL LINE
P4-6	A	2"	HH4-4	HH4-5	(3) #1, (1) #6 G.	
P4-6	D	2"	HH4-4	HH4-5	N/A	SPARE W/ PULL LINE
P4-6	E	2"	HH4-4	HH4-5	N/A	SPARE W/ PULL LINE
P4-6	F	2"	HH4-4	HH4-5	N/A	SPARE W/ PULL LINE
P4-7	A	2"	HH4-5	HH4-6	(3) #1, (1) #6 G.	
P4-7	D	2"	HH4-5	HH4-6	N/A	SPARE W/ PULL LINE
P4-7	E	2"	HH4-5	HH4-6	N/A	SPARE W/ PULL LINE
P4-7	F	2"	HH4-5	HH4-6	N/A	SPARE W/ PULL LINE
P4-8	A	2"	HH4-6	HH4-7	(3) #1, (1) #6 G.	
P4-8	D	2"	HH4-6	HH4-7	N/A	SPARE W/ PULL LINE
P4-9	K	2"	PNL-4	HH4-8	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-9L
P4-9	L	2"	PNL-4	HH4-8	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-9K
P4-9	M	2"	PNL-4	HH4-8	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-9N
P4-9	N	2"	PNL-4	HH4-8	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-9M
P4-9	O	2"	PNL-4	HH4-8	N/A	SPARE W/ PULL LINE
P4-9	P	2"	PNL-4	HH4-8	N/A	SPARE W/ PULL LINE
P4-9	Q	2"	PNL-4	HH4-8	N/A	SPARE W/ PULL LINE
P4-9	R	2"	PNL-4	HH4-8	N/A	SPARE W/ PULL LINE
P4-9	S	2"	PNL-4	HH4-8	N/A	SPARE W/ PULL LINE
P4-9	T	2"	PNL-4	HH4-8	N/A	SPARE W/ PULL LINE
P4-10	K	2"	HH4-8	HH4-9	(3) #1, (1) #6 G.	COMMON CONDUIT W/ P4-10L
P4-10	L	2"	HH4-8	HH4-9	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-10K
P4-10	M	2"	HH4-8	HH4-9	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-10N
P4-10	N	2"	HH4-8	HH4-9	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-10M
P4-10	O	2"	HH4-8	HH4-9	N/A	SPARE W/ PULL LINE
P4-10	P	2"	HH4-8	HH4-9	N/A	SPARE W/ PULL LINE
P4-10	Q	2"	HH4-8	HH4-9	N/A	SPARE W/ PULL LINE
P4-10	R	2"	HH4-8	HH4-9	N/A	SPARE W/ PULL LINE
P4-10	S	2"	HH4-8	HH4-9	N/A	SPARE W/ PULL LINE
P4-10	T	2"	HH4-8	HH4-9	N/A	SPARE W/ PULL LINE
P4-11	L	2"	HH4-9	HH4-10	(3) #4, (1) #6 G.	
P4-11	M	2"	HH4-9	HH4-10	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-11N
P4-11	N	2"	HH4-9	HH4-10	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-11M
P4-11	O	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-11	P	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-11	Q	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-11	R	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-11	S	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-11	T	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-12	L	2"	HH4-10	HH4-11	(3) #4, (1) #6 G.	
P4-12	M	2"	HH4-10	HH4-11	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-12N
P4-12	N	2"	HH4-10	HH4-11	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-12M
P4-12	O	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE
P4-12	P	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE
P4-12	Q	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE
P4-12	R	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE

CONTINUED

NODE 04 CONTINUED

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P4-13	M	2"	HH4-11	HH4-12	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-13N
P4-13	N	2"	HH4-11	HH4-12	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-13M
P4-13	O	2"	HH4-11	HH4-12	N/A	SPARE W/ PULL LINE
P4-13	P	2"	HH4-11	HH4-12	N/A	SPARE W/ PULL LINE
P4-13	Q	2"	HH4-11	HH4-12	N/A	SPARE W/ PULL LINE
P4-14	M	2"	HH4-12	HH4-13	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-14N
P4-14	N	2"	HH4-12	HH4-13	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-14M
P4-14	O	2"	HH4-12	HH4-13	N/A	SPARE W/ PULL LINE
P4-14	P	2"	HH4-12	HH4-13	N/A	SPARE W/ PULL LINE
P4-14	Q	2"	HH4-12	HH4-13	N/A	SPARE W/ PULL LINE
P4-15	N	2"	HH4-13	HH4-14	(3) #4, (1) #6 G.	
P4-15	O	2"	HH4-13	HH4-14	N/A	SPARE W/ PULL LINE
P4-15	P	2"	HH4-13	HH4-14	N/A	SPARE W/ PULL LINE
P4-15	Q	2"	HH4-13	HH4-14	N/A	SPARE W/ PULL LINE
P4-16	N	2"	HH4-14	HH4-15	(3) #4, (1) #6 G.	
P4-16	O	2"	HH4-14	HH4-15	N/A	SPARE W/ PULL LINE
P4-18	C	3"	HH4-16	HH4-17	(3) #2/0, (1) #3 G.	
P4-18	I	3"	HH4-16	HH4-17	N/A	SPARE W/ PULL LINE
P4-18	J	3"	HH4-16	HH4-17	N/A	SPARE W/ PULL LINE
P4-19	C	3"	HH4-17	HH4-18	(3) #2/0, (1) #3 G.	
P4-19	I	3"	HH4-17	HH4-18	N/A	SPARE W/ PULL LINE
P4-19	J	3"	HH4-17	HH4-18	N/A	SPARE W/ PULL LINE
P4-20	I	3"	HH4-18	HH4-19	N/A	SPARE W/ PULL LINE
P4-20	J	3"	HH4-18	HH4-19	N/A	SPARE W/ PULL LINE
P4-21	I	3"	HH4-19	HH4-20	N/A	SPARE W/ PULL LINE
P4-21	J	3"	HH4-19	HH4-20	N/A	SPARE W/ PULL LINE

P=power, F=fiber optic, C=controls
ALL POWER CONDUCTORS ARE AWG XHHW UNLESS OTHERWISE NOTED

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD	BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF	
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

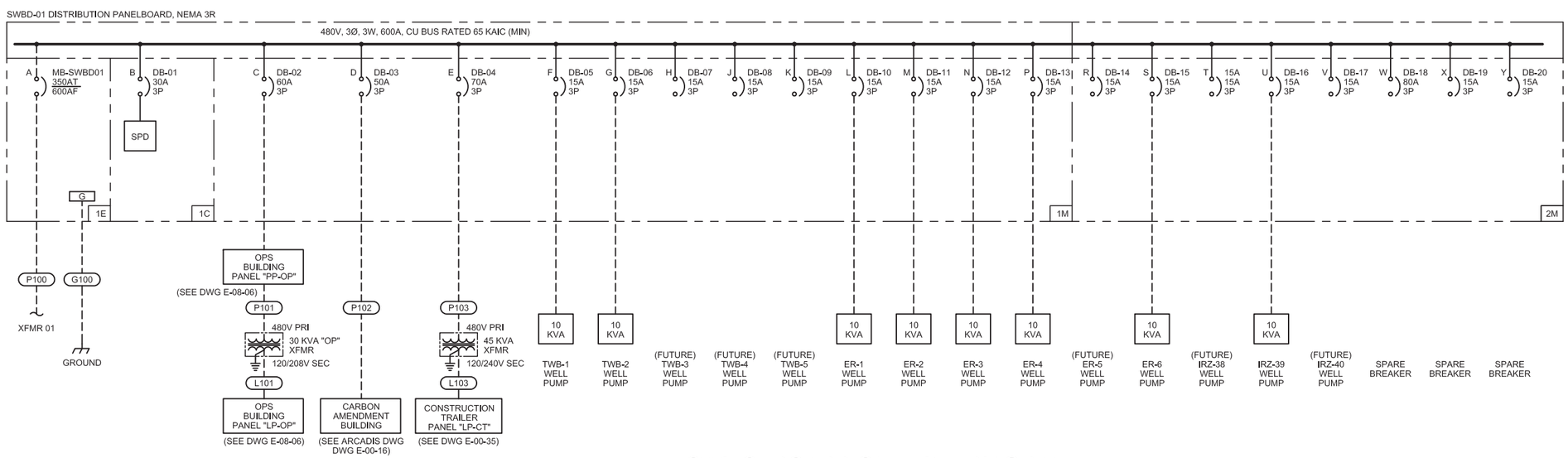
CONDUIT & CABLE SCHEDULES

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-14	REV 1

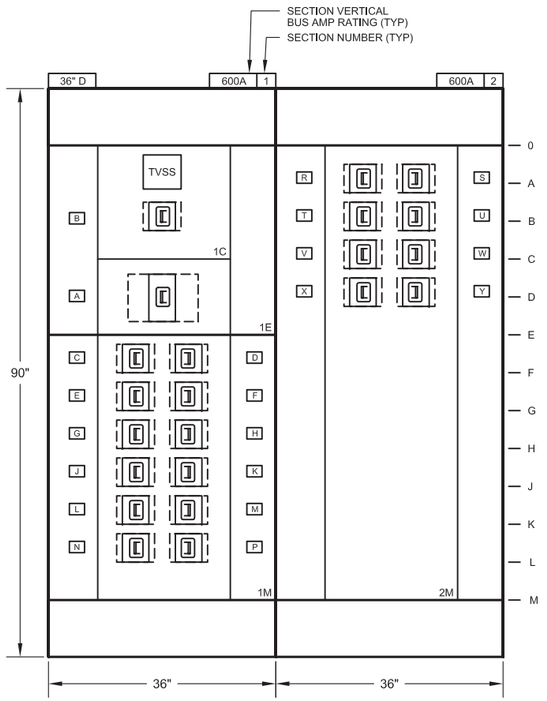
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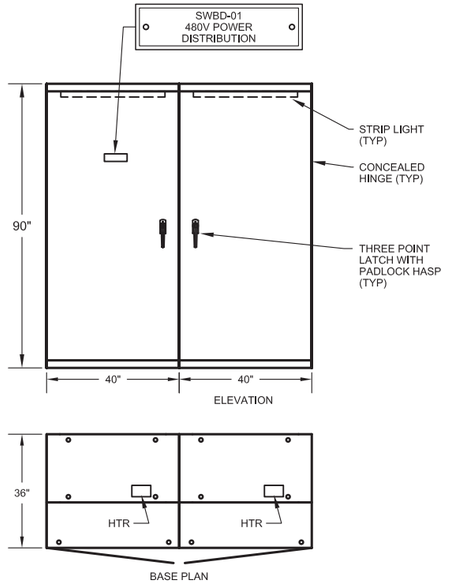
SWITCHBOARD ONE-LINE DIAGRAM

NOTES:
1. SEE LOAD CALCULATIONS ON E-00-35.

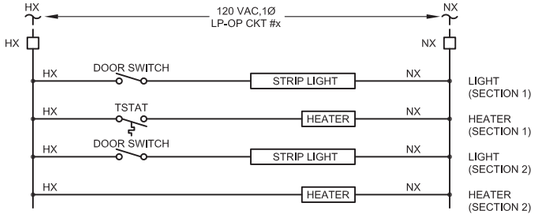


DISTRIBUTION PANELBOARD ELEVATION (1)(2)

NOTES:
1. PROVIDE NEMA 3R ENCLOSURE
2. PROVIDE NAMEPLATES PER SCHEDULE THIS PAGE.



DISTRIBUTION PANELBOARD WEATHERWRAP



PANELBOARD AUX. WIRING DIAGRAM

GENERAL NOTES:

1. REAR ACCESS SHALL NOT BE REQUIRED TO SERVICE OR REPLACE SWITCHBOARD COMPONENTS.
2. EACH BREAKER SHALL HAVE A PADLOCKABLE HASP TO LOCK BREAKER IN THE OFF POSITION.
3. ALL DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE PER MANUFACTURER APPROVED IN SUBMITTAL.
4. PANEL SHALL BE SUITABLE FOR OUTDOOR INSTALLATION (NEMA 3R) WITH GASKETED DOORS AND SCREENED VENTS.

WEATHERWRAP FABRICATION METHODS

1. NEMA 3R WEATHER-PROOF FOR OUTDOOR INSTALLATION.
2. OUTER DOORS SHALL BE SEALED WITH RUBBERIZED FOAM GASKET.
3. EXTERIOR FABRICATED FROM GALVANEAL (PAINT BOND) SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. OUTER DOORS TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCHES.
6. DOOR HINGES AND PINS SHALL BE CONCEALED.
7. PAINT APPLICATION SHALL BE AS FOLLOWS:
   A. TWO STAGE CHEMICAL BATH CLEANING.
   B. ELECTROSTATICALLY APPLIED POWDER COAT PAINT FINISH.
   C. OVEN CURED FOR TWO HOURS.
   D. EXTERIOR COLOR SHALL BE: ANSI 61 GRAY
8. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL OUTER DOOR SECTIONS.
9. FABRICATION, COMPONENTS, AND WIRING SHALL CONFORM TO UL, NEC AND NEMA STANDARDS. PANEL SHALL BE APPROPRIATELY LABELLED.
10. ALL WIRING SHALL BE LABELLED ON BOTH ENDS OF WIRE.
11. AS-BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.
12. PROVIDE DRAWING POCKET ON INSIDE OF CONTROL PANEL DOOR.

NAMEPLATE SCHEDULE

KEY	ENGRAVING LINE 1	ENGRAVING LINE 2	LETTER HEIGHT
A	MAIN	DISCONNECT	3/16"
B	SURGE PROTECTION DEVICE	DISCONNECT	3/16"
C	OPERATIONS BLDG	DISCONNECT	3/16"
D	CARBON AMENDMENT BLDG	DISCONNECT	3/16"
E	CONSTRUCTION TRAILER XFMR	DISCONNECT	3/16"
F	TWB-1 WELL	DISCONNECT	3/16"
G	TWB-2 WELL	DISCONNECT	3/16"
H	(FUTURE) TWB-3 WELL	DISCONNECT	3/16"
J	(FUTURE) TWB-4 WELL	DISCONNECT	3/16"
K	(FUTURE) TWB-5 WELL	DISCONNECT	3/16"
L	ER-1	DISCONNECT	3/16"
M	ER-2	DISCONNECT	3/16"
N	ER-3	DISCONNECT	3/16"
P	ER-4	DISCONNECT	3/16"
R	(FUTURE) ER-5	DISCONNECT	3/16"
S	ER-6	DISCONNECT	3/16"
T	(FUTURE) IRZ-38	DISCONNECT	3/16"
U	IRZ-39	DISCONNECT	3/16"
V	(FUTURE) IRZ-40	DISCONNECT	3/16"
W	SPARE	DISCONNECT	3/16"
X	SPARE	DISCONNECT	3/16"
Y	SPARE	DISCONNECT	3/16"

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FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

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REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF

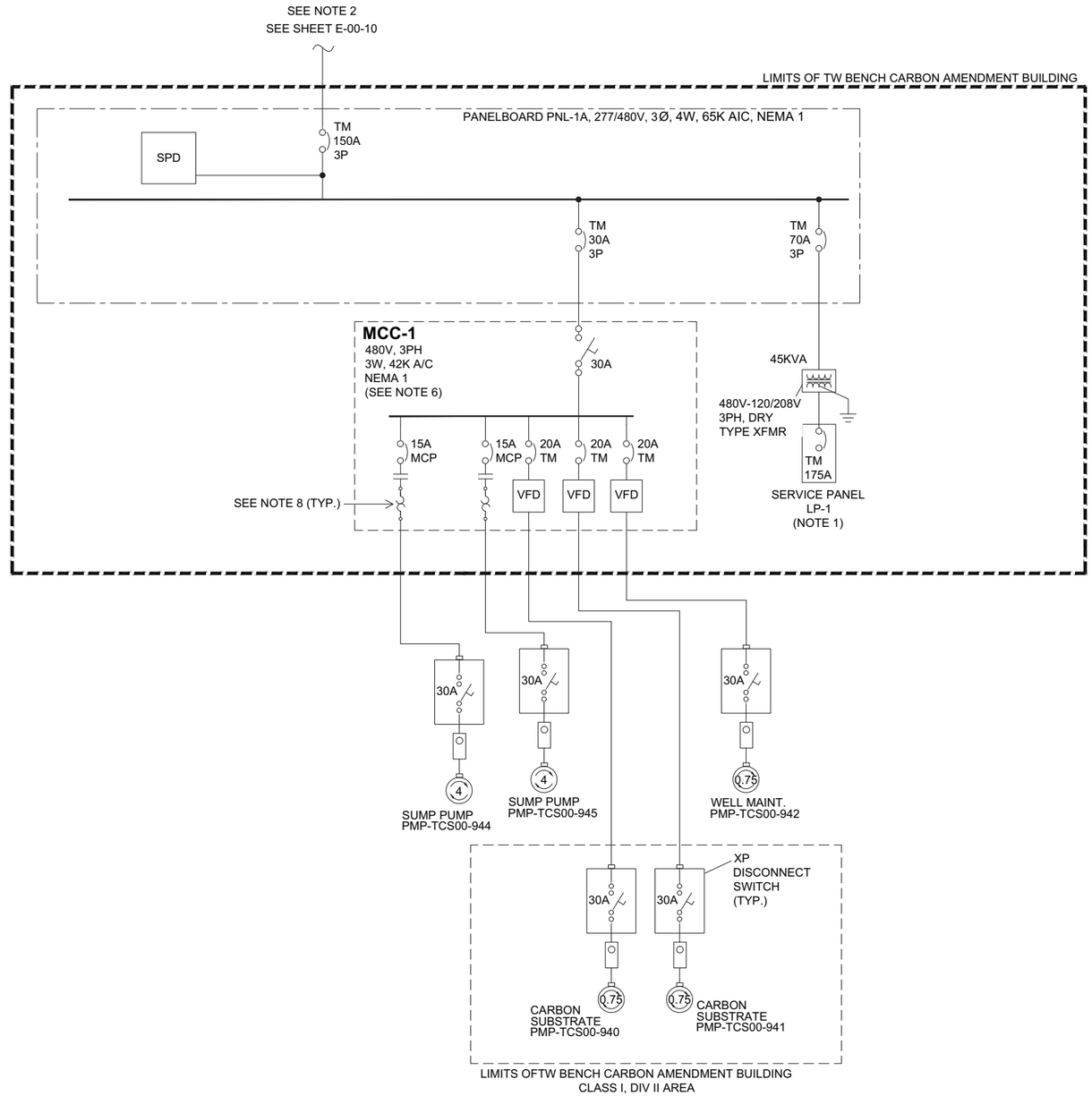
APPROVED BY: TPF

SO	
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DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN BENCH SWITCHBOARD ONE-LINE DIAGRAM (NODE 1)
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-15	REV 0

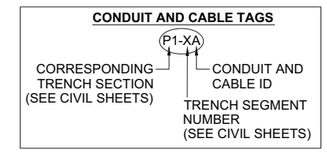
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PLOT DATE: Aug 25, 2014 PLOT TIME: 2:49:29pm
N1808



NOTES:

1. SERVICE PANEL LP-1 TO PROVIDE POWER TO HVAC, RECEPTACLES, LIGHTING, AND FANS IN NODE 1 BUILDING.
2. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
3. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.
4. SEAL-OFF FITTINGS SHALL BE INSTALLED ON ALL CONDUITS WHICH ENTER AND/OR EXIT CLASSIFIED AREAS. ELECTRICAL INSTALLATION IN CLASS I, DIV II AREA SHALL COMPLY WITH NEC ARTICLE 501.
5. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE IT'S CORRESPONDING VALVE VAULT.
6. MCC-1 SHALL BE PROVIDED BY CONTROL PANEL VENDOR.
7. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.
8. SEE SHEETS E-00-36 THROUGH E-00-47 FOR COMBINATION STARTER INFORMATION.

CONDUIT AND CABLE TAGS



ARCADIS

N1808

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

ONE-LINE DIAGRAM NODE 1

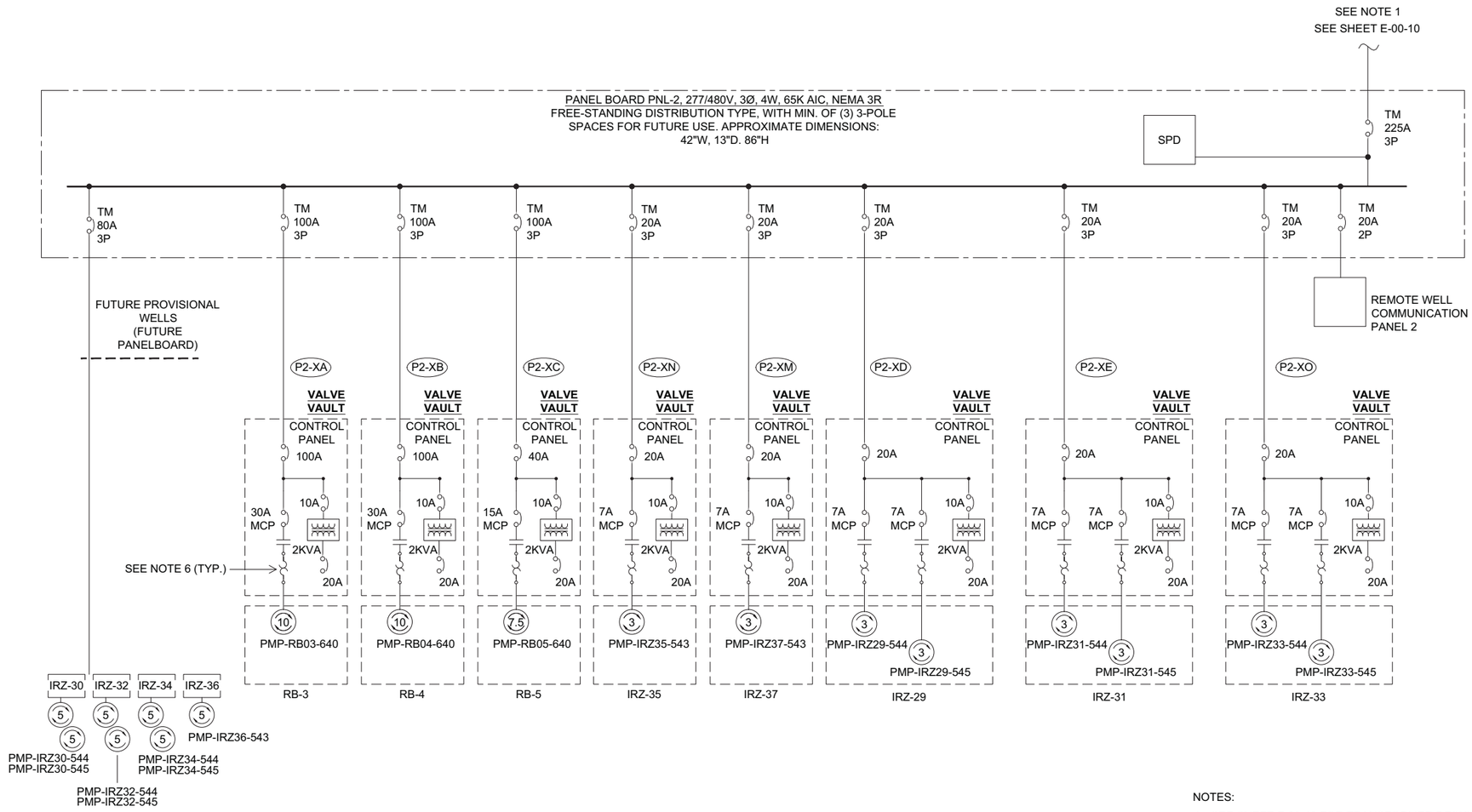
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

- DRAFT -
NOT FOR CONSTRUCTION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS

E-00-16 | REV 1

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CONDUIT AND CABLE TAGS

P1-XA

- CORRESPONDING TRENCH SECTION (SEE CIVIL SHEETS)
- CONDUIT AND CABLE ID
- TRENCH SEGMENT NUMBER (SEE CIVIL SHEETS)

NOTES:

1. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
2. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.
3. SEAL-OFF FITTINGS SHALL BE INSTALLED ON ALL CONDUITS WHICH ENTER AND/OR EXIT CLASSIFIED AREAS. ELECTRICAL INSTALLATION IN CLASS I, DIV II AREA SHALL COMPLY WITH NEC ARTICLE 501.
4. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE IT'S CORRESPONDING VALVE VAULT.
5. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.
6. SEE SHEETS E-00-36 THROUGH E-00-47 FOR COMBINATION STARTER INFORMATION.

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0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

ONE-LINE DIAGRAM NODE 2

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
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SHEET NO.	of SHEETS
E-00-17	REV 1

N1808

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SEE NOTE 2
SEE SHEET E-00-09

PNL-3M 277/480V 3PH 4W 65K AIC NEMA 1
FREE-STANDING DISTRIBUTION TYPE, WITH MIN. OF (3) 3-POLE SPACES FOR FUTURE USE. APPROXIMATE DIMENSIONS: 32"W, 9"D. 73"H

TM 350A 3P

SPD

125A 3P — FUTURE PROVISIONAL WELLS (FUTURE PANEL BOARD)

70A 3P — 45KVA — 175A LP-3

150A 3P

150A 3P — 150A MCC-3 3P — TO MCC-3 (SEE SHEET E-00-19)

CONDUIT AND CABLE TAGS

P1-XA
- CORRESPONDING TRENCH SECTION (SEE CIVIL SHEETS)
- CONDUIT AND CABLE ID
- TRENCH SEGMENT NUMBER (SEE CIVIL SHEETS)

NOTES:

1. SERVICE PANEL LP-3 TO PROVIDE POWER TO HVAC, RECEPTACLES, LIGHTING, AND FANS IN NODE 1 BUILDING.
2. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
3. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.
4. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE IT'S CORRESPONDING VALVE VAULT.
5. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.
6. SEE SHEETS E-00-36 THROUGH E-00-47 FOR COMBINATION STARTER INFORMATION.

LIMITS OF MW-20 BENCH CARBON AMENDMENT BUILDING

150A 3P

PNL-3A (NODE 3), 277/480V,65K AIC, NEMA 1 (FREE-STANDING DISTRIBUTION TYPE, WITH MIN. OF (3) 3-POLE SPACES FOR FUTURE USE. APPROXIMATE DIMENSIONS: 32"W, 9"D. 73"H)

TM 40A 3P — P3-XA VALVE VAULT
TM 40A 3P — P3-XB VALVE VAULT
TM 40A 3P — P3-XC VALVE VAULT
TM 40A 3P — P3-XD VALVE VAULT
TM 40A 3P — P3-XE VALVE VAULT
TM 80A 3P — P3-XK VALVE VAULT
TM 20A 3P — P3-XL VALVE VAULT

CONTINUED ON SHEET E-00-20

FUTURE PROVISIONAL WELLS (FUTURE PANELBOARD)

IRZ-18: PMP-IRZ18-546, PMP-IRZ18-547, PMP-IRZ18-548, PMP-IRZ18-549
IRZ-22: PMP-IRZ22-546, PMP-IRZ22-547, PMP-IRZ22-548, PMP-IRZ22-549
IRZ-24: PMP-IRZ24-544, PMP-IRZ24-545
IRZ-26: PMP-IRZ26-544, PMP-IRZ26-545
IRZ-28: PMP-IRZ28-544, PMP-IRZ28-545

P3-XA VALVE VAULT
40A; 7A MCP; 7A MCP; 10A 2KVA; 20A TM; 20A
SEE NOTE 6 (TYP.)
7A MCP; 7A MCP; 7A MCP
PMP-IRZ16-546; PMP-IRZ16-547 — IRZ-16A
PMP-IRZ16-548; PMP-IRZ16-549; PMP-IRZ16-430 — IRZ-16B

P3-XB VALVE VAULT
40A; 7A MCP; 7A MCP; 10A 2KVA; 20A TM; 20A
7A MCP; 7A MCP; 7A MCP
PMP-IRZ17-546; PMP-IRZ17-547 — IRZ-17A
PMP-IRZ17-548; PMP-IRZ17-549 — IRZ-17B

P3-XC VALVE VAULT
40A; 7A MCP; 7A MCP; 10A 2KVA; 20A TM; 20A
7A MCP; 7A MCP; 7A MCP
PMP-IRZ19-546; PMP-IRZ19-547 — IRZ-19A
PMP-IRZ19-548; PMP-IRZ19-549 — IRZ-19B

P3-XD VALVE VAULT
40A; 7A MCP; 7A MCP; 10A 2KVA; 20A TM; 20A
7A MCP; 7A MCP; 7A MCP
PMP-IRZ20-546; PMP-IRZ20-547 — IRZ-20A
PMP-IRZ20-548; PMP-IRZ20-549 — IRZ-20B

P3-XE VALVE VAULT
40A; 7A MCP; 7A MCP; 10A 2KVA; 20A TM; 20A
7A MCP; 7A MCP; 7A MCP
PMP-IRZ21-546; PMP-IRZ21-547 — IRZ-21A
PMP-IRZ21-548; PMP-IRZ21-549 — IRZ-21B

P3-XK VALVE VAULT
80A; 50A MCP; 10A 2KVA; 20A
PMP-IRZ23-540 — IRZ-23

P3-XL VALVE VAULT
20A; 7A MCP; 7A MCP; 10A 2KVA; 20A
PMP-IRZ25-544; PMP-IRZ25-545 — IRZ-25

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

ONE-LINE DIAGRAM NODE 3

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS

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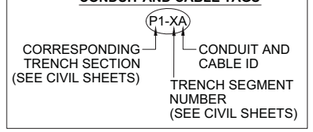
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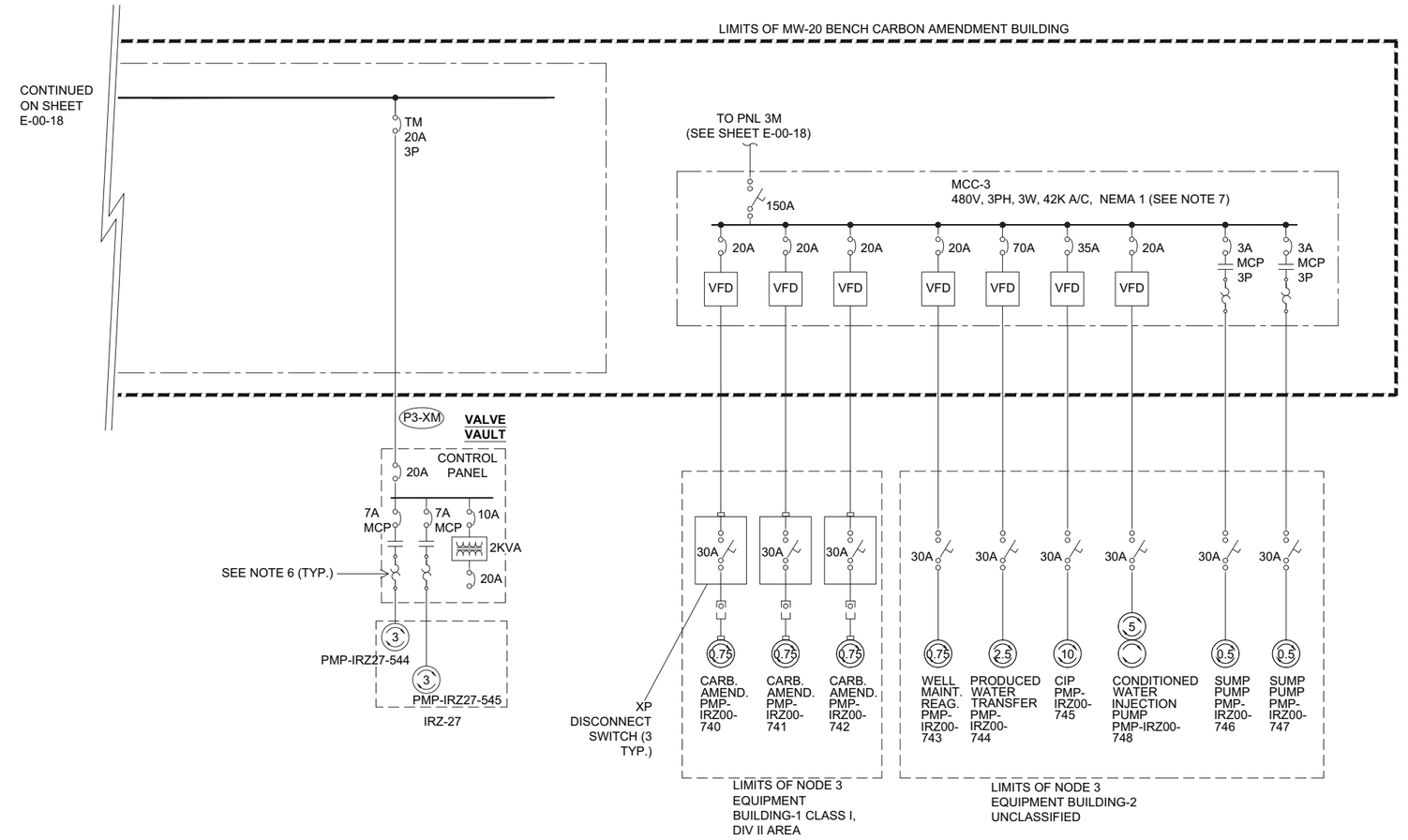
N1808

NOTES:

1. SERVICE PANEL LP-3 TO PROVIDE POWER TO HVAC, RECEPTACLES, LIGHTING, AND FANS IN NODE 1 BUILDING.
2. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
3. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.
4. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE IT'S CORRESPONDING VALVE VAULT.
5. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.
6. SEE SHEETS E-00-36 THROUGH E-00-47 FOR COMBINATION STARTER INFORMATION.
7. MCC-3 SHALL BE PROVIDED BY CONTROL PANEL VENDOR.

CONDUIT AND CABLE TAGS





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ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		JMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

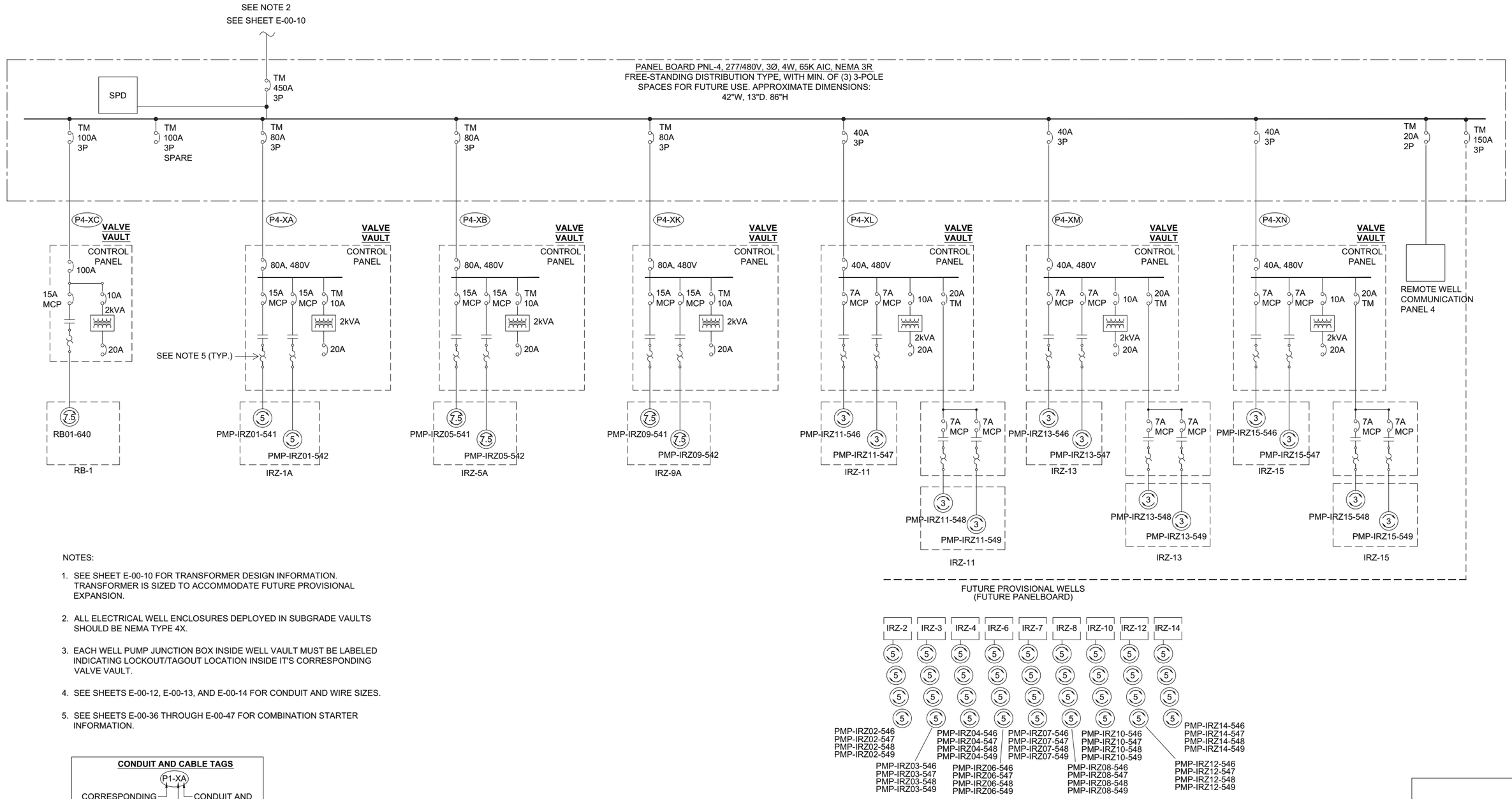
ONE-LINE DIAGRAM NODE 3

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
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SHEET NO.	of SHEETS
E-00-19	REV 1

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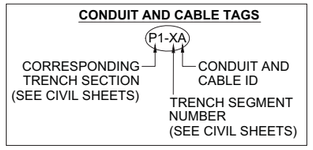
N1808



NOTES:

1. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
2. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.
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4. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.
5. SEE SHEETS E-00-36 THROUGH E-00-47 FOR COMBINATION STARTER INFORMATION.

CONDUIT AND CABLE TAGS



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0	04/05/13	INTERMEDIATE (60%) DESIGN		JMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	JMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

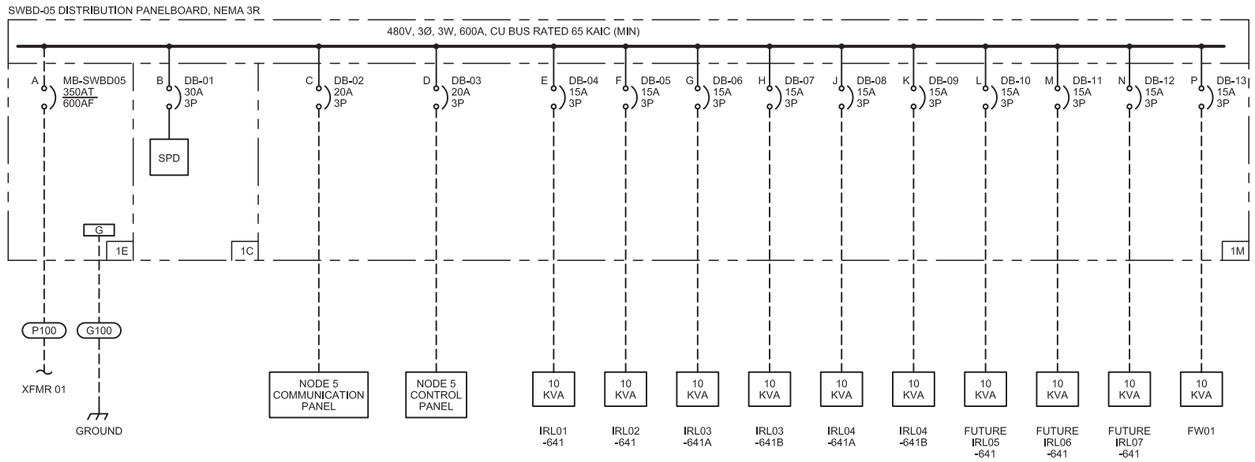
ONE-LINE DIAGRAM NODE 4

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-20	REV 1

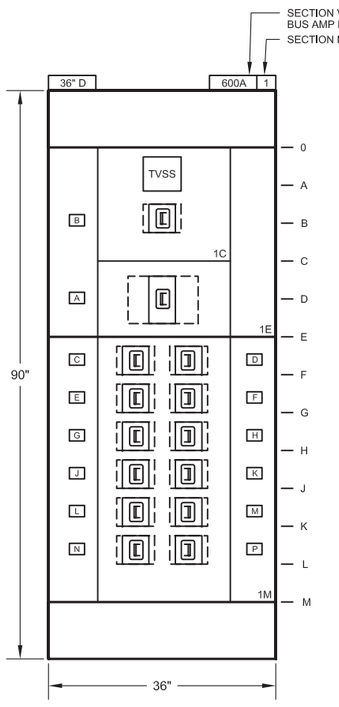
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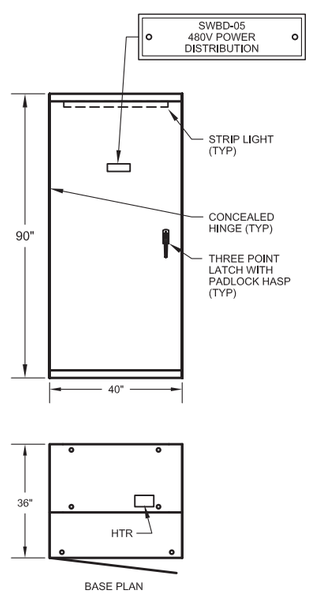
SWITCHBOARD ONE-LINE DIAGRAM

NOTES:
(1) SEE LOAD CALCULATIONS ON E-00-35.

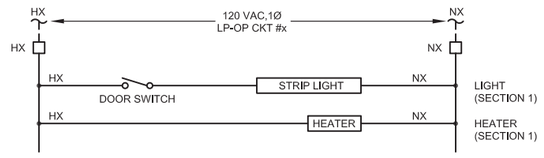


DISTRIBUTION PANELBOARD ELEVATION (1) (2)

NOTES:
(1) PROVIDE NEMA 3R ENCLOSURE
(2) PROVIDE NAMEPLATES PER SCHEDULE THIS PAGE.



DISTRIBUTION PANELBOARD WEATHERWRAP



PANELBOARD AUX. WIRING DIAGRAM

GENERAL NOTES:

1. REAR ACCESS SHALL NOT BE REQUIRED TO SERVICE OR REPLACE SWITCHBOARD COMPONENTS.
2. EACH BREAKER SHALL HAVE A PADLOCKABLE HASP TO LOCK BREAKER IN THE OFF POSITION.
3. ALL DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE PER MANUFACTURER APPROVED IN SUBMITTAL.
4. PANEL SHALL BE SUITABLE FOR OUTDOOR INSTALLATION (NEMA 3R) WITH GASKETED DOORS AND SCREENED VENTS.

WEATHERWRAP FABRICATION METHODS

1. NEMA 3R WEATHER-PROOF FOR OUTDOOR INSTALLATION.
2. OUTER DOORS SHALL BE SEALED WITH RUBBERIZED FOAM GASKET.
3. EXTERIOR FABRICATED FROM GALVANEAL (PAINT BOND) SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. OUTER DOORS TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCHES.
6. DOOR HINGES AND PINS SHALL BE CONCEALED.
7. PAINT APPLICATION SHALL BE AS FOLLOWS:
   A. TWO STAGE CHEMICAL BATH CLEANING.
   B. ELECTROSTATICALLY APPLIED POWDER COAT PAINT FINISH.
   C. OVEN CURED FOR TWO HOURS.
   D. EXTERIOR COLOR SHALL BE: ANSI 61 GRAY
8. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL OUTER DOOR SECTIONS.
9. FABRICATION, COMPONENTS, AND WIRING SHALL CONFORM TO UL, NEC AND NEMA STANDARDS. PANEL SHALL BE APPROPRIATELY LABELLED.
10. ALL WIRING SHALL BE LABELLED ON BOTH ENDS OF WIRE.
11. AS-BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.
12. PROVIDE DRAWING POCKET ON INSIDE OF CONTROL PANEL DOOR.

NAMEPLATE SCHEDULE

KEY	ENGRAVING LINE 1	ENGRAVING LINE 2	LETTER HEIGHT
A	MAIN	DISCONNECT	3/16"
B	SURGE PROTECTION DEVICE	DISCONNECT	3/16"
C	OPERATIONS BLDG	DISCONNECT	3/16"
D	CARBON AMENDMENT BLDG	DISCONNECT	3/16"
E	CONSTRUCTION TRAILER XFMR	DISCONNECT	3/16"
F	TWB-1 WELL	DISCONNECT	3/16"
G	TWB-2 WELL	DISCONNECT	3/16"
H	(FUTURE) TWB-3 WELL	DISCONNECT	3/16"
J	(FUTURE) TWB-4 WELL	DISCONNECT	3/16"
K	(FUTURE) TWB-5 WELL	DISCONNECT	3/16"
L	ER-1	DISCONNECT	3/16"
M	ER-2	DISCONNECT	3/16"
N	ER-3	DISCONNECT	3/16"
P	ER-4	DISCONNECT	3/16"
R	(FUTURE) ER-5	DISCONNECT	3/16"
S	ER-6	DISCONNECT	3/16"
T	(FUTURE) IRZ-38	DISCONNECT	3/16"
U	IRZ-39	DISCONNECT	3/16"
V	(FUTURE) IRZ-40	DISCONNECT	3/16"
W	SPARE	DISCONNECT	3/16"
X	SPARE	DISCONNECT	3/16"
Y	SPARE	DISCONNECT	3/16"

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY	
TPF	

SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN BENCH SWITCHBOARD ONE-LINE DIAGRAM (NODE 5)
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-21	REV 1

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N1808

REMEDY SCADA SYSTEM COMMUNICATIONS BLOCK DIAGRAM (2)

LEGEND

SYMBOL	DESCRIPTION
PLC	PLC CONTROL PANEL
HMI	HUMAN MACHINE INTERFACE LOCAL TOUCHSCREEN PANEL
FO ESW	FIBER OPTIC ETHERNET SWITCH
SPF	SMALL FORM FACTOR PLUGGABLE TRANSCIEVERS
WIC	WALL-MOUNTABLE INTERCONNECT CENTER
FOD	FIBER OPTIC DISTRIBUTION PANEL
	FIBER OPTIC SC STYLE GIGABIT CONNECTION
	RJ-45 ETHERNET (CAT6) GIGABIT CONNECTION
	FIBER OPTIC LC SFP MODULE GIGABIT CONNECTION
	SINGLE MODE FIBER OPTIC CABLE
	MULTI-MODE FIBER OPTIC CABLE
	10/100BASE-TX CAT5E CABLE
1	RACK MOUNT MANAGED SWITCH
2	RACK MOUNT MANAGED MODULAR GIGABIT SWITCH
3	DIN RAIL MOUNT MANAGED MODULAR GIGABIT SWITCH
4	9 PORT SINGLE MODE SWITCH
5	9 PORT MULTIMODE SWITCH
6	COMPACT MEDIA CONVERTER
7	6 PORT MULTIMODE SWITCH

EXTENTS OF OPERATIONS BUILDING COMMUNICATIONS PANEL (NODE 1)

REMEDY SCADA - OFFICE SWITCH
RACK MOUNT FO ESW
2 PORT 1000BASE-SX/LX
24 PORT 10/100BASE-TX
TO EXISTING PG&E STATION PLC ODN NETWORK
OPERATIONS-REMEDY SCADA TERMINAL 1 (GE IFIX)
OPERATIONS-REMEDY SCADA TERMINAL 2 (GE IFIX)
OPERATIONS-REMEDY SCADA HISTORIAN (GE IFIX)
REMEDY SCADA - OFFICE ADMIN SWITCH
REMEDY SCADA - OFFICE SECURITY SWITCH
REMEDY SCADA - OFFICE PHONE SWITCH
LAB LAPTOP
LAB LASER COLOR PRINTER
TYPICAL AVAILABLE NETWORK ACCESS
TO EXISTING PG&E UTILITY NETWORK(S)
TO EXISTING PG&E UTILITY DATA NETWORK (UDN)
WHIP ANTENNA (TYP)
WI-FI 802.11
REMEDY SCADA - FIELD 1 SWITCH
RACK MOUNT FO ESW
16 PORT 1000BASE-FX
8 PORT 1000BASE-TX
SECURITY S1
REMEDY WTP N1A
TW BENCH N1B
SOUTH NTH N1C
MW-20 BENCH N1D
NORTH NTH N1E
UPLANDS N1F
LOOPED FO CABLES TO EACH REMOTE NODE 2 CABLE PAIRS (1 LOOP) SINGLE MODE CONNECTION 1000BASE-FX WITH SC CONNECTORS
LOOPED FO CABLES TO EACH REMOTE NODE 2 CABLE PAIRS (1 LOOP) SINGLE MODE CONNECTION 1000BASE-FX WITH SC CONNECTORS

REMOTE SITE RADIO

FO ESW 1 PORT 100BASE-FX 4 PORT 10/100BASE-TX
RADIO
FO CABLES TO RADIO 1 CABLE PAIR MULTIMODE CONNECTION 100BASE-FX WITH SC CONNECTORS
SECTOR ANTENNA
PM REMEDY PLANT SWITCHBOARD
PM REMEDY REMOTE SITE PAD MOUNTED 12KV BREAKER

(REMEDY WTP) NODE 99

REMEDY WTP N99
FO ESW 8 PORT 1000BASE-FX 16 PORT 100BASE-FX 8 PORT 10/100BASE-TX
COMM PANEL
CONTROL PANEL
PLC
ESW
OIT
SEE DWG E-12-06
LOOPED FO CABLES TO REMOTE SITES 14 CABLE PAIRS MAXIMUM 7 LOOPS MAXIMUM MULTIMODE CONNECTION 100BASE-FX
SEE DWG E-12-09 FOR FIBER LOOPS TO REMOTE WELLS

(TW BENCH) NODE 1

FO ESW 8 PORT 1000BASE-FX 16 PORT 100BASE-FX
FIELD HMI 2 SWITCH
SEE DWG I-08-02
SEE DWG E-00-24 FOR FIBER LOOPS TO REMOTE WELLS

(SOUTH NTH) NODE 2

SOUTH NTH N2
FO ESW 8 PORT 1000BASE-FX 16 PORT 100BASE-FX 8 PORT 10/100BASE-TX
SEE DWG I-06-03
SEE DWG E-00-27 FOR FIBER LOOPS TO REMOTE WELLS

(MW-20 BENCH) NODE 3

MW-20 BENCH N3
SEE DWG I-04-04
SEE DWG E-00-29 FOR FIBER LOOPS TO REMOTE WELLS

(NORTH NTH) NODE 4

NORTH NTH N4
SEE DWG I-04-09
SEE DWG E-00-31 FOR FIBER LOOPS TO REMOTE WELLS

(UPLANDS) NODE 5

UPLANDS N5
OMNI ANTENNA (TYP)
SEE DWG E-00-33 FOR FIBER LOOPS TO REMOTE WELLS

DC-18 & DC-19

YAGGI ANTENNA (TYP)
WI-FI 802.11
RADIO
XMTR
SEE DWG E-16-01

(FUTURE) FW-HNWR-1

(PLC-011) FW-HNWR-1A

SEE DWG E-01-03

(PLC-012) SITE B

SEE DWG E-01-07

DC-20 & DC-21

DATA COLLECTION PANEL
SEE DWG E-16-01

NOTES:

1. MULTIPLE WICS PER LOCATION. REFERENCE COMMUNICATIONS PANEL LAYOUTS ON DRAWINGS E-00-22 THRU E-00-32 FOR QUANTITY REQUIRED IN EACH PANEL.
2. TERMINATE ALL FIBER AND COPPER CABLES. SPARE TERMINATION ARE NOT SHOWN.
3. THE EQUIPMENT AND FACILITY SHOWN IS PART OF A CONTINGENT SYSTEM AND MAY BE CONSTRUCTED IN THE FUTURE.

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
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0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

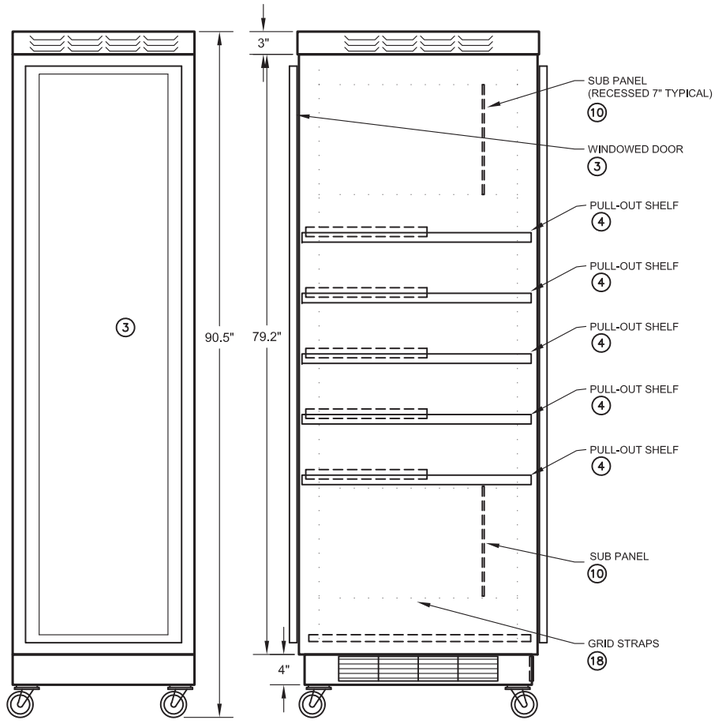
REVISIONS

APPROVED BY	SO
TPF	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY SCADA SYSTEM BLOCK DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

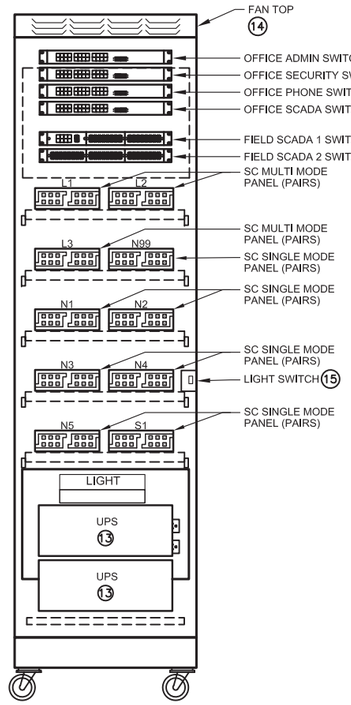
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SUPSD BY	
SHEET NO.	of SHEETS
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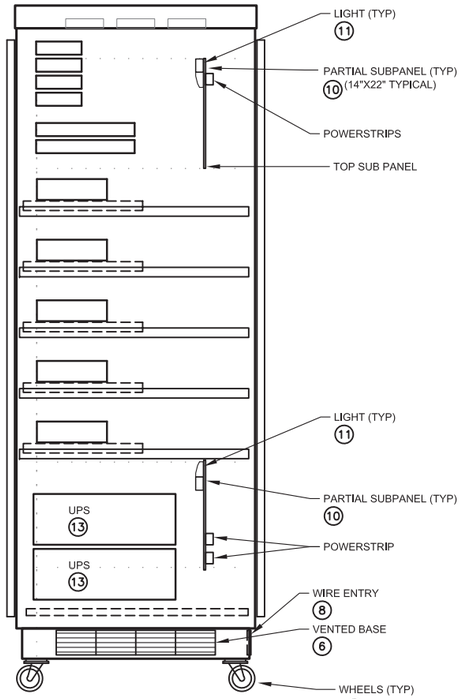


FRONT VIEW

SIDE VIEW



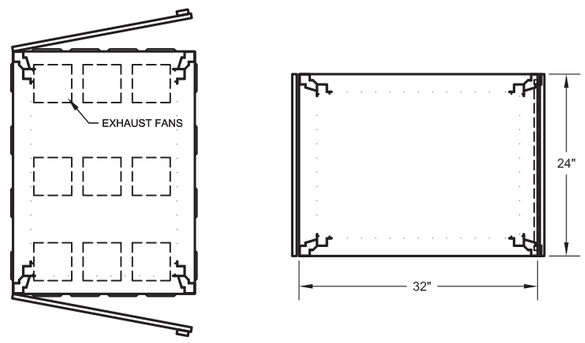
FRONT VIEW



SIDE VIEW
WITH SIDE PANEL REMOVED

COMMUNICATIONS PANEL EQUIPMENT LAYOUT

SCALE: 1" = 10"



TOP VIEW

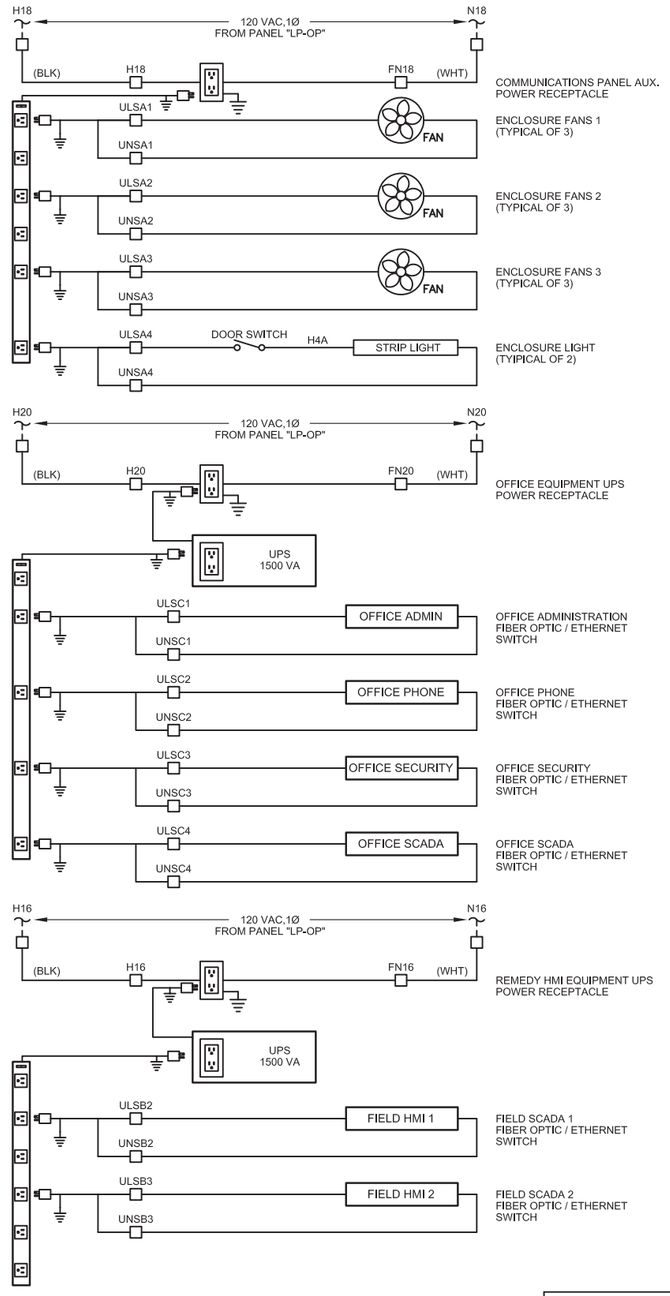
BOTTOM VIEW

COMMUNICATIONS PANEL ELEVATION

SCALE: 1" = 10"

BILL OF MATERIALS

REFERENCE CIRCLED NUMBER	DESCRIPTION	MANUFACTURE	PART NUMBER
1	PROLINE-PC MODULAR ENCLOSURE	HOFFMAN	EER43U6080
2	NOT USED		
3	WINDOW DOOR WITH LARGE WINDOW	HOFFMAN	EERPD43U
4	PROLINE FRAME FULL EXTENTION PULL-OUT SHELF	HOFFMAN	PFSHP66
5	PROLINE VENTED FRAME SHELF	HOFFMAN	PFSH66
6	PROLINE 100MM PLINTH BASE	HOFFMAN	PPB168
6	PROLINE VENTED SECTIONS FOR PLINTH BASE	HOFFMAN	PPBCV1600
7	NOT USED		
8	PROLINE CABLE ENTRY GLAND PLATE	HOFFMAN	PCEGP
9	PROLINE CASTER KIT	HOFFMAN	PC1M12
10	PROLINE PARTIAL SUBPANEL	HOFFMAN	PPP46
11	PROLINE FLUORESCENT LIGHT	HOFFMAN	ALF16M12R
12	15A POWERSTRIP WITH MINIMUM 6 SOCKETS AND 6FT LONG CORD	LEVITON	AS DESCRIBED
13	UNINTERRUPTIBLE POWER SUPPLY	APC	SUA1500XL-NETPKG
14	PROLINE VENTED TOP WITH INTEGRAL FAN TRAY	HOFFMAN	PVT3F861
15	PROLINE MANUAL LIGHT SWITCH KIT	HOFFMAN	PLFSWM
16	FLAT PANEL WALL MOUNT WITH DUAL ARTICULATING ARM WITH UNIVERSAL 4 BOLT MOUNTING.	SATECHI	B000X3D7V8
17	NOT USED		
18	GRID STRAPS	HOFFMAN	P-GH1S8
19	F.O. SWITCH	PER SPEC	PER SPEC
20	NOT USED		
21	NOT USED		
22	NOT USED		
23	NOT USED		
24	NOT USED		



COMMUNICATIONS PANEL WIRING DIAGRAM

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REVISIONS

APPROVED BY: TPF

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SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

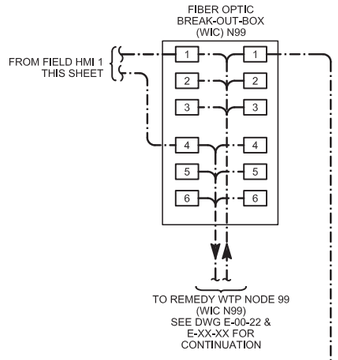
TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN BENCH
COMMUNICATION PANEL 1
ELEVATION & LAYOUT
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

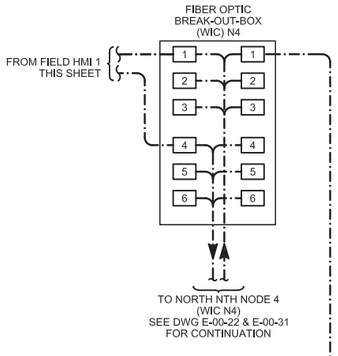
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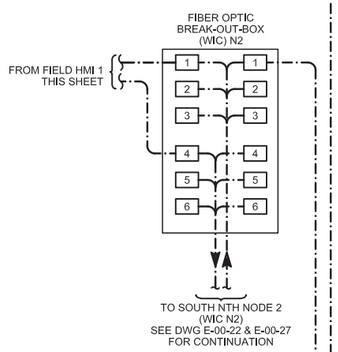
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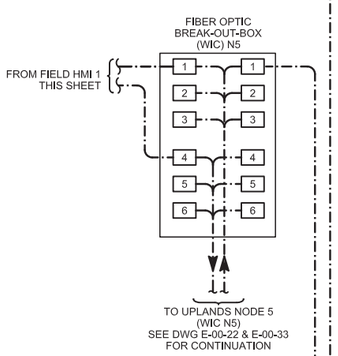
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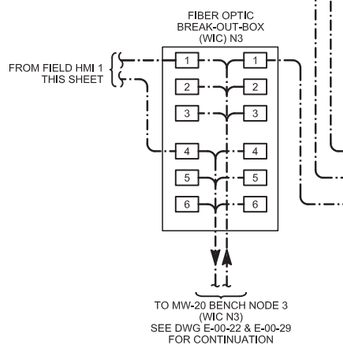
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SYMBOL	DESCRIPTION
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————	MULTI-MODE FIBER OPTIC CABLE
- - - - - -	10/100BASE-TX CAT5E CABLE

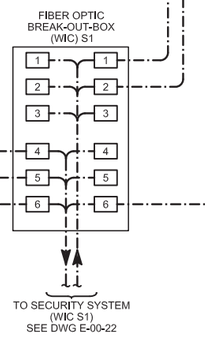


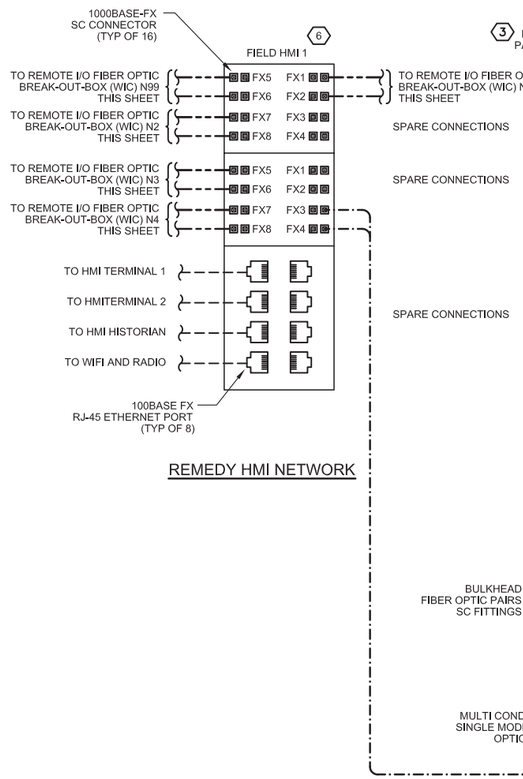


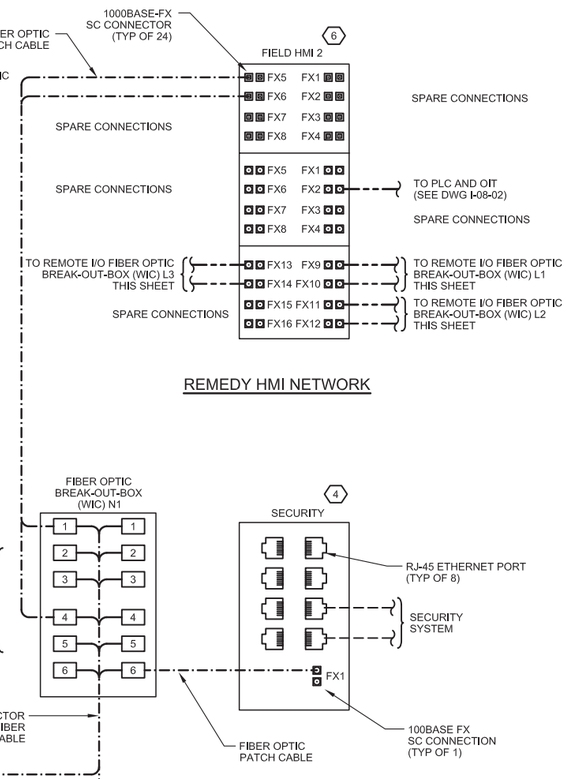


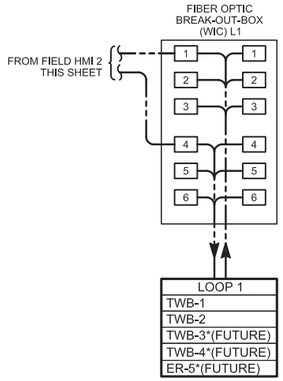


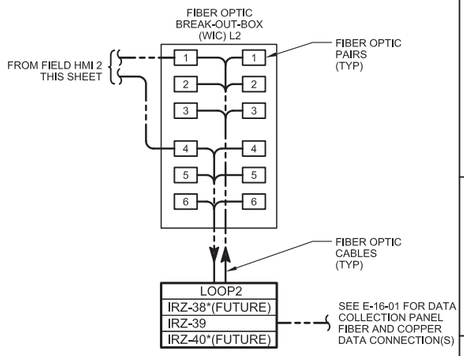


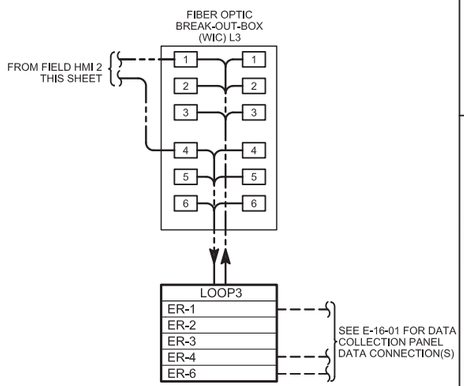












FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

FIBER OPTIC SWITCH CONNECTION DIAGRAM

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.
2. LC CONNECTOR FOR SINGLEMODE FIBER.
3. PATCH CABLE SHALL BE COORDINATED WITH FIBER CONNECTOR AND ETHERNET SWITCH.
4. SWITCH MODEL NTRON 309FXE-N-SC-15 OR EQUIVALENT.
5. SWITCH MODEL NTRON 309FX-N-SC OR EQUIVALENT.
6. SWITCH MODEL NTRON NT24k-DR24 WITH (2)NT24k-FX8-SC AND (1) NT24K-GXE8-SC-10 OR EQUIVALENT.

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1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

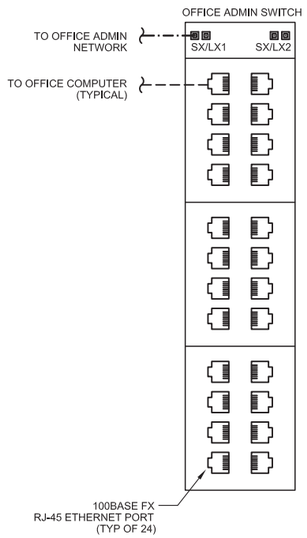
APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN BENCH COMMUNICATION PANEL 1 SCHEMATIC 1
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

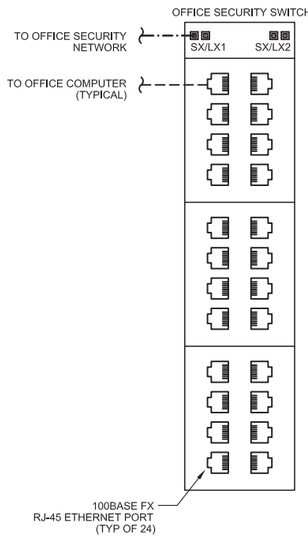
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BILL OF MATL	
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SHEET NO.	of SHEETS
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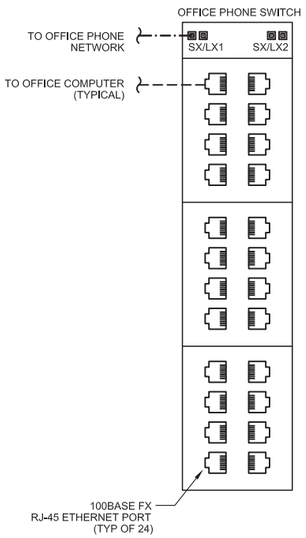
LEGEND	
SYMBOL	DESCRIPTION
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———·———	MULTI-MODE FIBER OPTIC CABLE
- - - - - -	10/100BASE-TX CAT5E CABLE



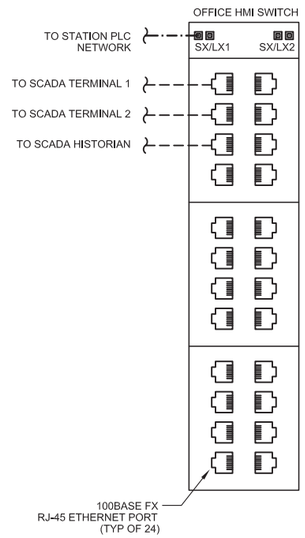
ADMIN NETWORK



SECURITY SYSTEM



PHONE NETWORK



STATION PLC NETWORK

ETHERNET SWITCH CONNECTION DIAGRAM

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0	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF

REVISIONS

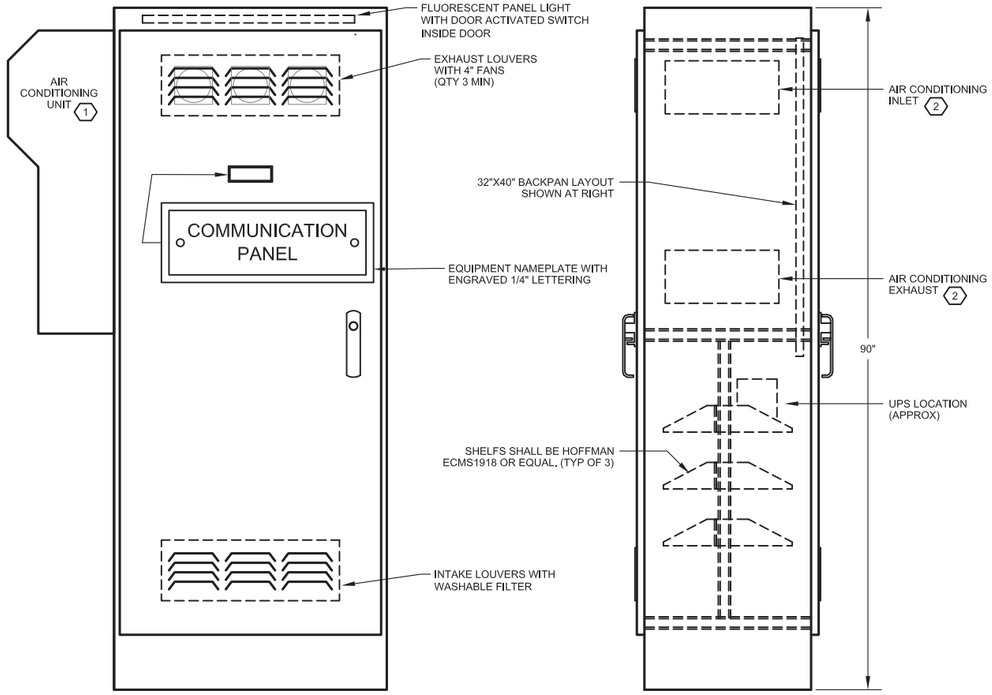
APPROVED BY	
TPF	SO
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	CHKD MF
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	DATE
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TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN BENCH
COMMUNICATION PANEL 1
SCHEMATIC 2
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
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N1808



FRONT ELEVATION

SIDE ELEVATION

ELEVATION

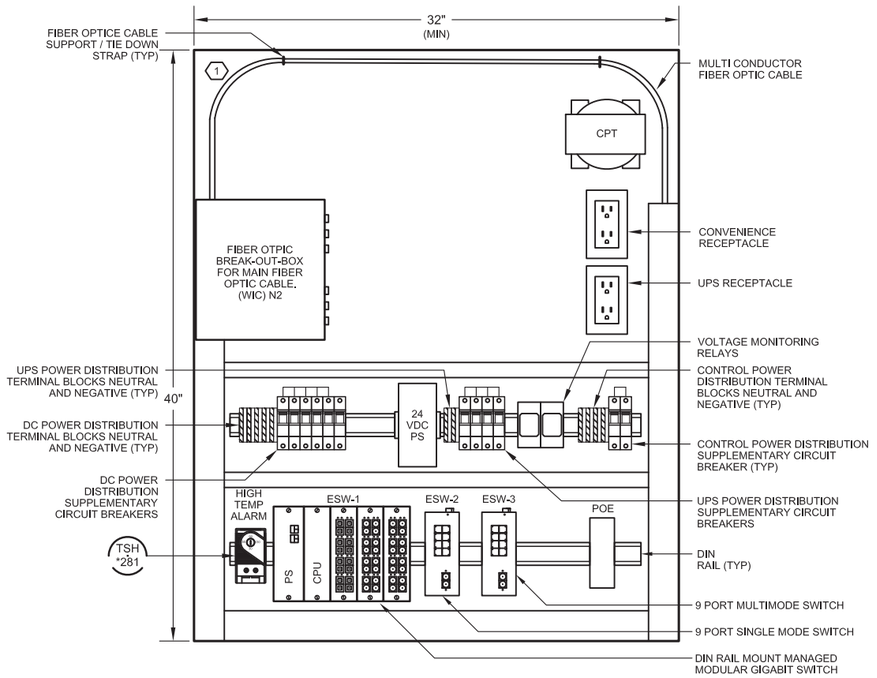
1" = 10"

BASE PLAN

1" = 10"

PANEL FABRICATION METHODS

1. NEMA 3R, DUAL ACCESS.
2. OUTER DOOR SEALED WITH RUBBERIZED FOAM GASKET.
3. PANEL SHALL BE FABRICATED FROM PAINT BOND GALVANEAL SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS SHALL HAVE CONTINUOUS WELD GROUND SMOOTH.
6. DOOR TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCH.
7. DOOR HINGES AND PINS SHALL BE CONTINUOUS, HEAVY DUTY.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE MACHINE THREAD INTO TAPPED BACKPAN.
10. EXTERIOR PANEL COLOR: ANSI 61 GRAY.
11. MOUNTING PAN AND INTERIOR DOOR COLOR: WHITE.
12. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
13. ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
14. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
15. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH EQUIPMENT.
16. HOFFMAN A903624FSDA FREE-STANDING, DUAL ACCESS OR EQUAL.



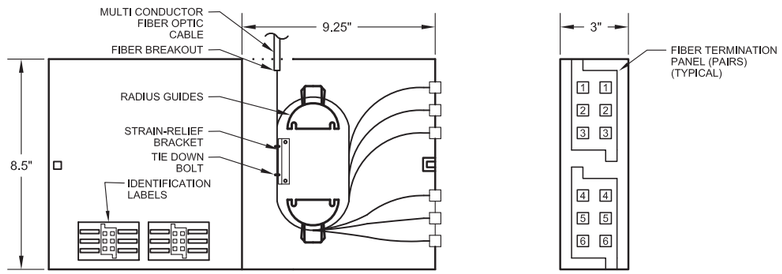
BACKPAN LAYOUT

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.

DRAWING REFERENCED NOTES:

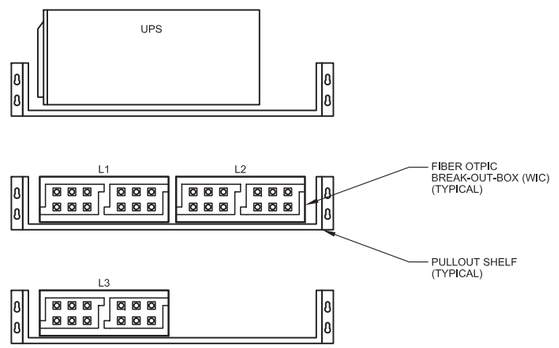
1. AIR CONDITIONING SHALL BE RITTAL 3305114 OR EQUAL.
2. AIR CONDITIONING INLET AND EXHAUST OPENING LOCATIONS PER MANUFACTURER.



DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION



SHELF LAYOUT

1" = 10"

TYPICAL FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY: TPF

SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

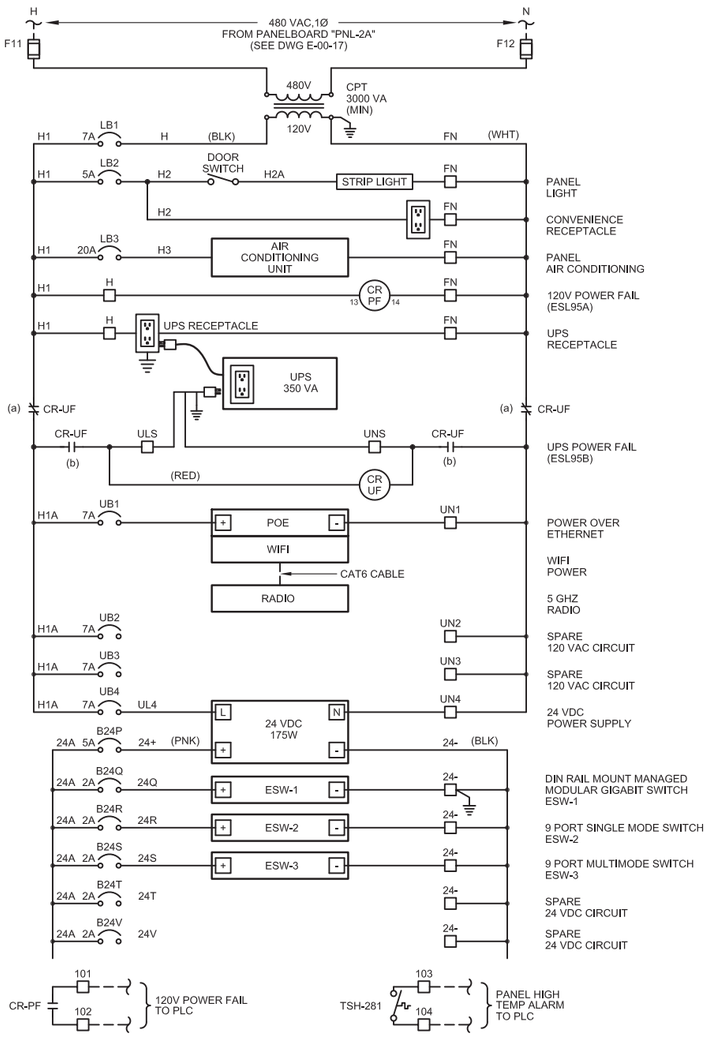
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL COMMUNICATION PANEL 2 ELEVATION & LAYOUT
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-26	REV 1

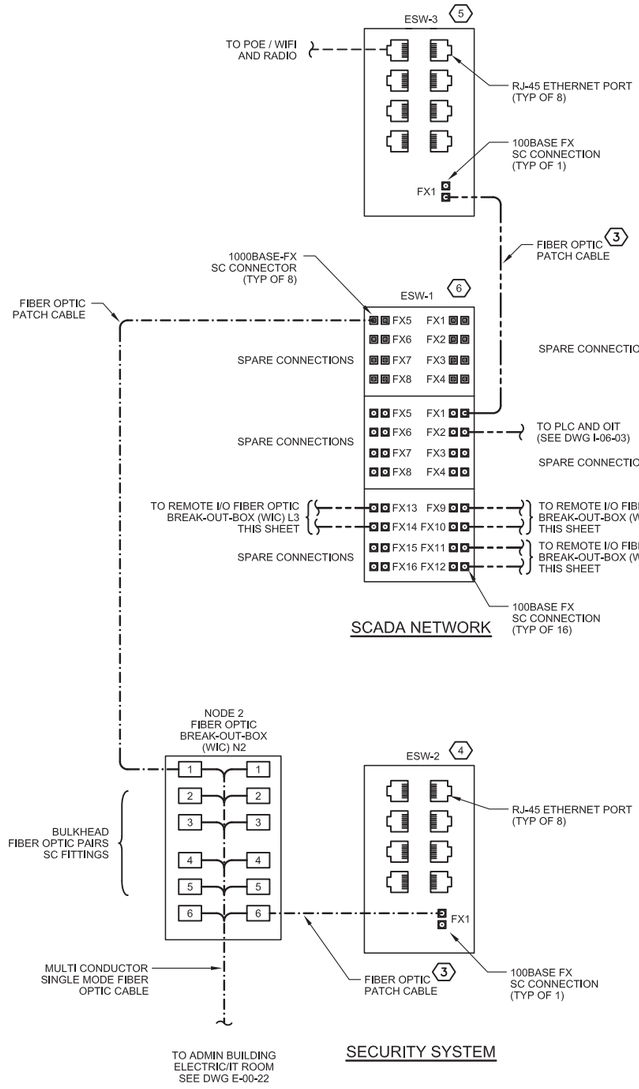
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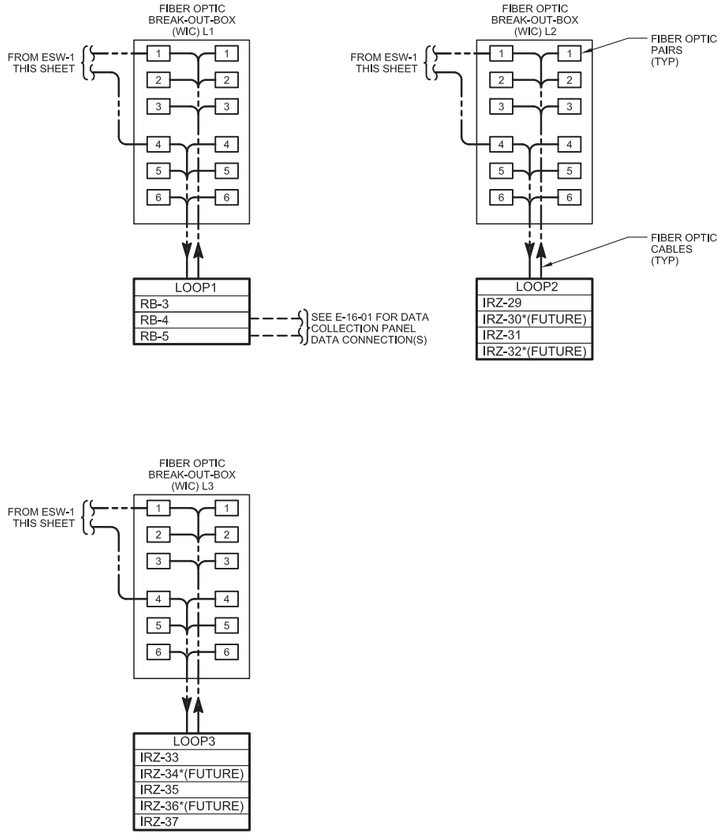
COMMUNICATIONS PANEL POWER DISTRIBUTION DIAGRAM



SCADA NETWORK

SECURITY SYSTEM

FIBER OPTIC SWITCH DIAGRAM



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

LEGEND	
SYMBOL	DESCRIPTION
——·——·——	SINGLE MODE FIBER OPTIC CABLE
————	MULTI-MODE FIBER OPTIC CABLE
- - - - - -	10/100BASE-TX CAT5E CABLE

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.
2. LC CONNECTOR FOR SINGLEMODE FIBER.
3. PATCH CABLE SHALL BE COORDINATED WITH FIBER CONNECTOR AND ETHERNET SWITCH.
4. SWITCH MODEL NTRON 309FXE-N-SC-15 OR EQUIVALENT.
5. SWITCH MODEL NTRON 309FX-N-SC OR EQUIVALENT.
6. SWITCH MODEL NTRON NT24k-DR24 WITH (2)NT24k-FX8-SC AND (1) NT24K-GXE8-SC-10 OR EQUIVALENT.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

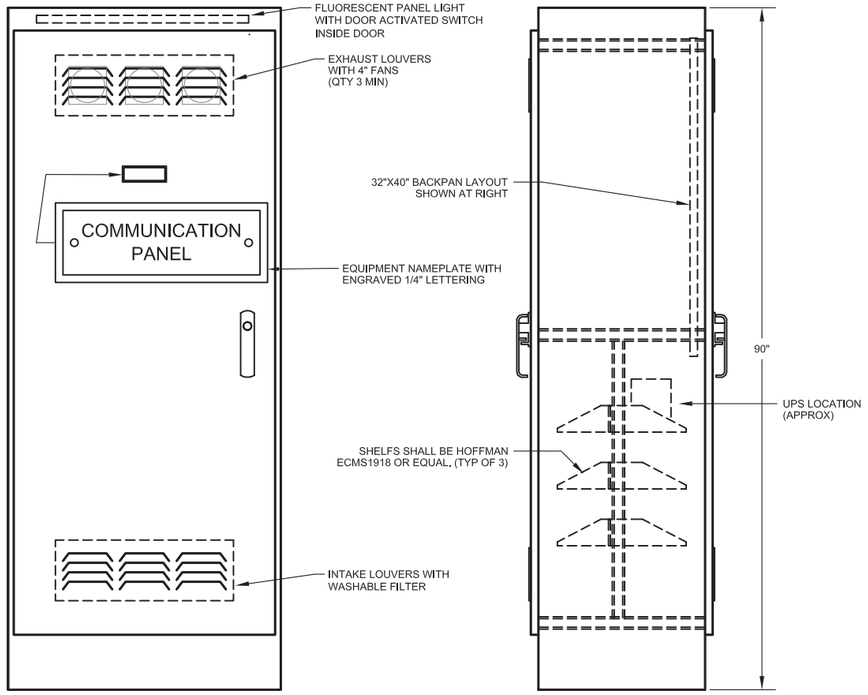
REVISIONS

APPROVED BY	
SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL
COMMUNICATION PANEL 2
SCHEMATIC
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-27	REV 1

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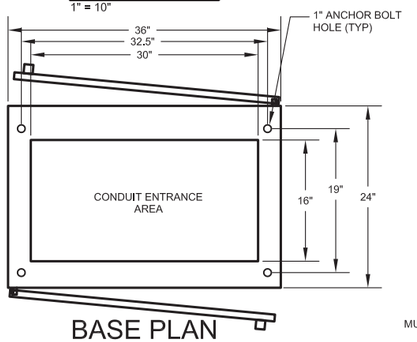


FRONT ELEVATION

SIDE ELEVATION

ELEVATION

1" = 10"

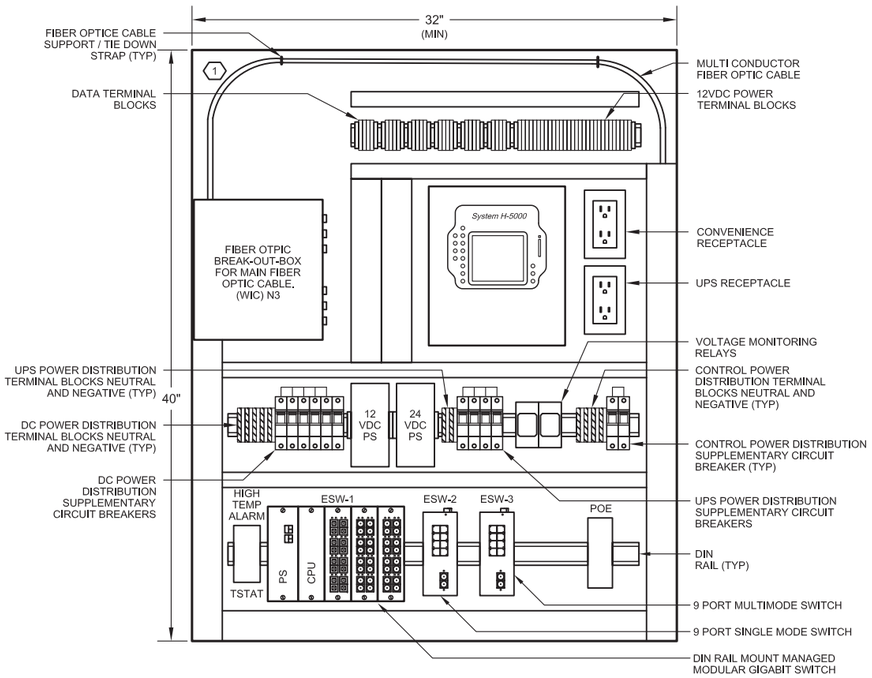


BASE PLAN

1" = 10"

PANEL FABRICATION METHODS

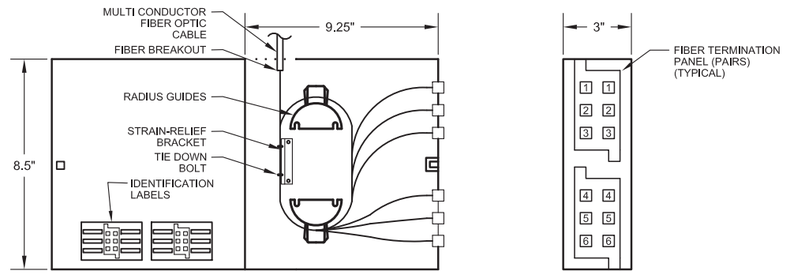
1. NEMA 3R, DUAL ACCESS.
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3. PANEL SHALL BE FABRICATED FROM PAINT BOND GALVANEAL SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS SHALL HAVE CONTINUOUS WELD GROUND SMOOTH.
6. DOOR TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCH.
7. DOOR HINGES AND PINS SHALL BE CONTINUOUS, HEAVY DUTY.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE MACHINE THREAD INTO TAPPED BACKPAN.
10. EXTERIOR PANEL COLOR: ANSI 61 GRAY.
11. MOUNTING PAN AND INTERIOR DOOR COLOR: WHITE.
12. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
13. ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
14. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
15. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH EQUIPMENT.
16. HOFFMAN A903624FSDA FREE-STANDING, DUAL ACCESS OR EQUAL.



BACKPAN LAYOUT

DRAWING REFERENCED NOTES:

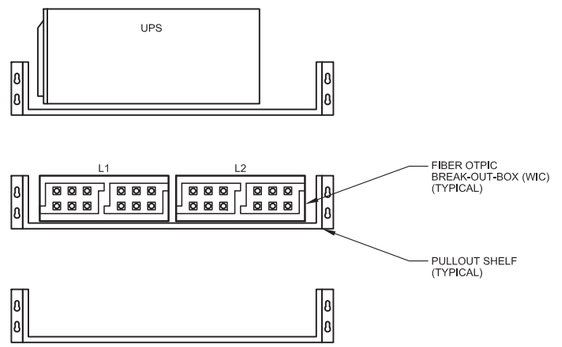
1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.



DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION



SHELF LAYOUT

1" = 10"

TYPICAL FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

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CONSTRUCTION

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13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
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WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

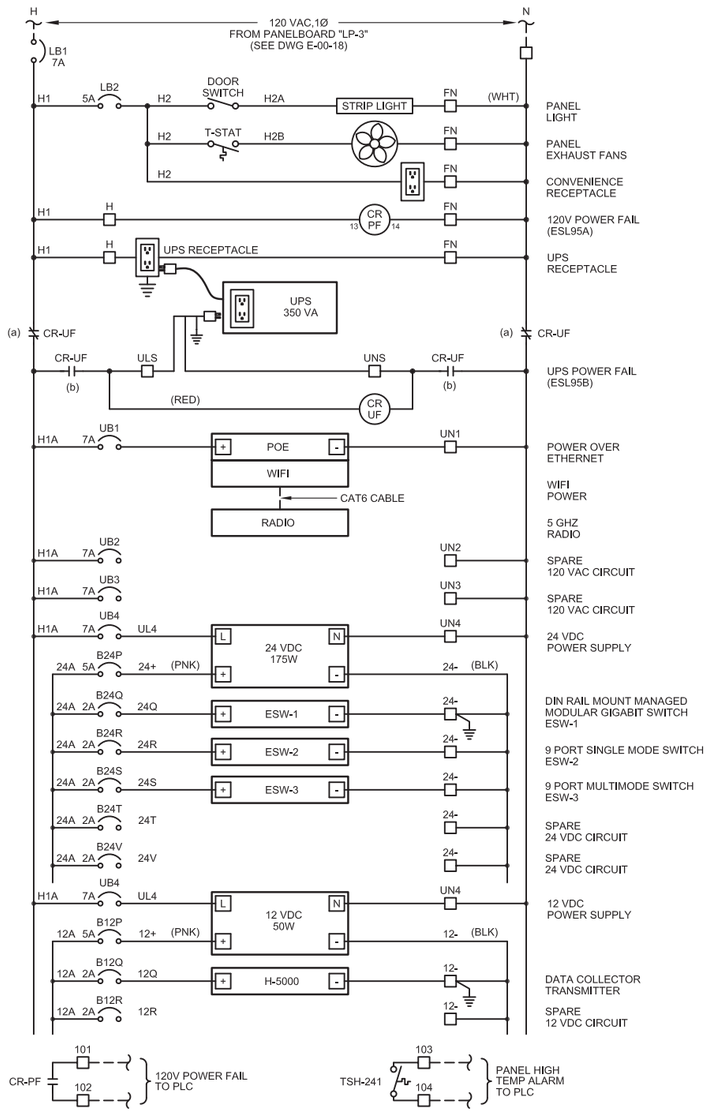
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

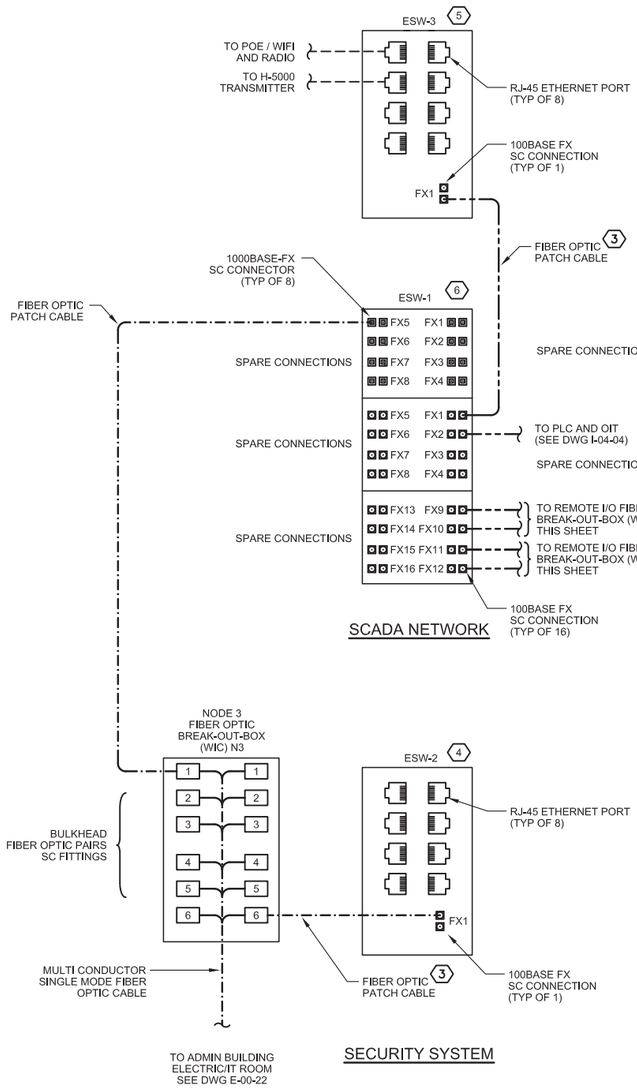
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL
COMMUNICATION PANEL 3
ELEVATION & LAYOUT
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-28	REV 1

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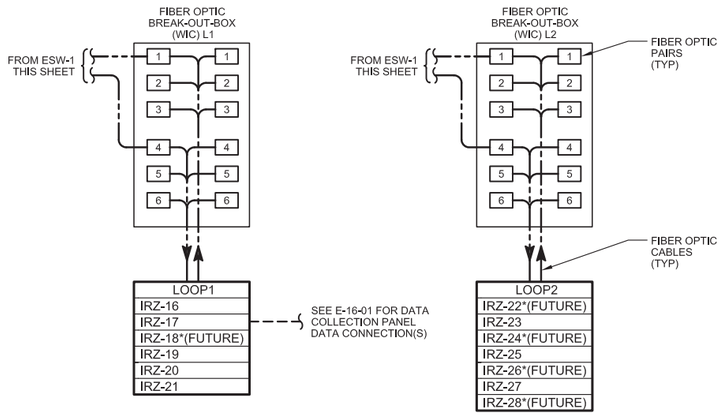


COMMUNICATIONS PANEL POWER DISTRIBUTION DIAGRAM



FIBER OPTIC SWITCH DIAGRAM

LEGEND	
SYMBOL	DESCRIPTION
——·——	SINGLE MODE FIBER OPTIC CABLE
———	MULTI-MODE FIBER OPTIC CABLE
- - - - -	10/100BASE-TX CAT5E CABLE



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.
2. LC CONNECTOR FOR SINGLEMODE FIBER.
3. PATCH CABLE SHALL BE COORDINATED WITH FIBER CONNECTOR AND ETHERNET SWITCH.
4. SWITCH MODEL NTRON 309FXE-N-SC-15 OR EQUIVALENT.
5. SWITCH MODEL NTRON 309FX-N-SC OR EQUIVALENT.
6. SWITCH MODEL NTRON NT24k-DR24 WITH (2)NT24k-FX8-SC AND (1) NT24K-GXE8-SC-10 OR EQUIVALENT.

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NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

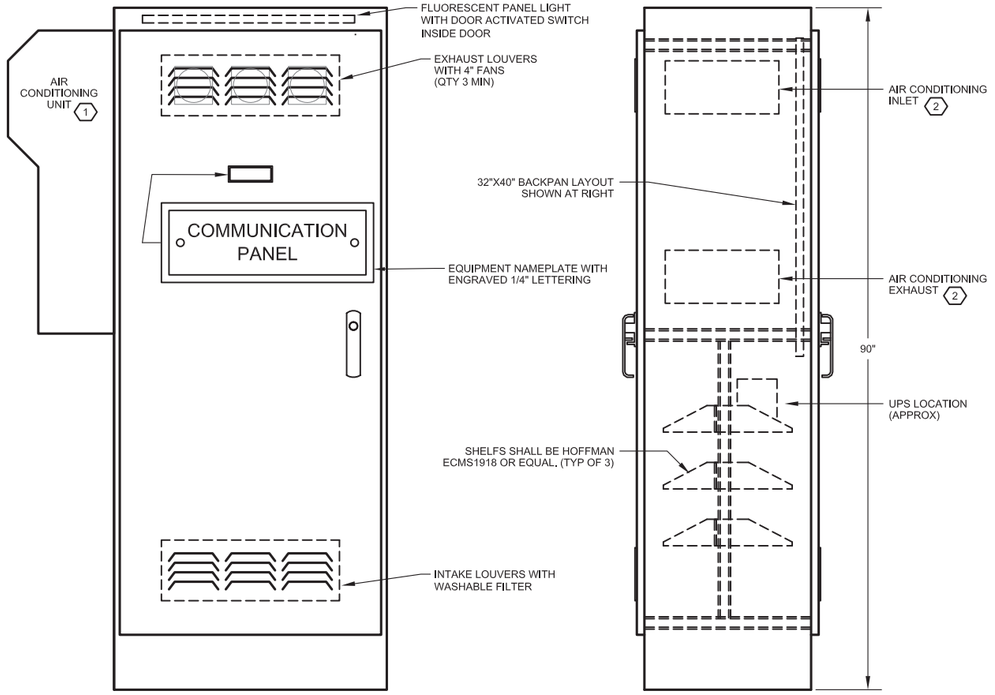
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL COMMUNICATION PANEL 3 SCHEMATIC
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-29	REV 1

PLOT DATE: Aug 26, 2014 PLOT TIME: 10:39:45am
FILENAME: FE-Exxx-0029AD.dwg
N1808



FRONT ELEVATION

SIDE ELEVATION

ELEVATION

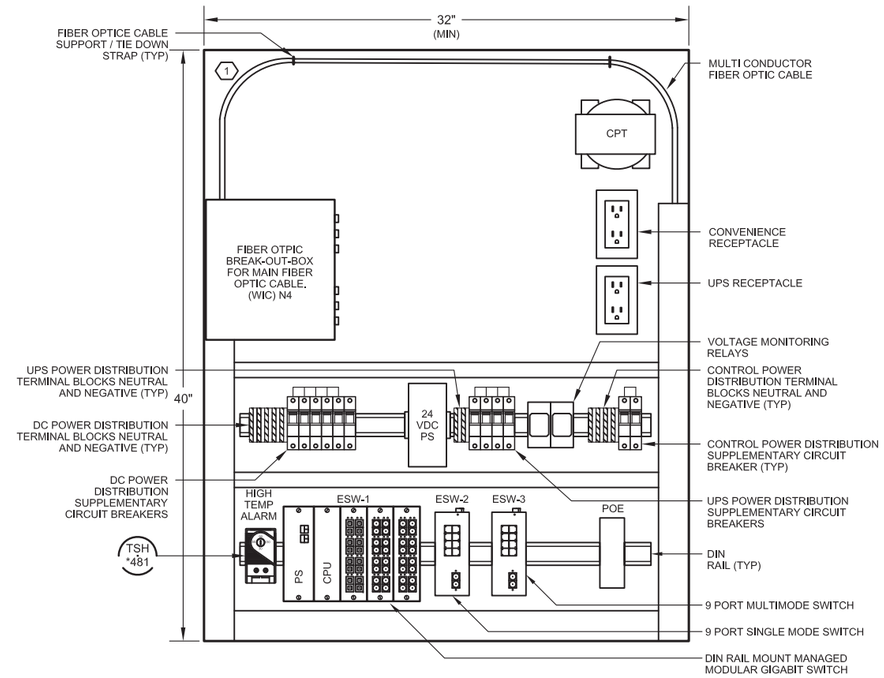
1" = 10"

BASE PLAN

1" = 10"

PANEL FABRICATION METHODS

1. NEMA 3R, DUAL ACCESS.
2. OUTER DOOR SEALED WITH RUBBERIZED FOAM GASKET.
3. PANEL SHALL BE FABRICATED FROM PAINT BOND GALVANEAL SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS SHALL HAVE CONTINUOUS WELD GROUND SMOOTH.
6. DOOR TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCH.
7. DOOR HINGES AND PINS SHALL BE CONTINUOUS, HEAVY DUTY.
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10. EXTERIOR PANEL COLOR: ANSI 61 GRAY.
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15. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH EQUIPMENT.
16. HOFFMAN A903624FSDA FREE-STANDING, DUAL ACCESS OR EQUAL.



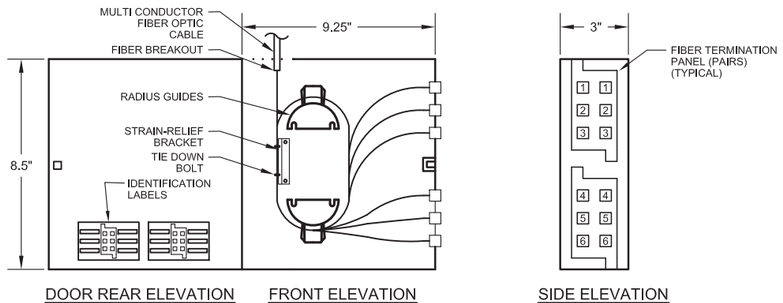
BACKPAN LAYOUT

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.

DRAWING REFERENCED NOTES:

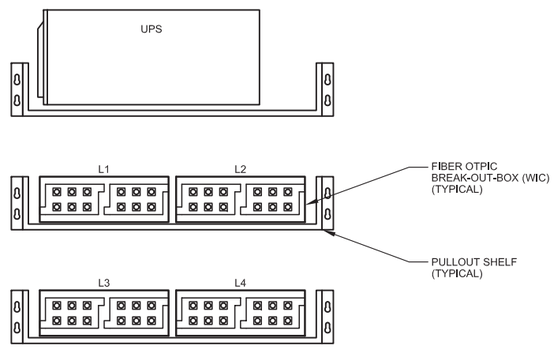
1. AIR CONDITIONING SHALL BE RITTAL 3305114 OR EQUAL.
2. AIR CONDITIONING INLET AND EXHAUST OPENING LOCATIONS PER MANUFACTURER.



DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION



SHELF LAYOUT

1" = 10"

TYPICAL FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

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FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY: TPF

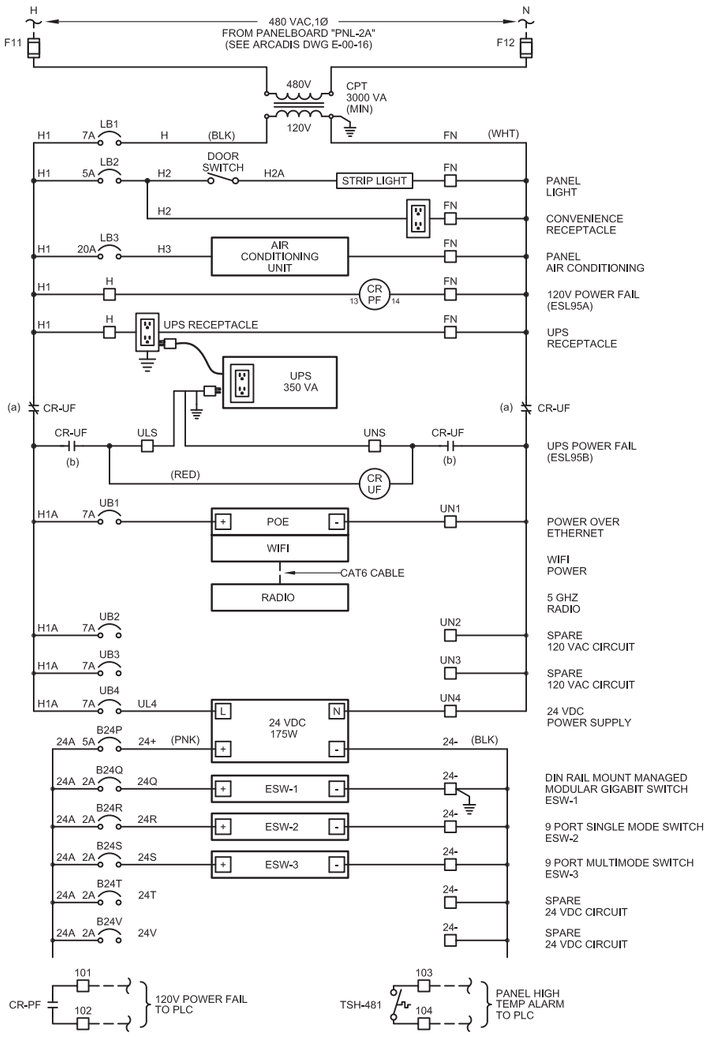
SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL COMMUNICATION PANEL 4 ELEVATION & LAYOUT
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

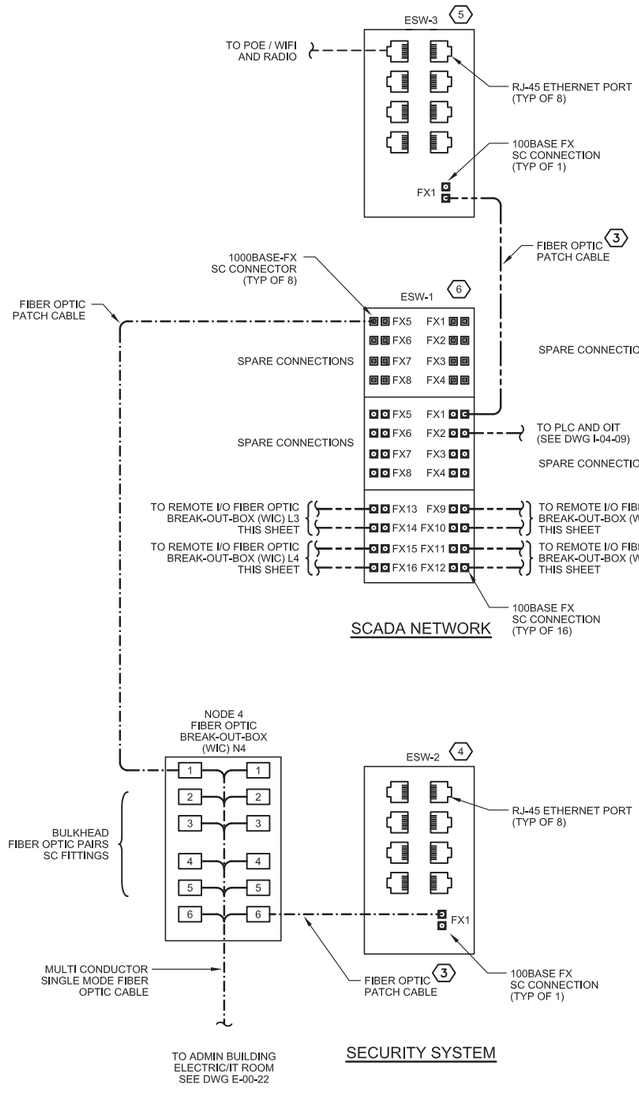
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BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-30	REV 1

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N1808



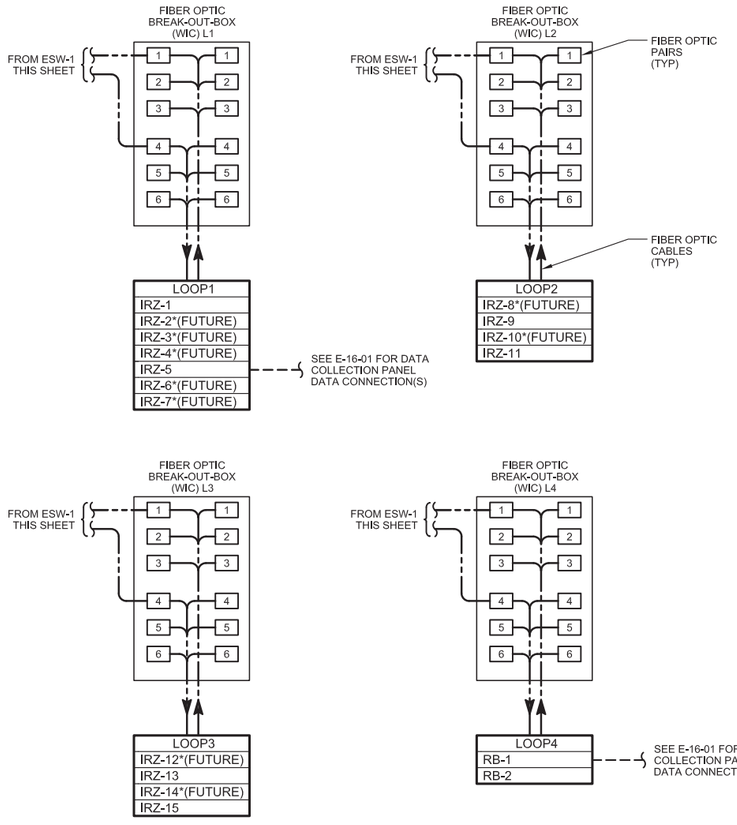
COMMUNICATIONS PANEL POWER DISTRIBUTION DIAGRAM



SCADA NETWORK

SECURITY SYSTEM

FIBER OPTIC SWITCH DIAGRAM



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

LEGEND	
SYMBOL	DESCRIPTION
——·——	SINGLE MODE FIBER OPTIC CABLE
———	MULTI-MODE FIBER OPTIC CABLE
- - - - -	10/100BASE-TX CAT5E CABLE

DRAWING REFERENCED NOTES:

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2. LC CONNECTOR FOR SINGLEMODE FIBER.
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6. SWITCH MODEL NTRON NT24k-DR24 WITH (2)NT24k-FX8-SC AND (1) NT24K-GXE8-SC-10 OR EQUIVALENT.

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CONSTRUCTION

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13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
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WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

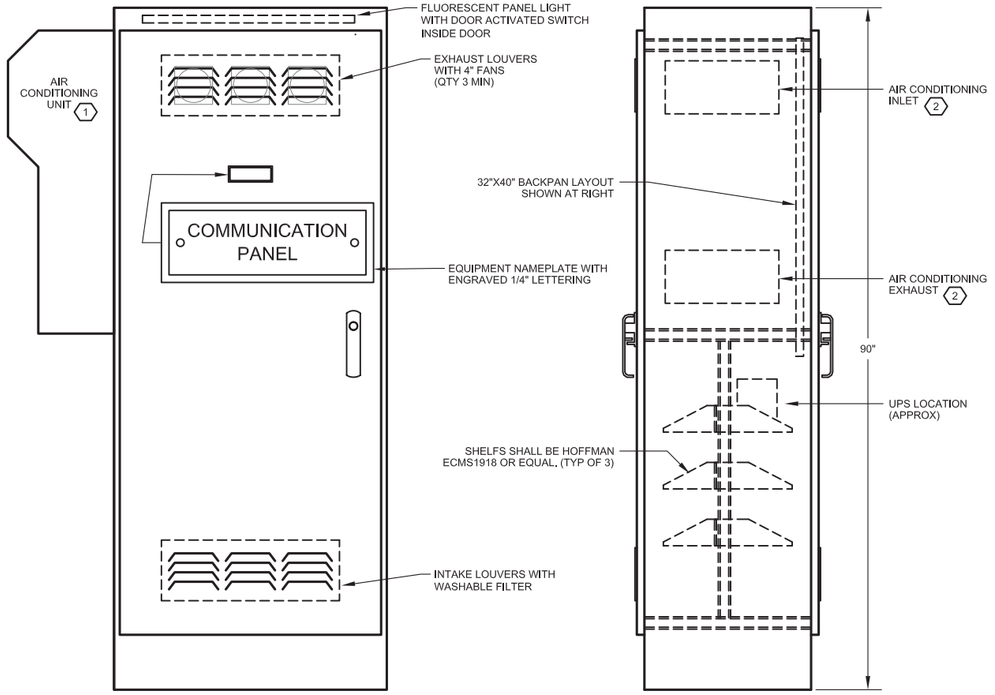
APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL COMMUNICATION PANEL 4 SCHEMATIC
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-31	REV 1

FILENAME: FE-E-xxx-0031AD.dwg
PLOT DATE: Aug 26, 2014
PLOT TIME: 10:41:03am

N1808



FRONT ELEVATION

SIDE ELEVATION

ELEVATION

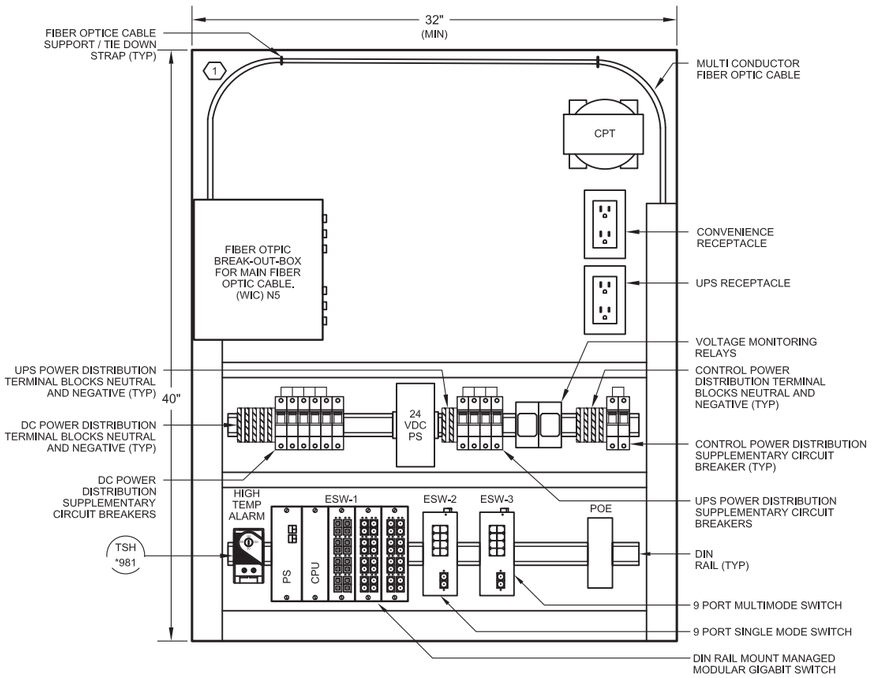
1" = 10"

BASE PLAN

1" = 10"

PANEL FABRICATION METHODS

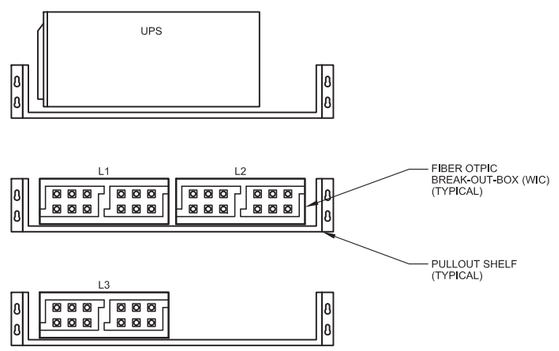
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16. HOFFMAN A903624FSDA FREE-STANDING, DUAL ACCESS OR EQUAL.



BACKPAN LAYOUT

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.

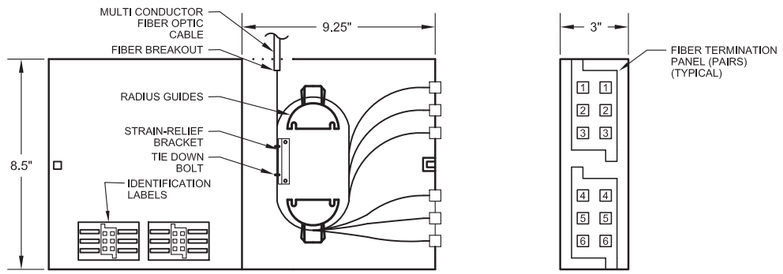


SHELF LAYOUT

1" = 10"

DRAWING REFERENCED NOTES:

1. AIR CONDITIONING SHALL BE RITTAL 3305114 OR EQUAL.
2. AIR CONDITIONING INLET AND EXHAUST OPENING LOCATIONS PER MANUFACTURER.



DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION

TYPICAL FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

DRAFT
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CONSTRUCTION

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CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

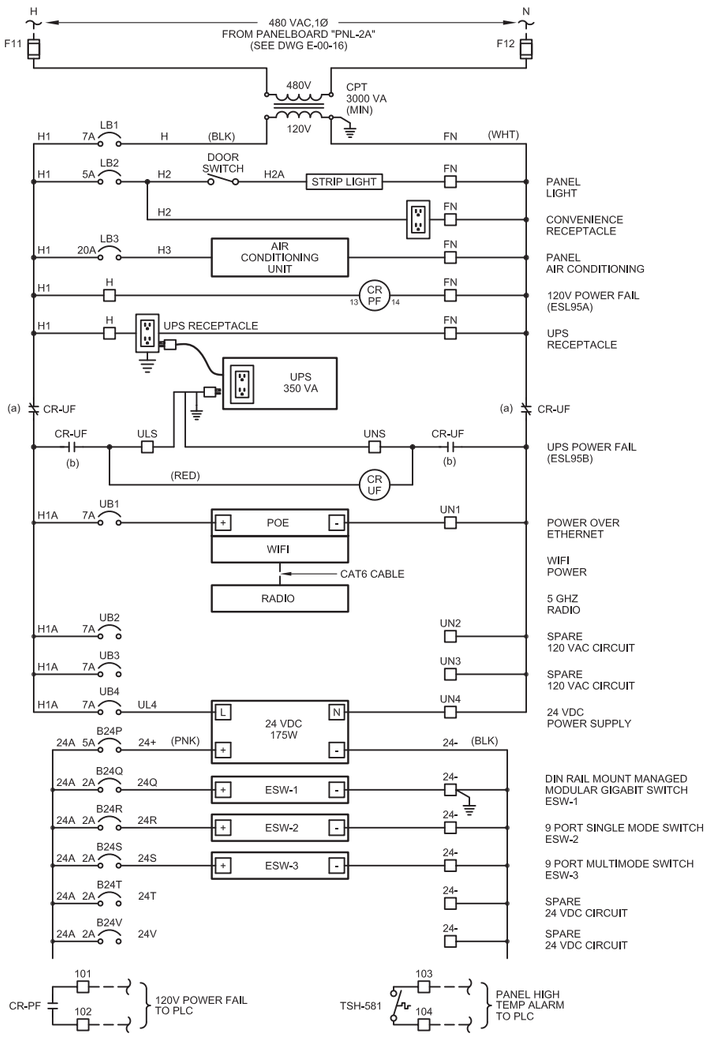
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

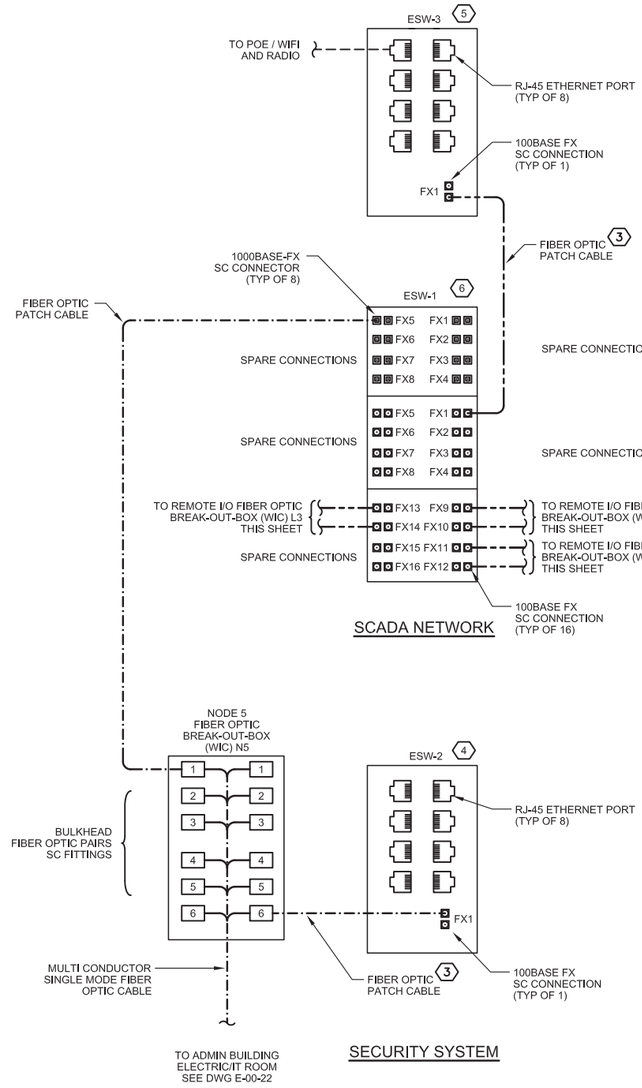
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL
COMMUNICATION PANEL 5
ELEVATION & LAYOUT
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

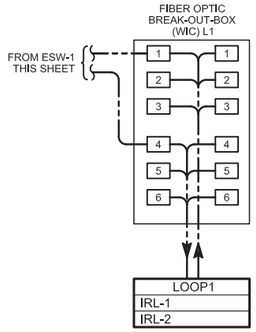
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-32	REV 1

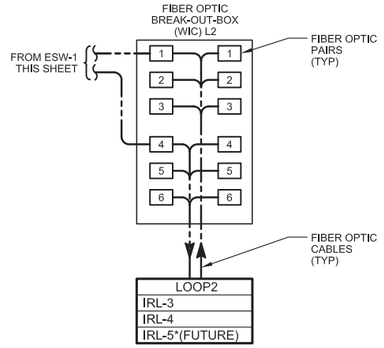
PLOT DATE: Aug 25, 2014 PLOT TIME: 2:51:19pm
FILENAME: FE-E-xxx-0032A0.dwg

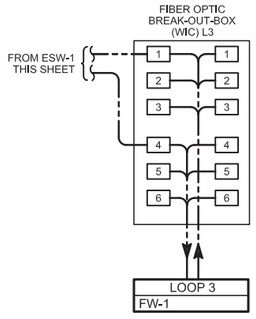


COMMUNICATIONS PANEL POWER DISTRIBUTION DIAGRAM









LEGEND	
SYMBOL	DESCRIPTION
——·——·——	SINGLE MODE FIBER OPTIC CABLE
————	MULTI-MODE FIBER OPTIC CABLE
- - - - - -	10/100BASE-TX CAT5E CABLE

FIBER OPTIC SWITCH DIAGRAM

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.
2. LC CONNECTOR FOR SINGLEMODE FIBER.
3. PATCH CABLE SHALL BE COORDINATED WITH FIBER CONNECTOR AND ETHERNET SWITCH.
4. SWITCH MODEL NTRON 309FXE-N-SC-15 OR EQUIVALENT.
5. SWITCH MODEL NTRON 309FX-N-SC OR EQUIVALENT.
6. SWITCH MODEL NTRON NT24k-DR24 WITH (2)NT24k-FX8-SC AND (1) NT24K-GXE8-SC-10 OR EQUIVALENT.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY	
SO	
TPF	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL
COMMUNICATION PANEL 5
SCHEMATIC
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-33	REV 1

PLOT DATE: Aug 25, 2014 PLOT TIME: 2:51:27pm
FILENAME: FE-E-xxx-0033AD.dwg

SUMMARY		
TRANSFORMER	kW	kW-hr/yr
REMEDY MCC	202.6	322667.8
TRANSFORMER 001	318.5	1450056.5
TRANSFORMER 002	136.3	654206.5
TRANSFORMER 003	166.5	585348.9
TRANSFORMER 004	266.4	1040862.4
TRANSFORMER 005	168.4	30579.6
SUBTOTAL	1258.6	4626418.5
⟨2⟩ ELECTRICAL INEFFICIENCIES	0.85	0.85
TOTAL	1480.7	5442845.3

REMEDY MCC, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
TCS01-P442	10.00	9.00	3.0%	6.71	1763.76
TCS01-P443	10.00	9.00	3.0%	6.71	1763.76
TCS02-P442	10.00	9.00	3.0%	6.71	1763.76
TCS02-P443	10.00	9.00	3.0%	6.71	1763.76
FW02-PMP01	30.00	27.00	3.0%	20.13	5291.28
SECONDARY CONTAINMENT PUMP 1	20.00	18.00	0.0%	13.42	0.00
SECONDARY CONTAINMENT PUMP 2	20.00	18.00	0.0%	13.42	0.00
INFLUENT TANK RECIRC PUMPS 1	30.00	27.00	20.0%	20.13	35275.17
INFLUENT TANK RECIRC PUMPS 2	30.00	27.00	20.0%	20.13	35275.17
INFLUENT TANK RECIRC PUMPS 3	30.00	27.00	20.0%	20.13	35275.17
INFLUENT TANK RECIRC PUMPS 4	30.00	27.00	20.0%	20.13	35275.17
CONDITIONED WATER TRANSFER PUMP 1	1.50	0.90	30.0%	0.67	1763.76
CONDITIONED WATER TRANSFER PUMP 2	1.50	0.90	30.0%	0.67	1763.76
FILTER FEED PUMP 1 – A SIDE	1.50	1.35	10.0%	1.01	881.88
FILTER FEED PUMP 2 – A SIDE	1.50	1.35	10.0%	1.01	881.88
FILTER FEED PUMP 1 – B SIDE	3.00	2.70	10.0%	2.01	1763.76
FILTER FEED PUMP 2 – B SIDE	3.00	2.70	10.0%	2.01	1763.76
TCS TRUCK FILL PUMP	7.50	6.75	5.0%	5.03	2204.70
AIR COMPRESSOR	25.00	22.50	20.0%	16.78	29395.97
SEAL WATER PUMP	1.50	1.35	50.0%	1.01	4409.40
HVAC	–	–	80.0%	2.00	14016.00
HVAC	–	–	25.0%	2.00	4380.00
HVAC	–	–	80.0%	2.00	14016.00
HVAC	–	–	25.0%	2.00	4380.00
MCC TRANSFORMER	–	–	100.0%	10.00	87600.00
			SUBTOTAL	202.6	322667.8

XFMR 001, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
TWB01-P441	3.00	0.90	100.0%	0.67	5900.88
TWB02-P441	3.00	0.90	100.0%	0.67	5900.88
TWB03-P441 [FUTURE PROVISIONAL]	3.00	0.90	0.0%	0.67	0.00
TWB04-P441 [FUTURE PROVISIONAL]	3.00	0.90	0.0%	0.67	0.00
TWB05-P441 [FUTURE PROVISIONAL]	0.75	0.90	0.0%	0.67	0.00
ER01-P440	0.50	0.90	50.0%	0.67	2950.44
ER02-P440	0.50	0.90	50.0%	0.67	2950.44
ER03-P440	0.50	0.90	50.0%	0.67	2950.44
ER04-P440	0.50	0.90	50.0%	0.67	2950.44
ER05-P440 [FUTURE PROVISIONAL]	0.50	0.90	0.0%	0.67	0.00
ER06-P440	1.00	0.90	100.0%	0.67	5900.88
IRZ39-P543	5.00	2.60	0.3%	1.94	50.41
IRZ38-P543 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ40-P540 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
REMEDY OPERATIONS BUILIDING PANEL "PP-OP"	–	–	50.0%	100.00	438000.00
CONSTRUCTION TRAILER TRANSFORMER	–	–	50.0%	100.00	438000.00
CARBON AMENDMENT PANEL PNL-1A	–	–	80.0%	37.00	259296.00
			SUBTOTAL:	318.5	1450056.5

XFMR 002, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
RB03-P640	30.00	27.00	100.0%	20.13	176375.84
RB04-P640	30.00	27.00	100.0%	20.13	176375.84
RB05-P640	30.00	27.00	100.0%	20.13	176375.84
RB06-P640	30.00	27.00	0.0%	20.13	0.00
RB07-P640	30.00	27.00	0.0%	20.13	0.00
IRZ29-P544	5.00	2.60	100.0%	1.94	16984.34
IRZ29-P545	5.00	2.60	100.0%	1.94	16984.34
IRZ31-P544	5.00	2.60	100.0%	1.94	16984.34
IRZ31-P545	5.00	2.60	100.0%	1.94	16984.34
IRZ33-P544	5.00	2.60	0.3%	1.94	50.41
IRZ33-P545	5.00	2.60	0.3%	1.94	50.41
IRZ35-P543	5.00	2.60	0.3%	1.94	50.41
IRZ37-P543	5.00	2.60	0.3%	1.94	50.41
IRZ30-P544 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ30-P545 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ32-P544 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ32-P545 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ34-P544 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ34-P545 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ36-P543 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
WELLS CPT	–	–	100.0%	6.50	56940.00
			SUBTOTAL	136.3	654206.5

XFMR 003, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
IRZ16-P546	5.00	3.27	100.0%	2.44	21361.07
IRZ16-P547	5.00	3.27	100.0%	2.44	21361.07
IRZ16-P548	5.00	3.27	100.0%	2.44	21361.07
IRZ16-P549	5.00	3.27	100.0%	2.44	21361.07
IRZ17-P546	5.00	3.27	0.0%	2.44	0.00
IRZ17-P547	5.00	3.27	0.0%	2.44	0.00
IRZ17-P548	5.00	3.27	0.0%	2.44	0.00
IRZ17-P549	5.00	3.27	0.0%	2.44	0.00
IRZ19-P546	5.00	3.27	0.0%	2.44	0.00
IRZ19-P547	5.00	3.27	0.0%	2.44	0.00
IRZ19-P548	5.00	3.27	0.0%	2.44	0.00
IRZ19-P549	5.00	3.27	0.0%	2.44	0.00
IRZ20-P546	5.00	3.27	0.0%	2.44	0.00
IRZ20-P547	5.00	3.27	0.0%	2.44	0.00
IRZ20-P548	5.00	3.27	0.0%	2.44	0.00
IRZ20-P549	5.00	3.27	0.0%	2.44	0.00
IRZ21-P546	5.00	3.27	0.0%	2.44	0.00
IRZ21-P547	5.00	3.27	0.0%	2.44	0.00
IRZ21-P548	5.00	3.27	0.0%	2.44	0.00
IRZ21-P549	5.00	3.27	0.0%	2.44	0.00
IRZ23-P540	20.00	19.20	100.0%	14.32	125422.82
IRZ25-P544	5.00	2.60	0.0%	1.94	0.00
IRZ25-P545	5.00	2.60	0.0%	1.94	0.00
IRZ27-P544	5.00	2.60	0.0%	1.94	0.00
IRZ27-P545	5.00	2.60	0.0%	1.94	0.00
IRZ18-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ18-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ18-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ18-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ22-P546 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ22-P547 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ22-P548 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ22-P549 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ24-P544 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ24-P545 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ26-P544 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ26-P545 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ28-P544 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ28-P545 [FUTURE PROVISIONAL]	5.00	2.60	0.0%	1.94	0.00
IRZ00-P740 (MW-20 BENCH)	3.00	2.60	100.0%	1.94	16984.34
IRZ00-P741 (MW-20 BENCH)	3.00	2.60	100.0%	1.94	16984.34
IRZ00-P742 (MW-20 BENCH)	3.00	2.60	100.0%	1.94	16984.34
IRZ00-P743 (MW-20 BENCH)	3.00	2.60	0.0%	1.94	0.00
IRZ00-P744 (MW-20 BENCH)	15.00	13.70	100.0%	10.22	89494.41
IRZ00-P745 (MW-20 BENCH)	20.00	15.60	0.0%	11.63	0.00
IRZ00-P746 (MW-20 BENCH)	0.50	13.70	100.0%	10.22	89494.41
IRZ00-P747 (MW-20 BENCH)	0.50	13.70	0.0%	10.22	0.00
WELLS CPT	–	–	100.0%	16.50	144540.00
			SUBTOTAL	166.5	585348.9

XFMR 004, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
RB01-P640	30.00	27.00	100.0%	20.13	176375.84
RB02-P640	30.00	27.00	100.0%	20.13	176375.84
RB08-P640	30.00	27.00	0.0%	20.13	0.00
RB09-P640	30.00	27.00	0.0%	20.13	0.00
IRZ01-P541	15.00	13.70	100.0%	10.22	89494.41
IRZ01-P542	15.00	13.70	100.0%	10.22	89494.41
IRZ05-P541	15.00	13.70	100.0%	10.22	89494.41
IRZ05-P542	15.00	13.70	100.0%	10.22	89494.41
IRZ09-P541	15.00	13.70	100.0%	10.22	89494.41
IRZ09-P542	15.00	13.70	100.0%	10.22	89494.41
IRZ11-P546	5.00	3.27	100.0%	2.44	21361.07
IRZ11-P547	5.00	3.27	100.0%	2.44	21361.07
IRZ11-P548	5.00	3.27	100.0%	2.44	21361.07
IRZ11-P549	5.00	3.27	100.0%	2.44	21361.07
IRZ13-P546	5.00	3.27	0.0%	2.44	0.00
IRZ13-P547	5.00	3.27	0.0%	2.44	0.00
IRZ13-P548	5.00	3.27	0.0%	2.44	0.00
IRZ13-P549	5.00	3.27	0.0%	2.44	0.00
IRZ15-P546	5.00	3.27	0.0%	2.44	0.00
IRZ15-P547	5.00	3.27	0.0%	2.44	0.00
IRZ15-P548	5.00	3.27	0.0%	2.44	0.00
IRZ15-P549	5.00	3.27	0.0%	2.44	0.00
IRZ02-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ02-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ02-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ02-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ03-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ03-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ03-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ03-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ04-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ04-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ04-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ04-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ06-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ06-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ06-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ06-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ07-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ07-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ07-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ07-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ08-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ08-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ08-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ08-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ10-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ10-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ10-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ10-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ12-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ12-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ12-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ12-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ14-P546 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ14-P547 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ14-P548 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
IRZ14-P549 [FUTURE PROVISIONAL]	5.00	3.27	0.0%	2.44	0.00
WELLS CPT	–	–	100.0%	7.50	65700.00
			SUBTOTAL	266.4	1040862.4

XFMR 05, ESTIMATED LOAD SCHEDULE

LOAD DESCIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
IRL01-P641	30.00	29.27	0.3%	21.83	567.50
IRL02-P641	30.00	29.99	0.3%	22.36	581.46
IRL03-P641A	30.00	29.99	0.3%	22.36	581.46
IRL03-P641B	30.00	29.99	0.3%	22.36	581.46
IRL04-P641A	40.00	34.56	0.3%	25.77	670.07
IRL04-P641B	40.00	34.56	0.3%	25.77	670.07
IRL05-P641 [FUTURE PROVISIONAL]	30.00	32.00	0.0%	23.86	0.00
IRL06-P641 [FUTURE PROVISIONAL]	40.00	37.80	0.0%	28.19	0.00
IRL07-P641 [FUTURE PROVISIONAL]	40.00	27.80	0.0%	20.73	0.00
FW01	40.00	33.40	0.3%	24.91	647.58
WELLS CPT	–	–	100.0%	3.00	26280.00
			SUBTOTAL	241.2	30579.6

DRAWING REFERENCED NOTES:

⟨1⟩ ENERGY USAGE CALCULATIONS ONLY INCLUDE REMEDY PROJECT FACITLTIES USING POWER FROM FOSSIL FUEL SOURCES.

⟨2⟩ ELECTRICAL INEFFICIENCY IS SHOWN TO ACCOUNT FOR TRANSFORMER, MOTORS, WIRE AND OTHER ELECTRICAL EQUIPMENT INEFFICINECIES THAT ARE NOT ADDRESSED IN THE ENERGY USE CALCULATIONS.

ENERGY USE CALCULATIONS ⟨1⟩

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY		
	SO	
	SUPV	TPF
TPF	DSGN	MBY
	DWN	MBY, NC
	CHKD	MF
	OK	TPF
	DATE	
	SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ENERGY USE CALCULATIONS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
E-00-34 REV 1

PLOT TIME: 2:51:39pm
PLOT DATE: Aug 25, 2014
FILENAME: FE-E-XXX-0034AD.dwg

N1806

TOTAL REMEDY LOAD CALCULATIONS

LOAD DESCRIPTION	CONNECTED LOAD LOAD	QTY	TOTAL	MAXIMUM LOAD LOAD	QTY	TOTAL	NOMINAL LOAD LOAD	QTY	TOTAL	MINIMUM LOAD LOAD	QTY	TOTAL
REMEDY MCC	387.36 A	1	322044.5 VA	330.92 A	1	275120.3 VA	198.12 A	1	164712.4 VA	64.32 A	1	53473.2 VA
TRANSFORMER 001	151.24 A	1	125740.8 VA	156.28 A	1	129929.7 VA	118.56 A	1	98573.1 VA	104.50 A	1	86883.0 VA
TRANSFORMER 002	360.62 A	1	299810.2 VA	180.66 A	1	150194.2 VA	74.60 A	1	62025.2 VA	53.48 A	1	44466.4 VA
TRANSFORMER 003	450.20 A	1	374287.1 VA	120.53 A	1	100204.6 VA	92.35 A	1	76774.8 VA	48.13 A	1	40011.0 VA
TRANSFORMER 004	755.57 A	1	628171.5 VA	299.73 A	1	249193.2 VA	115.53 A	1	96048.1 VA	103.43 A	1	85988.3 VA
TRANSFORMER 005	522.53 A	1	434421.9 VA	127.37 A	1	105892.0 VA	98.06 A	1	81523.9 VA	9.26 A	1	7697.0 VA
TOTAL LOAD =	2627.52 A		2184475.9 VA	1215.48 A		1010534.0 VA	697.22 A		579657.5 VA	383.12 A		318518.8 VA
LOAD CORRECTION FACTORS												
LARGEST MOTOR LOAD x 25%:												
40 HP HP => 0.25 x 43230.0 VA =	13.00 A		10807.5 VA	13.00 A		10807.5 VA	13.00 A		10807.5 VA	13.00 A		10807.5 VA
1% SYSTEM LOSSES TOTAL x % =	26.28 A		21844.8 VA	12.15 A		10105.3 VA	6.97 A		5796.6 VA	3.83 A		3185.2 VA
25% BREAKER DERATING = TOTAL x % =	656.88 A		546119.0 VA	303.87 A		252633.5 VA	174.30 A		144914.4 VA	95.78 A		79629.7 VA
FOR CONTINUOUS LOADS NEC 210-20												
SERVICE SIZE (MIN) =	3323.67 A		2763247.1VA	1544.51A		1284080.4VA	891.50 A		741175.9VA	495.73 A		412141.2VA
MAIN BREAKER SIZE REQUIRED =				2000AMP								
480V, 3 PHASE, 4 WIRE												

LOAD CALCULATIONS - REMEDY WWTP MCC

LOAD DESCRIPTION	CONNECTED LOAD LOAD	QTY	TOTAL	MAXIMUM LOAD LOAD	QTY	TOTAL	NOMINAL LOAD LOAD	QTY	TOTAL	MINIMUM LOAD LOAD	QTY	TOTAL
10 HP TCS01-P442	7.60 A	1	6318.5 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA
10 HP TCS01-P443	7.60 A	1	6318.5 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA
10 HP TCS02-P442	7.60 A	1	6318.5 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA
10 HP TCS02-P443	7.60 A	1	6318.5 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA
30 HP FW02-PMP01	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA
20 HP SECONDARY CONTAINMENT PUMP 1	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA
20 HP SECONDARY CONTAINMENT PUMP 2	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA
30 HP INFLUENT TANK RECIRC PUMPS 1	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA
30 HP INFLUENT TANK RECIRC PUMPS 2	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA
30 HP INFLUENT TANK RECIRC PUMPS 3	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	40.00 A	0	0.0 VA
30 HP INFLUENT TANK RECIRC PUMPS 4	40.00 A	1	33255.4 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	40.00 A	0	0.0 VA
1.5 HP CONDITIONED WATER TRANSFER PUMP 1	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	0	0.0 VA
1.5 HP CONDITIONED WATER TRANSFER PUMP 2	3.00 A	1	2494.2 VA	3.00 A	0	0.0 VA	3.00 A	0	0.0 VA	3.00 A	0	0.0 VA
1.5 HP FILTER FEED PUMP 1 - A SIDE	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	0	0.0 VA
1.5 HP FILTER FEED PUMP 2 - A SIDE	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	0	0.0 VA	3.00 A	0	0.0 VA
3 HP FILTER FEED PUMP 1 - B SIDE	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA
3 HP FILTER FEED PUMP 2 - B SIDE	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA	4.80 A	0	0.0 VA
7.5 HP TCS TRUCK FILL PUMP	11.00 A	1	9145.2 VA	11.00 A	1	9145.2 VA	11.00 A	0	0.0 VA	11.00 A	0	0.0 VA
25 HP AIR COMPRESSOR	34.00 A	1	28267.1 VA	34.00 A	1	28267.1 VA	34.00 A	0	0.0 VA	34.00 A	0	0.0 VA
1.5 HP SEAL WATER PUMP	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	1	2494.2 VA	3.00 A	0	0.0 VA
75 KVA TRANSFORMER XFMR LP	30.86 A	1	25656.0 VA	7.82 A	1	6500.0 VA	7.82 A	1	6500.0 VA	7.82 A	1	6500.0 VA
TOTAL LOAD =	384.86 A		319966.1 VA	328.42 A		273041.8 VA	195.62 A		162634.0 VA	61.82 A		51394.8 VA
LOAD CORRECTION FACTORS												
30 HP HP => 0.25 x 8313.8 VA =	2.50 A		2078.5 VA	2.50 A		2078.5 VA	2.50 A		2078.5 VA	2.50 A		2078.5 VA
2% SYSTEM LOSSES TOTAL x % =	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA
0% BREAKER DERATING = TOTAL x % =	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA
FOR CONTINUOUS LOADS NEC 210-20												
SERVICE SIZE (MIN) =	387.36 A		322044.5VA	330.92 A		275120.3VA	198.12 A		164712.4VA	64.32 A		53473.2VA
MAIN BREAKER SIZE REQUIRED =	400 AMP											
480V, 3 PHASE, 4 WIRE												

NODE 1 LOAD CALCULATIONS

LOAD DESCRIPTION	CONNECTED LOAD LOAD	QTY	TOTAL	MAXIMUM LOAD LOAD	QTY	TOTAL	NOMINAL LOAD LOAD	QTY	TOTAL	MINIMUM LOAD LOAD	QTY	TOTAL
3 HP TWB01-P441	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA
3 HP TWB02-P441	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA
3 HP TWB03-P441 [FUTURE PROVISIONAL]	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA	4.80 A	0	0.0 VA	4.80 A	0	0.0 VA
3 HP TWB04-P441 [FUTURE PROVISIONAL]	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA	4.80 A	0	0.0 VA	4.80 A	0	0.0 VA
0.75 HP TWB05-P441 [FUTURE PROVISIONAL]	1.60 A	1	1330.2 VA	1.60 A	0	0.0 VA	1.60 A	0	0.0 VA	1.60 A	0	0.0 VA
0.5 HP ER01-P440	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA
0.5 HP ER02-P440	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA
0.5 HP ER03-P440	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA
0.5 HP ER04-P440	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA
0.5 HP ER05-P440 [FUTURE PROVISIONAL]	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	0	0.0 VA
1 HP ER06-P440	2.10 A	1	1745.9 VA	2.10 A	1	1745.9 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA
5 HP IRZ39-P543	7.60 A	1	6318.5 VA	7.60 A	1	6318.5 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA
5 HP IRZ38-P543 [FUTURE PROVISIONAL]	7.60 A	1	6318.5 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA
5 HP IRZ40-P540 [FUTURE PROVISIONAL]	7.60 A	1	6318.5 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA	7.60 A	0	0.0 VA
3 HP TCS00-P940	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA
3 HP TCS00-P941	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA
3 HP TCS00-P942	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA
3 HP TCS00-P943	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA
0.5 HP TCS00-P944	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	0	0.0 VA
0.5 HP TCS00-P945	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	1	914.5 VA	1.10 A	0	0.0 VA
100 KVA REMEDY OPERATIONS BUILIDING LIGHTING AND RECEPT	120.28 A	1	100000.0 VA	90.21 A	1	75000.0 VA	60.14 A	1	50000.0 VA	60.14 A	1	50000.0 VA
28 KW REMEDY OPERATIONS BUILIDNG HVAC	33.96 A	1	28235.0 VA	33.96 A	1	28235.0 VA	33.96 A	1	28235.0 VA	33.96 A	1	28235.0 VA
28 KW REMEDY OPERATIONS BUILIDNG HVAC	33.96 A	1	28235.0 VA	33.96 A	1	28235.0 VA	33.96 A	1	28235.0 VA	33.96 A	1	28235.0 VA
45 KVA TWB PROCESS LOADS	54.13 A	1	45000.0 VA	54.13 A	1	45000.0 VA	43.30 A	1	36000.0 VA	43.30 A	1	36000.0 VA
10 KVA WELLS CPT	12.03 A	1	10000.0 VA	12.03 A	1	10000.0 VA	7.22 A	1	6000.0 VA	7.22 A	1	6000.0 VA
1 KVA MCC CONTROLS	1.20 A	1	1000.0 VA	0.60 A	1	500.0 VA	0.60 A	1	500.0 VA	0.60 A	1	500.0 VA
TOTAL LOAD =	328.16 A		272828.5 VA	271.09 A		225380.0 VA	221.58 A		184220.7 VA	208.68 A		173495.8 VA
LOAD CORRECTION FACTORS												
LARGEST MOTOR LOAD x 25%:												
5 HP HP => 0.25 x 0.0 VA =	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA
9% SYSTEM LOSSES TOTAL x % =	29.53 A		24554.6 VA	24.40 A		20284.2 VA	19.94 A		16579.9 VA	18.78 A		15614.6 VA
0% BREAKER DERATING = TOTAL x % =	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA
FOR CONTINUOUS LOADS NEC 210-20												
SERVICE SIZE (MIN) =	357.70 A		297383.1VA	295.49 A		245664.2VA	241.53 A		200800.6VA	227.46 A		189110.5VA
SERVICE SIZE REQUIRED =				450 A								
480V, 3 PHASE, 4 WIRE												

NODE 5 LOAD CALCULATIONS

LOAD DESCRIPTION	CONNECTED LOAD LOAD	QTY	TOTAL	MAXIMUM LOAD LOAD	QTY	TOTAL	NOMINAL LOAD LOAD	QTY	TOTAL	MINIMUM LOAD LOAD	QTY	TOTAL
30 HP IRL01-P641	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	27.00 A	0	0.0 VA	27.00 A	0	0.0 VA
30 HP IRL02-P641	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	27.00 A	0	0.0 VA	27.00 A	0	0.0 VA
30 HP IRL03-P641A	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	27.00 A	0	0.0 VA	27.00 A	0	0.0 VA
30 HP IRL03-P641B	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	27.00 A	0	0.0 VA	27.00 A	0	0.0 VA
40 HP IRL04-P641A	52.00 A	1	43232.0 VA	52.00 A	1	43232.0 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA
40 HP IRL04-P641B	52.00 A	1	43232.0 VA	52.00 A	1	43232.0 VA	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA
30 HP IRL05-P641 [FUTURE PROVISIONAL]	40.00 A	1	33255.4 VA	40.00 A	0	0.0 VA	40.00 A	0	0.0 VA	40.00 A	0	0.0 VA
40 HP IRL06-P641 [FUTURE PROVISIONAL]	52.00 A	1	43232.0 VA	52.00 A	0	0.0 VA	52.00 A	0	0.0 VA	52.00 A	0	0.0 VA
40 HP IRL07-P641 [FUTURE PROVISIONAL]	52.00 A	1	43232.0 VA	52.00 A	0	0.0 VA	52.00 A	0	0.0 VA	52.00 A	0	0.0 VA
40 HP FW01	52.00 A	1	43232.0 VA	52.00 A	0	0.0 VA	27.00 A	0	0.0 VA	27.00 A	0	0.0 VA
1.5 KVA COMMUNICATIONS EQUIPMENT	1.80 A	1	1500.0 VA	1.80 A	1	1500.0 VA	1.80 A	1	1500.0 VA	1.80 A	1	1500.0 VA
5 KVA WELLS CPT	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA	3.61 A	1	3000.0 VA	3.61 A	1	3000.0 VA
TOTAL LOAD =	467.82 A		388936.8 VA	111.82 A		92964.0 VA	85.41 A		71010.8 VA	5.41 A		4500.0 VA
LOAD CORRECTION FACTORS												
LARGEST MOTOR LOAD x 25%:												
40 HP HP => 0.25 x 10808.0 VA =	3.25 A		2702.0 VA	3.25 A		2702.0 VA	3.25 A		2702.0 VA	3.25 A		2702.0 VA
11% SYSTEM LOSSES TOTAL x % =	51.46 A		42783.1 VA	12.30 A		10226.0 VA	9.40 A		7811.2 VA	0.60 A		495.0 VA
0% BREAKER DERATING = TOTAL x % =	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA	0.00 A		0.0 VA
FOR CONTINUOUS LOADS NEC 210-20												
SERVICE SIZE (MIN) =	522.53 A		434421.9VA	127.37 A		105892.0VA	98.06 A		81523.9VA	9.26 A		7697.0VA
SERVICE SIZE REQUIRED =				350A								
480V, 3 PHASE, 4 WIRE												

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
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CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN	MBY			TPF	
0	4/5/13	INTERMEDIATE (60%) DESIGN	MBY			TPF	

REVISIONS

APPROVED BY: TPF

SO
SUPV TPF
DSGN MBY
DWN MBY, NC
CHKD MF
OK TPF
DATE
SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
LOAD CALCULATIONS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
E-00-35 REV 1

PLOT DATE: Aug 25, 2014 PLOT TIME: 2:51:48pm
FILENAME: FE-E-XXX-0035AD.dwg

N1808

PANEL SPECIFICATIONS AND NOTES:

1. THE PANEL MANUFACTURER SHALL HAVE A MINIMUM OF 5 YEARS EXPERIENCE MANUFACTURING SYSTEMS SPECIFICALLY FOR WASTEWATER APPLICATIONS.
2. THE CONTROL PANEL SHALL BE MANUFACTURED AND FABRICATED BY A UL 508A LISTED INDUSTRIAL CONTROL PANEL MANUFACTURER AND SHALL MEET UL 508A SAFETY STANDARDS.
3. ENCLOSURES SHALL BE UL LISTED, NEMA TYPE 4, PROPERLY SIZED TO CONTAIN THE REQUIRED COMPONENTS WITH ADDITIONAL 35% FREE SPACE UNLESS OTHERWISE INDICATED ON THE WIRING DIAGRAM. ENCLOSURES MOUNTED INSIDE VAULT SHALL BE CONSTRUCTED OF 316 STAINLESS STEEL BODY AND DOOR WITH CONTINUOUS HINGE (NEMA 4X).
4. ENCLOSURE ACCESSORIES, WHERE APPLICABLE, SHALL INCLUDE THE FOLLOWINGS:

- INNER SWING PANEL TO MOUNT OPERATOR DEVICES, INNER PANEL SIZE SHALL COVER THE ENTIRE OPENING OF THE ENCLOSURE.
- CONDENSATE HEATER, MINIMUM OF 100WATT, 120VAC WITH ADJUSTABLE THERMOSTAT
- WORK LIGHT, 12-INCH FLUORESCENT WITH A SAFETY LENS SHALL BE MOUNTED INSIDE THE TOP OF THE ENCLOSURE WITHOUT PENETRATING THE OUTSIDE OF THE PANEL. THE LIGHT SHALL BE OPERATED WITH A SWITCH ATTACHED TO THE DOOR THAT TURNS ON THE LIGHT WHEN THE DOOR IS OPEN.

7. ALL DEVICES WITHIN THE PANEL SHALL BE UL LISTED AND/ OR RECOGNIZED WHERE APPLICABLE AND SHALL BE MOUNTED AND WIRED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF UL508 AND NFPA.
8. THE CONTROL PANEL SHALL BE FULLY TESTED BY THE FACTORY PRIOR TO SHIPMENT. IT SHALL INCLUDE TESTING OF BOTH POWER AND CONTROL DEVICES AS WELL AS ALL CONTROL FUNCTIONS.
9. IT IS THE PANEL BUILDER RESPONSIBILITY TO PROVIDE PANEL LAYOUT, BILL OF MATERIAL, AND SUBMIT TO ARCADIS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
10. REFER TO CONTROL TRANSFORMER NAMEPLATE FOR CONNECTIONS OF PRIMARY AND SECONDARY LEADS.
11. CABINET WITH VFDs SHALL HAVE COOLING FAN, LOUVER WITH REMOVABLE FILTER ACCESSIBLE TO OPERATOR WITHOUT OPENING PANEL DOOR. COOLING FAN SIZE SHALL BE ADEQUATE TO PREVENT VFD FROM OVERHEATING. ENCLOSURE SHALL BE CARBON STEEL NEMA 3R. ALTERNATIVELY, CABINET INSTALLED INSIDE VAULT THAT CONTAINS VFDs SHALL BE 316 SS NEMA4X WITH SIDE MOUNTED AIR CONDITIONING UNIT.
12. FOR COMBINATION MOTOR CONTROLLER WITH MOTOR CIRCUIT PROTECTION, FOLLOW MANUFACTURER'S INSTRUCTION FOR SELECTING CURRENT ELEMENTS AND SETTING THE INSTANTANEOUS TRIP CIRCUIT BREAKER.
13. FIELD WIRING CONNECTIONS SHALL BE ONLY TO TERMINALS PROVIDED.
14. SIGNAL WIRES SHALL NOT BE PLACED WITH NON-SIGNAL WIRES AFTER ENTRY INTO THE CABINET.
15. INCOMING WIRES SHALL STAY OUTSIDE AREAS OF POWER AND WHERE CONTROL COMPONENTS ARE PLACED, AND SHALL NOT BE ROUTED IN WIRE CHANNELS.
16. GROUNDING SHALL COMPLY WITH LOCAL REQUIREMENT AND NEC ARTICLE 250, GROUNDING AND BONDING.
17. OPERATOR CONTROL DEVICES SHALL BE 22MM, NEMA AND UL LISTED FOR TYPES 1, 12, 3R, 4 AND 4X. CONTACT BLOCKS SHALL BE COLOR CODED RATED AT 10AMP. CONNECTION SHALL BE SUITABLE FOR TWO 14AWG CONTROL WIRES.
18. CONTROL RELAYS AND TIME DELAY RELAYS SHALL BE DPDT RATED 10A@120VAC SOCKET MOUNT TYPE.
19. ALL COMPONENTS MOUNTED ON THE DOOR SHALL HAVE FINGER PROOF TERMINALS, OTHERWISE, THEY SHALL BE WIRED WITH INSULATED CONNECTORS TO PREVENT ACCIDENTAL SHOCK HAZARDS.
20. SELF ADHESIVE VINYL CLOTH PRINTED WIRE MARKERS SHALL BE PLACED AT BOTH ENDS OF EVERY WIRE. ALL COMPONENTS ON THE BACKPANEL SHALL BE IDENTIFIED INCLUDING RATING AND SIZE.
21. COMPONENTS ON THE DOOR OF THE ENCLOSURE SHALL BE IDENTIFIED WITH CUSTOM ENGRAVED PLASTIC LEGEND PLATES.
22. VOLTAGE IDENTIFICATION AND WARNING LABELS SHALL BE INSTALLED ON THE CABINET DOOR.

LEGEND

TERMINAL BLOCK (TB) CONNECTION.

DASHED LINES DENOTES WIRING TO FIELD DEVICES

LINE NUMBER DESCRIPTION

0000
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS) — *LINE NUMBER (ALWAYS 2 DIGITS)*

WIRE NUMBER DESCRIPTION

00000
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS)
- *WIRE NUMBER (Always 1digit)*
- *LINE NUMBER (ALWAYS 2 DIGITS)*

INSTALLED IN REMOTE LOCATION

MCP	*MAIN CONTROL PANEL*
RCP	*REMOTE CONTROL PANEL*
MCE	*MOTOR CONTROL ENCLOSURE*
MSP	*MOTOR STARTER PANEL*
CMCP	*COMBINATION MOTOR CIRCUIT PROTECTION*
PS	*POWER SUPPLY*
TB	*TERMINAL BLOCK*
PTB	*POWER TERMINAL BLOCK*

(xx) *SYMBOL TO IDENTIFY COMPONENT SPECIFICATIONS*

xx *DEVICE ID NUMBER TO IDENTIFY PART NUMBER*

xxx *WIRE CONNECTION CONTINUATION REFERENCE.*

xxx → *FIELD WIRING TO OTHER CABINETS WITH CONNECTION REFERENCE.*

(DM) *DOOR MOUNTED*

(RM) *REMOTE MOUNTED*

(XP) *EXPLOSION PROOF (CLASS 1, DIV 2)*

PANEL MAIN DISCONNECT

GROUND

PANEL CHASSIS GROUND

MOV *PLUG-IN MOV (METAL OXIDE VARISTOR)*

CIRCUIT BREAKER

PUSH BUTTON SWITCH

SWITCH

PILOT LIGHT

RELAY/ STARTER COIL

PUSH TO TEST PILOT LIGHT

FUSE

PULSE INPUT

SOLENOID VALVE

COMBINATION MOTOR STARTER AND CIRCUIT PROTECTION

MAJOR COMPONENTS SPECIFICATION:

(1) UL 498 RATED MOLDED CASE CIRCUIT BREAKER, SIZE AS INDICATED, 600VAC, 3POLE, WITH THERMAL MAGNETIC TRIP.

(2) DOOR MOUNTED HANDLE, NFPA 79 COMPLIANT.

(3) POWER DISTRIBUTION BLOCK TO ALLOW INDIVIDUAL BRANCH DISCONNECT AND SHORT CIRCUIT PROTECTION TO HAVE A UL INTERRUPTING RATING OF 14KA AT 480 VAC.

(4) INCOMING SERVICE GROUND LUG. ADDITIONAL GROUND LUGS TO BE INSTALLED FOR EACH MOTOR.

(5) SINGLE PHASE, NON-VENTILATED AUTOMATION TRANSFORMER, MOUNTED ON SIDE OF PANEL. TRANSFORMER SHALL BE STAINLESS STEEL, UL LISTED.
1KVA: SOLA CATALOG NUMBER "HSS1F1BS"
1.5KVA: SOLA CATALOG NUMBER "HSS1F1.5AS"
2KVA: SOLA CATALOG NUMBER "HSS1F2AS"

(6A) MANUAL MOTOR STARTER WITH MAGNETIC SHORT CIRCUIT PROTECTION, AND OVERLOAD. MOTOR STARTER SHALL NOT HAVE AN AMPACITY LESS THAN 125% OF THE MOTOR FLA.

(6B) COMBINATION MOTOR STARTER WITH MAGNETIC SHORT CIRCUIT PROTECTION, OVERLOAD, CONTACTOR AND (2) N.O. AUXILIARY CONTACT. MOTOR STARTER SHALL NOT HAVE AN AMPACITY LESS THAN 125% OF THE MOTOR FLA.

(7) FEED THROUGH UL LISTED TERMINAL BLOCK, RATED 600VAC, 100KA SCCR RATING, DIN RAIL MOUNT, SCREW CONNECTION, FOR COPPER WIRE. BLOCK SIZE AND COLOR TO MATCH MINIMUM CIRCUIT REQUIREMENT.

(8A) IEC MINIATURE 4 POLE CONTROL RELAY, (2) N.O. AND (2) N.C. CONTACTS.

(8B) IEC MINIATURE 4 POLE CONTROL RELAY, (4) N.O. CONTACTS.

(9) 500VA UPS WITH ALARM RELAY (PHOENIX CONTACT OR APPROVED EQUAL).

(10) 24VDC POWER SUPPLY, NEC CLASS 2 COMPLIANCE. SIZE AS INDICATED.

(11) HAND SWITCH POSITION SHALL HAVE SPRING-RETURN MECHANISM FOR MOMENTARY OPERATION.

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

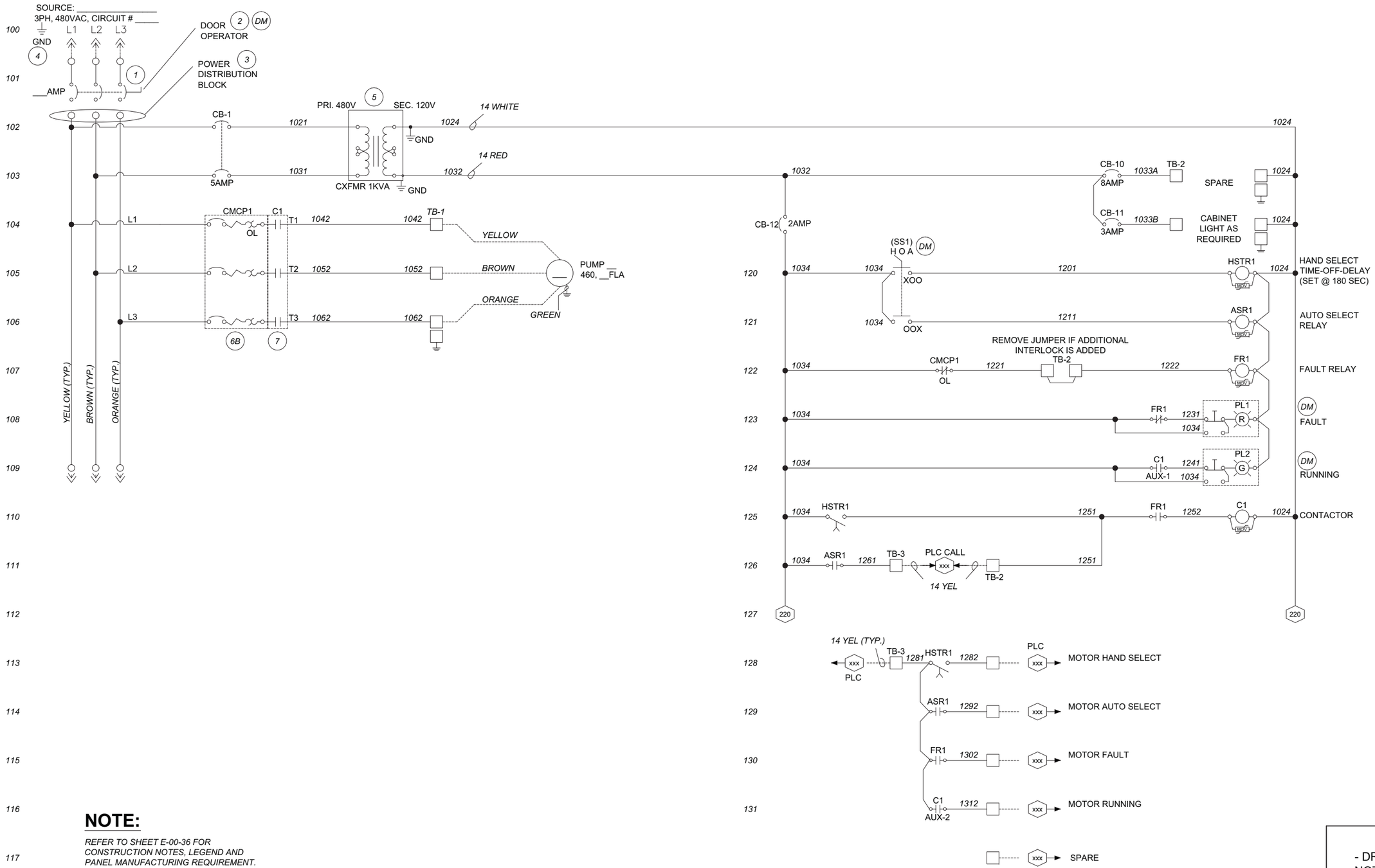
ELECTRICAL PANEL FABRICATION NOTES

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-36	REV 1

N1808

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NOTE:

REFER TO SHEET E-00-36 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-36.*

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

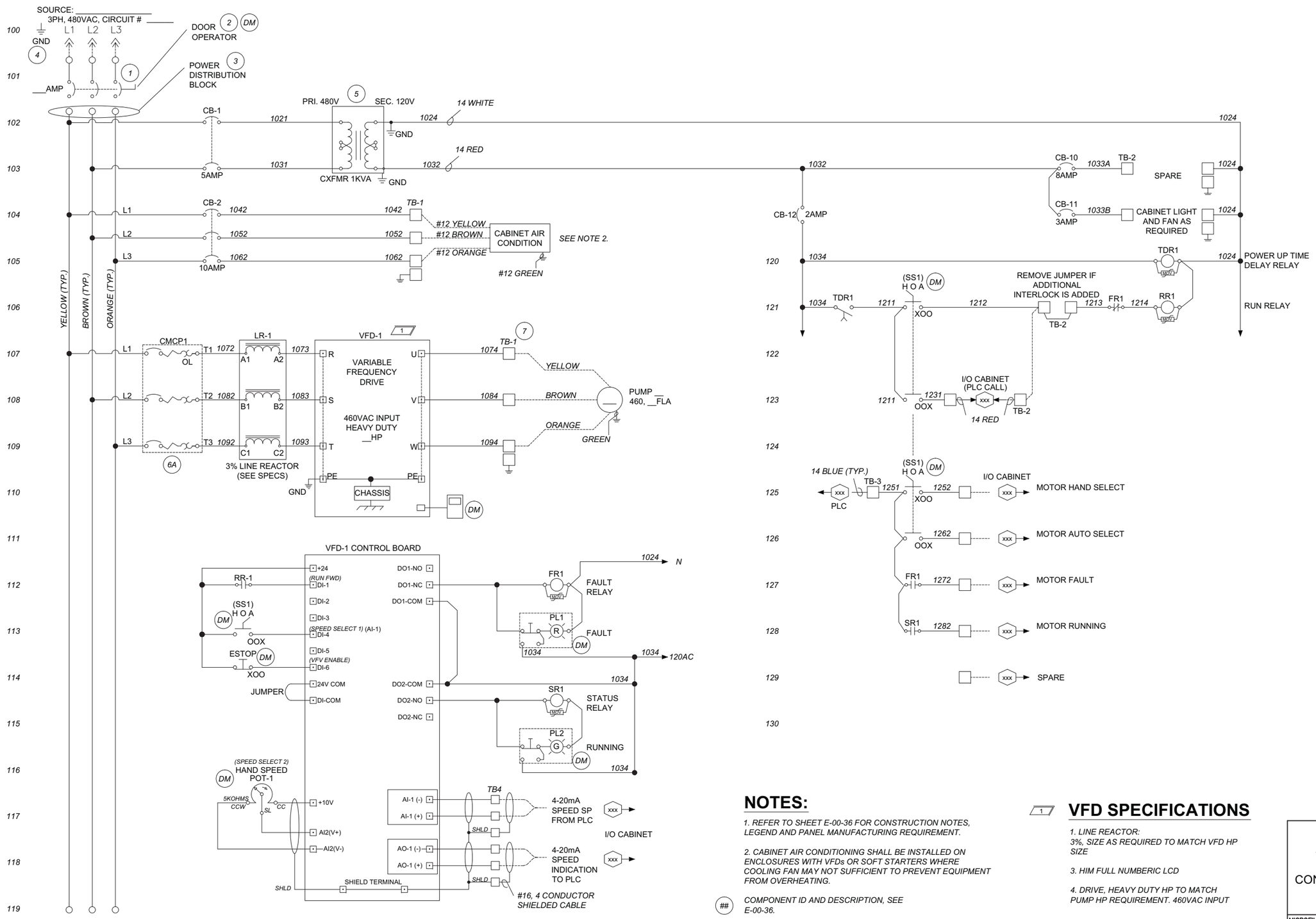
MOTOR ELECTRICAL PANEL EP1

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-37	REV 1

N1808

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NOTES:

1. REFER TO SHEET E-00-36 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.
2. CABINET AIR CONDITIONING SHALL BE INSTALLED ON ENCLOSURES WITH VFDs OR SOFT STARTERS WHERE COOLING FAN MAY NOT SUFFICIENT TO PREVENT EQUIPMENT FROM OVERHEATING.

(##) COMPONENT ID AND DESCRIPTION, SEE E-00-36.

VFD SPECIFICATIONS

1. LINE REACTOR: 3%, SIZE AS REQUIRED TO MATCH VFD HP SIZE
3. HIM FULL NUMBERIC LCD
4. DRIVE, HEAVY DUTY HP TO MATCH PUMP HP REQUIREMENT. 460VAC INPUT

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

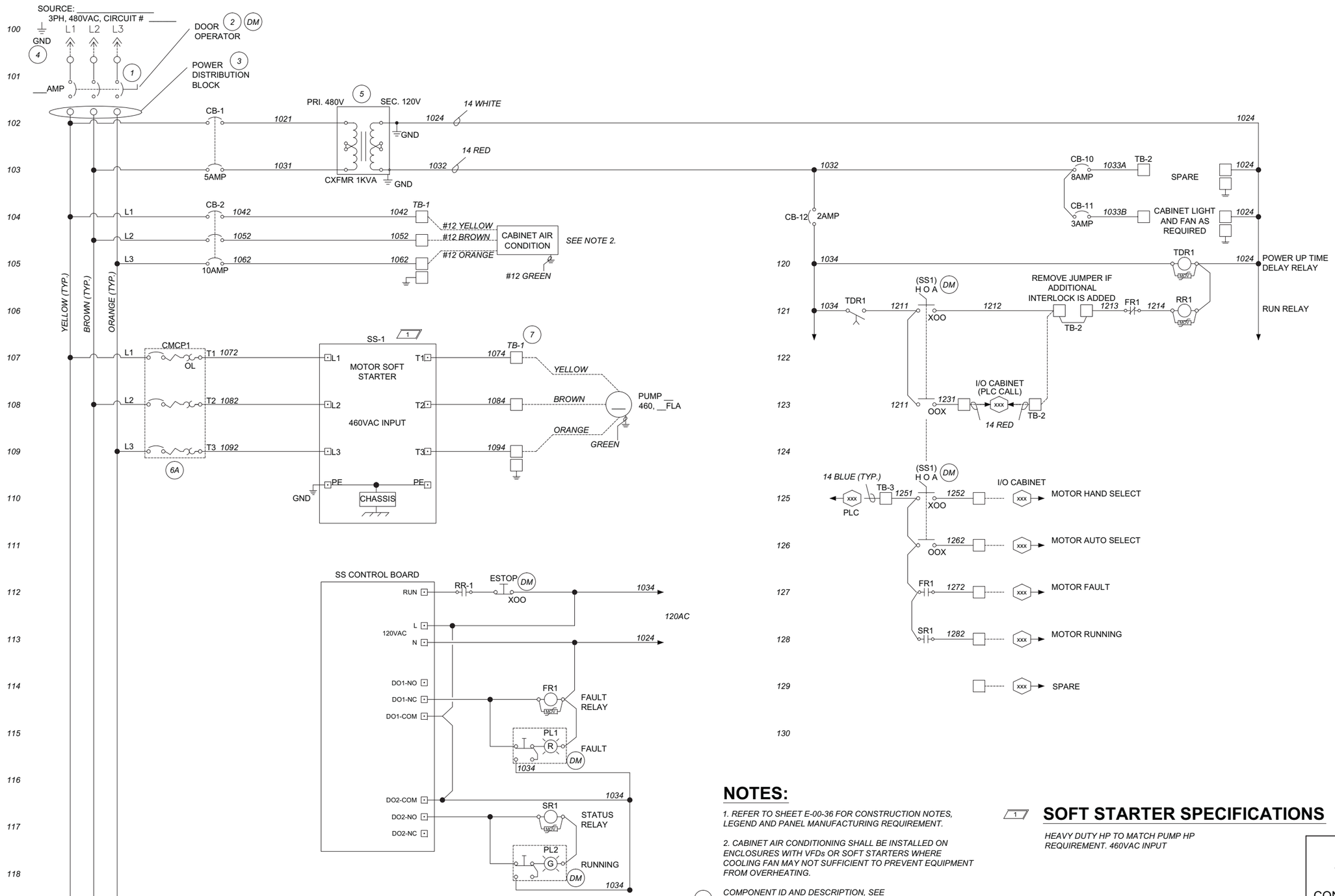
MOTOR ELECTRICAL PANEL EP2

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-38	REV 1

N1808

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NOTES:

1. *REFER TO SHEET E-00-36 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.*

2. *CABINET AIR CONDITIONING SHALL BE INSTALLED ON ENCLOSURES WITH VFDs OR SOFT STARTERS WHERE COOLING FAN MAY NOT SUFFICIENT TO PREVENT EQUIPMENT FROM OVERHEATING.*

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-36.*

1 SOFT STARTER SPECIFICATIONS

HEAVY DUTY HP TO MATCH PUMP HP REQUIREMENT. 460VAC INPUT

- DRAFT - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

ARCADIS

N1808

TOPOCK GROUNDWATER REMEDIATION PROJECT

MOTOR ELECTRICAL PANEL EP3

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-39	REV 1

09/04/2014, 14:11, G:\Graphics\ARIT\TOPOCK-01\Post 90%\EQUIP-E-00-36-39.DWG, Tab: SOFT STARTER

PANEL SPECIFICATIONS AND NOTES:

1. THE PANEL MANUFACTURER SHALL HAVE A MINIMUM OF 5 YEARS EXPERIENCE MANUFACTURING SYSTEMS SPECIFICALLY FOR WASTEWATER APPLICATIONS.
2. THE CONTROL PANEL SHALL BE MANUFACTURED AND FABRICATED BY A UL 508A LISTED INDUSTRIAL CONTROL PANEL MANUFACTURER AND SHALL MEET UL 508A SAFETY STANDARDS.
3. ENCLOSURES SHALL BE UL LISTED, NEMA TYPE 4, PROPERLY SIZED TO CONTAIN THE REQUIRED COMPONENTS WITH ADDITIONAL 35% FREE SPACE UNLESS OTHERWISE INDICATED ON THE WIRING DIAGRAM. ENCLOSURES MOUNTED INSIDE VAULT SHALL BE CONSTRUCTED OF 316 STAINLESS STEEL BODY AND DOOR WITH CONTINUOUS HINGE (NEMA 4X).
4. ENCLOSURE ACCESSORIES, WHERE APPLICABLE, SHALL INCLUDE THE FOLLOWINGS:

- INNER SWING PANEL TO MOUNT OPERATOR DEVICES, INNER PANEL SIZE SHALL COVER THE ENTIRE OPENING OF THE ENCLOSURE.
- CONDENSATE HEATER, MINIMUM OF 100WATT, 120VAC WITH ADJUSTABLE THERMOSTAT
- WORK LIGHT, 12-INCH FLUORESCENT WITH A SAFETY LENS SHALL BE MOUNTED INSIDE THE TOP OF THE ENCLOSURE WITHOUT PENETRATING THE OUTSIDE OF THE PANEL. THE LIGHT SHALL BE OPERATED WITH A SWITCH ATTACHED TO THE DOOR THAT TURNS ON THE LIGHT WHEN THE DOOR IS OPEN.

7. ALL DEVICES WITHIN THE PANEL SHALL BE UL LISTED AND/ OR RECOGNIZED WHERE APPLICABLE AND SHALL BE MOUNTED AND WIRED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF UL508 AND NFPA.
8. THE CONTROL PANEL SHALL BE FULLY TESTED BY THE FACTORY PRIOR TO SHIPMENT. IT SHALL INCLUDE TESTING OF BOTH POWER AND CONTROL DEVICES AS WELL AS ALL CONTROL FUNCTIONS.
9. IT IS THE PANEL BUILDER RESPONSIBILITY TO PROVIDE PANEL LAYOUT, BILL OF MATERIAL, AND SUBMIT TO ARCADIS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
10. REFER TO CONTROL TRANSFORMER NAMEPLATE FOR CONNECTIONS OF PRIMARY AND SECONDARY LEADS.
11. NOT USED.
12. FOR COMBINATION MOTOR CONTROLLER WITH MOTOR CIRCUIT PROTECTION, FOLLOW MANUFACTURER'S INSTRUCTION FOR SELECTING CURRENT ELEMENTS AND SETTING THE INSTANTANEOUS TRIP CIRCUIT BREAKER.
13. FIELD WIRING CONNECTIONS SHALL BE ONLY TO TERMINALS PROVIDED.
14. SIGNAL WIRES SHALL NOT BE PLACED WITH NON-SIGNAL WIRES AFTER ENTRY INTO THE CABINET.
15. INCOMING WIRES SHALL STAY OUTSIDE AREAS OF POWER AND WHERE CONTROL COMPONENTS ARE PLACED, AND SHALL NOT BE ROUTED IN WIRE CHANNELS.
16. GROUNDING SHALL COMPLY WITH LOCAL REQUIREMENT AND NEC ARTICLE 250, GROUNDING AND BONDING.
17. OPERATOR CONTROL DEVICES SHALL BE 22MM, NEMA AND UL LISTED FOR TYPES 1, 12, 3R, 4 AND 4X. CONTACT BLOCKS SHALL BE COLOR CODED RATED AT 10AMP. CONNECTION SHALL BE SUITABLE FOR TWO 14AWG CONTROL WIRES.
18. CONTROL RELAYS AND TIME DELAY RELAYS SHALL BE DPDT RATED 10A@120VAC SOCKET MOUNT TYPE.
19. ALL COMPONENTS MOUNTED ON THE DOOR SHALL HAVE FINGER PROOF TERMINALS, OTHERWISE, THEY SHALL BE WIRED WITH INSULATED CONNECTORS TO PREVENT ACCIDENTAL SHOCK HAZARDS.
20. SELF ADHESIVE VINYL CLOTH PRINTED WIRE MARKERS SHALL BE PLACED AT BOTH ENDS OF EVERY WIRE. ALL COMPONENTS ON THE BACKPANEL SHALL BE IDENTIFIED INCLUDING RATING AND SIZE.
21. COMPONENTS ON THE DOOR OF THE ENCLOSURE SHALL BE IDENTIFIED WITH CUSTOM ENGRAVED PLASTIC LEGEND PLATES.
22. VOLTAGE IDENTIFICATION AND WARNING LABELS SHALL BE INSTALLED ON THE CABINET DOOR.

LEGEND

TERMINAL BLOCK (TB) CONNECTION.

DASHED LINES DENOTES WIRING TO FIELD DEVICES

LINE NUMBER DESCRIPTION

0000
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS) — *LINE NUMBER (ALWAYS 2 DIGITS)*

WIRE NUMBER DESCRIPTION

00000
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS) — *WIRE NUMBER (Always 1digit)*; *LINE NUMBER (ALWAYS 2 DIGITS)*

INSTALLED IN REMOTE LOCATION

MCP	*MAIN CONTROL PANEL*
RCP	*REMOTE CONTROL PANEL*
MCE	*MOTOR CONTROL ENCLOSURE*
MSP	*MOTOR STARTER PANEL*
CMCP	*COMBINATION MOTOR CIRCUIT PROTECTION*
PS	*POWER SUPPLY*
TB	*TERMINAL BLOCK*
PTB	*POWER TERMINAL BLOCK*

(xx) *SYMBOL TO IDENTIFY COMPONENT SPECIFICATIONS*

xx *DEVICE ID NUMBER TO IDENTIFY PART NUMBER*

(xxx) *WIRE CONNECTION CONTINUATION REFERENCE.*

(xxx)→ *FIELD WIRING TO OTHER CABINETS WITH CONNECTION REFERENCE.*

(DM) *DOOR MOUNTED*

(RM) *REMOTE MOUNTED*

(XP) *EXPLOSION PROOF (CLASS 1, DIV 2)*

PANEL MAIN DISCONNECT

GROUND

PANEL CHASSIS GROUND

PLUG-IN MOV (METAL OXIDE VARISTOR)

CIRCUIT BREAKER

PUSH BUTTON SWITCH

SWITCH

PILOT LIGHT

RELAY/ STARTER COIL

PUSH TO TEST PILOT LIGHT

FUSE

PULSE INPUT

SOLENOID VALVE

COMBINATION MOTOR STARTER AND CIRCUIT PROTECTION

MAJOR COMPONENTS SPECIFICATION:

(1) UL 498 RATED MOLDED CASE CIRCUIT BREAKER, SIZE AS INDICATED, 600VAC, 3POLE, WITH THERMAL MAGNETIC TRIP.

(2) DOOR MOUNTED HANDLE, NFPA 79 COMPLIANT.

(3) POWER DISTRIBUTION BLOCK TO ALLOW INDIVIDUAL BRANCH DISCONNECT AND SHORT CIRCUIT PROTECTION TO HAVE A UL INTERRUPTING RATING OF 14KA AT 480 VAC.

(4) INCOMING SERVICE GROUND LUG. ADDITIONAL GROUND LUGS TO BE INSTALLED FOR EACH MOTOR.

(5) SINGLE PHASE, NON-VENTILATED AUTOMATION TRANSFORMER, MOUNTED ON SIDE OF PANEL. TRANSFORMER SHALL BE STAINLESS STEEL, UL LISTED.
1KVA: SOLA CATALOG NUMBER "HSS1F1BS"
1.5KVA: SOLA CATALOG NUMBER "HSS1F1.5AS"
2KVA: SOLA CATALOG NUMBER "HSS1F2AS"

(6A) MANUAL MOTOR STARTER WITH MAGNETIC SHORT CIRCUIT PROTECTION, AND OVERLOAD. MOTOR STARTER SHALL NOT HAVE AN AMPACITY LESS THAN 125% OF THE MOTOR FLA.

(6B) COMBINATION MOTOR STARTER WITH MAGNETIC SHORT CIRCUIT PROTECTION, OVERLOAD, CONTACTOR AND (2) N.O. AUXILIARY CONTACT. MOTOR STARTER SHALL NOT HAVE AN AMPACITY LESS THAN 125% OF THE MOTOR FLA.

(7) FEED THROUGH UL LISTED TERMINAL BLOCK, RATED 600VAC, 100KA SCCR RATING, DIN RAIL MOUNT, SCREW CONNECTION, FOR COPPER WIRE. BLOCK SIZE AND COLOR TO MATCH MINIMUM CIRCUIT REQUIREMENT.

(8A) IEC MINIATURE 4 POLE CONTROL RELAY, (2) N.O. AND (2) N.C. CONTACTS.

(8B) IEC MINIATURE 4 POLE CONTROL RELAY, (4) N.O. CONTACTS.

(9) 500VA UPS WITH ALARM RELAY (PHOENIX CONTACT OR APPROVED EQUAL).

(10) 24VDC POWER SUPPLY, NEC CLASS 2 COMPLIANCE. SIZE AS INDICATED.

(11) HAND SWITCH POSITION SHALL HAVE SPRING-RETURN MECHANISM FOR MOMENTARY OPERATION.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

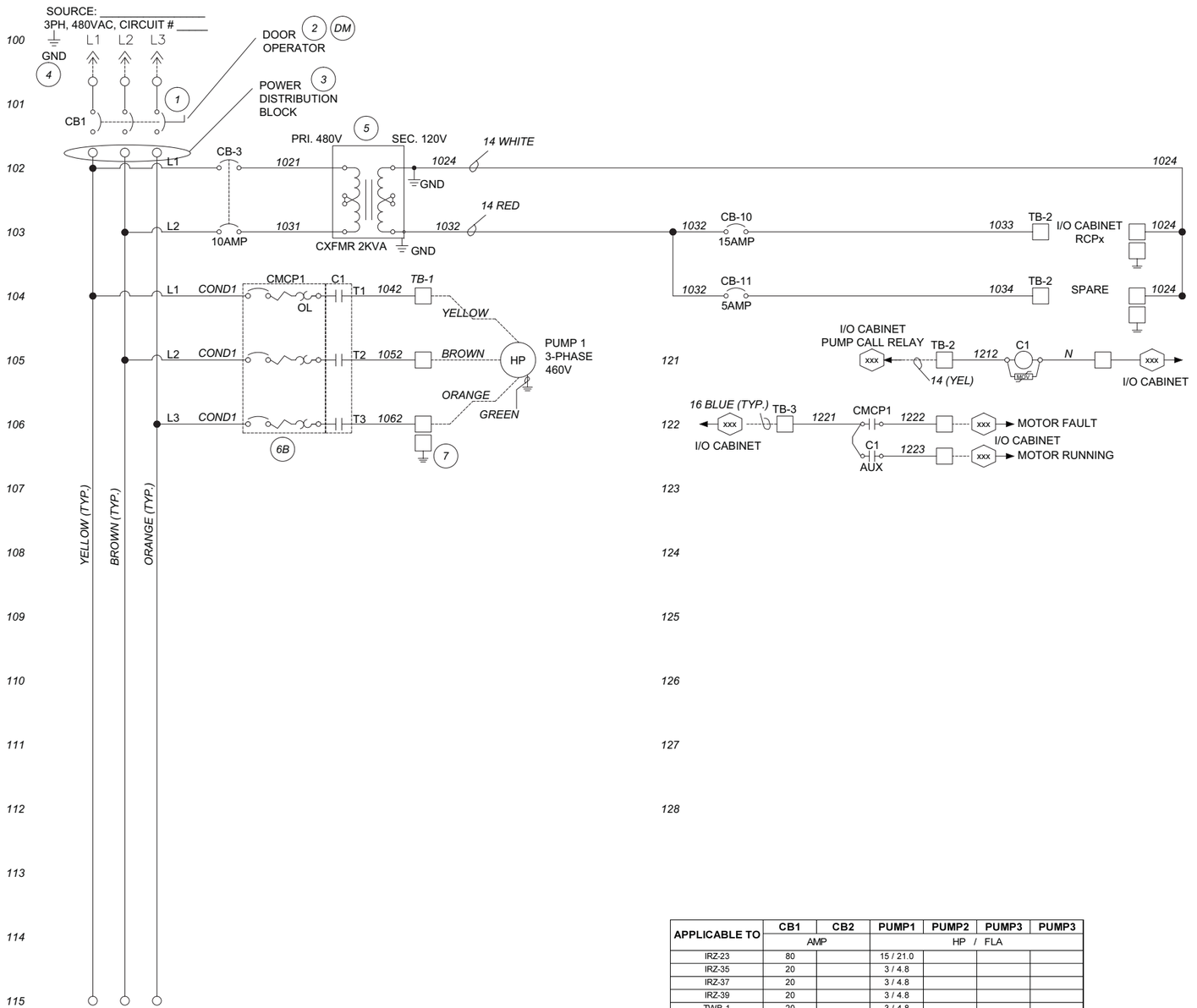
VAULT ELECTRICAL PANEL FABRICATION NOTES

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-40	REV 1

N1808

08/27/2014, 14:16, G:\Graphics\ARITOPOCK-01\Post 90%\VAULT_E-00-40-47.DWG, Tab: VAULT ELEC NOTES



APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
IRZ-23	80		15 / 21.0			
IRZ-35	20		3 / 4.8			
IRZ-37	20		3 / 4.8			
IRZ-39	20		3 / 4.8			
TWB-1	20		3 / 4.8			
TWB-2	20		3 / 4.8			
ER-1	20		0.5 / 1.1			
ER-2	20		0.5 / 1.1			
ER-3	20		0.5 / 1.1			
ER-4	20		0.5 / 1.1			
ER-6	20		0.5 / 1.1			

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

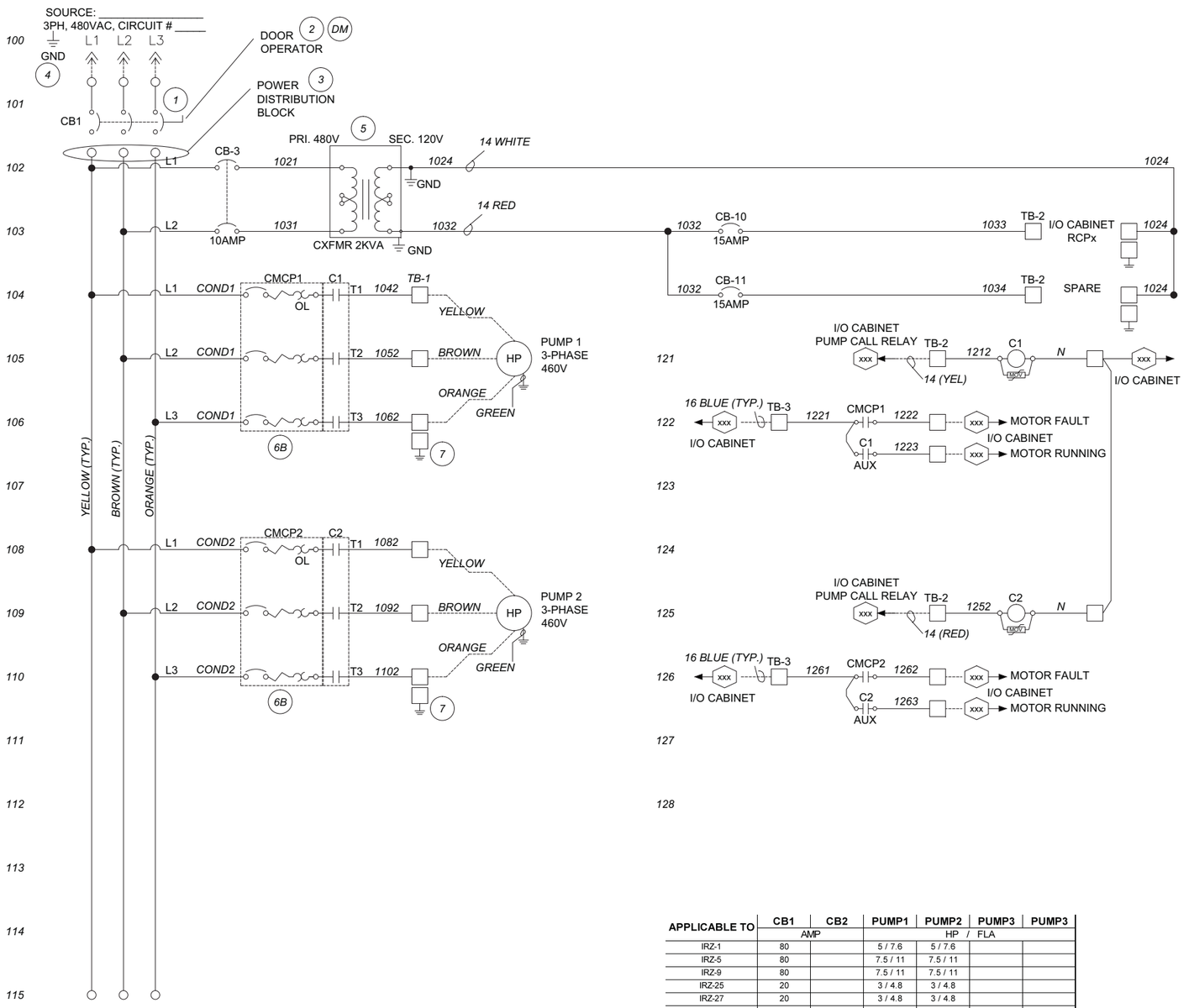
VAULT ELECTRICAL PANEL W1

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-41	REV 1

N1808

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APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
IRZ-1	80		5 / 7.6	5 / 7.6		
IRZ-5	80		7.5 / 11	7.5 / 11		
IRZ-9	80		7.5 / 11	7.5 / 11		
IRZ-25	20		3 / 4.8	3 / 4.8		
IRZ-27	20		3 / 4.8	3 / 4.8		
IRZ-29	20		3 / 4.8	3 / 4.8		
IRZ-31	20		3 / 4.8	3 / 4.8		
TCS-1	20		3 / 4.8	3 / 4.8		
TCS-2	20		3 / 4.8	3 / 4.8		

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT - NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN JMS
	DWN MMS
	CHKD JPB
	OK JEF
	DATE 09/08/14
	SCALES AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

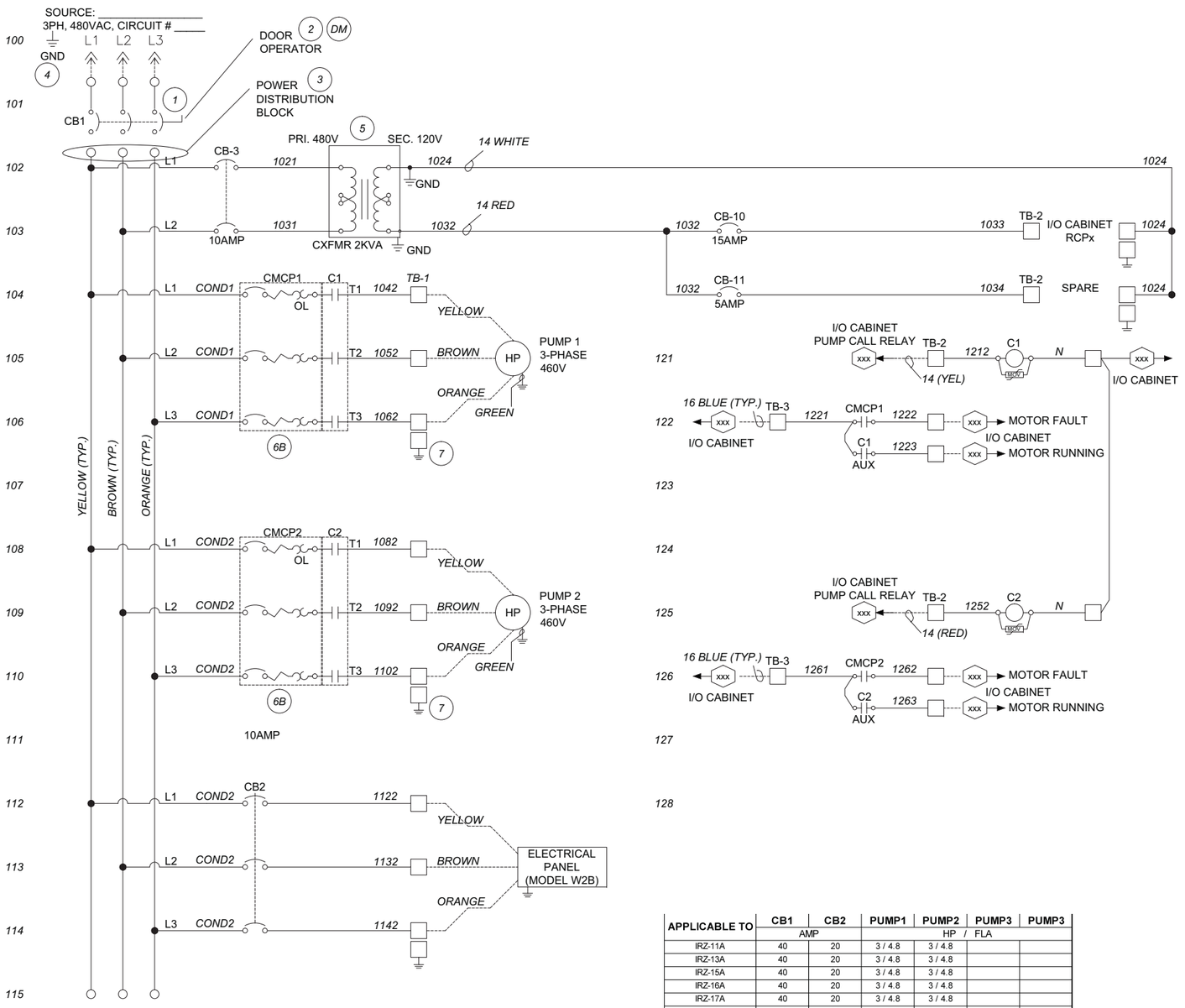
VAULT ELECTRICAL PANEL W2

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-42	REV 1

N1808

08/27/2014, 14:16, G:\Graphics\ART\TOPOCK-01\Post 90%\VAULT_E-00-40-47.DWG, Tab: W2



APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
IRZ-11A	40	20	3 / 4.8	3 / 4.8		
IRZ-13A	40	20	3 / 4.8	3 / 4.8		
IRZ-15A	40	20	3 / 4.8	3 / 4.8		
IRZ-16A	40	20	3 / 4.8	3 / 4.8		
IRZ-17A	40	20	3 / 4.8	3 / 4.8		
IRZ-19A	40	20	3 / 4.8	3 / 4.8		
IRZ-20A	40	20	3 / 4.8	3 / 4.8		
IRZ-21A	40	20	3 / 4.8	3 / 4.8		

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

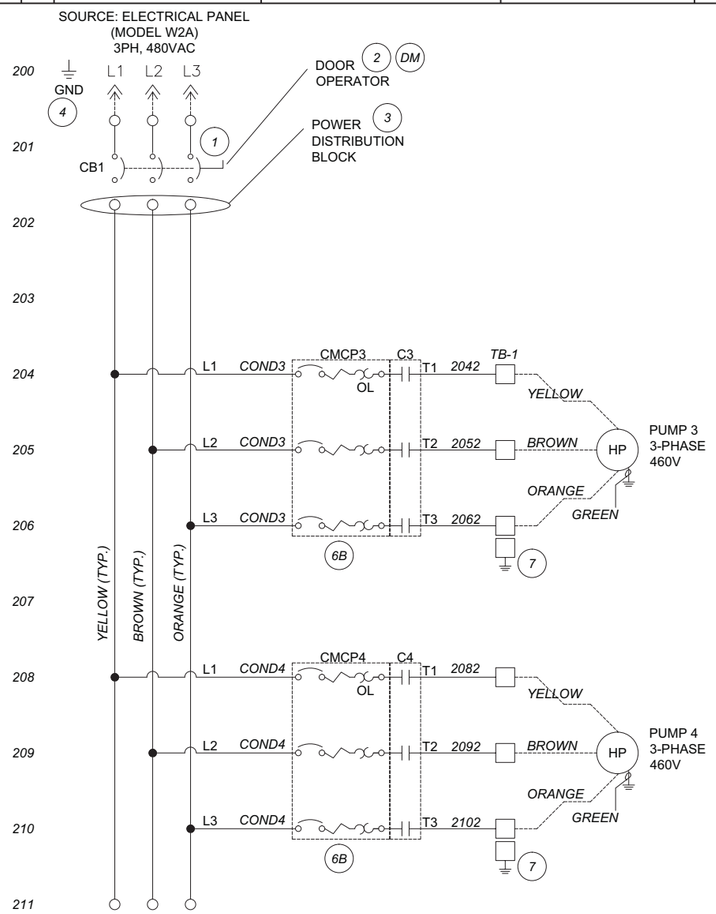
VAULT ELECTRICAL PANEL W2A

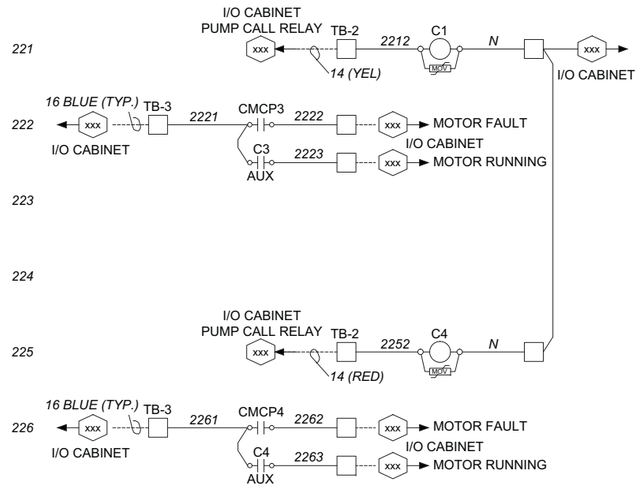
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-43	REV 1

08/27/2014, 14:17, G:\Graphics\ART\TOPOCK-01\Post 90%\VAULT_E-00-40-47.DWG, Tab: W2A

N1808





APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
IRZ-11B	20				3 / 4.8	3 / 4.8
IRZ-13B	20				3 / 4.8	3 / 4.8
IRZ-15B	20				3 / 4.8	3 / 4.8
IRZ-16B	20				3 / 4.8	3 / 4.8
IRZ-17B	20				3 / 4.8	3 / 4.8
IRZ-19B	20				3 / 4.8	3 / 4.8
IRZ-20B	20				3 / 4.8	3 / 4.8
IRZ-21B	20				3 / 4.8	3 / 4.8

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

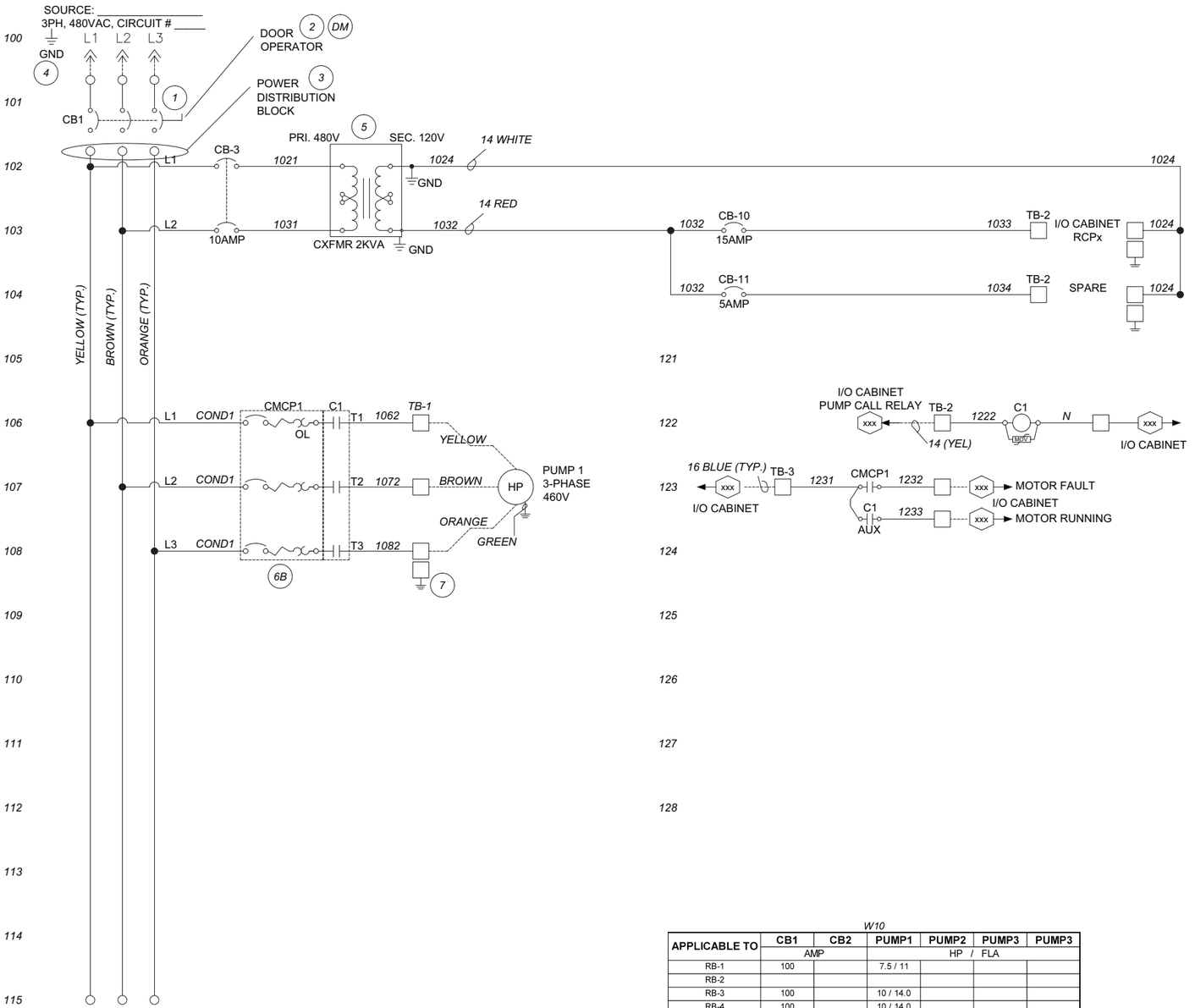
VAULT ELECTRICAL PANEL W2B

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-44	REV 1

N1808

08/27/2014, 14:17, G:\Graphics\AR\TOPOCK-01\Post 90%\VAULT_E-00-40-47.DWG, Tab: W2B



W10

APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
RB-1	100		7.5 / 11			
RB-2						
RB-3	100		10 / 14.0			
RB-4	100		10 / 14.0			
RB-5	100		7.5 / 11			

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	
SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

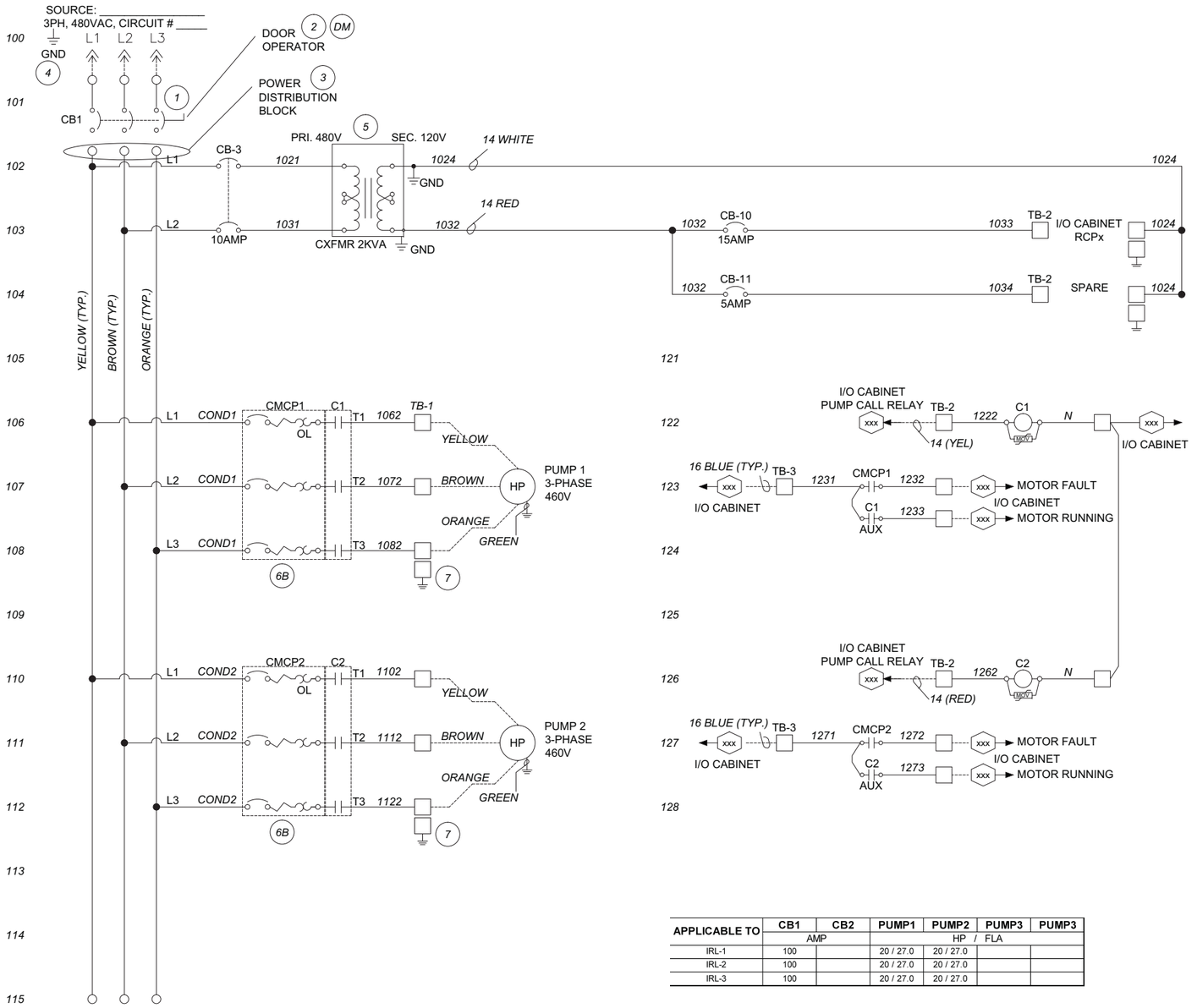
VAULT ELECTRICAL PANEL W10

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-45	REV 1

N1808

08/27/2014, 14:17, G:\Graphics\ARI\TOPOCK-01\Post 90%\VAULT_E-00-40-47.DWG, Tab: W10



APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
IRL-1	100		20 / 27.0	20 / 27.0		
IRL-2	100		20 / 27.0	20 / 27.0		
IRL-3	100		20 / 27.0	20 / 27.0		

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

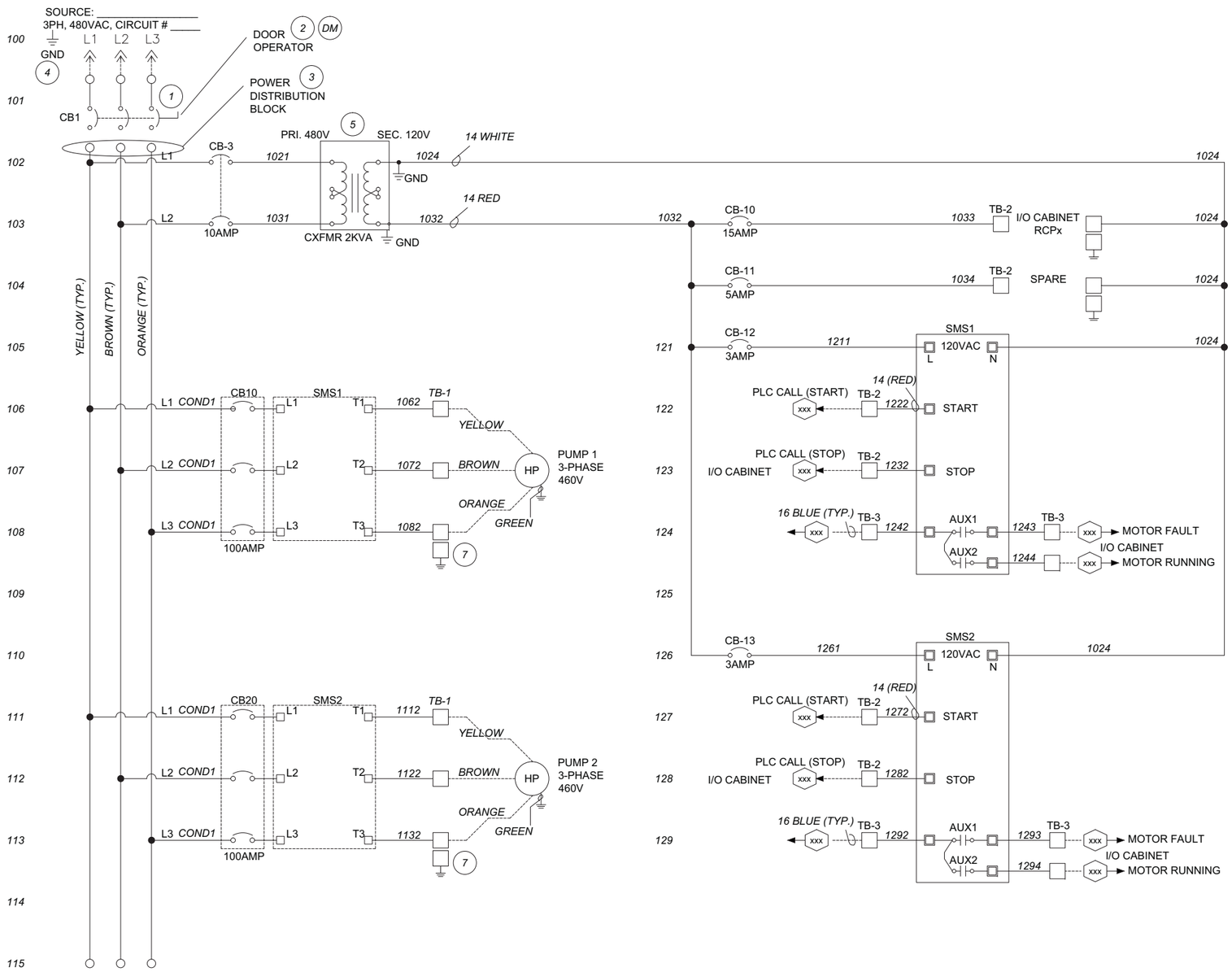
VAULT ELECTRICAL PANEL W20

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-46	REV 1

N1808

03/27/2014, 14:17, G:\Graphics\ARIT\TOPOCK-01\Post 90%\VAULT_E-00-40-47.DWG, Tab: W20



APPLICABLE TO	CB1	CB2	PUMP1	PUMP2	PUMP3	PUMP3
	AMP		HP / FLA			
IRL-4	125		30 / 40.0	30 / 40.0		

NOTE:

REFER TO SHEET E-00-40 FOR CONSTRUCTION NOTES, LEGEND AND PANEL MANUFACTURING REQUIREMENT.

(##) *COMPONENT ID AND DESCRIPTION, SEE E-00-40.*

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN		MMS	JMS	JPB	JEF
0	04/05/13	INTERMEDIATE (60%) DESIGN		MMS	JMS	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JMS
DWN	MMS
CHKD	JPB
QK	JEF
DATE	09/08/14
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

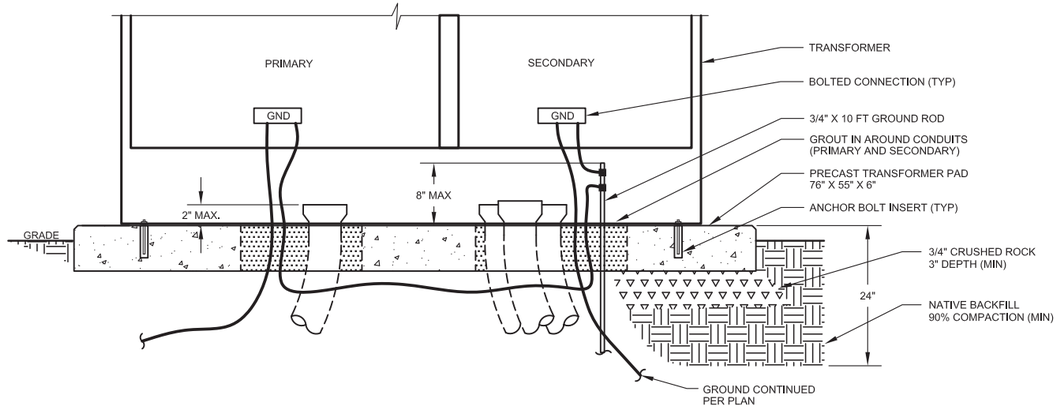
VAULT ELECTRICAL PANEL W30

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-47	REV 1

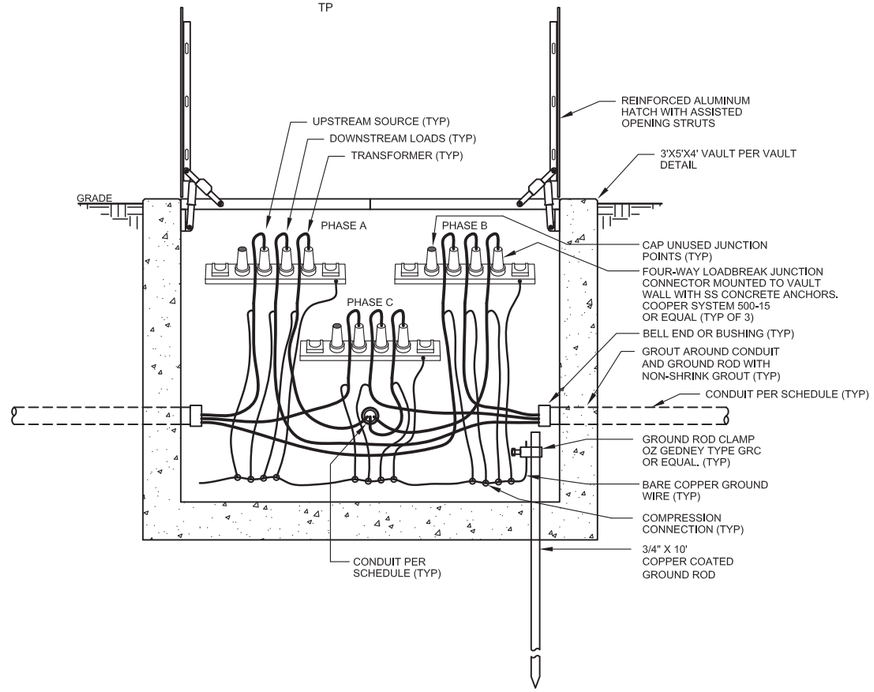
N1808

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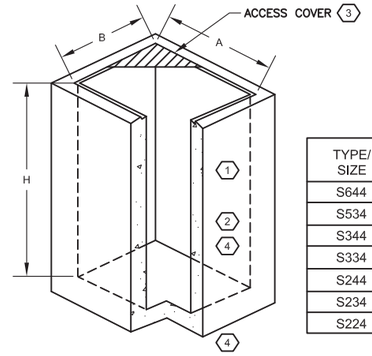
12KV TRANSFORMER PAD

1 DETAIL NTS
TP



12KV SECTIONALIZING PULLBOX

2 DETAIL NTS
12KPB



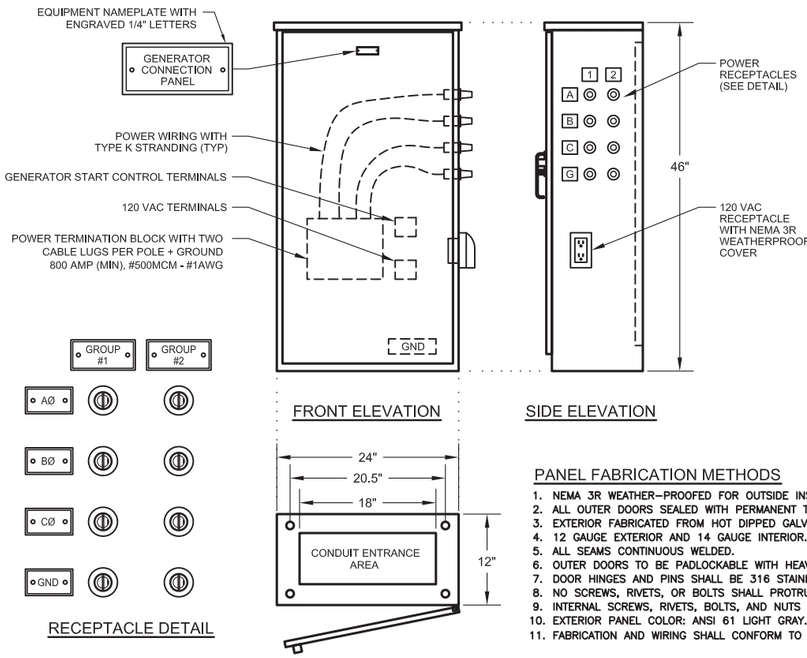
TYPE/ SIZE	DIMENSIONS (MIN)		
	A	B	H
S644	6'	4'	4'
S534	5'	3'	4'
S344	3'	4'	4'
S334	3'	3'	4'
S244	2'	4'	4'
S234	2'	3'	4'
S224	2'	2'	4'

ELECTRICAL VAULT NOTES

1. WIRES IN "P", "L" & "C" SERIES CONDUITS SHALL BE SUPPORTED ON ONE SIDE OF VAULT AND WIRES FOR "A", "D" & "S" SERIES ON OTHER SIDE. ALL WIRE SHALL BE STRAPPED TO CABLE SUPPORTS.
2. VAULTS SHALL BE CONSTRUCTED OF RE-INFORCED CONCRETE. PROVIDE VAULT BASE AND GRADE RING(S) AS NECESSARY TO MEET OR EXCEED REQUIRED DEPTH.
3. ACCESS COVERS SHALL BE 1/4" GALVANIZED STEEL CHECKER PLATE, HINGED, 2 PIECE, BOLT DOWN, WITH SPRING ASSIST. COVERS SHALL BE TRAFFIC LOAD RATED. LABEL LID "ELECTRICAL" WITH WELDED LETTERING.
4. CAULK AND GROUT SEAMS AND AROUND CONDUIT ENTRIES TO SMOOTH FINISH AND PREVENT LEAKS. CONDUIT ENTRANCES SHALL BE PER ENCASED CONDUIT END DETAIL. ATTACH CONDUIT LABELS TO WALL ABOVE CONDUIT.
5. OVER-EXCAVATE AND BACKFILL 18" OF 3/4" CRUSHED ROCK BELOW VAULT. BACKFILL AROUND VAULT WALLS WITH NATIVE SOIL.

ELECTRICAL VAULT

3 DETAIL NTS
EV



PANEL FABRICATION METHODS

1. NEMA 3R WEATHER-PROOFED FOR OUTSIDE INSTALLATION.
2. ALL OUTER DOORS SEALED WITH PERMANENT TYPE GASKETING.
3. EXTERIOR FABRICATED FROM HOT DIPPED GALVANIZED SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS CONTINUOUS WELDED.
6. OUTER DOORS TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCHES.
7. DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE STAINLESS STEEL.
10. EXTERIOR PANEL COLOR: ANSI 61 LIGHT GRAY.
11. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.

GENERATOR CONNECTION PANEL

4 DETAIL NTS
GCON

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

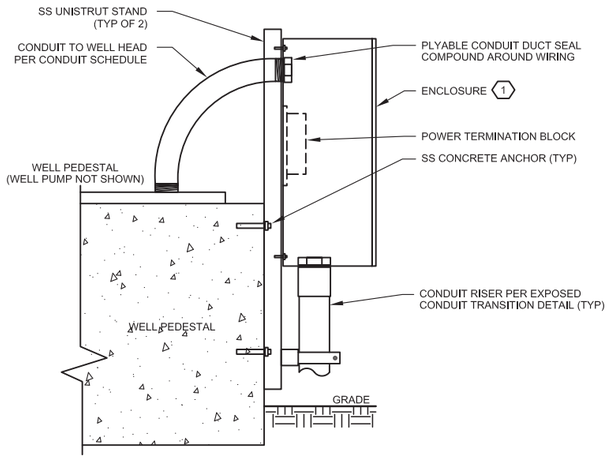
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL DETAILS 1
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-51	REV 1

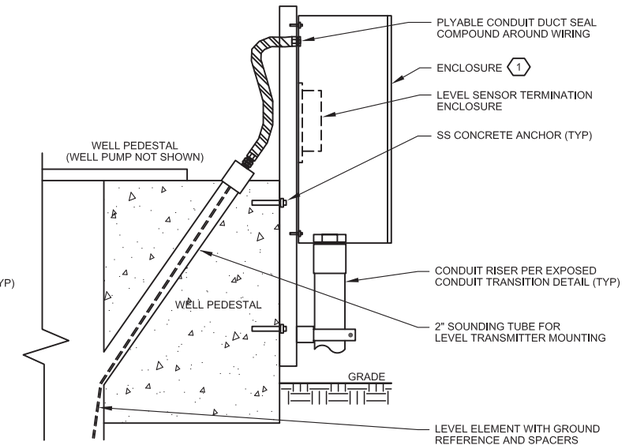
PLOT DATE: Aug 25, 2014 PLOT TIME: 2:51:54pm
FILENAME: FE-E-XXX-00510AD.dwg
N1808



NOTES: 1 16"H x 14"W x 6"D NEMA 12 PAINTED STEEL ENCLOSURE WITH POWER TERMINATION BLOCK. MECHANICALLY FASTEN PUMP CABLE TO PANEL FOR STRESS RELIEF. PROVIDE HOFFMAN CONCEPT OR APPROVED EQUAL.

WELL TERMINATION

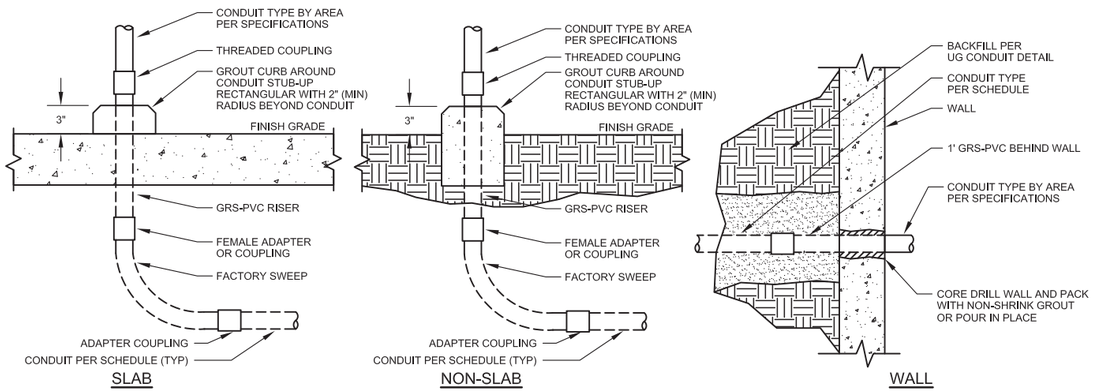
1 DETAIL NTS
WTP



NOTES: 1 16"H x 14"W x 6"D NEMA 12 PAINTED STEEL ENCLOSURE. MECHANICALLY FASTEN TRANSMITTER CABLE TO PANEL FOR STRESS RELIEF. PROVIDE HOFFMAN CONCEPT OR APPROVED EQUAL.

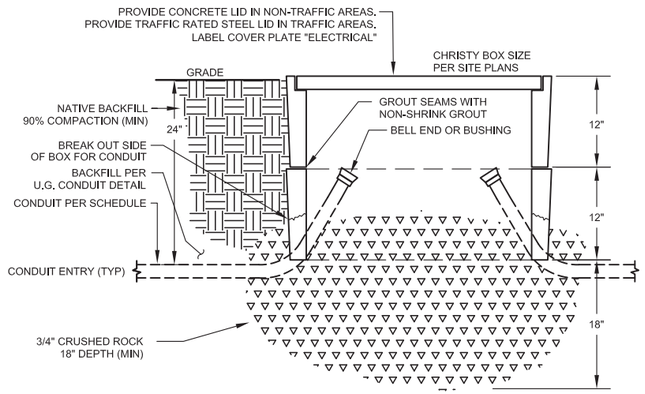
WELL LEVEL TRANSMITTER

3 DETAIL NTS
WLT



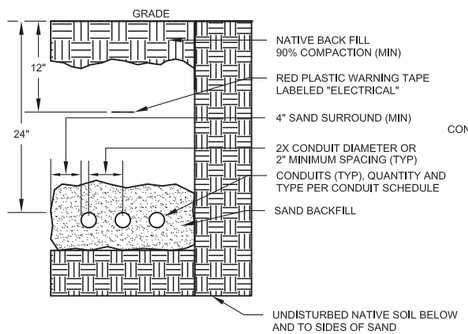
EXPOSED CONDUIT TRANSITION

5 DETAIL NTS
ECT



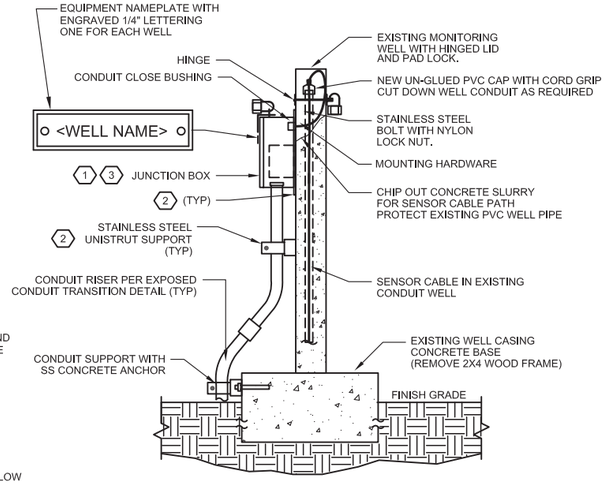
UNDERGROUND PULL BOX

2 DETAIL NTS
UPB



UNDERGROUND CONDUIT

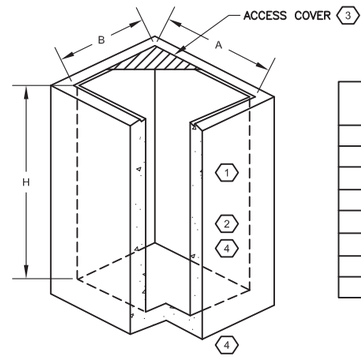
4 DETAIL NTS
UCD



NOTES:
1 10"X8"X4" NEMA 3R LOCKABLE TYPE JUNCTION BOX. MOUNTING HARDWARE SHALL NOT BE EXPOSED. HOFFMAN A-1008CHS OR EQUAL. PROVIDE EXTERNAL PADLOCK ATTACHMENT.
2 WELD BOX AND SUPPORTS TO PEDESTAL. PAINT WELDS WITH SILVER ENAMEL PAINT.
3 SUBMERSEIBLE LEVEL TRANSMITTER TERMINATION BOX WITH DESSICANT AND LIGHTNING ARRESTER SHALL BE INSTALLED IN JUNCTION BOX PER MANUFACTURERS INSTRUCTIONS.

MONITORING WELL DETAIL

6 DETAIL NTS
MWD



TYPE/ SIZE	DIMENSIONS (MIN)		
	A	B	H
S666	6'	6'	6'
S644	6'	4'	4'
S534	5'	3'	4'
S344	3'	4'	4'
S334	3'	3'	4'
S244	2'	4'	4'
S234	2'	3'	4'
S224	2'	2'	4'

NOTES:
1 WIRES IN "P", "L" & "C" SERIES CONDUITS SHALL BE SUPPORTED ON ONE SIDE OF VAULT AND WIRES FOR "A", "D" & "S" SERIES ON OTHER SIDE. ALL WIRE SHALL BE STRAPPED TO CABLE SUPPORTS.
2 VAULTS SHALL BE CONSTRUCTED OF RE-INFORCED CONCRETE. PROVIDE VAULT BASE AND GRADE RING(S) AS NECESSARY TO MEET OR EXCEED REQUIRED DEPTH.
3 ACCESS COVERS SHALL BE 1/4" GALVANIZED STEEL CHECKER PLATE, HINGED, 2 PIECE, BOLT DOWN, WITH SPRING ASSIST. COVERS SHALL BE TRAFFIC LOAD RATED. LABEL LID "ELECTRICAL" WITH WELDED LETTERING.
4 CAULK AND GROUT SEAMS AND AROUND CONDUIT ENTRIES TO SMOOTH FINISH AND PREVENT LEAKS. CONDUIT ENTRANCES SHALL BE PER ENCASED CONDUIT END DETAIL. ATTACH CONDUIT LABELS TO WALL ABOVE CONDUIT.
5 OVER-EXCAVATE AND BACKFILL 18" OF 3/4" CRUSHED ROCK BELOW VAULT. BACKFILL AROUND VAULT WALLS WITH NATIVE SOIL.

ELECTRICAL VAULT DETAIL

7 DETAIL NTS
VLT

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

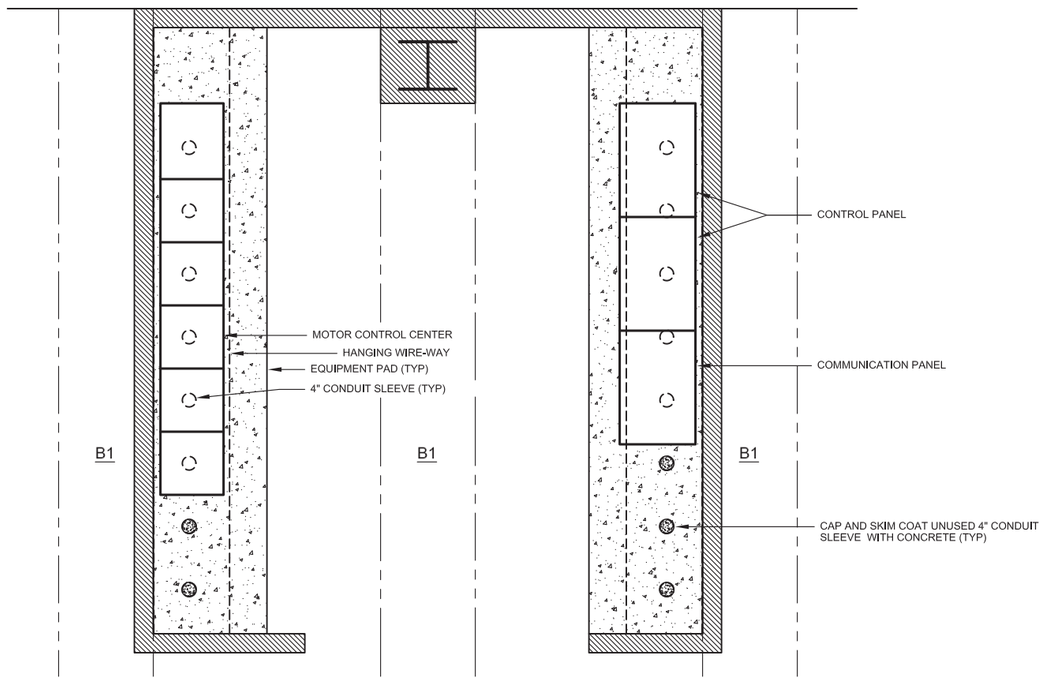
APPROVED BY: TPF

SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

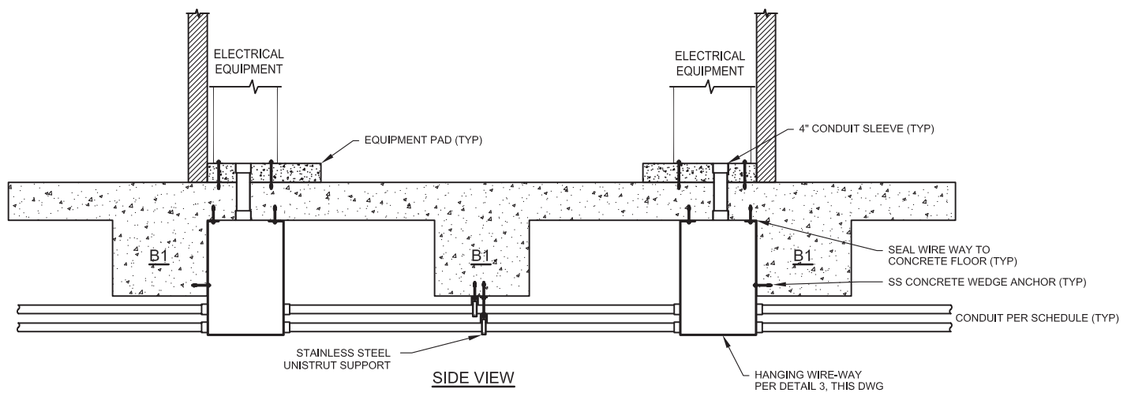
TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL
DETAILS 2
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-52	REV 1

FILENAME: FE-E-XXX-0052AD.dwg
PLOT DATE: Aug 25, 2014
PLOT TIME: 2:52:01pm
N1808



TOP VIEW

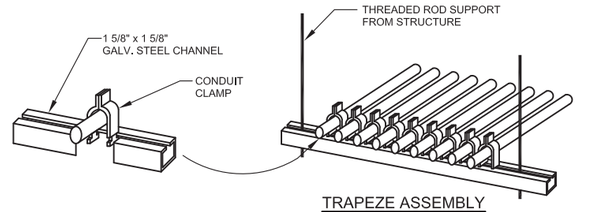


SIDE VIEW

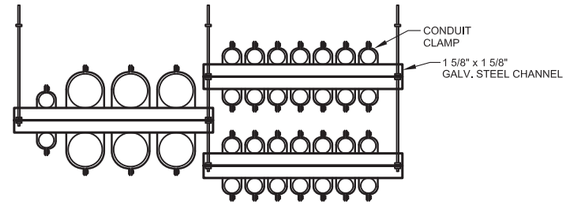
MCC ENTRY DETAIL

1 DETAIL NTS

MED



TRAPEZE ASSEMBLY



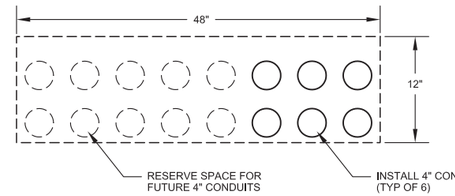
TRAPEZE LAYOUT

NOTES:
1. MATERIALS TYPE FOR CHANNEL, HARDWARE, AND ALL SUPPORT DEVICES TO BE RATED PER AREA CLASSIFICATION.
2. SUPPORT CHANNELS TO BE SPACED 5' MAXIMUM.
3. CONFIRM MOUNTING SUITABILITY AND STRUCTURAL INTEGRITY OF WALL OR CEILING TO BE USED.

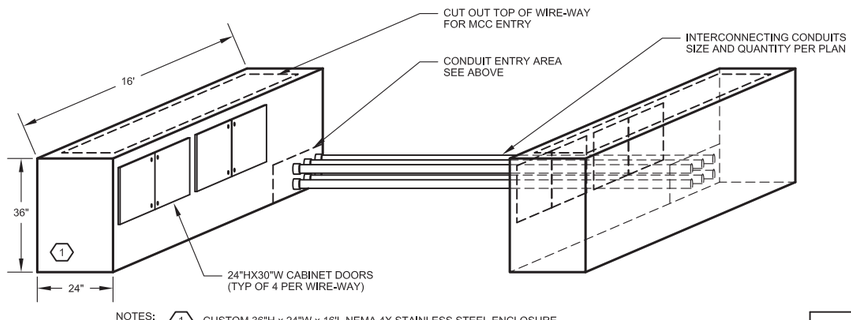
CONDUIT TRAPEZE MOUNTING

2 DETAIL NTS

HWW



CONDUIT ENTRY AREA



NOTES: 1. CUSTOM 36"H x 24"W x 16'L NEMA 4X STAINLESS STEEL ENCLOSURE.

HANGING WIRE-WAY DETAIL

3 DETAIL NTS

HWW

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NOT FOR
CONSTRUCTION

PLOT DATE: Aug 25, 2014 PLOT TIME: 2:52:10pm

FILENAME: FE-E-XXX-0053AD.DWG

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF

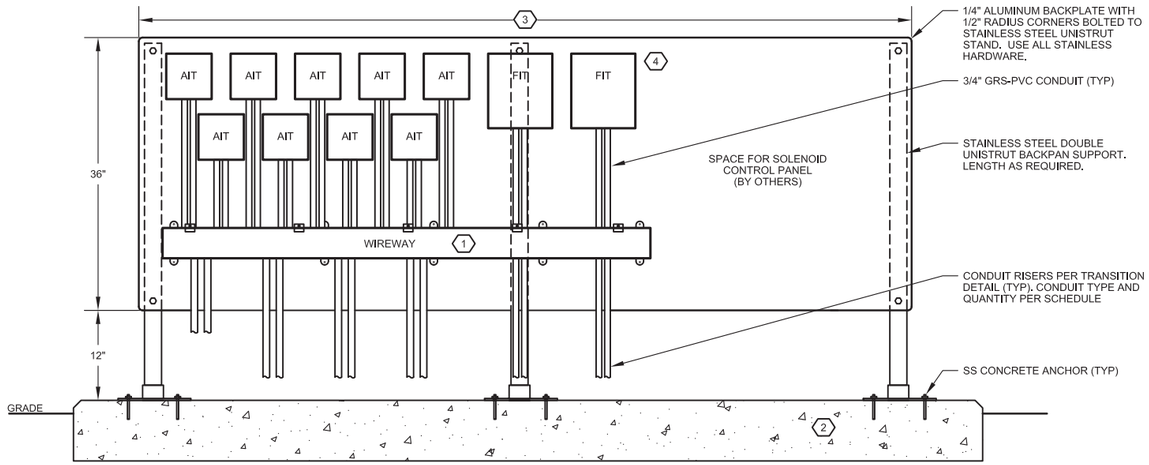
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL
DETAILS 3
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-53	REV 0

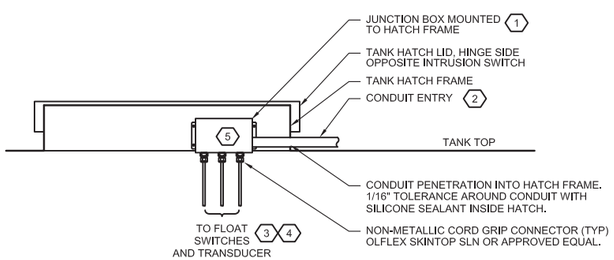
N1808



NOTES:
1. 6"H X 6"D X 84"W, NEMA 3R STAINLESS STEEL WIRING TROUGH. WIRING TROUGH SHALL BE B-LINE OR EQUAL. DOOR SHALL HAVE SEMI HINGES ON ONE SIDE AND SCREW CLAMPS ON OTHER. MOUNT TO BACKPAN USING ALL STAINLESS STEEL HARDWARE.
2. INSTALL EQUIPMENT PAD STRUCTURAL DETAILS.
3. WIDTH PER PLAN
4. DEVICE TYPE AND QUANTITY PER PLAN/P&ID

EQUIPMENT STACHION DETAIL

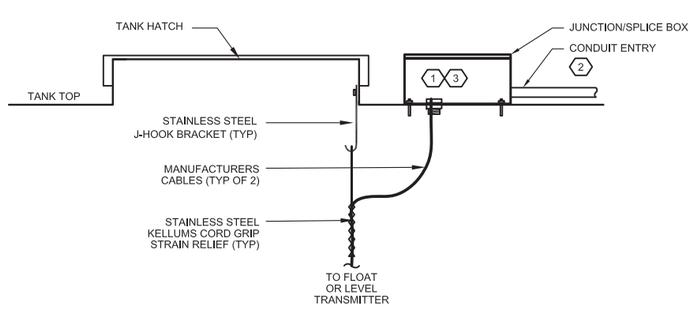
1 DETAIL NTS
ES



NOTES:
1. 6"H X 4"W X 4"D, NEMA 4X PVC JUNCTION/SPLICE BOX. JUNCTION BOX SHALL BE HOFFMAN JFGQRR OR EQUAL. MOUNT BOX ON WALL OF HATCH FRAME USING STAINLESS STEEL HARDWARE. MOUNT BOX WITH HINGE ON BOTTOM. APPLY SILICONE SEALANT TO PENETRATION BACKS TO SEAL BOX COMPLETELY.
2. CONDUIT ON TANK SHALL BE GRS AND PAINTED WITH TANK. SUPPORT CONDUIT WITH SINGLE BOLT CLAMPS WITH CLAMP-BACK SPACERS. DRILL AND TAP TANK FOR STAINLESS STEEL BOLT. COMPLETE CONDUIT INSTALLATION PRIOR TO TANK BEING PAINTED.
3. FLOAT SWITCH CABLES SHALL BE ATTACHED TO LADDER INSIDE TANK. USE ALL-PLASTIC ZIP TIES ON 2 FOOT CENTERS. HIGH FLOAT SHALL TRIP 4 INCHES BELOW OVERFLOW OUTLET. LOW FLOAT SHALL (UN)TRIP 6 INCHES ABOVE PUMP SUCTION OUTLET.
4. SUBMERSIBLE LEVEL TRANSDUCER SHALL HANG FREELY AND EXTEND TO 6" ABOVE BOTTOM OF TANK. DO NOT ATTACH TO LADDER.
5. SPLICES IN SPLICE BOX SHALL BE WATERPROOF. AFTER TESTING, INSTALL EPOXY RESIN SPLICE KITS, 3M SCOTCH-CAST OR APPROVED EQUAL.

TANK HATCH DETAIL

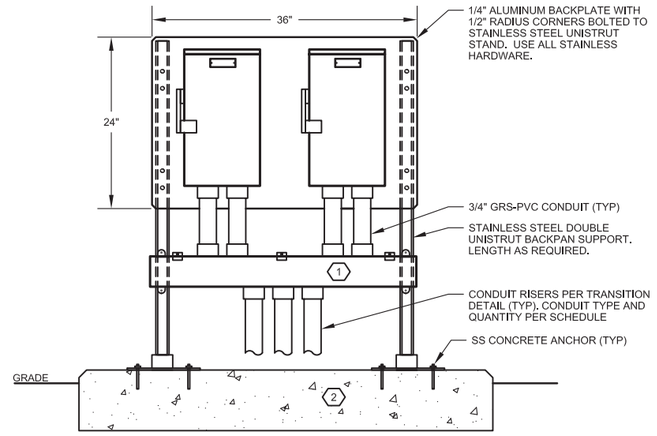
2 DETAIL NTS
TH



NOTES:
1. 14"W X 12"H X 8"D, NEMA 4X STAINLESS STEEL JUNCTION/SPLICE BOX. JUNCTION BOX SHALL BE HOFFMAN CHNFSS OR EQUAL.
2. CONDUIT ON TANK SHALL BE GRS AND PAINTED WITH TANK. SUPPORT CONDUIT WITH SINGLE BOLT CLAMPS WITH CLAMP-BACK SPACERS. DRILL AND TAP TANK FOR STAINLESS STEEL BOLT. COMPLETE CONDUIT INSTALLATION PRIOR TO TANK BEING PAINTED.
3. SPLICES IN SPLICE BOX SHALL BE WATERPROOF. AFTER TESTING, INSTALL EPOXY RESIN SPLICE KITS, 3M SCOTCH-CAST OR APPROVED EQUAL.

TANK HATCH JUNCTION BOX DETAIL

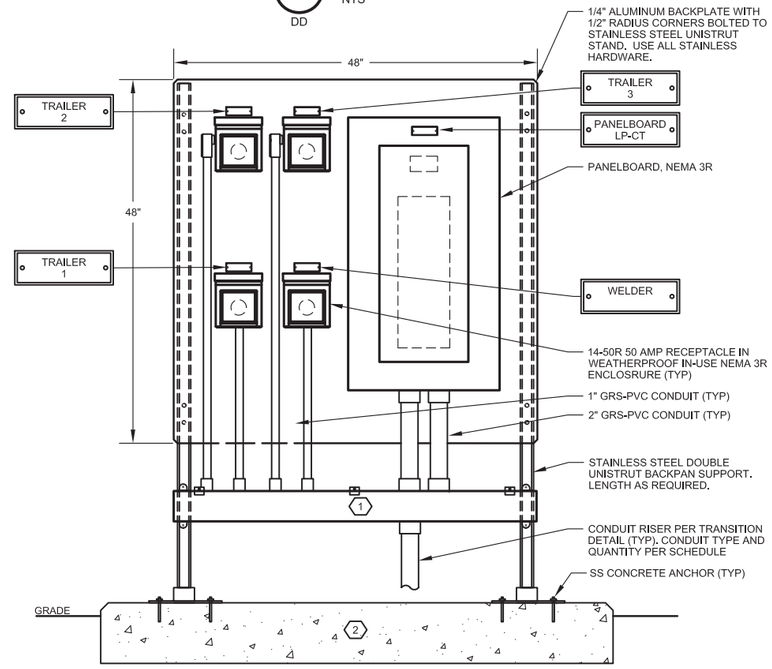
3 DETAIL NTS
THJ



NOTES:
1. 6"H X 6"D X 36"W, NEMA 3R STAINLESS STEEL WIRING TROUGH. WIRING TROUGH SHALL BE B-LINE OR EQUAL. DOOR SHALL HAVE SEMI HINGES ON ONE SIDE AND SCREW CLAMPS ON OTHER. MOUNT TO UNISTRUT USING ALL STAINLESS STEEL HARDWARE.
2. INSTALL EQUIPMENT PAD STRUCTURAL DETAILS.

DISCONNECT DETAIL

4 DETAIL NTS
DD



NOTES:
1. 4"H X 4"D X 48"W, NEMA 3R STAINLESS STEEL WIRING TROUGH. WIRING TROUGH SHALL BE B-LINE OR EQUAL. DOOR SHALL HAVE SEMI HINGES ON ONE SIDE AND SCREW CLAMPS ON OTHER. MOUNT TO UNISTRUT USING ALL STAINLESS STEEL HARDWARE.
2. INSTALL EQUIPMENT PAD STRUCTURAL DETAILS.

CONSTRUCTION TRAILER POWER DISTRIBUTION DETAIL

5 DETAIL NTS
CTP

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CONSTRUCTION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-54	REV 0

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0	9/8/14	PRE-FINAL (90%) DESIGN	MBY				TPF

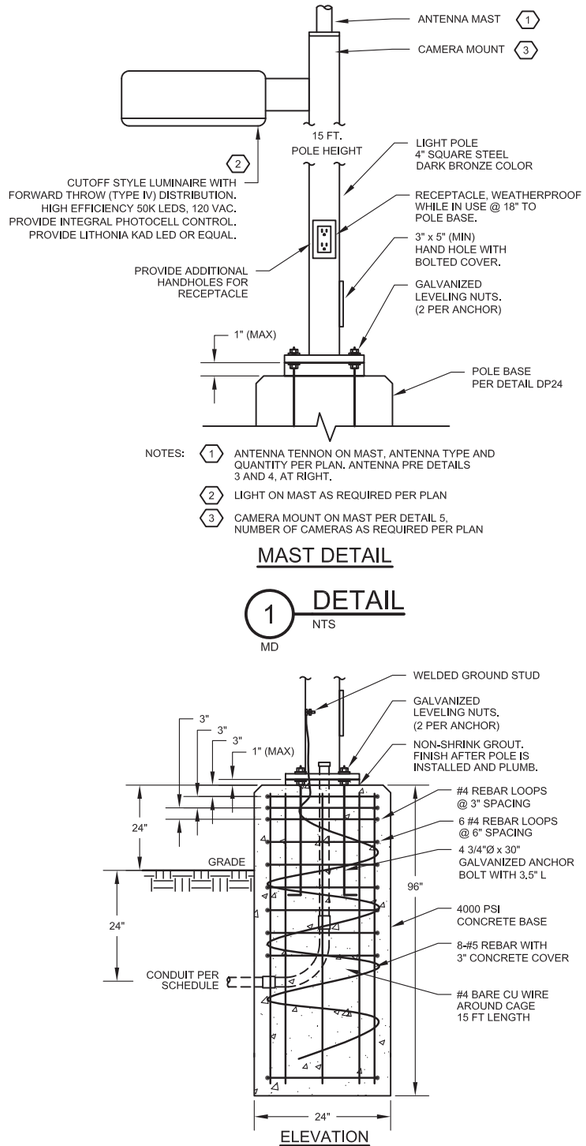
REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL DETAILS 4
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

PLOT DATE: Aug 25, 2014
PLOT TIME: 2:52:17pm
FILENAME: FE-E-XXX-0054AD.dwg

N1808

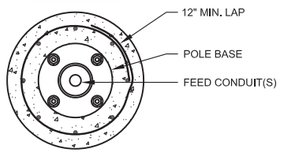


MAST DETAIL

1 DETAIL NTS

MD

ELEVATION

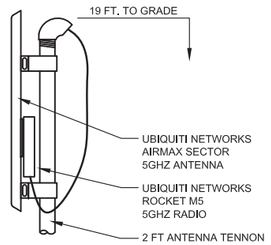


TOP VIEW

DRILLED PIER DETAIL

2 DETAIL NTS

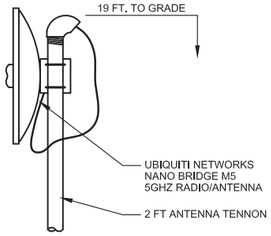
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AIRMAX SECTOR ANTENNA

3 DETAIL NTS

ASA



NANO BRIDGE ANTENNA

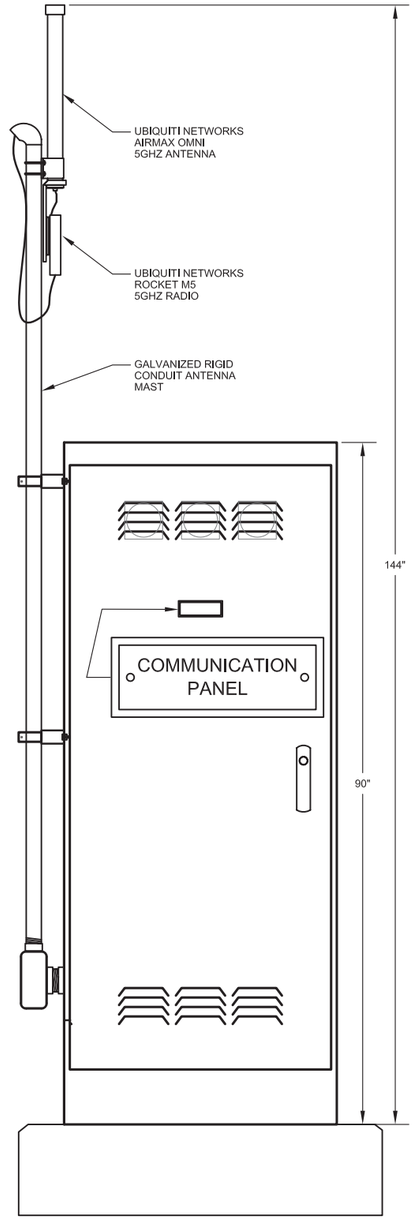
4 DETAIL NTS

NBA

CAMERA MOUNT DETAIL

5 DETAIL NTS

CAM



NODE ANTENNA DETAIL

6 DETAIL NTS

NAD

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0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

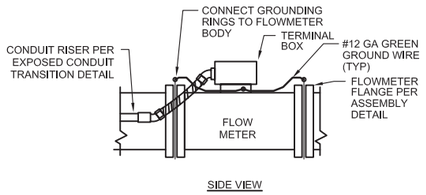
APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL DETAILS 5
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-55	REV 1

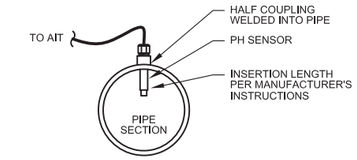
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N1808



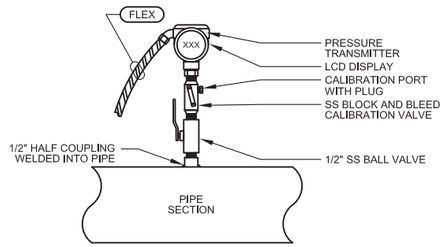
FLOWMETER DETAIL

1 DETAIL NTS
FM



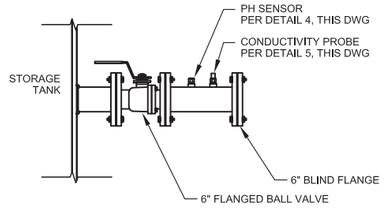
INLINE PH SENSOR DETAIL

4 DETAIL NTS
IPH



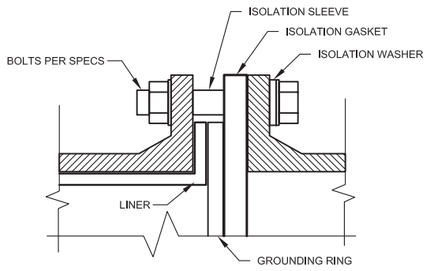
PRESSURE TRANSMITTER DETAIL

7 DETAIL NTS
PT



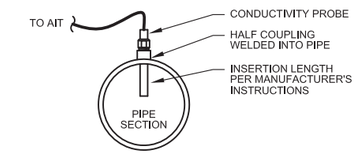
TANK PROBE DETAIL

10 DETAIL NTS
TP



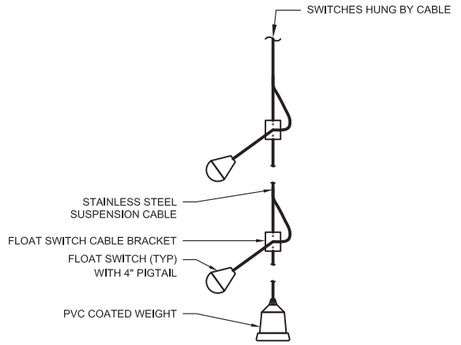
FLOWMETER FLANGE ASSEMBLY

2 DETAIL NTS
FMF



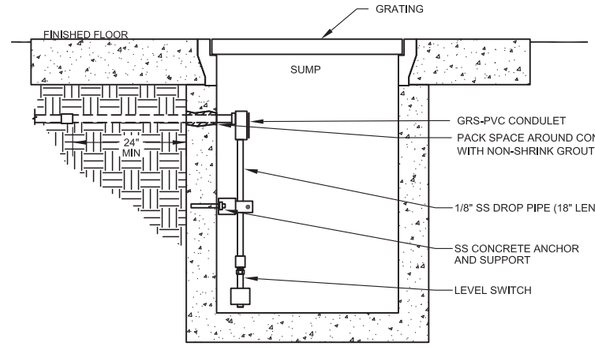
INLINE CONDUCTIVITY PROBE DETAIL

5 DETAIL NTS
ICP



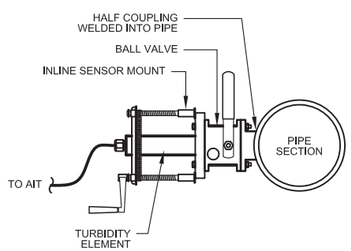
FLOAT SWITCH DETAIL

8 DETAIL NTS
FS



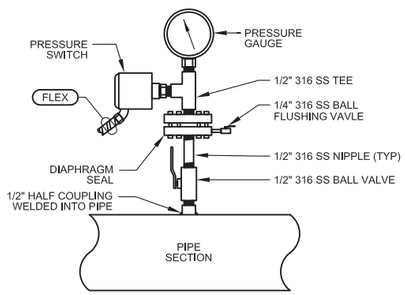
SUMP FLOAT SWITCH DETAIL

11 DETAIL NTS
FS



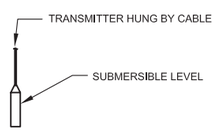
INLINE TURBIDITY PROBE DETAIL

3 DETAIL NTS
ITA



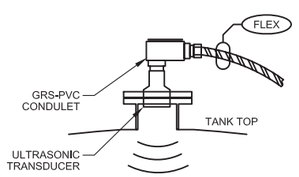
PRESSURE SWITCH DETAIL

6 DETAIL NTS
PS



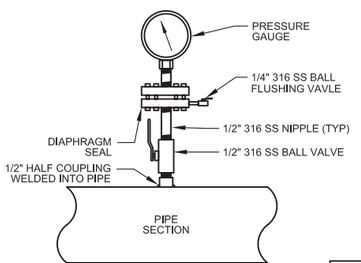
LEVEL TRANSMITTER DETAIL

9 DETAIL NTS
LT



ULTRASONIC LEVEL DETAIL

12 DETAIL NTS
USL



PRESSURE GAUGE DETAIL

13 DETAIL NTS
PG

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REVISIONS

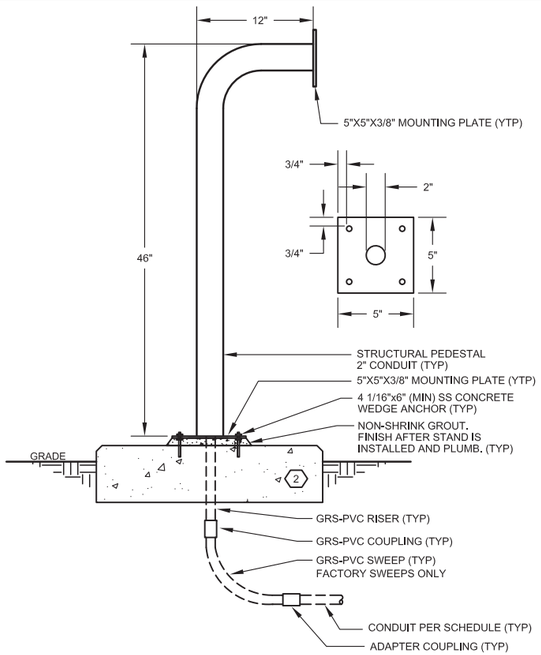
APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL
DETAILS 6
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-56	REV 1

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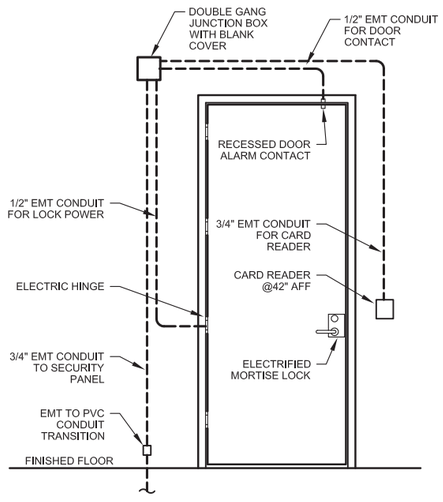


NOTES: 1 2' X 3' X 6" CONCRETE PAD WITH CHAMFERED CORNERS.

GATE ACCESS CONTROL
SINGLE HEIGHT GOOSENECK

1 DETAIL NTS

ARG

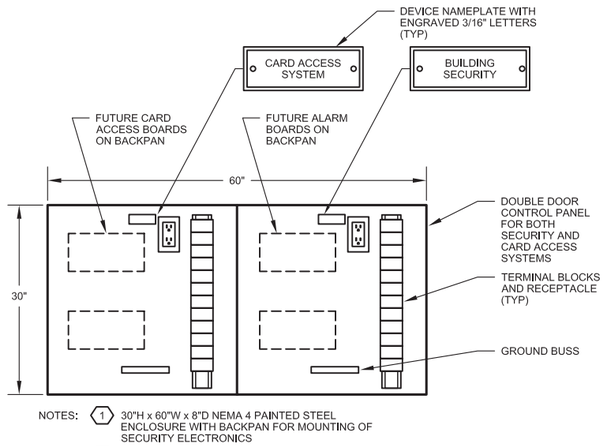


ACCESS CONTROL DOOR

SECURE SIDE, MIRROR FOR RIGHT HINGE

2 DETAIL NTS

ACD



NOTES: 1 30"H x 60"W x 8"D NEMA 4 PAINTED STEEL ENCLOSURE WITH BACKPAN FOR MOUNTING OF SECURITY ELECTRONICS

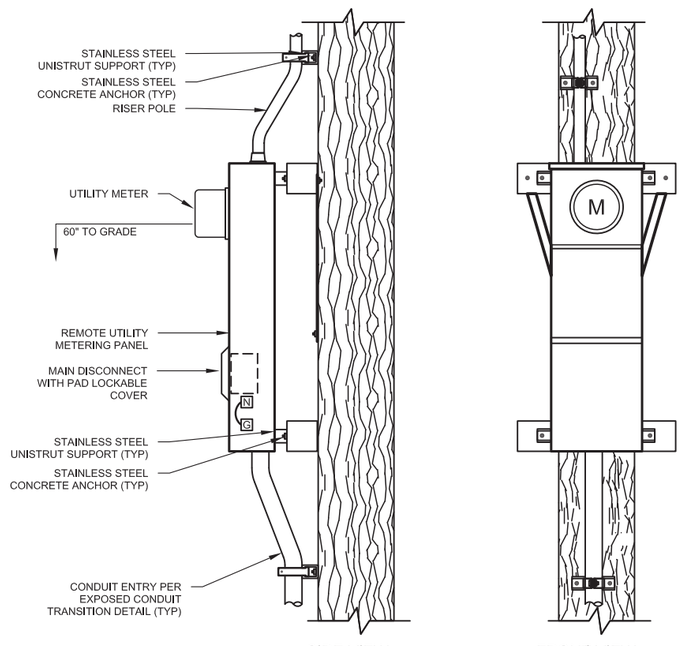
2 WIRE SENSORS TO TERMINAL BLOCKS FOR FUTURE CONNECTION BY OTHERS.

SECURITY ENCLOSURE

OUTER DOOR NOT SHOWN

3 DETAIL NTS

SED

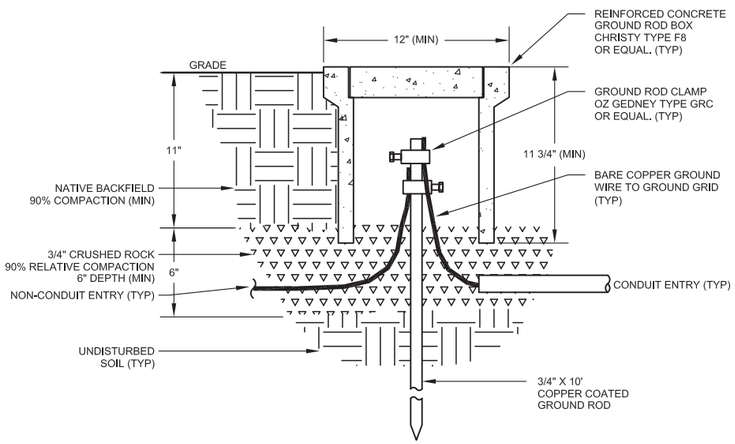


SIDE VIEW FRONT VIEW

METER/MAIN DISCONNECT DETAIL

4 DETAIL NTS

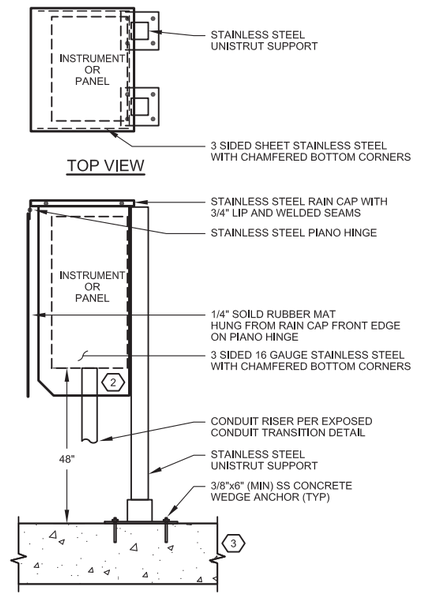
MMD



GROUND INSPECTION BOX DETAIL

5 DETAIL NTS

GIB



TOP VIEW

SIDE VIEW

NOTES: 1 ALL STAINLESS STEEL CONSTRUCTION WITH STAINLESS MACHINE HARDWARE.

2 SUNSHADE SHALL BE CUSTOM SIZED FOR INSTRUMENT OR CONTROL PANEL. PROVIDE 3" SPACE AROUND ALL SIDES OF PROTECTED EQUIPMENT

3 2' X 3' X 6" CONCRETE PAD (MINIMUM) WITH CHAMFERED CORNERS.

SUN SHADE DETAIL

6 DETAIL NTS

SS

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CONSTRUCTION

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FOLSOM, CA 95630
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0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY	
TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

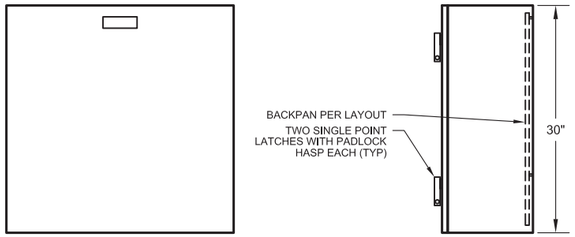
TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL
DETAILS 7
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-57	REV 1

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N1808

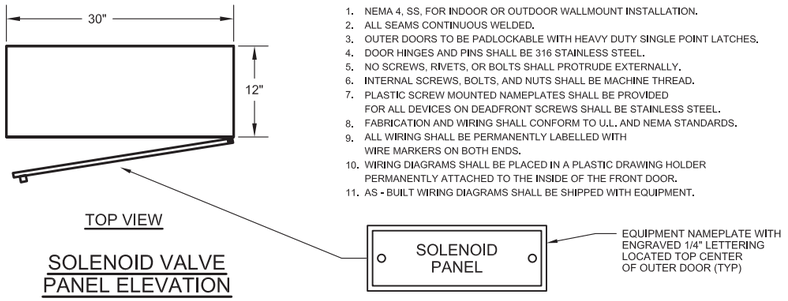


DOOR FRONT VIEW

SIDE ELEVATION

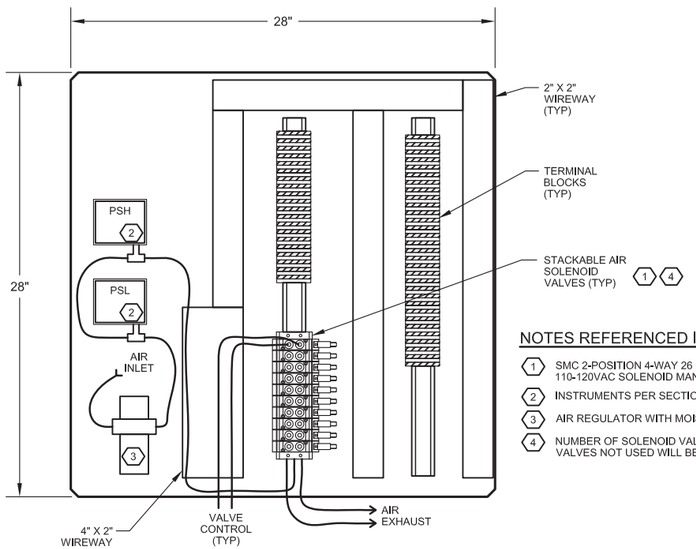
PANEL FABRICATION METHODS

1. NEMA 4, SS, FOR INDOOR OR OUTDOOR WALLMOUNT INSTALLATION.
2. ALL SEAMS CONTINUOUS WELDED.
3. OUTER DOORS TO BE PADLOCKABLE WITH HEAVY DUTY SINGLE POINT LATCHES.
4. DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
5. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
6. INTERNAL SCREWS, BOLTS, AND NUTS SHALL BE MACHINE THREAD.
7. PLASTIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL DEVICES ON DEADFRONT SCREWS SHALL BE STAINLESS STEEL.
8. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
9. ALL WIRING SHALL BE PERMANENTLY LABELLED WITH WIRE MARKERS ON BOTH ENDS.
10. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
11. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH EQUIPMENT.



TOP VIEW

SOLENOID VALVE PANEL ELEVATION



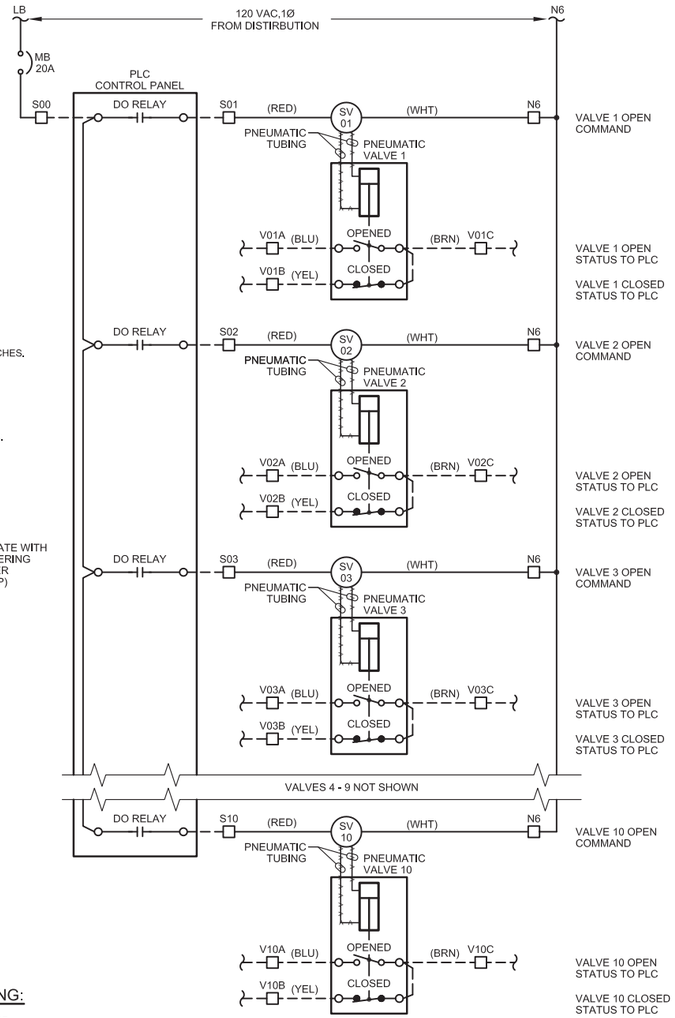
SOLENIOD VALVE PANEL BACKPAN LAYOUT

NOTES REFERENCED IN DRAWING:

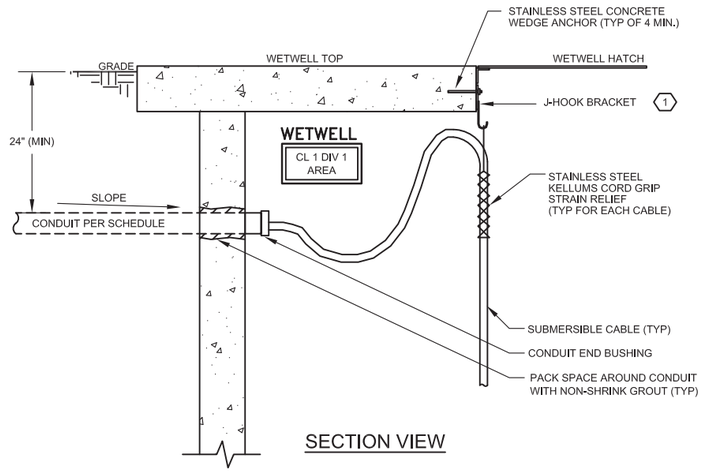
1. SMC 2-POSITION 4-WAY 26 SCFM @ 80PSIG, 110-120VAC SOLENOID MANIFOLD VALVE. (TYP)
2. INSTRUMENTS PER SECTION 16940 AND P&IDS
3. AIR REGULATOR WITH MOISTURE TRAP
4. NUMBER OF SOLENOID VALVES PER P&ID, VALVES NOT USED WILL BE SPARE.

SOLENIOD VALVE PANEL
NOT TO SCALE

1 DETAIL NTS
ACD



VALVE CONTROL (TYPICAL)
(TYPICAL FOR ALL 10 PNEUMATIC VALVES)



SECTION VIEW

NOTES: 1 CUSTOM MANUFACTURERED J-HOOK ASSEMBLY CONSISTING OF STAINLESS STEEL PLATE WITH STAINLESS STEEL J-HOOKS WELDED TO PLATE. PROVIDE ONE HOOK PER WETWELL CABLE.

WETWELL CONDUIT ENTRANCE DETAIL
NOT TO SCALE

2 DETAIL NTS
WWD

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF

REVISIONS

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TPF	SO
	SUPV TPF
	DSGN MBY
	DWN MBY, NC
	CHKD MF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL
DETAILS 8
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

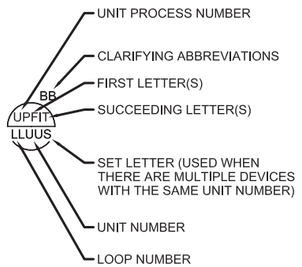
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SHEET NO. of SHEETS	
E-00-58	REV 0

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FILENAME: FE-E-XXX-0058AD.dwg

INSTRUMENT IDENTIFICATION

ANALOG IND.

EXAMPLE SYMBOLS



DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- $\triangle_X$ DISCRETE INPUT
- ∇_X DISCRETE OUTPUT

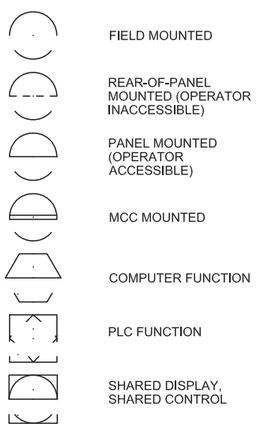
INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST-LETTER		SUCCEEDING-LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION
A	ANALYSIS (+)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
C	USER'S CHOICE (*)			CONTROL	
D	DENSITY (S.G.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT, SENSOR		
	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE (*)		GLASS, GAUGE VIEWING DEVICE	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
O	USER'S CHOICE (*)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI VARIABLE		MULTI FUNCTION	MULTI FUNCTION	MULTI FUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (*)	X AXIS	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TABLE BASED ON THE INSTRUMENTATION, SYSTEMS, AND AUTOMATION SOCIETY (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.
(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT.

GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS



TRANSDUCERS

A	ANALOG	I	CURRENT
D	DIGITAL	P	PNEUMATIC
E	VOLTAGE	PF	PULSE FREQUENCY
F	FREQUENCY	PD	PULSE DURATION
H	HYDRAULIC	R	RESISTANCE

EXAMPLE



CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

ACCESSORY DEVICES

A	ALARM
C	CONTROLLER
I	INDICATOR
R	RECORDER
S	SWITCH
T	TRANSMITTER
X	UNCLASSIFIED

EXAMPLE



TRANSMITTER AS AN ACCESSORY TO A FLOW ELEMENT

SPECIAL CASES



ON AND OFF EVENT LIGHTS



ON-OFF HAND SWITCH, MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).



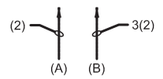
STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

LINE LEGEND



- PRIMARY PROCESS LINE
- SECONDARY PROCESS LINE
- PACKAGE PROCESS LINE
- VENDOR PROCESS LINE
- EXISTING PROCESS LINE
- FUTURE PROCESS LINE
- PROCESS FLOW DIAGRAM
- DISCRETE SIGNAL LINE
- ANALOG SIGNAL LINE
- SOFTWARE LINK SIGNAL LINE
- PNUEMATIC SYMBOL LINE
- FILLED SYSTEM SIGNAL LINE
- INSTRUMENT AIR SIGNAL LINE

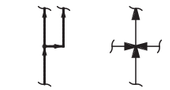
PARALLELING LINES



(A) TOTAL OF 2 SIGNALS

(B) 3 TYPICAL SETS OF 2 SIGNALS EACH. TOTAL OF 6 SIGNALS.

CONNECTING LINES



NON-CONNECTING LINES



INTERFACE SYMBOLS



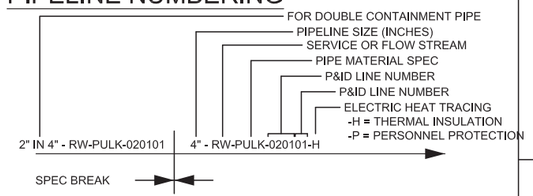
PROCESS INTERFACE

D DESTINATION DRAWING NO.

S SOURCE DRAWING NO.



PIPELINE NUMBERING



SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

X-DDD-EFF

X LOCATION ID

DDD	EQUIPMENT DESIGNATION
ARV	AIR RELEASE VALVE
AVRV	AIR AND VACUUM RELEASE VALVE
CMP	AIR COMPRESSOR
DRM	EXTRACTION WELL
EXT	DRUM/VESSEL
FIL	FILTER
INJ	INJECTION WELL
LPS	LIQUID PHASE SEPARATOR
MOV	MOTOR OPERATED VALVE
MTR	MOTOR
PMP	PUMPS
TNK	ATMOSPHERIC STORAGE TANK
V	PACKAGE EQUIPMENT
X	MISCELLANEOUS EQUIPMENT

E AREA

FF TWO DIGIT EQUIPMENT IDENTIFIER

X LOCATION ID

XV	PNEUMATIC VALVE (OPEN/CLOSE, NO MODULATING)
FCV	FLOW CONTROL VALVE (ANALOG MODULATING)
FV	FLOW VALVE (OPEN/CLOSE, NO MODULATING)

SEE SPECIFICATIONS SECTION 40 27 02 FOR VALVE TYPE

ABBREVIATIONS & LETTER SYMBOLS

AC	ALTERNATING CURRENT
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CCS	CENTRAL CONTROL SYSTEM
CL_2 etc.	CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATIONS)
CM	COMPUTER-MANUAL
COD	CHEMICAL OXYGEN DEMAND
CP-X	CONTROL PANEL NO. X
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU	DISTRIBUTED CONTROL UNIT
DO	DISSOLVED OXYGEN
FCL_2	FREE CHLORINE RESIDUAL
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP-W-X	FIELD PANEL NO. WX (W=UNIT PROCESS NUMBER X=PANEL NUMBER)
FR	FORWARD-REVERSE
HC	HAND CONTROL
HDPE	HIGH DENSITY POLYETHYLENE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HS	HAND-SWITCH
ISR	INTRINSICALLY SAFE RELAY
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MC	MODULATE-CLOSE
MCC-X	MOTOR CONTROL CENTER NO. X
MSC	MANUFACTURER SUPPLIED CABLE
OC	OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
pH	HYDROGEN ION CONCENTRATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
RIO	REMOTE I/O UNIT
RM-X	REMOTE MULTIPLEXING MODULE NO. X
RTU-X	REMOTE TELEMETRY UNIT NO. X
SF	SLOWER-FASTER
SS	START-STOP
SSC	SUPERVISORY SET POINT CONTROL
STL	CARBON STEEL
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
Δ	DIFFERENCE
Σ	SUM
X	MULTIPLY
÷	DIVIDE
F(X)	CHARACTERIZED
X^n	RAISED TO THE Nth POWER
$\sqrt{\ }$	SQUARE ROOT
AVG	AVERAGE
1:1	REPEAT OR BOOST
>	SELECT HIGHEST SIGNAL
<	SELECT LOWEST SIGNAL
}	BIAS
%	GAIN OR ATTENUATE

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (✳) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (✳✳) ARE TO BE PROVIDED UNDER DIVISION 40, ELECTRICAL.
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THE PROJECT.

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1	9/8/14	PRE-FINAL (90%) DESIGN		MBY			TPF
0	4/5/13	INTERMEDIATE (60%) DESIGN		MBY			TPF

REVISIONS

APPROVED BY: TPF

SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INSTRUMENTATION SYMBOLS AND ABBREVIATIONS 1
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
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N1808

VALVE SYMBOLS

- GATE
- KNIFE GATE
- BUTTERFLY
- GLOBE
- BALL
- DIAPHRAGM WEIR
- PINCH
- NEEDLE
- SWING CHECK
- BACKFLOW PREVENTER
- SAMPLE
- PRESSURE RELIEF
- AIR AND/OR VACUUM RELEASE
- REGULATED SIDE PRESSURE CONTROL
- MULTI-PORT VALVE (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
- ANGLE GATE

ACTUATOR SYMBOLS

- PNEUMATIC DIAPHRAGM SPRING-OPPOSED, SINGLE OR DOUBLE ACTING
- VALVE POSITIONER
- MANUAL
- PNEUMATIC CYLINDER SINGLE OR DOUBLE ACTING ACTUATED BY ONE INPUT
- HYDRAULIC
- ELECTRIC MOTOR
- DIAPHRAGM, DIFFERENTIAL PRESSURE
- SOLENOID
- ELECTROHYDRAULIC

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)

XX: FO FAIL OPEN
FC FAIL CLOSED
FLP FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

- ELECTROMAGNETIC FLOWMETER
- LEVEL (BUBBLER TUBE)
- LEVEL (FLOAT)
- ROTAMETER
- DENSITY METER
- GENERIC
- LEVEL

TANKS, VESSEL AND VEHICLES

- DOUBLE CONTAINED TANK
- FRAC TANK
- DISHED HEAD FLAT BOTTOM
- TANK TRUCK - END
- 55 GALLON DRUM
- DRUM / VESSEL

MISCELLANEOUS SYMBOLS

- VENT TO ATMOSPHERE
- AIR GAP
- DRIP TRAP
- SELF CONTAINED AIR SUPPLY
- AIR PURGE SET
- FLUSHING CONNECTION
- SEAL WATER SET
- WATER PURGE SET
- FLEXIBLE CONNECTION
- DIAPHRAGM SEAL
- ANNULAR DIAPHRAGM SEAL
- CALIBRATION COLUMN
- BLIND FLANGE
- PIPE CAP
- STRAINER
- PULSATION DAMPENER
- HOSE CONNECTION
- DOUBLE NOZZLE
- SPECIALTY ITEM
- WALL PLUG/SOCKET
- CARTRIDGE FILTER
- DOWN HOLE FLOW CONTROL VALVE
- BASKET FILTER
- PANEL CONTINUED ON SAME OR OTHER DRAWING
- PANEL OUTLINE
- PANEL NAME
- 120 VOLT, 60 HZ POWER
- 480 VOLT, 60 HZ POWER
- AIR SET XX = SUPPLY PRESSURE IN PSIG.
- PLUG
- RECEPTACLE
- TV MONITOR
- TV CAMERA
- LOGIC ELEMENT: IF A AND NOT B THEN C
- LOGIC ELEMENT: IF A OR B THEN C
- RADIO ANTENNA
- INTERLOCK, SEE CONTROL DIAGRAMS
- VOICE COMMUNICATION POINT
- REDUCER
- EJECTOR
- SECONDARY CONTAINMENT
- AIR INLET FILTER
- MAN WAY
- STATIC MIXER

LINE SIZE AND MATERIAL IDENTIFICATION

(FOR REFERENCE ONLY. SEE SITE AND MECHANICAL DRAWINGS AND SPECIFICATIONS)

CSLF	A53 B CS, CLASS 125
HALE	HDPE, SDR 11
HLAD	HDPE, SOLVAY ELTEX TUB 124
HSLF	HDPE, SDR 9 (FM APPROVED)
LCLF	A53 B CEMENT LINED CS, CLASS 125
PULK	CPVC, CLASS 150
PVLK	PVC, CLASS 150
SABD	A312 TP304/304L SS, CLASS 300
SUTK	A213 TYPE 316L, SS TUBING

FLOW STREAM IDENTIFICATION

ACD	19% HCl OR 93% H2SO4
CA	RIVERBANK EXTRACTION WATER (MAY BE CARBON AMENDED)
CAU	25% CAUSTIC
CO2	CARBON DIOXIDE
COG	COAGULANT
DR	DRAIN
EW	EMERGENCY/FIRE WATER
EX	EXTRACTED GROUNDWATER (TRANSWESTERN OR EAST RAVINE)
FW	FRESH WATER
IA	INSTRUMENT AIR
HC	HYPOCHLORITE
DCL	DECHLORINATION
RW	REMEDY PRODUCED WATER
SL	SLURRY/SOLIDS
TFW	TREATED FRESHWATER
TW	TREATED (FILTERED) REMEDY PRODUCED WATER
UA	UTILITY AIR
VT	VENT
WS	WASTE STREAM
LW	LAB WASTE
PW	POTABLE WATER
BWS	BACKWASH SUPPLY
BWW	BACKWASH WASTE
UW	UTILITY WATER

PUMP AND COMPRESSOR SYMBOLS

- CENTRIFUGAL PUMP
- METERING PUMP (POSITIVE DISPLACEMENT)
- CENTRIFUGAL COMPRESSOR
- SCREW COMPRESSOR
- SUBMERSIBLE SUMP PUMP
- WELL PUMP
- PERISTALTIC PUMP
- AIR DIAPHRAGM PUMP

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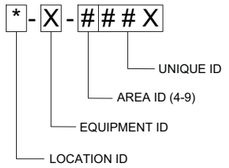
REVISIONS

APPROVED BY	TPF
SO	
SUPV	TPF
DSGN	MBY
DWN	MBY, NC
CHKD	MF
OK	TPF
DATE	
SCALES	N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INSTRUMENTATION SYMBOLS AND ABBREVIATIONS 2
GAS TRANSMISSION & DISTRIBUTION
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FILENAME: FE-I-XXX-0002AD.dwg
N1808



INTERLOCKS

- 400 TCS LOOP WELL HEAD VAULT FLOAT SWITCH INTERLOCK
  DISABLE PUMPS P-4XX. DISABLE FLOW CONTROL VALVES FV-4XX.
- 401 TCS LOOP PIPELINE LEAK DETECTION
  DISABLE PUMPS P-4XX. DISABLE FLOW CONTROL VALVES FV-4XX.
- 402 TCS LOOP PACKER PRESSURE LOW
  DISABLE PUMPS P-4XX. DISABLE FLOW CONTROL VALVES FV-4XX.
- 500 IRZ WELL HEAD VAULT FLOAT SWITCH INTERLOCK
  DISABLE PUMPS P-5XX. DISABLE FLOW CONTROL VALVES FV-5XX.
- 501 IRZ PIPELINE LEAK DETECTION
  DISABLE PUMPS P-5XX. DISABLE FLOW CONTROL VALVES FV-5XX.
- 502 IRZ PACKER PRESSURE LOW
  DISABLE PUMPS P-5XX. DISABLE FLOW CONTROL VALVES FV-5XX.
- 600 IRL LOOP WELL HEAD VAULT FLOAT SWITCH INTERLOCK
  DISABLE PUMPS P-6XX. DISABLE FLOW CONTROL VALVES FV-6XX.
- 601 IRL LOOP PIPELINE LEAK DETECTION
  DISABLE PUMPS P-6XX. DISABLE FLOW CONTROL VALVES FV-6XX.
- 602 IRL PACKER PRESSURE LOW
  DISABLE PUMPS P-6XX. DISABLE FLOW CONTROL VALVES FV-6XX.
- 700 MW-20 CARBON AMENDMENT ROOM LEAK DETECTION
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 701 MW-20 CARBON AMENDMENT ROOM LEAK DETECTION
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
  DISABLE WELLS IRZXX-, IRLXX-, AND RBXX-.
- 702 MW-20 CARBON AMENDMENT ROOM PRESSURE DETECTION
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 703 MW-20 ETHANOL TANK HIGH LEVEL
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 704 MW-20 ETHANOL TANK LOW LEVEL
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 705 MW-20 WELL MAINTENANCE ROOM LEAK DETECTION
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 706 MW-20 WELL MAINTENANCE ROOM PRESSURE DETECTION
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 707 MW-20 WELL MAINTENANCE DAY TANK HIGH LEVEL
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 708 MW-20 WELL MAINTENANCE DAY TANK LOW LEVEL
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 709 MW-20 EYEWASH STATION INTERLOCK
  DISABLE PUMPS P-7XX. DISABLE FLOW CONTROL VALVES FV-7XX.
- 900 TWB CARBON AMENDMENT ROOM LEAK DETECTION
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 901 TWB CARBON AMENDMENT ROOM LEAK DETECTION
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
  DISABLE WELLS TCSXX-, TWBXX-, AND ERXX-.
- 902 TWB CARBON AMENDMENT ROOM PRESSURE DETECTION
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 903 TWB ETHANOL TANK HIGH LEVEL
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 904 TWB ETHANOL TANK LOW LEVEL
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 905 TWB WELL MAINTENANCE ROOM LEAK DETECTION
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 906 TWB WELL MAINTENANCE ROOM PRESSURE DETECTION
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 907 TWB WELL MAINTENANCE DAY TANK HIGH LEVEL
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 908 TWB WELL MAINTENANCE DAY TANK LOW LEVEL
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.
- 909 TWB EYEWASH STATION INTERLOCK
  DISABLE PUMPS P-8XX. DISABLE FLOW CONTROL VALVES FV-8XX.

IRZ (AREA ID 5)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	PHYSICAL WELL ID
IRZ-1	IRZ01-	1	IRZ01-A
IRZ-1	IRZ01-	3	IRZ01-A
IRZ-5	IRZ05-	1	IRZ05-A
IRZ-5	IRZ05-	3	IRZ05-A
IRZ-9	IRZ09-	1	IRZ09-A
IRZ-9	IRZ09-	3	IRZ09-A
IRZ-11	IRZ11-	1	IRZ11-A
IRZ-11	IRZ11-	2	IRZ11-A
IRZ-11	IRZ11-	3	IRZ11-B
IRZ-11	IRZ11-	4	IRZ11-B
IRZ-13	IRZ13-	1	IRZ13-A
IRZ-13	IRZ13-	2	IRZ13-A
IRZ-13	IRZ13-	3	IRZ13-B
IRZ-13	IRZ13-	4	IRZ13-B
IRZ-15	IRZ15-	1	IRZ15-A
IRZ-15	IRZ15-	2	IRZ15-A
IRZ-15	IRZ15-	3	IRZ15-B
IRZ-15	IRZ15-	4	IRZ15-B
IRZ-16	IRZ16-	1	IRZ16-A
IRZ-16	IRZ16-	2	IRZ16-A
IRZ-16	IRZ16-	3	IRZ16-B
IRZ-16	IRZ16-	4	IRZ16-B
IRZ-17	IRZ17-	1	IRZ17-A
IRZ-17	IRZ17-	2	IRZ17-A
IRZ-17	IRZ17-	3	IRZ17-B
IRZ-17	IRZ17-	4	IRZ17-B
IRZ-19	IRZ19-	1	IRZ19-A
IRZ-19	IRZ19-	2	IRZ19-A
IRZ-19	IRZ19-	3	IRZ19-B
IRZ-19	IRZ19-	4	IRZ19-B
IRZ-20	IRZ20-	1	IRZ20-A
IRZ-20	IRZ20-	2	IRZ20-A
IRZ-20	IRZ20-	3	IRZ20-B
IRZ-20	IRZ20-	4	IRZ20-B
IRZ-21	IRZ21-	1	IRZ21-A
IRZ-21	IRZ21-	2	IRZ21-A
IRZ-21	IRZ21-	3	IRZ21-B
IRZ-21	IRZ21-	4	IRZ21-B
IRZ-23	IRZ23-	1	IRZ23-A
IRZ-25	IRZ25-	1	IRZ25-A
IRZ-25	IRZ25-	3	IRZ25-A
IRZ-27	IRZ27-	1	IRZ27-A
IRZ-27	IRZ27-	3	IRZ27-A
IRZ-29	IRZ29-	1	IRZ29-A
IRZ-29	IRZ29-	3	IRZ29-A
IRZ-31	IRZ31-	1	IRZ31-A
IRZ-31	IRZ31-	3	IRZ31-A
IRZ-33	IRZ33-	1	IRZ33-A
IRZ-33	IRZ33-	3	IRZ33-A
IRZ-35	IRZ35-	1	IRZ35-A
IRZ-37	IRZ37-	1	IRZ37-A
IRZ-39	IRZ39-	1	IRZ39-A

NOTES

1. AREA ID 7 DENOTES NTH IRZ CARBON AMENDMENT FACILITY AT MW-20 BENCH.
2. AREA 9 DENOTES CARBON AMENDMENT FACILITY AT TRANSWESTERN BENCH.

FUTURE PROVISIONAL IRZ (AREA ID 5)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	PHYSICAL WELL ID
IRZ-2	IRZ02-	1	IRZ02-A
IRZ-2	IRZ02-	2	IRZ02-A
IRZ-2	IRZ02-	3	IRZ02-B
IRZ-2	IRZ02-	4	IRZ02-B
IRZ-3	IRZ03-	1	IRZ03-A
IRZ-3	IRZ03-	2	IRZ03-A
IRZ-3	IRZ03-	3	IRZ03-B
IRZ-3	IRZ03-	4	IRZ03-B
IRZ-4	IRZ04-	1	IRZ04-A
IRZ-4	IRZ04-	2	IRZ04-A
IRZ-4	IRZ04-	3	IRZ04-B
IRZ-4	IRZ04-	4	IRZ04-B
IRZ-6	IRZ06-	1	IRZ06-A
IRZ-6	IRZ06-	2	IRZ06-A
IRZ-6	IRZ06-	3	IRZ06-B
IRZ-6	IRZ06-	4	IRZ06-B
IRZ-7	IRZ07-	1	IRZ07-A
IRZ-7	IRZ07-	2	IRZ07-A
IRZ-7	IRZ07-	3	IRZ07-B
IRZ-7	IRZ07-	4	IRZ07-B
IRZ-8	IRZ08-	1	IRZ08-A
IRZ-8	IRZ08-	2	IRZ08-A
IRZ-8	IRZ08-	3	IRZ08-B
IRZ-8	IRZ08-	4	IRZ08-B
IRZ-10	IRZ10-	1	IRZ10-A
IRZ-10	IRZ10-	2	IRZ10-A
IRZ-10	IRZ10-	3	IRZ10-B
IRZ-10	IRZ10-	4	IRZ10-B
IRZ-12	IRZ12-	1	IRZ12-A
IRZ-12	IRZ12-	2	IRZ12-A
IRZ-12	IRZ12-	3	IRZ12-B
IRZ-12	IRZ12-	4	IRZ12-B
IRZ-14	IRZ14-	1	IRZ14-A
IRZ-14	IRZ14-	2	IRZ14-A
IRZ-14	IRZ14-	3	IRZ14-B
IRZ-14	IRZ14-	4	IRZ14-B
IRZ-18	IRZ18-	1	IRZ18-A
IRZ-18	IRZ18-	2	IRZ18-A
IRZ-18	IRZ18-	3	IRZ18-B
IRZ-18	IRZ18-	4	IRZ18-B
IRZ-22	IRZ22-	1	IRZ22-A
IRZ-22	IRZ22-	2	IRZ22-A
IRZ-22	IRZ22-	3	IRZ22-B
IRZ-22	IRZ22-	4	IRZ22-B
IRZ-24	IRZ24-	1	IRZ24-A
IRZ-24	IRZ24-	3	IRZ24-A
IRZ-26	IRZ26-	1	IRZ26-A
IRZ-26	IRZ26-	3	IRZ26-A
IRZ-28	IRZ28-	1	IRZ28-A
IRZ-28	IRZ28-	3	IRZ28-A
IRZ-30	IRZ30-	1	IRZ30-A
IRZ-30	IRZ30-	3	IRZ30-A
IRZ-32	IRZ32-	1	IRZ32-A
IRZ-32	IRZ32-	3	IRZ32-A
IRZ-34	IRZ34-	1	IRZ34-A
IRZ-36	IRZ36-	1	IRZ36-A
IRZ-38	IRZ38-	1	IRZ38-A
IRZ-40	IRZ40-	1	IRZ40-A

TCS LOOP (AREA ID 4)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
TCS-1	TCS01-	1	TCS01-A
TCS-1	TCS01-	3	TCS01-A
TCS-2	TCS02-	1	TCS02-A
TCS-2	TCS02-	3	TCS02-A

EAST RAVINE (AREA ID 4)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
ER-1	ER01-	1	ER01-A
ER-2	ER02-	1	ER02-A
ER-3	ER03-	1	ER03-A
ER-4	ER04-	1	ER04-A
ER-6	ER06-	1	ER06-A

TRANSWESTERN BENCH (AREA ID 4)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
TWB-1	TWB01-	1	TWB01-A
TWB-2	TWB02-	1	TWB02-A

INNER RECIRCULATION LOOP (AREA ID 6)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
IRL-1	IRL01-	1	IRL01-A
IRL-2	IRL02-	1	IRL02-A
IRL-3	IRL03-	1	IRL03-A
IRL-4	IRL04-	1	IRL04-A

RIVERBANK (AREA ID 6)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	PHYSICAL WELL ID
RB-1	RB01-	1	RB01-A
RB-2	RB02-	1	RB02-A
RB-3	RB03-	1	RB03-A
RB-4	RB04-	1	RB04-A
RB-5	RB05-	1	RB05-A

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	09/08/14	PRE-FINAL (90%) DESIGN	MS	MWM	JPB	JEF	
0	04/05/13	INTERMEDIATE (60%) DESIGN	MS	MWM	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN MWM
DWN MS
CHKD JPB
OK JEF
DATE 09/08/14
SCALES NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

REMEDY WELL ID SCHEDULE

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

- DRAFT - NOT FOR CONSTRUCTION

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
I-00-03
REV 1

N180B

08/27/2014, 10:59, G:\Graphics\ART\TOPOCK-01\Post 90%\I-00-03.dwg, Tab: I-00-03