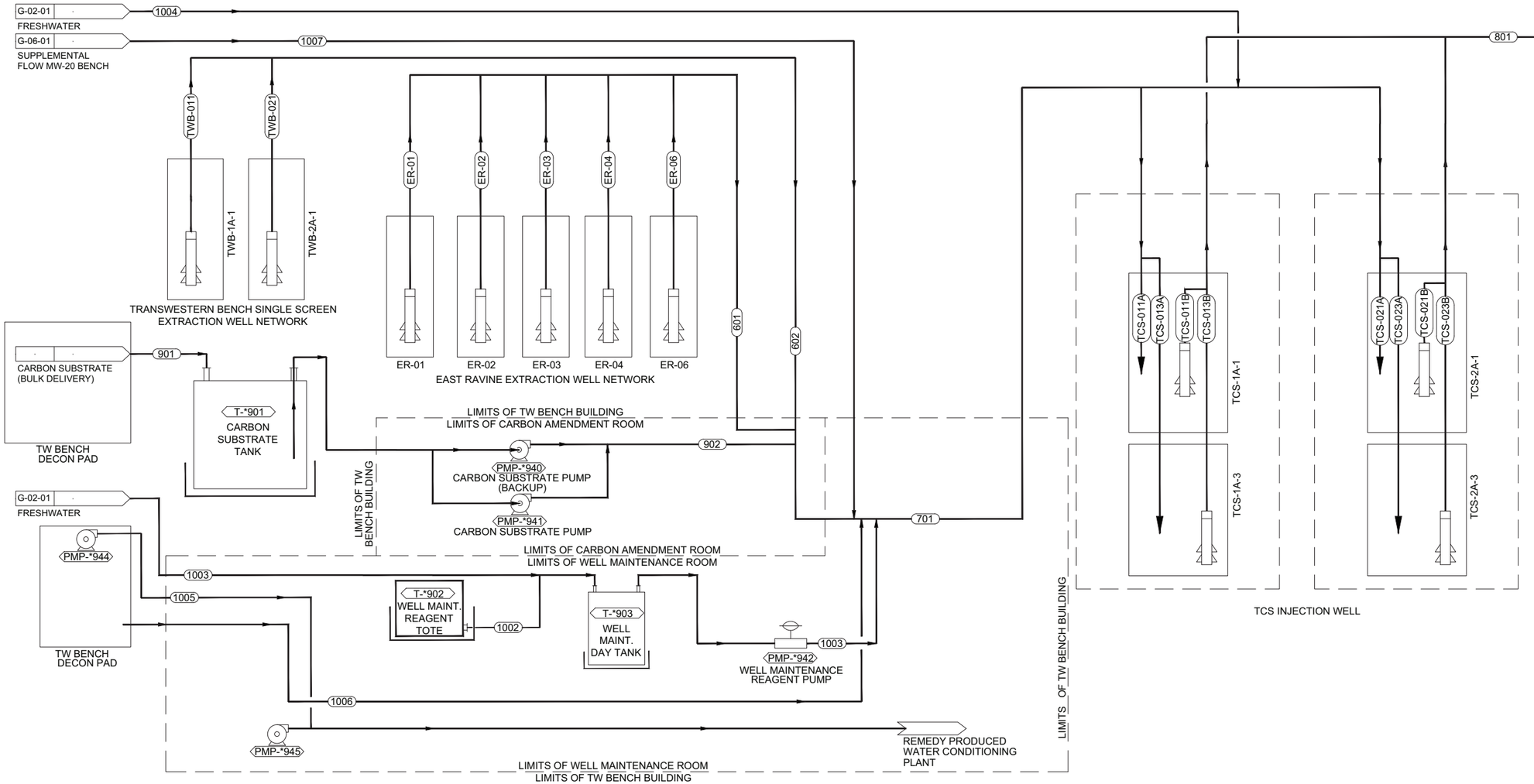

Design Basis and Mass Balance[a]

Stream ID:	601	602	701	801	901	902	1001	1002	1003	1004	1005	1006	1007	TWB-011	TWB-021	ER-01	ER-02	ER-03	ER-04	ER-06	TCS-011A	TCS-013A	TCS-021A	TCS-023A	TCS-XXXB
Stream Description:	EXGW	EXGW	CAGW	BWGW	ETOH	ETOH	FW	WMR	WMR	FW			Supp. Flow	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	CAGW	CAGW	CAGW	CAGW	BWGW[f]
Nominal Design Parameters																									
Flow Rate (GPM):	5	22	24	12	----	---	TBD	TBD	TBD	TBD	TBD	TBD	TBD	13	9	0.5	0.5	0.5	0.5	3	6	6	6	6	g
Carbon Substrate[b,c] (GPD):	---	---	8.3	---	---	8.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.1	2.1	2.1	2.1	---
TOC[b,c] (mg/L):	---	---	100	---	---	100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	100	100	100	100	---
Chromium[d] (µg/L):	77	3,914	---	---	---	---	---	---	---	---	---	---	---	4,200	3,500	400	250	65	55	2460	---	---	---	---	---
Chromium[d] (lbs/day):	4.6E-03	1.0E+00	---	---	---	---	---	---	---	---	---	---	---	6.5E-01	3.8E-01	2.4E-03	1.5E-03	3.9E-04	3.3E-04	8.8E-02	---	---	---	---	---
Maximum Design Parameters																									
Flow Rate (GPM):	9	30	75	40	---	38	TBD	TBD	TBD	TBD	TBD	TBD	TBD	15	15	1	1	1	1	5	20	20	20	20	g
Carbon Substrate[b,c] (GPD):	---	---	130	---	e	130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	35	35	35	35	---
TOC[b,c] (mg/L):	---	---	500	---	---	500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	500	500	500	500	---
Chromium[d] (µg/L):	86	3,850	---	---	---	---	---	---	---	---	---	---	---	4,200	3,500	400	250	65	55	2460	---	---	---	---	---
Chromium[d] (lbs/day):	9.2E-03	1.4	---	---	---	---	---	---	---	---	---	---	---	7.5E-01	6.3E-01	4.8E-03	3.0E-03	7.8E-04	6.6E-04	1.5E-01	---	---	---	---	---

Typ. For XXX = 011 to 023

a - Values represent target/estimated design parameters for initial operation; system operation may be modified to optimize system performance.
b - Denatured ethanol assumed; instantaneous dosage concentration will not exceed 1-percent by volume.
c - Average flow rate/concentration over time; carbon substrate dosing will be periodic and duration/frequency will vary.
d - Estimated initial concentration.
e - Maximum delivered volume = 2,700 gallons.
f - Single pump operation, in succession.
g - Backwash flow rate equals twice the nominal injection flow rate and twice the maximum injection flow rate.

ABBREVIATIONS:

BWGW:	BACKWASH GROUNDWATER
CAGW:	CARBON AMENDED GROUNDWATER
CIPR:	CLEAN IN PLACE REAGENT
ETOH:	ETHANOL
EXGW:	EXTRACTED GROUNDWATER
FW:	FRESH WATER
GPD:	GALLONS PER DAY
GPM:	GALLONS PER MINUTE
IRL:	INNER RECIRCULATION LOOP
IRZ:	IN-SITU REACTIVE ZONE
lbs/day	POUNDS PER DAY
mg/L:	MILLIGRAMS PER LITER
NTH:	NATIONAL TRAIL HIGHWAY
TOC:	TOTAL ORGANIC CARBON
TW:	TREATED WATER
WMR:	WELL MAINTENANCE REAGENT
µg/L:	MICROGRAMS PER LITER

NOTES:

1. SPARE HEADERS AND FUTURE PROVISIONAL WELLS ARE NOT SHOWN.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

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

REVISIONS

APPROVED BY: JEF

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP PROCESS FLOW 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
G-03-01
REV 1

N1808

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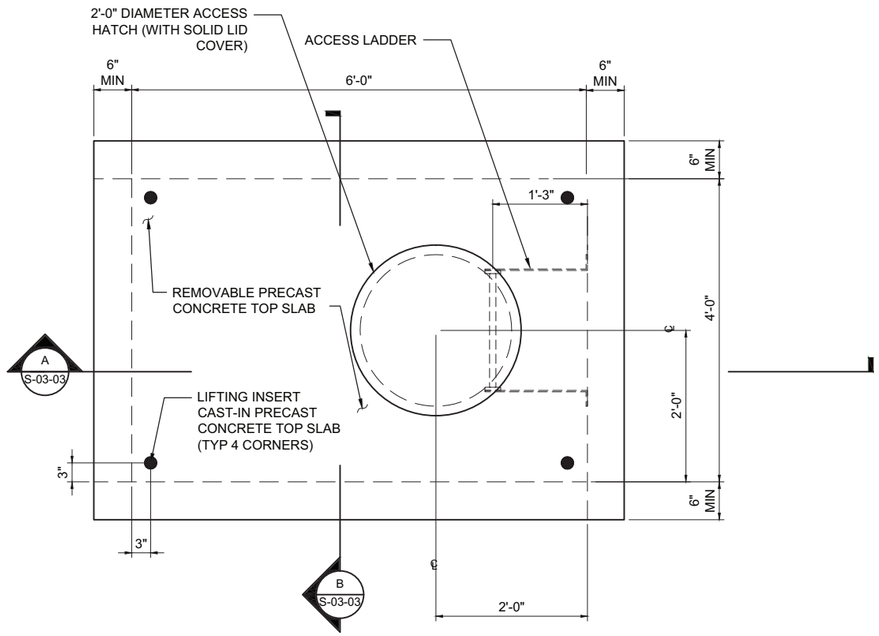


TCS LOOP EXTRACTION WELL VAULT TYPE 2 - PLAN

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.
7. ACCESS HATCH, SOLID LID, AND FRAME TO BE HIGHWAY RATED (HS20-44) AND MANUFACTURED BY NEENAH FOUNDRY OR EAST JORDAN IRON WORKS.
8. PROVIDE 90° HOOK AT ENDS OF TOP AND BOTTOM RESTEEL IN WELL METER VAULT TOP SLAB WITHIN 1'-0" OF LIFTING INSERTS.

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

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

TCS LOOP EXTRACTION WELL VAULTS - TYPE 2 - PLAN

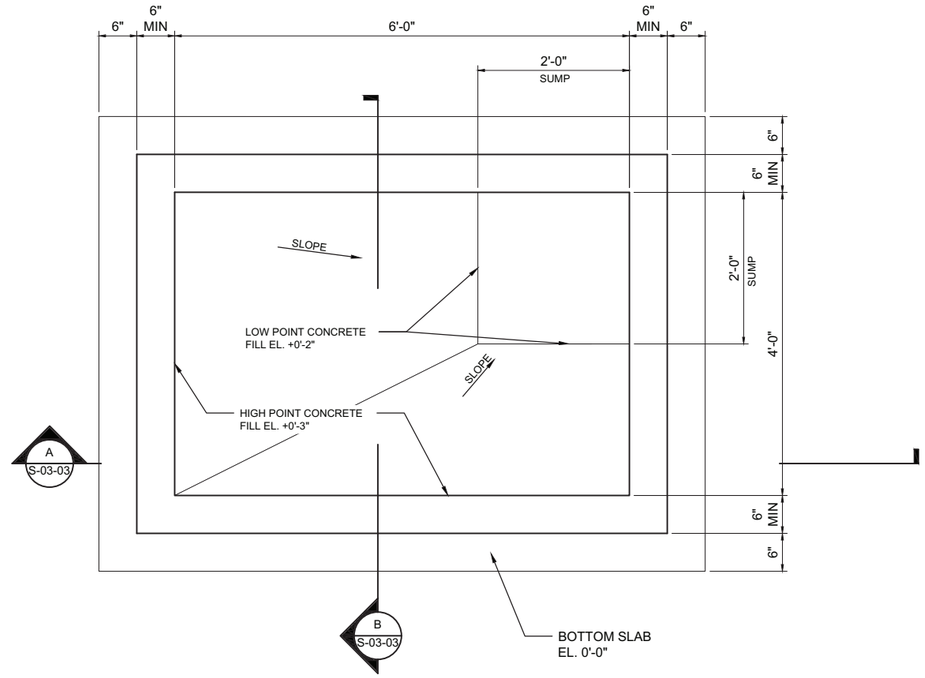
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-01	REV 1

N1808



TCS LOOP EXTRACTION WELL VAULT- FOUNDATION PLAN

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.

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

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

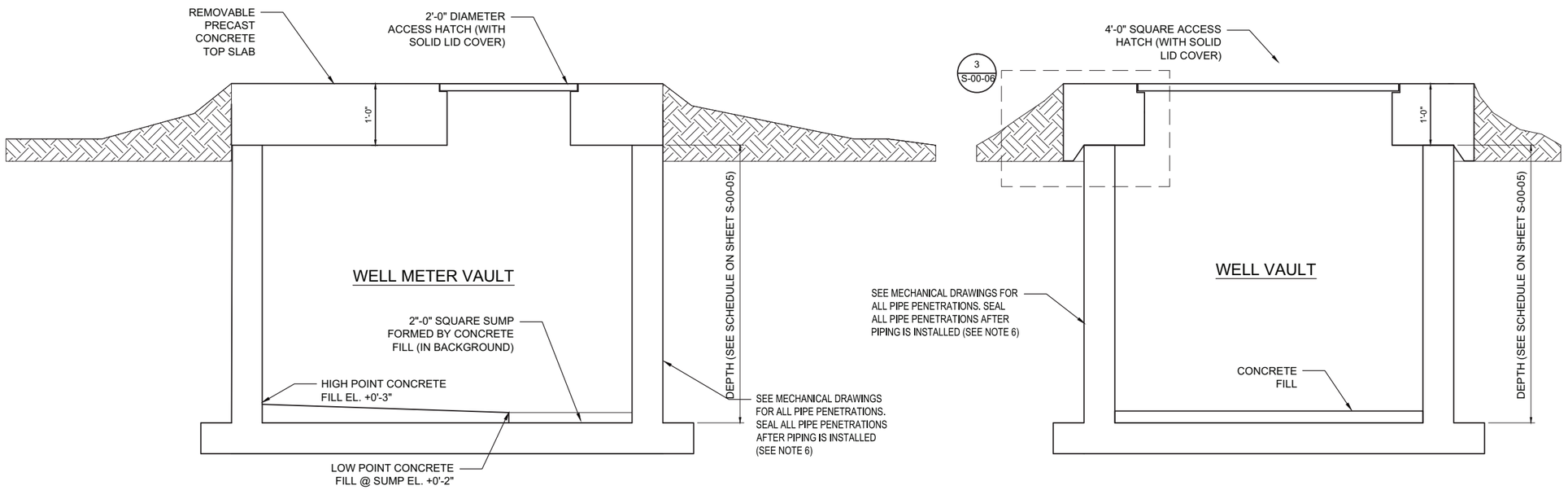
TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP EXTRACTION WELL VAULTS - FOUNDATION 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
S-03-02	REV 1

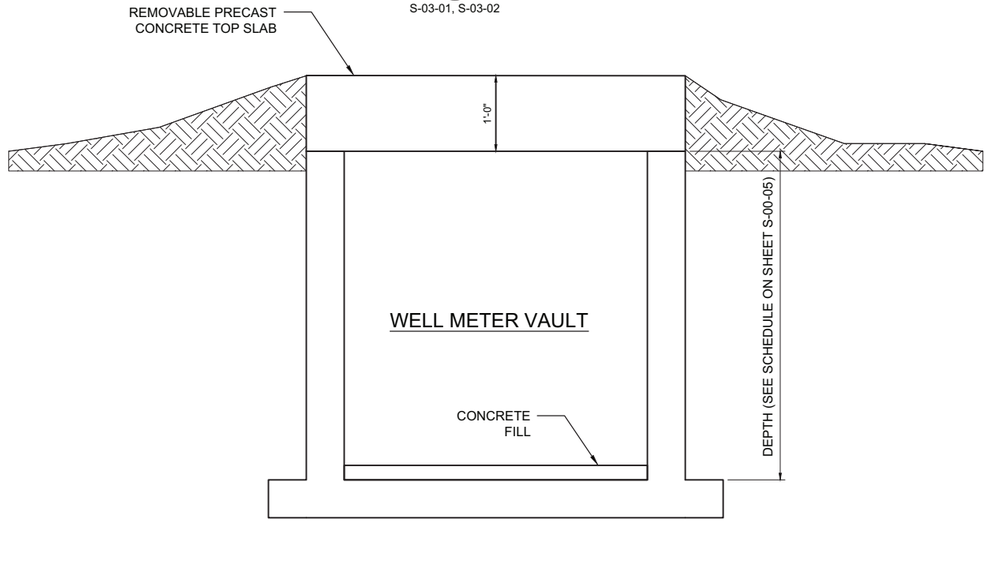
N1808



A TCS LOOP EXTRACTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

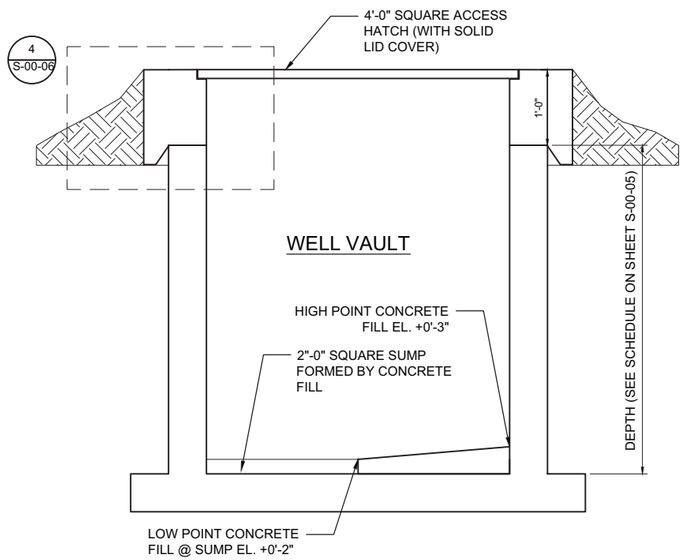
S-03-01, S-03-02



B TCS LOOP EXTRACTION WELL METER VAULT TYPE 2 - SECTION

1" = 1'-0"

S-03-01, S-03-02



C TCS LOOP EXTRACTION WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

S-03-01, S-03-02

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

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

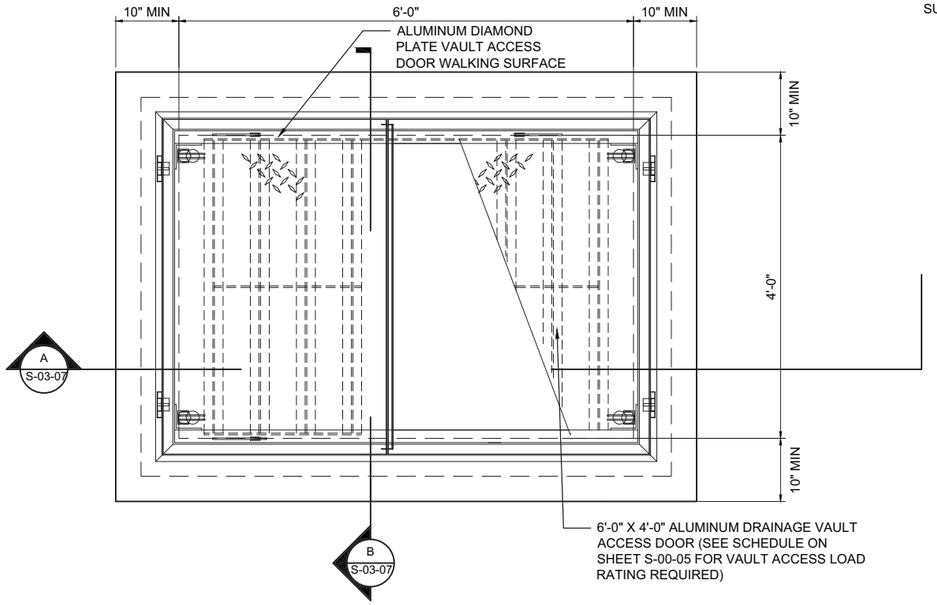
TCS LOOP EXTRACTION WELL VAULTS - SECTIONS

GAS TRANSMISSION & DISTRIBUTION

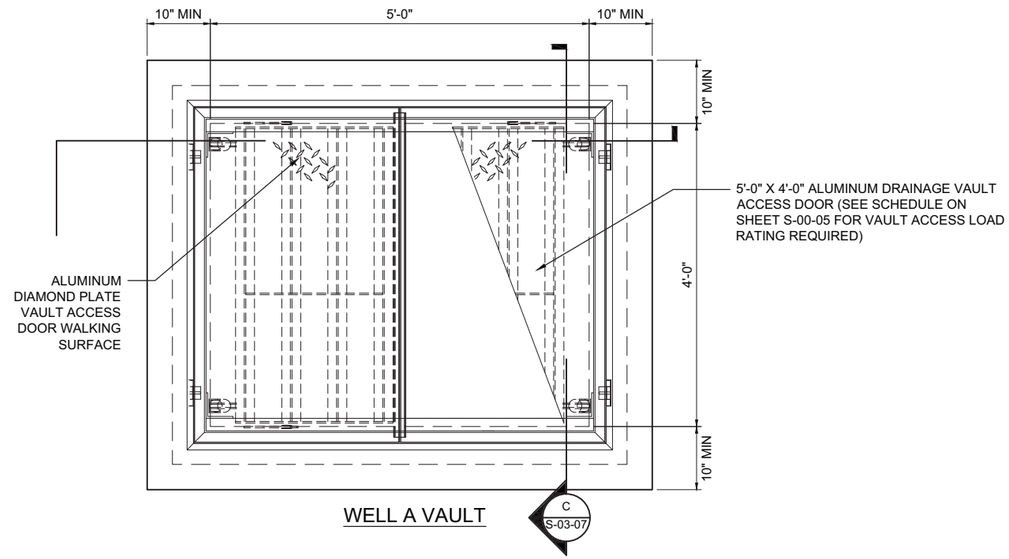
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

N1808



WELL METER VAULT



WELL A VAULT

TCS LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 1 - PLAN

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.
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5. ALL PIPE PENETRATIONS SHALL BE LINK SEALED IN ACCORDANCE WITH SPECIFICATIONS.
6. SEE MECHANICAL DRAWINGS FOR ALL PIPE PENETRATIONS.

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

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

TCS LOOP INJECTION WELL VAULTS - TYPE 1 - PLAN

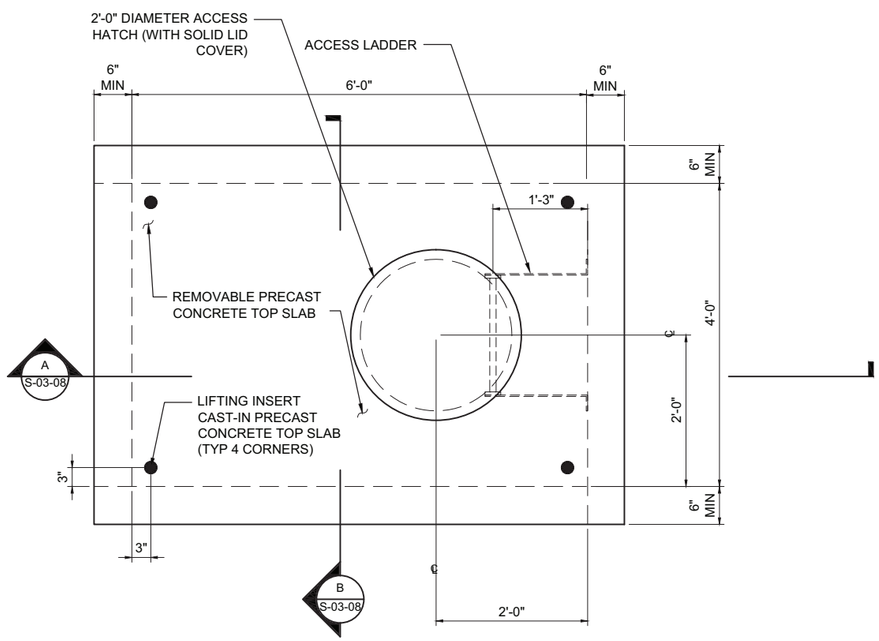
GAS TRANSMISSION & DISTRIBUTION

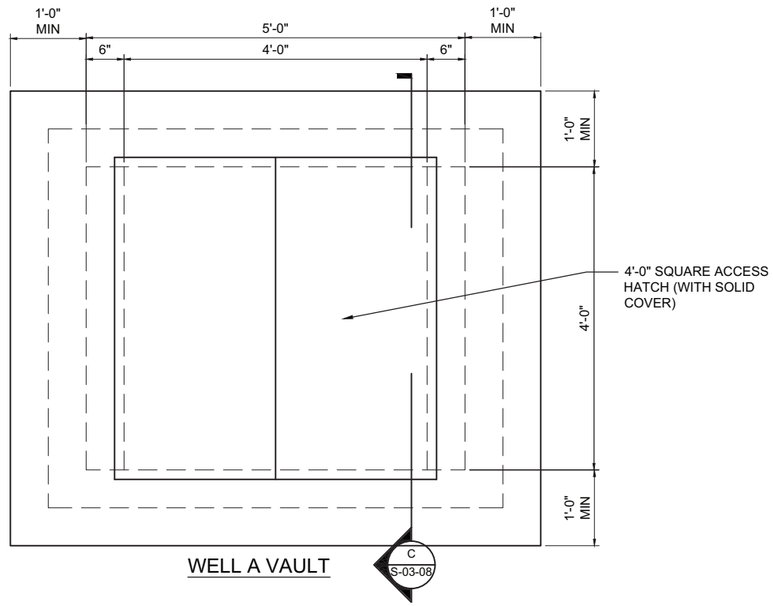
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-04	REV 1

N1808





WELL A VAULT

TCS LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 2 - PLAN

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.
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6. SEE MECHANICAL DRAWINGS FOR ALL PIPE PENETRATIONS.
7. ACCESS HATCH, SOLID LID, AND FRAME TO BE HIGHWAY RATED (HS20-44) AND MANUFACTURED BY NEENAH FOUNDRY OR EAST JORDAN IRON WORKS.
8. PROVIDE 90° HOOK AT ENDS OF TOP AND BOTTOM RESTEEL IN WELL METER VAULT TOP SLAB WITHIN 1'-0" OF LIFTING INSERTS.

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

- DRAFT - NOT FOR CONSTRUCTION

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

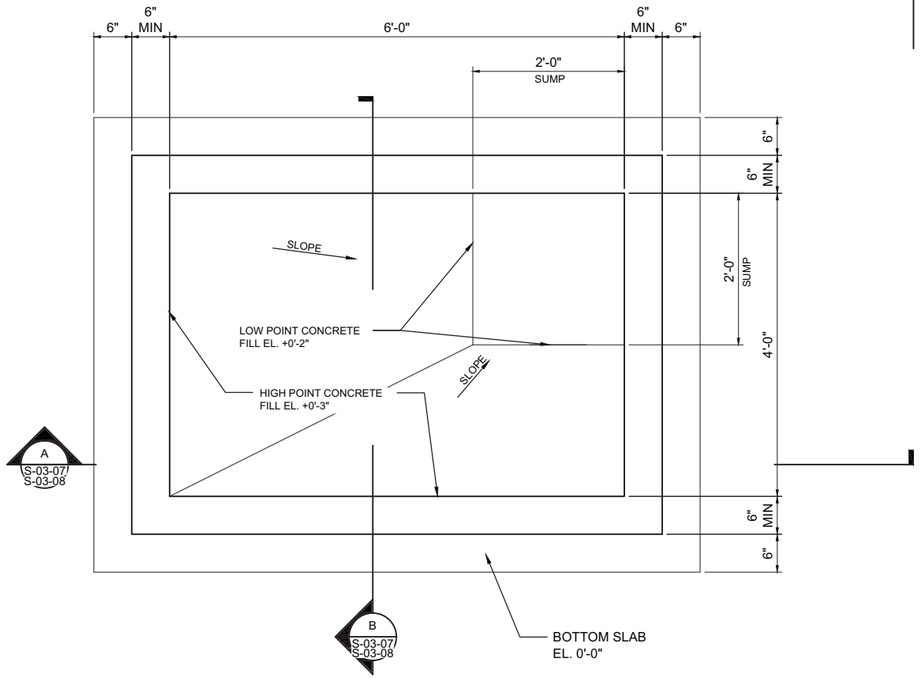
TOPOCK GROUNDWATER REMEDIATION PROJECT

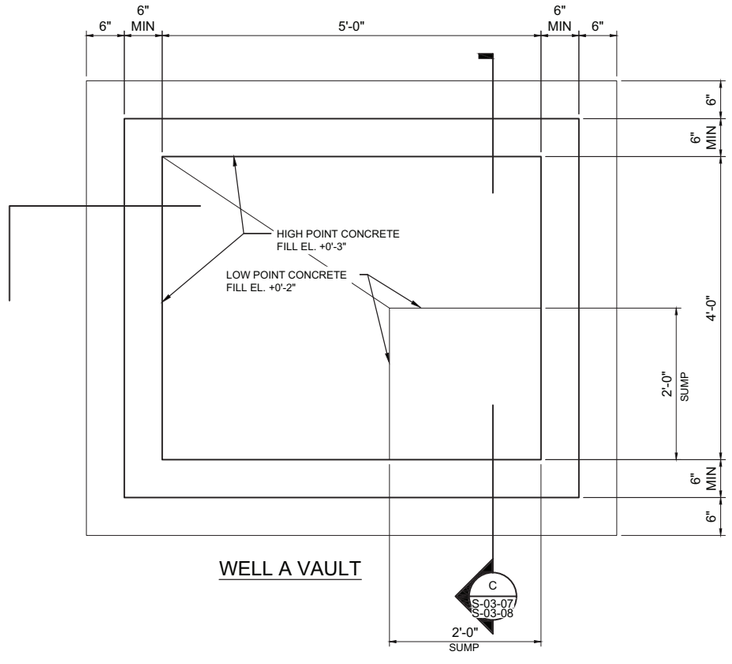
TCS LOOP INJECTION WELL VAULTS - TYPE 2 - PLAN

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

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-05	REV 1

N1808





WELL A VAULT

TCS LOOP INJECTION WELL METER VAULT AND WELL VAULTS - FOUNDATION PLAN

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.
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5. ALL PIPE PENETRATIONS SHALL BE LINK SEALED IN ACCORDANCE WITH SPECIFICATIONS.
6. SEE MECHANICAL DRAWINGS FOR ALL PIPE PENETRATIONS.

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

- DRAFT - NOT FOR CONSTRUCTION

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

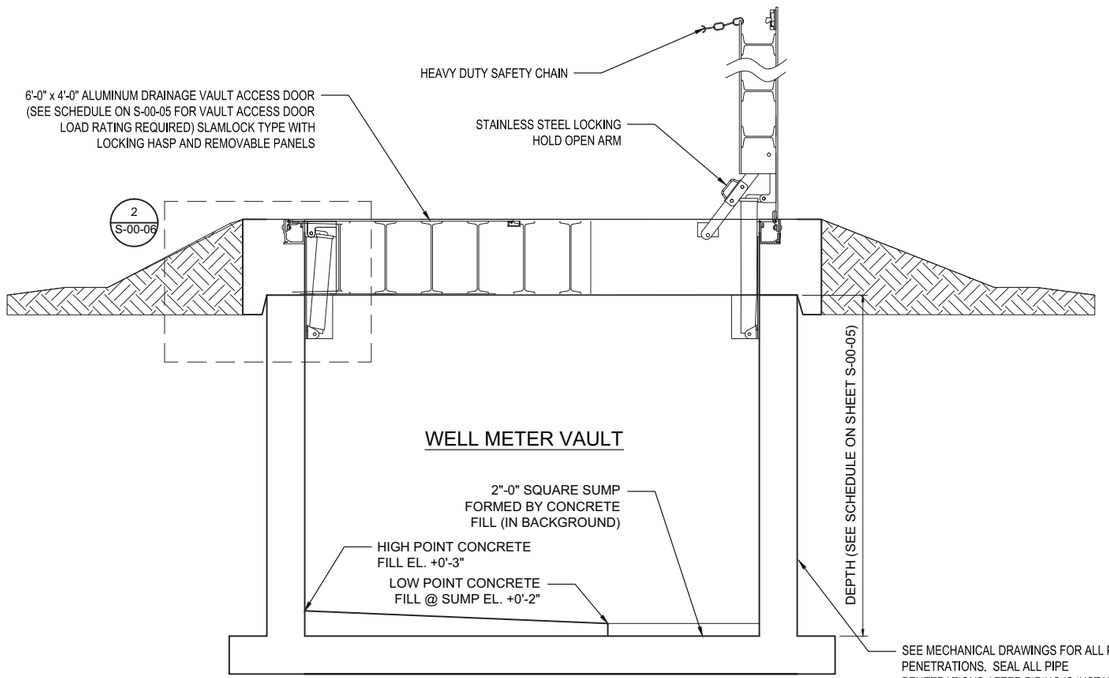
TOPOCK GROUNDWATER REMEDIATION PROJECT

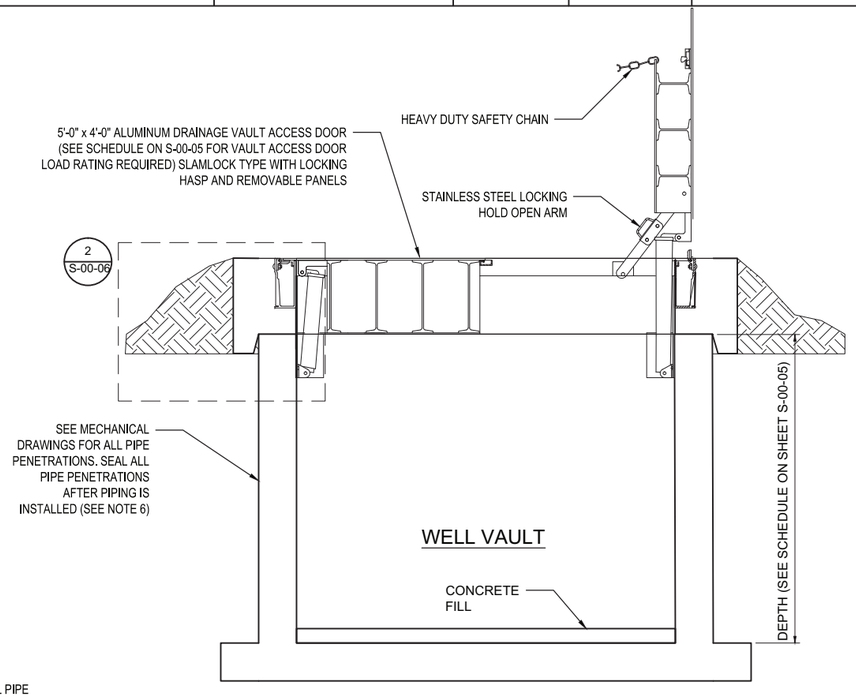
TCS LOOP INJECTION WELL VAULTS - FOUNDATION PLAN

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

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-06	REV 1

N1B08

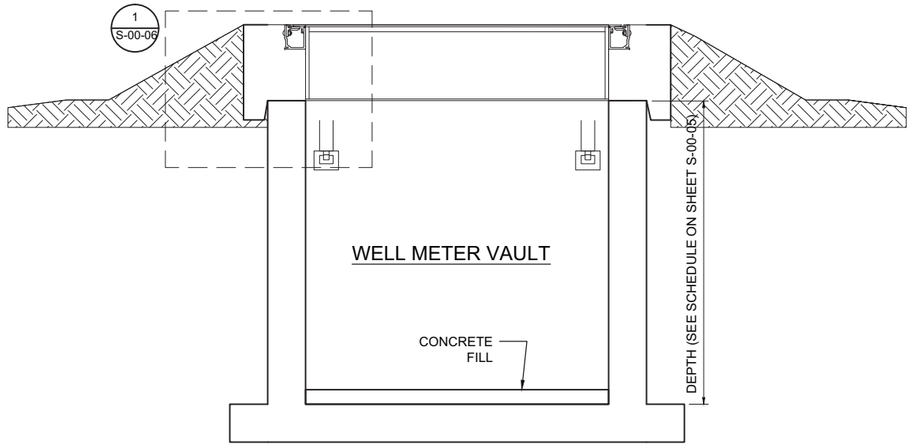


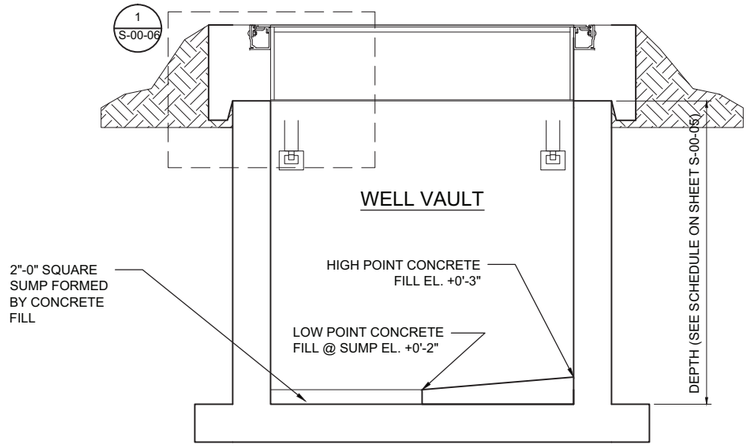


A TCS LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-03-04, S-03-06





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.

B TCS LOOP INJECTION WELL METER VAULT TYPE 1 - SECTION

1" = 1'-0"

S-03-04, S-03-06

C TCS LOOP INJECTION WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-03-04, S-03-06

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

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

TCS LOOP INJECTION WELL VAULTS - SECTIONS SHEET 1 OF 2

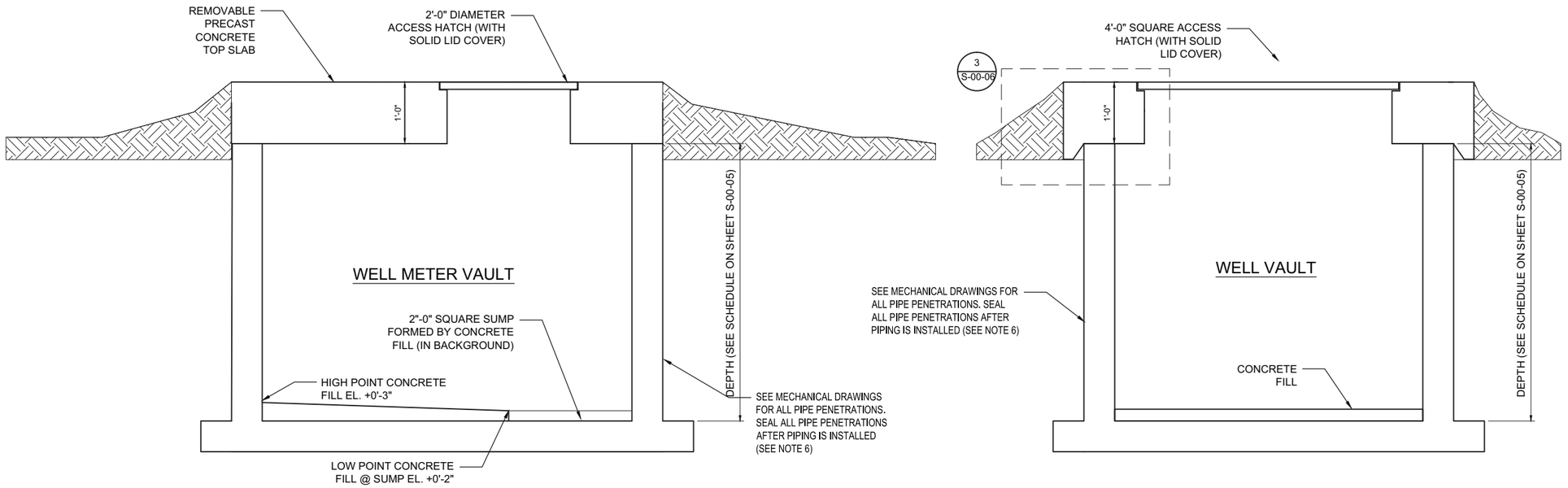
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-07	REV 1

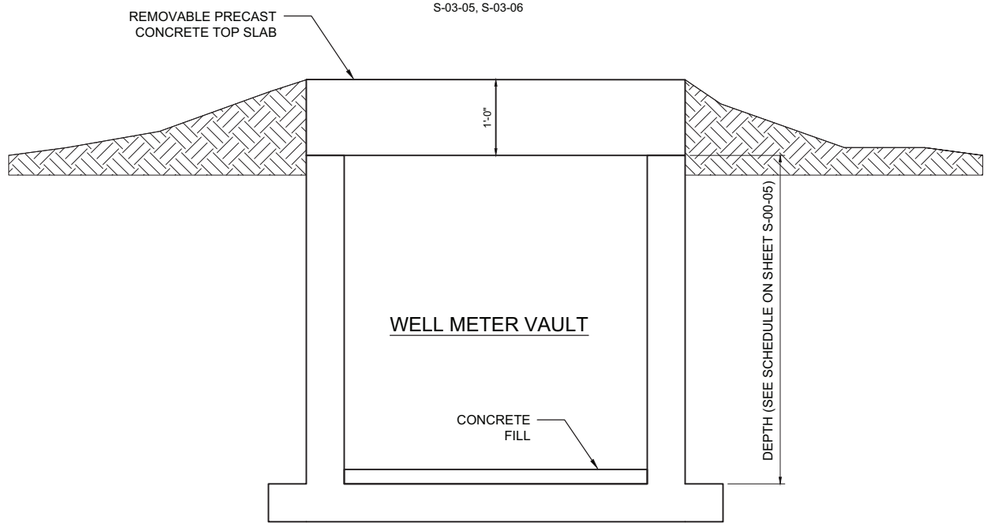
N1808



A TCS LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

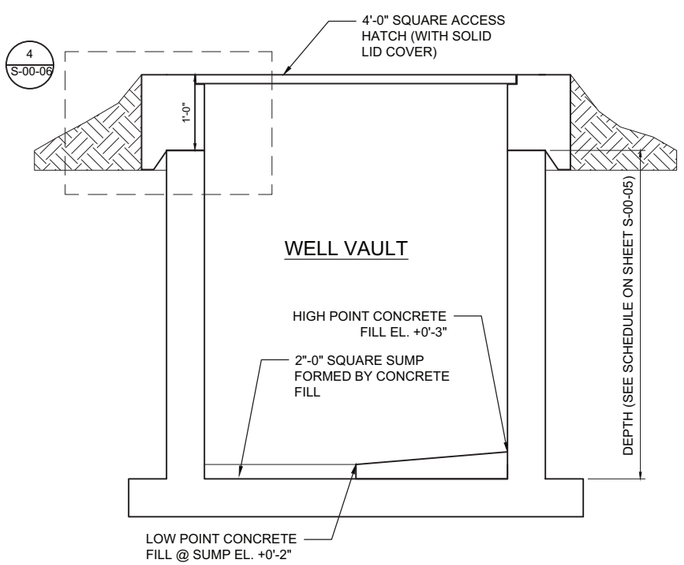
S-03-05, S-03-06



B TCS LOOP INJECTION WELL METER VAULT TYPE 2 - SECTION

1" = 1'-0"

S-03-05, S-03-06



C TCS LOOP INJECTION WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

S-03-05, S-03-06

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

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

TCS LOOP INJECTION WELL VAULTS - SECTIONS

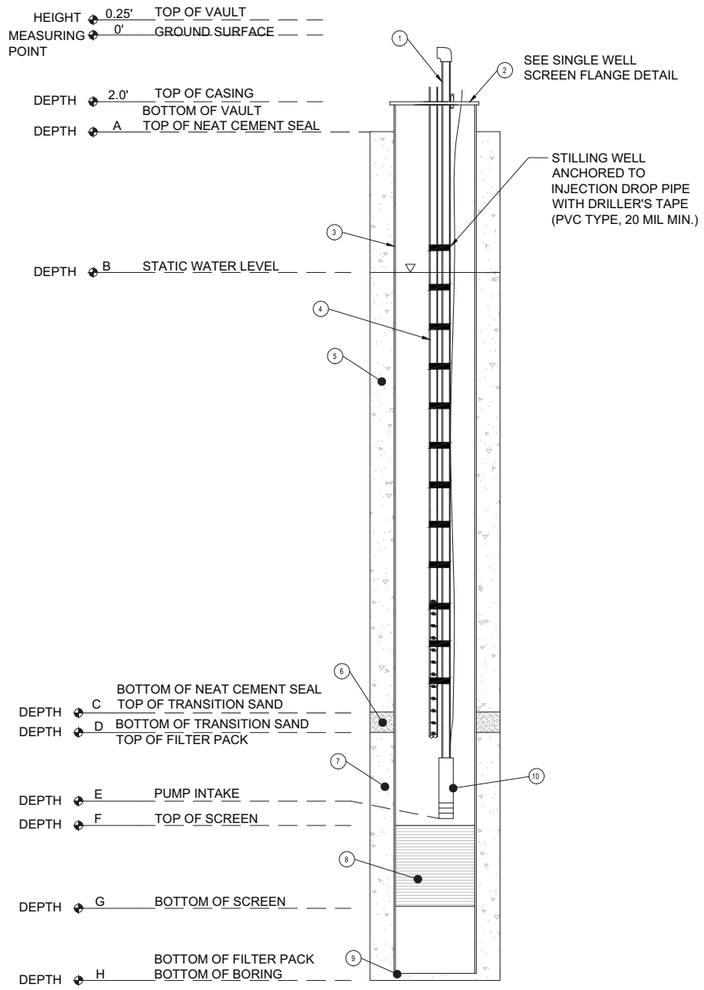
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-08	REV 1

N1B08



A SINGLE SCREEN EXTRACTION WELL DETAIL

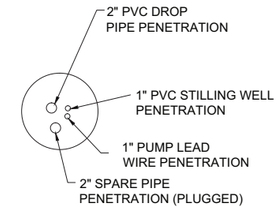
NO SCALE

SEE WELL CONSTRUCTION SCHEDULE SHEET M-X-01 FOR REPRESENTATIVE DEPTHS. WELL DIAMETER EXAGGERATED TO SHOW DETAIL.

1	2" PVC DROP PIPE
2	CUSTOM TAPERED WELL FLANGE
3	WELL CASING (MATERIALS TBD)
4	1" PVC TUBING (STILLING WELL WITH PRESSURE TRANSDUCER)
5	ANNULAR SPACE, 100% NEAT CEMENT GROUT
6	ANNULAR SPACE, TRANSITION SAND (SIZE TBD)
7	ANNULAR SPACE, FILTER PACK (SIZE TBD)
8	WELL SCREEN (MATERIALS & TYPE TBD)
9	SUMP
10	GROUNDWATER EXTRACTION PUMP

NOTES:

1. ALL DEPTH INTERVALS 'A' THRU 'K' ARE IN FEET BELOW GROUND SURFACE.
2. ALL COORDINATES BASED ON NAD83, CA ZONE V.
3. ALL WELL SEALS ARE 100% NEAT CEMENT.
4. ALL ABOVE-GRADE PIPING AND INSTRUMENTATION INSTALLED IN ACCORDANCE WITH THE P&ID AND THE WELLHEAD MECHANICAL LAYOUT



B SINGLE SCREEN WELL FLANGE DETAIL

NO SCALE

ARCADIS

N1808

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

TCS LOOP EXTRACTION WELL CONSTRUCTION DETAILS

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
M-03-01	REV 1

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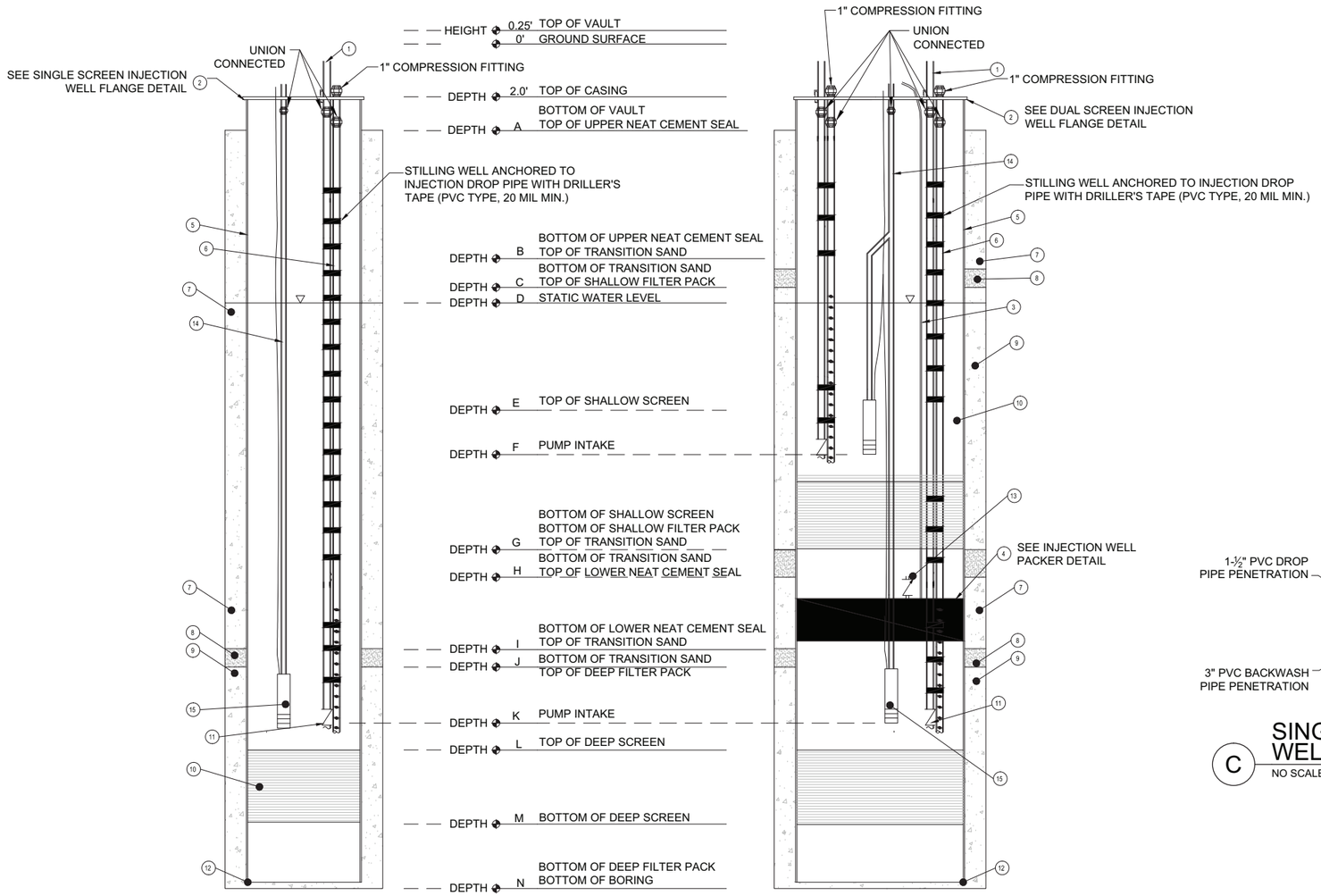


1	1-½" PVC DROP PIPE (MATERIALS TBD)
2	CUSTOM TAPPED WELL FLANGE
3	¼" DIAMETER HOSE FROM PACKER TO FILL ASSEMBLY
4	PNEUMATIC WELL PACKER
5	WELL CASING (MATERIALS TBD)
6	1" PVC TUBING (STILLING WELL WITH PRESSURE TRANSDUCER)
7	ANNULAR SPACE, 100% NEAT CEMENT GROUT
8	ANNULAR SPACE, TRANSITION SAND (SIZE TBD)
9	ANNULAR SPACE, FILTER PACK (TYPE TBD)
10	WELL SCREEN (MATERIALS TBD)
11	SPRING CHECK VALVE (TYPE AND MATERIALS TBD)
12	SUMP
13	¾" PACKER PRESSURE RELIEF SAFETY VALVE
14	3" BACKWASH PIPING
15	BACKWASH PUMP

NOTES:

1. ALL DEPTH INTERVALS 'A' THRU 'K' ARE IN FEET BELOW GROUND SURFACE.
2. ALL COORDINATES BASED ON NAD83, CA ZONE V.
3. ALL WELL SEALS ARE 100% NEAT CEMENT.
4. ALL ABOVE-GRADE PIPING AND INSTRUMENTATION INSTALLED IN ACCORDANCE WITH THE P&ID AND THE WELLHEAD MECHANICAL LAYOUT

A SINGLE SCREEN INJECTION WELL WITH BACKWASH PUMP DETAIL

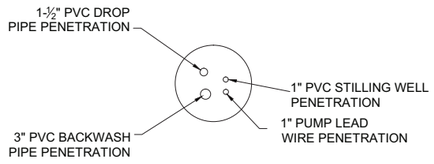
NO SCALE

SEE WELL CONSTRUCTION SCHEDULE SHEET M-X-01 FOR REPRESENTATIVE DEPTHS. WELL DIAMETER EXAGGERATED TO SHOW DETAIL.

B DUAL SCREEN INJECTION WELL WITH BACKWASH PUMPS DETAIL

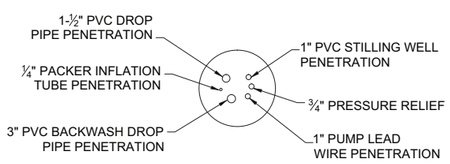
NO SCALE

SEE WELL CONSTRUCTION SCHEDULE SHEET M-X-01 FOR REPRESENTATIVE DEPTHS. WELL DIAMETER EXAGGERATED TO SHOW DETAIL.



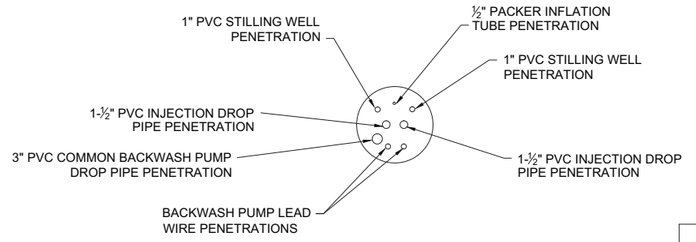
C SINGLE SCREEN WELL FLANGE DETAIL

NO SCALE



D INJECTION WELL PACKER DETAIL

NO SCALE



E DUAL SCREEN INJECTION WELL FLANGE DETAIL

NO SCALE

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP INJECTION WELL CONSTRUCTION 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
M-03-02	REV 1

N1808

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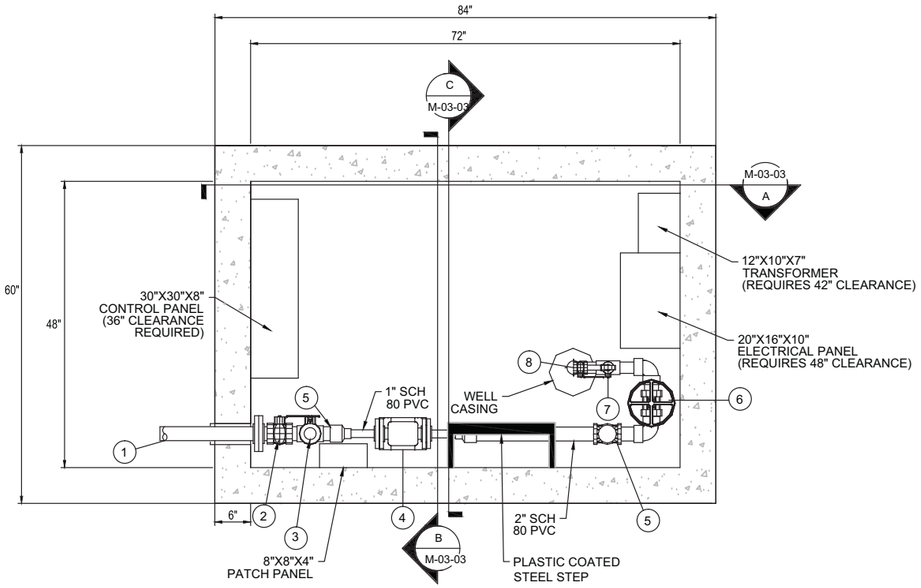
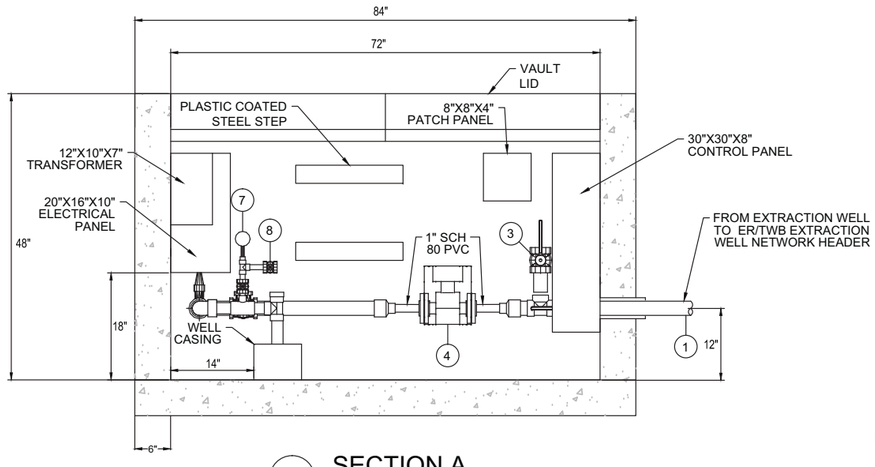


EXTRACTON WELL VAULT PLAN VIEW

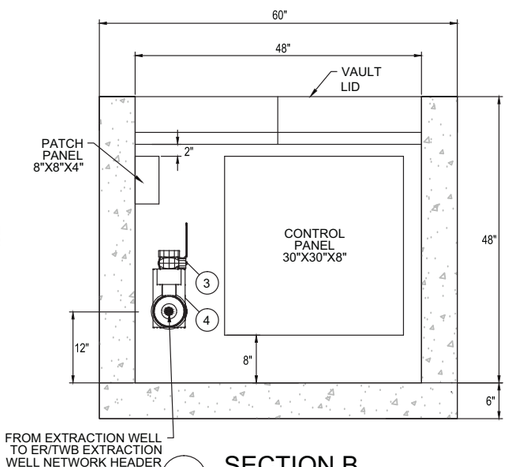
1" = 1'-0"

EXTRACTION WELL VAULT SCHEDULE					
ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION	ID TAG
1	2"	HDPE	EXTRACTED GROUNDWATER	EXTRACTED WATER CONVEYANCE LINE	-
2	2"	PVC	EXTRACTED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT	V-*401D
3	2"	PVC	EXTRACTED GROUNDWATER	BALL VALVE	V-*401A
4	1"	TEFLON	EXTRACTED GROUNDWATER	MAGNETIC FLOWMETER	FM-*470A
5	2"	PVC	EXTRACTED GROUNDWATER	CHECK VALVE	V-*401C
6	2"	PVC	EXTRACTED GROUNDWATER	GLOBE VALVE	V-*401B
7	1/2"	TBD	EXTRACTED GROUNDWATER	PRESSURE GAUGE ASSEMBLY	PIT-*460A, V-*460A
8	1/4"	TBD	EXTRACTED GROUNDWATER	SAMPLE PORT	V-*460B

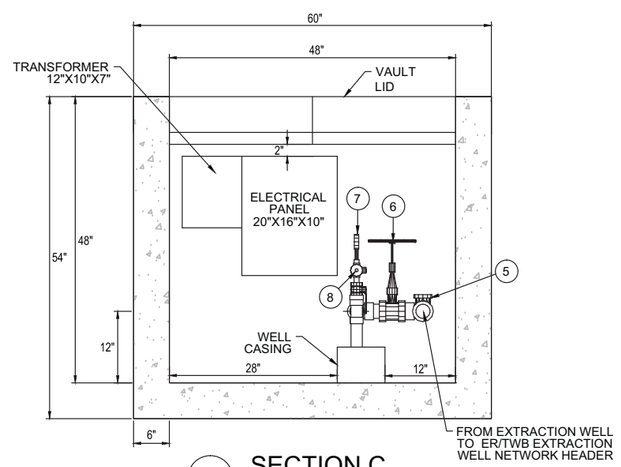
NOTES:
1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
2. ALL PIPING AND INSTRUMENTATION SHALL BE INSTALLED PER P&IDs.
3. INSTALLATION OF ELECTRIC COMPONENTS SHALL COMPLY WITH ALL APPLICABLE NEC AND LOCAL CODES.
4. CROSS SECTIONS SHOW ONLY THOSE COMPONENTS NECESSARY TO INDICATE ELEVATIONS AND SPACE REQUIREMENTS FOR PIPING AND MAJOR COMPONENTS. INSTALL PIPING AND INSTRUMENTATION PER THE P&IDs.
5. ALL INSTRUMENTATION SHALL BE INSTALLED SUCH THAT IT MAY BE READ WITHOUT ENTERING THE WELL VAULT.
6. ALL VALVE HANDLES SHALL BE INSTALLED SUCH THAT THEY ARE ACCESSIBLE WITHOUT ENTERING THE WELL VAULT AND OPERABLE THROUGH ENTIRE STROKE.
7. ALL PIPING AND CONDUIT SHALL BE SECURED TO THE WALLS OF THE CONCRETE WELL VAULT WITH ANCHOR BOLTS AND UNI-STRUT. SUPPORTS SHALL BE INSTALLED WHEREVER NECESSARY TO PROPERLY SUPPORT PIPING AND CONDUIT.
8. PIPE SIZES AND MATERIALS ARE SHOWN ON THE P&IDs.
9. PIPING KNOCKOUTS AND ROUTING OF PIPING SHOWN AS PROPOSED AND APPROXIMATE. ACTUAL ROUTING TO BE FIELD DETERMINED AND IS SUBJECT TO ENGINEER'S APPROVAL.
10. ALL FLANGES SHALL BE CLASS 150 RATE FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.



A SECTION A
1"=1'-0"
M-03-03



B SECTION B
1"=1'-0"
M-03-03



C SECTION C
1"=1'-0"
M-03-03

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

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

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	KLD
DWN	LUK
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	1" = 1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT

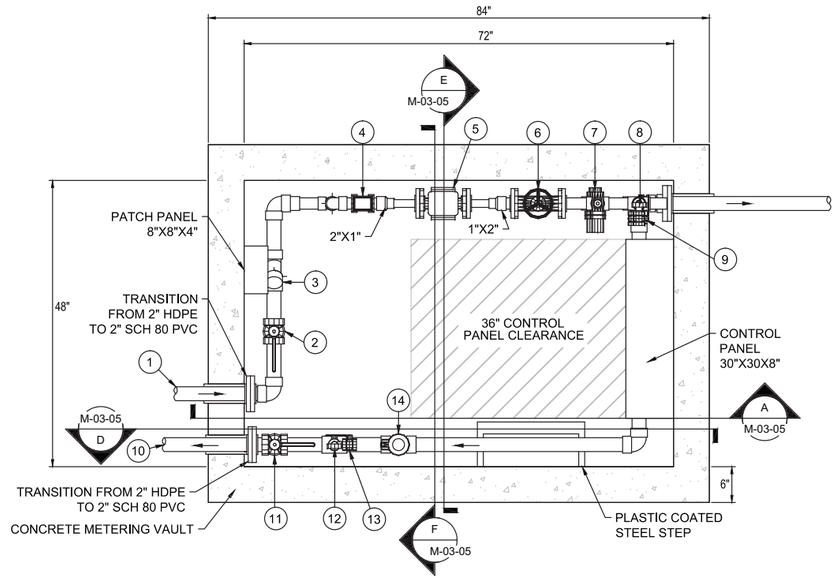
TCS LOOP EXTRACTION WELL VAULTS MECHANICAL DETAILS

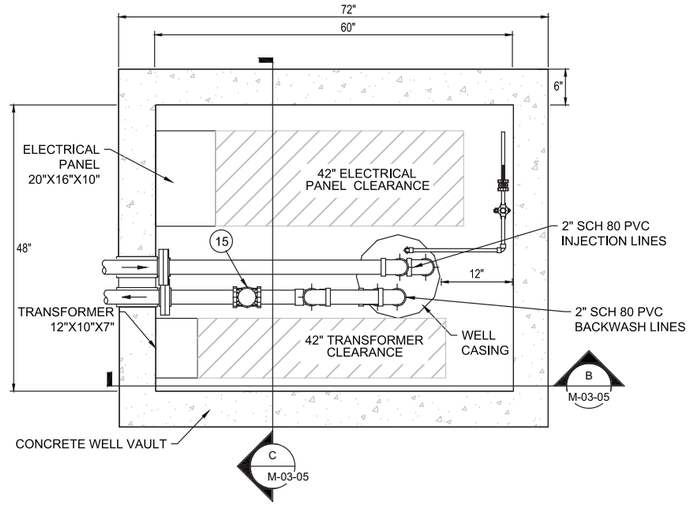
GAS TRANSMISSION & DISTRIBUTION

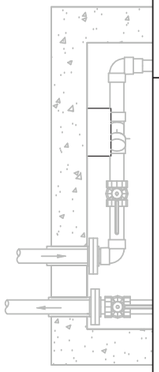
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

N1808







NOTES:

INJECTION WELL METERING AND WELL VAULT PLAN VIEW

1" = 1'-0"

NOTES:

1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
2. ALL PIPING AND INSTRUMENTATION SHALL BE INSTALLED PER P&IDs.
3. INSTALLATION OF ELECTRIC COMPONENTS SHALL COMPLY WITH ALL APPLICABLE NEC AND LOCAL CODES.
4. CROSS SECTIONS SHOW ONLY THOSE COMPONENTS NECESSARY TO INDICATE ELEVATIONS AND SPACE REQUIREMENTS FOR PIPING AND MAJOR COMPONENTS. INSTALL PIPING AND INSTRUMENTATION PER THE P&IDs.
5. ALL INSTRUMENTATION SHALL BE INSTALLED SUCH THAT IT MAY BE READ WITHOUT ENTERING THE WELL VAULT.
6. ALL VALVE HANDLES SHALL BE INSTALLED SUCH THAT THEY ARE ACCESSIBLE WITHOUT ENTERING THE WELL VAULT AND OPERABLE THROUGH ENTIRE STROKE.
7. ALL PIPING AND CONDUIT SHALL BE SECURED TO THE WALLS OF THE CONCRETE WELL VAULT WITH ANCHOR BOLTS AND UNI-STRUT. SUPPORTS SHALL BE INSTALLED WHEREVER NECESSARY TO PROPERLY SUPPORT PIPING AND CONDUIT.
8. PIPE SIZES AND MATERIALS ARE SHOWN ON THE P&IDs.
9. PIPING KNOCKOUTS AND ROUTING OF PIPING SHOWN AS PROPOSED AND APPROXIMATE. ACTUAL ROUTING TO BE FIELD DETERMINED AND IS SUBJECT TO ENGINEER'S APPROVAL.
10. ALL FLANGES SHALL BE CLASS 150 RATE FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

INJECTION WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION	ID TAG
1	2"	HDPE	CARBON AMENDED GROUNDWATER	CARBON AMENDED GROUNDWATER CONVEYANCE LINE	-
2	2"	PVC	CARBON AMENDED GROUNDWATER	BALL VALVE	V-*403A
3	2"	PVC	CARBON AMENDED GROUNDWATER	2" WYE STRAINER	F-*403
4	2"	TBD	CARBON AMENDED GROUNDWATER	ACTUATED BALL VALVE	FV-*407, FV-*408
5	1"	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOW METER	FM-*472A, FM-*472B
6	2"	PVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE	V-*403B, V-*404G
7	1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY	V-*403E, V-*403C, V-*404H, V-*404I
8	1/4"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY	V-*462A, PI-*462A, V-*462E, PI-*462E
9	1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT	V-*462B, V-*462F
10	2"	HDPE	BACKWASH WATER	BACKWASH WATER CONVEYANCE LINE	-
11	2"	PVC	BACKWASH WATER	ISOLATION BALL VALVE EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE OF VAULT	V-*405B
12	1/4"	TBD	BACKWASH WATER	PRESSURE GAUGE ASSEMBLY	V-*462G, PI-*462B
13	1/4"	TBD	BACKWASH WATER	SAMPLE PORT	V-*462H
14	2"	PVC	BACKWASH WATER	BALL VALVE	V-*405C
15	2"	PVC	BACKWASH WATER	CHECK VALVE	V-*405A

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

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

REVISIONS

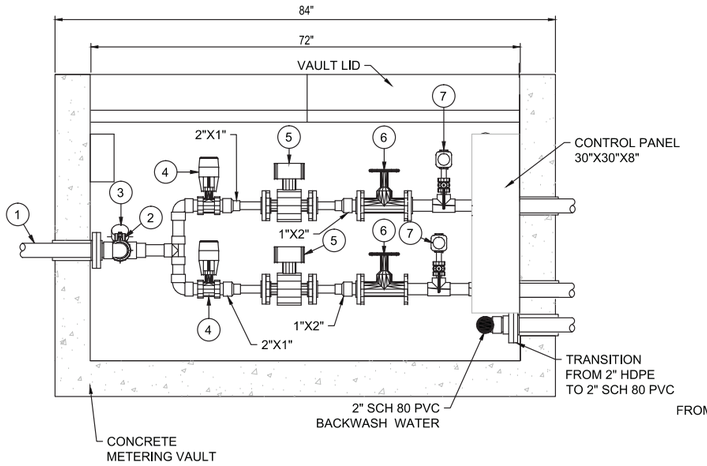
APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	KLD
DWN	LUK
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	1" = 1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS LOOP
INJECTION WELL VAULTS
MECHANICAL 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
M-03-04	REV 1

N1808



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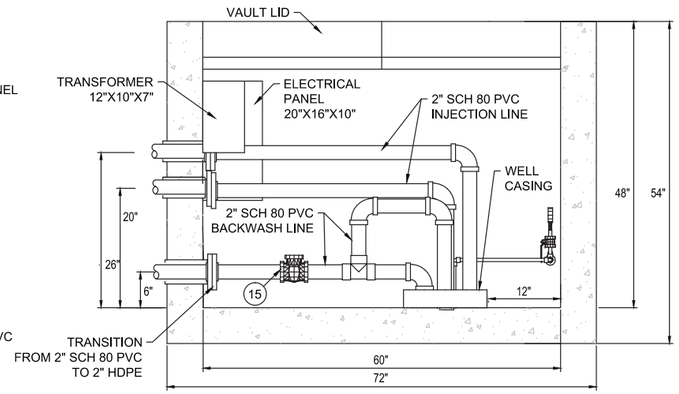
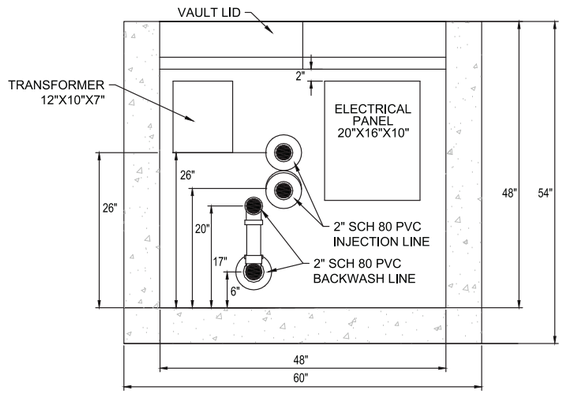
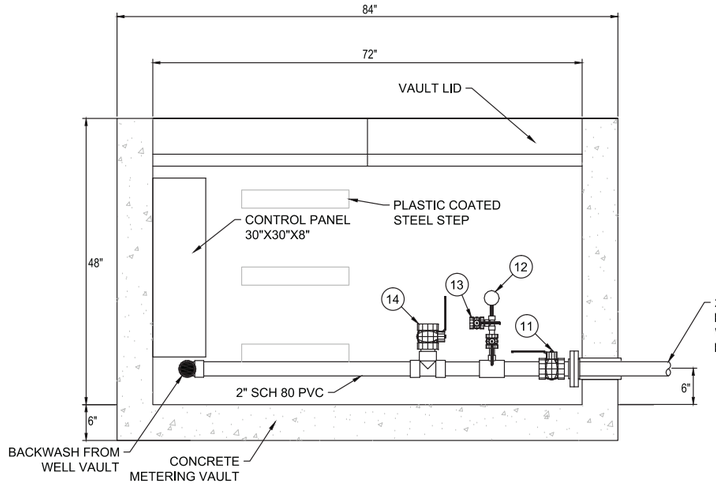
1"=1'-0"
M-03-04



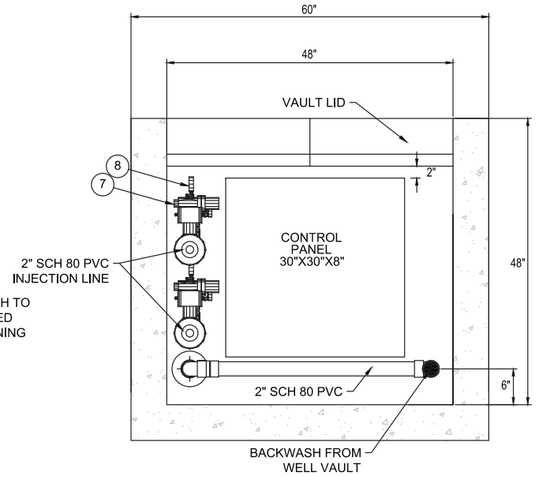
B SECTION B
1"=1'-0"
M-03-04



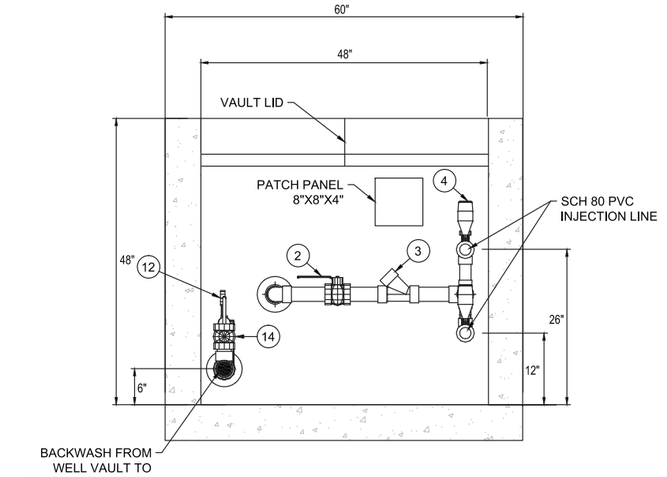
C SECTION C
1"=1'-0"
M-03-04



D SECTION D
1"=1'-0"
M-03-04



E SECTION E
1"=1'-0"
M-03-04



F SECTION F
1"=1'-0"
M-03-04

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

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

REVISIONS

APPROVED BY	
JEF	
SO	
SUPV	JPB
DSGN	KLD
DWN	LUK
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	1" = 1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT

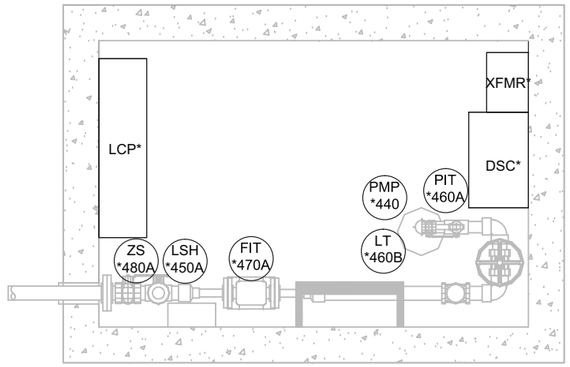
TCS LOOP INJECTION VAULTS MECHANICAL SECTIONS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

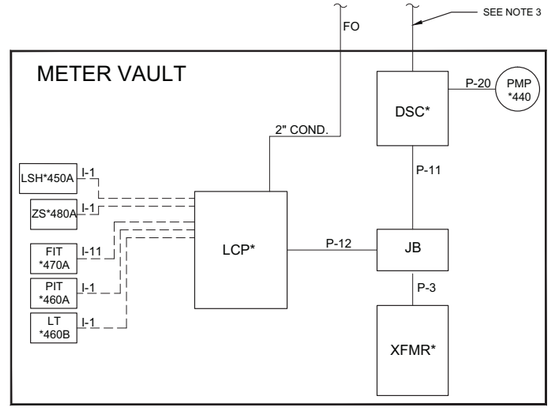
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-03-05	REV 1

N1B08



WELL VAULT ELECTRICAL & INSTRUMENTATION PLAN

1" = 1'-0"



WELL VAULT RISER DIAGRAM

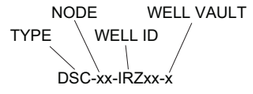
NOT TO SCALE

NOTES:

1. CONDUIT ROUTING WITHIN VAULTS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY ENGINEER.
2. "*" IS A PLACEHOLDER FOR THE LOCATION ID. SEE DESCRIPTION BELOW FOR FULL LOCATION ID NUMBER.
3. REFER TO CONDUIT AND CABLE SCHEDULES AND SINGLE LINE DIAGRAMS ON SHEETS E-00-12 THROUGH E-00-20 FOR VAULT MAIN POWER FEED CONDUIT AND WIRE SIZES.

LEGEND

CP	CONTROL PANEL
DSC	DISCONNECT
JB	JUNCTION BOX
P	POWER
I	INSTRUMENTATION
C	CABLE (POWER)
FO	FIBER OPTIC
XFMR	TRANSFORMER
_ _ _ _ _ _	MUTLICONDUCTOR SHIELDED CABLE



WELLS RISER DIAGRAM CONDUCTOR SCHEDULE

SYMBOL	WIRE TYPE, SIZE, AND QTY.	CONDUCTOR OR CABLE TYPE	CONDUIT SIZE (INCHES)
P-1A	REFER TO SINGLE LINE DIAGRAM.		
P-1B			
P-11	(2)#12 BLK, (2)#12 GRN,(7)#14YEL, (1)#14WHT	XHHW	1
P-12	(1)#12RED, (1)#12WHT, (1)#12GRN, (7)#14YEL, (1)#14WHT	XHHW	1
P-2	(5) #12 BLK, (3) #12 GRN, (14)#14YEL, (2)#14WHT	XHHW	2
P-20	(3) #12 BLK, (1) #12 GRN	XHHW	3/4"
P-3	(2)#12BLK, (2)#12GRN,(1)#12RED, (1)#12WHT	XHHW	1
P-4	(3) #12 BLK, (1) #12 GRN, (7)#14YEL, (1)#14WHT	XHHW	1
P-5	(1)#12RED, (1)#12WHT, (1)#12GRN, (4)14YEL, (2)#14WHT	XHHW	1
FO	MULTI-MODE FIBER OPTIC		2
I-1	(1) #16, 2 CONDUCTOR SHIELDED CABLE	BELDEN 9952	3/4"
I-11	(1) #16, 4 CONDUCTOR SHIELDED CABLE	BELDEN 9954	3/4"
I-17	(1) #18, 7 CONDUCTOR SHIELDED CABLE	BELDEN 5305FE	3/4"
C-1	SOW CABLE (1)#16BLK, (1)#16WHT, (1)#16GRN	XHHW	3/4"
NOTE:	THIS SCHEDULE APPLIES TO ALL VAULT RISER DIAGRAMS. SOME OF THE SYMBOLS MAY NOT BE USED ON THIS DRAWING.		

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

REVISIONS

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

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	KLD
DWN	LUK
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	1" = 1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT

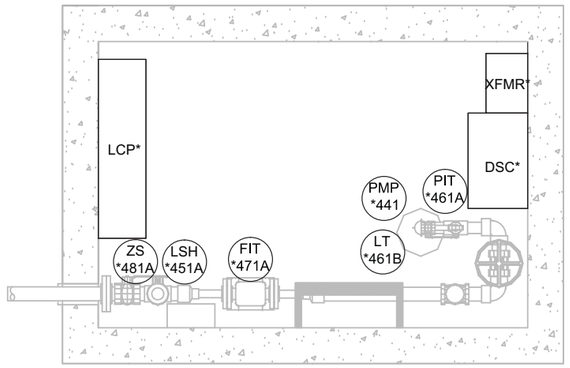
TCS LOOP EAST RAVINE EXTRACTION WELL ELECTRICAL PLAN

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

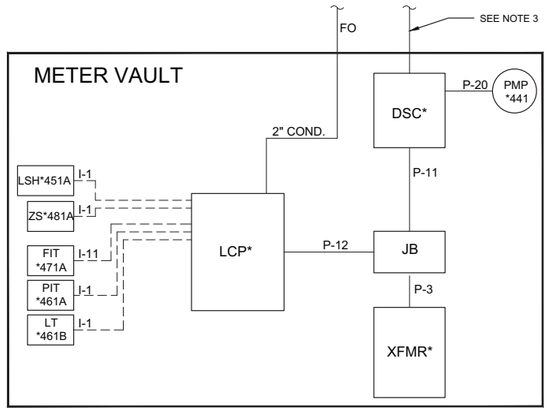
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-03-01	REV 1

N1808



WELL VAULT ELECTRICAL & INSTRUMENTATION PLAN

1" = 1'-0"



WELL VAULT RISER DIAGRAM

NOT TO SCALE

NOTES:

1. CONDUIT ROUTING WITHIN VAULTS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY ENGINEER.
2. "*" IS A PLACEHOLDER FOR THE LOCATION ID. SEE DESCRIPTION BELOW FOR FULL LOCATION ID NUMBER.
3. REFER TO CONDUIT AND CABLE SCHEDULES AND SINGLE LINE DIAGRAMS ON SHEETS E-00-12 THROUGH E-00-20 FOR VAULT MAIN POWER FEED CONDUIT AND WIRE SIZES.

LEGEND

CP	CONTROL PANEL
DSC	DISCONNECT
JB	JUNCTION BOX
P	POWER
I	INSTRUMENTATION
C	CABLE (POWER)
FO	FIBER OPTIC
XFMR	TRANSFORMER
_ _ _ _ _ _	MUTLICONDUCTOR SHIELDED CABLE

NODE — WELL VAULT
TYPE — WELL ID
DSC-xx-IRZxx-x

WELLS RISER DIAGRAM CONDUCTOR SCHEDULE

SYMBOL	WIRE TYPE, SIZE, AND QTY.	CONDUCTOR OR CABLE TYPE	CONDUIT SIZE (INCHES)
P-1A	REFER TO SINGLE LINE DIAGRAM.		
P-1B			
P-11	(2)#12 BLK, (2)#12 GRN,(7)#14YEL, (1)#14WHT	XHHW	1
P-12	(1)#12RED, (1)#12WHT, (1)#12GRN, (7)#14YEL, (1)#14WHT	XHHW	1
P-2	(5) #12 BLK, (3) #12 GRN, (14)#14YEL, (2)#14WHT	XHHW	2
P-20	(3) #12 BLK, (1) #12 GRN	XHHW	3/4"
P-3	(2)#12BLK, (2)#12GRN,(1)#12RED, (1)#12WHT	XHHW	1
P-4	(3) #12 BLK, (1) #12 GRN, (7)#14YEL, (1)#14WHT	XHHW	1
P-5	(1)#12RED, (1)#12WHT, (1)#12GRN, (4)14YEL, (2)#14WHT	XHHW	1
FO	MULTI-MODE FIBER OPTIC		2
I-1	(1) #16, 2 CONDUCTOR SHIELDED CABLE	BELDEN 9952	3/4"
I-11	(1) #16, 4 CONDUCTOR SHIELDED CABLE	BELDEN 9954	3/4"
I-17	(1) #18, 7 CONDUCTOR SHIELDED CABLE	BELDEN 5305FE	3/4"
C-1	SOW CABLE (1)#16BLK, (1)#16WHT, (1)#16GRN	XHHW	3/4"
NOTE:	THIS SCHEDULE APPLIES TO ALL VAULT RISER DIAGRAMS. SOME OF THE SYMBOLS MAY NOT BE USED ON THIS DRAWING.		

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

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

REVISIONS

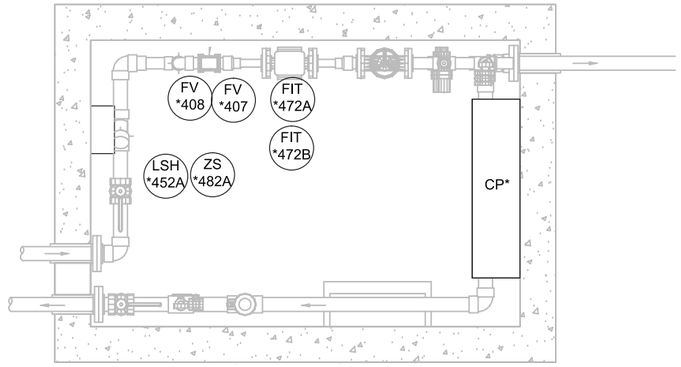
APPROVED BY: JEF

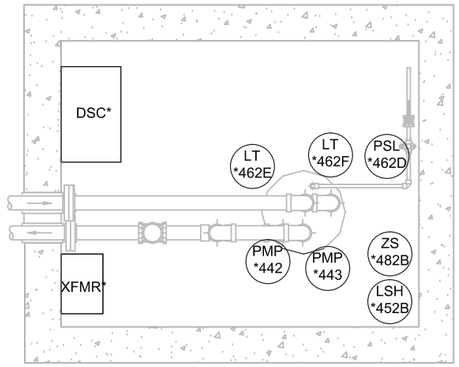
SO	
SUPV	JPB
DSGN	KLD
DWN	LUK
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	1" = 1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS LOOP TRANSWESTERN BENCH EXTRACTION WELL ELECTRICAL 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-03-02	REV 1

N1808





NOTES:

1. CONDUIT ROUTING WITHIN VAULTS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY ENGINEER.
2. "*" IS A PLACEHOLDER FOR THE LOCATION ID. SEE DESCRIPTION BELOW FOR FULL LOCATION ID NUMBER.
3. REFER TO CONDUIT AND CABLE SCHEDULES AND SINGLE LINE DIAGRAMS ON SHEETS E-00-12 THROUGH E-00-20 FOR VAULT MAIN POWER FEED CONDUIT AND WIRE SIZES.

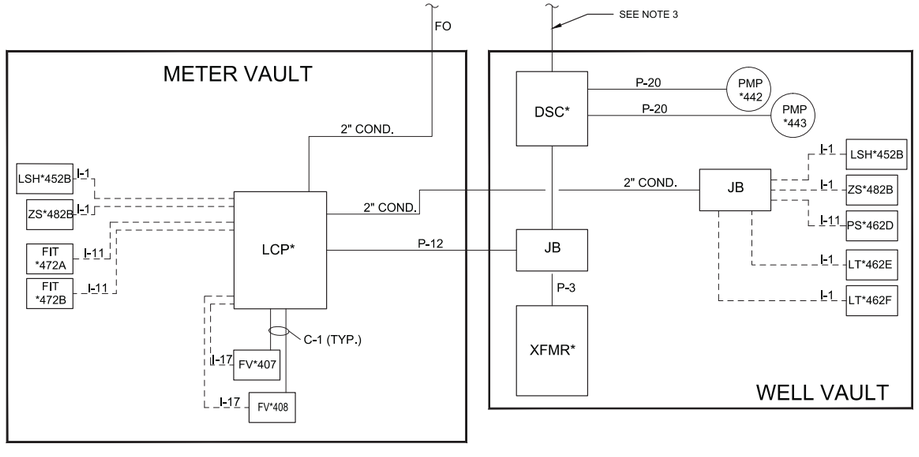
LEGEND

CP	CONTROL PANEL
DSC	DISCONNECT
JB	JUNCTION BOX
P	POWER
I	INSTRUMENTATION
C	CABLE (POWER)
FO	FIBER OPTIC
XFMR	TRANSFORMER
------	MULTICONDUCTOR SHIELDED CABLE

NODE WELL VAULT
TYPE WELL ID
DSC-xx-IRZxx-x

METER AND WELL VAULT ELECTRICAL & INSTRUMENTATION PLAN

1" = 1'-0"



METER AND WELL VAULT RISER DIAGRAM

NOT TO SCALE

WELLS RISER DIAGRAM CONDUCTOR SCHEDULE

SYMBOL	WIRE TYPE, SIZE, AND QTY.	CONDUCTOR OR CABLE TYPE	CONDUIT SIZE (INCHES)
P-1A	REFER TO SINGLE LINE DIAGRAM.		
P-1B			
P-11	(2)#12 BLK, (2)#12 GRN,(7)#14YEL, (1)#14WHT	XHHW	1
P-12	(1)#12RED, (1)#12WHT, (1)#12GRN, (7)#14YEL, (1)#14WHT	XHHW	1
P-2	(5) #12 BLK, (3) #12 GRN, (14)#14YEL, (2)#14WHT	XHHW	2
P-20	(3) #12 BLK, (1) #12 GRN	XHHW	3/4"
P-3	(2)#12BLK, (2)#12GRN,(1)#12RED, (1)#12WHT	XHHW	1
P-4	(3) #12 BLK, (1) #12 GRN, (7)#14YEL, (1)#14WHT	XHHW	1
P-5	(1)#12RED, (1)#12WHT, (1)#12GRN, (4)14YEL, (2)#14WHT	XHHW	1
FO	MULTI-MODE FIBER OPTIC		2
I-1	(1) #16, 2 CONDUCTOR SHIELDED CABLE	BELDEN 9952	3/4"
I-11	(1) #16, 4 CONDUCTOR SHIELDED CABLE	BELDEN 9954	3/4"
I-17	(1) #18, 7 CONDUCTOR SHIELDED CABLE	BELDEN 5305FE	3/4"
C-1	SOW CABLE (1)#16BLK, (1)#16WHT, (1)#16GRN	XHHW	3/4"
NOTE:	THIS SCHEDULE APPLIES TO ALL VAULT RISER DIAGRAMS. SOME OF THE SYMBOLS MAY NOT BE USED ON THIS DRAWING.		

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

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

REVISIONS

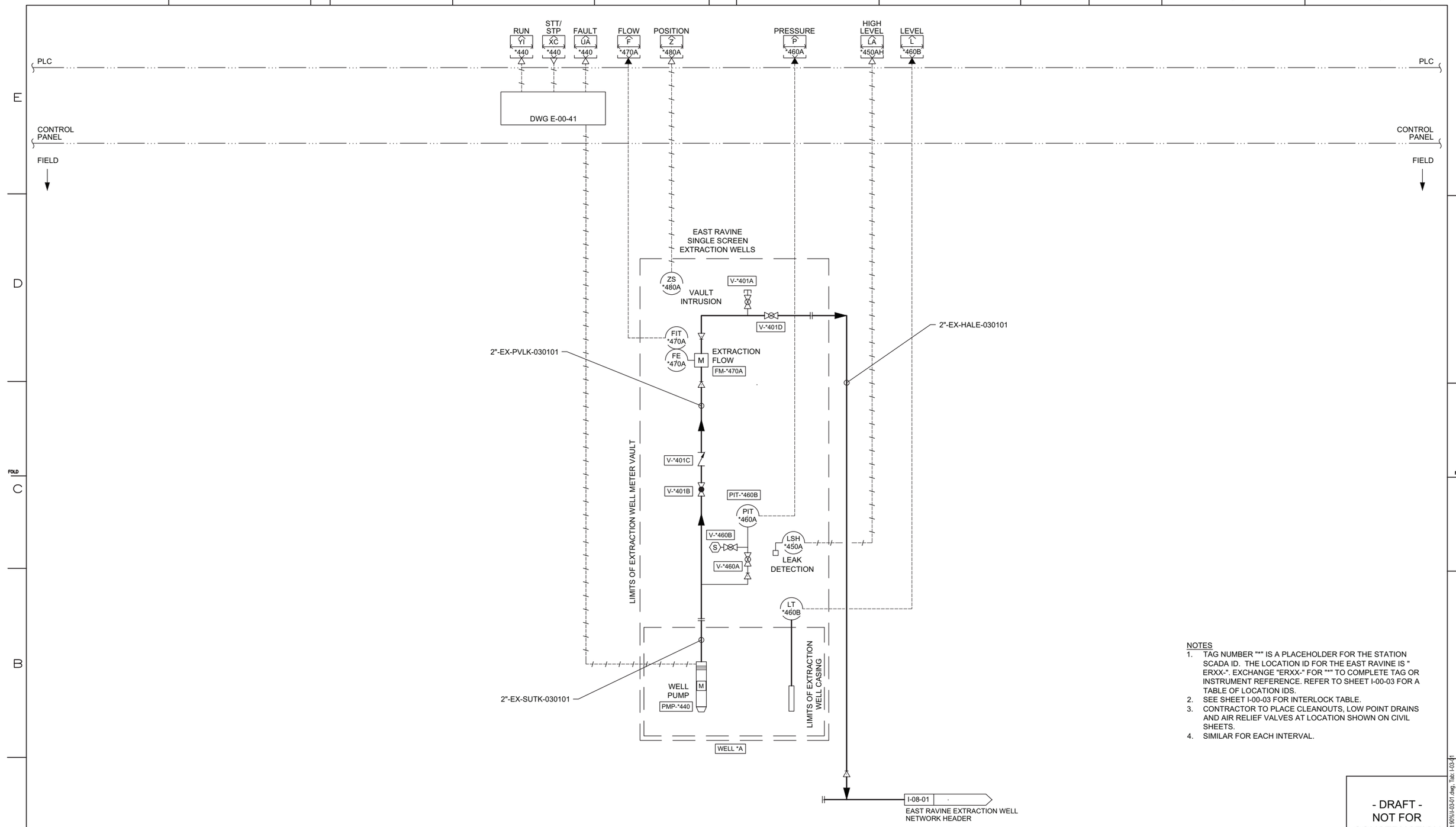
APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	KLD
DWN	LUK
CHKD	JPB
OK	JEF
DATE	09/08/14
SCALES	1" = 1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS LOOP
INJECTION WELL
ELECTRICAL 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-03-03	REV 1

N1808



NOTES

1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE EAST RAVINE IS " ERXX-". EXCHANGE "ERXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
2. SEE SHEET I-00-03 FOR INTERLOCK TABLE.
3. CONTRACTOR TO PLACE CLEANOUTS, LOW POINT DRAINS AND AIR RELIEF VALVES AT LOCATION SHOWN ON CIVIL SHEETS.
4. SIMILAR FOR EACH INTERVAL.

- DRAFT -
NOT FOR
CONSTRUCTION

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

TCS LOOP EAST RAVINE EXTRACTION WELLS P&ID

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

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-03-01	REV 1

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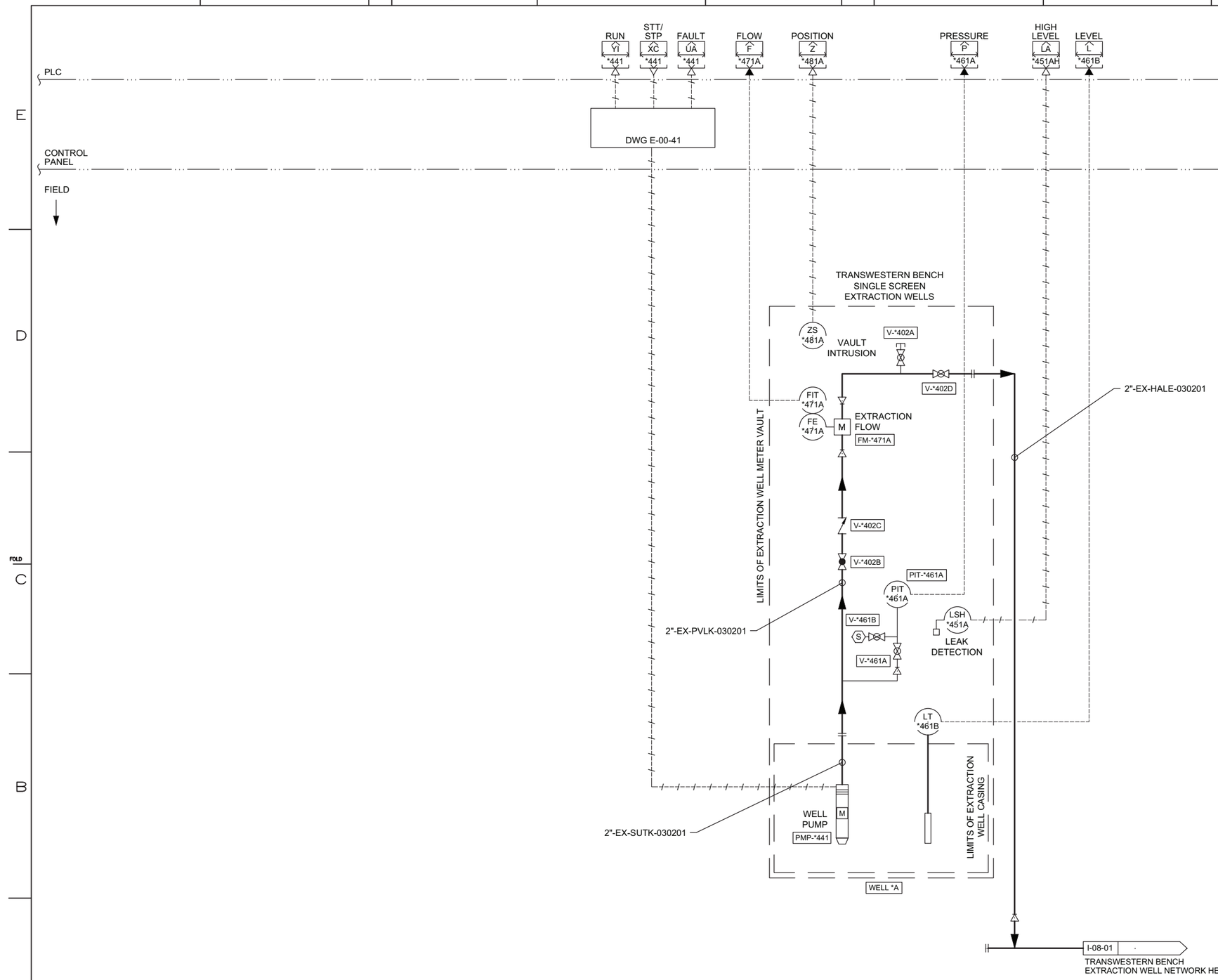
N1808



NOTES
1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR TRANSWESTERN BENCH EXTRACTION WELLS IS "TWBXX". EXCHANGE "TWBXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
2. SEE SHEET I-00-03 FOR INTERLOCK TABLE.
3. CONTRACTOR TO PLACE CLEANOUTS, LOW POINT DRAINS AND AIR RELIEF VALVES AT LOCATION SHOWN ON CIVIL SHEETS.
4. SIMILAR FOR EACH INTERVAL.

- DRAFT - NOT FOR CONSTRUCTION

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

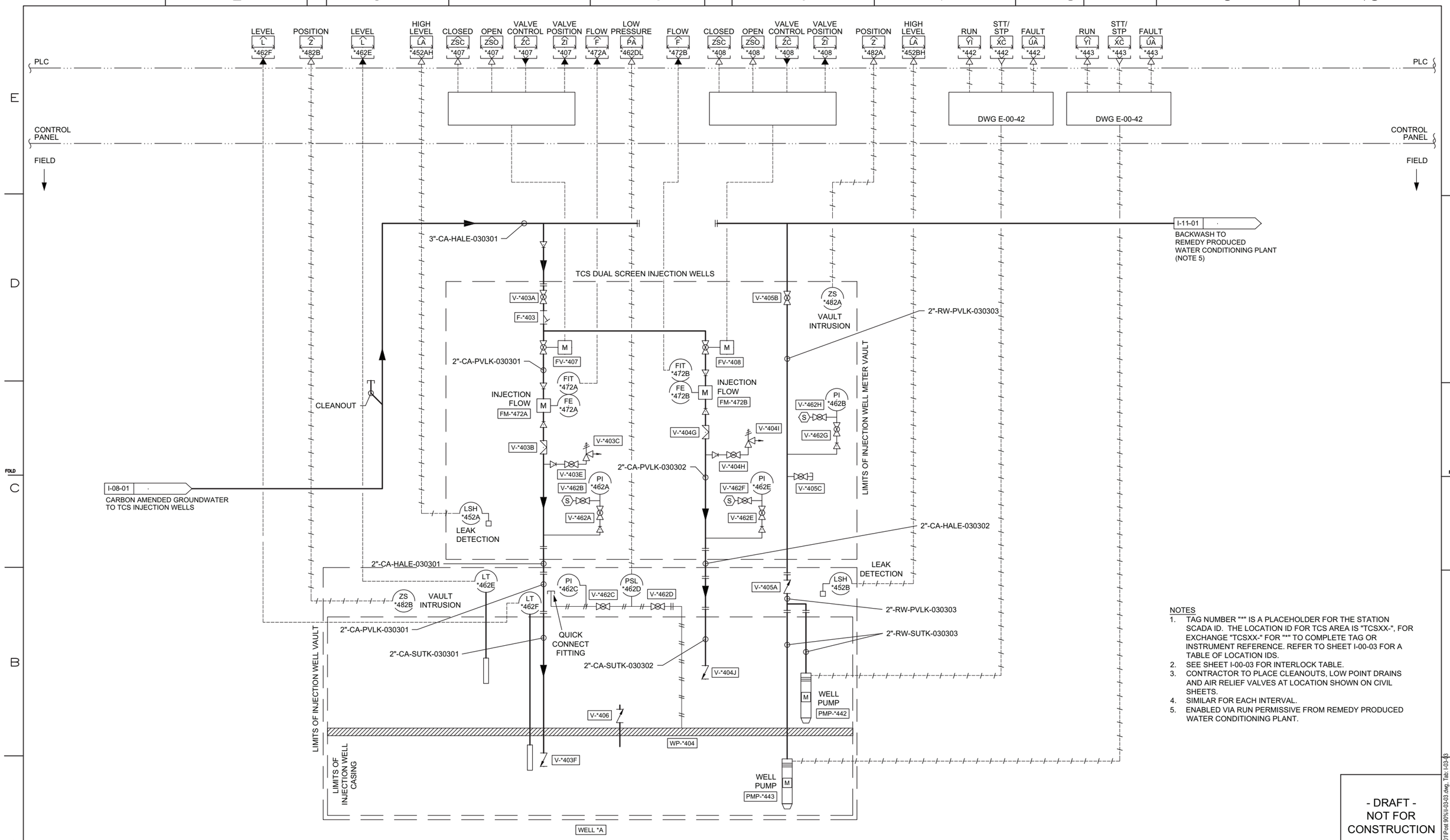
APPROVED BY
JEF

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS LOOP TRANSWESTERN BENCH EXTRACTION WELLS P&ID
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-03-02	REV 1

N1808



NOTES

1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR TCS AREA IS "TCSXX-", FOR EXCHANGE "TCSXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
2. SEE SHEET I-00-03 FOR INTERLOCK TABLE.
3. CONTRACTOR TO PLACE CLEANOUTS, LOW POINT DRAINS AND AIR RELIEF VALVES AT LOCATION SHOWN ON CIVIL SHEETS.
4. SIMILAR FOR EACH INTERVAL.
5. ENABLED VIA RUN PERMISSIVE FROM REMEDY PRODUCED WATER CONDITIONING PLANT.

- DRAFT - NOT FOR CONSTRUCTION

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

TCS LOOP INJECTION WELLS P&ID

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

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

N1808

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