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

G FOR STANDARD PROJECT ABBREVIATIONS, SEE SHEET G-00-04 FOR GENERAL LEGENDS AND ABBREVIATIONS , SEE SHEET G-00-05

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. COORDINATE SPACING AND LOCATION WITH 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 CH-A-XXX-1212AD.

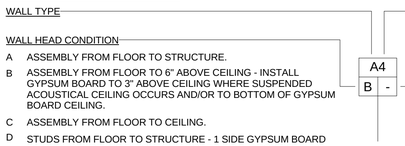
INTERIOR ELEVATIONS

A SEE SHEET CH-A-XXX-1212AD FOR STANDARD MOUNTING HEIGHTS.

EXTERIOR ELEVATIONS

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

WALL TYPE SYMBOL



WALL TYPE

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.

STUD SIZE OR NOMINAL CMU SIZE

1 = 1 5/8" 4 = 4"
2 = 2 1/2" 6 = 6"
3 = 3 5/8" 8 = 8"
4 = 4" 12 = 12"
6 = 6"
8 = 8"

INSULATION TYPE

- NO INSULATION REQUIRED
A PROVIDE ACOUSTICAL INSULATION
T PROVIDE THERMAL INSULATION

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
C	CENTERLINE
DAT	DATUM
DF	DRINKING FOUNTAIN
DI	DISTILLED WATER
DIA OR /○	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 NUMBER
BUILDING SECTOR
BUILDING LEVEL
BUILDING CODE
DOOR TAG
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
GLAZING TAG
FINISH TAG
KEYNOTE TAG
SPECIFICATION DIVISION NUMBER
KEYNOTE NUMBER
SPECIFICATION TAG
EQUIPMENT TAG

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 EYEWASH 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
S 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

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

APPROVED BY	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

LEGENDS & ABBREVIATIONS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

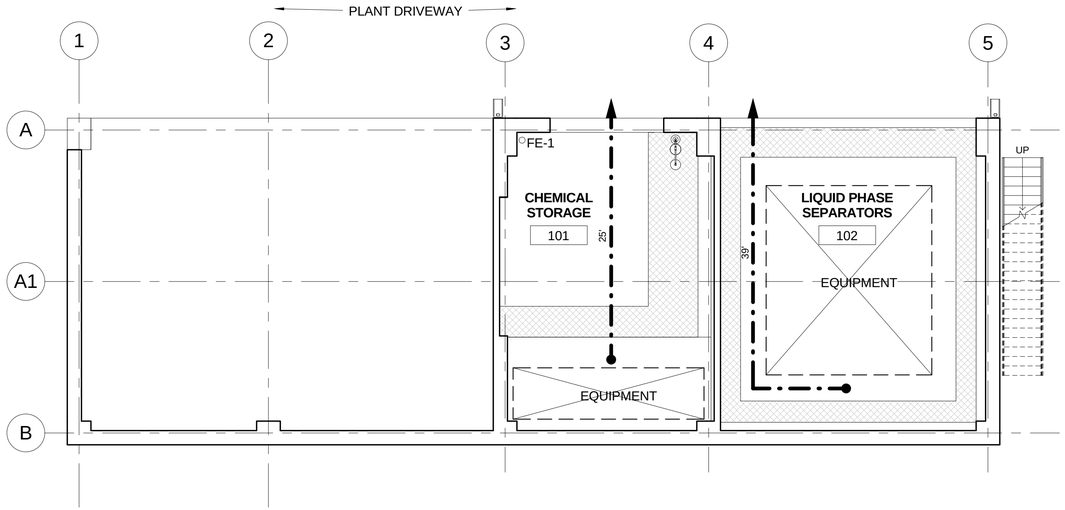
SAN FRANCISCO, CALIFORNIA

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

FILENAME:

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

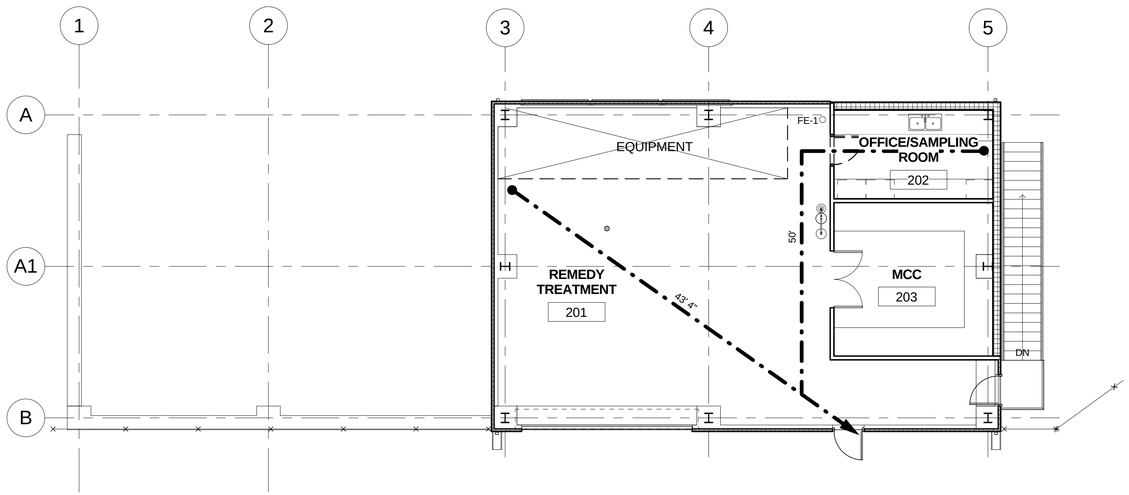
N1808



1 FIRST FLOOR LIFE SAFETY PLAN

1/8" = 1'-0"

A-12-01



2 SECOND FLOOR LIFE SAFETY PLAN

1/8" = 1'-0"

A-12-01

OTHER CODES:

2010 CALIFORNIA FIRE CODE
2010 CALIFORNIA MECHANICAL CODE
2010 CALIFORNIA PLUMBING CODE
2010 CALIFORNIA ELECTRICAL CODE
2010 CALIFORNIA ENERGY CODE

LEGEND

- X' — TRAVEL DISTANCE (X = TOTAL DISTANCE TO EXIT IN FEET)
- X" — EGRESS WIDTH (IN INCHES)
- F. EXT-1 — FIRE EXTINGUISHER
- EYEWASH/SAFETY SHOWER

GENERAL NOTES:

1. FOR SIGN INFORMATION AND TYPE DESCRIPTIONS SEE SPECIFICATIONS SECTION 10 14 00.
2. FOR ARCHITECTURAL LEGEND SEE DWG CH-A-XXX-1201AD.
3. FOR ABBREVIATIONS SEE DWG CH-A-XXX-1201AD.
4. FOR FIRE EXTINGUISHER INFORMATION SEE SPECIFICATIONS SECTION 10 14 00.

EXIT REQUIREMENTS

REQUIRED EXITS (IBC 1014.1 & 1018):	1
MAX.TRAVEL DISTANCE ALLOWED: (TABLE 1015.1)	200
MAX. COMMON PATH TRAVEL: (IBC 1013.3)	75
MAX. DEAD ENDS: (TABLE 1016.3)	20
CORRIDOR WIDTH (IBC 1016.2):	44"
MIN. EGRESS WIDTH (IBC 1005.1):	36"

PLUMBING FIXTURES (TABLE 2902.1)

		WC		LAV					
OCCUPANCY		M	F	M	F	SHOWER	0	SINK	0
MINIMUM FIXTURE COUNT		0	0	0	0	DF	0	SS	0
ACTUAL FIXTURE COUNT		0		0		SHOWER	0	SINK	0
		M	F	M	F	DF	0	SS	0

URINALS (419.2 IPC)	NOT MORE THAN 50% OF WC REQD.
TRAVEL DISTANCE (2902.4.1)	500 FT
TRAVEL DISTANCE EXCEPTION (LOCAL FACILITY NOT PROVIDED) [IBC 2902.4.1]	APPROVED BY OFFICIAL:

REQUIRED FIRE RESISTANT RATINGS

BUILDING ELEMENTS (TABLE 601)	
STRUCTURAL FRAME	0 HR
EXTERIOR BEARING WALLS	0 HR
INTERIOR BEARING WALLS	0 HR
INTERIOR NON-BEARING WALLS	0 HR
FLOOR CONSTRUCTION	0 HR
ROOF CONSTRUCTION	0 HR
SHAFT ENCLOSURE (707.4)	0 HR
STAIRWAY ENCLOSURE (1019.1)	0 HR
CORRIDOR (TABLE 1016.1)	0 HR
ALLOWABLE AREA OF EXTERIOR DOORS AND WINDOWS (704.8)	UNLIMITED
OCCUPANCY SEPARATIONS (IBC 508.3.3)	N/A
INCIDENTAL USE AREAS (508.2)	N/A
ACCESSORY USE AREAS (508.3.1)	N/A
NON-SEPARATED USE (508.3.2)	N/A
FIRE SEPARATION DISTANCE (TABLE 602)	30'
DISTANCE FROM ADJACENT BUILDING OR PROPERTY LINE	>30'

INTERIOR FINISHES (IBC 803.5)

OCCUPANCY:	F1	AREA:	3,424	CLASSIFICATION:	C
OCCUPANCY:	N/A	AREA:	N/A	CLASSIFICATION:	N/A

INSULATION REQUIREMENTS

INSULATION (R-VALUE):	
ROOF:	R = 6.5
WALLS:	R = 1.4 CONT EXT INSUL
EXTERIOR DOORS:	U = 0.77
WINDOWS:	U = 0.71
ATTIC:	R-38 OR U = 0.027 MAX
UNHEATTED SLAB ON GRADE:	N/A
SGHC:	U = 0.400
ROLL-UP OR SLIDING DOORS:	U = 0.500
GLAZING PERCENTAGE:	
WINDOW:	40% MAX
SKYLIGHT:	5% MAX
OTHER:	
DAYLIGHT CONTROLS:	YES
PERIMETER SLAB INSULATION:	N/A

TBD

CODE DATA

2010 CALIFORNIA BUILDING STANDARDS CODE

BUILDING:

PROJECT:	ARCHITECT:
PACIFIC GAS & ELECTRIC COMPANY TOPOCK REMEDIATION	CH2M HILL 2020 SW 4th AVENUE PORTLAND, OREGON

LOCAL OFFICIALS:

BUILDING DEPARTMENT CONTACTS	BUILDING OFFICIAL:	TBD	PHONE: XXX-XXX-XXXX
	PLANS EXAMINER:	TBD	PHONE: XXX-XXX-XXXX
FIRE DEPARTMENT CONTACT	FIRE MARSHAL:	TBD	PHONE: XXX-XXX-XXXX
OTHER			PHONE:

PROJECT DESCRIPTION

NEW 2 STORY WATER TREATMENT FACILITY

GENERAL INFORMATION

USE AND OCCUPANCY CLASSIFICATION (CHAPTER 3)	F1
CONSTRUCTION CLASSIFICATION (IBC 602 & TABLE 503)	II-B

AREA AND HEIGHT LIMITATIONS

MAXIMUM ALLOWABLE AREA PER STORY (TABLE 503)	15,500
ALLOWABLE AREA A = T + [TF/100] + [TS/100]	
OCCUPANCY:	F1
TABULAR AREA (T) [TABLE 503]:	15,500
SPRINKLER INCREASE (S) [506.3]:	N/A
FRONTAGE INCREASE (F) [506.2]:	3,625
ALLOWABLE AREA PER FLOOR (A):	19,125
ACTUAL AREA:	
ACTUAL PER FLOOR: FIRST	1,632
SECOND	1,792

INTERMEDIATE LEVELS:

MEZZANINE:	AREA: N/A	# OF OCCUPANTS: N/A	# OF EXITS: N/A
INDUSTRIAL EQUIPMENT PLATFORM (IBC 505.5):	AREA: N/A		

MAXIMUM ALLOWABLE STORIES (TABLE 503)	2
ACTUAL NUMBER OF STORIES:	2
MAXIMUM ALLOWABLE HEIGHT (TABLE 503)	55'
ACTUAL HEIGHT:	39'
AUTOMATIC SPRINKLER FOR STORY INCREASE (IBC 504.2):	N/A

OCCUPANCY / EGRESS INFORMATION

DESIGN OCCUPANCY (TABLE 1004.1.2)	F1
NUMBER OF OCCUPANCY PER FLOOR:	4
EGRESS WIDTH BASED ON OCCUPANCY (TABLE 1005.1)	44"

FIRE PROTECTION

SPRINKLERS (IBC SECT 903)	N/A
FIRE EXTINGUISHERS (SECT 906)	2A:40BC
DISTANCE TO FIRE HYDRANT	TBD

0' 8' 16' 24'

SCALE 1/8"=1'

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

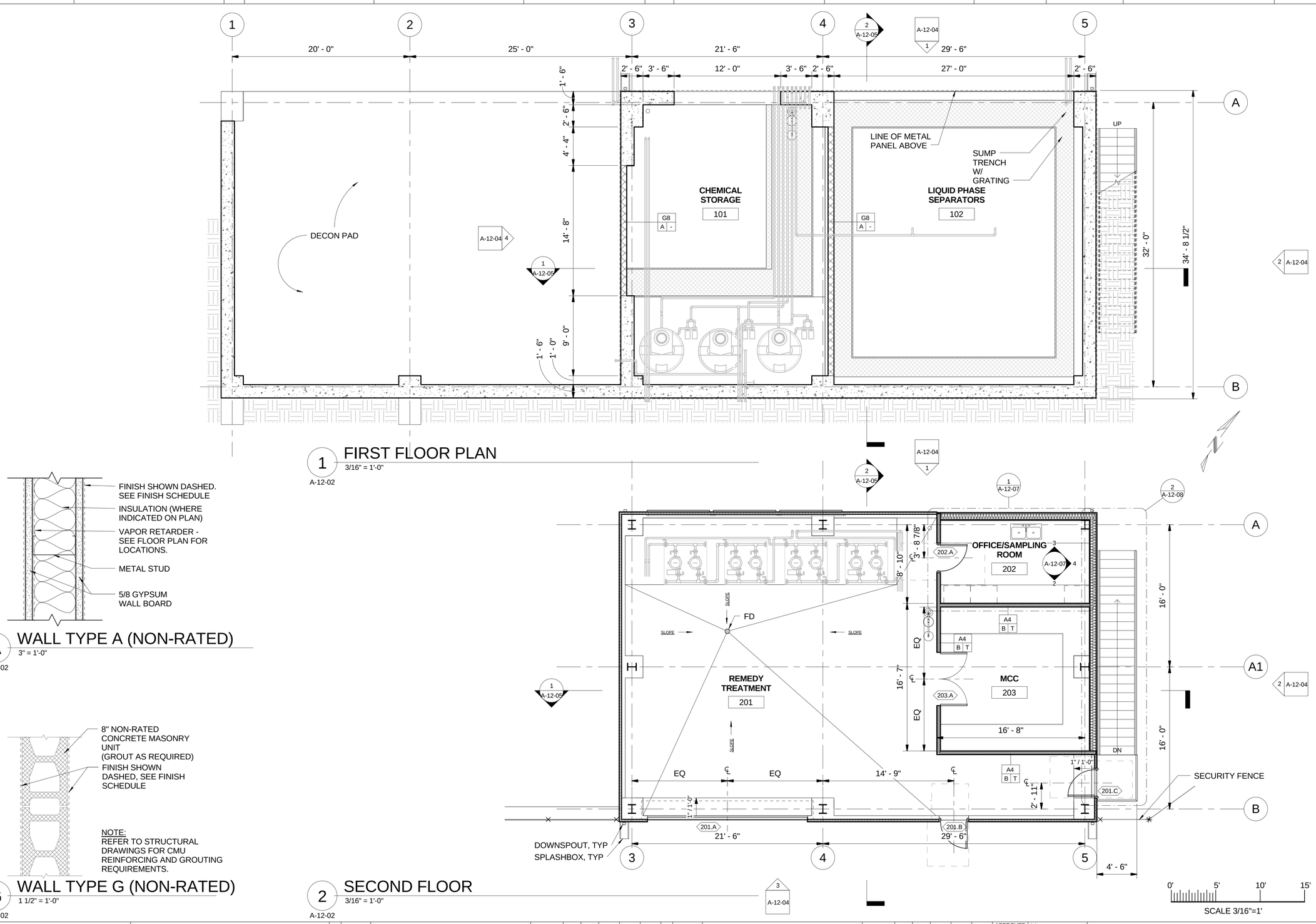
APPROVED BY	
	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
CODE SUMMARY SHEET
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-12-01	REV

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

N1808



1 FIRST FLOOR PLAN
3/16" = 1'-0"
A-12-02

A WALL TYPE A (NON-RATED)
3" = 1'-0"
A-12-02

NOTE:
REFER TO STRUCTURAL DRAWINGS FOR CMU REINFORCING AND GROUTING REQUIREMENTS.

G WALL TYPE G (NON-RATED)
1 1/2" = 1'-0"
A-12-02

2 SECOND FLOOR
3/16" = 1'-0"
A-12-02

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

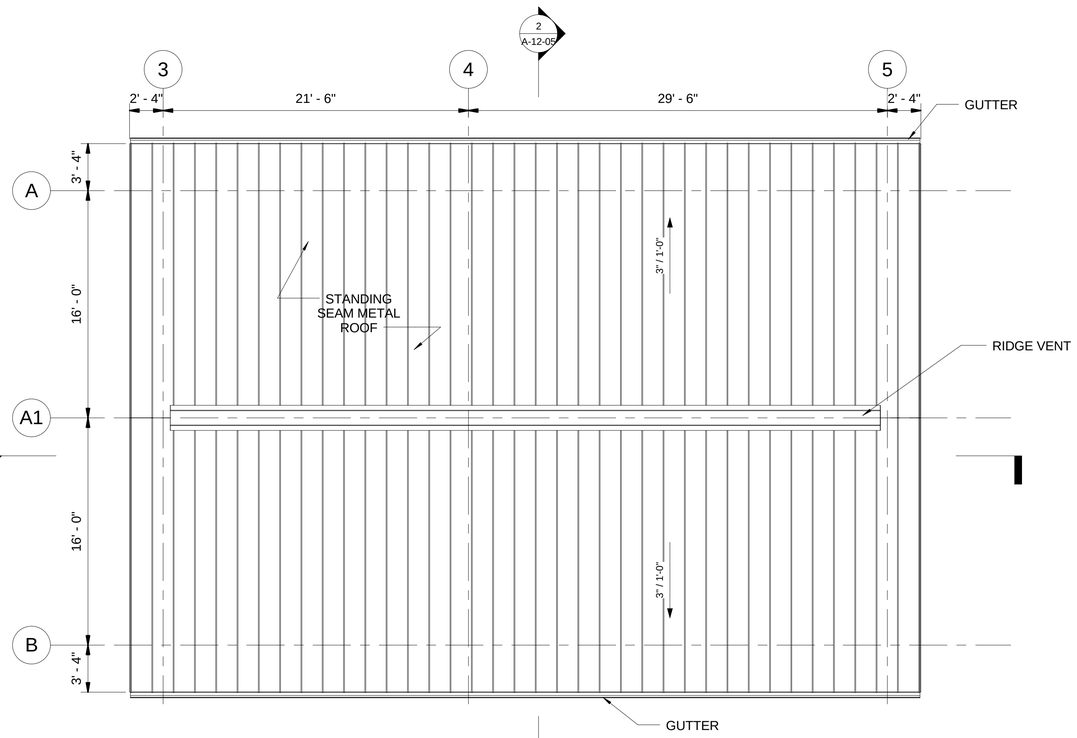
APPROVED BY	
	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
FLOOR PLANS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

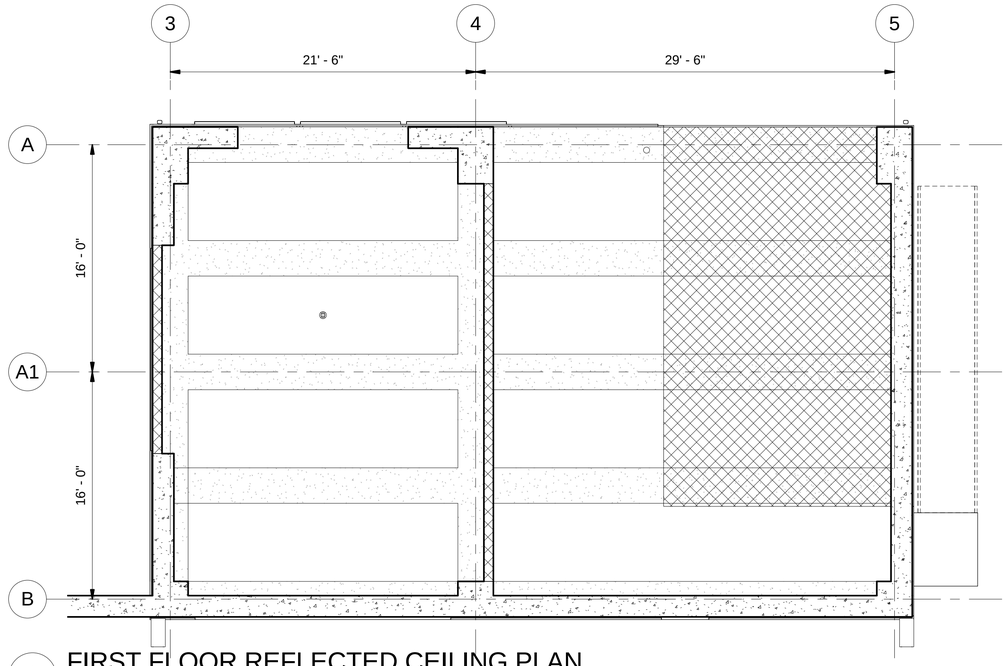
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-02	REV

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

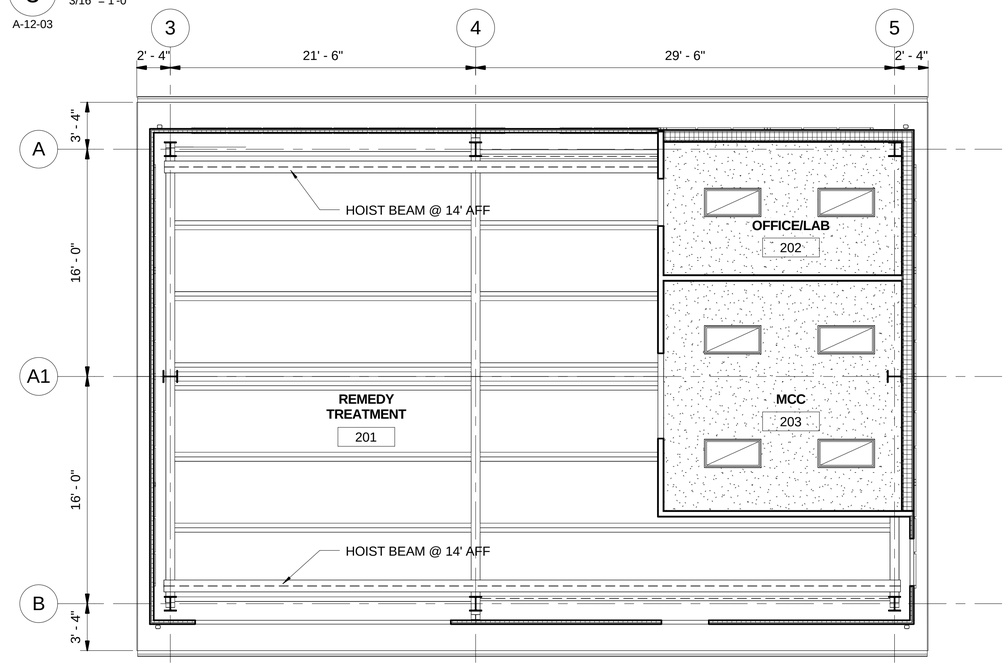
N1808



1 ROOF PLAN
3/16" = 1'-0"
A-12-03



3 FIRST FLOOR REFLECTED CEILING PLAN
3/16" = 1'-0"
A-12-03



2 SECOND FLOOR REFLECTED CEILING PLAN
3/16" = 1'-0"
A-12-03

0' 5' 10' 15'
SCALE 3/16"=1'

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

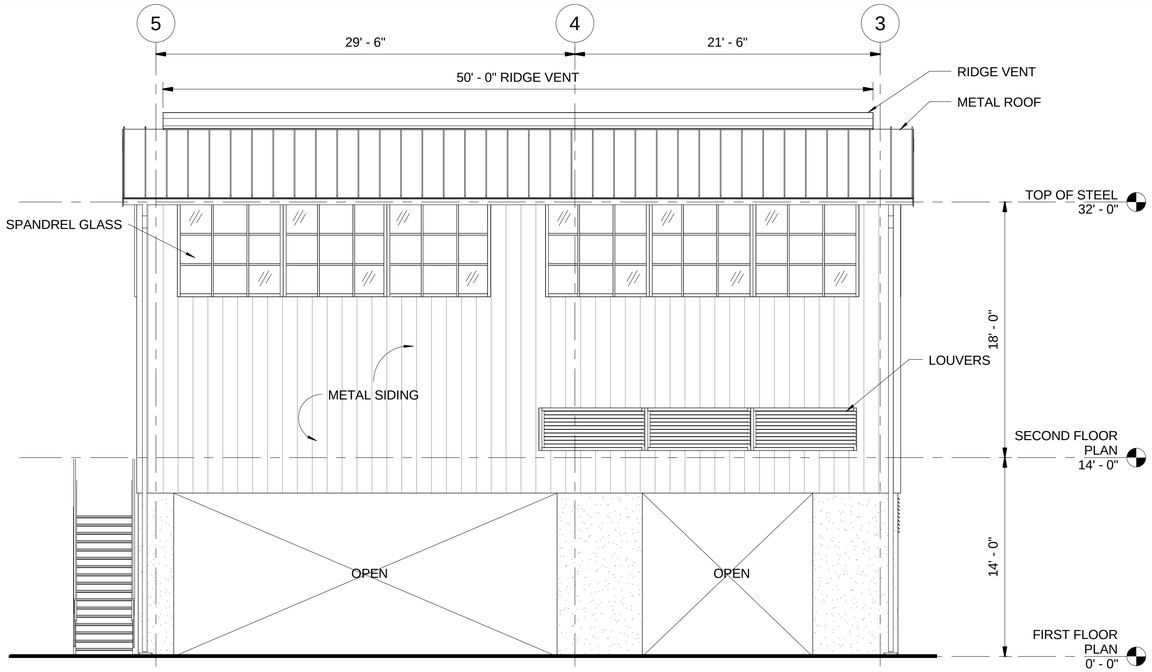
APPROVED BY	
	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
ROOF PLAN & REFLECTED CEILING PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

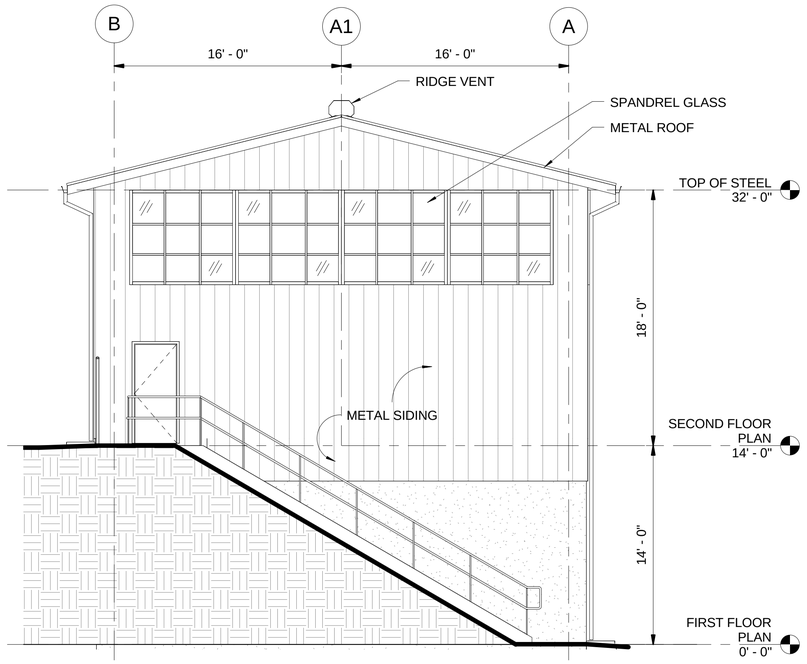
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-03	REV

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

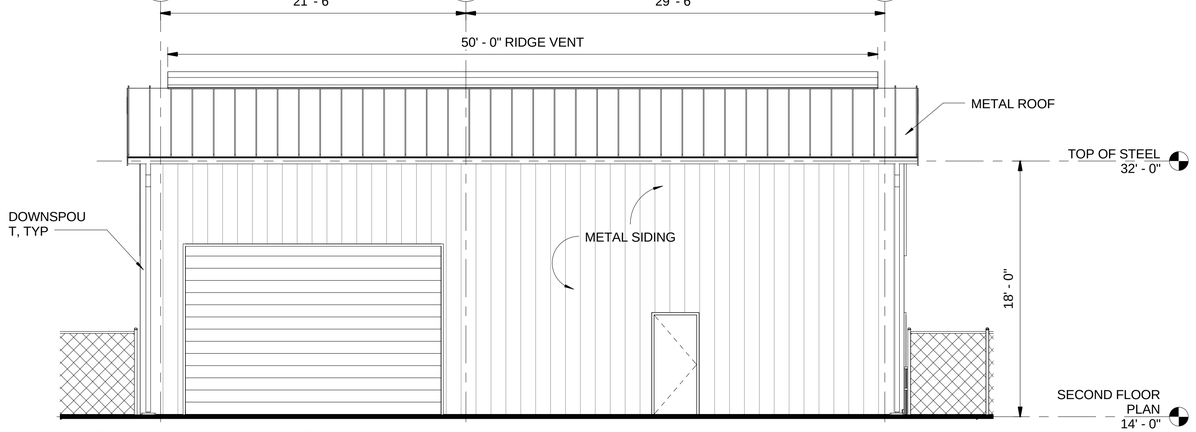
N1808



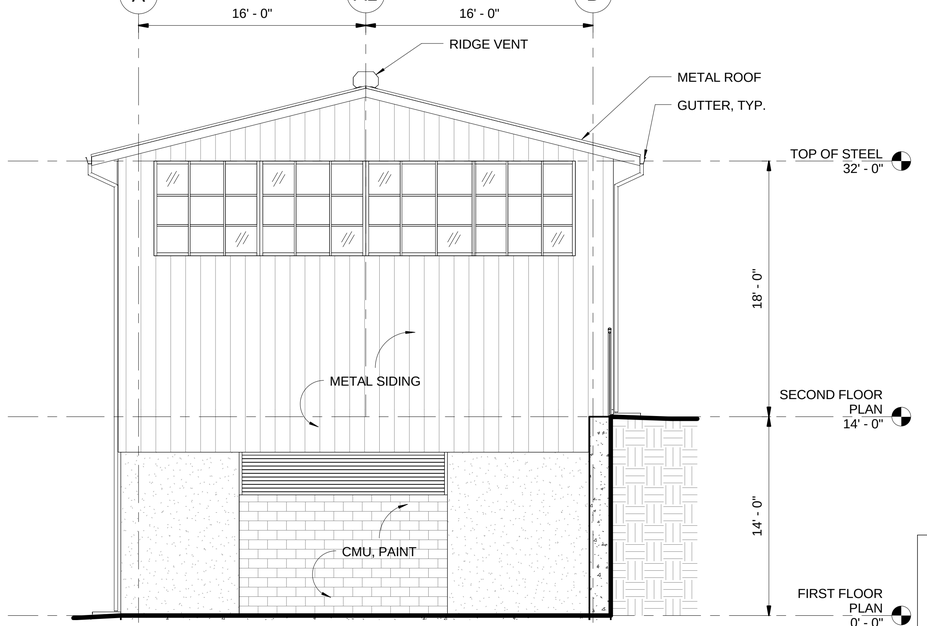
1 NORTH ELEVATION
3/16" = 1'-0"
A-12-04



2 EAST ELEVATION
3/16" = 1'-0"
A-12-04



3 SOUTH ELEVATION
3/16" = 1'-0"
A-12-04



4 WEST ELEVATION
3/16" = 1'-0"
A-12-04

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

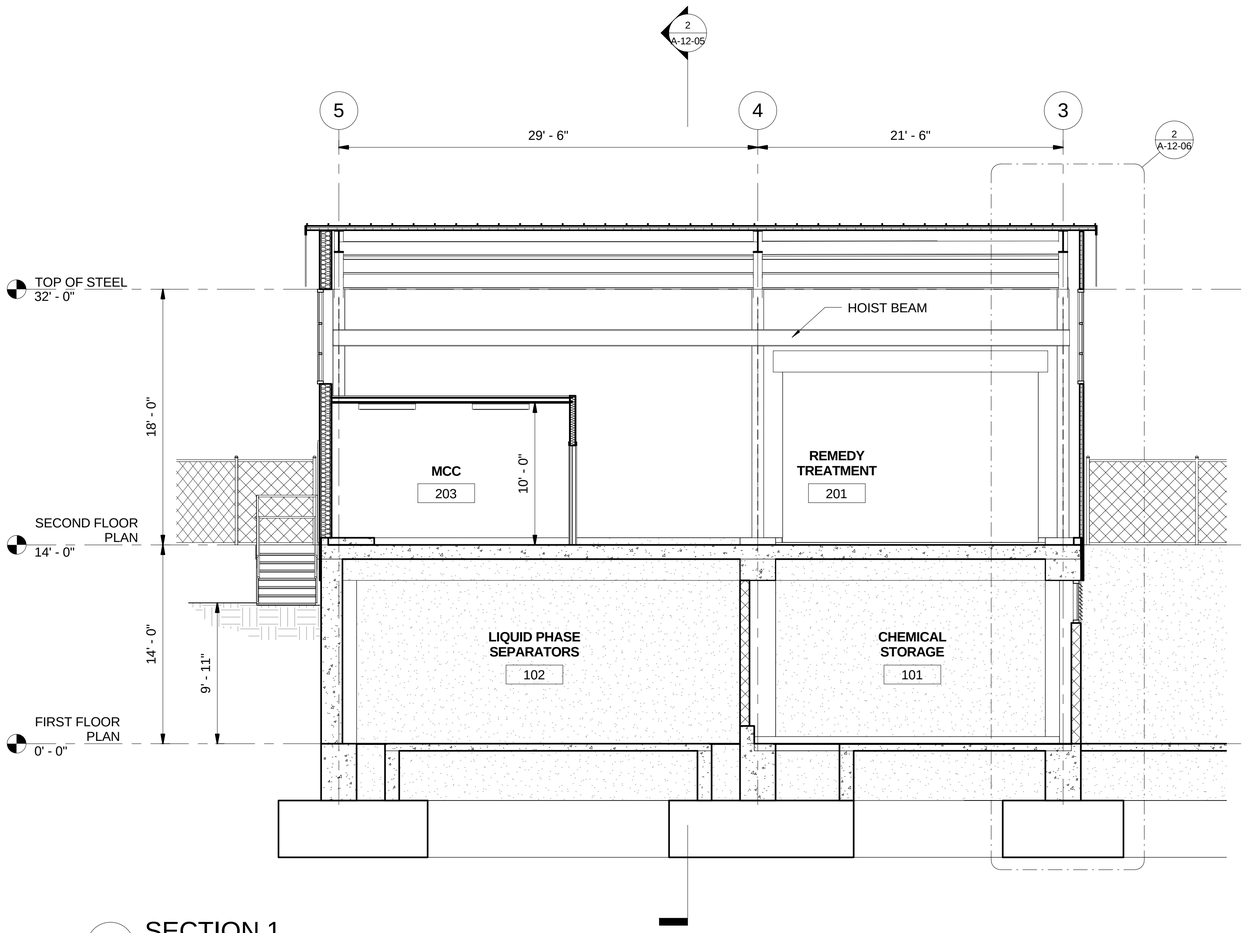
APPROVED BY	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER
CONDITIONING PLANT
EXTERIOR ELEVATIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

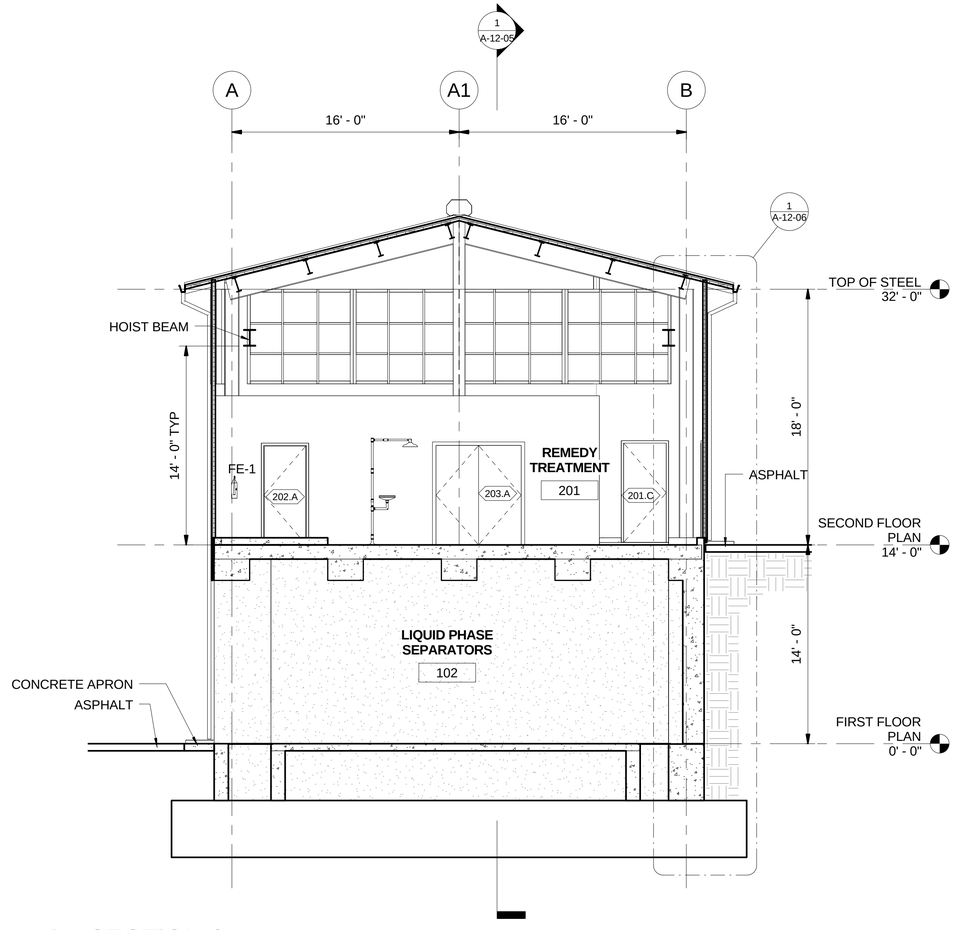
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-04	REV

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

N1808



1 SECTION 1
3/16" = 1'-0"
A-12-05



2 SECTION 2
3/16" = 1'-0"
A-12-05

0' 5' 10' 15'
SCALE 3/16"=1'

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

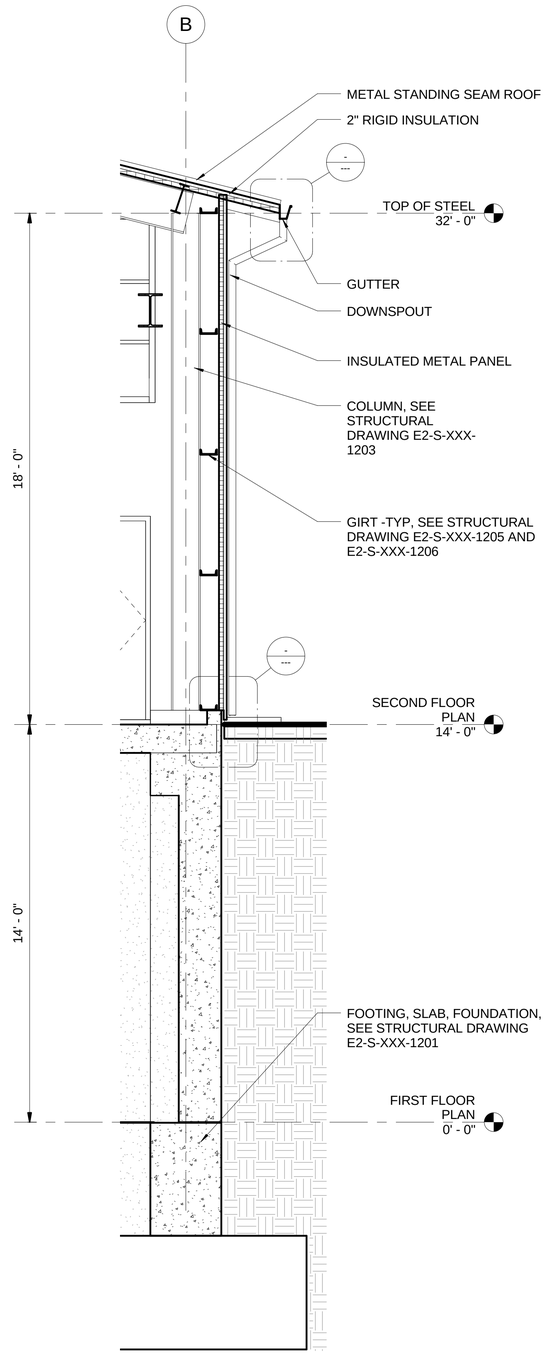
APPROVED BY	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER
CONDITIONING PLANT
BUILDING SECTIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

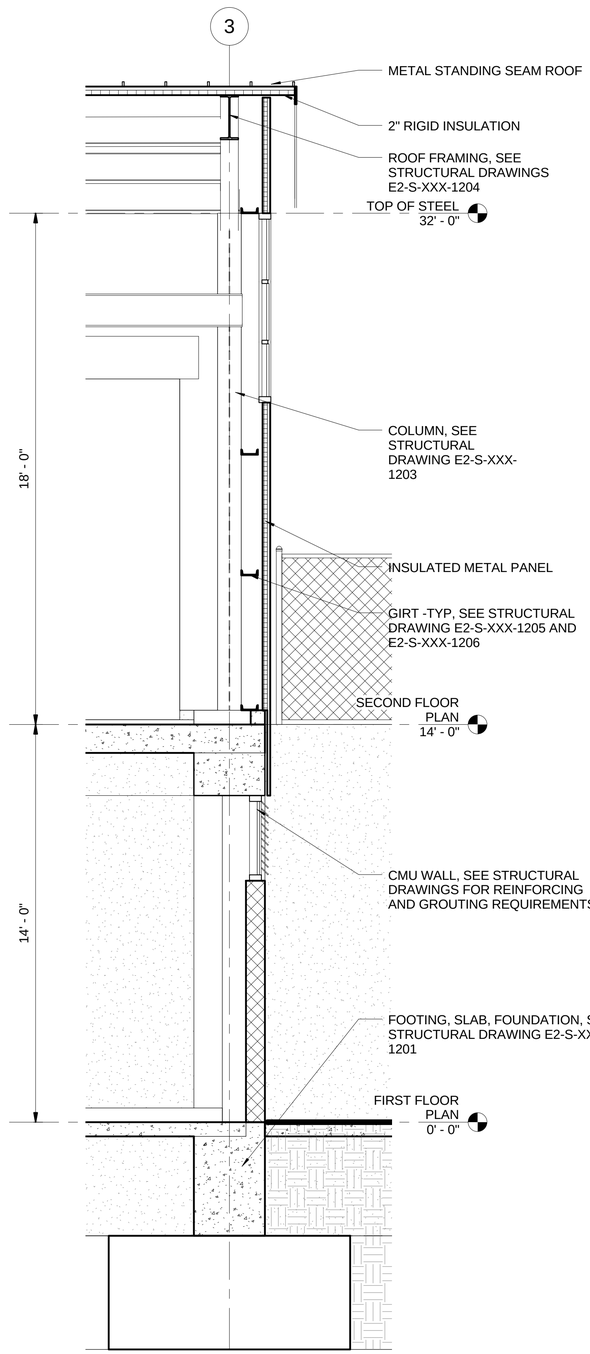
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-05	REV

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

N1808



1 WALL SECTION
3/8" = 1'-0"
A-12-06



2 CALLOUT OF SECTION 1
3/8" = 1'-0"
A-12-06

0' 3' 6' 9'
SCALE 3/8"=1'

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

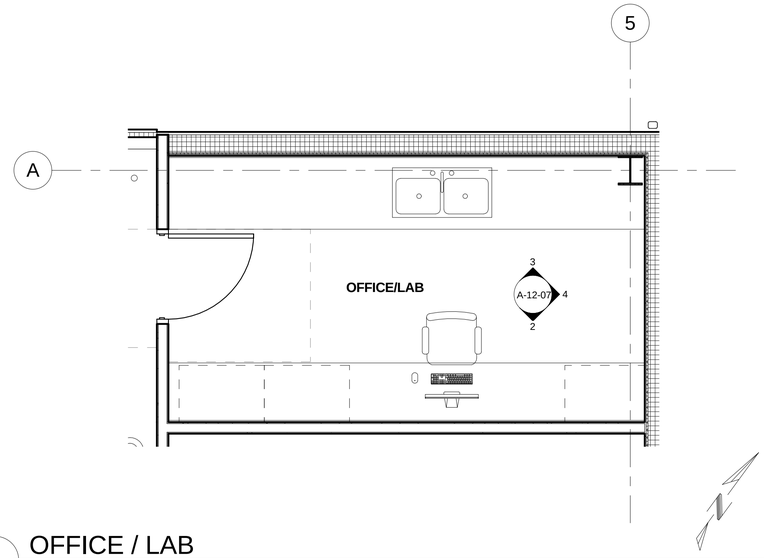
APPROVED BY	
	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
WALL SECTIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

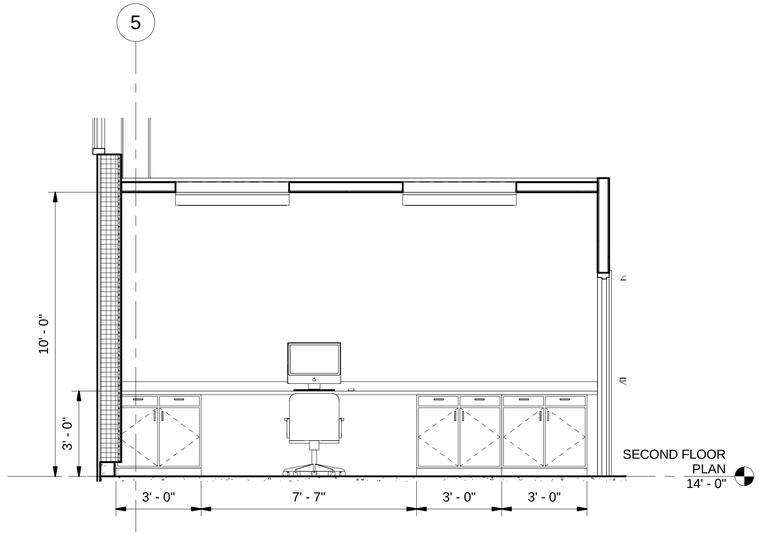
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-06	REV

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

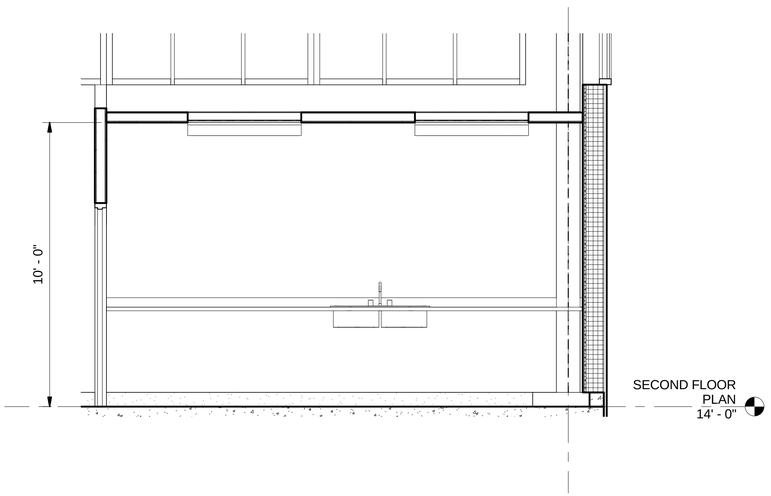
N1808



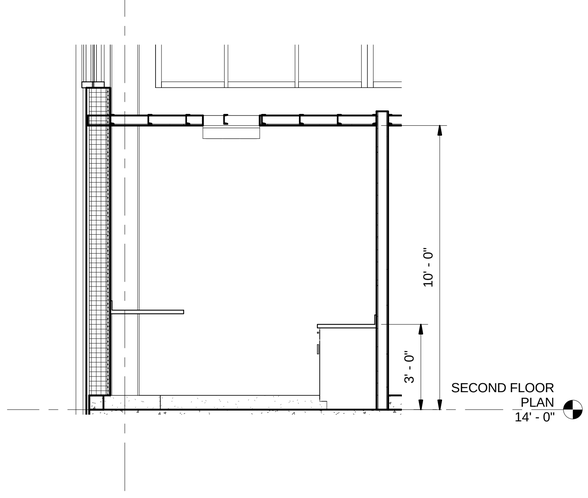
1 OFFICE / LAB
3/8" = 1'-0"
A-12-07



2 INTERIOR ELEVATION - SOUTH
3/8" = 1'-0"
A-12-07



3 INTERIOR ELEVATION - NORTH
3/8" = 1'-0"
A-12-07



4 INTERIOR ELEVATION - EAST
3/8" = 1'-0"
A-12-07

0' 3' 6' 9'
SCALE 3/8"=1'

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

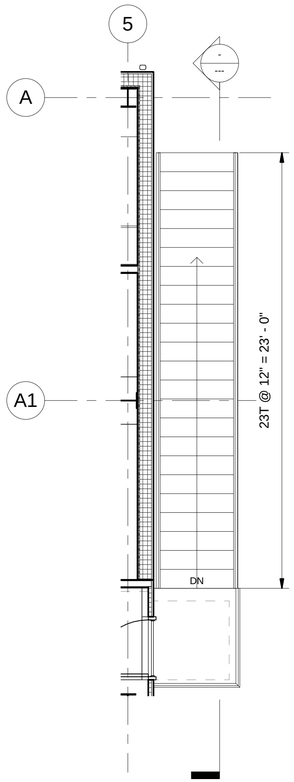
APPROVED BY	
	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
ENLARGED PLANS & ELEVATIONS
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-12-07	REV

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

N1808



2 STAIR PLAN

1/4" = 1'-0"

A-12-08

0' 4' 8' 12'

SCALE 1"=4'

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

APPROVED BY	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

REMEDY PRODUCED WATER CONDITIONING PLANT

STAIR & DETAILS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

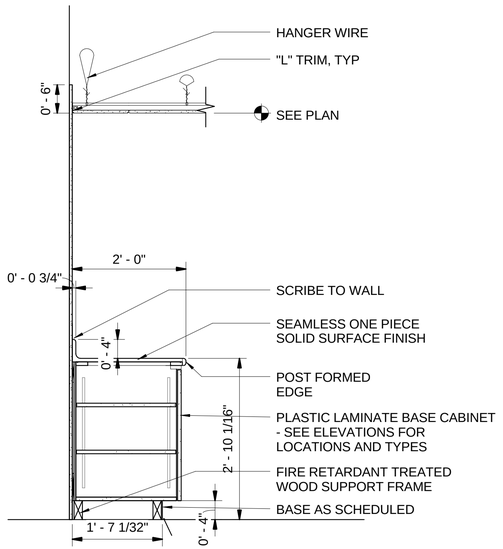
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-08	REV

PLOT TIME: $PLOTTIME

PLOT DATE: $PLOTDATE

FILENAME:

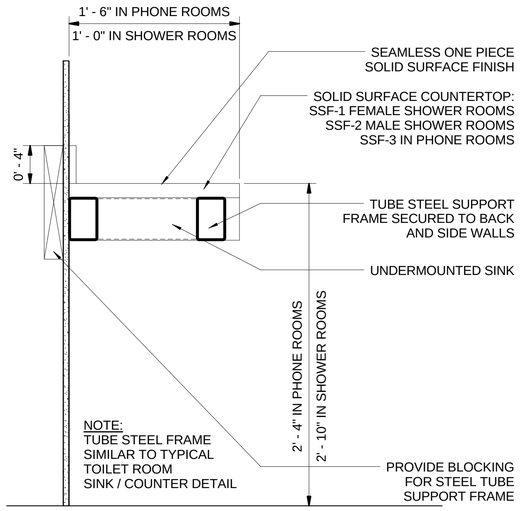
N1808



1 MILLWORK - BASE (NO BULKHEAD)

3/4" = 1'-0"

A-12-09



2 COUNTERTOP DETAIL

1 1/2" = 1'-0"

A-12-09

0' 1' 2'

SCALE 1 1/2"=1'

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

CH2MHILL®

APPROVED BY	
	SO
	SUPV
	DSGN NS
	DWN NS
	CHKD AV
	OK AV
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

REMEDY PRODUCED WATER CONDITIONING PLANT DETAILS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

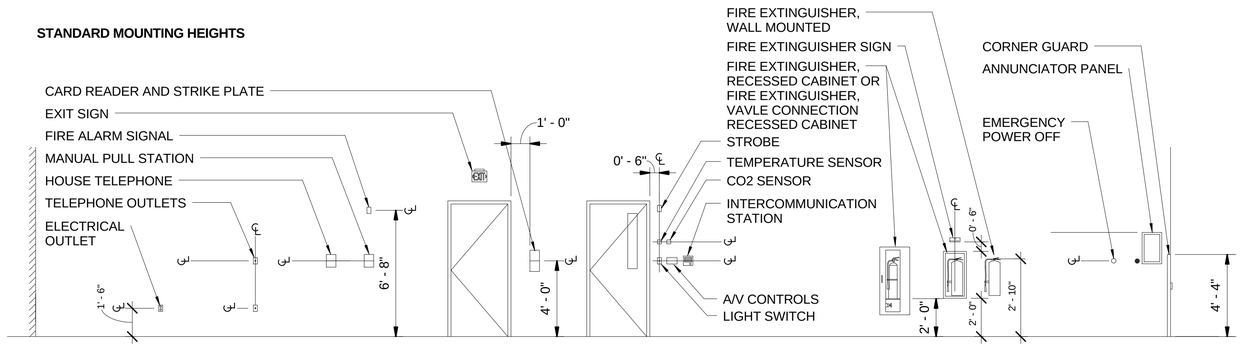
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
A-12-09	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

FILENAME:

N1808

STANDARD MOUNTING HEIGHTS



TYPICAL CORRIDOR/AISLE FIXTURES - STANDARD MOUNTING HEIGHTS

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	ROOM AREA	FLOORS			WALLS								CEILINGS		COMMENTS
						NORTH WALL		SOUTH WALL		WEST WALL		EAST WALL				
			MATERIAL	FINISH	BASE	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	
101	CHEMICAL STORAGE	711 SF														
102	LIQUID PHASE SEPARATORS	935 SF														
201	REMEDY TREATMENT	1299 SF														
202	OFFICE/LAB	157 SF														
203	MCC	272 SF														

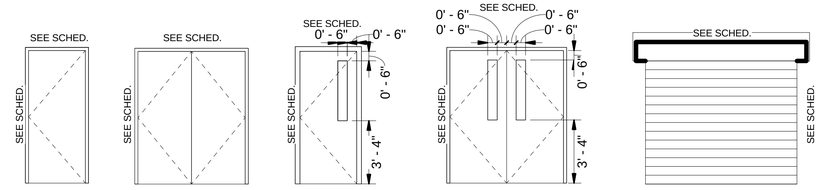
FINISH KEY SCHEDULE

Finish	Manufacturer	Style/Pattern	Size	Color
ACT-1	CERTAINTEED	SYMPHONY M	24" X 24"	
CONC-1		TWO COMPONENT CLEAR COAT EPOXY COATING		
CONC-2		SEALED CONCRETE		
CP-1	WAUSAU TILE	CONCRETE PAVERS	24" X 24"	
CP-2	WAUSAU TILE	CONCRETE PAVERS	12" X 24"	
PL-1	ABET LAMINATI	SOLID COLORS		
PL-2	ABET LAMINATI	WOODGRAINS		
PNT-1	BENJAMIN MOORE			
PNT-2	BENJAMIN MOORE			
SSF-1	NEOPARIES			
VCT-1	ESTRIE	STONESCAPE	12" X 12"	
WD-1		MAPLE VENEER		

DOOR SCHEDULE

NUMBER	SIZE			DOOR		FRAME				FIRE RATING	CARD READER	HARDWARE	GLASS	COMMENTS
	WIDTH	HEIGHT	THICKNESS	TYPE	MATERIAL	TYPE	MATERIAL	HEAD	JAMB					
201.A	18' - 0"	12' - 0"	0' - 2"					5	6					
201.B	3' - 0"	7' - 0"	0' - 2"	N	HM	A	HM	2	4					
201.C	3' - 0"	7' - 0"	0' - 2"	N	HM	A	HM	2	4					
202.A	3' - 0"	7' - 0"	0' - 2"	N	HM	A	HM	1	3					
203.A	6' - 0"	7' - 0"	0' - 2"	F/F	HM	A	HM	1	3					

DOOR TYPES



F FLUSH

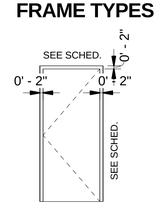
F/F DOUBLE FLUSH

N NARROW LIGHT

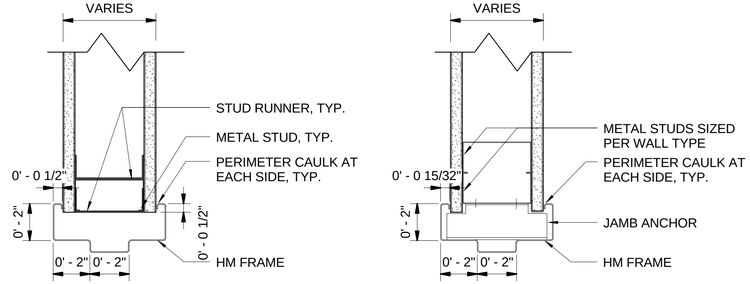
N/N DOUBLE NARROW LIGHT

OH OVERHEAD

FRAME TYPES



A



1 HEAD @ PARTITIONS
3" = 1'-0"
A-12-10

2 JAMB @ PARTITIONS
3" = 1'-0"
A-12-10

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

APPROVED BY
SO
SUPV
DSGN NS
DWN NS
CHKD AV
OK AV
DATE
SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
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
A-12-10
REV

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

N1808

GENERAL STRUCTURAL NOTES

GENERAL

GOVERNING CODES

CALIFORNIA BUILDING CODE (CBC), 2010 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 WHEEL LOAD 16K
ELEVATED CONCRETE FLOOR	- 200 PSF OR FORKLIFT 4K
ROOF	- 20 PSF

WIND LOADS

DESIGN HORIZONTAL WIND LOADS ON VERTICAL SURFACES:

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

SEISMIC LOADS

CBC, 2010 SITE CLASS: D
SEISMIC DESIGN CATEGORY: D

S_s = 0.434 (NEEDLES, CA.)
S_1 = 0.135 (NEEDLES, CA.)
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 BU 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(00) 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(00).

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	TENSION LAP LAP SLICES 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 SECTION XXXXXX.

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, $\frac{3}{4}$ 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

ALUMINUM

DESIGN DATA

CODES	- CALIFORNIA BUILDING CODE, 2010
SPECIFICATION	- ASTM - 6061-T6 ALLOY, UNLESS OTHERWISE NOTED.

MASONRY

DESIGN DATA

CODE - CALIFORNIA BUILDING CODE (2010)

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

MORTAR - ASTM C270, CONFORM WITH UBC-2007, 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

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

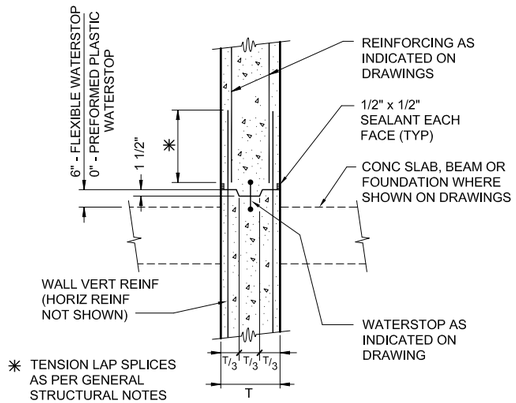
TOPOCK GROUNDWATER REMEDIATION PROJECT

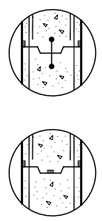
GENERAL STRUCTURAL NOTES

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

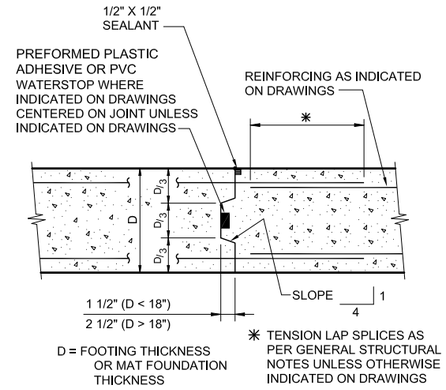
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0001.dwg



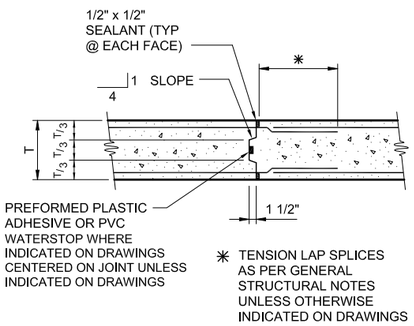


CONST JT LEGEND

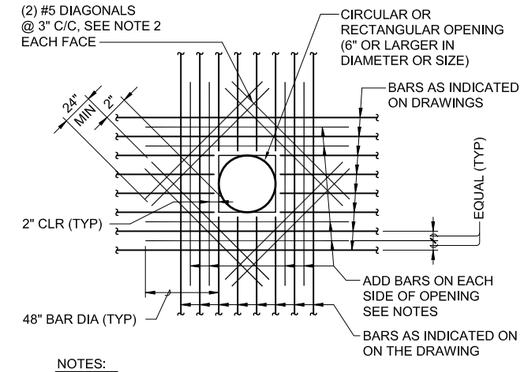
1 WALL HORIZONTAL CONSTRUCTION JOINT
TYP NTS



2 FOUNDATION OR BASE SLAB CONSTRUCTION JOINT
TYP NTS



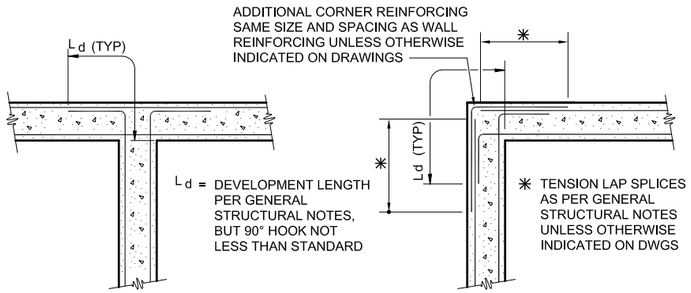
3 WALL VERTICAL CONSTRUCTION JOINT
TYP NTS

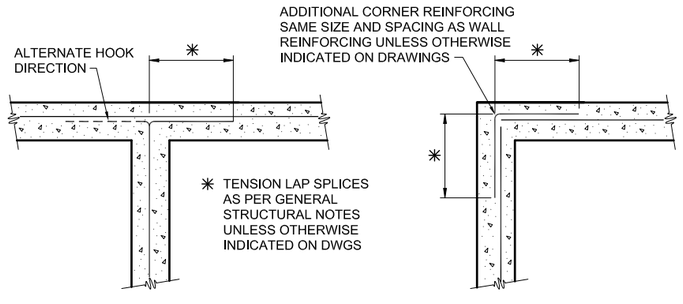


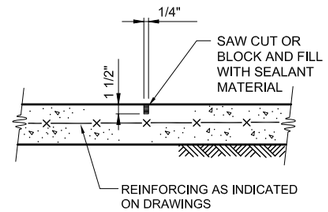
NOTES:

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

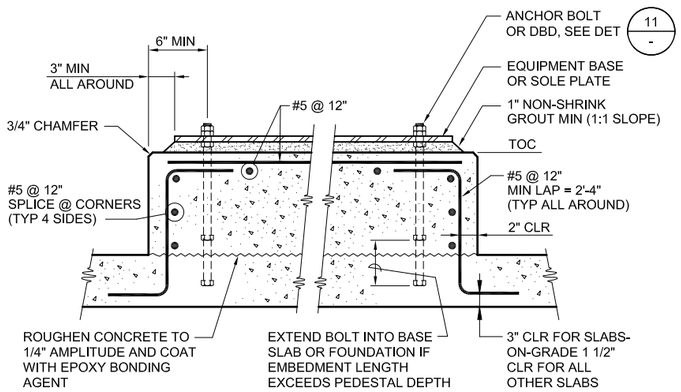




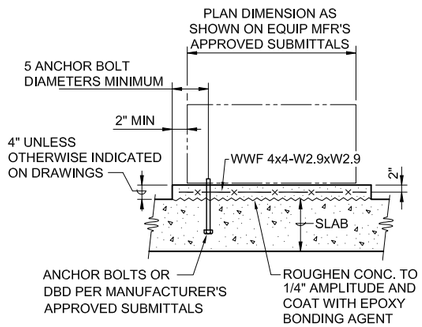


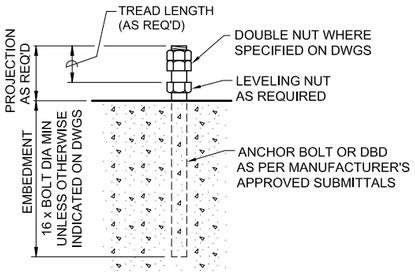
T.B.D.

5 DOUBLE REINFORCING WALL DETAIL
TYP NTS

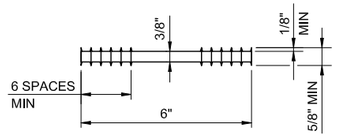


6 SINGLE REINFORCING WALL DETAIL
TYP NTS



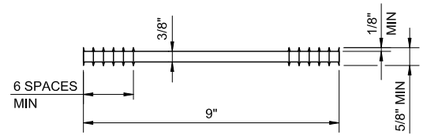


7 CONTROL JOINT DETAIL
TYP NTS

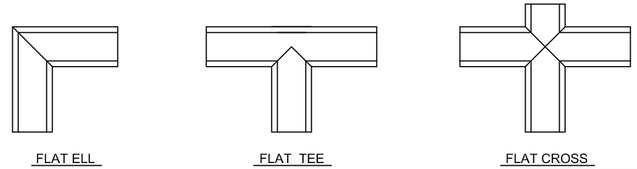


6" - FLATSTRIP WATERSTOP

8 CONCRETE WALKWAY DETAIL
TYP NTS



9" - FLATSTRIP WATERSTOP



12 PREFABRICATED WATERSTOP JOINT DETAIL
TYP NTS

9 EQUIPMENT FOUNDATION DETAIL
TYP NTS

10 EQUIPMENT PAD DETAIL
TYP NTS

11 ANCHOR BOLT DETAIL
TYP 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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT

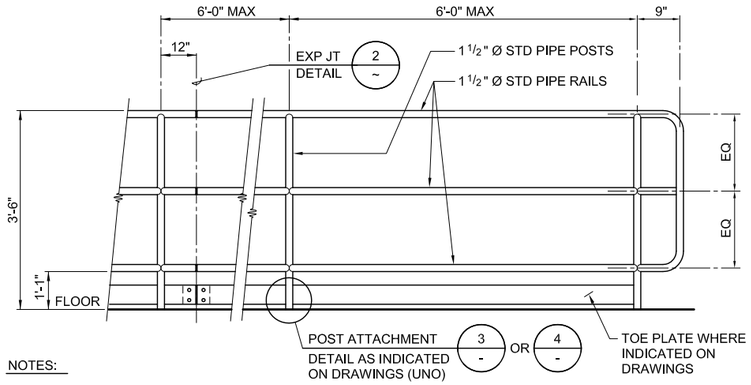
GENERAL STRUCTURAL DETAILS

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

PLOT TIME: $PLOTTIME
PLOT DATE: $PLOTDATE
FILENAME: E2-S-XXX-0002.dwg

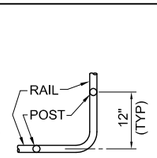
N1808



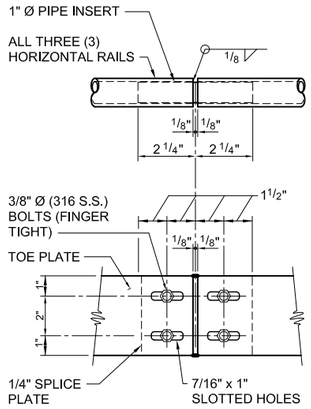
NOTES:

1. ALL MATERIAL TO BE ALUMINUM 6061-T6.

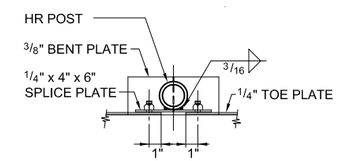
1 HANDRAIL DETAIL
NTS
TYP



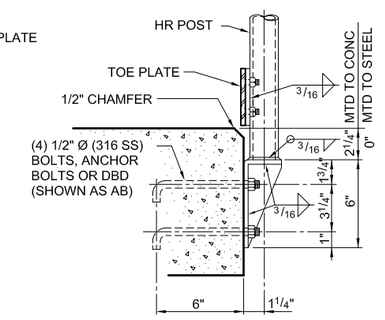
CORNER PLAN



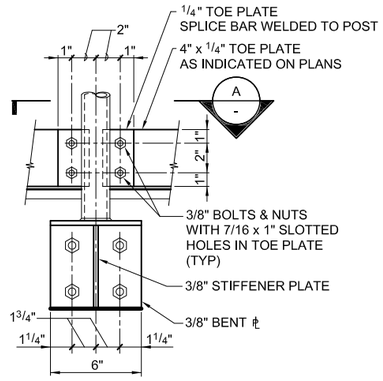
2 HANDRAIL EXPANSION JT. DETAIL
NTS



A SECTION
NTS



SIDE ELEVATION

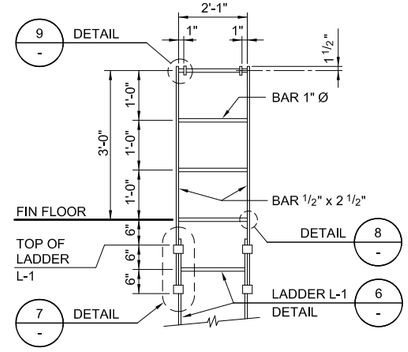


FRONT ELEVATION

NOTES:

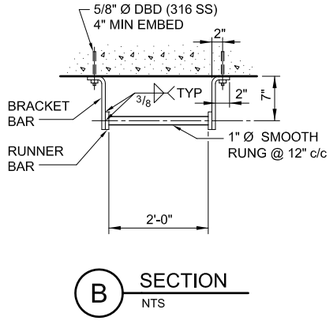
1. ALL CONNECTION ANGLES, PLATES, STIFFENER PLATES AND TOE PLATES SHALL BE OF ALUMINUM 6061-T6 AND ALL FASTENERS SHALL BE TYPE 316 SS.
2. COAT ALUMINUM SURFACES IN CONTACT WITH CONCRETE PER SPECIFICATIONS.
3. OPTIONAL TO USE APPROVED MFR's SUPPORT ASSEMBLY.
4. FOR ATTACHMENT TO STEEL MEMBERS USE TYPE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

3 SIDE MOUNTED POST ATTACHMENT DETAIL
NTS

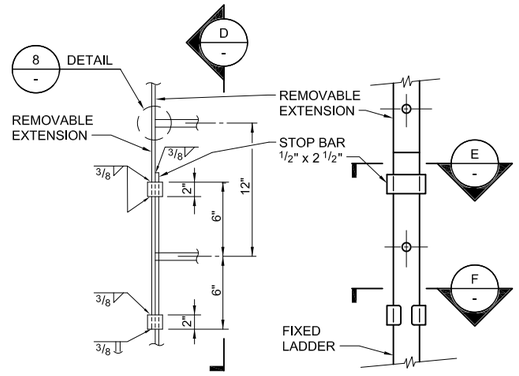


NOTE: ALL MATERIAL SHALL BE ALUMINUM (6061-T6)

5 EXTENSION LADDER L-2 DETAIL
NTS
TYP

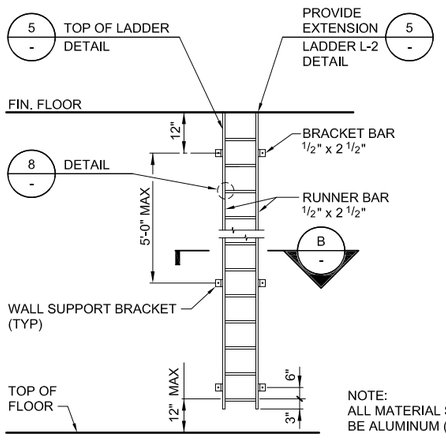


B SECTION
NTS



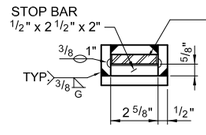
7 DETAIL
NTS

D SECTION
NTS

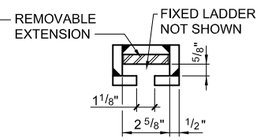


NOTE: ALL MATERIAL SHALL BE ALUMINUM (6061-T6)

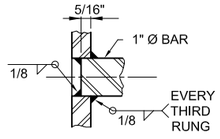
6 LADDER L-1 DETAIL
NTS
TYP



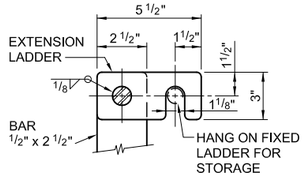
E SECTION
NTS



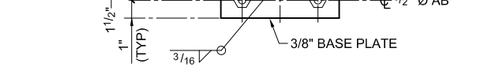
F SECTION
NTS

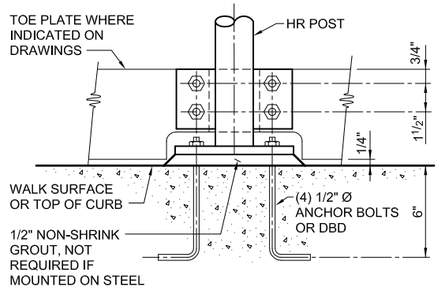


8 DETAIL
NTS



9 DETAIL
NTS





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.

4 SIDE MOUNTED POST ATTACHMENT 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
		REVISIONS					

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

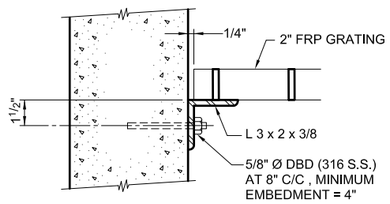
GENERAL STRUCTURAL DETAILS

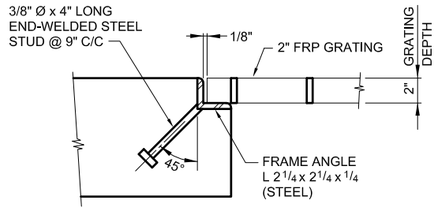
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

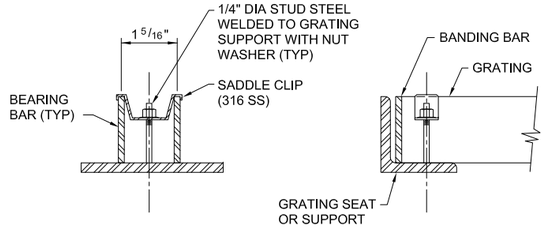
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
S-00-03	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0003.dwg

N1808





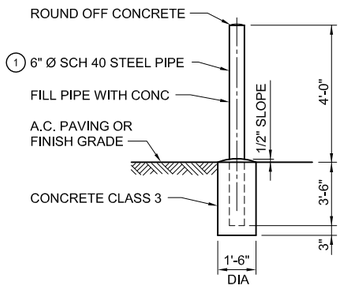


NOTES:

1. ALL MATERIAL SHALL BE ALUMINUM 6061-T6 UNLESS OTHERWISE NOTED.
2. PROVIDE 4 CLOPS PER GRATING PANEL APPROXIMATELY 4 INCHES FROM PANEL CORNERS. MAXIMUN CLIP SPACING = 36 INCHES OC.

1 GRATING SUPPORT DETAIL
NTS

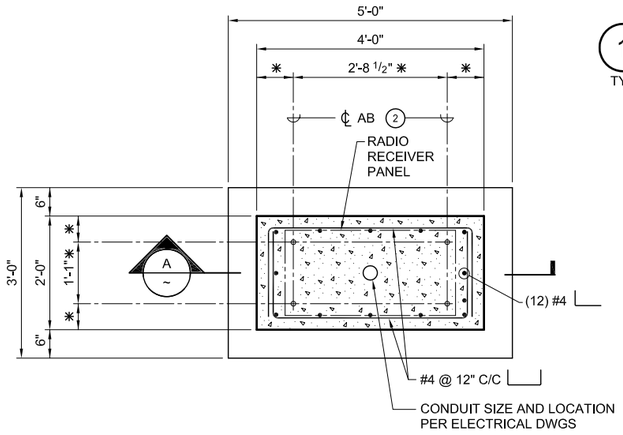
TYP



1 PRIME PIPE WITH SSPC15 TYPE 1 RED OXIDE PRIMER AND PAINT HAZARD YELLOW.

2 GUARD POST DETAIL
NTS

TYP

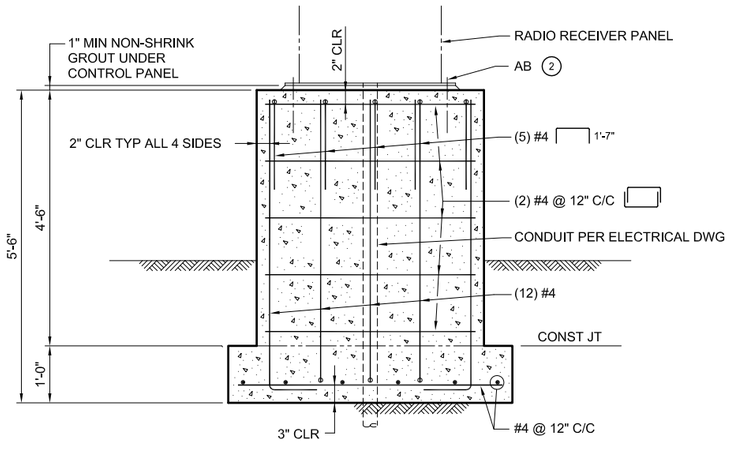


KEY NOTES:

1. DIMENSIONS MARKED WITH AN ASTERISK (✱) TO BE VERIFIED WITH APPROVED SUBMITTAL FOR RADIO RECEIVER PANEL.
2. 316 SS ANCHOR BOLTS, SIZE AND LOCATION PER RADIO RECEIVER PANEL MANUFACTURER'S RECOMMENDATION.

3 DETAIL - RADIO RECEIVER PANEL BASE
3/4" = 1'-0"

C-14.01



A SECTION
3/4" = 1'-0"

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
		REVISIONS					

APPROVED BY

SO
SUPV
DSGN KJD
DWN WTH
CHKD VMB
OK PT
DATE 4/5/13
SCALES

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

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

N1808

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, 4, 5]	Vault Access Door with Integral Safety Grating[3, 4, 5] (Yes/ No)	Reference Sheet(s)
NTH IRZ Wells								
IRZ Injection Well Meter Vault (New)	IRZ-20 IRZ-27 IRZ-29 IRZ-31 IRZ-33 IRZ-35 IRZ-37	8'-6" X 5'-0"	5'-0"	7	2	Highway rated (HS20-44)	No	S-04-02, S-04-03 and S-04-05
IRZ Injection Well Meter Vault (New)	IRZ-16 IRZ-21 IRZ-25 IRZ-39	8'-6" X 5'-0"	5'-0"	4	1	Off-street traffic rated (HS20)	Yes	S-04-01, S-04-03 and S-04--04
IRZ Injection Well Meter Vault (New)	IRZ-11 IRZ-13 IRZ-15 IRZ-17 IRZ-19	8'-6" X 5'-0"	5'-0"	5	1	Parkway rated	Yes	S-04-01, S-04-03 and S-04--04
IRZ Injection Well Meter Vault (Future Provisional)	IRZ-22 IRZ-24 IRZ-28 IRZ-30 IRZ-32 IRZ-34 IRZ-36	8'-6" X 5'-0"	5'-0"	7	2	Highway rated (HS20-44)	No	S-04-02, S-04-03 and S-04-05
IRZ Injection Well Meter Vault (Future Provisional)	IRZ-2 IRZ-4 IRZ-6 IRZ-8 IRZ-10 IRZ-12 IRZ-14 IRZ-18	8'-6" X 5'-0"	5'-0"	8	1	Off-street traffic rated (HS20)	Yes	S-04-01, S-04-03 and S-04--04
IRZ Injection Well Meter Vault (Future Provisional)	IRZ-3 IRZ-7 IRZ-26 IRZ-38	8'-6" X 5'-0"	5'-0"	4	1	Parkway rated	Yes	S-04-01, S-04-03 and S-04--04
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'-10"	8	2	Highway rated (HS20-44)	No	S-04-02, S-04-03 and S-04-05
IRZ Injection Well Vault (New)	IRZ16-A IRZ16-B IRZ21-A IRZ21-B IRZ25-A IRZ39-A	5'-0" X 4'-0"	4'-10"	6	1	Off-street traffic rated (HS20)	Yes	S-04-01, S-045-03 and S-04-04
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'-10"	10	1	Parkway rated	Yes	S-04-01, S-04-03 and S-04-04
IRZ Injection Well Vault (Future Provisional)	IRZ22-A IRZ22-B IRZ24-A IRZ28-A IRZ30-A IRZ32-A IRZ34-A IRZ36-A	5'-0" X 4'-0"	4'-10"	8	2	Highway rated (HS20-44)	No	S-04-02, S-04-03 and S-04-05
IRZ Injection Well Vault (Future Provisional)	IRZ02-A IRZ02-B IRZ04-A IRZ04-B IRZ06-A IRZ06-B IRZ08-A IRZ08-B IRZ10-A IRZ10-B IRZ12-A IRZ12-B IRZ14-A IRZ14-B IRZ18-A IRZ18-B	5'-0" X 4'-0"	4'-10"	16	1	Off-street traffic rated (HS20)	Yes	S-04-01, S-04-03 and S-04-04
IRZ Injection Well Vault (Future Provisional)	IRZ03-A IRZ03-B IRZ07-A IRZ07-B IRZ26-A IRZ38-A	5'-0" X 4'-0"	4'-10"	6	1	Parkway rated	Yes	S-04-01, S-04-03 and S-04-04
IRZ Extraction Well Meter Vault (New)	IRZ-23	8'-6" X 5'-0"	5'-0"	1	1	Off-street traffic rated (HS20)	Yes	S-04-06, S-04-08 and S-05-09
IRZ Extraction Well Meter Vault (New)	IRZ-5 IRZ-9	8'-6" X 5'-0"	5'-0"	2	1	Parkway rated	Yes	S-04-06, S-04-08 and S-04-09
IRZ Extraction Well Meter Vault (New)	IRZ-1	8'-6" X 5'-0"	5'-0"	1	2	Highway rated (HS20-44)	No	S-04-07, S-04-08 and S-04-10
IRZ Extraction Well Meter Vault (Future Provisional)	IRZ-40	8'-6" X 5'-0"	5'-0"	1	1	Parkway rated	Yes	S-04-06, S-04-08 and S-04-09
IRZ Extraction Well Vault (New)	IRZ23-A	5'-0" X 4'-0"	4'-10"	1	1	Off-street traffic rated (HS20)	Yes	S-04-06, S-04-08 and S-04-09
IRZ Extraction Well Vault (New)	IRZ05-A IRZ09-A	5'-0" X 4'-0"	4'-10"	2	1	Parkway rated	Yes	S-04-06, S-04-08 and S-04-09
IRZ Extraction Well Vault (New)	IRZ01-A	5'-0" X 4'-0"	4'-10"	1	2	Highway rated (HS20-44)	No	S-04-07, S-04-08 and S-04-10
IRZ Extraction Well Vault (Future Provisional)	IRZ40-A	5'-0" X 4'-0"	4'-10"	1	1	Parkway rated	Yes	S-04-06, S-04-08 and S-04-09
INNER RECIRCULATION LOOP								
Extraction Well Meter Vault (New)	RB-1 RB-2 RB-3 RB-4 RB-5	8'-6" X 5'-0"	5'-0"	5	1	Parkway rated	Yes	S-05-06, S-05-07 and S-05-08
Extraction Well Vault (New)	RB01-A RB02-A RB03-A RB04-A RB05-A	5'-0" X 4'-0"	4'-10"	5	1	Parkway rated	Yes	S-05-06, S-05-07 and S-05-08
Injection Well Meter Vault (New)	IRL-1 IRL-2 IRL-4	8'-6" X 5'-0"	5'-0"	3	1	Off-street traffic rated (HS20)	Yes	S-05-01, S-05-03 and S-05-04
Injection Well Meter Vault (New)	IRL-3	8'-6" X 5'-0"	5'-0"	1	2	Highway rated (HS20-44)	No	S-05-02, S-05-03 and S-05-05
Injection Well Meter Vault (Future Provisional)	IRL-5 IRL-6 IRL-7	8'-6" X 5'-0"	5'-0"	3	1	Parkway rated	Yes	S-05-01, S-05-03 and S-05-04
Injection Well Vault (New)	IRL01-A IRL02-A IRL04-A	5'-0" X 4'-0"	4'-10"	3	1	Off-street traffic rated (HS20)	Yes	S-05-01, S-05-03 and S-05-04
Injection Well Vault (New)	IRL03-A	5'-0" X 4'-0"	4'-10"	1	2	Highway rated (HS20-44)	No	S-05-02, S-05-03 and S-05-05
Injection Well Vault (Future Provisional)	IRL05-A IRL06-A IRL07-A	5'-0" X 4'-0"	4'-10"	3	1	Parkway rated	Yes	S-05-01, S-05-03 and S-05-04
TCS LOOP								
Extraction Well Meter Vault (New)	ER-1 ER-2 ER-3 ER-4 ER-6	8'-6" X 5'-0"	5'-0"	5	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Meter Vault (Future Provisional)	ER-6	8'-6" X 5'-0"	5'-0"	1	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Vault (New)	ER01-A ER02-A ER03-A ER04-A ER06-A	5'-0" X 4'-0"	4'-10"	5	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Vault (Future Provisional)	ER06-A	5'-0" X 4'-0"	4'-10"	1	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Meter Vault (New)	TWB-1 TWB-2	8'-6" X 5'-0"	5'-0"	2	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Meter Vault (Future Provisional)	TWB-3 TWB-4 TWB-5	8'-6" X 5'-0"	5'-0"	3	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Vault (New)	TWB01-A TWB02-A	5'-0" X 4'-0"	4'-10"	2	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Extraction Well Vault (Future Provisional)	TWB03-A TWB04-A TWB05-A	5'-0" X 4'-0"	4'-10"	3	2	Highway rated (HS20-44)	No	S-03-06, S-03-07 and S-03-08
Injection Well Meter Vault	TCS-1	8'-6" X 5'-0"	5'-0"	1	2	Highway rated (HS20-44)	No	S-03-02, S-03-03 and S-03-05
Injection Well Meter Vault	TCS-2	8'-6" X 5'-0"	5'-0"	1	1	Off-street traffic rated (HS20)	Yes	S-03-01, S-03-03 and S-03-04
Injection Well Vault	TCS01-A	5'-0" X 4'-0"	4'-10"	1	2	Highway rated (HS20-44)	No	S-03-02, S-03-03 and S-03-05
Injection Well Vault	TCS02-A	5'-0" X 4'-0"	4'-10"	1	1	Off-street traffic rated (HS20)	Yes	S-03-01, S-03-03 and S-03-04

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. Safety grating is under the floor door at the top of the vault. Intermediate grating will not be used.
4. Well meter vault covers that are highway rated shall be typ. 2' diameter manholes with no safety grating.
5. Well vaults that are highway rated shall be typ 3'(min) square traffic lids with no safety grating.

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN MSL
DWN GWE
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS SHOWN

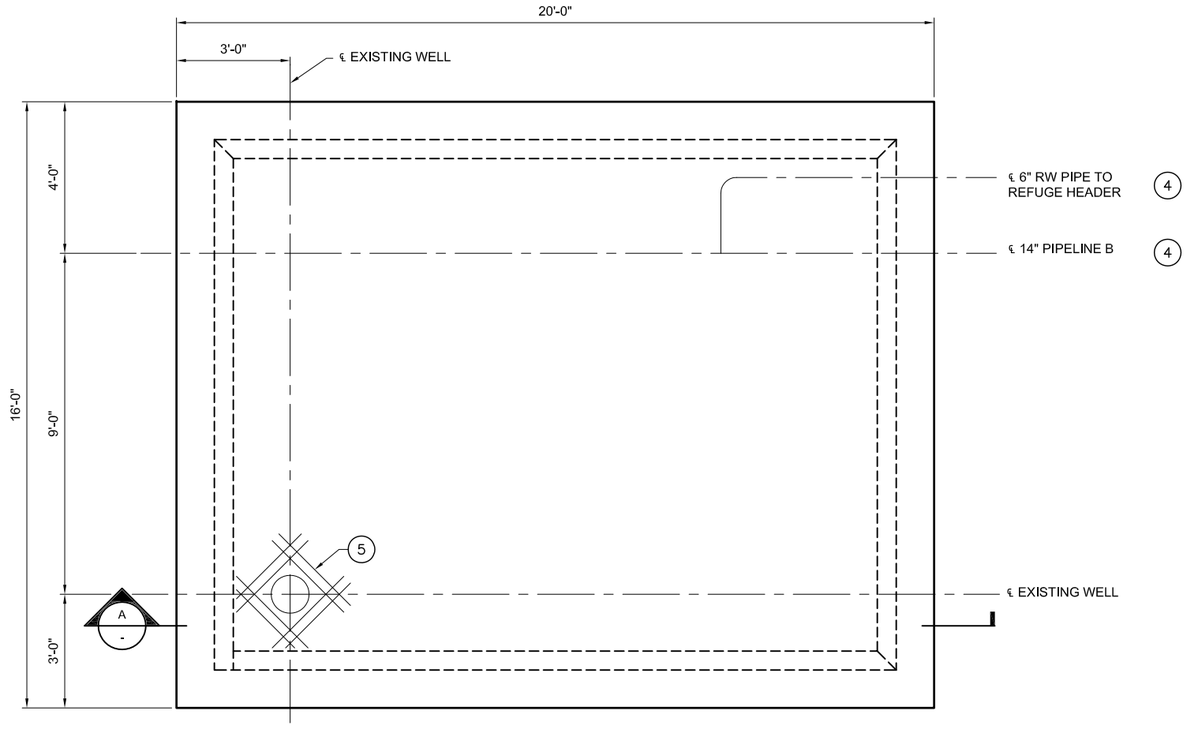
TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL VAULT SCHEDULE

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

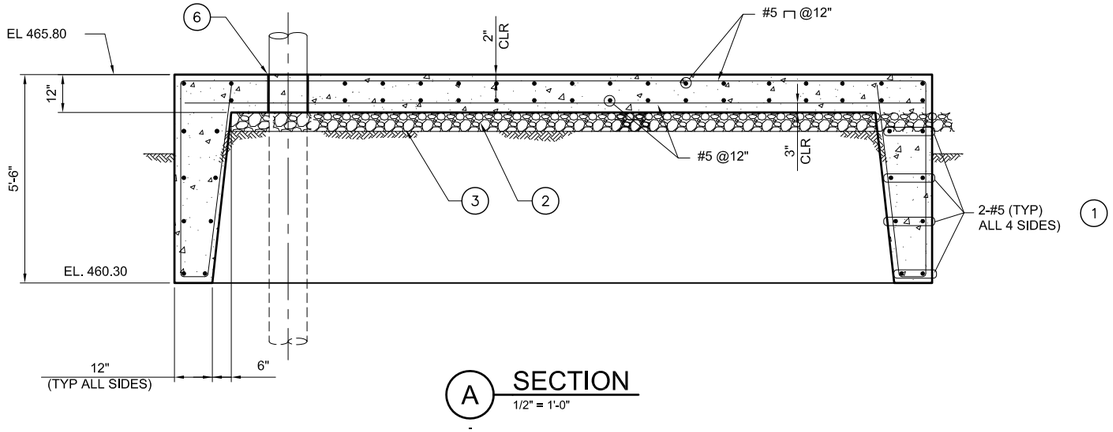
MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. S-00-05 of SHEETS
REV

N1808



FOUNDATION AND FLOOR PLAN

1/2" = 1'-0"



A SECTION

1/2" = 1'-0"

KEY NOTES

1. PROVIDE CORNER REINFORCING PER DETAIL 5 ON S-00-02
2. 6" CRUSHED DRAIN ROCK
3. STRUCTURAL FILL, 90% COMPACTION (MIN)
4. FOR PIPE SUPPORTS, SEE DWG M-01-02
5. PROVIDE ADDITIONAL REINFORCING PER DETAIL 4 ON S-00-02
6. PROVIDE 1/2" EXPANSION JOINT MATERIAL AROUND EXISTING WELL W/ 1/2"x1/2" JOINT SEALANT AT TOP

2' 0 2' 4'

SCALE: 1/2"=1'

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

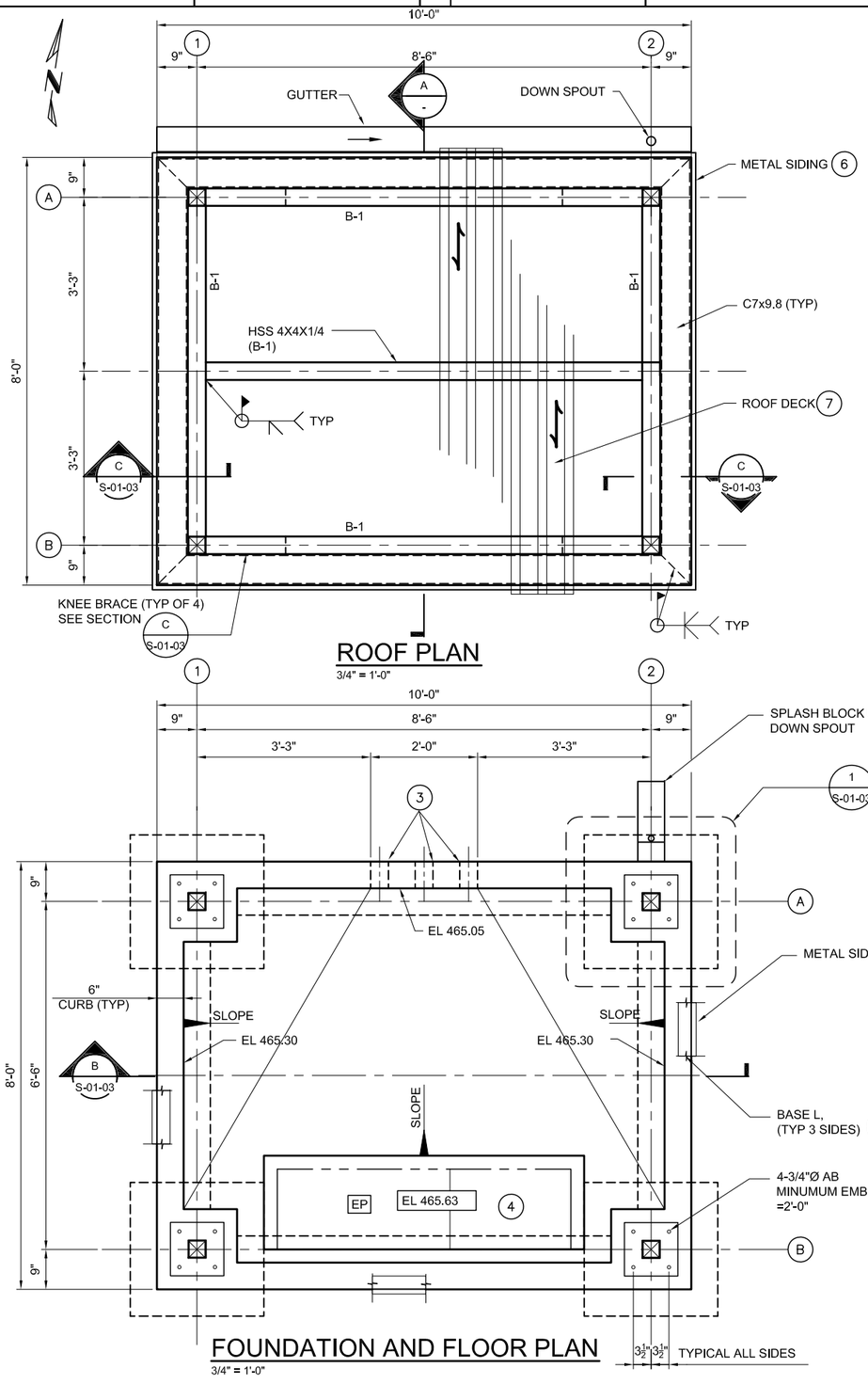
TOPOCK GROUNDWATER REMEDIATION PROJECT

HNWR FRESHWATER WELL FOUNDATION PLAN AND SECTION

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-01-01	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0101AD.dwg

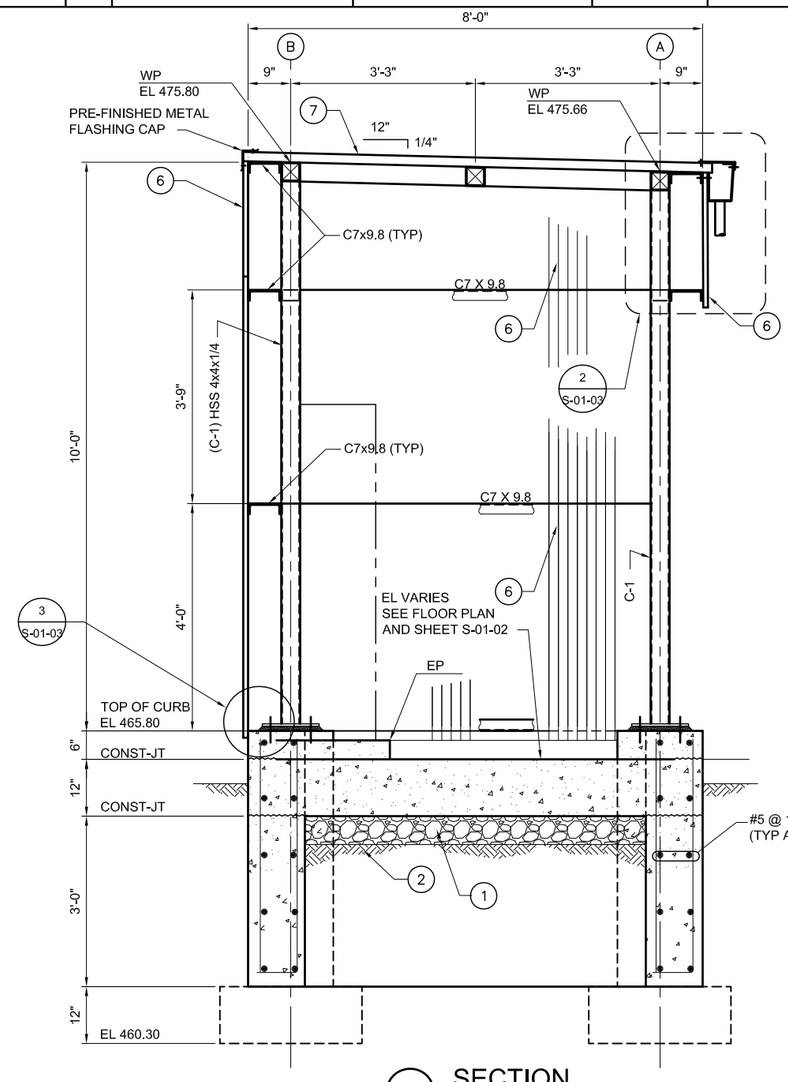


ROOF PLAN

3/4" = 1'-0"

FOUNDATION AND FLOOR PLAN

3/4" = 1'-0"



A SECTION

3/4" = 1'-0"

KEY NOTES

1. PROVIDE 6" CRUSHED DRAIN ROCK
2. STRUCTURAL FILL ~ 90% COMPACTION
3. PROVIDE 3-4"Ø HALF ROUND PVC PIPE IN CURB FOR DRAINAGE
4. FOR EQUIPMENT PAD (EP) SEE DETAIL 10 ON S-00-02
5. PROVIDE CORNER REINFORCING PER DETAIL 5 ON S-00-02
6. METAL SIDING: 3/4" HIGH X 36" WIDE PANEL (6 RIBS @ 6" C/C PER PANEL) GALVANIZED 24 GAGE,
   MINIMUM PROPERTIES/LF OF WIDTH:
   +I = 0.0323 IN^4
   -I = 0.0220 IN^3
   +S = 0.0592 IN^3
7. ROOF DECK: 1 1/2" HIGH X 36" WIDE PANEL (6 RIBS @ 6" C/C PER PANEL) GALVANIZED 20 GAGE,
   MINIMUM PROPERTIES/LF OF WIDTH:
   I = 0.216 IN^4
   +S = 1.235 IN^3
   -S = 0.248 IN^3
   -S = 0.0538 IN^3

1' 0 1' 2'

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

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

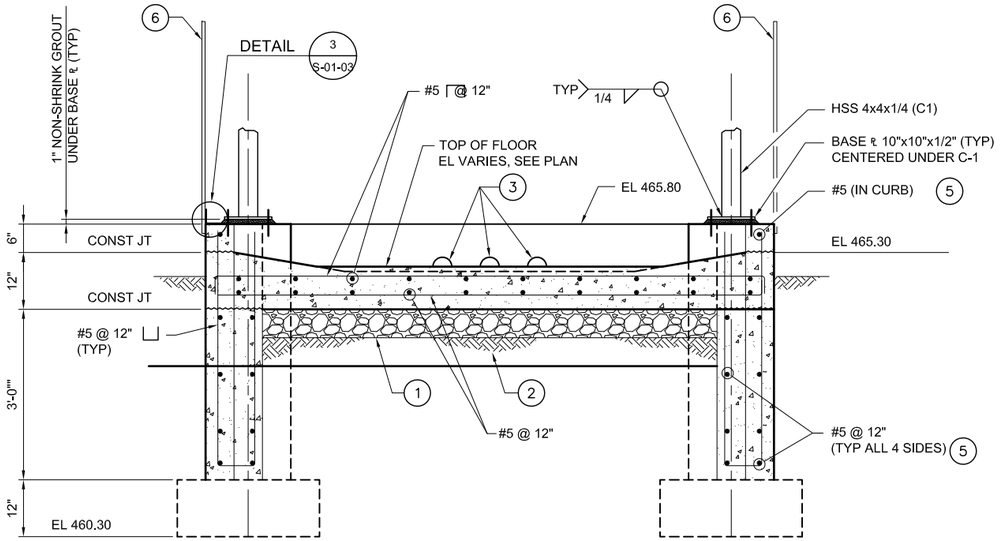
REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

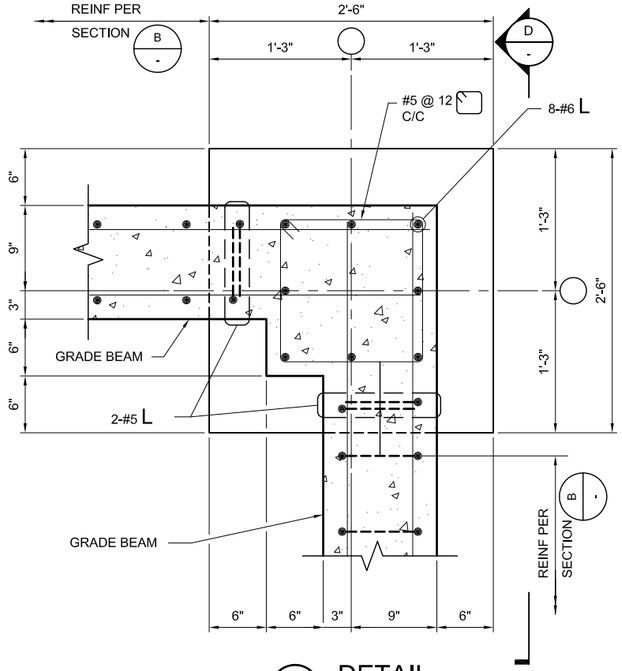
TOPOCK GROUNDWATER REMEDIATION PROJECT
HNWR FRESHWATER WELL
ELECTRICAL PAD
FLOOR & ROOF PLAN AND SECTIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-01-02	REV

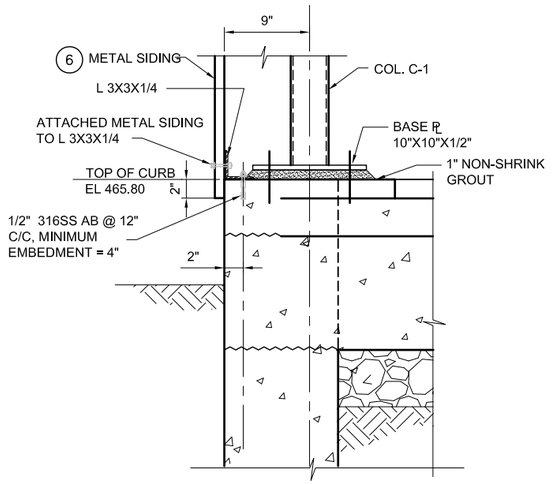
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0102AD.dwg



B SECTION
3/4" = 1'-0"
S-01-02

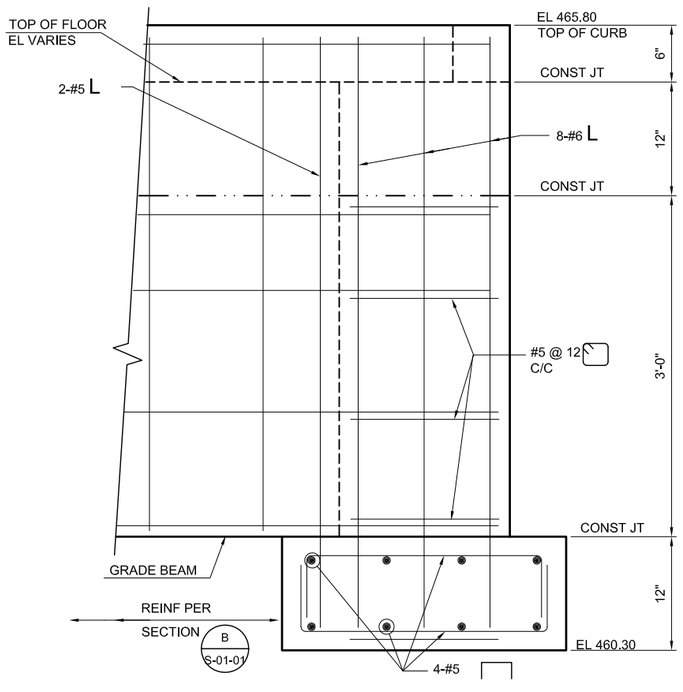


1 DETAIL
1-1/2" = 1'-0"
S-01-02

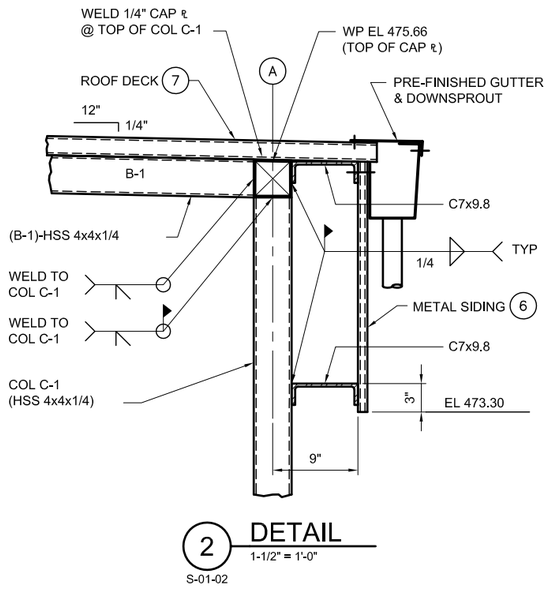


3 DETAIL
1-1/2" = 1'-0"
S-01-02

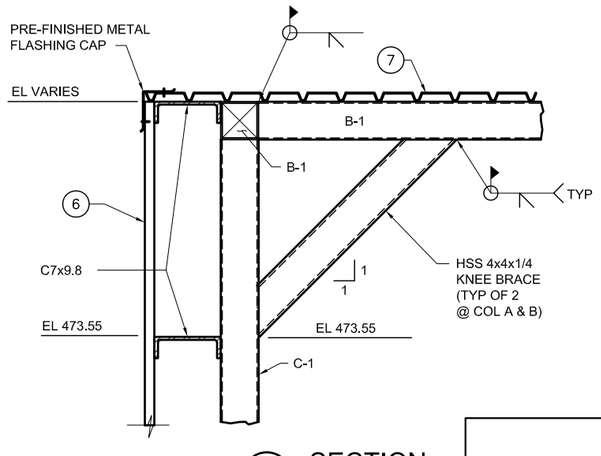
FOR KEY NOTES, SEE SHEET S-01-02



D SECTION
1-1/2" = 1'-0"



2 DETAIL
1-1/2" = 1'-0"
S-01-02



C SECTION
1-1/2" = 1'-0"
S-01-02

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
		REVISIONS					

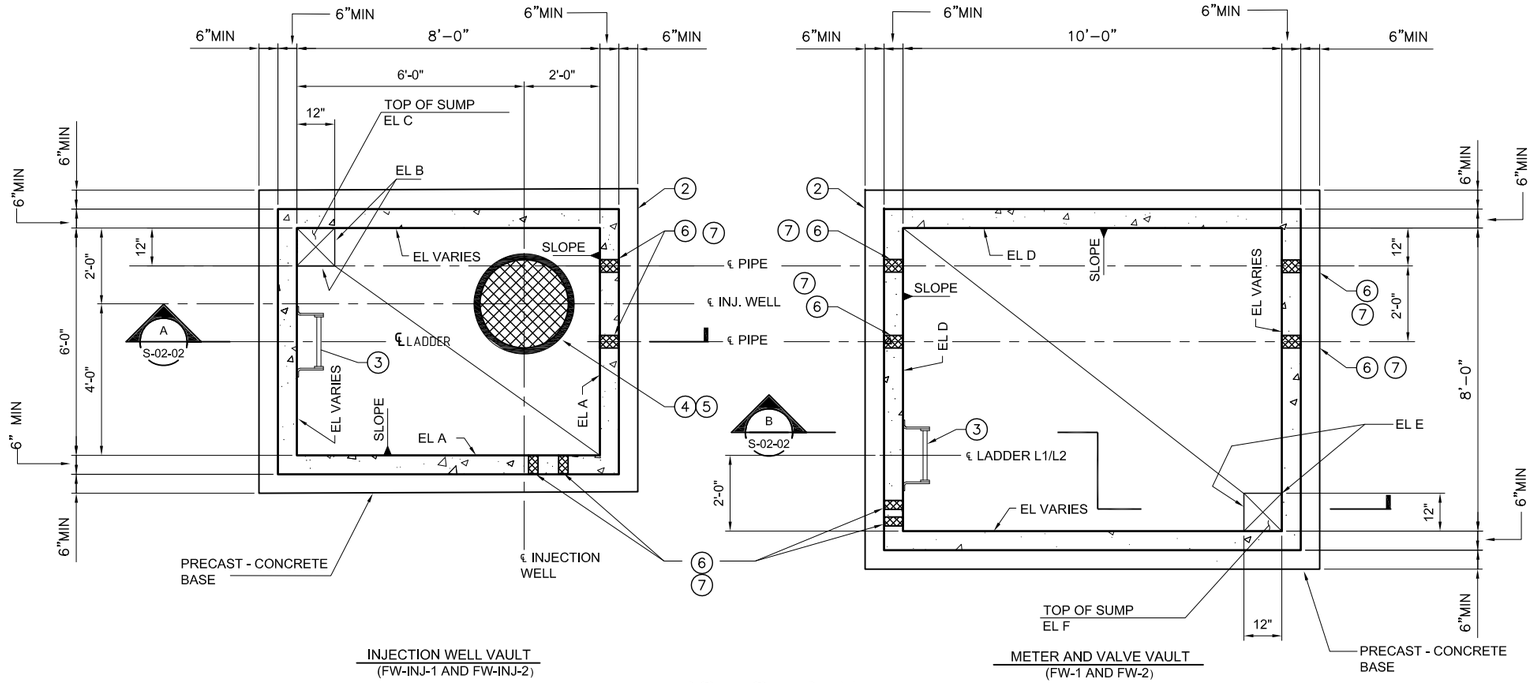
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN MD
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
HNWR FRESHWATER WELL ELECTRICAL PAD SECTIONS AND 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-01-03	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0103AD.dwg



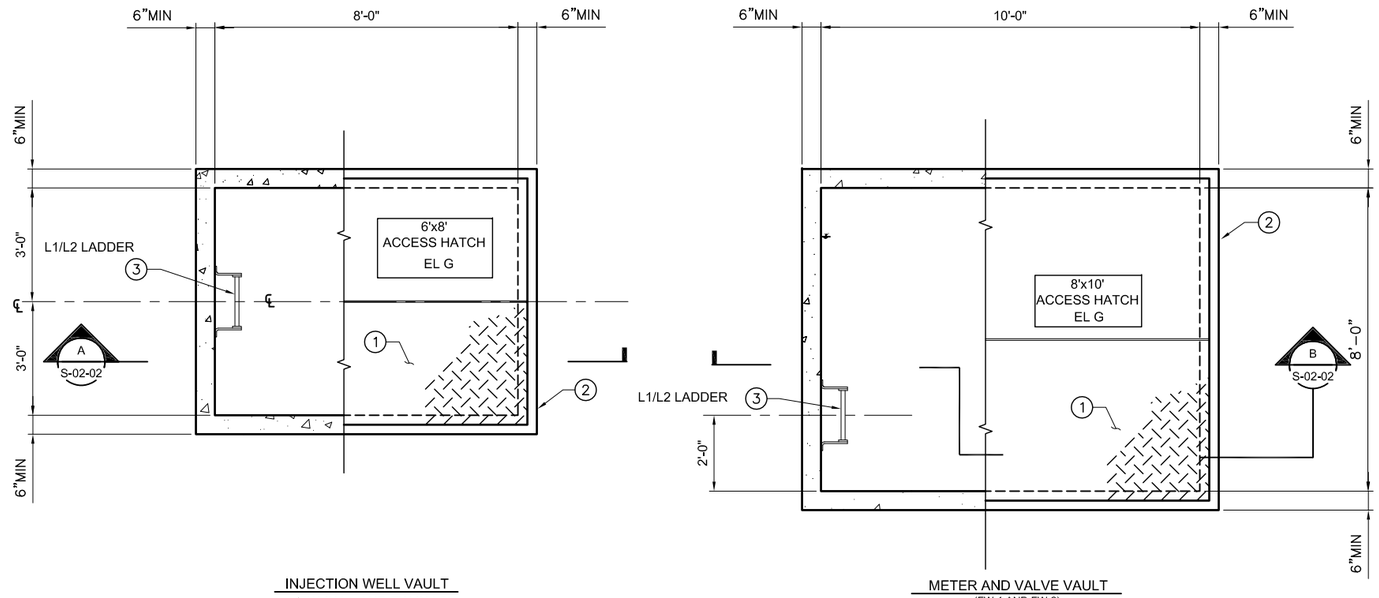
INJECTION WELL VAULT
(FW-INJ-1 AND FW-INJ-2)

METER AND VALVE VAULT
(FW-1 AND FW-2)

BOTTOM PLAN
1/2" = 1'-0"

KEY NOTE:

1. GALVANIZED STEEL ACCESS HATCH DESIGN LL= H20 LANDING
2. PRECAST CONCRETE VAULT INCLUDING BASE AS APPROVED BY ENGINEER.
3. ACCESS LADDER L-1 WITH EXTENSION LADDER L-2. SEE DETAIL 6/S-00-03
4. PROVIDE 1/2"x1/2" JOINT SEALANT AROUND WELL.
5. PROVIDE 1/2" THICK EXPANSION JOINT MATERIAL BETWEEN WALL AND PRE-CAST CONCRETE BASE SLAB.
6. FOR PIPE PENETRATION SEE DETAIL X/S-00-XX
7. FOR PIPE PENETRATION LOCATION, COORDINATE WITH CIVIL, MECHANICAL & ELECTRICAL DRAWINGS.



INJECTION WELL VAULT
(FW-INJ-1 AND FW-INJ-2)

METER AND VALVE VAULT
(FW-1 AND FW-2)

TOP PLAN
1/2" = 1'-0"

ELEVATIONS				
	WELL VAULT		METER VAULT	
EL	FW-1	FW-2	FW-1	FW-2
A	557.00	544.50	-	-
B	556.67	544.17	-	-
C	556.33	543.83	-	-
D	-	-	557.00	605.50
E	-	-	556.67	605.17
F	-	-	556.33	604.83
G	561.50	549.00	561.50	610.00

0 2' 4' 6'
SCALE: 1/2"=1'-0"

DRAFT
NOT FOR
CONSTRUCTION

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

CH2MHILL®

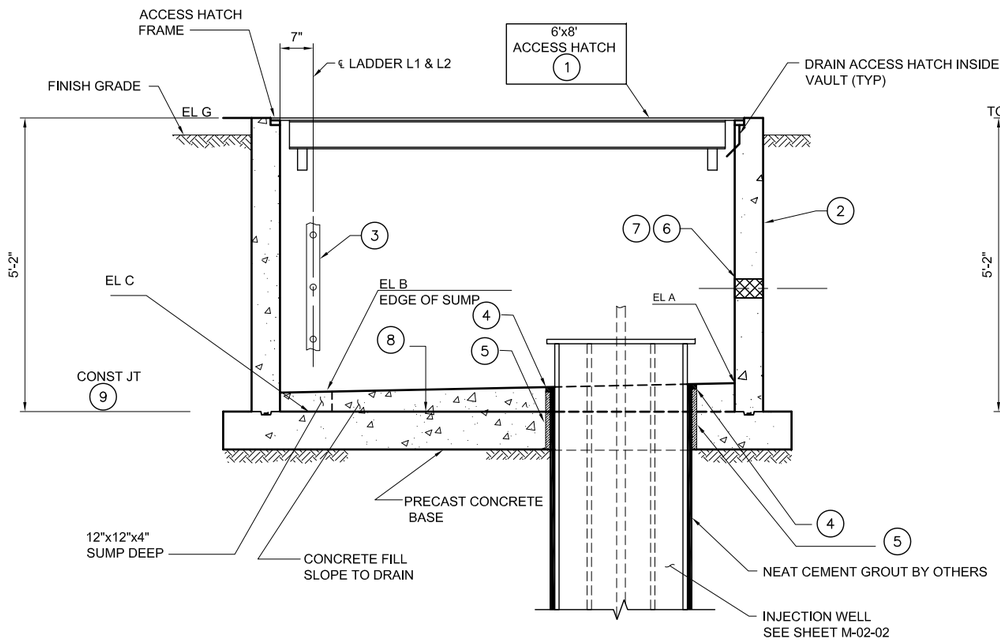
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
REVISIONS							

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL - METER & VALVE VAULT- TOP & BOTTOM PLANS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

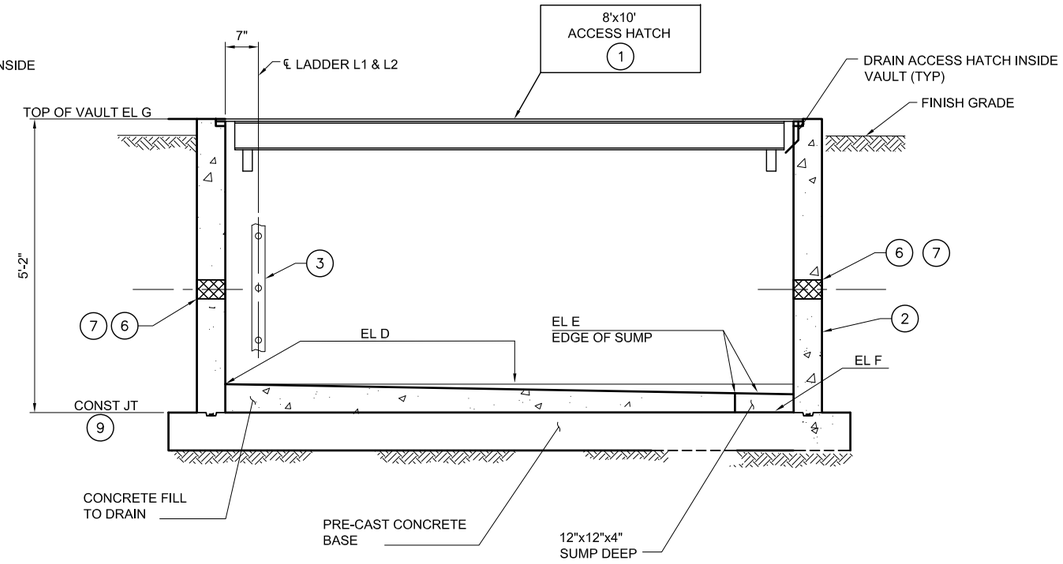
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-02-01	REV

FILENAME: E2-S-XXX-02012AD.dwg
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME



INJECTION WELL VAULT
(FW-1 AND FW-2)

A SECTION
3/4" = 1'-0"
S-02-01



METER AND VALVE VAULT
(FW-1 AND FW-2)

B SECTION
3/4" = 1'-0"
S-02-01

NOTES:

1. FOR ELEVATIONS, SEE SHEET S-02-01.
2. FOR PIPING LAYOUT AND SUPPORTS, SEE SHEET M-02-01.

KEY NOTE:

1. GALVANIZED STEEL ACCESS HATCH DESIGN LL= H20 L OADING
2. PRECAST CONCRETE VAULT INCLUDING BASE AS APPROVED BY ENGINEER.
3. ACCESS LADDER L-1 WITH EXTENSION LADDER L-2. SEE DETAIL 6/S-00-03
4. PROVIDE 1/2"x1/2" JOINT SEALANT AROUND WELL.
5. PROVIDE 1/2" THICK EXPANSION JOINT MATERIAL BETWEEN WALL AND PRE-CAST CONCRETE BASE SLAB.
6. ▨ FOR PIPE PENETRATION SEE DETAIL X/S-00-XX
7. ▨ FOR PIPE PENETRATION LOCATION, COORDINATE WITH CIVIL, MECHANICAL & ELECTRICAL DRAWINGS.
8. ROUGHEN PRECAST CONCRETE BASE SURFACE AND APPLY BONDING AGENT PRIOR TO POURING CONCRETE FILL.
9. WALL HORIZONTAL CONSTRUCTION JOINT W/PREFORMED PLASTIC ADHESIVE WATERSTOP,

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

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

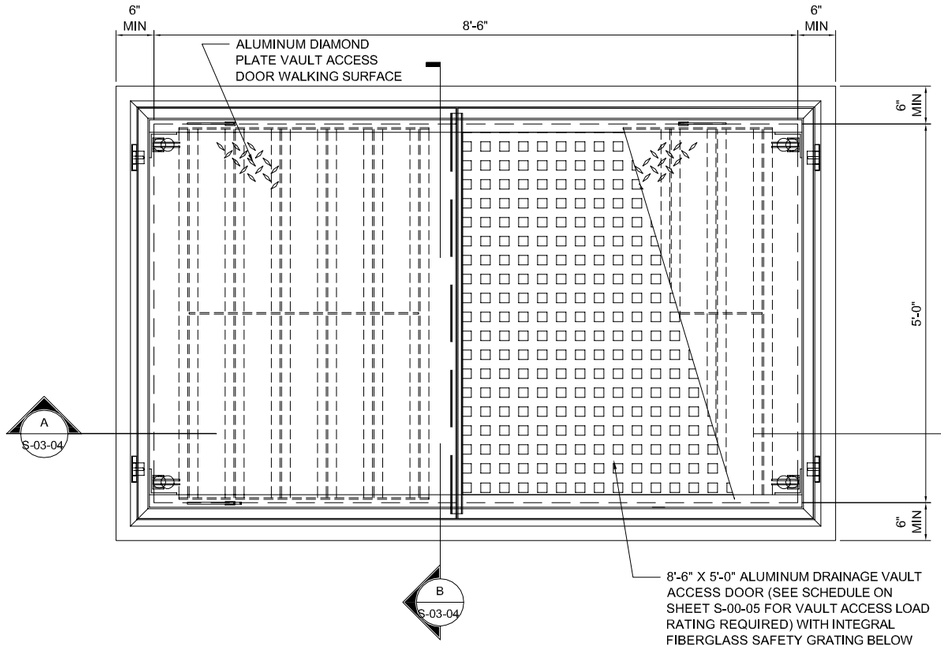
REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

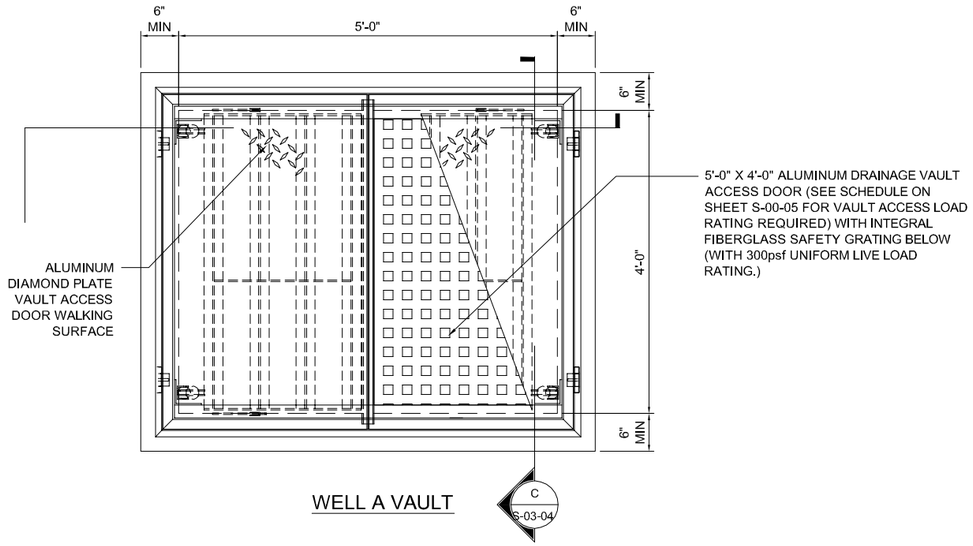
TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL - METER & VALVE VAULT - SECTIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

FILENAME: E2-S-XXX-0202AD.dwg
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME



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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	SO	
JEF	SUPV	JPB
	DSGN	MSL
	DWN	GWE
	CHKD	JPB
	OK	JEF
	DATE	04/05/13
	SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP INJECTION WELL VAULTS - TYPE 1 - PLAN

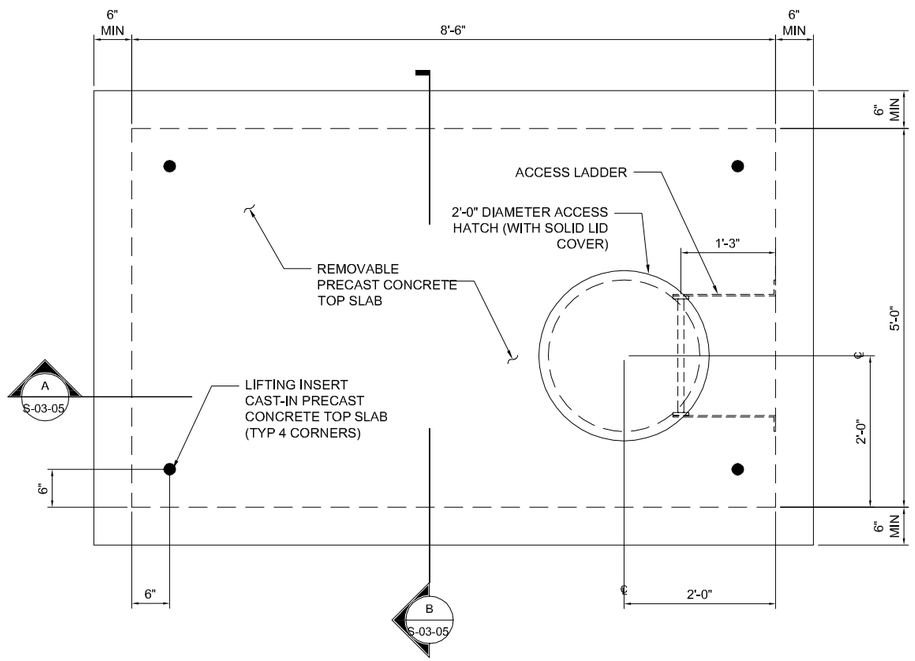
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

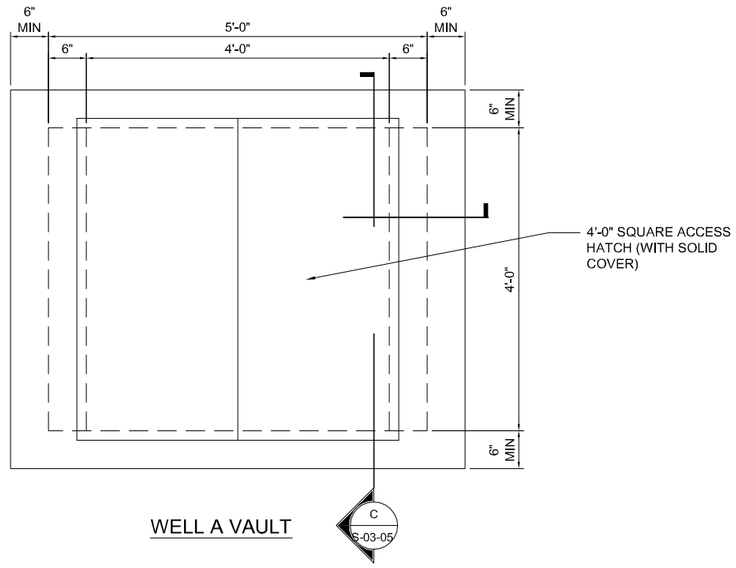
SAN FRANCISCO, CALIFORNIA

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

N180B



WELL METER VAULT



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 XX XX XX.
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.

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN MSL
DWN GWE
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS SHOWN

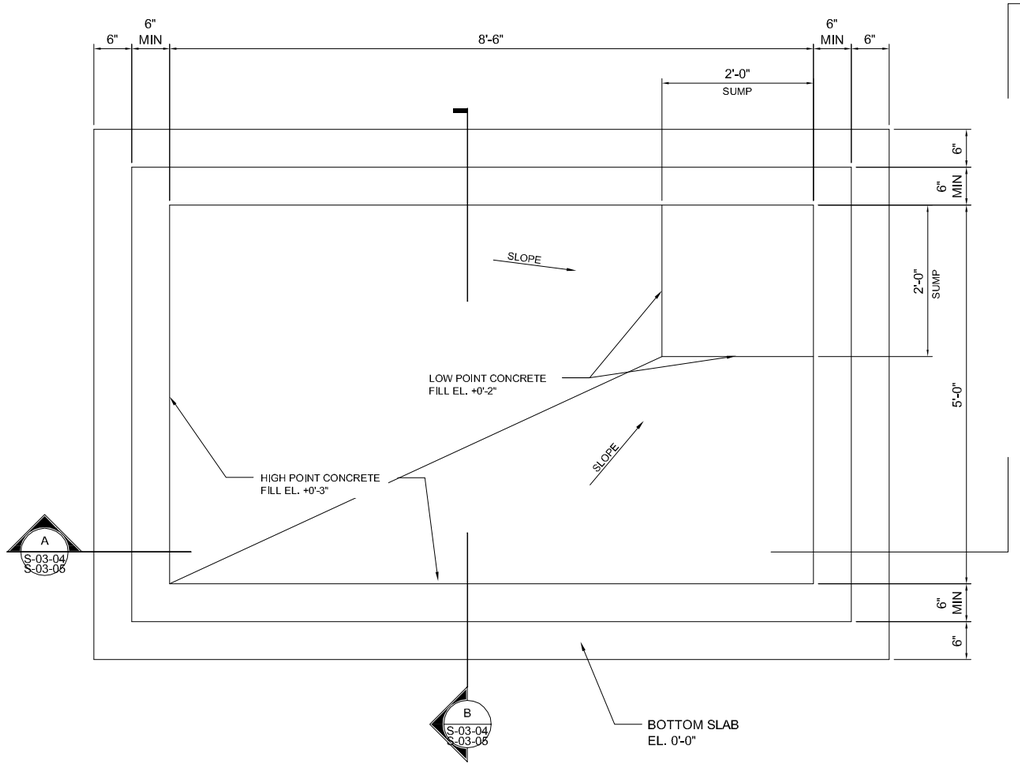
TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP INJECTION WELL VAULTS - TYPE 2 - PLAN

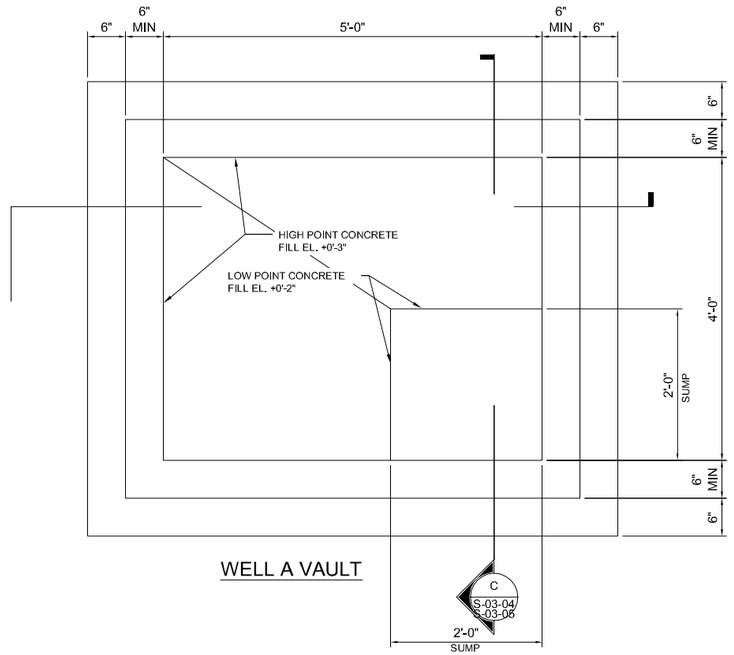
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

N1808



WELL METER VAULT



WELL A VAULT

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

1"=1'-0"

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 XX XX XX.
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
		REVISIONS					
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF
		REVISIONS					

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

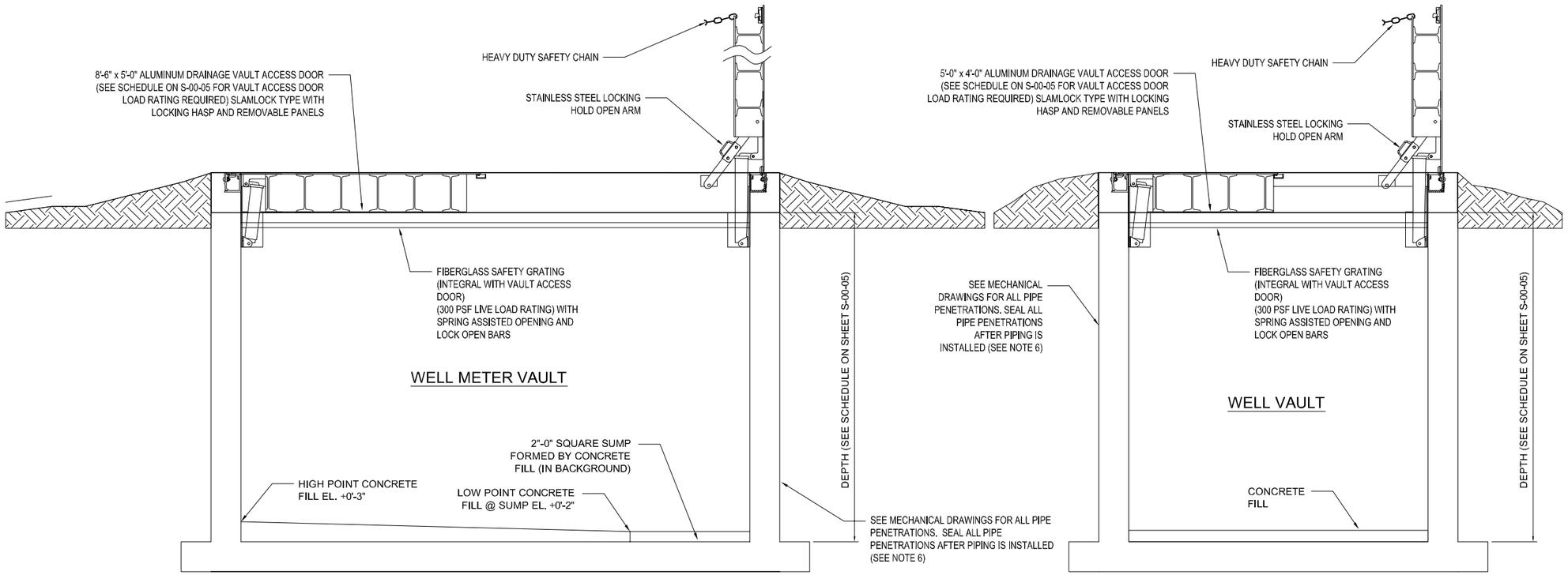
TOPOCK GROUNDWATER REMEDIATION PROJECT

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-03-03	REV

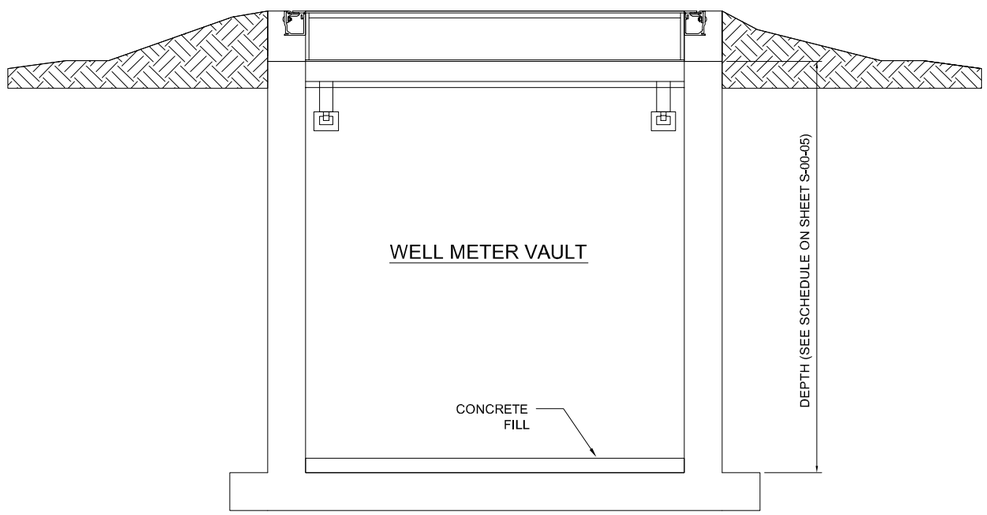
N1808



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

1" = 1'-0"

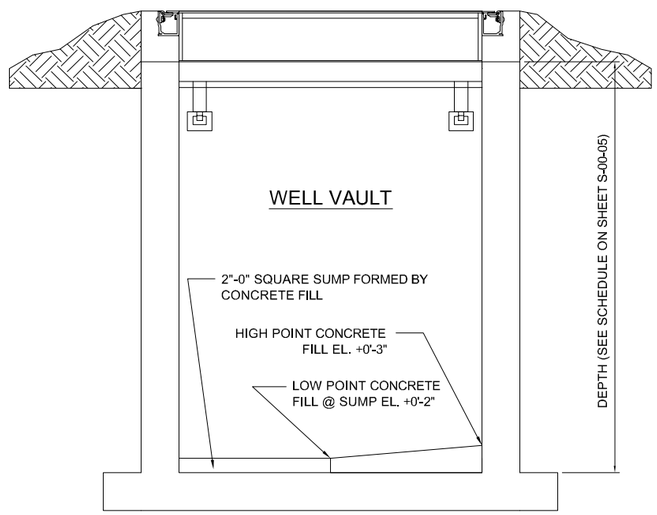
S-03-01, S-03-03



B TCS LOOP INJECTION WELL METER VAULT TYPE 1 - SECTION

1" = 1'-0"

S-03-01, S-03-03



C TCS LOOP INJECTION WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-03-01, S-03-03

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP INJECTION WELL VAULTS - SECTIONS

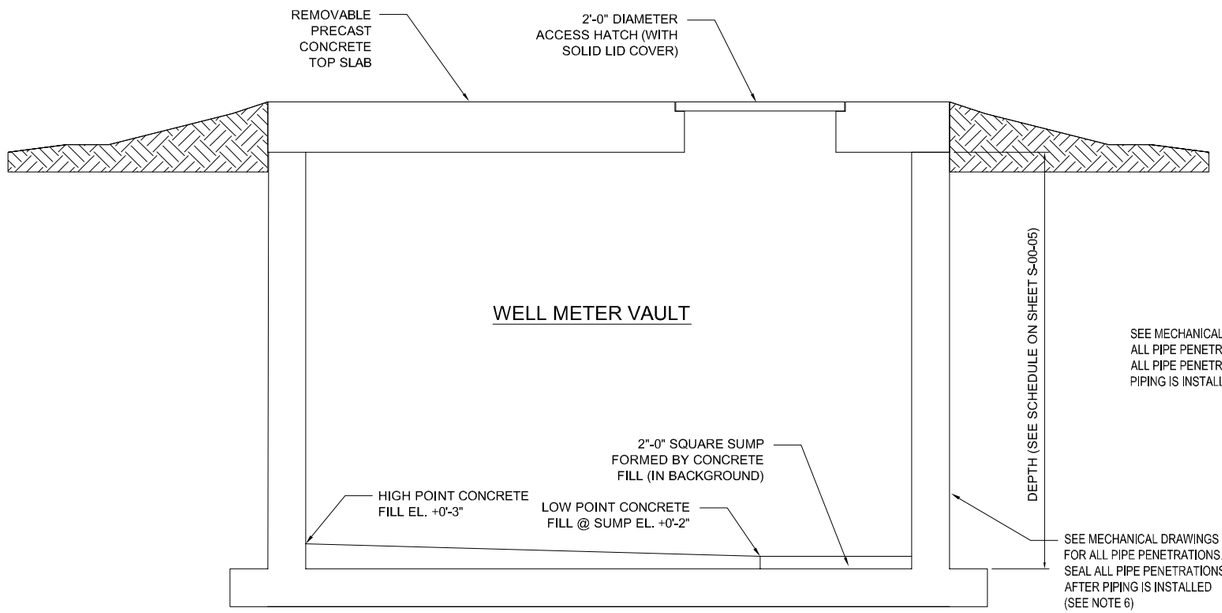
GAS TRANSMISSION & DISTRIBUTION

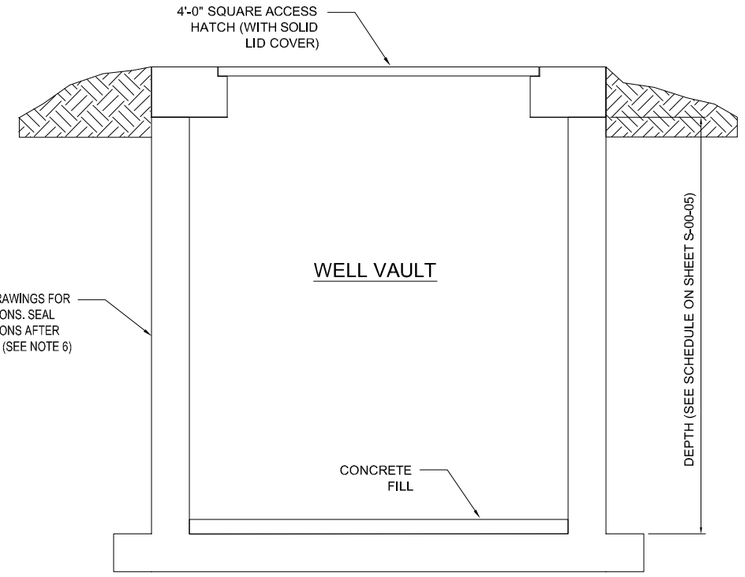
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

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

N180B

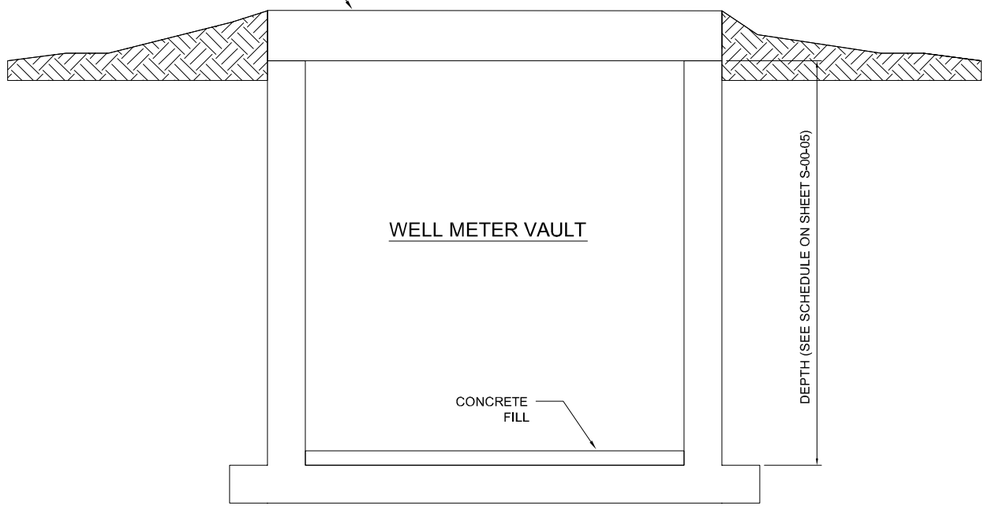




A TCS LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

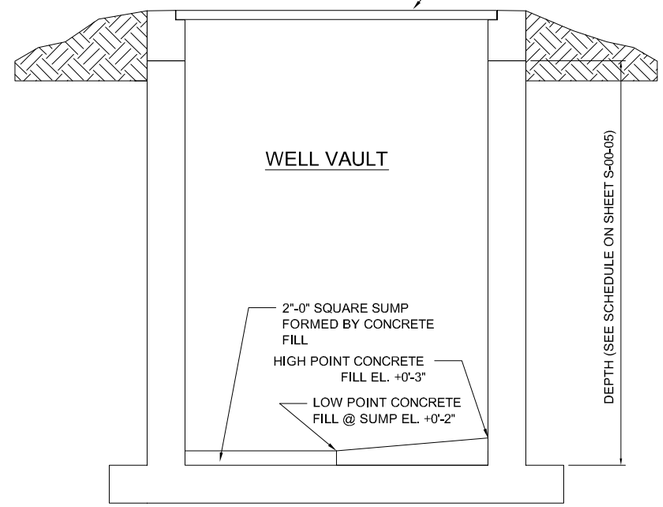
S-03-02, S-03-03



B TCS LOOP INJECTION WELL METER VAULT TYPE 2 - SECTION

1" = 1'-0"

S-03-02, S-03-03



C TCS LOOP INJECTION WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

S-03-02, S-03-03

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP INJECTION WELL VAULTS - SECTIONS

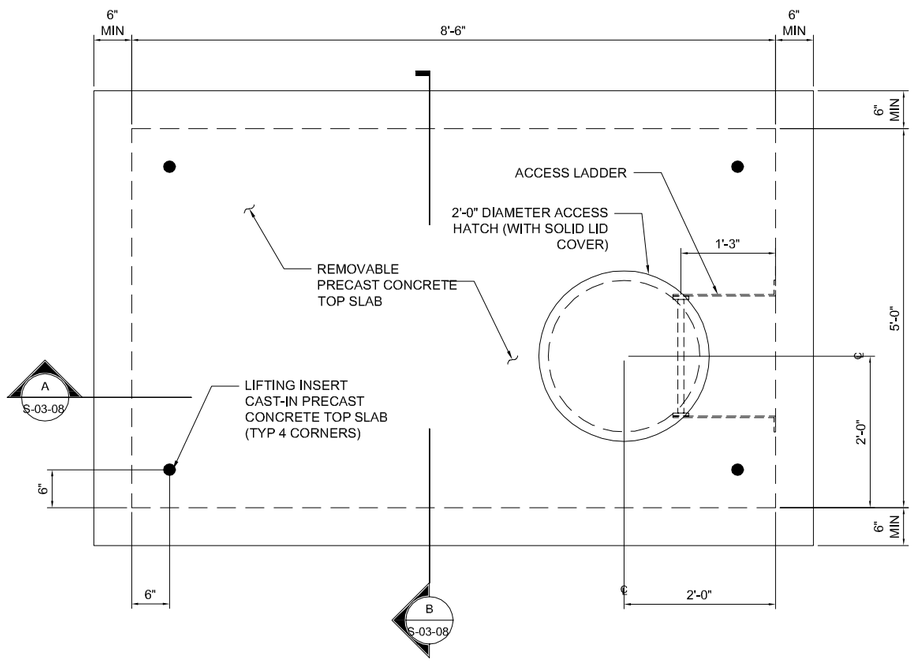
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

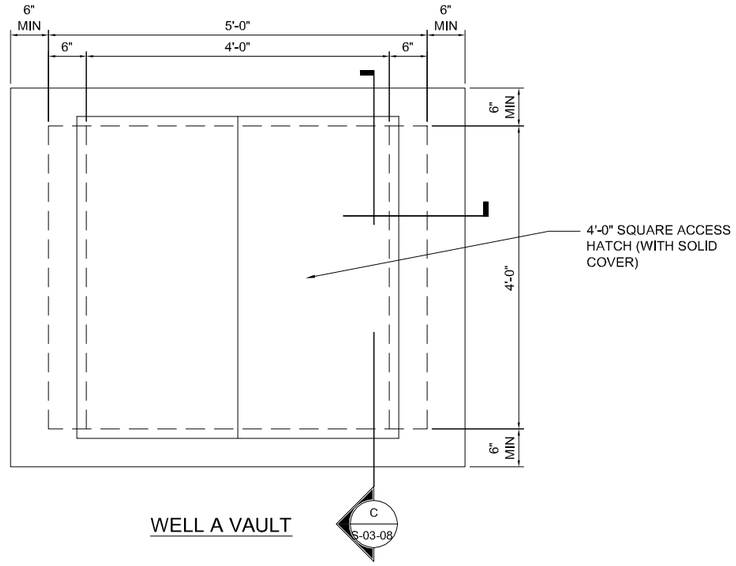
SAN FRANCISCO, CALIFORNIA

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

N1808



WELL METER VAULT



WELL A VAULT

TCS LOOP EXTRACTION 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 XX XX XX.
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.

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	SO	
JEF	SUPV	JPB
	DSGN	MSL
	DWN	GWE
	CHKD	JPB
	OK	JEF
	DATE	04/05/13
	SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP EXTRACTION WELL VAULTS - TYPE 2 - PLAN

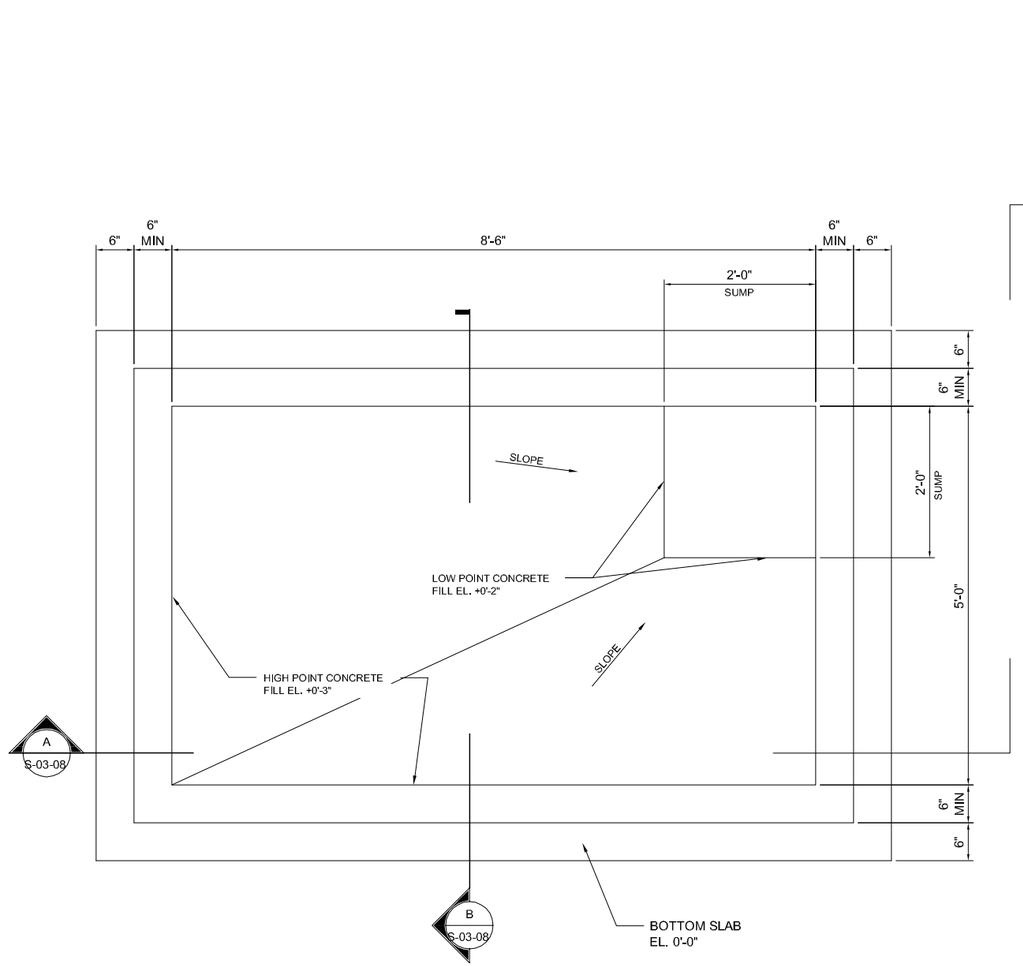
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

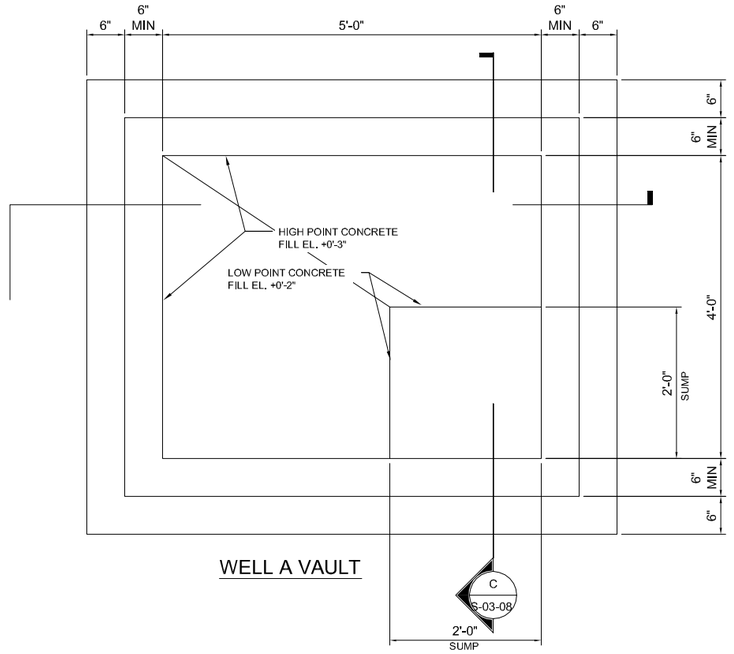
SAN FRANCISCO, CALIFORNIA

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

N1808



WELL METER VAULT



WELL A VAULT

TCS LOOP EXTRACTION 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.
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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

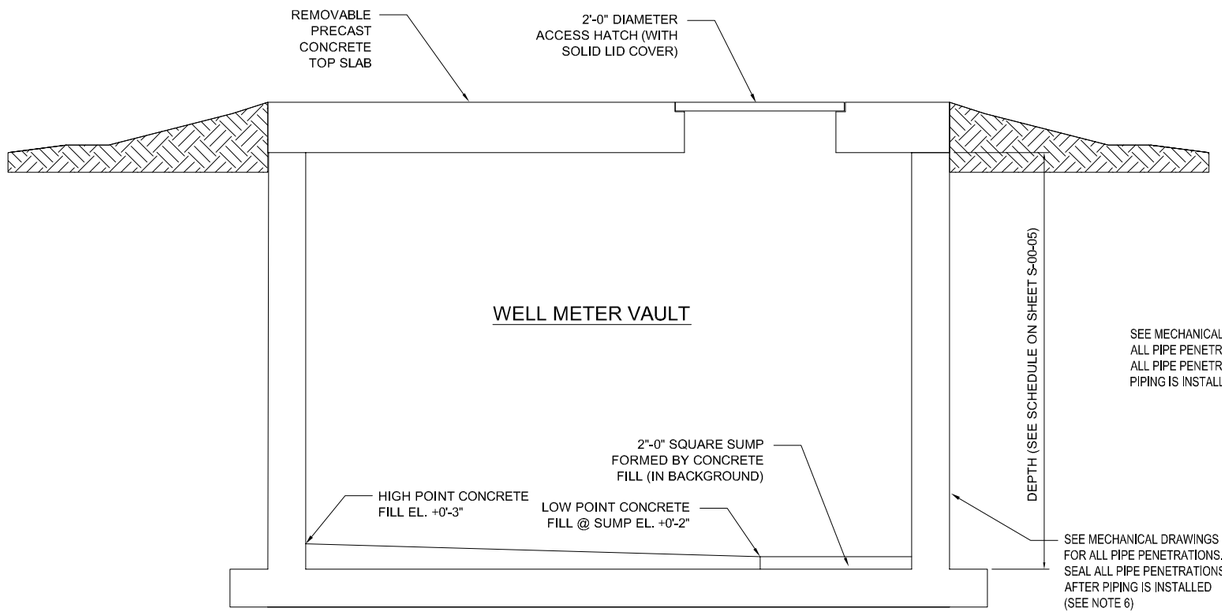
TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP EXTRACTION WELL VAULTS - FOUNDATION PLAN

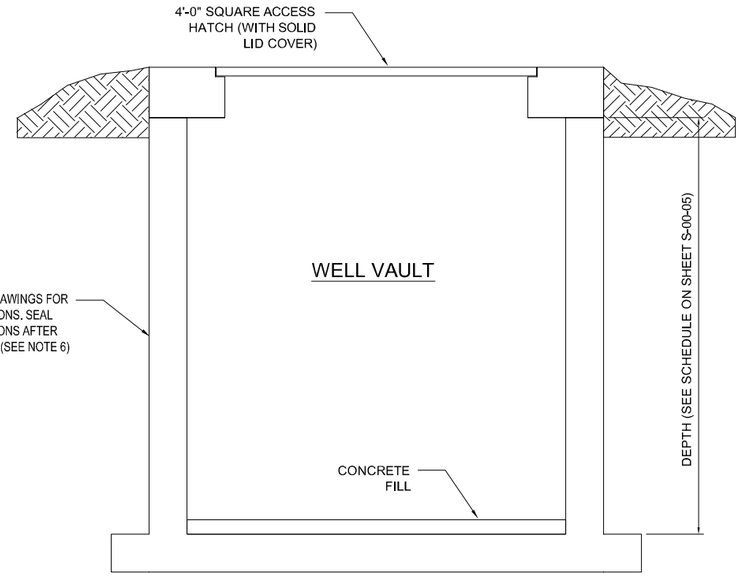
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

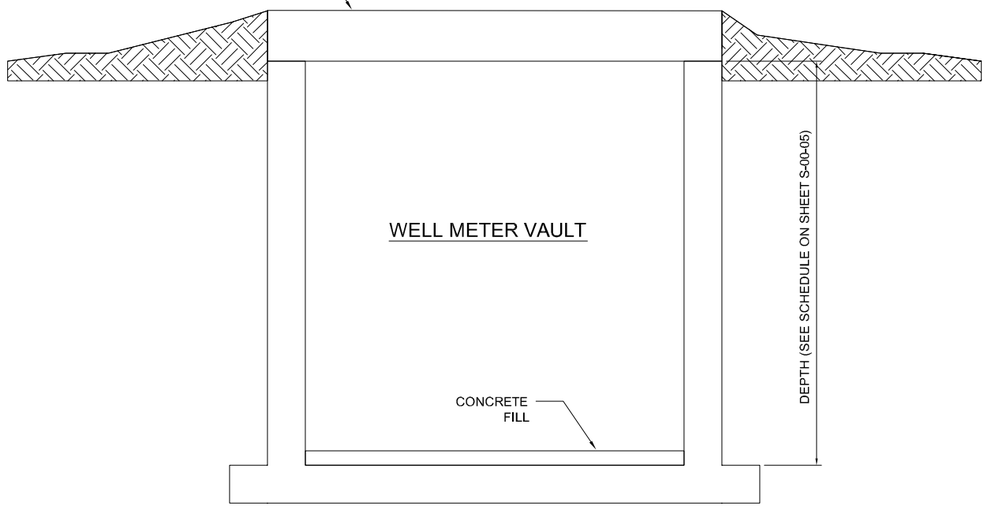
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-03-07	REV

N1808

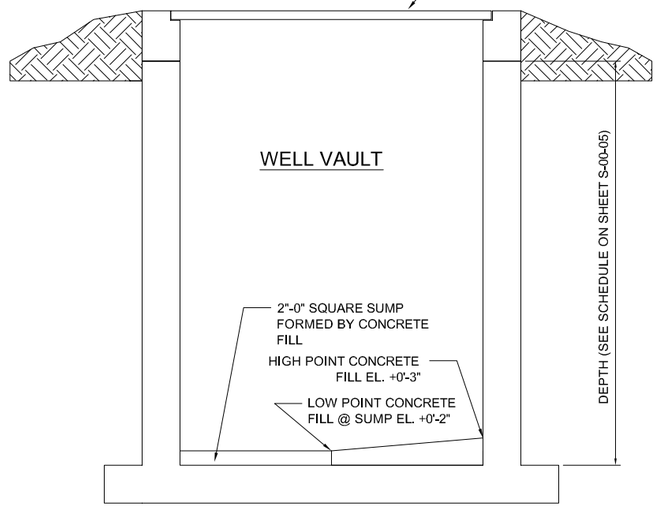


A TCS LOOP EXTRACTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION
1" = 1'-0"
S-03-06, S-03-07





B TCS LOOP EXTRACTION WELL METER VAULT TYPE 2 - SECTION
1" = 1'-0"
S-03-06, S-03-07



C TCS LOOP EXTRACTION WELL VAULT TYPE 2 - SECTION
1" = 1'-0"
S-03-06, S-03-07

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

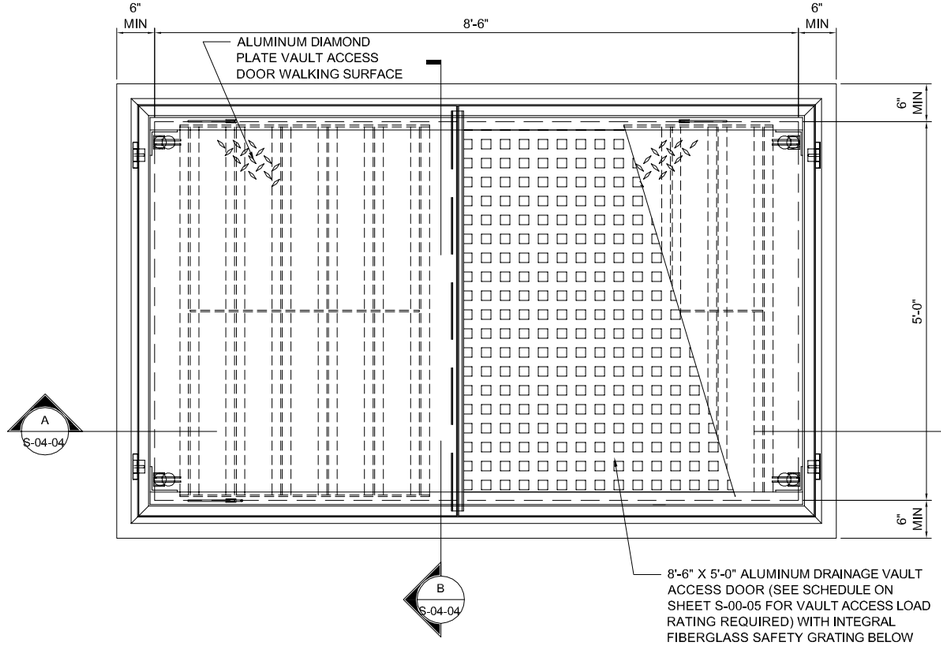
TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP EXTRACTION
WELL VAULTS - SECTIONS

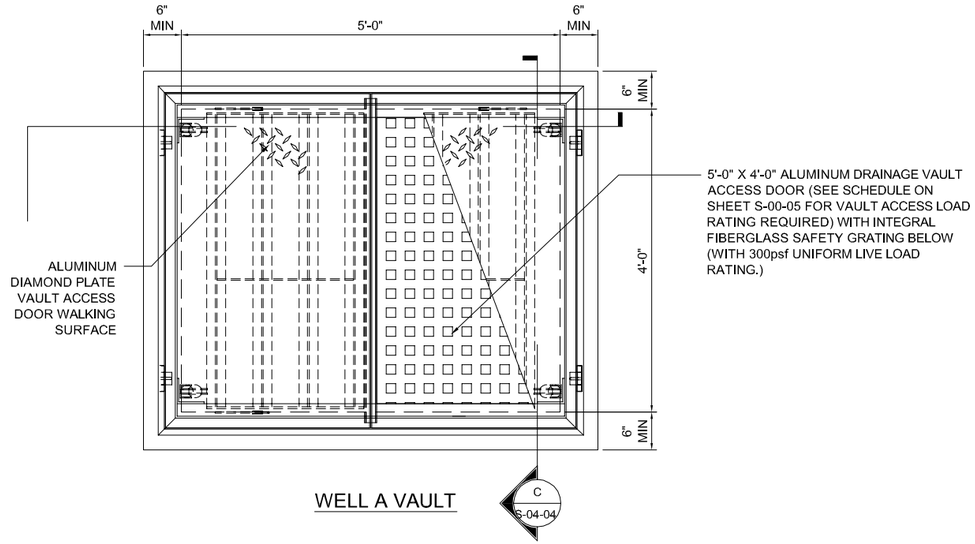
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

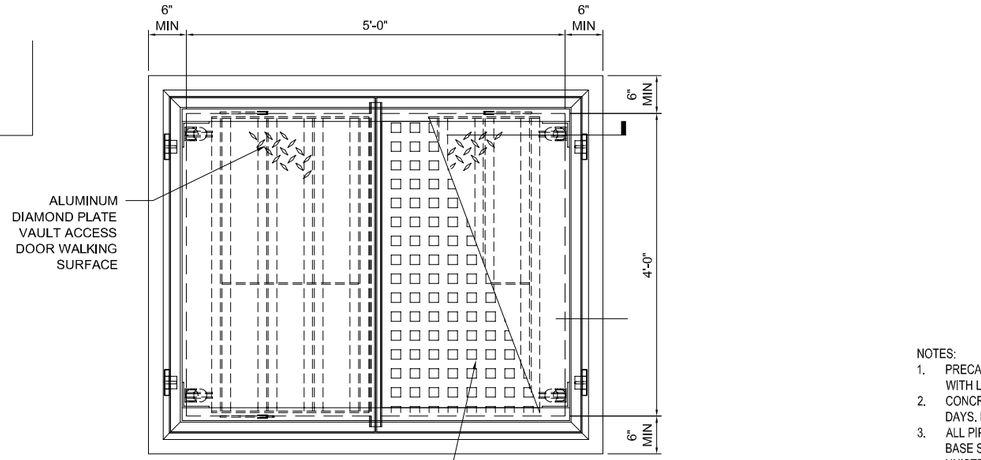
N1808



WELL METER VAULT



WELL A VAULT



WELL B VAULT

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 XX XX XX.
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.

IRZ INJECTION WELL METER VAULT AND WELL VAULT TYPE 1 - PLAN

1" = 1'-0"

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN MSL
	DWN GWE
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

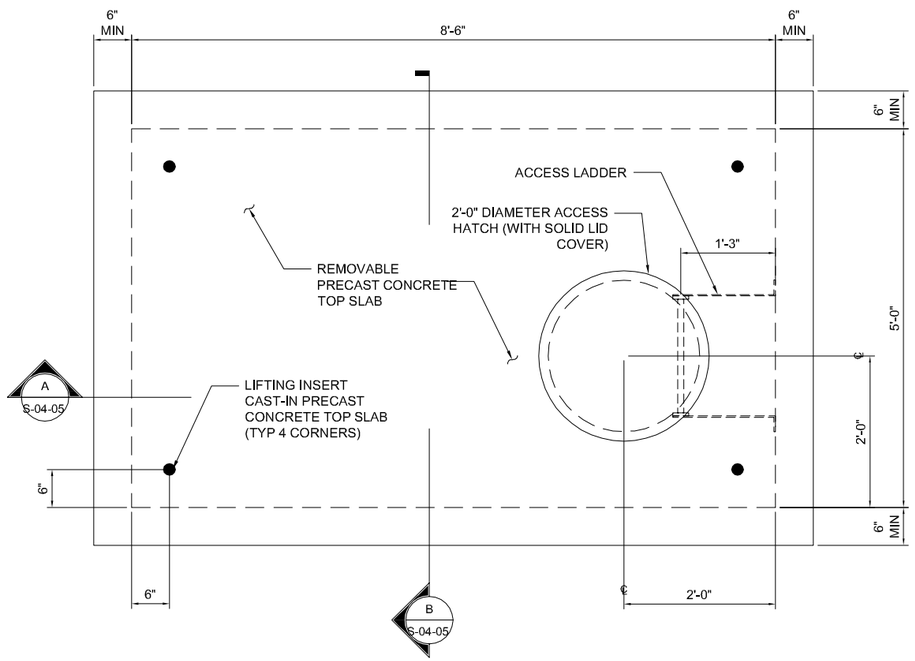
IRZ INJECTION WELL VAULTS - TYPE 1 - PLAN

GAS TRANSMISSION & DISTRIBUTION

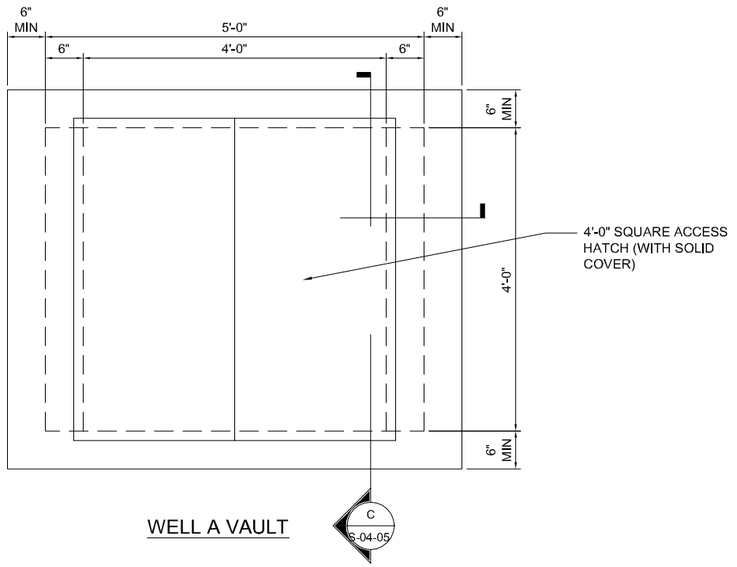
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-01	REV

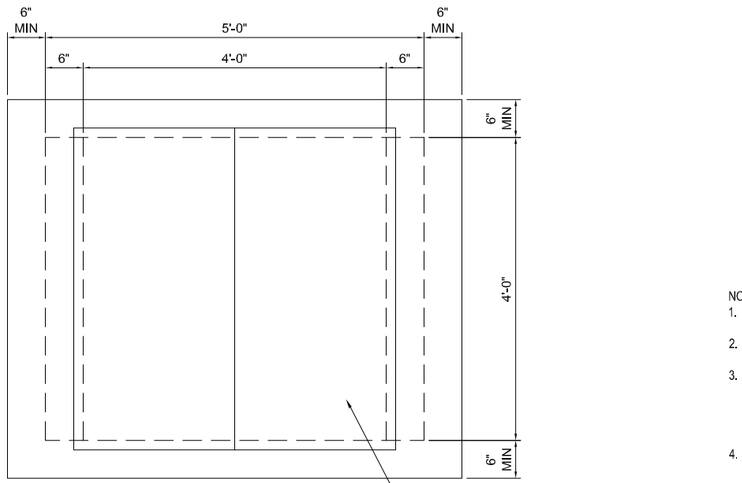
N1808



WELL METER VAULT



WELL A VAULT



WELL B VAULT

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 XX XX XX.
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.

IRZ INJECTION WELL METER VAULT AND WELL VAULT TYPE 2 - PLAN

1"=1'-0"

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	SO
JEF	SUPV JPB
	DSGN MSL
	DWN GWE
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ INJECTION WELL VAULTS - TYPE 2 - PLAN

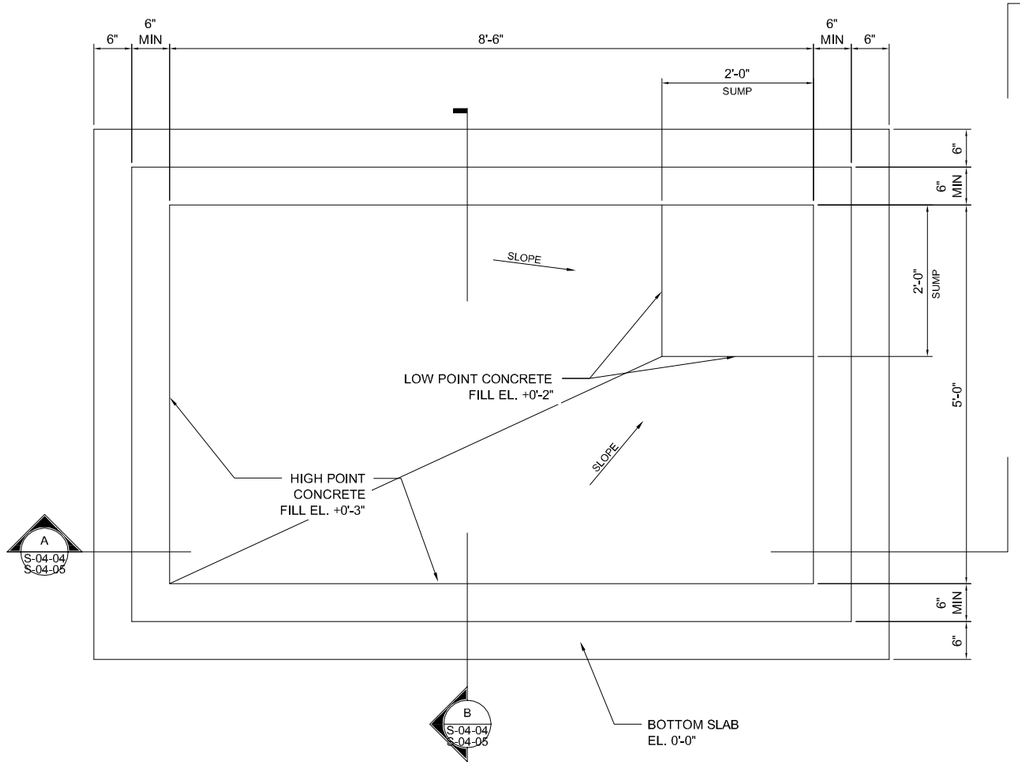
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

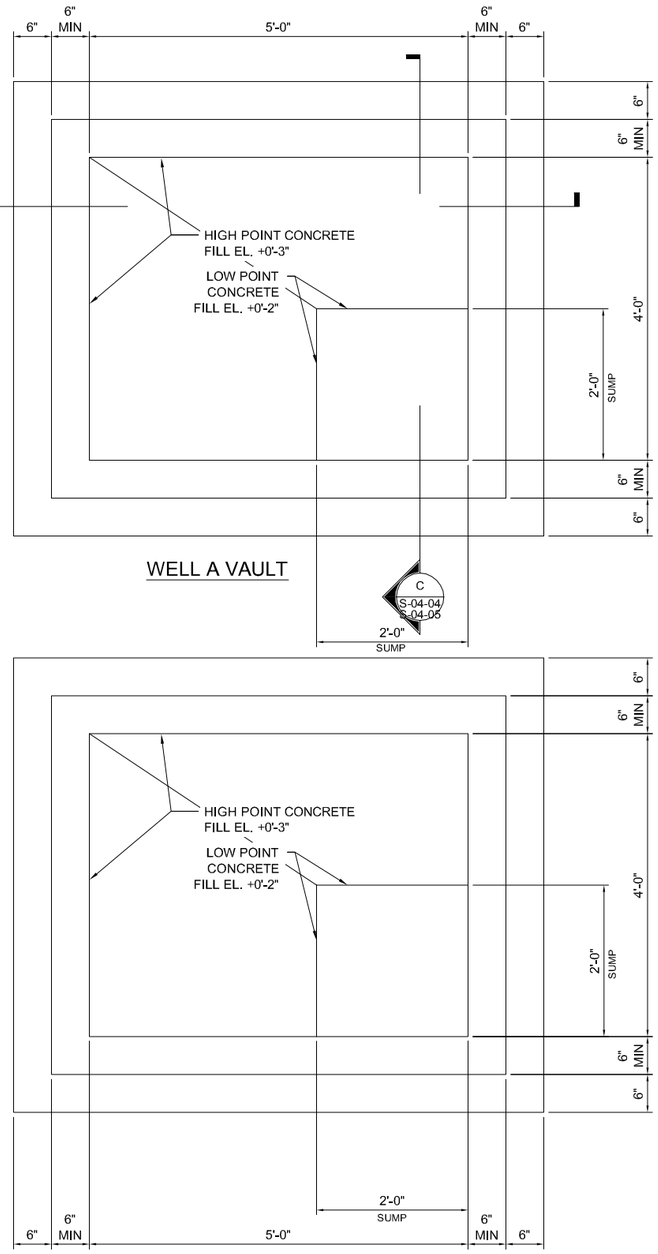
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-02	REV

N1808



WELL METER VAULT



WELL A VAULT

WELL B VAULT

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 XX XX XX.
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"

IRZ INJECTION WELL METER VAULT AND WELL VAULTS - FOUNDATION PLAN

1"=1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

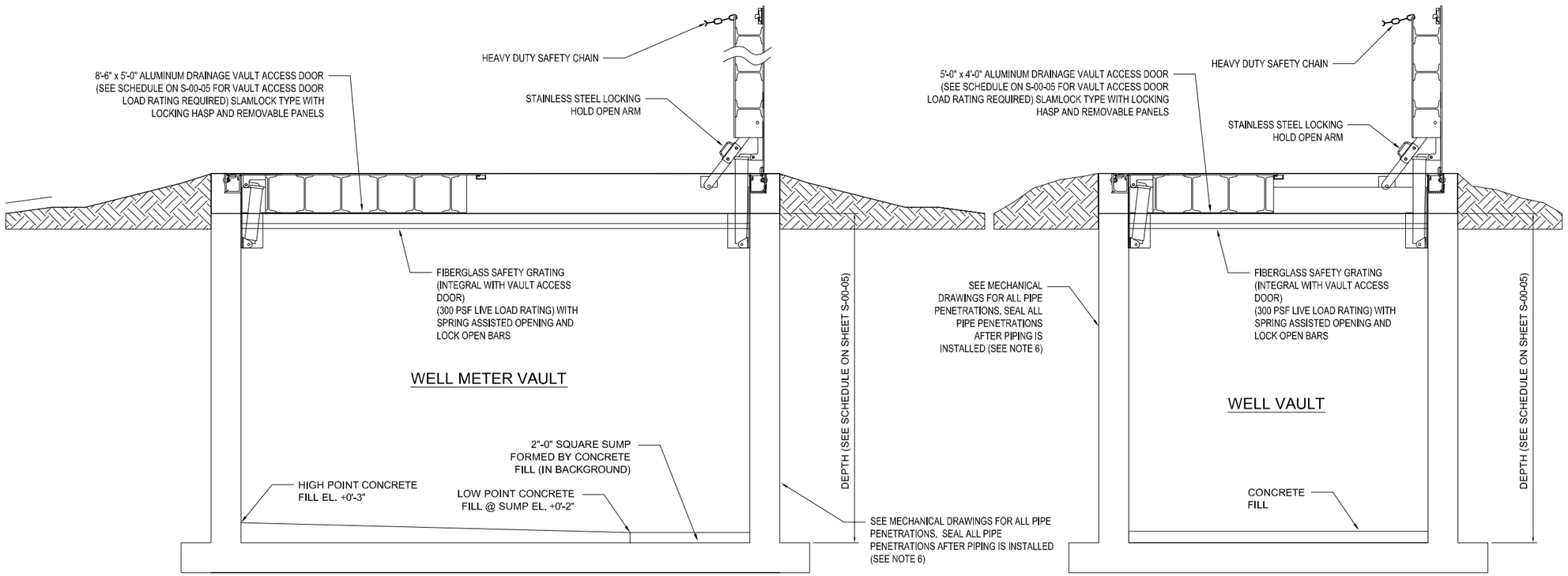
TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ 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-04-03	REV

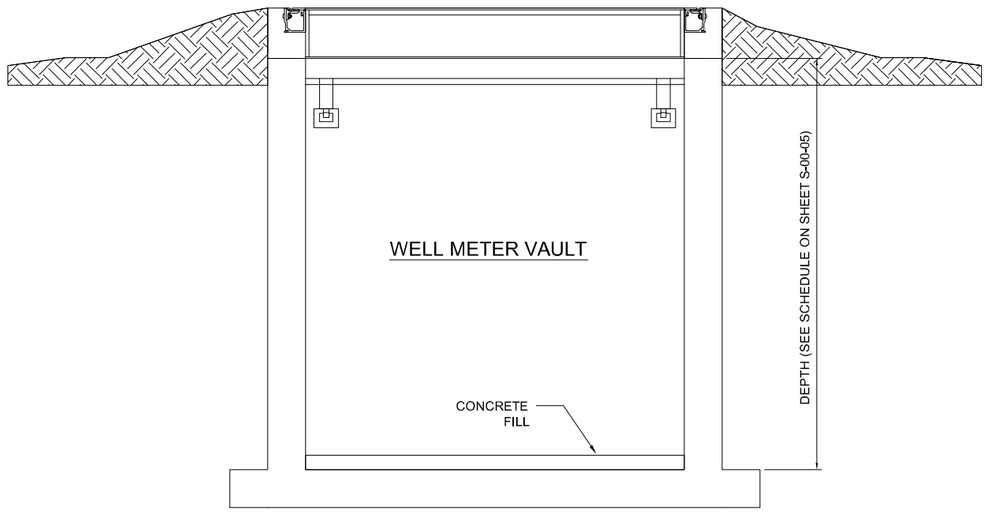
N180B



A IRZ INJECTION WELL METER VAULT AND WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

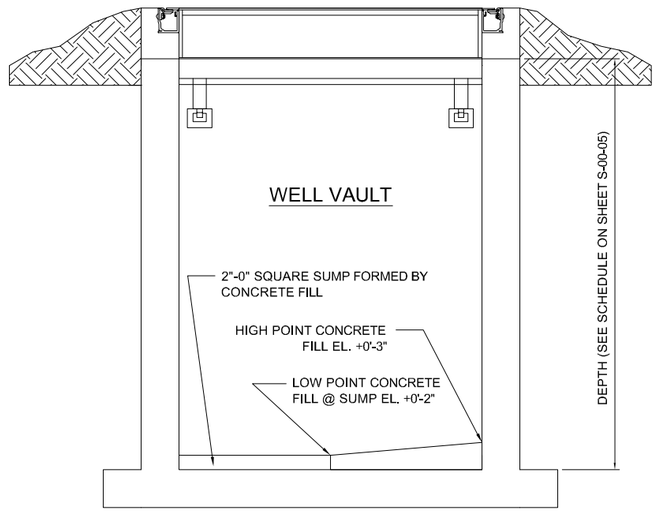
S-04-01, S-04-03



B IRZ INJECTION WELL METER VAULT TYPE 1 - SECTION

1" = 1'-0"

S-04-01, S-04-03



C IRZ INJECTION WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-04-01, S-04-03

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ INJECTION WELL VAULTS - SECTIONS

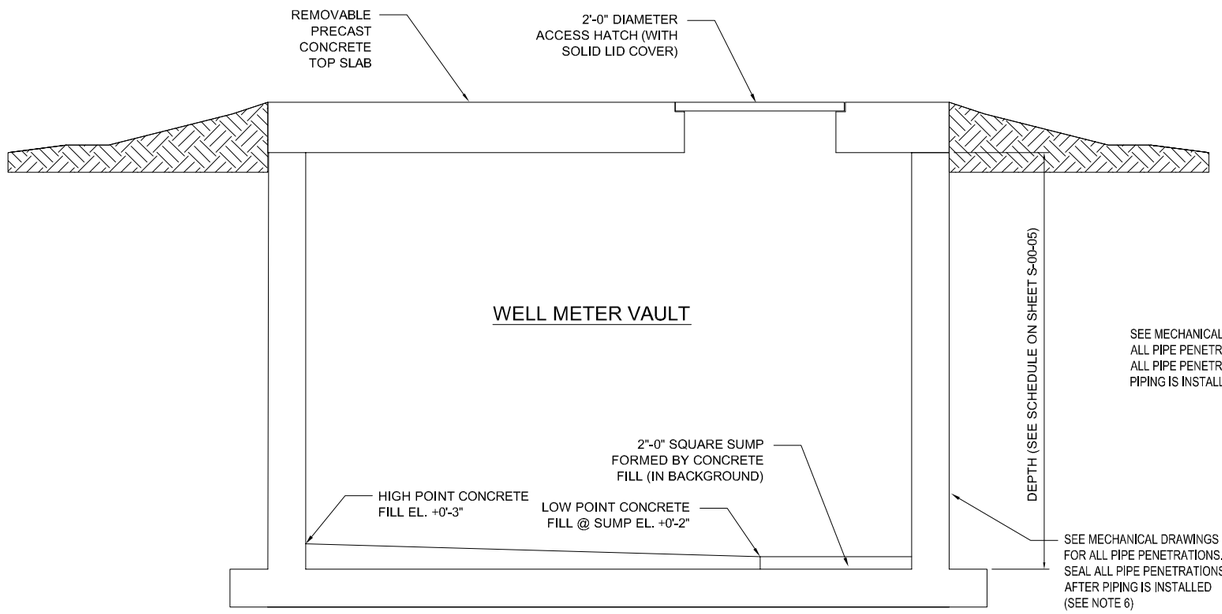
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

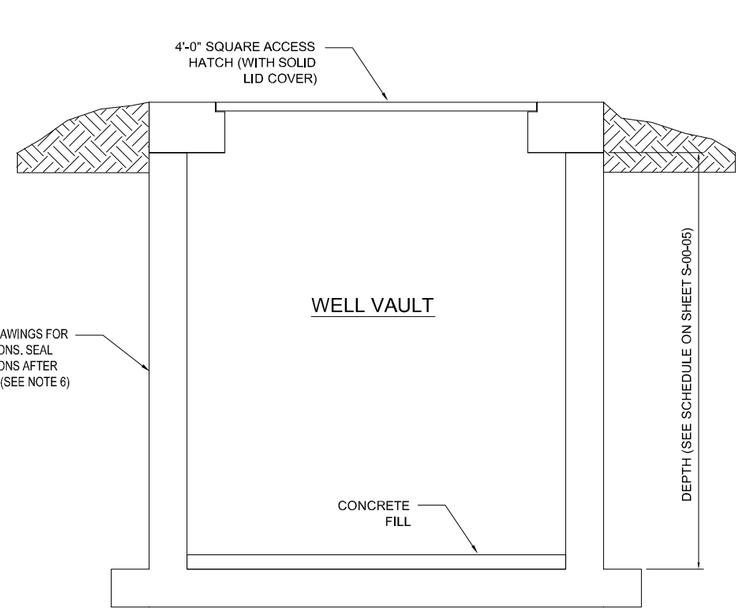
SAN FRANCISCO, CALIFORNIA

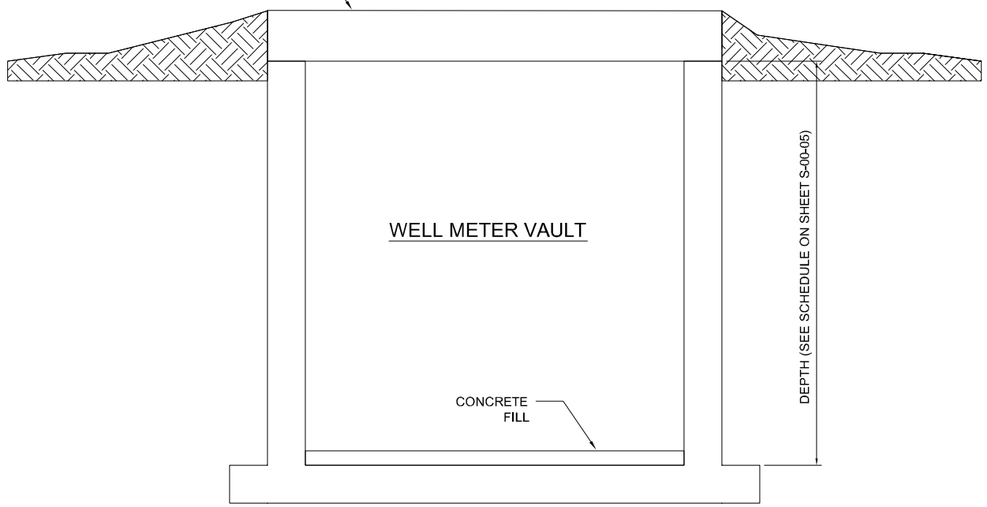
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-04	REV

N180B

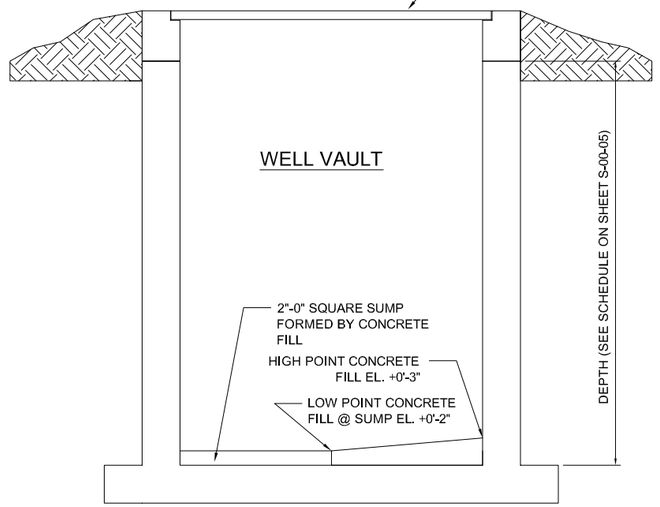


A IRZ INJECTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION
1" = 1'-0"
S-04-02, S-04-03





B IRZ INJECTION WELL METER VAULT TYPE 2 - SECTION
1" = 1'-0"
S-04-02, S-04-03



C IRZ INJECTION WELL VAULT TYPE 2 - SECTION
1" = 1'-0"
S-04-02, S-04-03

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

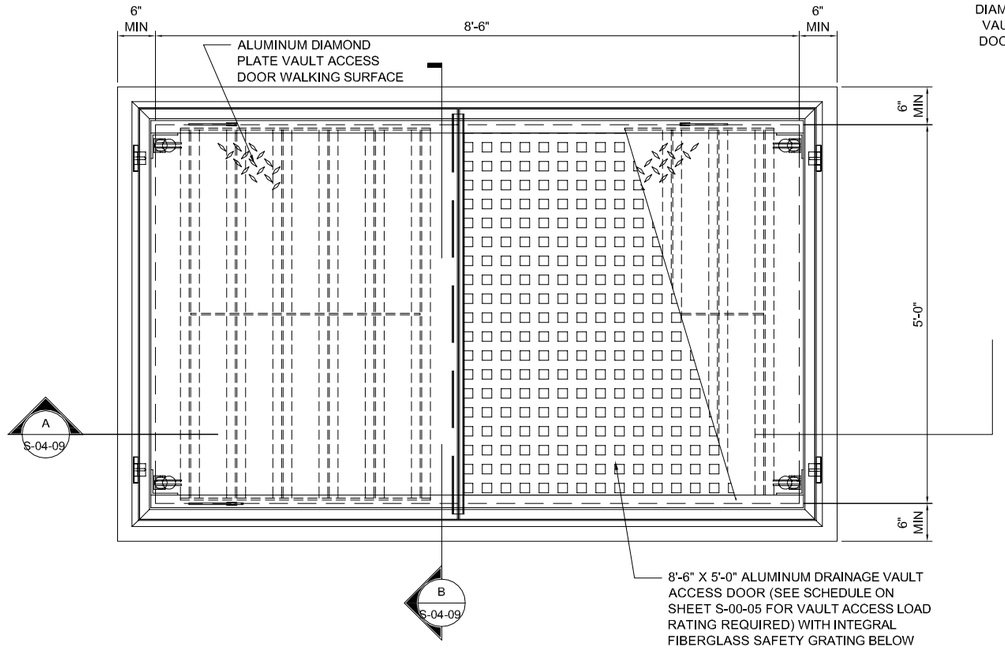
TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ INJECTION WELL VAULTS - SECTIONS

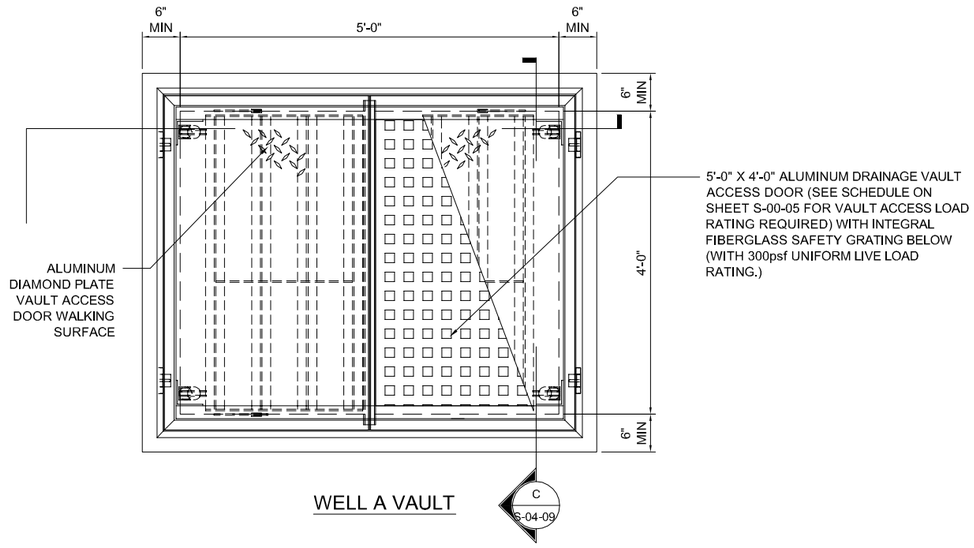
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-05	REV

N1808



WELL METER VAULT



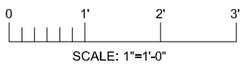
WELL A VAULT

IRZ EXTRACTION 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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	SO	
JEF	SUPV	JPB
	DSGN	MSL
	DWN	GWE
	CHKD	JPB
	OK	JEF
	DATE	04/05/13
	SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ EXTRACTION WELL VAULTS - TYPE 1 - PLAN

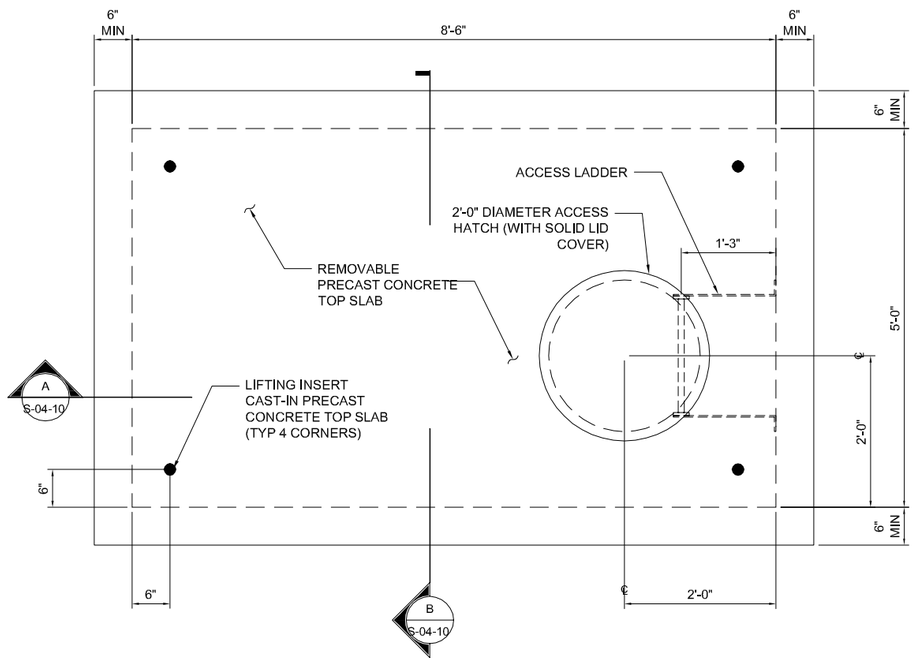
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

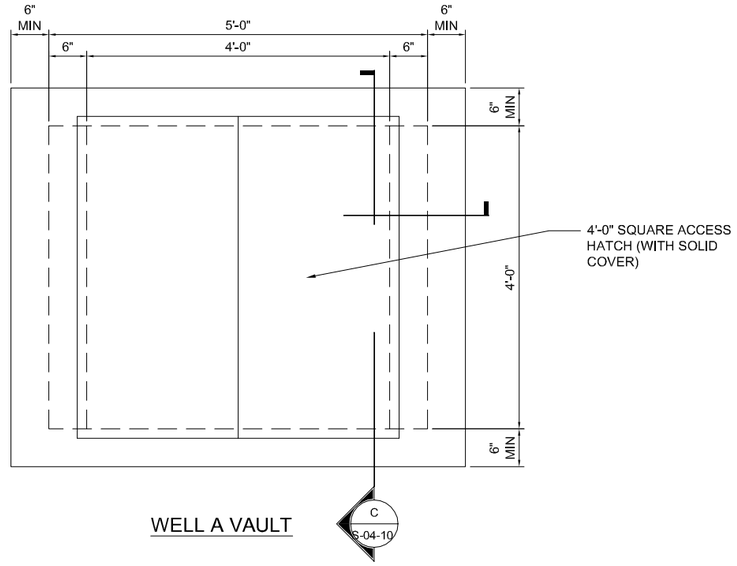
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-06	REV

N180B



WELL METER VAULT



WELL A VAULT

IRZ EXTRACTION 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 XX XX XX.
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.

0 1' 2' 3'

SCALE: 1"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN MSL
	DWN GWE
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ EXTRACTION WELL VAULTS - TYPE 2 - PLAN

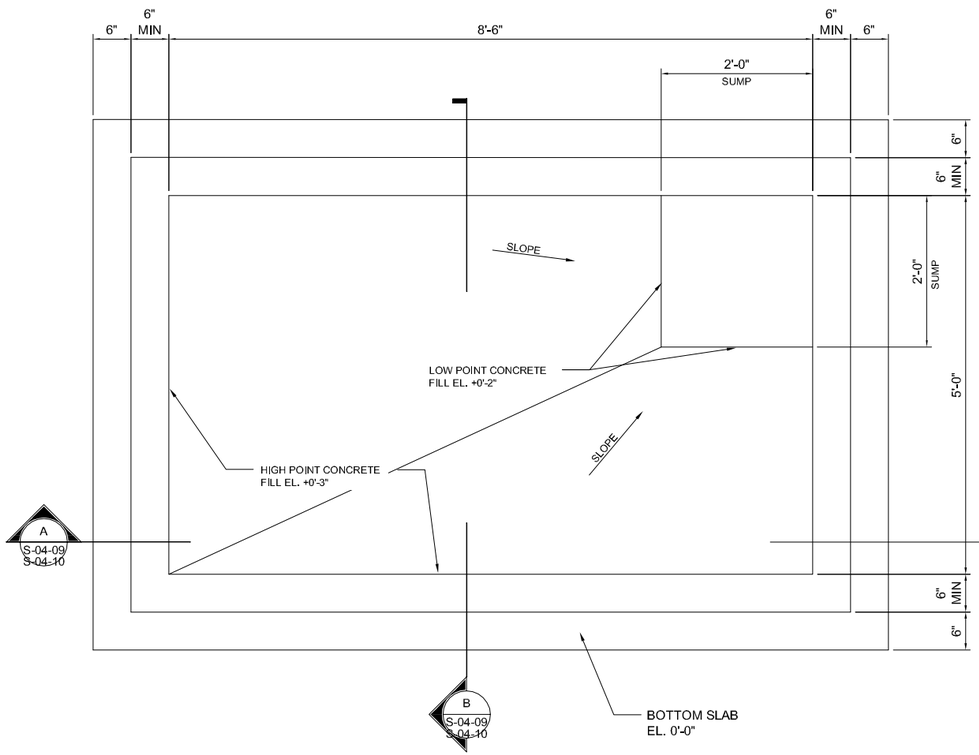
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

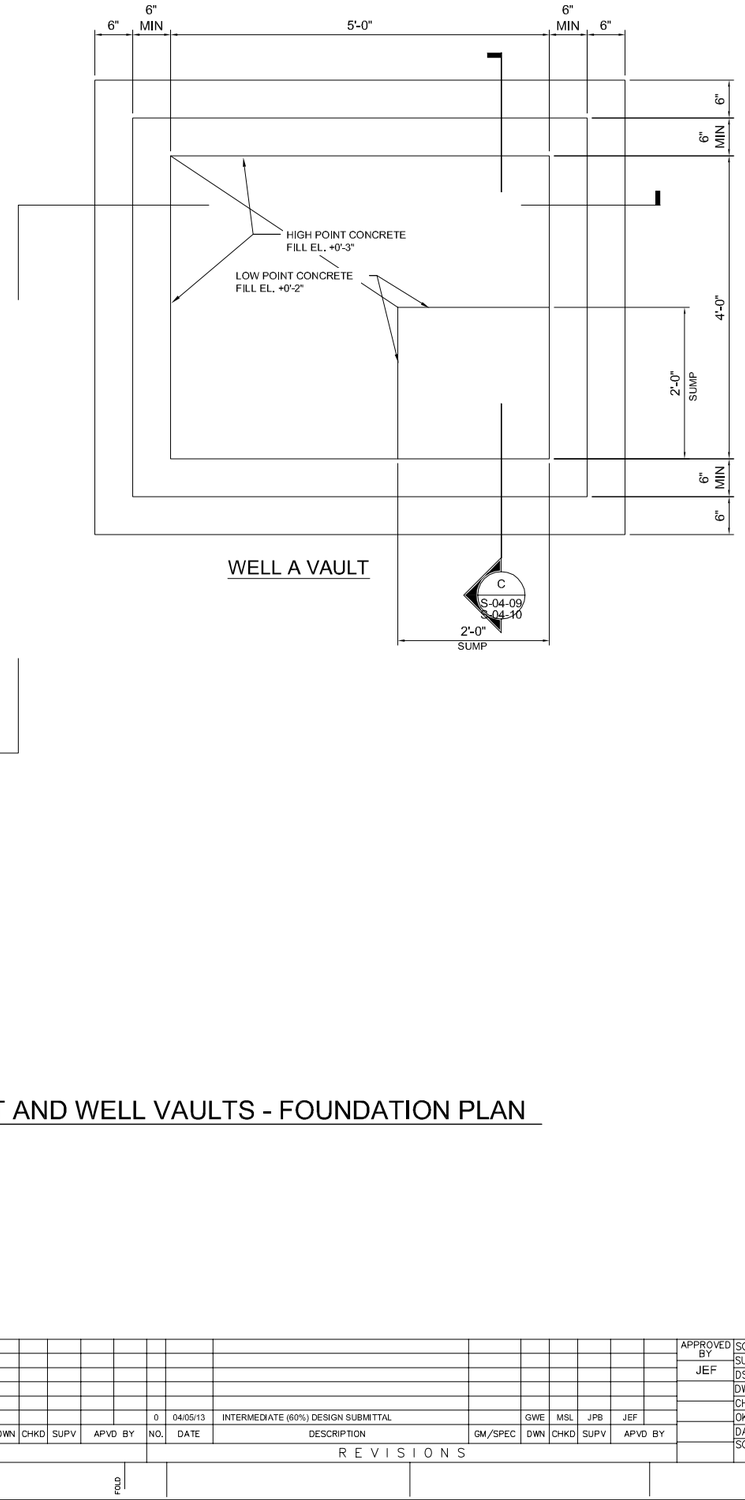
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-07	REV

N180B



WELL METER VAULT



WELL A VAULT

IRZ EXTRACTION 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.
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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN MSL
DWN GWE
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

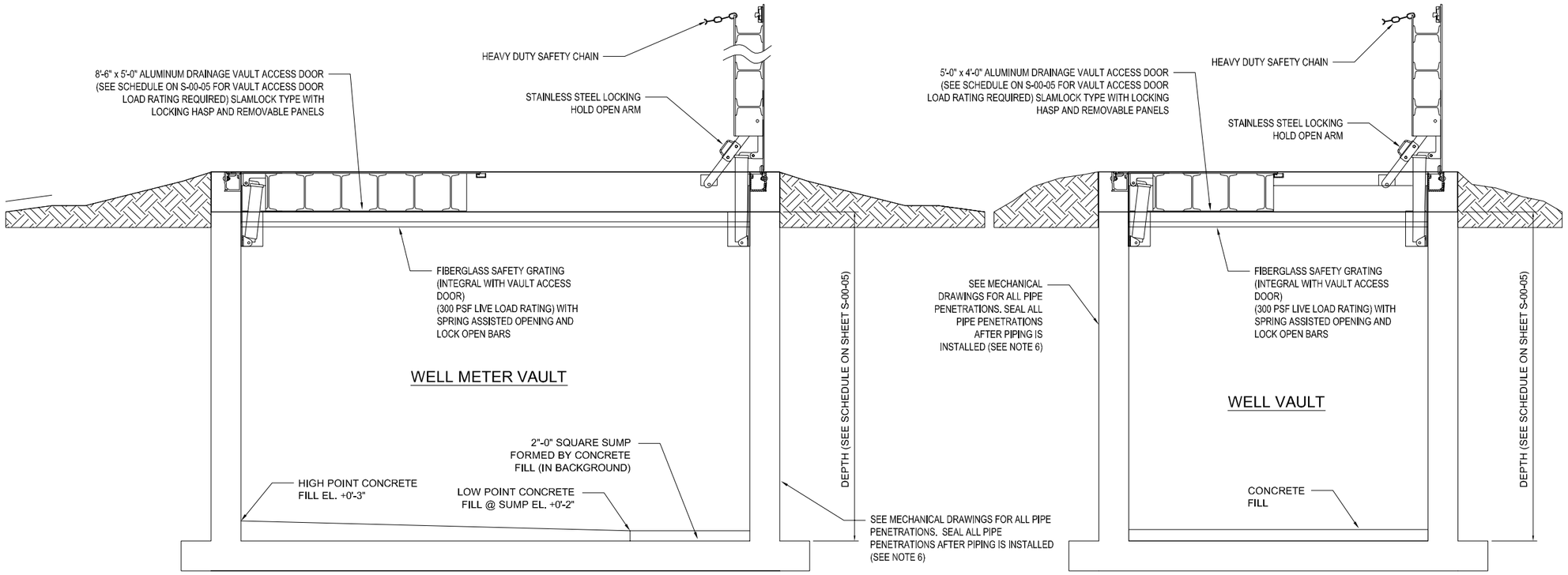
IRZ EXTRACTION WELL VAULTS - FOUNDATION PLAN

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-04-08
REV

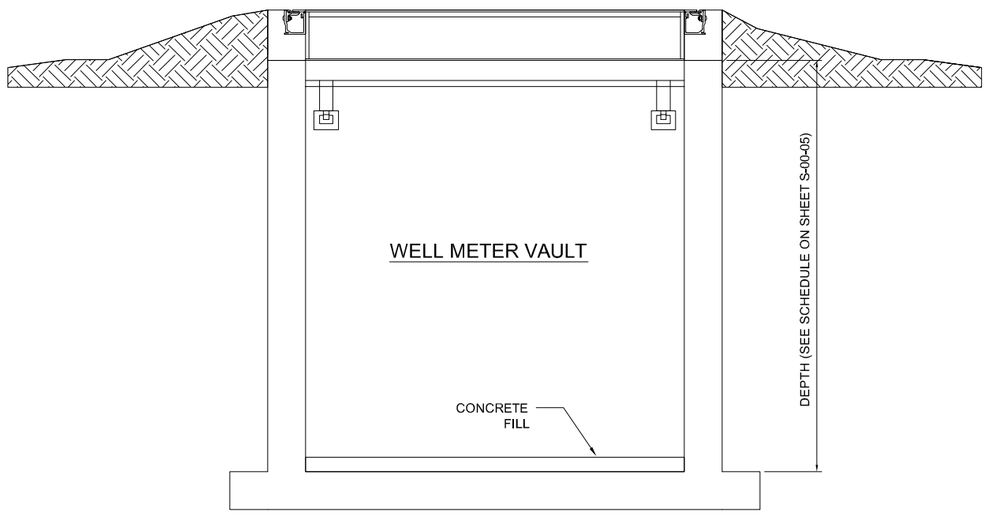
N1808

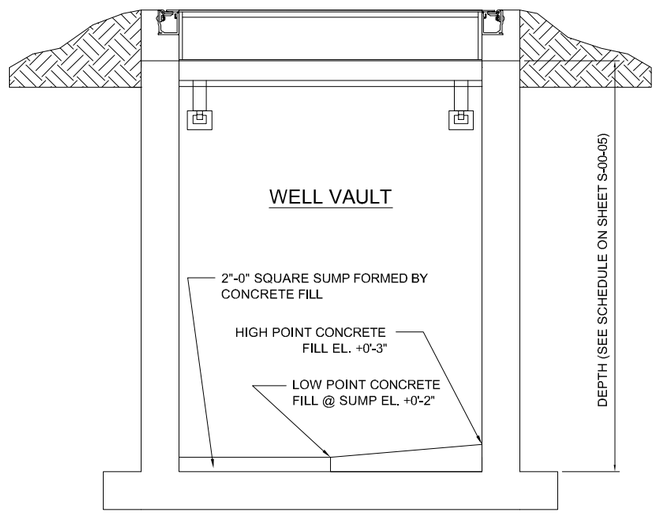


A IRZ EXTRACTION WELL METER VAULT AND WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-04-06, S-04-08





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 XX XX XX.
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"

B IRZ EXTRACTION WELL METER VAULT TYPE 1 - SECTION

1" = 1'-0"

S-04-06, S-04-08

C IRZ EXTRACTION WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-04-06, S-04-08

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN MSL
	DWN GWE
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ EXTRACTION WELL VAULTS - SECTIONS

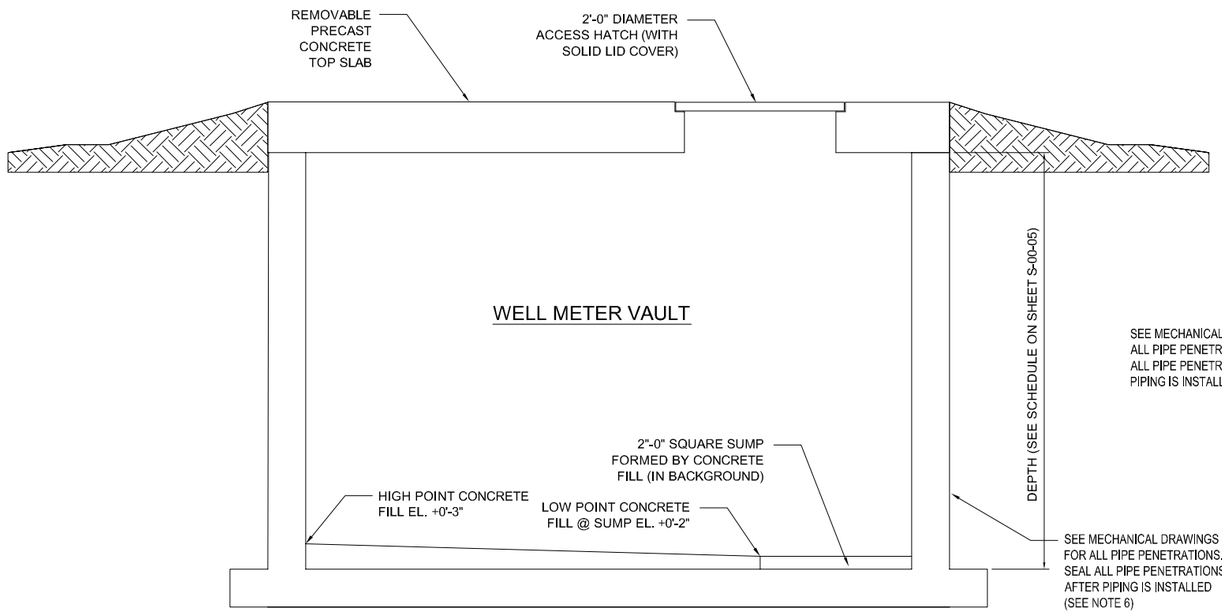
GAS TRANSMISSION & DISTRIBUTION

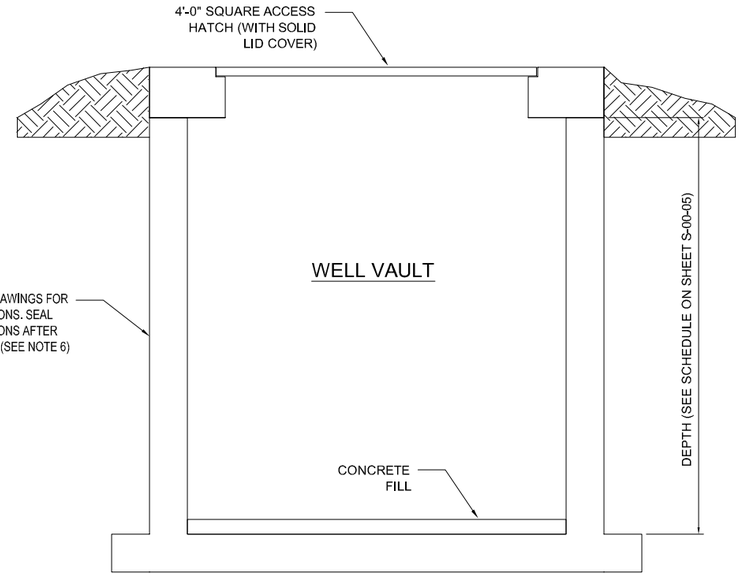
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-09	REV

N1808

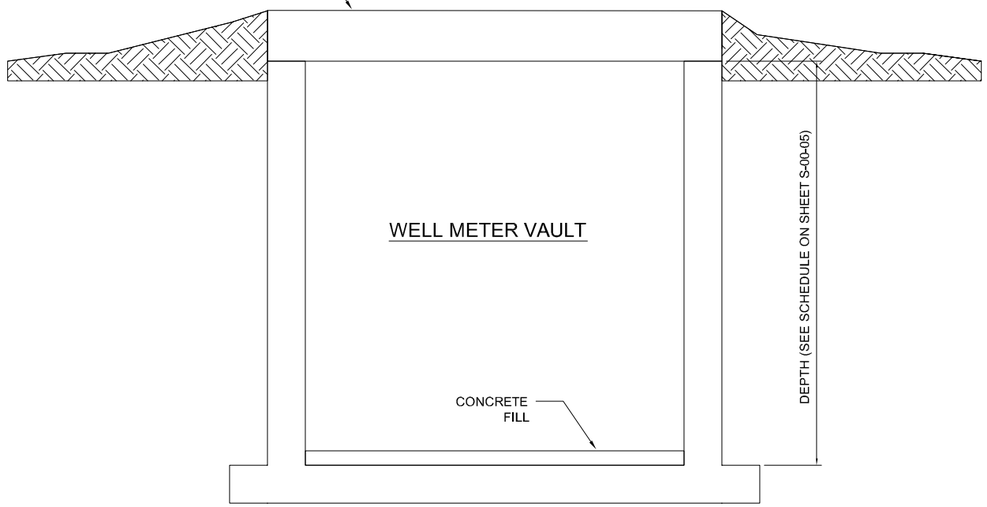


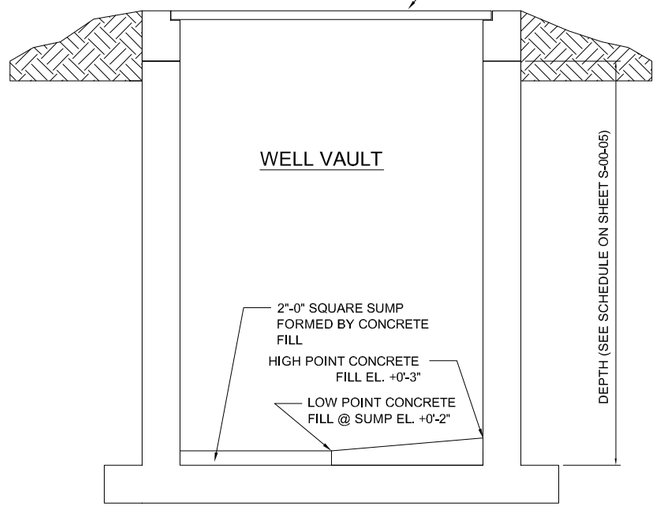


A IRZ EXTRACTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

S-04-07, S-04-08





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 XX XX XX.
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 IRZ EXTRACTION WELL METER VAULT TYPE 2 - SECTION

1" = 1'-0"

S-04-07, S-04-08

C IRZ EXTRACTION WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

S-04-07, S-04-08

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ EXTRACTION WELL VAULTS - SECTIONS

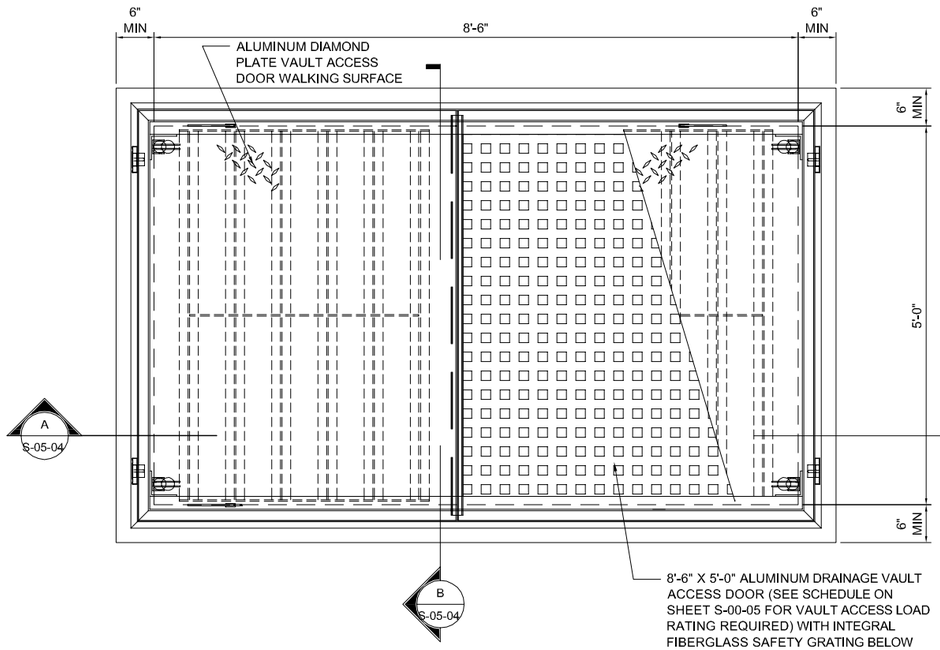
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

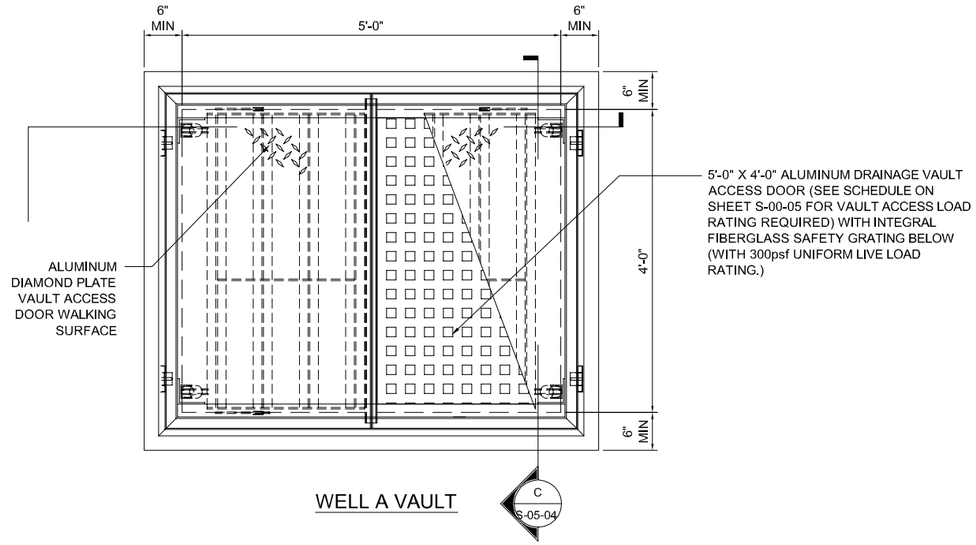
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-04-10	REV

N1808



WELL METER VAULT



WELL A VAULT

INNER RECIRCULATION 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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP INJECTION WELL VAULTS - TYPE 1 - PLAN

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM

BILL OF MATL

DWG LIST

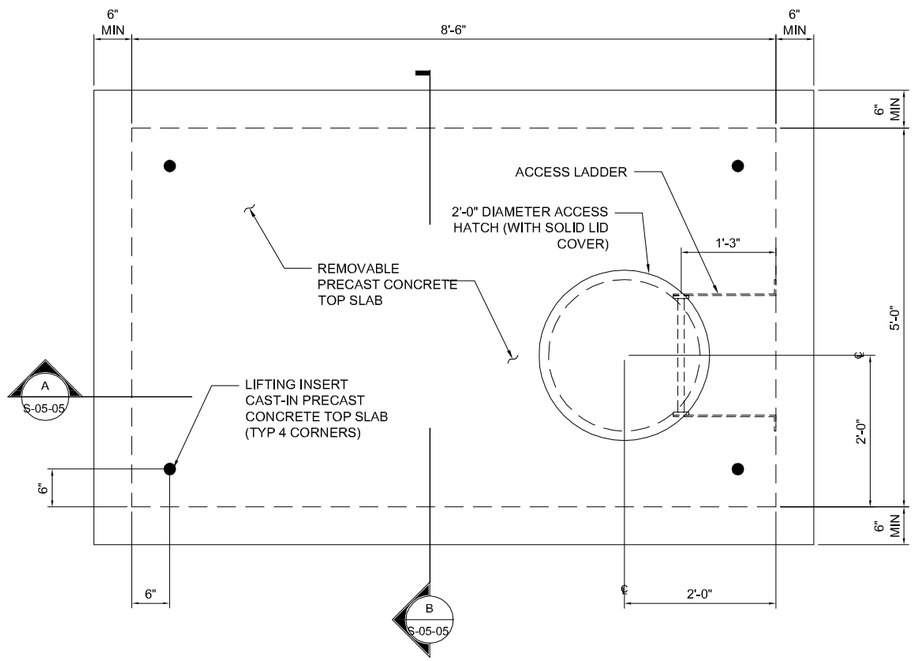
SUPSDS

SUPSD BY

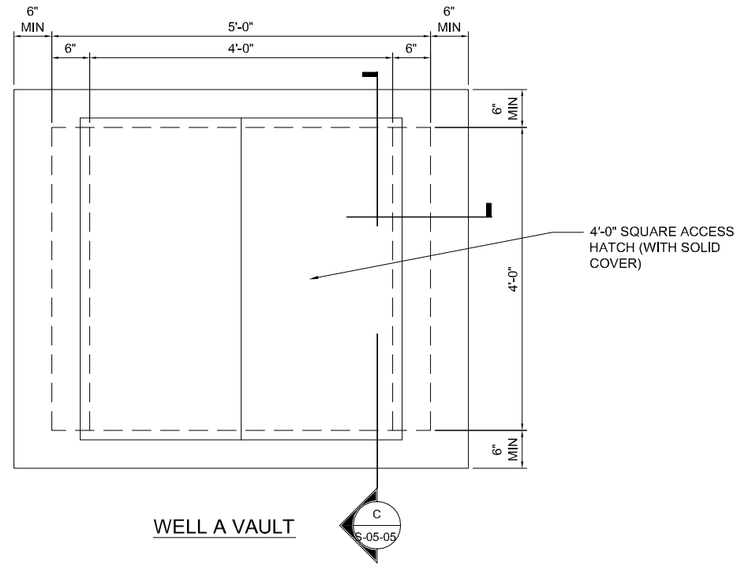
SHEET NO. S-05-01 of SHEETS

REV

N180B



WELL METER VAULT



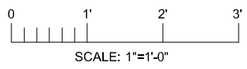
WELL A VAULT

INNER RECIRCULATION 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 XX XX XX.
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.



- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

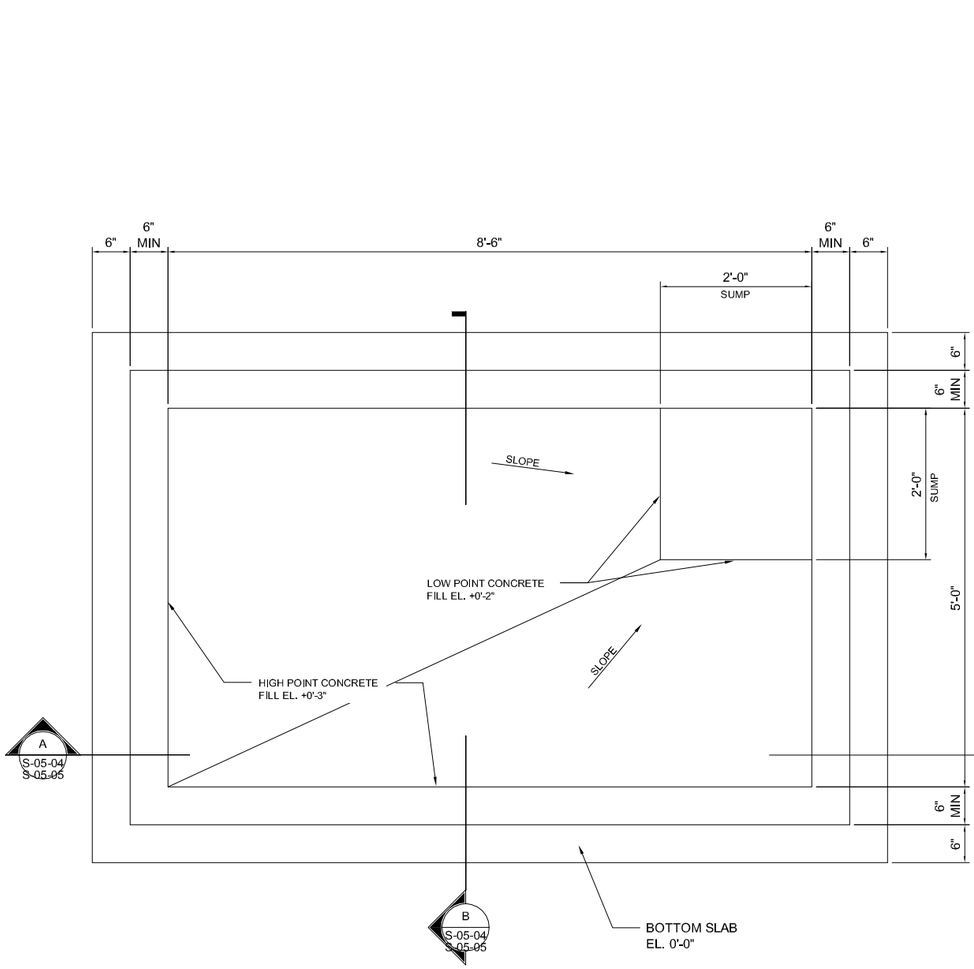
APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

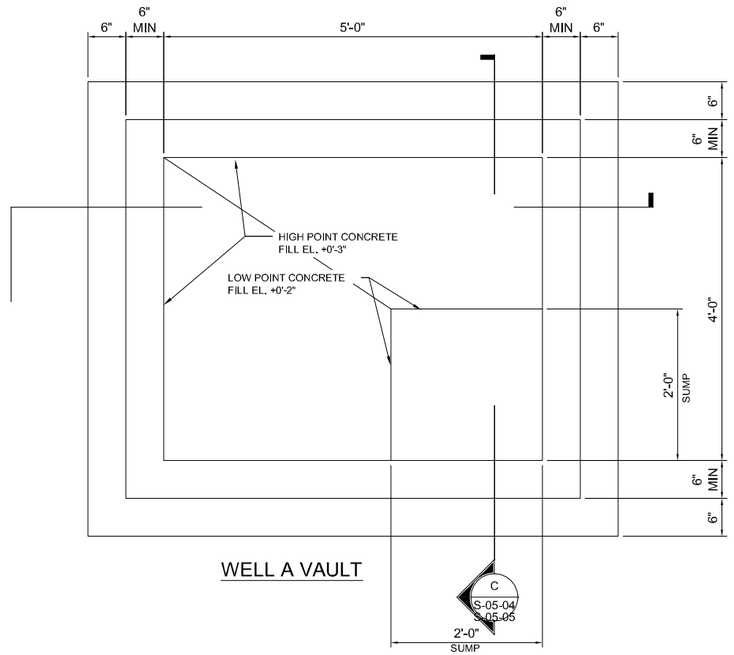
TOPOCK GROUNDWATER REMEDIATION PROJECT
INNER RECIRCULATION LOOP INJECTION WELL VAULTS TYPE 2 - PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-05-02	REV

N1808



WELL METER VAULT



WELL A VAULT

INNER RECIRCULATION 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.
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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

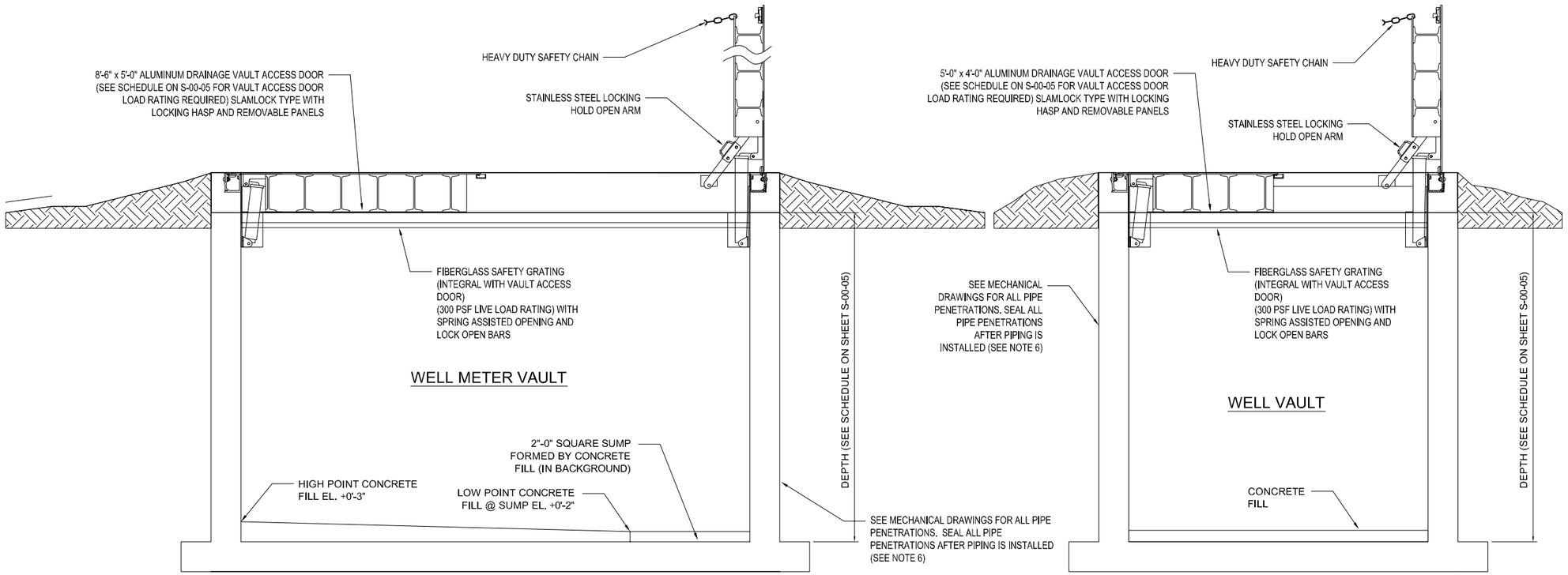
INNER RECIRCULATION LOOP INJECTION WELL VAULTS - FOUNDATION PLAN

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-05-03	REV

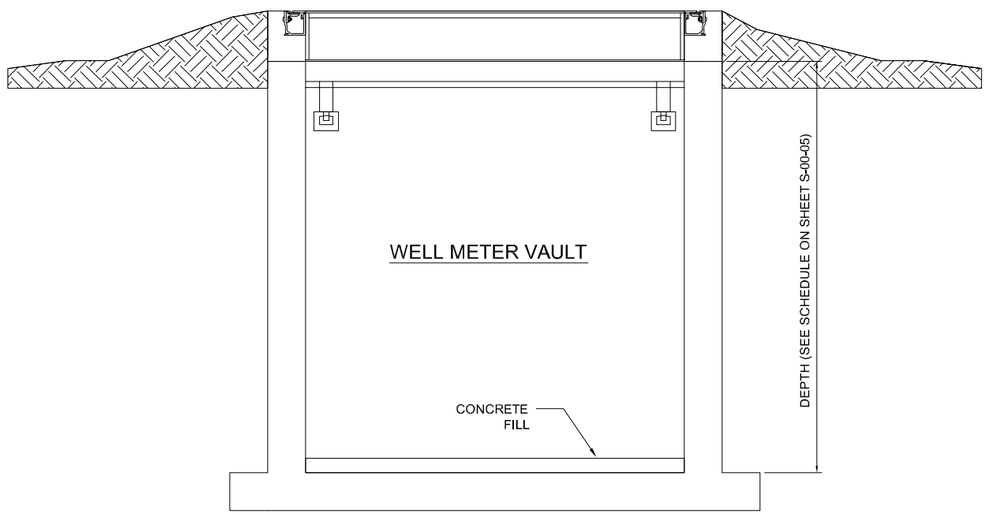
N1808



A INNER RECIRCULATION LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

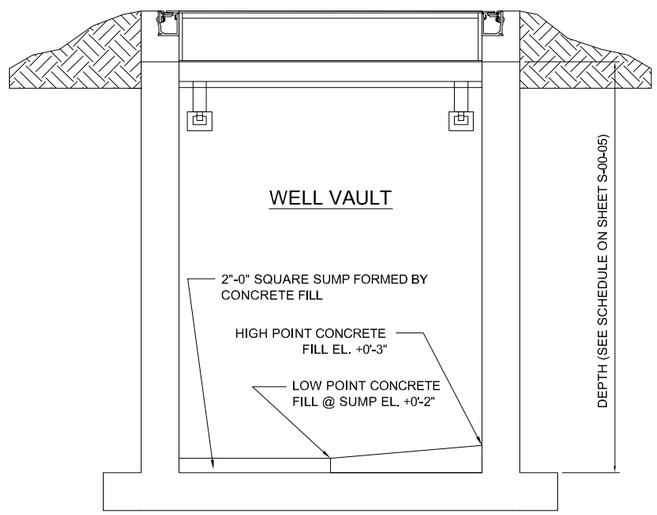
S-05-01, S-05-03



B INNER RECIRCULATION LOOP INJECTION WELL METER VAULT TYPE 1 - SECTION

1" = 1'-0"

S-05-01, S-05-03



C INNER RECIRCULATION LOOP INJECTION WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-05-01, S-05-03

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN MSL
	DWN GWE
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP INJECTION WELL VAULTS - SECTIONS

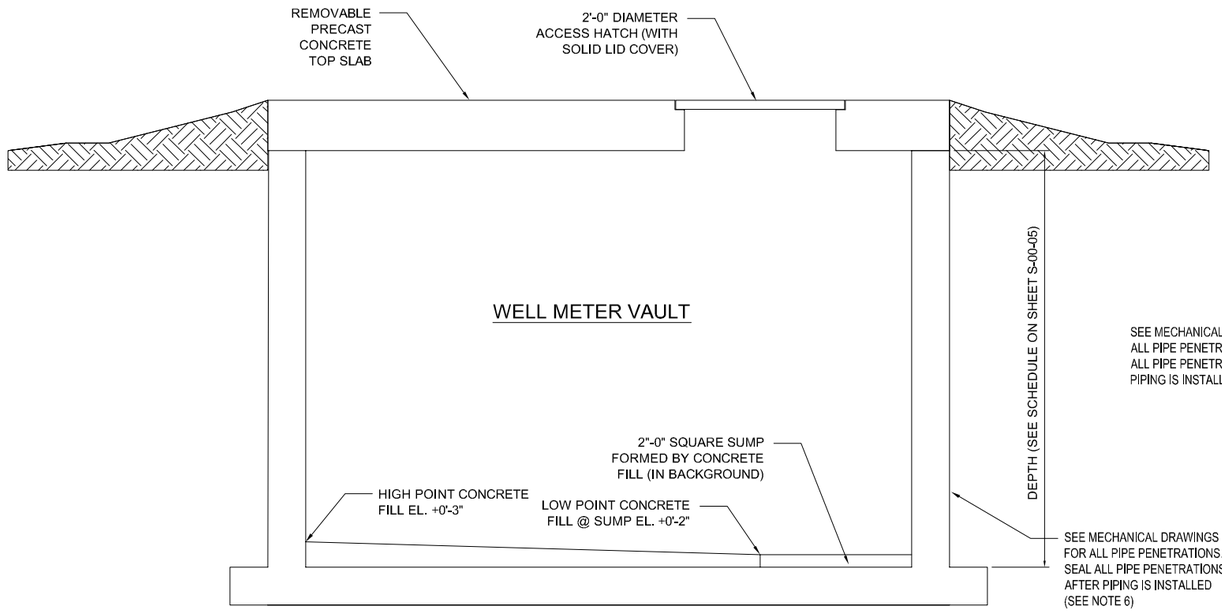
GAS TRANSMISSION & DISTRIBUTION

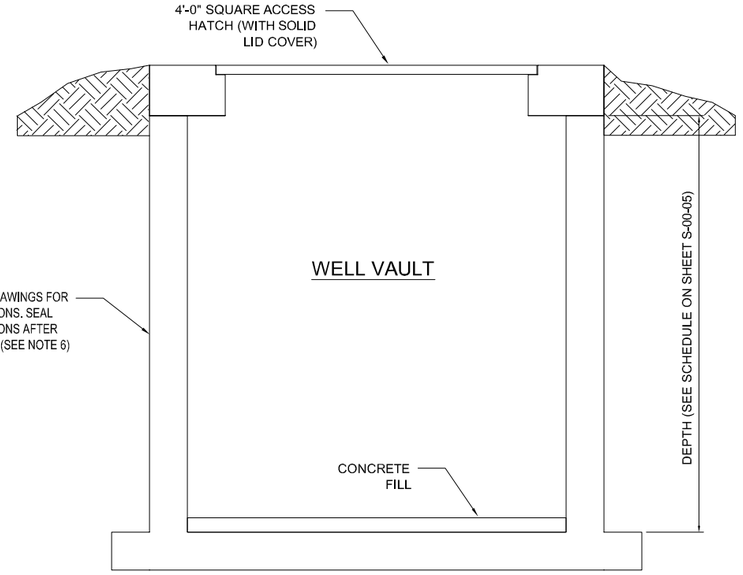
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-05-04	REV

N180B

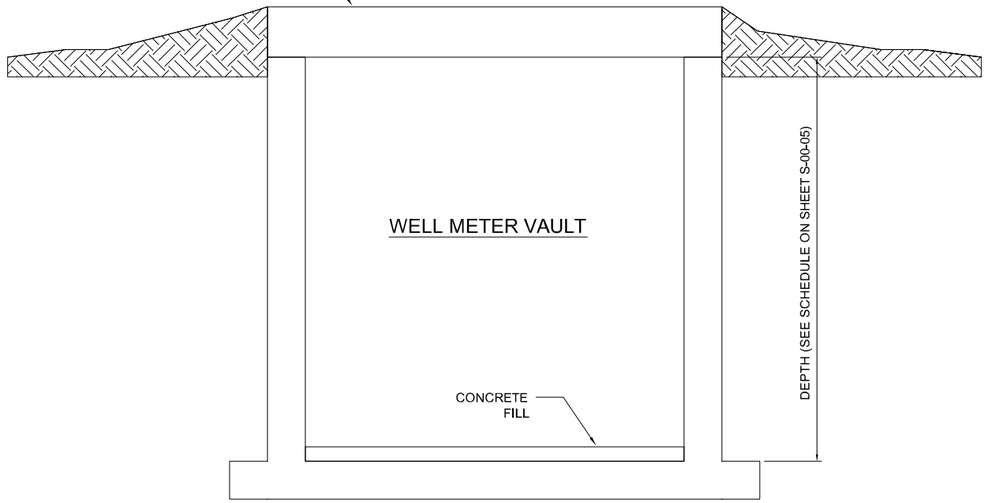




A INNER RECIRCULATION LOOP INJECTION WELL METER VAULT AND WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

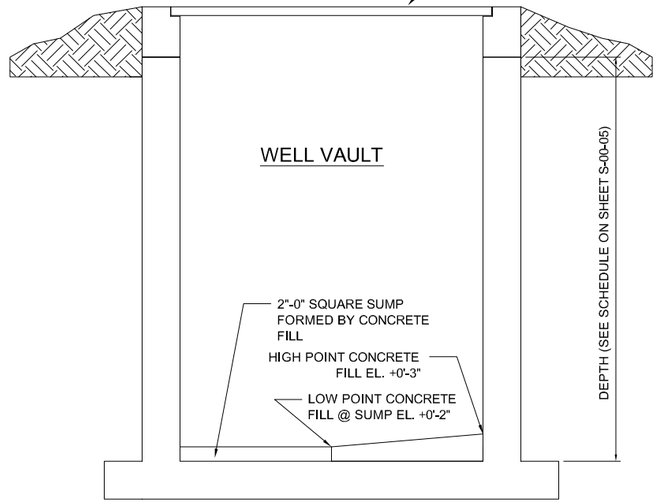
S-05-02, S-05-03



B INNER RECIRCULATION LOOP INJECTION WELL METER VAULT TYPE 2 - SECTION

1" = 1'-0"

S-05-02, S-05-03



C INNER RECIRCULATION LOOP INJECTION WELL VAULT TYPE 2 - SECTION

1" = 1'-0"

S-05-02, S-05-03

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP INJECTION WELL VAULTS - SECTIONS

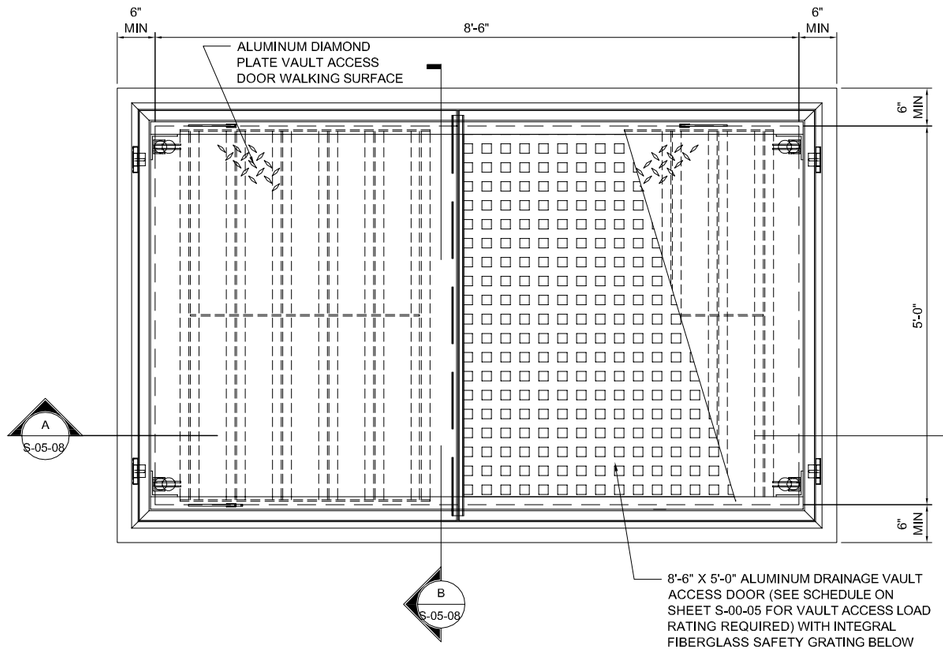
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

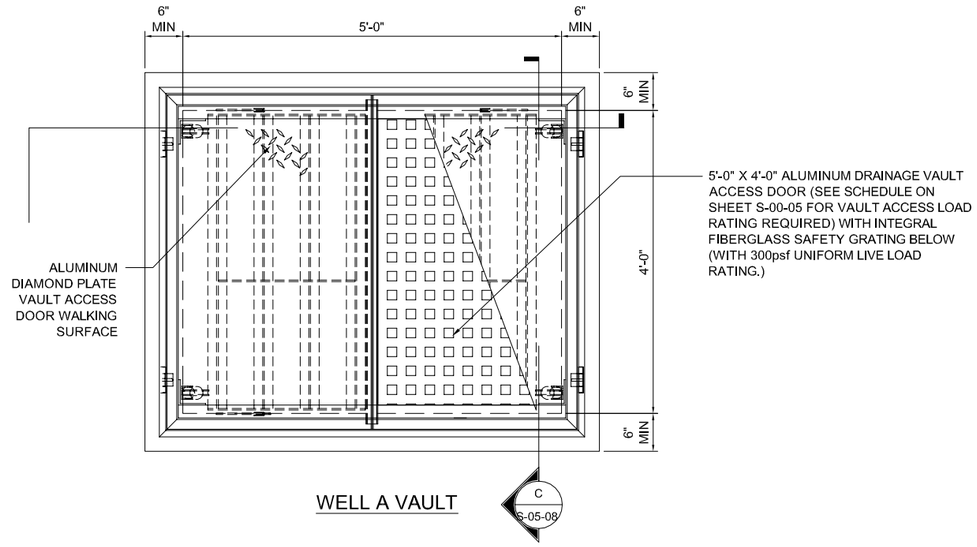
SAN FRANCISCO, CALIFORNIA

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

N1808



WELL METER VAULT



WELL A VAULT

INNER RECIRCULATION LOOP EXTRACTION 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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

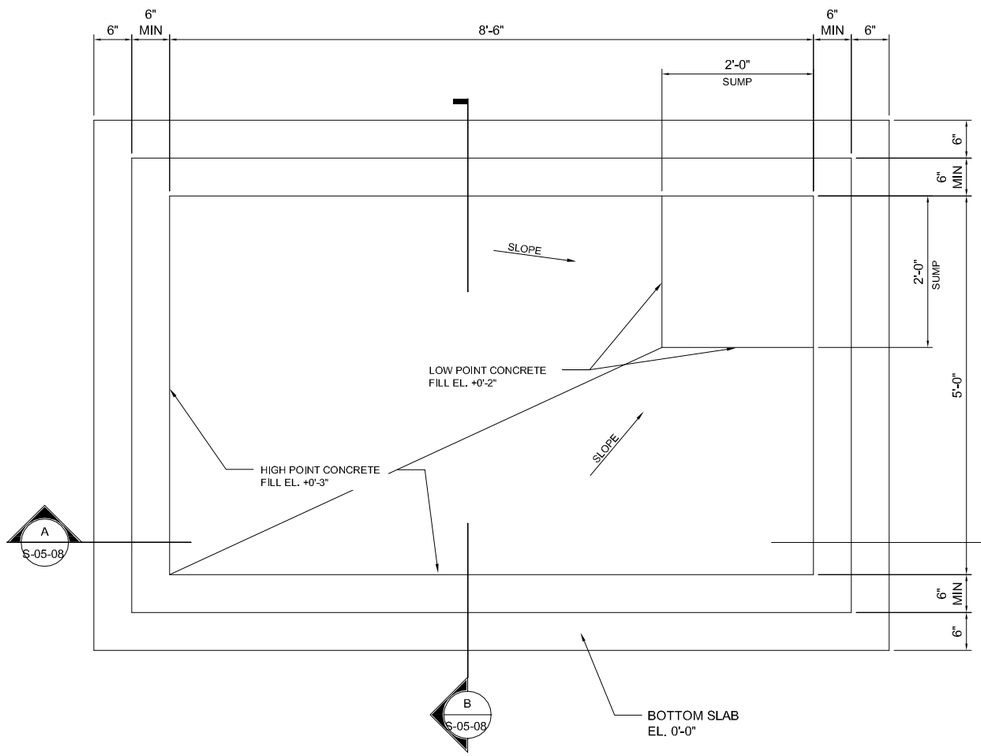
INNER RECIRCULATION LOOP EXTRACTION WELL VAULTS TYPE 1 - PLAN

GAS TRANSMISSION & DISTRIBUTION

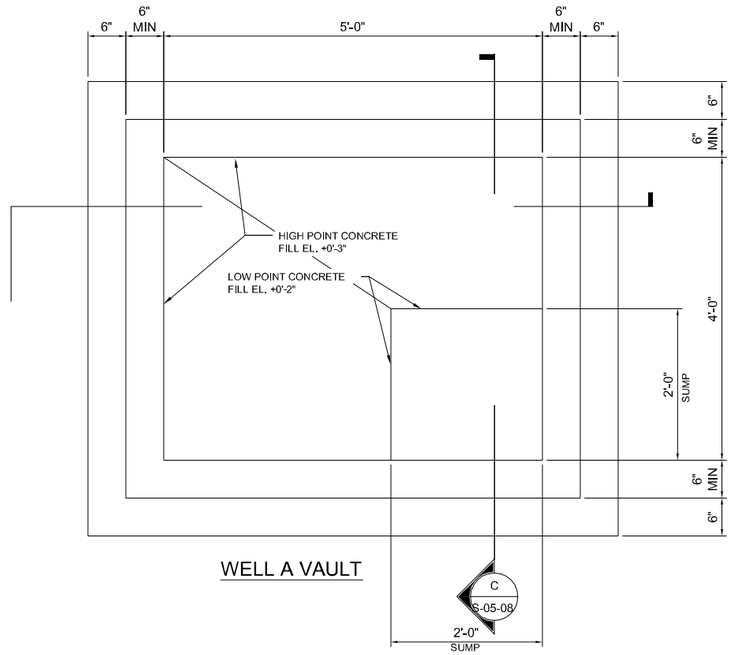
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-05-06	REV

N180B



WELL METER VAULT



WELL A VAULT

INNER RECIRCULATION LOOP EXTRACTION 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.
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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP EXTRACTION WELL VAULTS - FOUNDATION PLAN

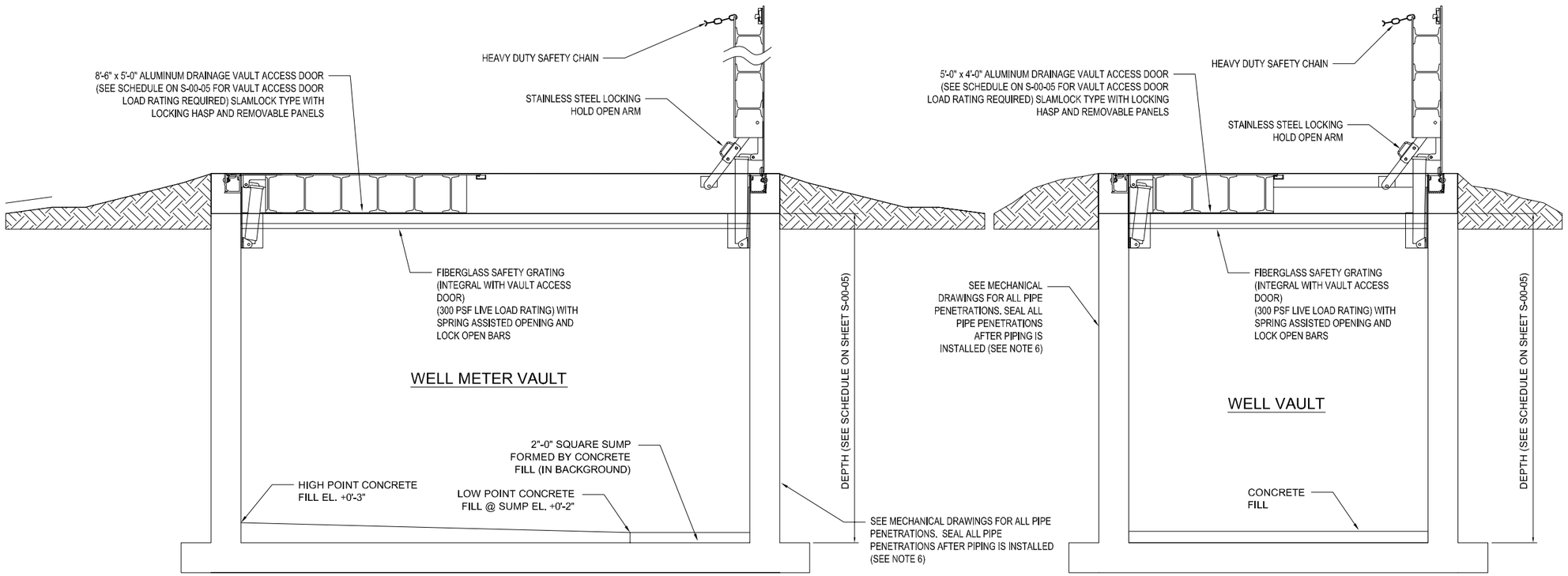
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-05-07	REV

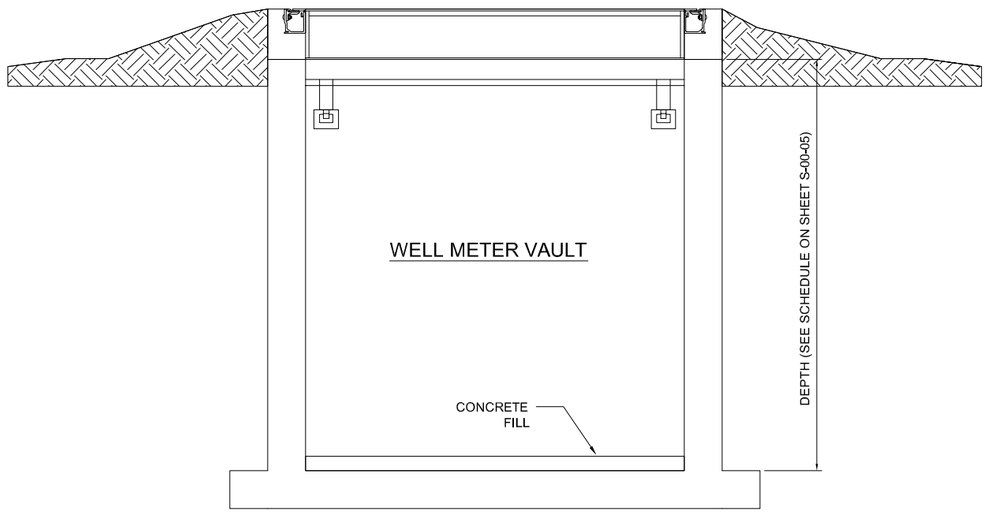
N1808



A INNER RECIRCULATION LOOP EXTRACTION WELL METER VAULT AND WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

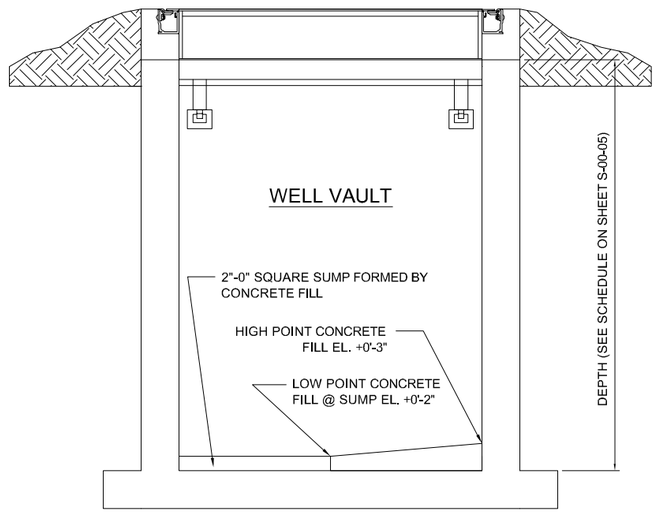
S-05-06, S-05-07



B INNER RECIRCULATION LOOP EXTRACTION WELL METER VAULT TYPE 1 - SECTION

1" = 1'-0"

S-05-06, S-05-07



C INNER RECIRCULATION LOOP EXTRACTION WELL VAULT TYPE 1 - SECTION

1" = 1'-0"

S-05-06, S-05-07

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 XX XX XX.
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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	SO	
JEF	SUPV	JPB
	DSGN	MSL
	DWN	GWE
	CHKD	JPB
	OK	JEF
	DATE	04/05/13
	SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP EXTRACTION WELL VAULTS - SECTIONS

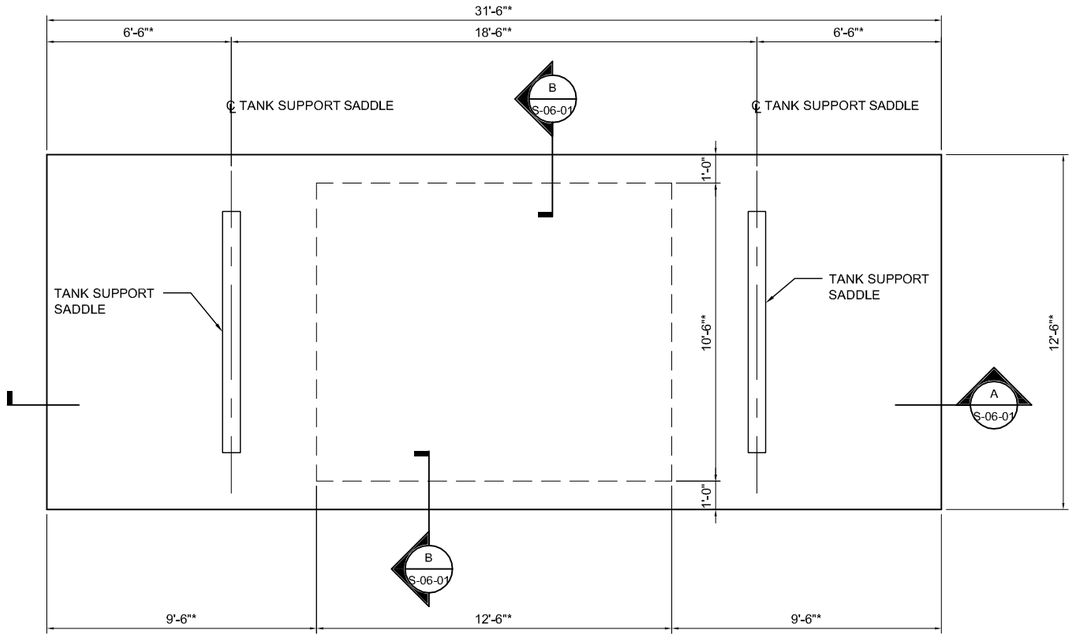
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-05-08	REV

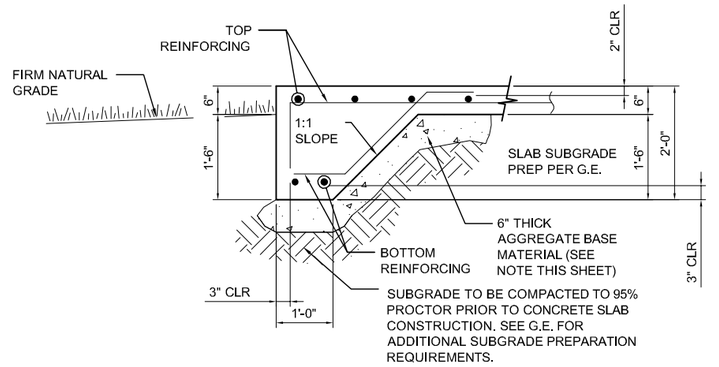
N180B



* TO BE VERIFIED BY CONTRACTOR PER APPROVED MANUFACTURER'S STORAGE TANK SHOP DRAWINGS

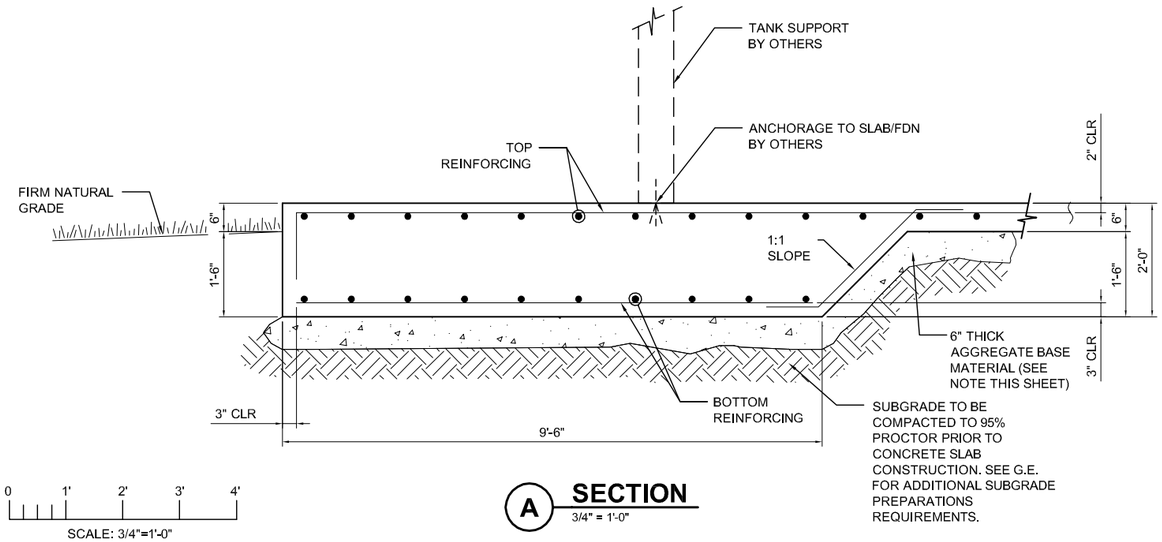
IRZ CARBON SUBSTRATE STORAGE TANK: FOUNDATION PLAN

3/8" = 1'-0"



B SECTION

3/4" = 1'-0"



A SECTION

3/4" = 1'-0"

0 1' 2' 3' 4'

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

0 2' 4' 6' 8'

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

FOUNDATION NOTES:

- CARBON AMENDMENT TANK SUPPORTS/SADDLES ARE BY OTHERS, ATTACHMENT OF CARBON AMENDMENT TANK TO SUPPORTS/SADDLES IS BY OTHERS; ANCHORAGE OF CARBON AMENDMENT TANK OR SUPPORTS/SADDLES TO THE CONCRETE SLAB/FOUNDATION IS BY OTHERS.
- FOUNDATION DESIGN IS BASED UPON 1500 psf ALLOWABLE BEARING PRESSURE, IN CONFORMANCE WITH CBC TABLE 18-1-C FOR CLASSIFICATION(S) SW, SP, SM, SC. GM, AND/OR GC. A LICENSED GEOTECHNICAL ENGINEER SHALL PROVIDE SUBGRADE COMPACTION AND PREPARATION REQUIREMENTS, AND SHALL INSPECT THE EXCAVATIONS AND CONFIRM THAT 1500 psf BEARING IS ALLOWED FOR THE FOUNDATIONS DELINEATED HEREIN, AS WELL AS 0.40 FRICTION FOR THE CARBON AMENDMENT TANK FOUNDATION. WHEN ENGINEERED FILL IS REQUIRED BY THE GEOTECHNICAL ENGINEER, IT SHALL BE TESTED AND INSPECTED BY THE GEOTECHNICAL ENGINEER.
- IF THE BUILDING OFFICIAL OR GEOTECHNICAL ENGINEER DETERMINES THAT EXPANSIVE SOILS OR OTHER GEOLOGIC ISSUES OF CONCERN MAY BE PRESENT, THEN HE/SHE MAY REQUIRE THAT SPECIAL PROVISIONS BE MADE TO THE FOUNDATION DESIGN TO SAFEGUARD AGAINST DAMAGE DUE TO THE EXPANSIVENESS OR OTHER GEOLOGIC ISSUES. IF THIS BECOMES THE SITUATION THEN ALL FOUNDATION CONSTRUCTION MUST BE HALTED AND THE GEOTECHNICAL ENGINEER SHALL PROVIDE A GEOTECHNICAL REPORT WITH RECOMMENDATIONS IN CONSIDERATION OF THE CONDITIONS.
- GROSS WEIGHT OF CARBON AMENDMENT STORAGE TANK (INCLUDING CONTENTS (FUEL) AND SUPPORT SADDLES) SHALL NOT EXCEED 181,000 lbs. THIS PARAMETER SHALL BE POSTED IN PLAIN SIGHT WITH PERMANENT LETTERING.
- REFER TO THE GENERAL NOTES AND STRUCTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- STRUCTURAL OBSERVATIONS OF CONSTRUCTION ARE RECOMMENDED (PER CBC SECTION 1702), SO AS TO OBSERVE THE PROGRESS AND QUALITY OF THE CONTRACTOR'S WORK AND TO DETERMINE IF THE WORK IS PROCEEDING IN GENERAL ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
- REINFORCING STEEL: ASTM A615, 60KSI YIELD GRADE, DEFORMED BILLET STEEL BARS, UNFINISHED
- PLACE, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. DO NOT DEVIATE FROM REQUIRED POSITION.
- AGGREGATE BASE MATERIAL: TO BE CRUSHED GRAVEL MEETING THE FOLLOWING GRADATION AND COMPACTED TO 95% MAXIMUM DRY DENSITY OF MODIFIED PROCTOR.

SIEVE SIZE	TOTAL PERCENT PASSING
2 INCH	100
1 INCH	70 TO 100
3/4 INCH	50 TO 90
NO. 4	30 TO 60
NO. 30	9 TO 33
NO. 200	0 TO 15

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		GWE	MSL	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ CARBON SUBSTRATE STORAGE TANK FOUNDATION

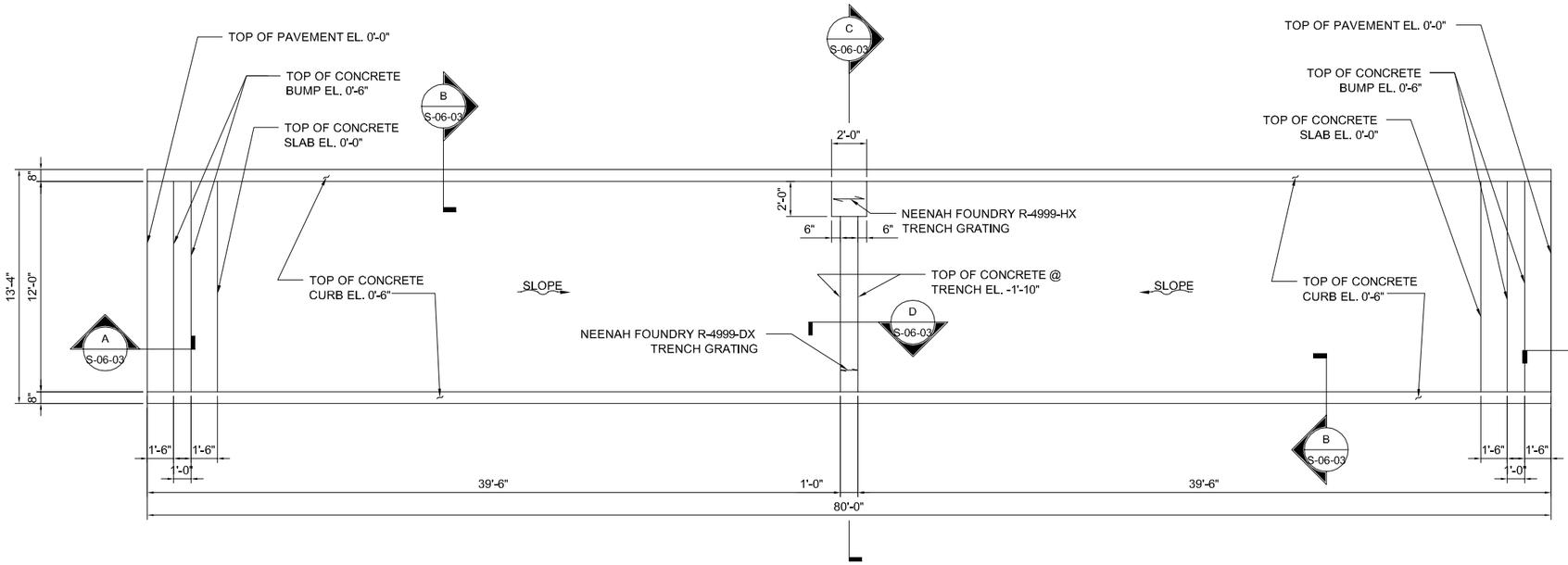
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-06-01	REV

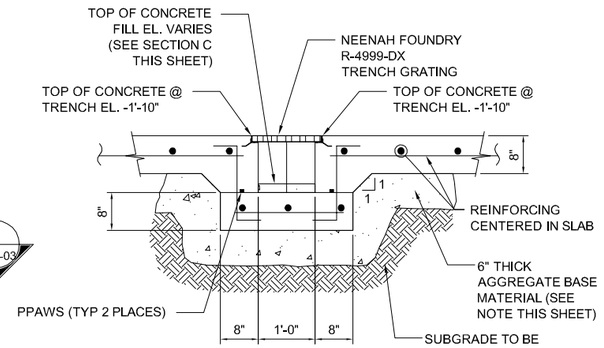
N180B



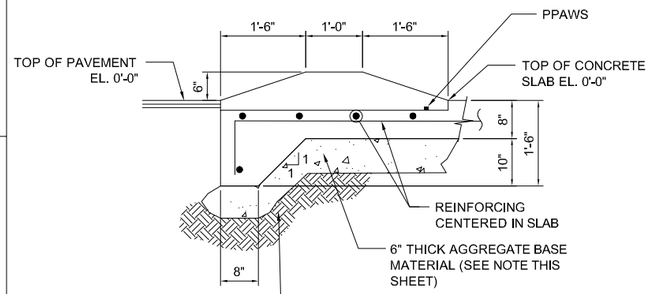
* TO BE VERIFIED BY CONTRACTOR FOR APPROVED MANUFACTURER'S STORAGE TANK SHOP DRAWINGS

IRZ UNLOADING PAD

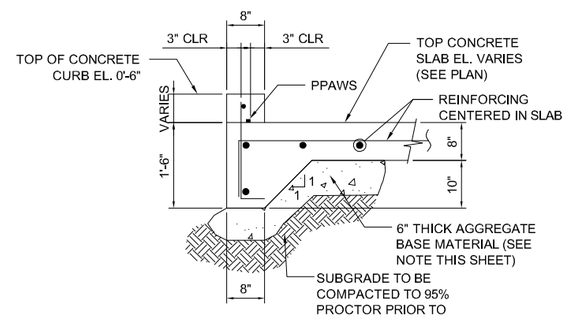
1/4" = 1'-0"



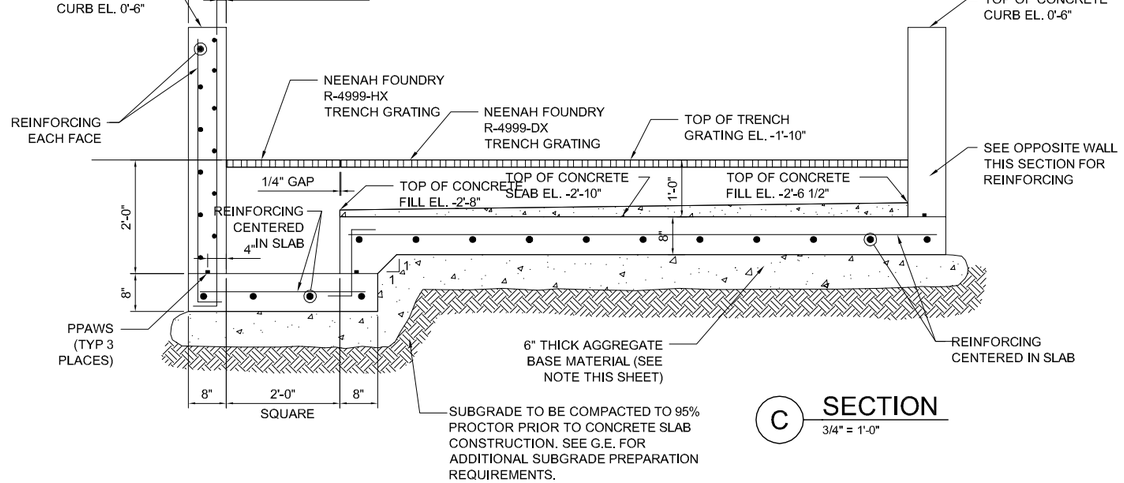
D SECTION
3/4" = 1'-0"



A SECTION
3/4" = 1'-0"



B SECTION
3/4" = 1'-0"



C SECTION
3/4" = 1'-0"

FOUNDATION NOTES:

- REFER TO THE GENERAL NOTES AND STRUCTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- STRUCTURAL OBSERVATIONS OF CONSTRUCTION ARE RECOMMENDED (PER CBC SECTION 1702), SO AS TO OBSERVE THIS PROGRESS AND QUALITY OF THE CONTRACTOR'S WORK AND TO DETERMINE IF THE WORK IS PROCEEDING IN GENERAL ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
- PPAWS: PREFORMED ADHESIVE WATERSTOP EXTRUDED ROPE FORM (CONSISTING OF N.B.R. COMPOUND WITH POLY PROPYLENE RESINS AND OTHER SOLVENT RESISTANT ELASTOMERS) BETWEEN TWO PROTECTIVE SILICONE TREATED PAPER 7/8" x 1 1/8" CROSS SECTION, 1 INCH LAP SPLICE, FURNISH AND USE WITH SF311 PAPER.
- REINFORCING STEEL: ASTM A615, 60KSI YIELD GRADE, DEFORMED BILLET STEEL BARS, UNFINISHED
- PLACE, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. DO NOT DEVIATE FROM REQUIRED POSITION.
- AGGREGATE BASE MATERIAL: TO BE CRUSHED GRAVEL MEETING THE FOLLOWING GRADATION AND COMPACTED TO 95% MAXIMUM DRY DENSITY OF MODIFIED PROCTOR.

SIEVE SIZE	TOTAL PERCENT PASSING
2 INCH	100
1 INCH	70 TO 100
3/4 INCH	50 TO 90
NO. 4	30 TO 60
NO. 30	9 TO 33
NO. 200	0 TO 15

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

0 2' 4' 6' 8'
SCALE: 3/8"=1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN MSL
	DWN GWE
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ UNLOADING PAD

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-06-03	REV

N1808

SYMBOLS:

#	NUMBER
(#)	FIRE RESISTANCE RATING IN HOURS
●	FIRE EXTINGUISHER LOCATIONS
[E]	ILLUMINATED EXIT SIGN LOCATION
###	ROOM NUMBER
600-1A	DOOR NUMBER
E/S	EMERGENCY EYEWASH AND SHOWER
	BRICK MASONRY
	CONCRETE MASONRY
	CONCRETE
	EXISTING BRICK MASONRY
	EXISTING CONCRETE MASONRY
	EXISTING CONCRETE
	GROUT
	STEEL
	EARTH
	RIGID INSULATION
	GRATING

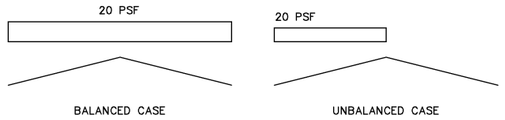
BUILDING CODE NOTES:

ITEM	REMARKS
DESIGN CODES	2010 CALIFORNIA BUILDING CODE, 2009 INTERNATIONAL BUILDING CODE 2005 ASCE-7
BUILDING OCCUPANCY CLASSIFICATION	GROUP F-2
TYPE OF CONSTRUCTION	II-B
BUILDING AREA	1300 SF
BUILDING HEIGHT	1 STORY
FIRE SUPPRESSION SYSTEM	NONE

A. GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS.
2. ALL FOUNDATIONS AND SLABS SHALL BEAR ON A 6 INCH MINIMUM THICKNESS OF COMPACT GRANULAR FILL. ASSUMED ALLOWABLE SOIL BEARING CAPACITY – 4,000 POUNDS PER SQUARE FOOT.
3. ANCHOR BOLTS SHALL BE ASTM F1554 GRADE 36 THREADED RODS WITH HEAVY HEX NUTS AND WASHERS.
4. NON-SHRINK GROUT SHALL BE NS GROUT BY EUCLID CHEMICAL COMPANY, OR EQUAL.
5. LIVE LOADING:
   GRADE SLAB – 500 PSF.
6. METAL BUILDING DESIGN CRITERIA:
   THE METAL BUILDING MANUFACTURER SHALL DESIGN THE BUILDING FOR THE FOLLOWING LOADS, BASED ON THE CALIFORNIA BUILDING CODE AND ASCE-7:

   ROOF COLLATERAL LOAD – 5 PSF.



ROOF LIVE LOADING

WIND LOADING:
BASIC WIND SPEED (3 SECOND GUST) V=90 MPH.
WIND IMPORTANCE FACTOR – Iw = 1.0.
CATEGORY II.
WIND EXPOSURE C.
ENCLOSURE – PARTIALLY ENCLOSED.
INTERNAL PRESSURE COEFFICIENT – ±0.55.
ALL COMPONENTS AND CLADDING SHALL BE DESIGNED FOR THE CONDITIONS OF INTERNAL AND EXTERNAL PRESSURES.

SEISMIC CRITERIA:
SEISMIC IMPORTANCE FACTOR – Ie=1.0.
USE GROUP – II.
DESIGN CATEGORY – D.
SITE CLASS – D.
MAPPED SPECTRAL RESPONSE ACCELERATIONS – Ss=0.434, S1=0.135.
SPECTRAL RESPONSE COEFFICIENTS – Sds=0.420, Sd1=0.203.
SEISMIC FORCE RESISTING SYSTEMS:
NORTH-SOUTH DIRECTION: ORDINARY STEEL MOMENT FRAMES
Cs=12%, R=3.5, BASE SHEAR: V=2.9 KIPS.
EAST-WEST DIRECTION: ORDINARY STEEL CONCENTRICALLY BRACED FRAMES
Cs=1.3%, R=3.25, BASE SHEAR: V=3.1 KIPS.
ANALYSIS PROCEDURE – EQUIVALENT LATERAL FORCE.

FOUNDATIONS:
THE BUILDING FOUNDATIONS HAVE BEEN DESIGNED FOR THE FOLLOWING MAXIMUM SERVICE LOAD REACTIONS. THE METAL BUILDING MANUFACTURER SHALL PROPORTION THE BUILDING SUCH THAT THE ACTUAL REACTIONS DO NOT EXCEED THOSE LISTED. IF THE FINAL REACTIONS EXCEED THOSE LISTED, THE CONTRACTOR SHALL BEAR THE COST OF RE-DESIGNING THE FOUNDATIONS TO THE SATISFACTION OF THE ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.

8.3 KIPS DOWNWARD
2.3 KIPS EAST-WEST SHEAR
2.1 KIPS NORTH-SOUTH SHEAR
5.1 KIPS NET UPLIFT

B. CONCRETE NOTES:

1. DETAILS, WORKMANSHIP, AND GENERAL PROCEDURE SHALL CONFORM TO ACI 318, ACI 315, ACI 301, ACI SP66 DETAILING MANUAL, AND CRSI MANUAL OF STANDARD PRACTICE, UNLESS OTHERWISE NOTED.
2. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS – 5,000 PSI.
3. BAR REINFORCING – ASTM A615 GRADE 60.
4. WELDED WIRE FABRIC REINFORCING – ASTM A185.
5. ALL LAP SPLICES SHALL BE CLASS B OR AS SHOWN.
6. CONCRETE COVER OVER REINFORCING:
   3" FOR CONCRETE CAST AGAINST EARTH.
   2" OTHERWISE.
   SLABS ON GRADE – AS SHOWN.
7. FLOOR SLAB SHALL RECEIVE A CHEMICAL HARDENER.
8. ELASTOMERIC SEALANT FOR JOINTS SHALL BE SIKAFLEX -2C SL OR EQUAL.

C. MASONRY NOTES:

1. DETAILS, WORKMANSHIP, AND GENERAL PROCEDURE SHALL CONFORM TO ACI 530 AND ACI 530.1 UNLESS OTHERWISE NOTED.
2. MINIMUM COMPRESSIVE STRENGTH OF MASONRY f'm – 1,500 PSI.
3. MINIMUM COMPRESSIVE STRENGTH OF MASONRY GROUT – 3,000 PSI.
4. CONCRETE MASONRY BLOCK UNITS – ASTM C90, 1,900 PSI MINIMUM COMPRESSIVE STRENGTH.
5. MORTAR – TYPE M, MINIMUM COMPRESSIVE STRENGTH 2,500. PSI.
6. BAR REINFORCING – ASTM A615 GRADE 60.
7. LAP SPLICES – 24 INCHES FOR #4 BARS.
8. PROVIDE ALL MASONRY BOND BEAMS WITH (2) CONTINUOUS #5 BARS. BOND BEAM REINFORCING SHALL BE CONTINUOUS AT WALL CORNERS AND INTERSECTIONS.
9. PROVIDE #4@48" TYPICAL VERTICAL REINFORCING IN GROUTED CORES FOR ALL WALLS UNLESS NOTED OTHERWISE.
10. MASONRY CORES CONTAINING REINFORCING STEEL OR BOLTS, INCLUDING BOND BEAMS AND LINTELS, SHALL BE GROUTED SOLID.
11. LAP ALL VERTICAL REINFORCING WITH DOWELS INTO CONCRETE FOUNDATION WALL.
12. PROVIDE (1) #4 BAR VERTICALLY IN EACH OF THE FIRST TWO CORES ON BOTH SIDES OF ALL MASONRY WALL OPENINGS, CONTROL JOINTS AND AT ALL CORNERS.
13. ALL VERTICAL MASONRY REINFORCING SHALL BE CONTINUOUS FROM TOP OF FOUNDATION TO TOP OF WALL.
14. WHERE VERTICAL MASONRY REINFORCING IS REQUIRED TO PASS THRU MASONRY OR STEEL LINTELS, THE LINTELS SHALL BE FABRICATED WITH OVERSIZE HOLES TO ALLOW THE PASSAGE OF REINFORCING. HOLES SHALL BE GROUTED SOLID AFTER PLACING THE REINFORCING.
15. HORIZONTAL JOINT REINFORCEMENT SHALL CONSIST OF 2 – 9 GAGE WIRES (W1.7) SPACED 16" O.C. TYPICAL, AT THE TOP AND BOTTOM OF ALL WALL OPENINGS AND EXTEND A MINIMUM OF 24" PAST THE OPENING.

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT
BUILDING GENERAL NOTES (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-06-04	REV

4/3/2013 8:18:42 AM
G:\Projects\RC000753.0008\Struct\Pre-Engineered Building\MCNTopok Bench Building Stactural 3-27-13.rvt

PRE-ENGINEERED BUILDING

1.1 DESIGN REQUIREMENTS
- A. APPLICABLE BUILDING CODE: INTERNATIONAL BUILDING CODE 2009, SEE DESIGN INFORMATION TABLE ON SHEET S-3 FOR LOAD VALUES.
- B. DESIGN WALL AND ROOF PANEL SYSTEM TO WITHSTAND SPECIFIED LOADS WITH DEFLECTION OF 1/240TH OF SPAN, MAXIMUM.
- C. ANCHOR RODS: FURNISH DESIGN CRITERIA FOR ANCHOR BOLTS FURNISHED BY OTHERS, TO RESIST THE LOADS INDUCED BY THE DESIGN LOADS ON THE STRUCTURE.

1.2 SUBMITTALS
- A. DESIGN DATA: PROVIDE DETAILED DESIGN CRITERIA AND CALCULATIONS.
- B. CERTIFICATION: MANUFACTURER CERTIFICATION THAT THE BUILDING CONFORMS TO THE CONTRACT DOCUMENTS AND MANUFACTURER'S STANDARD DESIGN PROCEDURES.
- C. SHOP DRAWINGS: SHOW BUILDING LAYOUT, PRIMARY AND SECONDARY FRAMING MEMBER SIZES AND LOCATIONS, CROSS-SECTIONS, AND PRODUCT AND CONNECTION DETAILS.
- D. PRODUCT DATA: INFORMATION ON MANUFACTURED PRODUCTS TO BE INCORPORATED INTO THE PROJECT.
- E. COLOR CHARTS: FOR SELECTION OF COLORS.
- F. ANCHOR ROD INSTALLATION DRAWINGS: LAYOUTS WITH BOLT DIAMETERS.
- G. REACTIONS: SUBMIT REACTIONS FOR DESIGN OF FOUNDATION.
- H. SPECIMEN WARRANTY.

1.3 QUALITY ASSURANCE
- A. DESIGN STRUCTURAL COMPONENTS, DEVELOP SHOP DRAWINGS, AND PERFORM SHOP AND SITE WORK UNDER DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER EXPERIENCED IN DESIGN OF THIS WORK AND LICENSED IN THE STATE OF CALIFORNIA.

- B. DESIGN DATA AND SHOP DRAWINGS SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CALIFORNIA.
- C. QUALIFICATIONS:
  1. MANUFACTURER: COMPANY SPECIALIZING IN MANUFACTURING PRODUCTS SPECIFIED IN THIS SECTION WITH MINIMUM 5 YEARS DOCUMENTED EXPERIENCE.
  2. ERECTOR: COMPANY SPECIALIZING IN PERFORMING WORK OF THIS SECTION WITH MINIMUM 5 YEARS DOCUMENTED EXPERIENCE AND APPROVED BY MANUFACTURER.

1.4 WARRANTY
- A. PROVIDE MANUFACTURER'S STANDARD WARRANTY FOR:
  1. PANEL FINISH: 20 YEARS.
  2. WEATHER-TIGHTNESS: 20 YEARS

PART 2 PRODUCTS

2.1 MANUFACTURERS
- A. METALLIC BUILDING COMPANY.
- B. OR AS APPROVED.

2.2 METAL MATERIALS
- A. STRUCTURAL STEEL PLATE, BAR, SHEET, AND STRIP FOR USE IN BOLTED AND WELDED CONSTRUCTIONS: ASTM A572, A570, A529, OR A36, WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.
- B. STRUCTURAL STEEL MATERIAL FOR USE IN ROLL FORMED OR PRESS BROKEN SECONDARY STRUCTURAL MEMBERS: ASTM A570, OR A607 WITH MINIMUM YIELD STRENGTH OF 55,000 PSI.
- C. GALVANIZED STEEL SHEET FOR ROLL-FORMED OR PRESS BROKEN ROOF AND WALL COVERINGS, TRIM AND FLASHING: ASTM A653, WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.
- D. HOT-ROLLED STEEL SHAPES: W, M AND S SHAPES, ANGLES, RODS, CHANNELS AND OTHER SHAPES; ASTM A992 OR ASTM A36 AS APPLICABLE; WITH MINIMUM YIELD STRENGTHS REQUIRED FOR THE DESIGN.
- E. STRUCTURAL BOLTS AND NUTS USED WITH PRIMARY FRAMING: HIGH STRENGTH, ASTM A325.
- F. BOLTS AND NUTS USED WITH SECONDARY FRAMING MEMBERS: ASTM A307.

2.3 FRAMING COMPONENTS
- A. PRIMARY FRAMING: RIGID FRAME SOLID WEB FRAMING CONSISTING OF TAPERED OR UNIFORM DEPTH RAFTERS RIGIDLY CONNECTED TO TAPERED OR UNIFORM DEPTH COLUMNS. PROVIDE A CLEAR SPAN THAT SUPPORTS THE LOADS AT BAY SPACINGS INDICATED.
- B. ENDWALL FRAMING: PORTAL FRAME AND X-BRACED FRAMING, SEE DRAWINGS FOR LOCATIONS.
- C. PURLINS: Z-SHAPED; DEPTH AS REQUIRED; WITH MINIMUM YIELD STRENGTH OF 55,000 PSI; SIMPLE SPAN OR CONTINUOUS SPAN AS REQUIRED FOR DESIGN.
- D. GIRTS: Z- OR C-SHAPED; DEPTH AS REQUIRED, WITH MINIMUM YIELD STRENGTH OF 55,000 PSI; SIMPLE SPAN OR CONTINUOUS SPAN AS REQUIRED FOR DESIGN.
- E. WIND BRACING: PORTAL, TORSIONAL, DIAGONAL BRACING OR DIAPHRAGM IN ACCORDANCE WITH MANUFACTURER'S STANDARD DESIGN PRACTICES; UTILIZING RODS, ANGLES, AND OTHER MEMBERS, WITH MINIMUM YIELD STRENGTHS AS REQUIRED FOR DESIGN.
- F. PRIMARY FRAME FLANGE BRACING: ATTACHED FROM PURLINS OR GIRTS TO THE PRIMARY FRAMING, MINIMUM YIELD STRENGTH AS REQUIRED FOR DESIGN.
- G. BASE ANGLES: 2 INCH BY 3 INCH BY 0.059 INCH STEEL ANGLES, WITH MINIMUM YIELD STRENGTH OF 55,000 PSI.
- H. DOOR HEADERS AND JAMBS: Z- OR C-SHAPED; DEPTH AS REQUIRED; WITH MINIMUM YIELD STRENGTH OF 55,000 PSI.
- I. SAG ANGLES AND BRIDGING: STEEL ANGLES WITH MINIMUM YIELD STRENGTH OF 36,000 PSI.
- J. FABRICATION: FABRICATE ACCORDING TO MANUFACTURER'S STANDARD PRACTICE.
  1. FABRICATE STRUCTURAL MEMBERS MADE OF WELDED PLATE SECTIONS BY JOINTING THE FLANGES AND WEBS BY CONTINUOUS AUTOMATIC SUBMERGED ARC WELDING PROCESS.
  2. ALL WELDING OPERATORS AND PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE, AWS D1.1.
  3. FIELD CONNECTIONS. PREPARE MEMBERS FOR BOLTED FIELD CONNECTIONS BY MAKING PUNCHED, DRILLED, OR REAMED HOLES IN THE SHOP.
- K. SHOP COATING: FINISH ALL STRUCTURAL STEEL MEMBERS USING ONE COAT OF MANUFACTURER'S STANDARD SHOP COAT, AFTER CLEANING OF OIL, DIRT, LOOSE SCALE AND FOREIGN MATTER.

2.4 ROOF AND WALL PANEL COMPONENTS
- A. ROOF PANELS: 36 INCH WIDE NET COVERAGE WITH 1-1/4 INCH HIGH MAJOR RIBS AT 12 INCHES ON CENTER WITH MINOR RIBS SPACED BETWEEN THE MAJOR RIBS.
  1. MATERIAL: GALVANIZED STEEL WITH G90 COATING.
  2. THICKNESS: 26 GAGE.
  3. SIDE LAPS: AT LEAST ONE FULL MAJOR RIB, WITH A SUPPORTING MEMBER BEARING EDGE ON THE LOWER PANEL AND AN ANTI-CAPILLARY GROOVE ON THE UPPER PANEL.
  4. LENGTH: CONTINUOUS FROM EAVE TO RIDGE.
  5. ENDLAPS WHERE REQUIRED: 6 INCHES WIDE, LOCATED AT A SUPPORT MEMBER.
  6. FINISH: KYNAR 500 PRE-PAINTED FINISH ON EXTERIOR SURFACE, WASH COAT ON INTERIOR SURFACE. COLOR SELECTED BY OWNER FROM MANUFACTURER'S FULL LINE.
  7. THE ROOF SHALL BE TESTED AND CERTIFIED TO MEET UNDERWRITERS LABORATORIES, INC., UPLIFT RATING: UL 90.
- B. WALL PANELS: 36 INCH WIDE NET COVERAGE WITH 1-1/4 INCH HIGH MAJOR RIBS AT 12 INCHES ON CENTER WITH MINOR RIBS SPACED BETWEEN THE MAJOR RIBS.
  1. MATERIAL: GALVANIZED STEEL WITH G90 COATING.
  2. THICKNESS: 26 GAGE.
  3. SIDE LAPS: TWO FULLY OVERLAPPING MAJOR RIBS SECURED TOGETHER WITH 1/4 INCH DIAMETER COLOR-MATCHED CARBON STEEL FASTENERS.
  4. LENGTH: CONTINUOUS FROM SILL TO EAVE.
  5. ENDLAPS WHERE REQUIRED: 4 INCHES WIDE, LOCATED AT A SUPPORT MEMBER.
  6. CRIMP PANELS AT THE BASE AND NOTCH TO MAKE ROOF PANEL CONFIGURATION AT THE EAVE.
  7. CUT PANELS SQUARE AT EACH END; PROVIDE BASE TRIM AT SILL.
  8. FINISH: KYNAR 500 PRE-PAINTED FINISH ON EXTERIOR SURFACE, WASH COAT ON INTERIOR SURFACE. COLOR SELECTED BY OWNER FROM MANUFACTURER'S FULL LINE.
- C. PANEL FASTENERS:
  1. FOR ROOF PANELS: STAINLESS STEEL-CAPPED CARBON STEEL FASTENERS WITH INTEGRAL SEALING WASHER.
  2. FOR WALL PANELS: COATED CARBON STEEL.
  3. COLOR OF EXPOSED FASTENER HEADS TO MATCH THE WALL PANEL FINISH.
  4. CONCEALED FASTENERS: SELF-DRILLING TYPE, OF SIZE AS REQUIRED.
  5. PROVIDE FASTENERS IN QUANTITIES AND LOCATION AS REQUIRED BY THE MANUFACTURER.

PRE-ENGINEERED BUILDING (CONT.)

- D. FLASHING AND TRIM: MATCH MATERIAL AND COLOR OF ADJACENT COMPONENTS. PROVIDE TRIM AT RAKES, INCLUDING PEAK AND CORNER ASSEMBLIES, HIGH AND LOW EAVES, CORNERS, BASES, FRAMED OPENINGS AND AS REQUIRED OR SPECIFIED TO PROVIDE WEATHER-TIGHTNESS AND A FINISHED APPEARANCE.
- E. PLASTIC PARTS: GLASS FIBER-REINFORCED RESIN OR THERMO-FORMED ABS.
  1. ABS: MINIMUM 1/8 INCH THICK.
  2. COLOR: MANUFACTURER'S STANDARD COLOR.
- F. SEALANTS, MASTICS AND CLOSURES: MANUFACTURER'S STANDARD TYPE.
  1. PROVIDE AT ROOF PANEL ENDLAPS, SIDELAPS, RAKE, EAVE, TRANSITIONS AND ACCESSORIES AS REQUIRED TO PROVIDE A WEATHER-RESISTANT ROOF SYSTEM; USE TAPE MASTIC OR GUNNABLE SEALANT AT SIDELAPS AND ENDLAPS.
  2. PROVIDE AT WALL PANEL RAKES, EAVES, TRANSITIONS AND ACCESSORIES.
  3. CLOSURES: FORMED TO MATCH PANEL PROFILES; CLOSED CELL ELASTIC MATERIAL, MANUFACTURER'S STANDARD COLOR.
  4. TAPE MASTIC: PRE-FORMED BUTYL RUBBER-BASED, NON-HARDENING, NON-CORROSIVE TO METAL; WHITE OR LIGHT GRAY.
  5. GUNNABLE SEALANT: NON-SKINNING SYNTHETIC ELASTOMER BASED MATERIAL; GRAY OR BRONZE.
- G. BLANKET INSULATION: GLASS FIBER WITH FACTORY-LAMINATED FACING MATERIAL:
  1. GLASS FIBER: ODORLESS, NEUTRAL-COLORED, LONG FILAMENT, FLEXIBLE RESILIENT, PRODUCED IN COMPLIANCE WITH THE NAIMA 202 SPECIFICATIONS.
  2. THERMAL RESISTANCE: TO MEET R=19 AT 75 DEGREES F MEAN TEMPERATURE.
  3. FLAME SPREAD INDEX: 25 OR LESS, WHEN TESTED IN ACCORDANCE WITH UL 723.
  4. SMOKE DEVELOPED INDEX: 50 OR LESS, WHEN TESTED IN ACCORDANCE WITH UL 723.
  5. UL CLASSIFIED.
  6. FACING: WHITE VINYL SCRIM POLYESTER; 0.0025 INCH THICK PVC FILM, GLASS FIBER SCRIM REINFORCING, 0.0005 INCH THICK POLYESTER FILM; PERMEANCE 0.02 PERMS. COMPOSITE FIBERGLASS AND FACING TO MEET FLAME SPREAD OF 25 OR LESS, SMOKE DEVELOPED OF 50 OR LESS, WHEN TESTED IN ACCORDANCE WITH UL 723.
  7. PROVIDE FACING 3 INCHES WIDER ON BOTH EDGES THAN BLANKET.
  8. WIDTH: AS REQUIRED FOR INSTALLATION.
  9. USE BLANKET INSULATION AT ROOF AND WALLS.

2.5 WALL ACCESSORIES
- A. SERVICE DOORS.
- B. SECTIONAL OVERHEAD DOORS.
- C. PROVIDE FRAMED OPENINGS FOR LOUVERS.

2.6 ROOF ACCESSORIES
- A. EAVE GUTTERS: ROLL-FORMED 26 GAGE STEEL SHEET, WITH GUTTER STRAPS, FASTENERS AND JOINT SEALANT; SAME COLOR AS WALL PANELS.
  1. DOWNSPOUTS: 4 BY 5 INCHES IN 10 FOOT LENGTHS WITH DOWNSPOUT ELBOWS AND DOWNSPOUT STRAPS; SAME COLOR AS WALL PANELS.

2.7 DOORS
- A. OVERHEAD DOORS TO BE COILING TYPE, STEEL CONSTRUCTION, INSULATED. CURTAIN SLATS MIN 20 GA EXTERIOR AND 24 GA BACK COVER. LOCKING MECHANISM REQUIRED. PROVIDE COUNTERBALANCING MECHANISM WITH HELICAL TORSIONAL SPRINGS. PLACE HOOD EXTERIOR OF BUILDING.
- B. INTERIOR MANDOOR - 20 GA., HONEY COMB CORE, WITH 16 GA. FRAME AND LOCKS.
- C. EXTERIOR MANDOOR - 18 GA., INSULATED CORE, STANDARD KEYING, BALL BEARING HINGES, AND 16 GA. FRAME.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY

SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

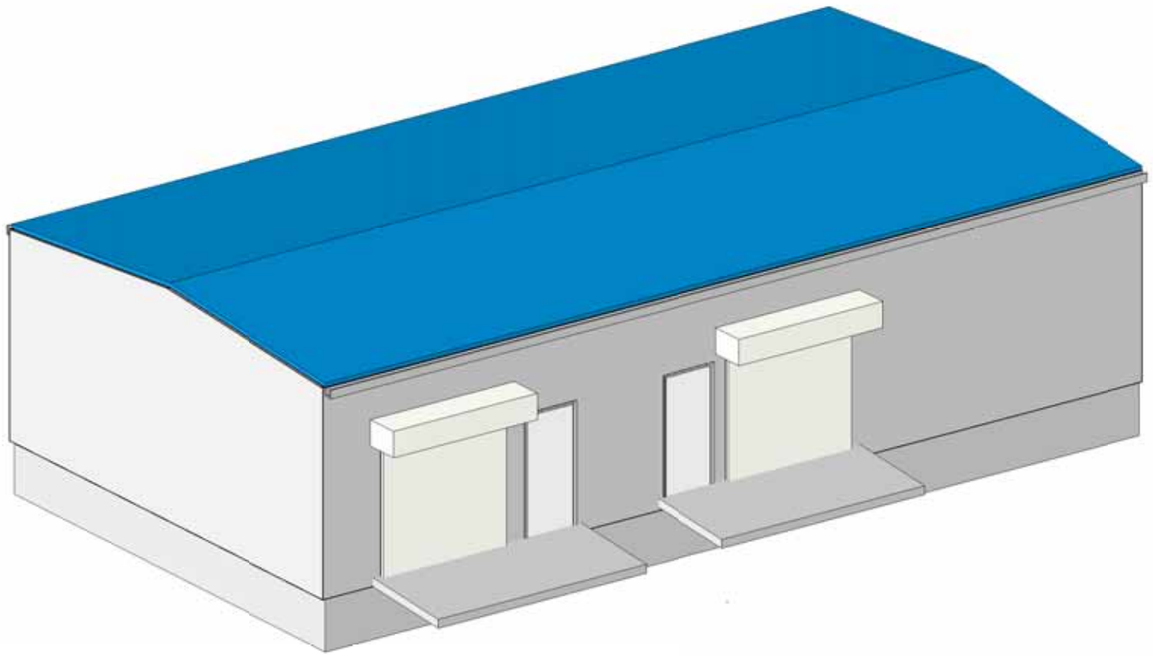
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING GENERAL NOTES (2 OF 2)

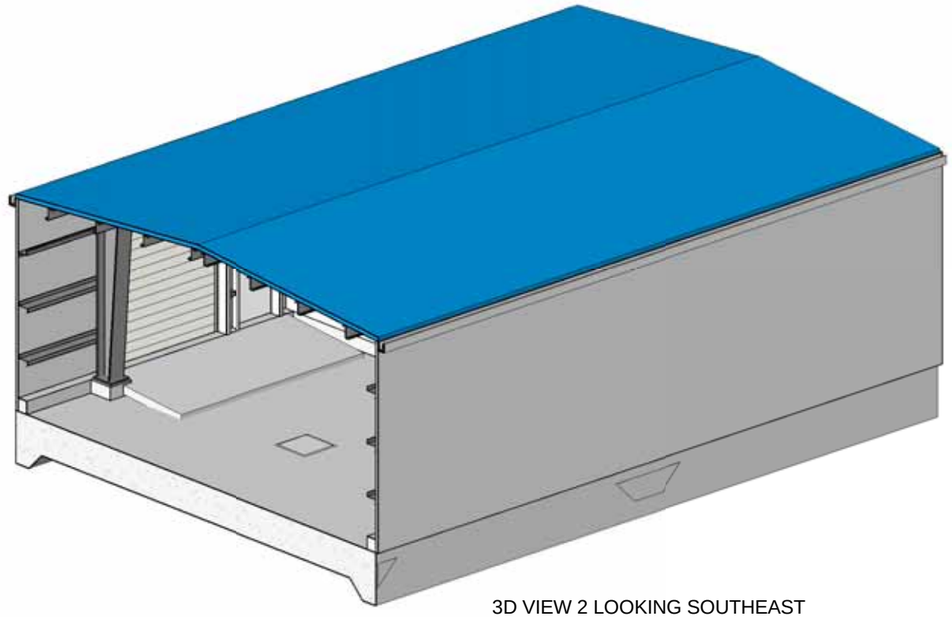
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-06-05	REV

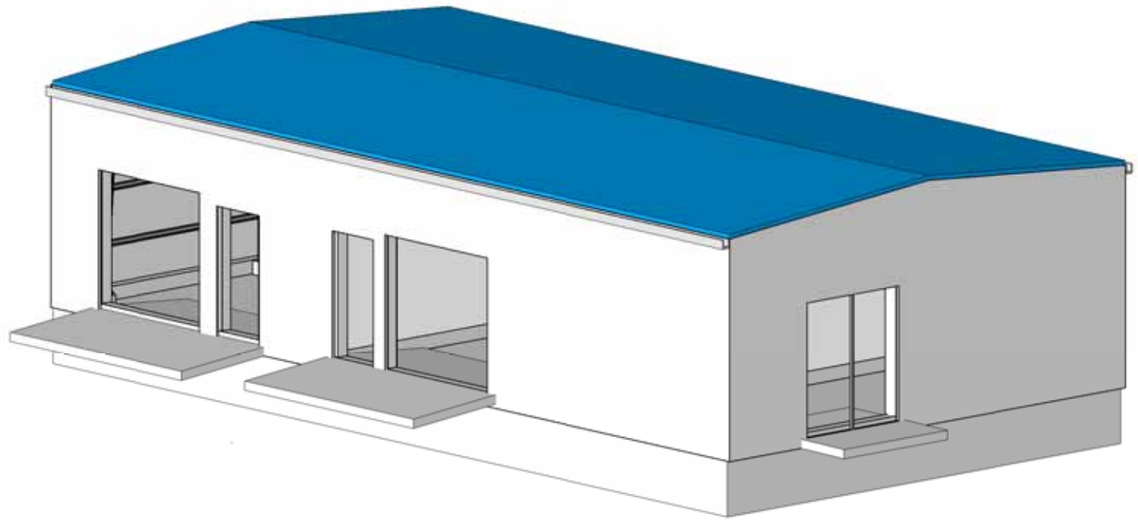
4/3/2013 8:18:43 AM
G:\Projects\RC000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.vvt



3D VIEW LOOKING SOUTHEAST



3D VIEW 2 LOOKING SOUTHEAST



3D VIEW LOOKING NORTHEAST

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY		
	SO	
	SUPV	MSL
	DSGN	PJD
	DWN	JMO
	CHKD	PJD
	OK	LT
	DATE	04/05/13
	SCALES	NONE or AS SHOWN

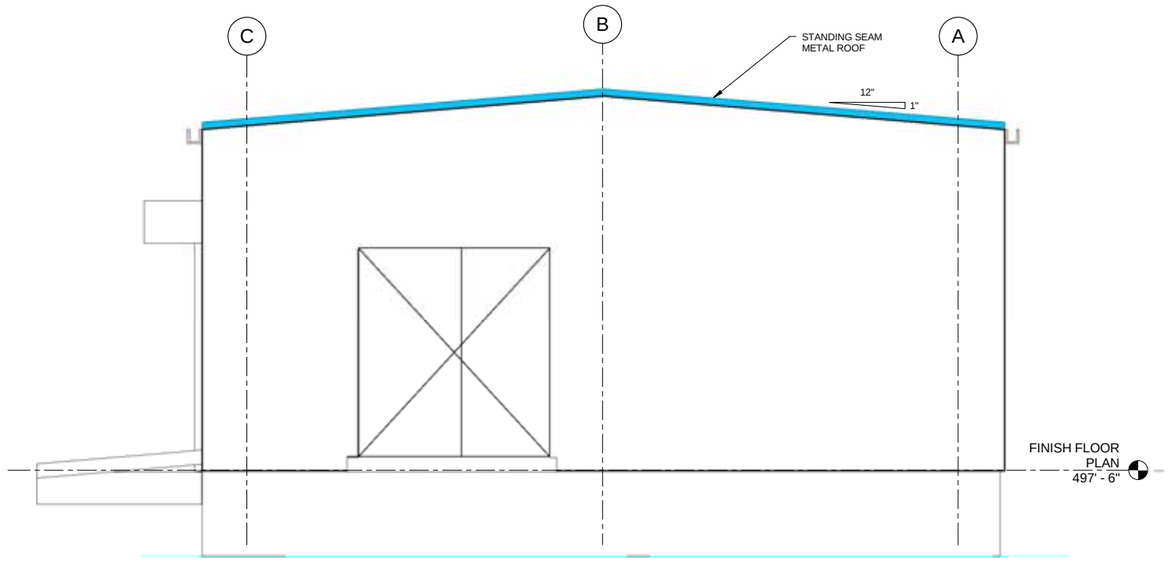
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING AXONOMETRIC VIEWS

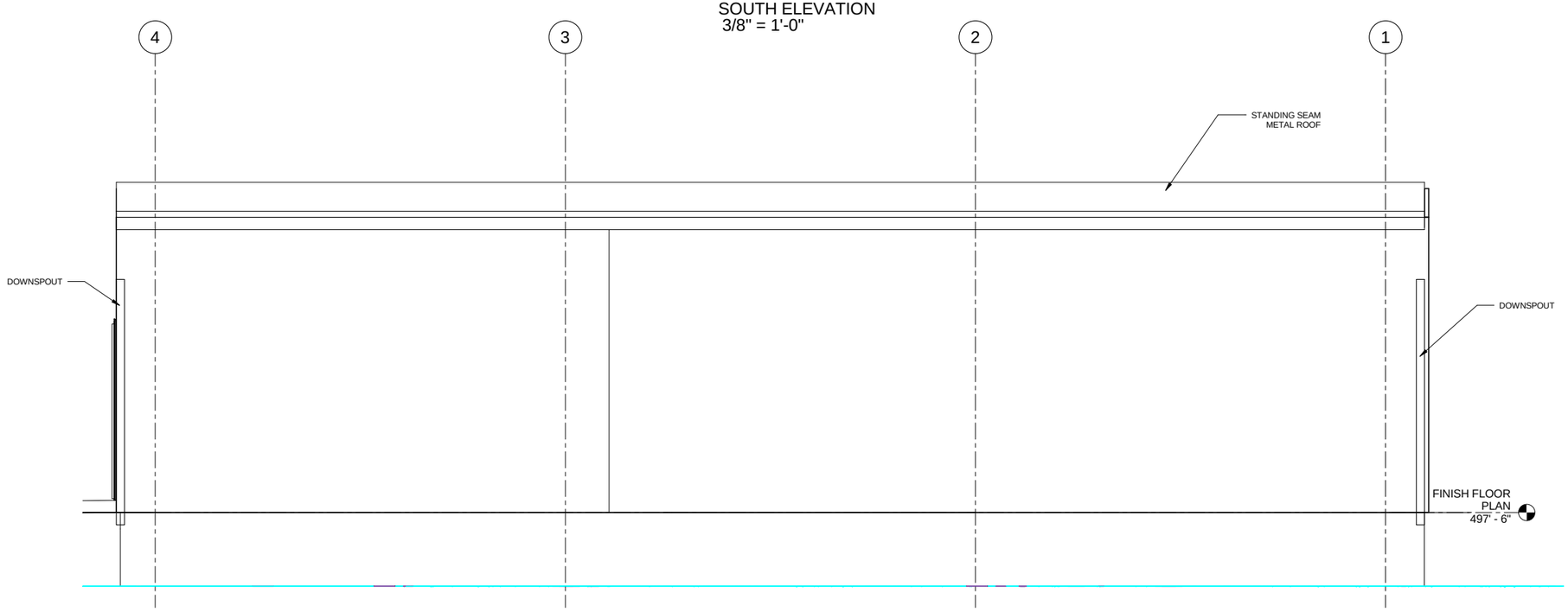
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

4/3/2013 8:18:45 AM
G:\Projects\RC-000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.rvt



SOUTH ELEVATION
3/8" = 1'-0"



EAST ELEVATION
3/8" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

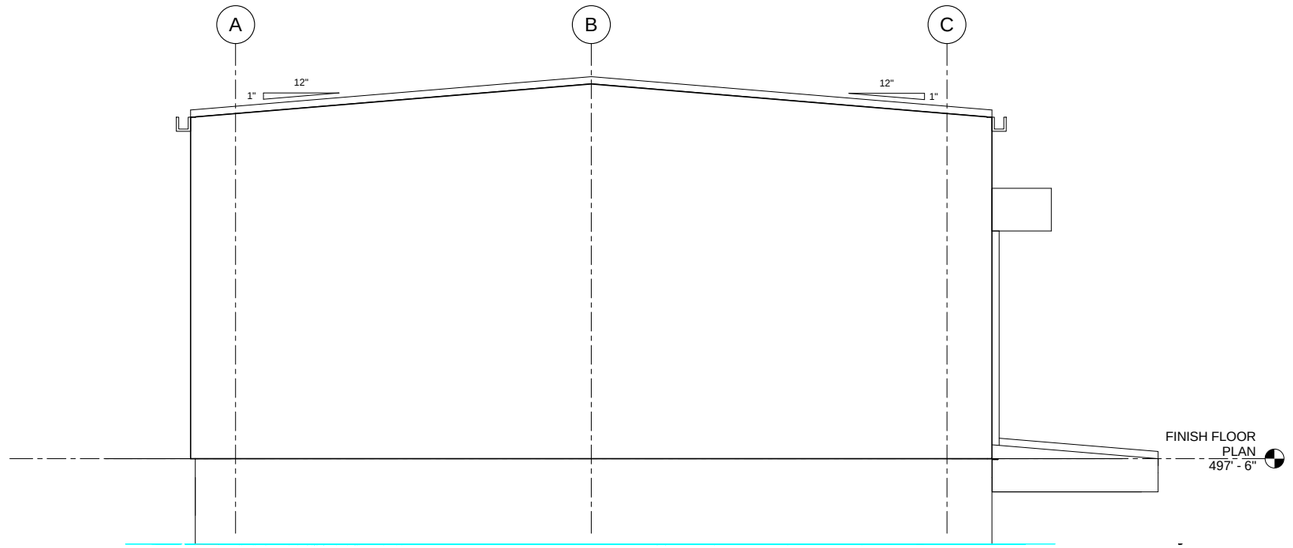
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING ELEVATIONS (1 OF 2)

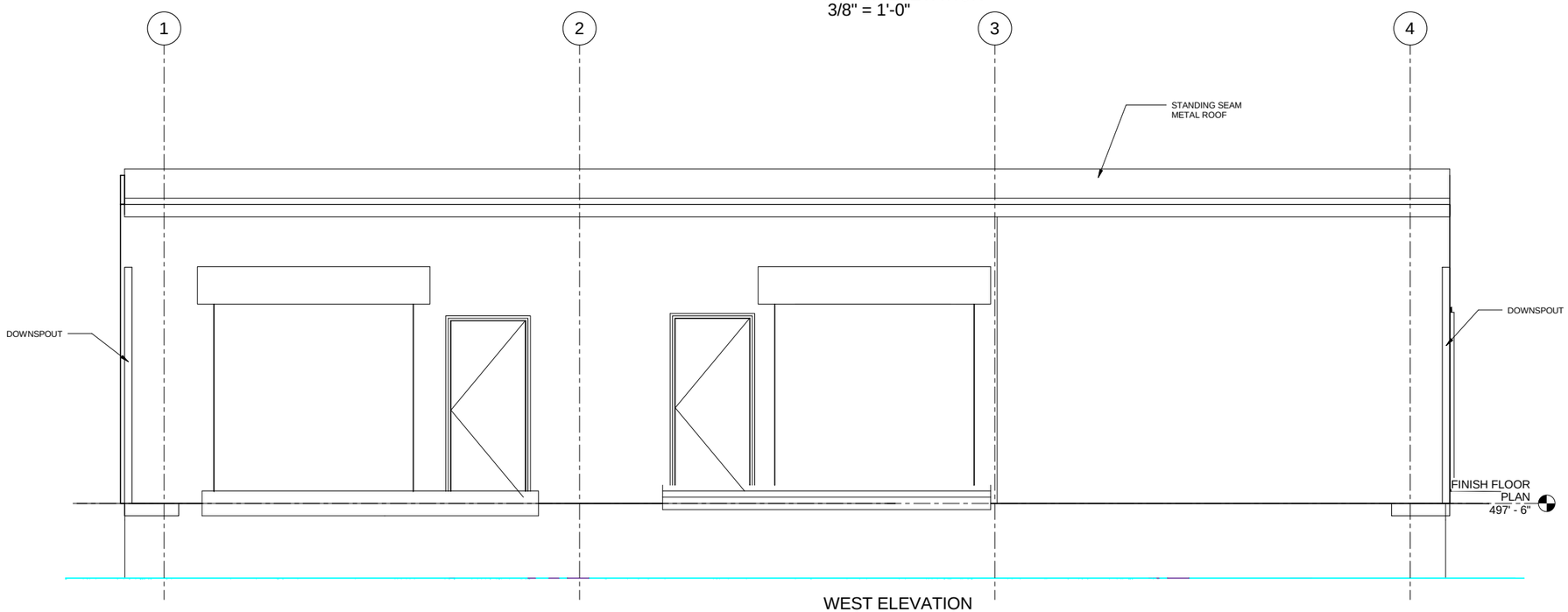
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-06-07	REV

4/2/2013 8:18:56 AM
G:\Projects\RC000753.0000\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.rvt



NORTH ELEVATION
3/8" = 1'-0"



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

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

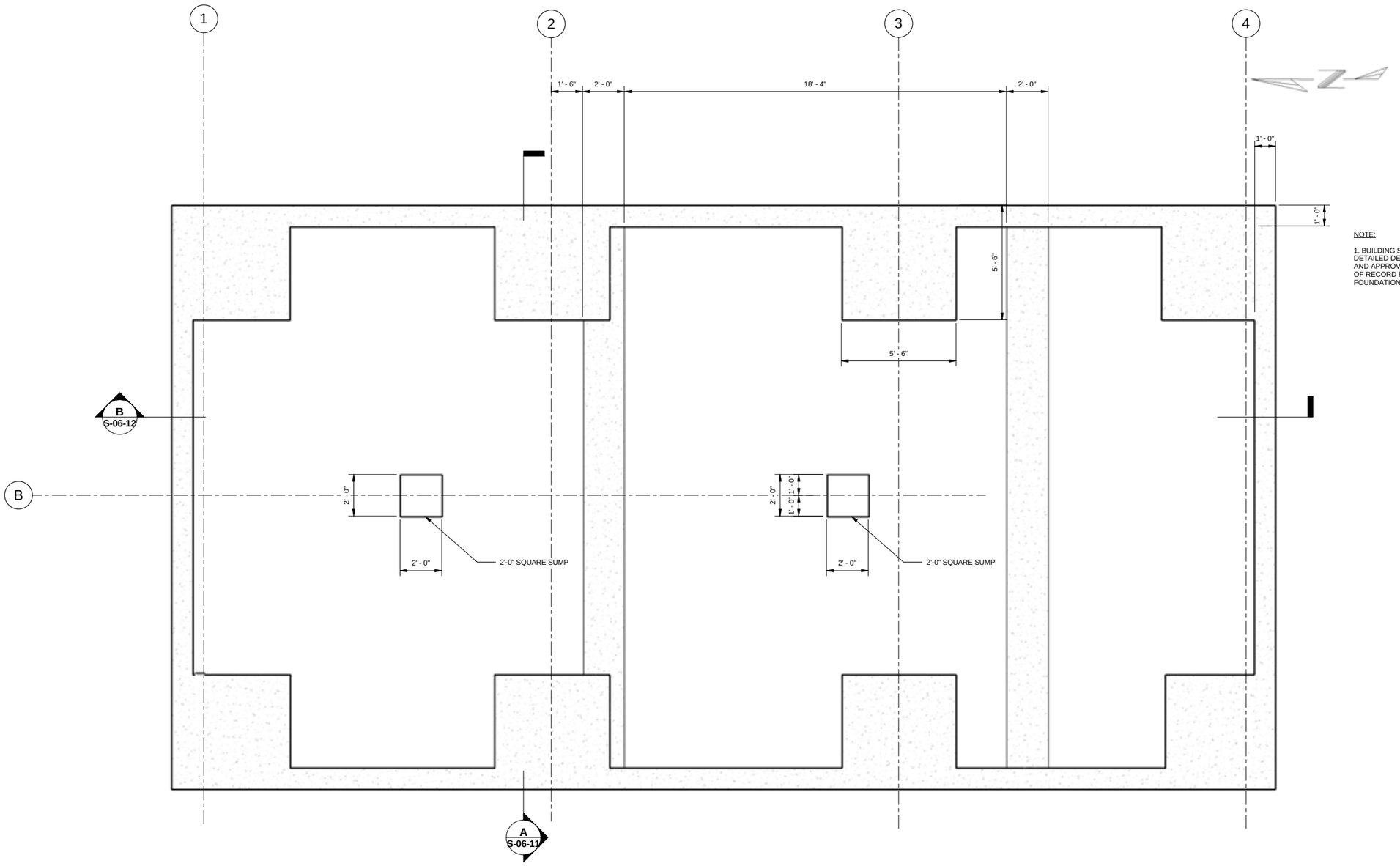
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING ELEVATIONS (2 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-06-08	REV

4/2/2013 8:19:04 AM
G:\Projects\RC000753.0000\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.rvt



NOTE:

1. BUILDING SHOP DRAWINGS AND DETAILED DESIGN IS TO BE COMPLETED AND APPROVED BY THE ENGINEER OF RECORD PRIOR TO PLACEMENT OF FOUNDATION CONCRETE.

FOUNDATION PLAN
3/8" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

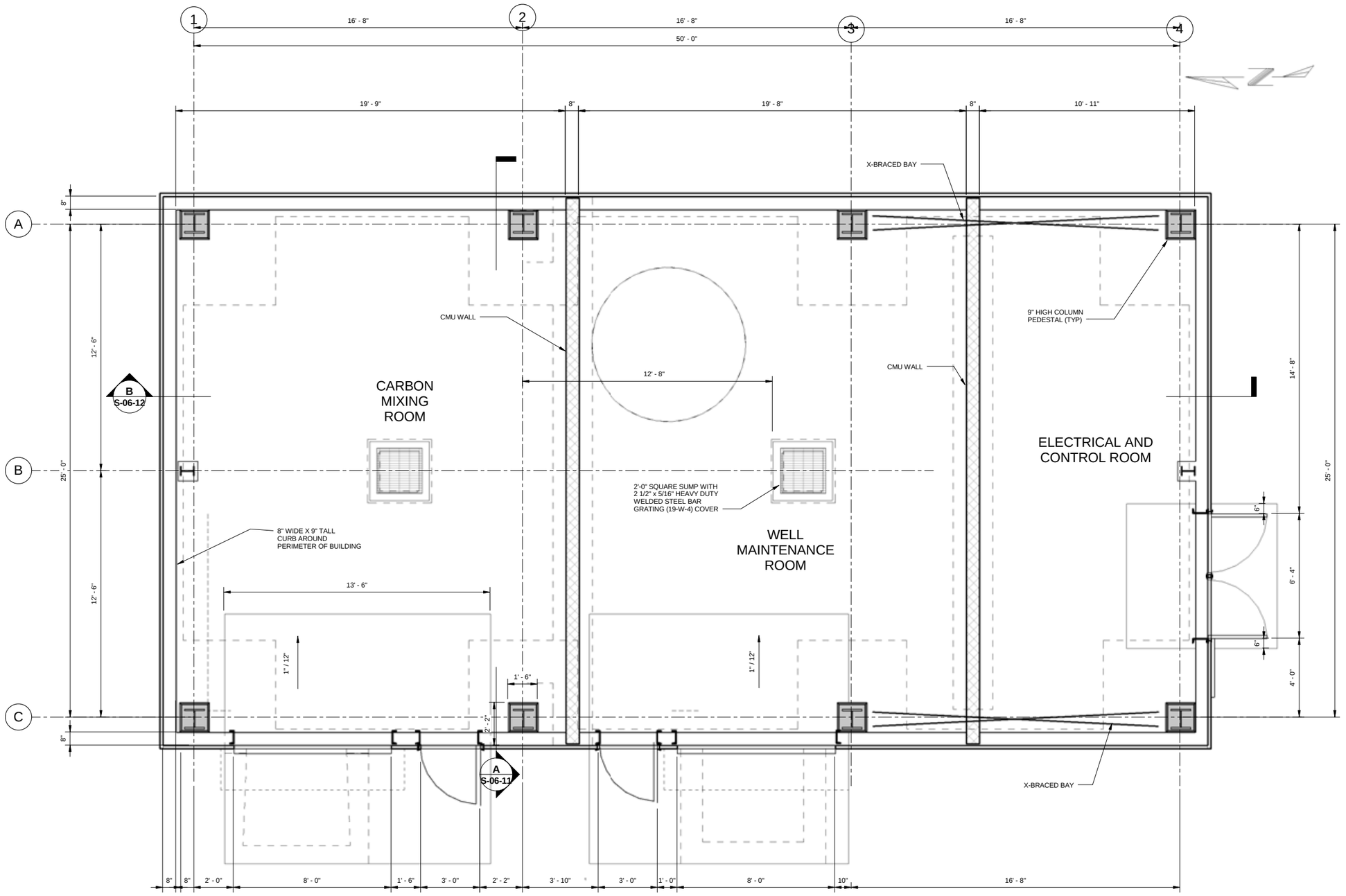
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT
BUILDING 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-06-09	REV

4/3/2013 8:19:05 AM
G:\Projects\RC000753.0008\Struct\Pkt-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.vrt



FINISH FLOOR PLAN
3/8" = 1'-0"

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	JMO	PJD	MSL	LT	

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

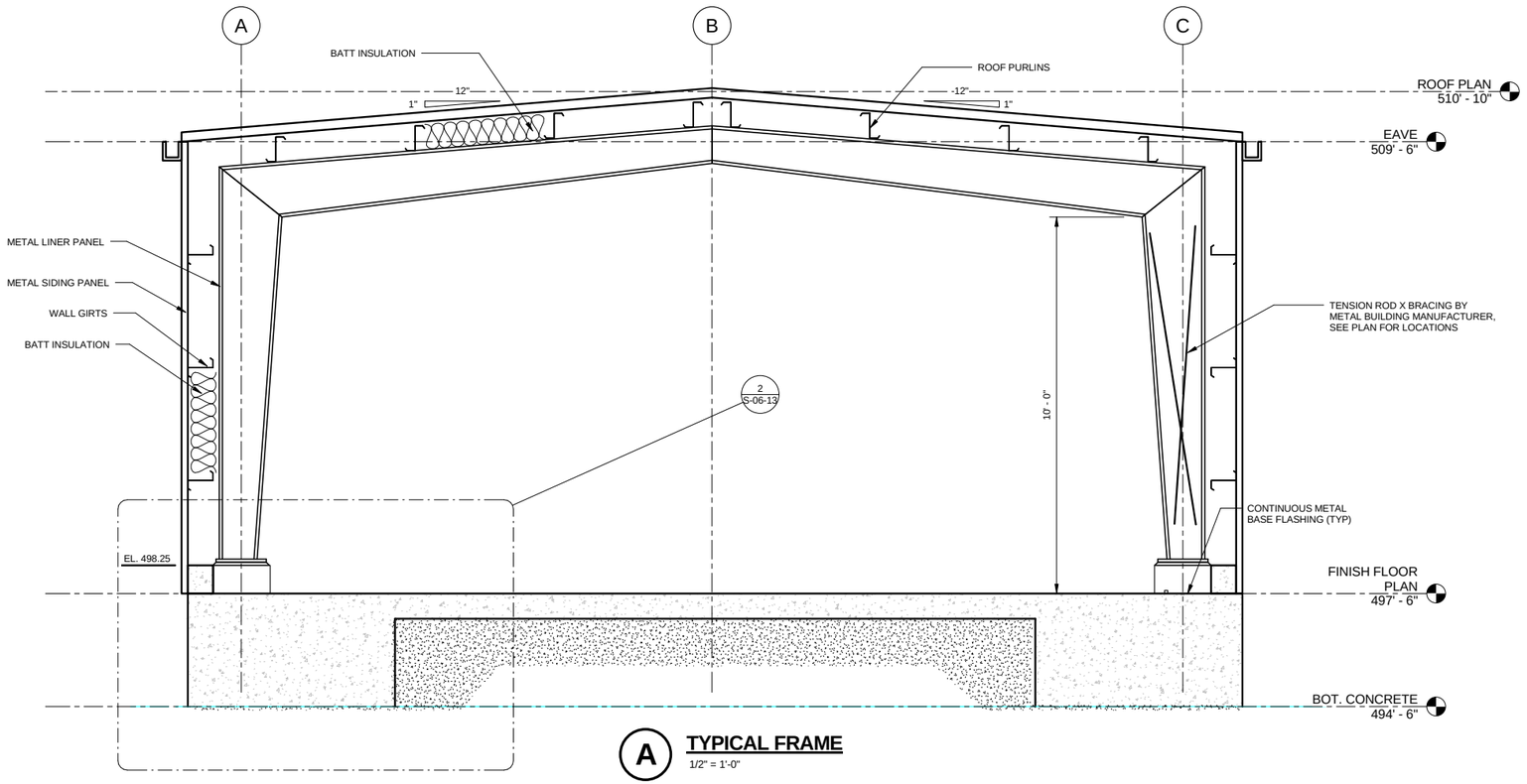
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING FINISH FLOOR 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-06-10	REV

4/3/2013 8:19:07 AM
G:\Projects\PC000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.rvt



A TYPICAL FRAME
1/2" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

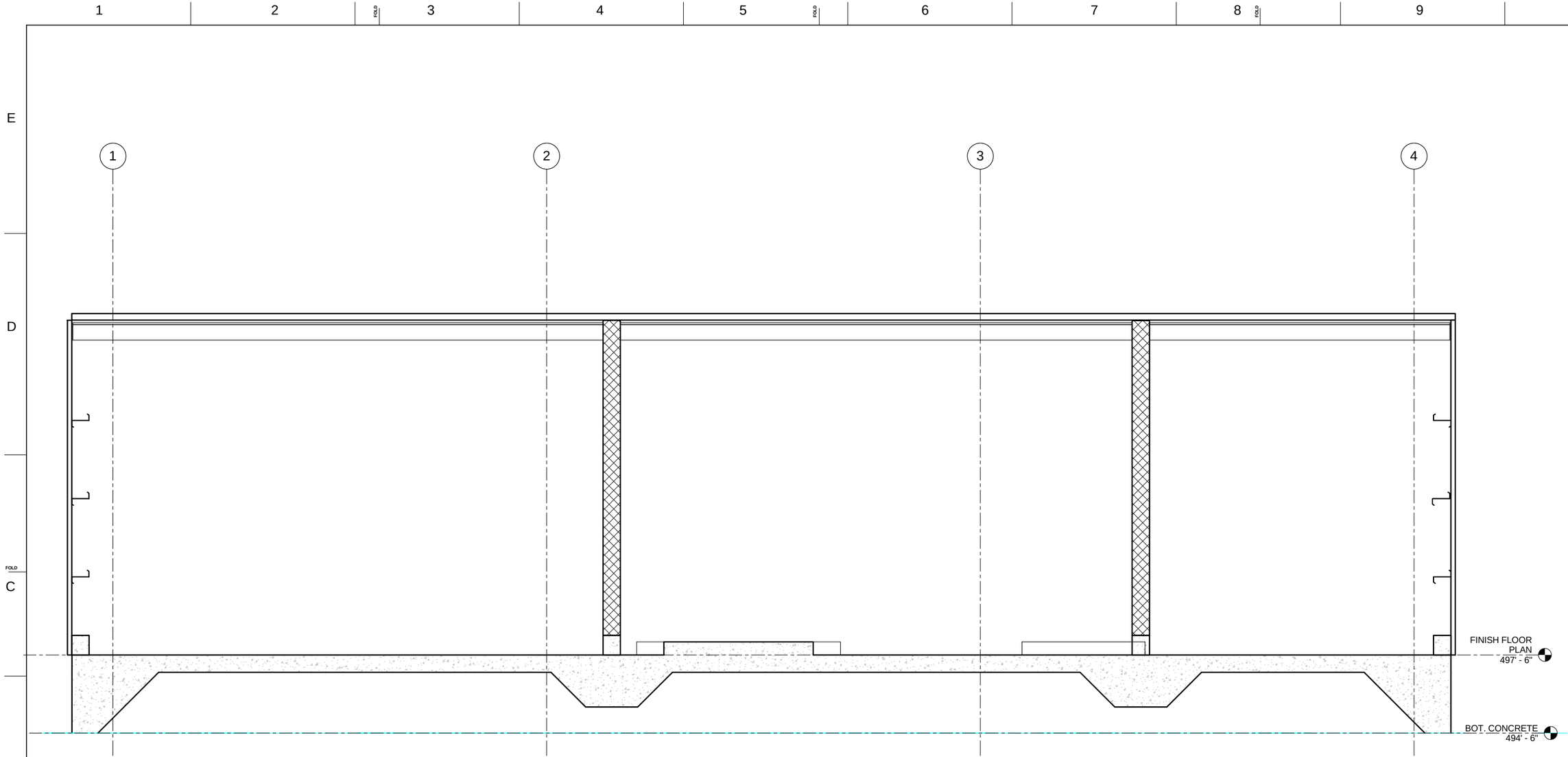
MW-20 BENCH CARBON AMENDMENT BUILDING SECTION-TYPICAL FRAME

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-06-11 | REV

4/3/2013 8:19:09 AM
G:\Projects\RC000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Stuctural 3-27-13.rvt



B **BUILDING SECTION**
1/2" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

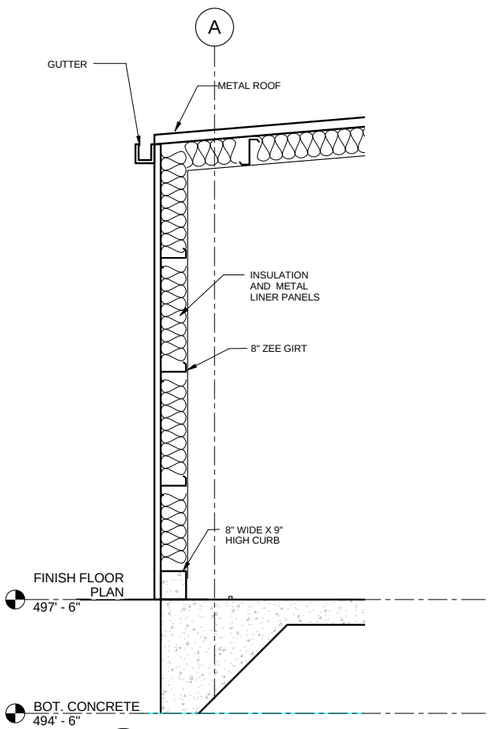
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING SECTION

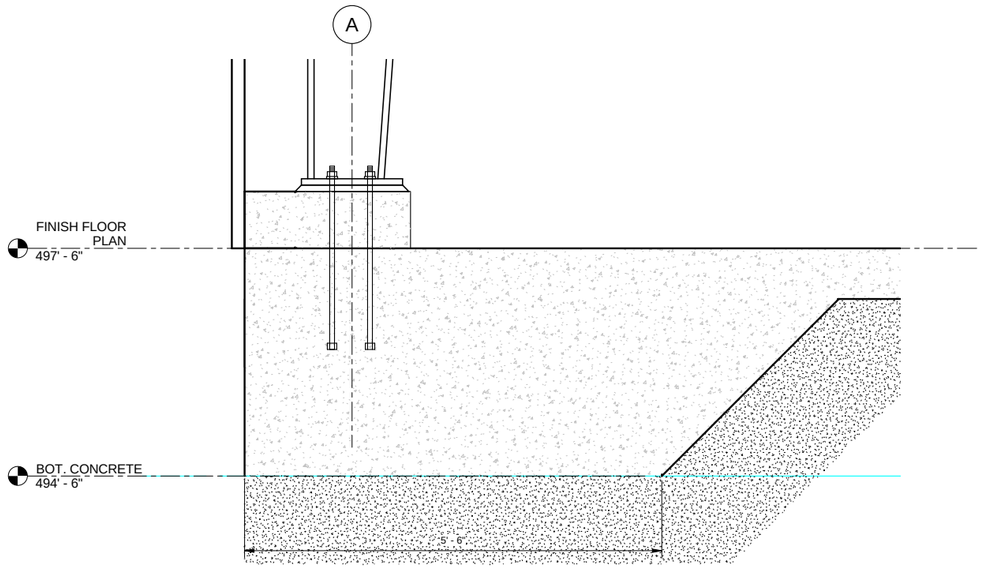
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-06-12	REV

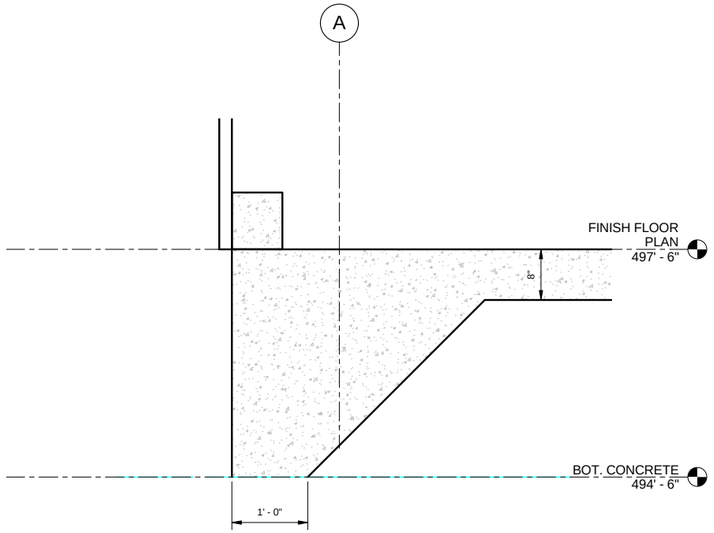
4/3/2013 8:19:09 AM
G:\Project\RC.000750.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.rvt



1 TYPICAL SIDEWALL SECTION
1/2" = 1'-0"



2 FRAME PIER DETAIL
1" = 1'-0"



3 TYPICAL WALL FOOTER
1" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

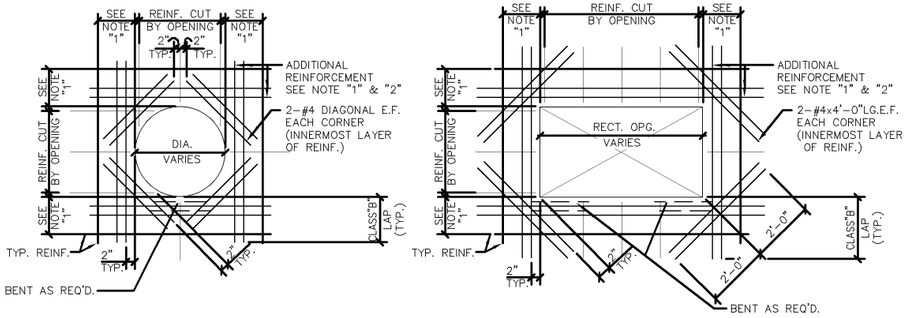
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING SECTIONS & 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-06-13	REV

4/3/2013 8:19:10 AM
G:\Projects\RC000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Structural 3-27-13.rvt

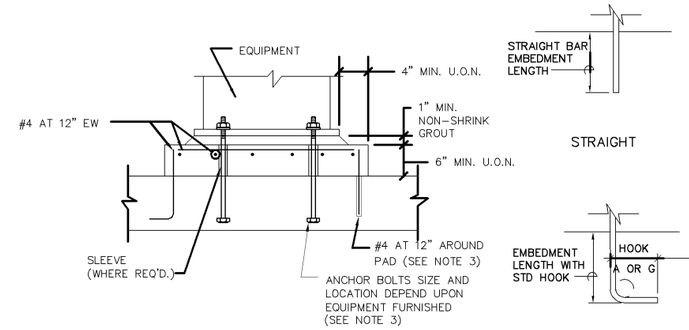


CIRCULAR RECTANGULAR

1 TYPICAL REINFORCING AROUND OPENING IN WALL AND SLAB

SCALE: NO SCALE

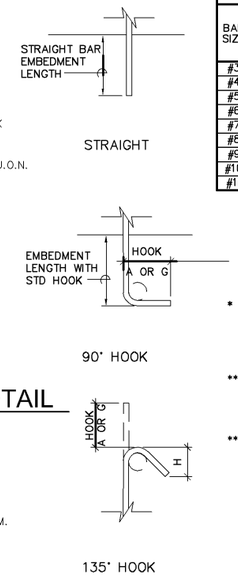
NOTES:
1. PROVIDE ADDITIONAL REINFORCEMENT AT ALL OPNGS. EQUAL IN AREA TO TYPICAL REINFORCEMENT CUT BY OPENING IN EACH DIRECTION. ADDITIONAL REINFORCEMENT TO MATCH SIZE OF TYPICAL REINFORCEMENT (MIN. 2 BARS E.F.) AND PLACED BETWEEN TYPICAL REINFORCEMENT ON EACH SIDE OF OPENING
2. PROVIDE MATCHING DWLS. WHERE REQ'D. TO PROVIDE CLASS "B" LAP WITH ADDITIONAL REINF.



2 TYPICAL EQUIPMENT SUPPORT PAD DETAIL

SCALE: NO SCALE

NOTES:
1. PROVIDE TYP. 6" MIN. CONCRETE SUPPORT PAD FOR ALL EQUIPMENT UON.
2. COORDINATE LOCATION AND SIZE OF PADS WITH OTHER DWGS AND MFGRS CERTIFED DWGS.
3. FOR EXIST. SLABS, DRILL HOLE DIA. & DEPTH IN EXISTING SLAB PER MANUFACTURER'S REQ'MTS FOR ADHESIVE ANSHORAGE SYSTEM.



REINFORCEMENT LAP SPLICE, EMBEDMENT LENGTH AND STANDARD HOOKS

BAR SIZE	MIN LAP LENGTHS FOR BEAMS AND COLUMNS* CLASS B TOP***	MIN LAP LENGTHS FOR BEAMS AND COLUMNS* CLASS B OTHERS	MIN LAP LENGTHS FOR SLABS AND WALLS ** CLASS B TOP***	MIN LAP LENGTHS FOR SLABS AND WALLS ** CLASS B OTHERS	MIN EMBEDMENT LENGTHS FOR BEAMS AND COLUMNS * TOP***	MIN EMBEDMENT LENGTHS FOR BEAMS AND COLUMNS * OTHERS	MIN EMBEDMENT LENGTHS FOR SLABS AND WALLS ** TOP***	MIN EMBEDMENT LENGTHS FOR SLABS AND WALLS ** OTHERS	WITH STD HOOKS	MIN STD. HOOKS 90° A OR G	MIN STD. HOOKS 135° A OR G	MIN STD. HOOKS 135° H
#3	25	19	16	16	19	15	12	12	5	6	4	2.5
#4	33	25	20	16	25	19	15	12	7	8	4.5	3
#5	41	31	25	19	31	24	19	15	9	10	5.5	3.75
#6	49	37	29	23	37	29	23	18	10	12	8	4.5
#7	71	54	43	33	54	42	33	25	12	14	9	5.25
#8	81	62	49	37	62	48	37	29	14	16	10.5	6
#9	91	70	60	46	70	54	46	36	15	19	–	–
#10	102	79	74	57	79	61	57	44	17	22	–	–
#11	114	87	89	69	87	67	68	53	19	24	–	–

NOTES:

REINFORCEMENT LAP SPLICE, EMBEDMENT LENGTH AND STANDARD HOOKS TABLE IS BASED ON A MINIMUM CONCRETE COMPRESSIVE STRENGTH OF 4000 PSI AND 60000 PSI REINFORCEMENT (WITH NO EPOXY COATING).

ALL LAP SPLICES SHALL BE CLASS B SPLICES.

* THE MINIMUM LAP LENGTH FOR BEAMS, COLUMNS, AND STRAIGHT EMBEDMENTS ARE BASED ON A 3 BAR DIAMETER MINIMUM CENTER TO CENTER BAR SPACING AND A 2 INCH BAR COVER. IF THE SPLICE AND/OR EMBEDMENT DOES NOT CONFORM TO THESE REQUIREMENTS, THEN CONTRACTOR SHALL APPLY APPROPRIATE FACTORS IN COMPLIANCE WITH ACI 318 WITH APPROVAL BY ENGINEER.

** THE MINIMUM LAP LENGTH FOR SLABS, WALLS, AND STRAIGHT EMBEDMENTS ARE BASED ON A 6 INCH BAR SPACING AND A 2 INCH BAR COVER. IF THE LAP CONDITION DOES NOTE CONFORM TO THESE REQUIREMENTS, THEN USE BEAM LAP LENGTHS; OR COMPLY WITH LAP REQUIREMENTS OF ACI 318 WITH APPROVAL BY ENGINEER.

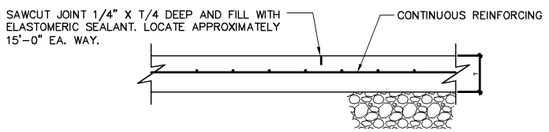
*** TOP BARS ARE DEFINED AS ALL HORIZONTAL BARS, EXCLUDING WALL BARS, WITH 12" OR MORE FRESH CONCRETE BENEATH.

WHERE SPLICES ARE REQUIRED BETWEEN BARS OF DIFFERENT SIZES, THE LAP LENGTH SHALL BE NO LESS THAN THE EMBEDMENT LENGTH OF THE LARGER BAR OR THE LAP LENGTH OF THE SMALLER BAR, WHICHEVER IS GREATER.

IN CIRCULAR TANKS DESIGNED FOR RING TENSION, THE LOCATION OF SPLICES SHOULD BE STAGGERED. ADJACENT HOOP REINFORCING SPLICES SHOULD BE STAGGERED HORIZONTALLY (CENTER OF LAP TO CENTER OF LAP) BY NOT LESS THAN ONE LAP LENGTH NOR 3 FEET AND SHOULD NOT COINCIDE IN VERTICAL ARRAYS MORE FREQUENTLY THAN EVERY THIRD BAR.

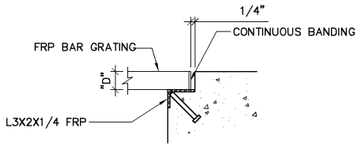
3 LAP SPLICE AND EMBEDMENT LENGTH TABLE

SCALE: NO SCALE



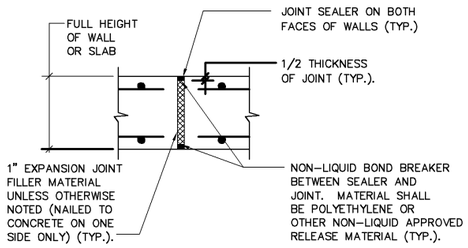
4 TYP SAWCUT JOINT FOR SLAB ON GRADE

SCALE: NO SCALE



5 TYP GRATING SUPPORT

SCALE: NO SCALE

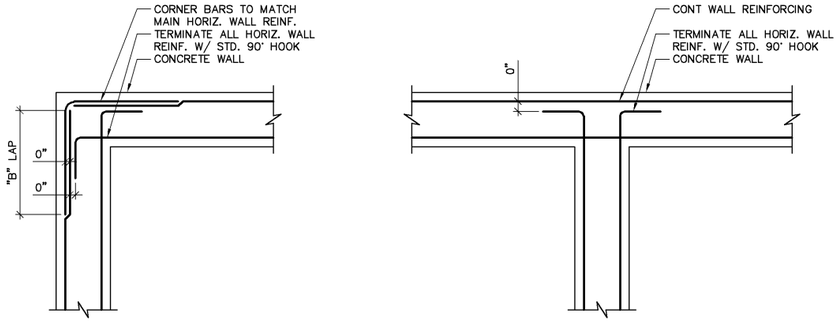


HORIZONTAL & VERTICAL

6 TYPICAL EXPANSION JOINT DETAIL

SCALE: NO SCALE

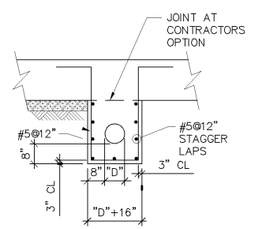
NOTES:
1. DISCONTINUE ALL REINFORCEMENT BARS AT EXPANSION JOINTS.



NOTES:
1. SEE PLANS AND SECTIONS FOR WALL INFORMATION.
2. VERTICAL REINFORCEMENT NOT SHOWN FOR CLARITY.
3. FOR ALL STRUCTURES UNLESS NOTED OTHERWISE.

7 TYPICAL CORNER REINFORCEMENT DETAIL

SCALE: NO SCALE



NOTES:
1. BOTTOM REINFORCEMENT TO BE CONTINUOUS WHERE POSSIBLE.
2. FOR PIPE SIZE "D" AND ELEVATION, SEE MECHANICAL DRAWINGS.
3. ALL PIPES LOCATED BENEATH BASE SLABS SHALL BE ENCASED IN CONCRETE UNLESS OTHERWISE NOTED.

8 PIPE ENCASEMENT DETAIL

SCALE: NO SCALE

SCALE: NO SCALE

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	SO
	SUPV MSL
	DSGN PJD
	DWN JMO
	CHKD PJD
	OK LT
	DATE 04/05/13
	SCALES NONE or AS SHOWN

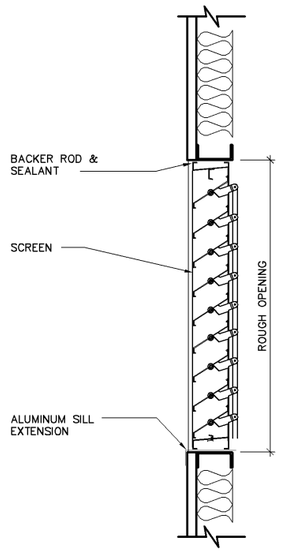
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT BUILDING TYPICAL DETAILS 1 OF 2

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

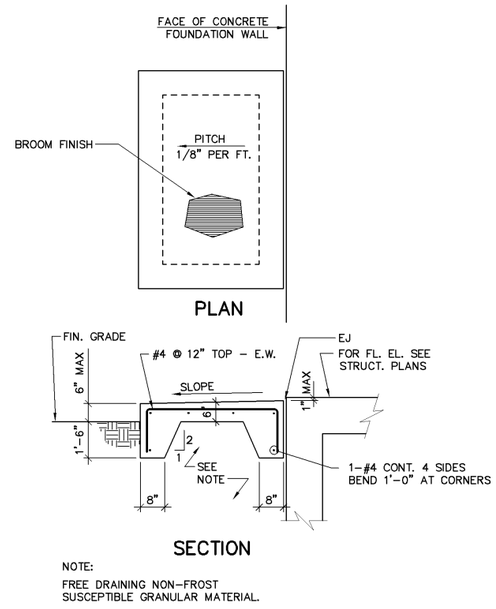
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-06-14	REV

4/3/2013 8:19:11 AM
G:\Project\RC000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Stactural-3-27-13.rvt



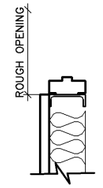
NOTE:
FOR LOUVERS SEE H DRAWINGS

1 LOUVER
SCALE: 1' = 1'-0"

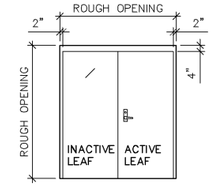


NOTE:
FREE DRAINING NON-FROST
SUSCEPTIBLE GRANULAR MATERIAL.

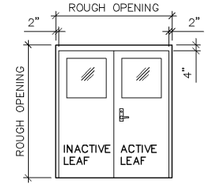
2 CONCRETE ENTRANCE PAD DETAIL
SCALE: NO SCALE



3 DOOR JAMB
SCALE: NO SCALE



4 DOOR TYPE 1
SCALE: NO SCALE



5 DOOR TYPE 2
SCALE: NO SCALE

DOOR SCHEDULE

DOOR NUMBER	ROUGH OPENING WIDTH	ROUGH OPENING HEIGHT	DOOR TYPE	FRAME TYPE	DETAILS HEAD	DETAILS JAMB	U.L. LABEL	HARDWARE SET	REMARKS
101	6'–4"	7'–2"	2	HM	A	A	–	1	24" X 24" VISION PANEL
102	6'–4"	7'–2"	2	HM	A	A	–	1	24" X 24" VISION PANEL
103	6'–4"	7'–2"	2	HM	A	A	–	1	24" X 24" VISION PANEL

HM – HOLLOW METAL

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

No.	Date	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		JMO	PJD	MSL	LT

REVISIONS

APPROVED BY	
SO	
SUPV	MSL
DSGN	PJD
DWN	JMO
CHKD	PJD
OK	LT
DATE	04/05/13
SCALES	NONE or AS SHOWN

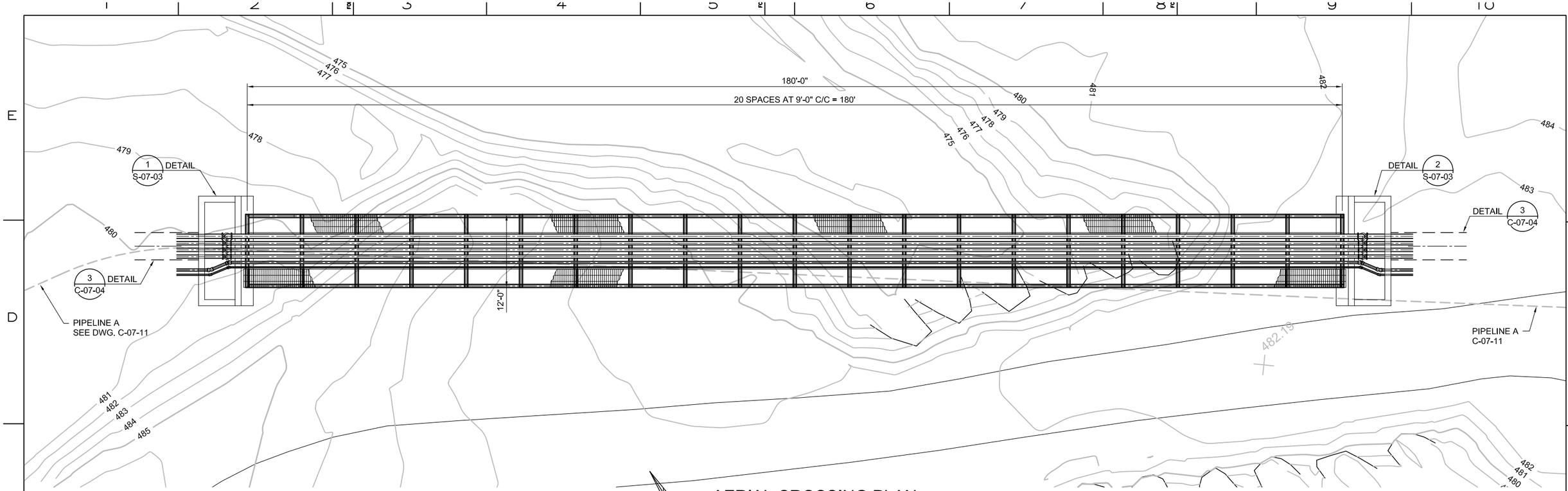
TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH CARBON AMENDMENT
BUILDING TYPICAL DETAILS 2 OF 2

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

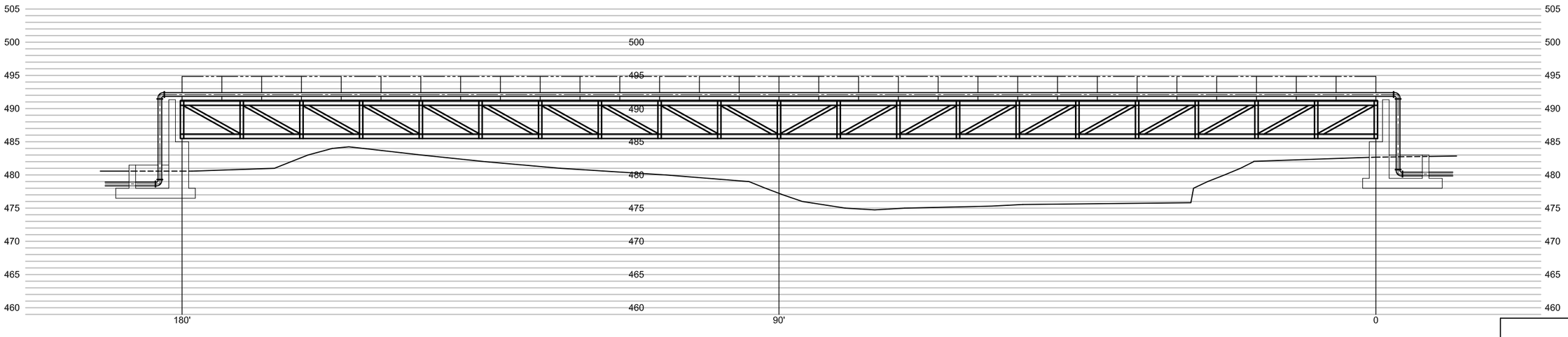
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-06-15	REV

4/3/2013 8:19:11 AM
G:\Project\RC000753.0008\Struct\Pre-Engineered Building\JMO\Topok Bench Building Slactural 3-27-13.rvt



AERIAL CROSSING PLAN

1/8" = 1'-0"



AERIAL CROSSING ELEVATION

1/8" = 1'-0"

0 8' 16' 24'

SCALE: 1/8"=1'

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	VMB
DWN	WTH
CHKD	PT
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
AERIAL CROSSING
PIPELINE "A"
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-07-01	REV

FILENAME: E2-S-XXX-0701.dwg
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

N1808

PIPELINE I
SEE DWG. C-07-22

200'-0"
20 SPACES AT 10'-0" = 200'

10'-0"

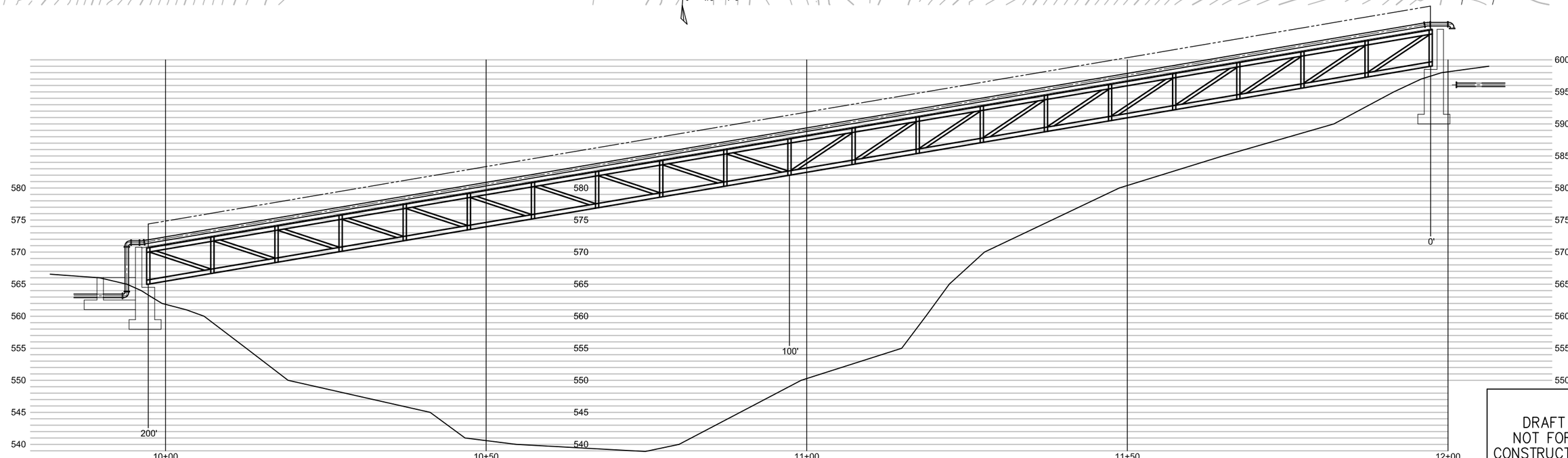
PIPE

DETAIL 1 S-07-04

DETAIL 2 S-07-04

FOR CONTINUATION
SEE DWG. C-XX-XX

AERIAL CROSSING PLAN
1/8" = 1'-0"



AERIAL CROSSING ELEVATION
1/8" = 1'-0"

0 8' 16' 24'
SCALE: 1/8"=1'

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

REVISIONS

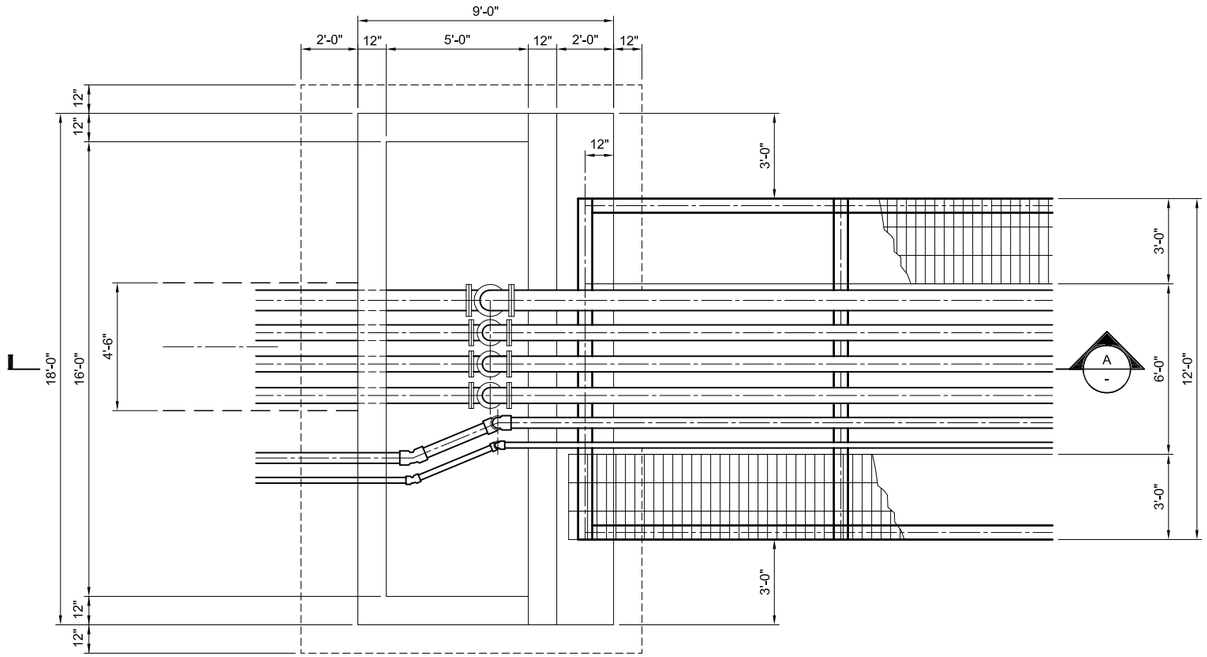
APPROVED BY	
	SO
	SUPV
	DSGN VMB
	DWN WTH
	CHKD PT
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
AERIAL CROSSING
PIPELINE "I"

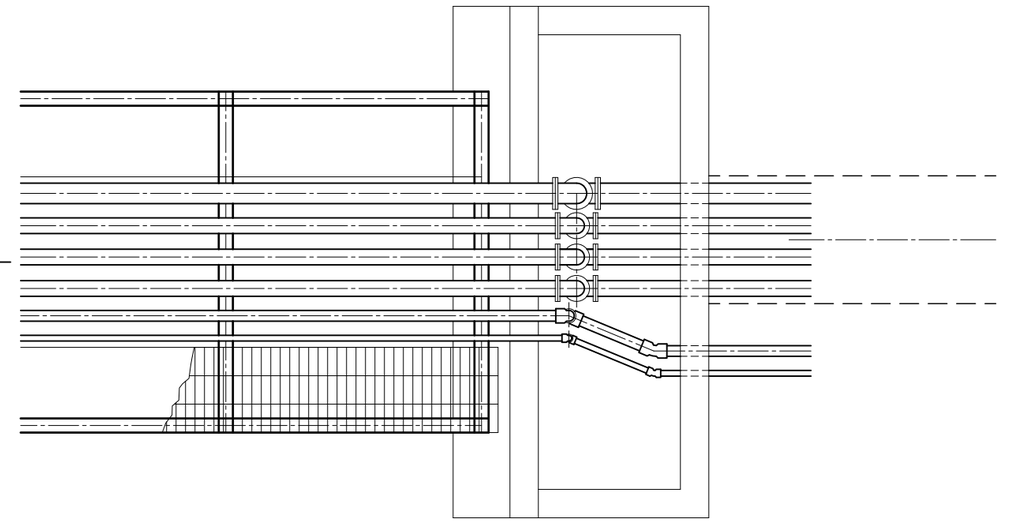
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-07-02	REV

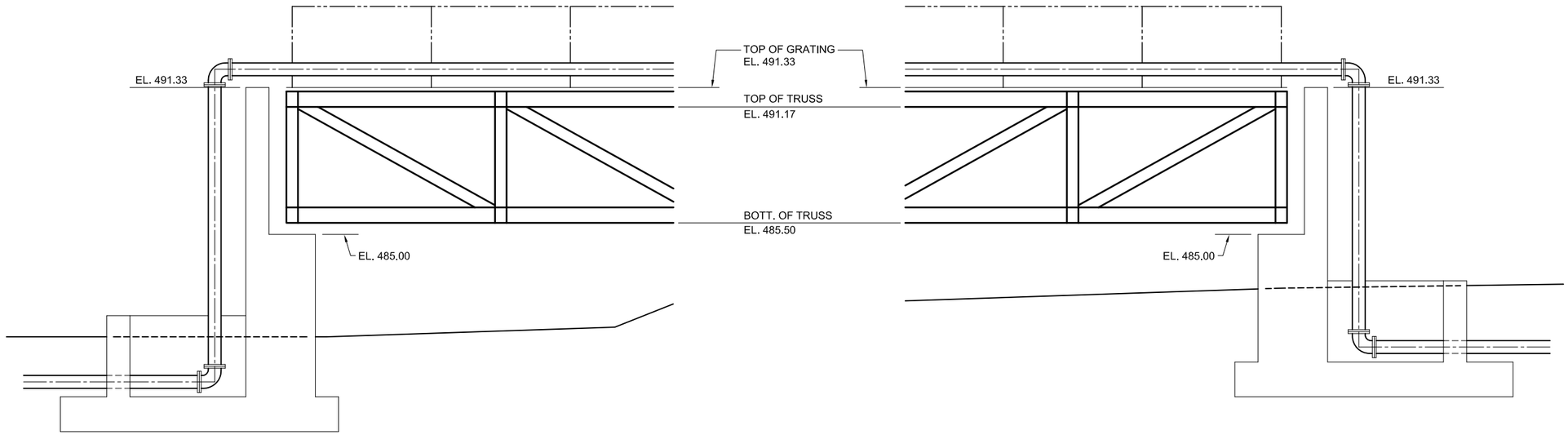
FILENAME: E2-SAXX-0702.dwg
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FOLD
N1808



1 PLAN DETAIL
3/8" = 1'-0"
S-07-01



2 PLAN DETAIL
3/8" = 1'-0"
S-07-01



A SECTION
3/8" = 1'-0"
-

B SECTION
3/8" = 1'-0"
-

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
		REVISIONS					

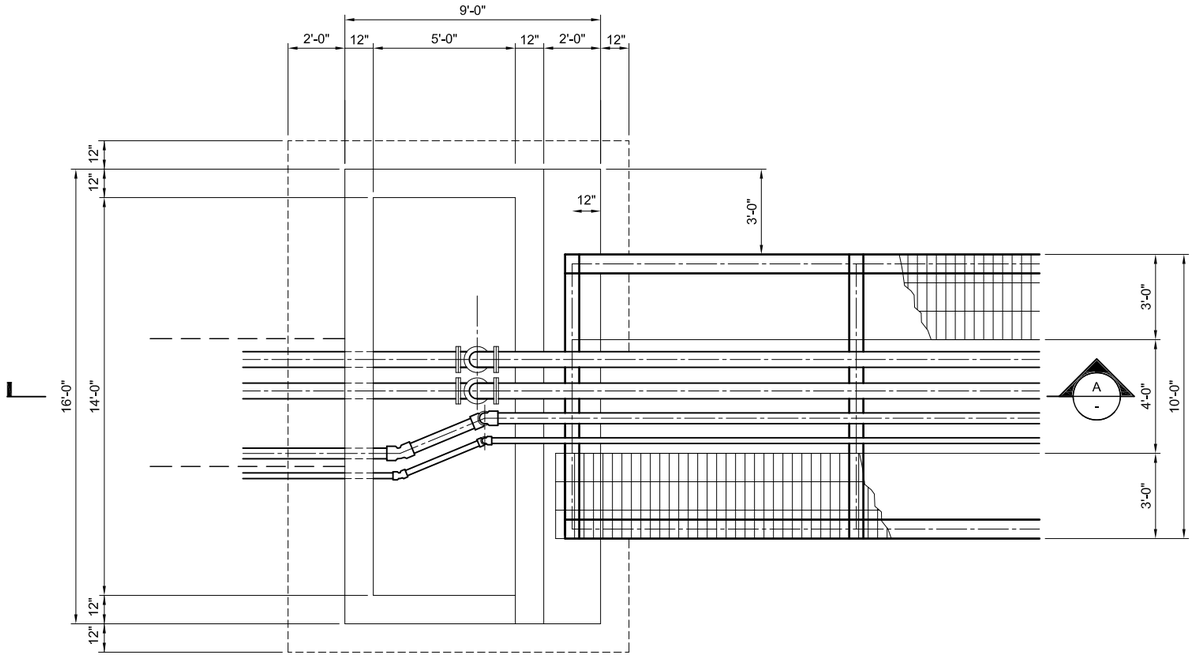
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

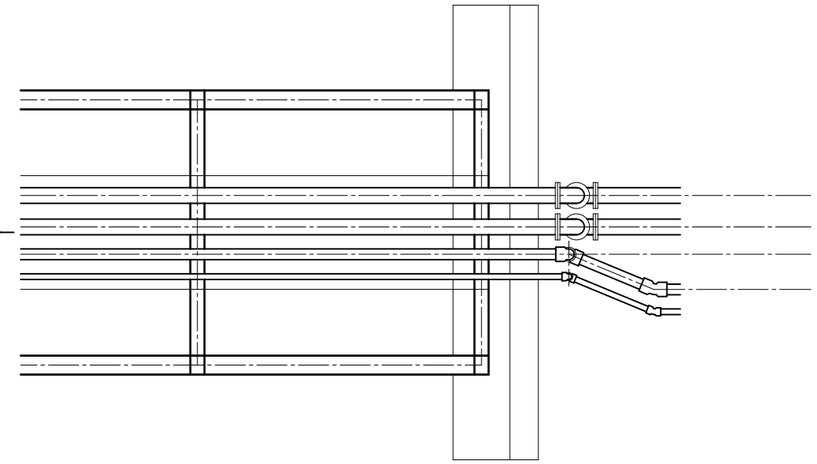
TOPOCK GROUNDWATER REMEDIATION PROJECT
AERIAL CROSSING PIPELINE "A" SECTIONS AND DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

FOLD
FOL
PLOT TIME: $PLOTTIME
PLOT DATE: $PLOTDATE
FILENAME: E2-S-XXX-0703.dwg
N1808



1 PLAN DETAIL
3/8" = 1'-0"
S-07-02



2 PLAN DETAIL
3/8" = 1'-0"
S-07-02

A SECTION
3/8" = 1'-0"
-

B SECTION
3/8" = 1'-0"
-

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

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

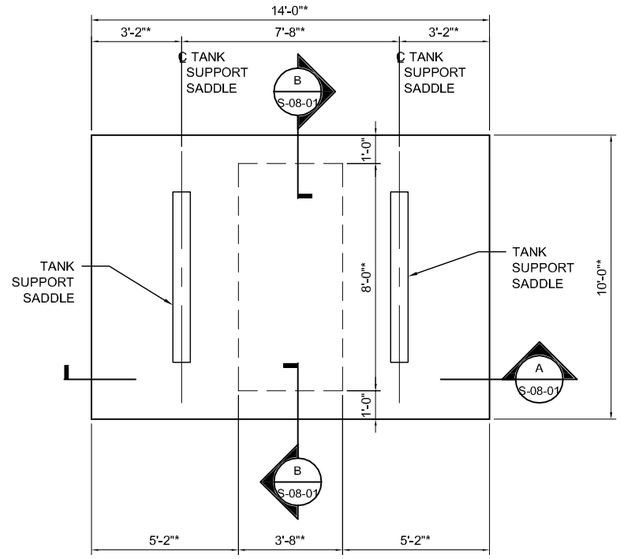
TOPOCK GROUNDWATER REMEDIATION PROJECT
AERIAL CROSSING PIPELINE"I"
SECTIONS AND DETAILS

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-07-04	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-0704.dwg

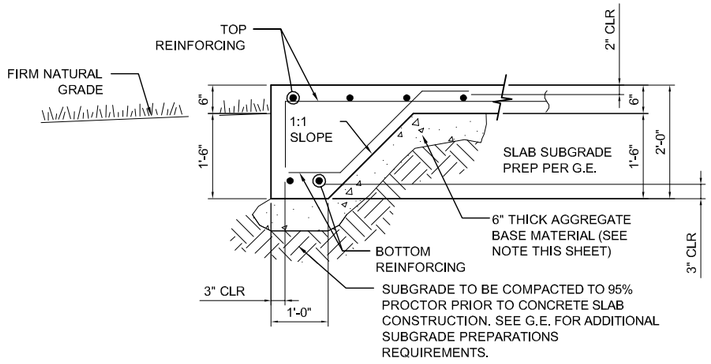
FOLD
FOL
N1808



* TO BE VERIFIED BY CONTRACTOR PER APPROVED MANUFACTURER'S STORAGE TANK SHOP DRAWINGS

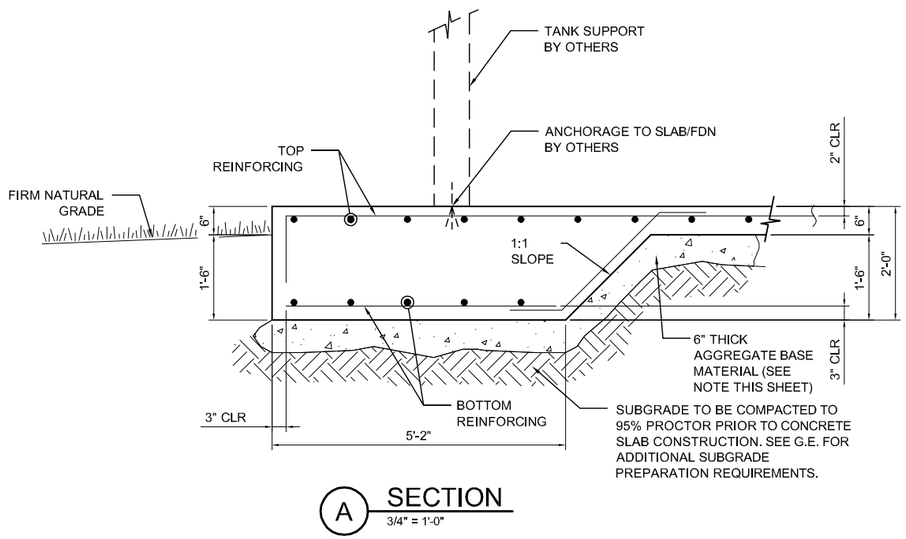
TW BENCH STORAGE TANK: FOUNDATION PLAN

3/8" = 1'-0"



B SECTION

3/4" = 1'-0"



A SECTION

3/4" = 1'-0"

0 1' 2' 3' 4'

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

0 2' 4' 6' 8'

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

FOUNDATION NOTES:

- CARBON AMENDMENT TANK SUPPORTS/SADDLES ARE BY OTHERS, ATTACHMENT OF CARBON AMENDMENT TANK TO SUPPORTS/SADDLES IS BY OTHERS; ANCHORAGE OF CARBON AMENDMENT TANK OR SUPPORTS/SADDLES TO THE CONCRETE SLAB/FOUNDATION IS BY OTHERS.
- FOUNDATION DESIGN IS BASED UPON 1500 psf ALLOWABLE BEARING PRESSURE, IN CONFORMANCE WITH CBC TABLE 18-1-C FOR CLASSIFICATION(S) SW, SP, SM, SC, GM, AND/OR GC. A LICENSED GEOTECHNICAL ENGINEER SHALL PROVIDE SUBGRADE COMPACTION AND PREPARATION REQUIREMENTS, AND SHALL INSPECT THE EXCAVATIONS AND CONFIRM THAT 1500 psf BEARING IS ALLOWED FOR THE FOUNDATIONS DELINEATED HEREIN, AS WELL AS 0.40 FRICTION FOR THE CARBON AMENDMENT TANK FOUNDATION. WHEN ENGINEERED FILL IS REQUIRED BY THE GEOTECHNICAL ENGINEER, IT SHALL BE TESTED AND INSPECTED BY THE GEOTECHNICAL ENGINEER.
- IF THE BUILDING OFFICIAL OR GEOTECHNICAL ENGINEER DETERMINES THAT EXPANSIVE SOILS OR OTHER GEOLOGIC ISSUES OF CONCERN MAY BE PRESENT, THEN HE/SHE MAY REQUIRE THAT SPECIAL PROVISIONS BE MADE TO THE FOUNDATION DESIGN TO SAFEGUARD AGAINST DAMAGE DUE TO THE EXPANSIVENESS OR OTHER GEOLOGIC ISSUES. IF THIS BECOMES THE SITUATION THEN ALL FOUNDATION CONSTRUCTION MUST BE HALTED AND THE GEOTECHNICAL ENGINEER SHALL PROVIDE A GEOTECHNICAL REPORT WITH RECOMMENDATIONS IN CONSIDERATION OF THE CONDITIONS.
- GROSS WEIGHT OF CARBON AMENDMENT STORAGE TANK (INCLUDING CONTENTS (FUEL) AND SUPPORT SADDLES) SHALL NOT EXCEED 42,000 lbs. THIS PARAMETER SHALL BE POSTED IN PLAIN SIGHT WITH PERMANENT LETTERING.
- REFER TO THE GENERAL NOTES AND STRUCTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- STRUCTURAL OBSERVATIONS OF CONSTRUCTION ARE RECOMMENDED (PER CBC SECTION 1702), SO AS TO OBSERVE THE PROGRESS AND QUALITY OF THE CONTRACTOR'S WORK AND TO DETERMINE IF THE WORK IS PROCEEDING IN GENERAL ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
- REINFORCING STEEL: ASTM A615, 60KSI YIELD GRADE, DEFORMED BILLET STEEL BARS, UNFINISHED
- PLACE, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. DO NOT DEVIATE FROM REQUIRED POSITION.
- AGGREGATE BASE MATERIAL: TO BE CRUSHED GRAVEL MEETING THE FOLLOWING GRADATION AND COMPACTED TO 95% MAXIMUM DRY DENSITY OF MODIFIED PROCTOR.

SIEVE SIZE	TOTAL PERCENT PASSING
2 INCH	100
1 INCH	70 TO 100
3/4 INCH	50 TO 90
NO. 4	30 TO 60
NO. 30	9 TO 33
NO. 200	0 TO 15

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	GWE	MSL	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MSL
DWN	GWE
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

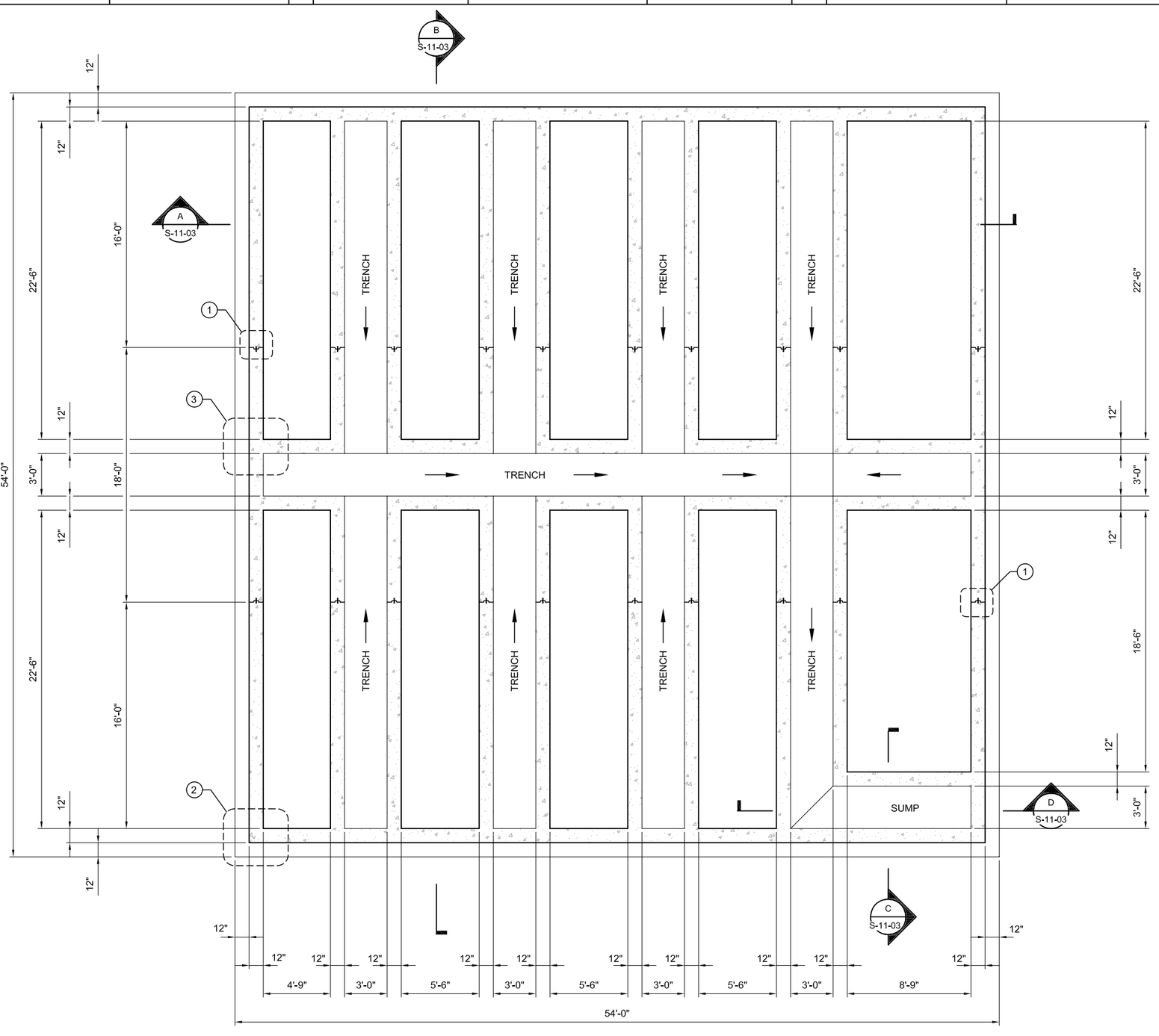
TW BENCH STORAGE TANK FOUNDATION

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-08-01	REV



SHEET NOTES:

1. WALL VERTICAL CONSTRUCTION JOINT WITH PVC WATERSTOP, SEE DETAIL 3/S-00-02
2. CORNER REINFORCING, SEE DETAIL 5/S-00-02
3. T-CORNER REINFORCING, SEE DETAIL 5/S-00-02

FOUNDATION PLAN

1/4" = 1'-0"

0 4' 8' 12'

SCALE: 1/4"=1'

DRAFT
NOT FOR
CONSTRUCTION

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

CH2MHILL®

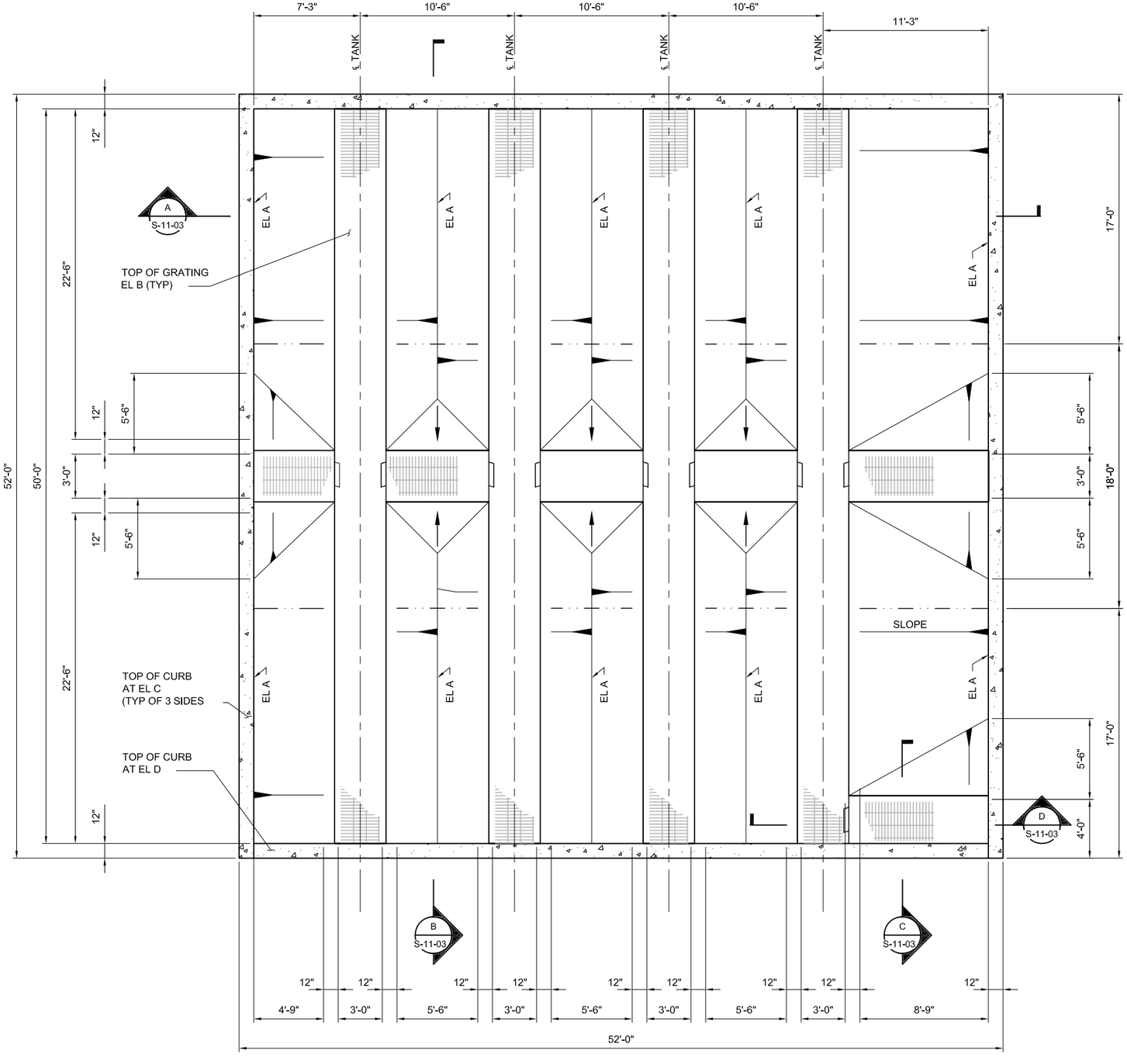
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	1/4"=1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
INFLUENT TANK FARM
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-11-01	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1101AD.dwg



FLOOR PLAN

1/4" = 1'-0"

TABLE OF ELEVATIONS		
EL.	ELEVATIONS(FT)	REMARKS
A	626.17	TOP OF CONCRETE
B	626.00	TOP OF GRATING
C	626.50	TOP OF CURB
D	626.17	TOP OF CURB
E	626.00	BOTTOM OF SLAB ON GRADE

0 4' 8' 12'

SCALE: 1/4"=1'

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
		REVISIONS					

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN MD
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES 1/4"=1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT

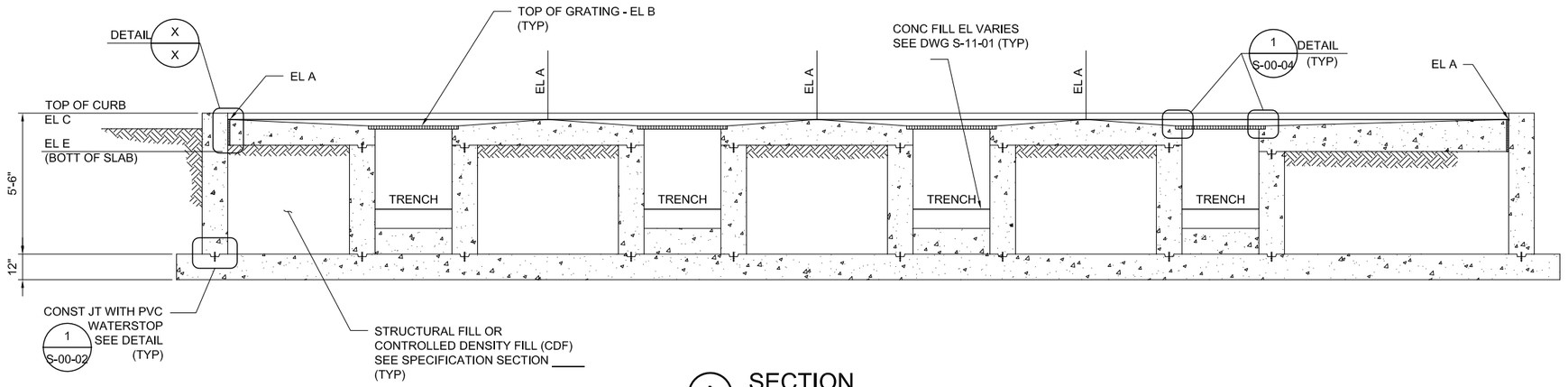
INFLUENT TANK FARM FLOOR PLAN

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-11-02	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1102AD.dwg

N180B



A SECTION
3/8" = 1'-0"
S-11-01
S-11-02

NOTES:

1. SEE SHEET S-11-02 FOR ELEVATIONS.

0 3' 6' 9'
SCALE: 3/8"=1'

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

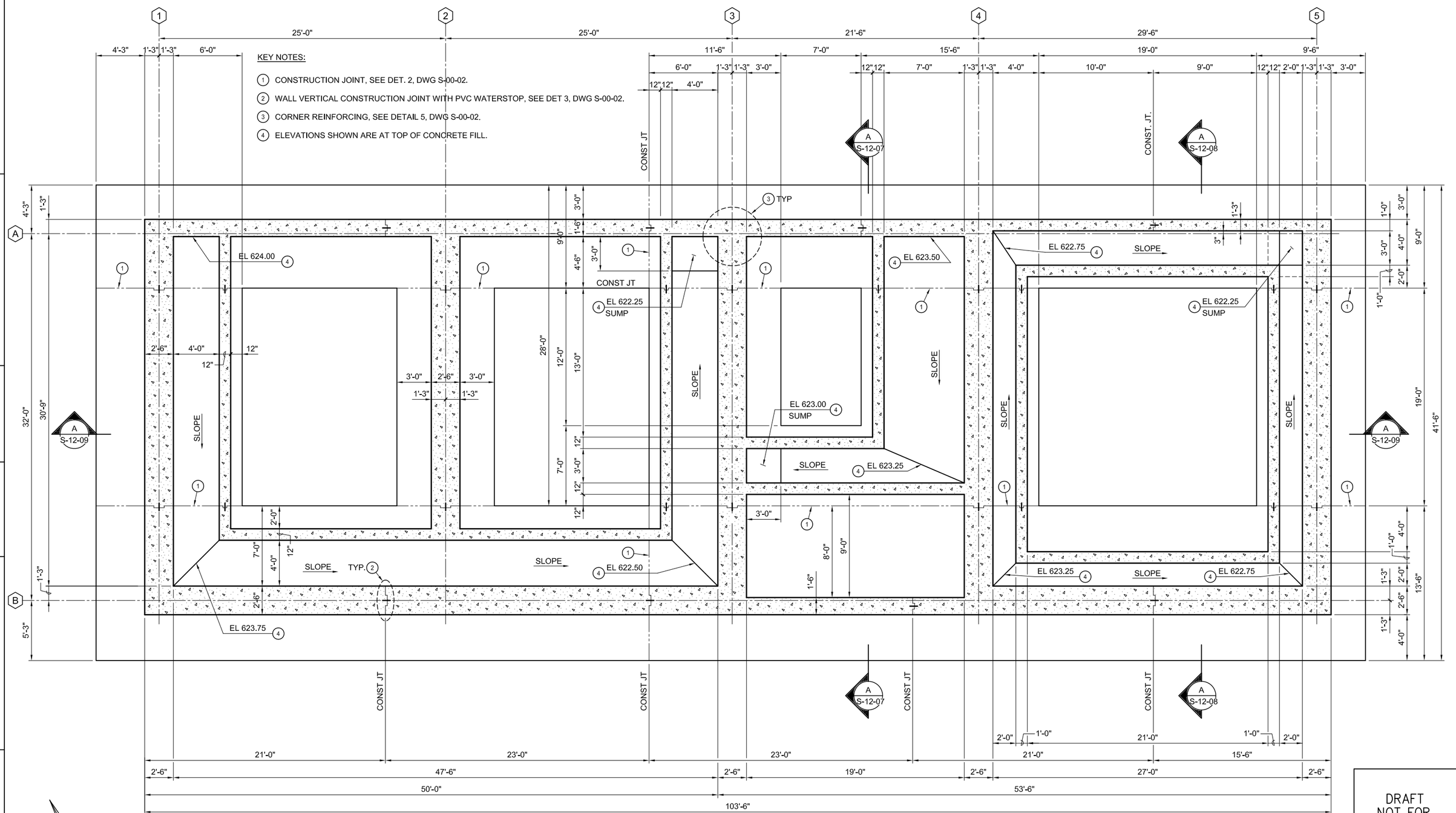
TOPOCK GROUNDWATER REMEDIATION PROJECT
INFLUENT TANK FARM
SECTIONS AND DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-11-03	REV

FILENAME: E2-S-XXX-1103AD.dwg
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME

KEY NOTES:

1. CONSTRUCTION JOINT, SEE DET. 2, DWG S-00-02.
2. WALL VERTICAL CONSTRUCTION JOINT WITH PVC WATERSTOP, SEE DET 3, DWG S-00-02.
3. CORNER REINFORCING, SEE DETAIL 5, DWG S-00-02.
4. ELEVATIONS SHOWN ARE AT TOP OF CONCRETE FILL.



NOTES:

1. FOR GENERAL STRUCTURAL NOTES, SEE DWG S-00-01.
2. PILASTER SCHEDULE, SEE DWG S-12-XX.

FOUNDATION PLAN

1/4" = 1'-0"

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED WATER CONDITIONING PLANT
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-12-01	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-SXXX-1201.dwg

N1808

KEY NOTES:

1. TOP OF 3" DEEP GALVANIZED STEEL GRATING EL 626.00.
2. TOP OF 3" DEEP (HI4730) FRP FIBERGRATE GRATING EL 626.00.
3. EP - INDICATES EQUIPMENT PAD, SEE DET 10, DWG S-00-02.
4. GRATING SUPPORT L, SEE DETAIL 1, DWG S-00-04.
5. GRATING SUPPORT CHANNEL, SEE DETAIL 2, DWG S-00-04.
6. GUIDE CHANNELS, SEE DETAIL 3, DWG S-00-04.

NOTES:

1. FOR GENERAL STRUCTURAL NOTES, SEE DWG S-00-01.
2. FOR PILASTER SCHEDULE, SEE DWG S-12-XX.
3. DIMENSIONS MARKED WITH AN ASTERISK SHALL BE VERIFIED WITH APPROVED SUBMITTALS.

FIRST FLOOR PLAN

1/4" = 1'-0"

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

REVISIONS

APPROVED BY
SO
SUPV
DSGN KJD
DWN WTH
CHKD VMB
OK PT
DATE 4/5/13
SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED WATER CONDITIONING PLANT
FIRST FLOOR PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. S-12-02 of SHEETS
REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-SXXX-1202.dwg

KEY NOTES:

1. TOP OF CURB EL 640.50 UNLESS NOTED OTHERWISE.
2. EP-1 AND EP-2, TOP OF CONCRETE EL 640.33, SEE DETAIL 10, DWG S-00-02.
3. FD - INDICATES FLOOR DRAIN, TOP AT EL 639.83 LOCATION PER MECHANICAL DWG M-12-XX.
4. TOP OF PERIMETER CURB AT EL 640.50 UNLESS OTHERWISE NOTED.
5. FOR STAIR DETAILS SEE DWG S-12-XX.
6. ELEVATED SLAB CONSTRUCTION JOINT, SEE DETAIL 3, DWG S-00-02.
7. FOR BEAM VERTICAL CONSTRUCTION JOINT, SEE DETAIL X, S-12-XX.
8. 13" DIA OPENING FOR 12" DUCT.
9. 18" x 18" x 6" HIGH CURB WITH 13" DIA OPENING FOR 12" DUCT, SEE DETAIL X, DWG. S-XX-XX.
10. TOP MOUNTED HANDRAIL, SEE DETAIL 1, DWG S-00-03.

NOTES:

1. FOR BEAM SCHEDULE SEE DWG S-12-XX.
2. FOR PIPE PENETRATIONS, SEE M- DWGS.
3. DIMENSIONS MARKED WITH AN ASTERISK ✳ SHALL BE VERIFIED WITH THE MANUFACTURER'S APPROVED SUBMITTALS.

SECOND FLOOR PLAN

1/4" = 1'-0"

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

REVISIONS

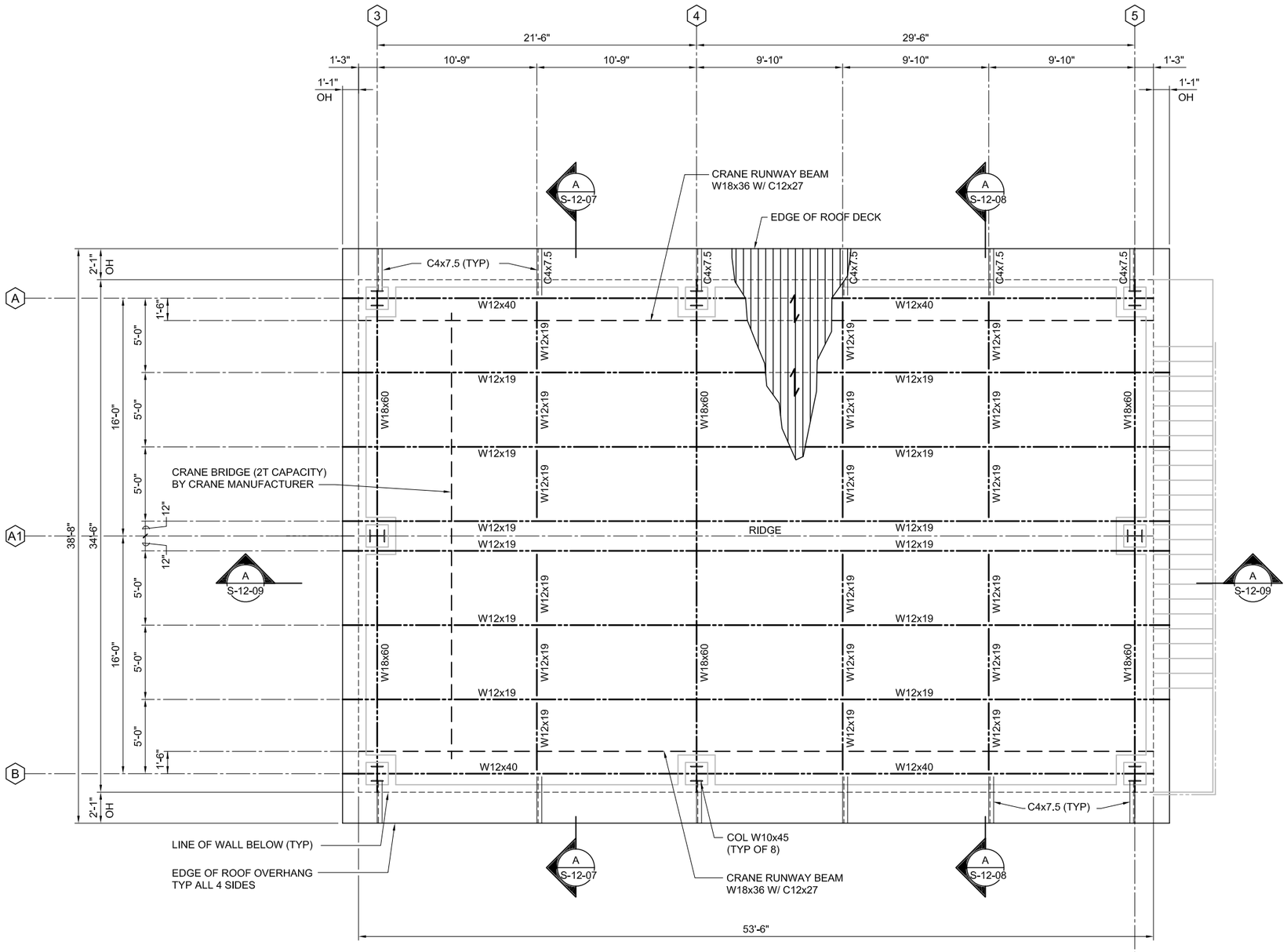
APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED WATER CONDITIONING PLANT
SECOND FLOOR 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-12-03	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1203.dwg

N1808



ROOF FRAMING PLAN

1/4" = 1'-0"

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
		REVISIONS					

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

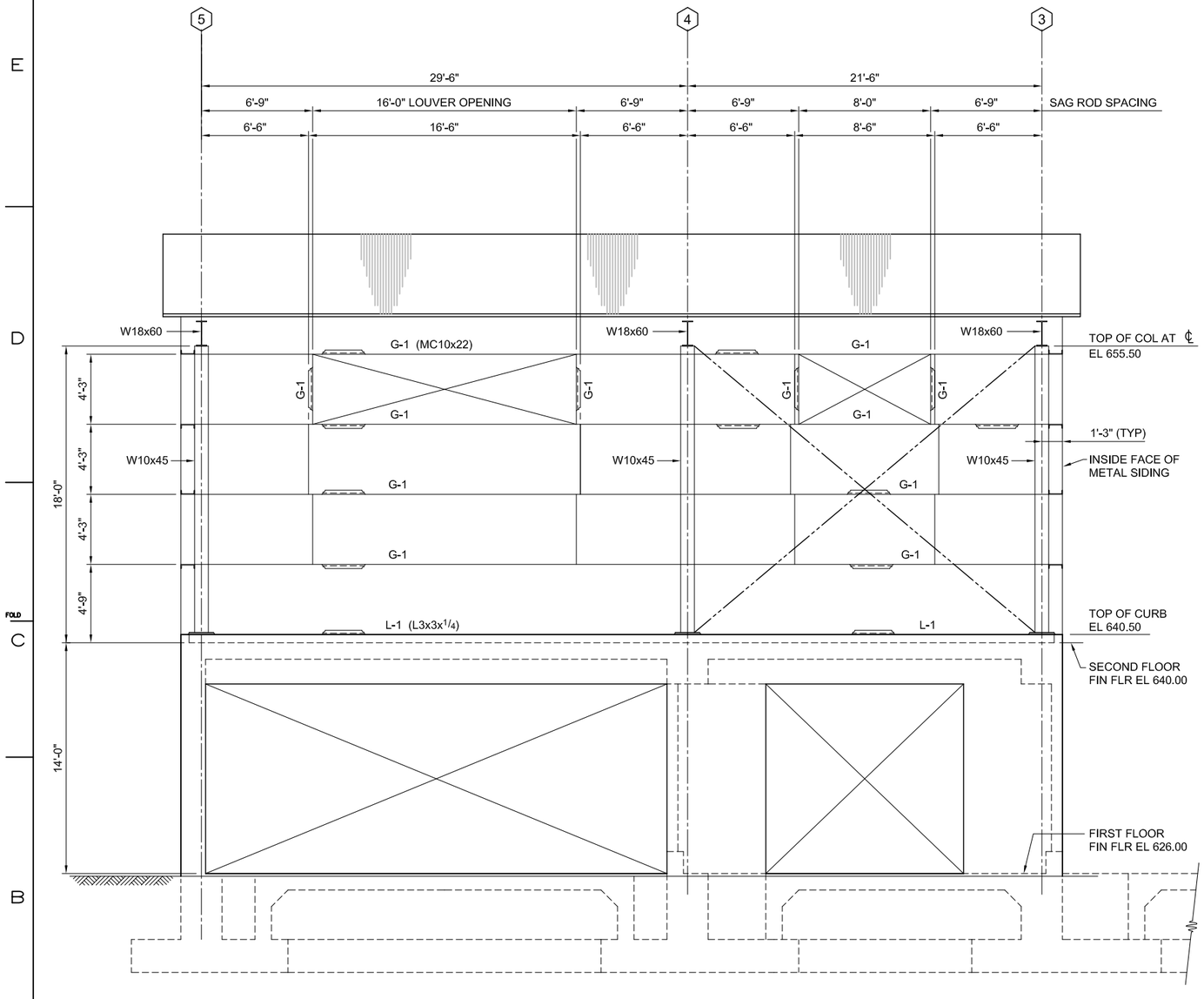
APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

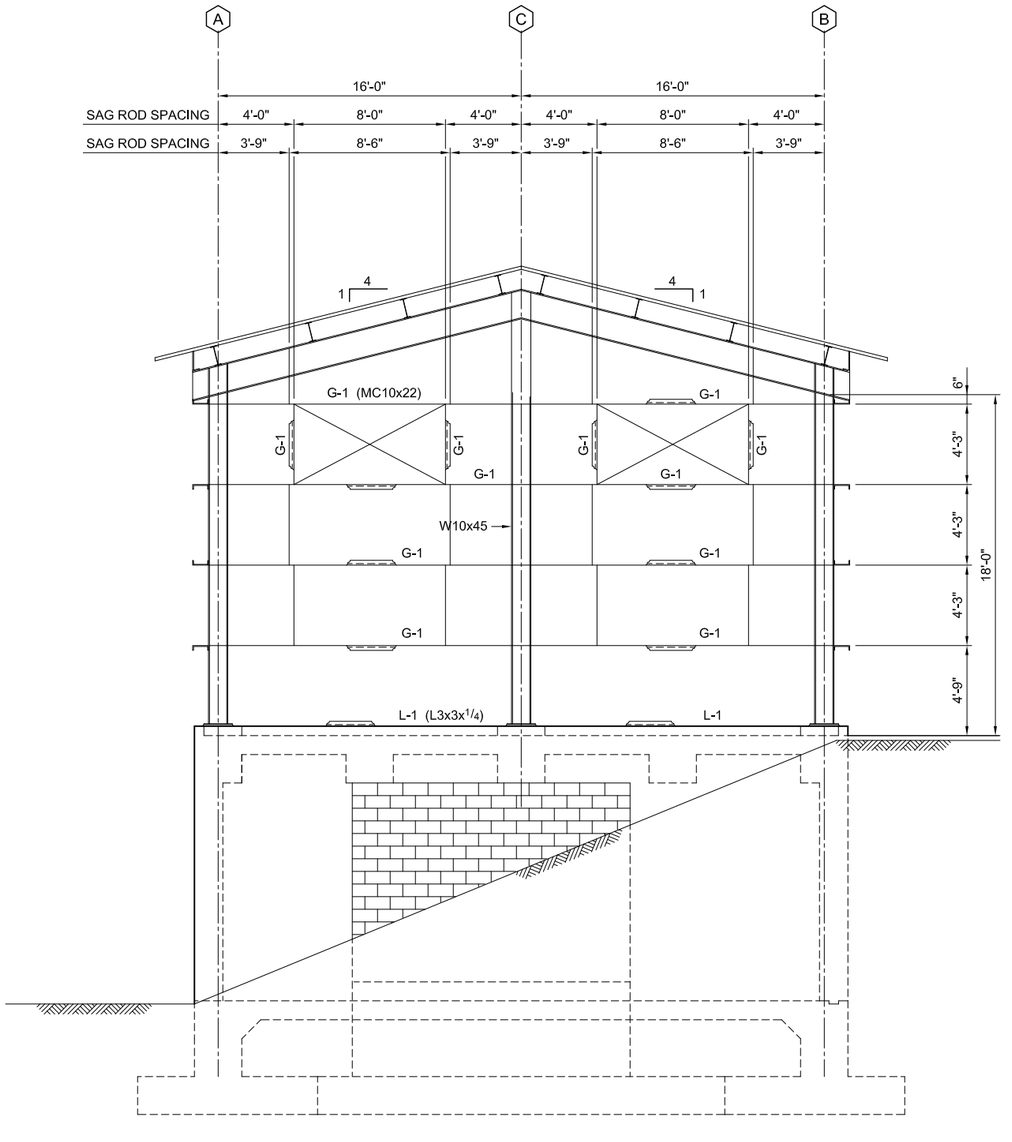
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED
WATER CONDITIONING PLANT
ROOF FRAMING PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-12-04	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-SAXXX-1204.dwg

N1808





KEY NOTES:

1. 1
2. 2
3. 3

NORTH ELEVATION - AT COLUMN LINE A

1/4" = 1'-0"

WEST ELEVATION - AT COLUMN LINE 3

1/4" = 1'-0"

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

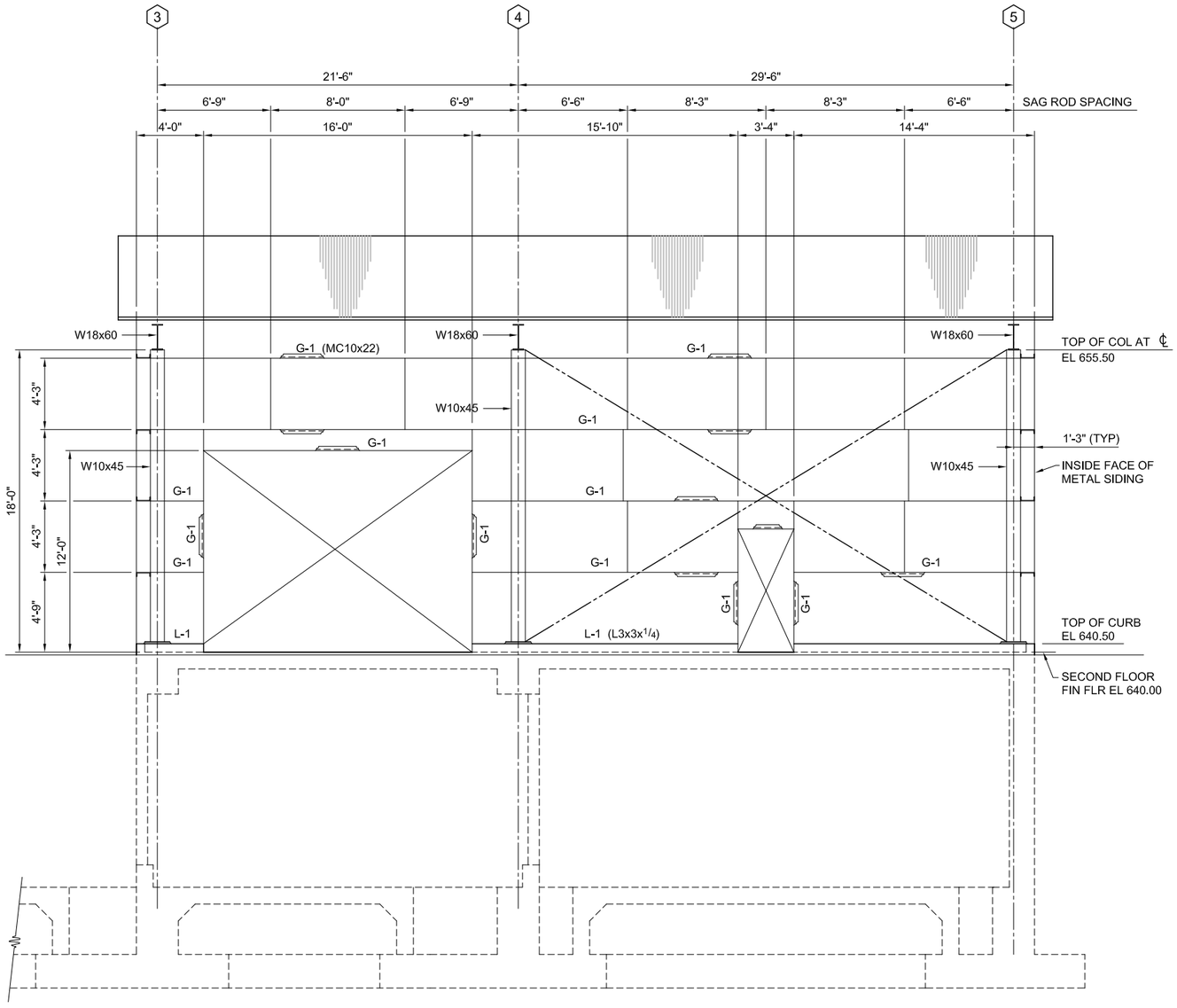
REVISIONS

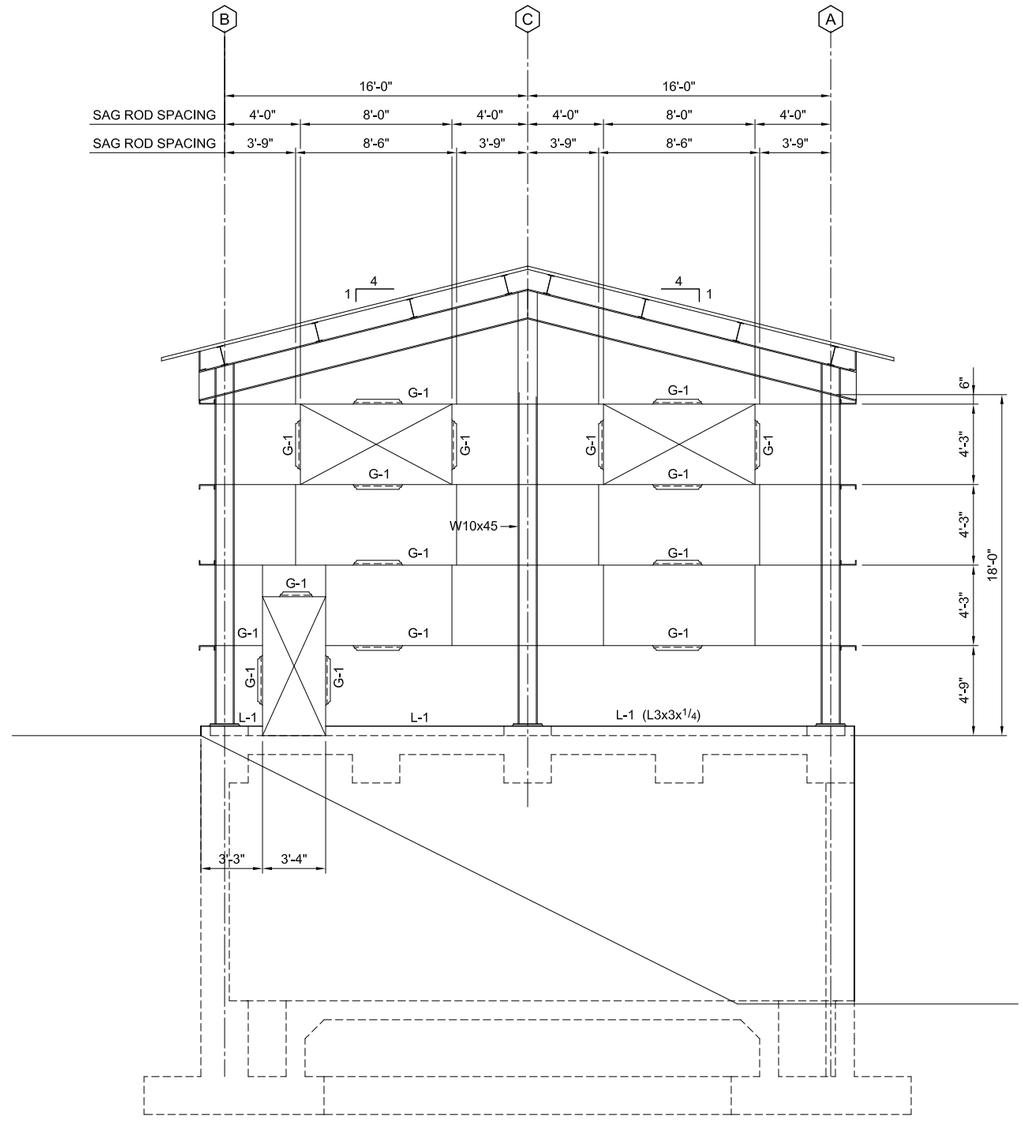
APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED
WATER CONDITIONING PLANT
WALL FRAMING ELEVATIONS
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-12-05	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1205.dwg





SOUTH ELEVATION - AT COLUMN LINE (B)

1/4" = 1'-0"

KEY NOTES:

(1) 1
(2) 2
(3) 3

EAST ELEVATION - AT COLUMN LINE (5)

1/4" = 1'-0"

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
		REVISIONS					

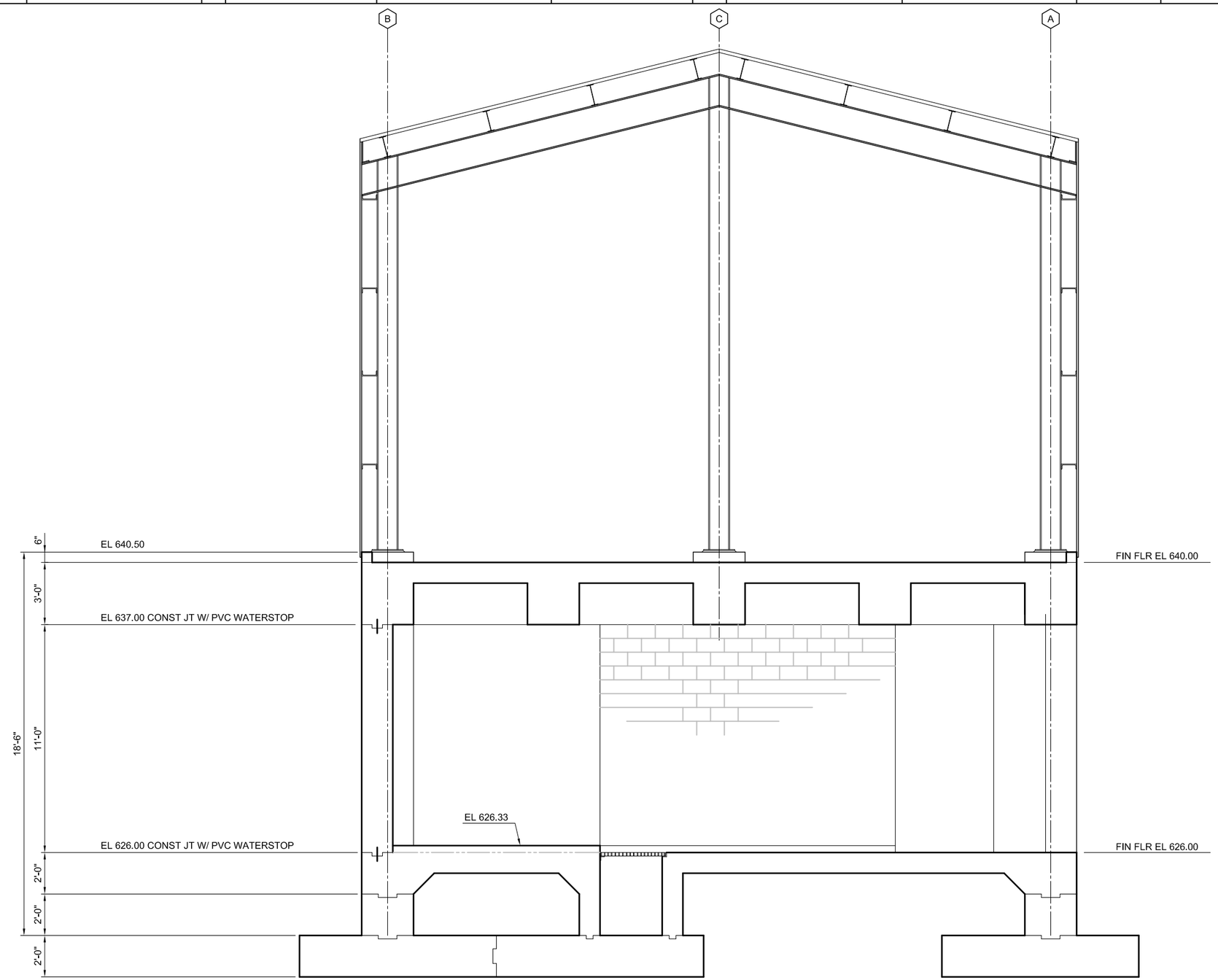
APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED
WATER CONDITIONING PLANT
WALL FRAMING ELEVATIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	REV
S-12-06	

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1206.dwg

N1808



A SECTION
X 3/8" = 1'-0"

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

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

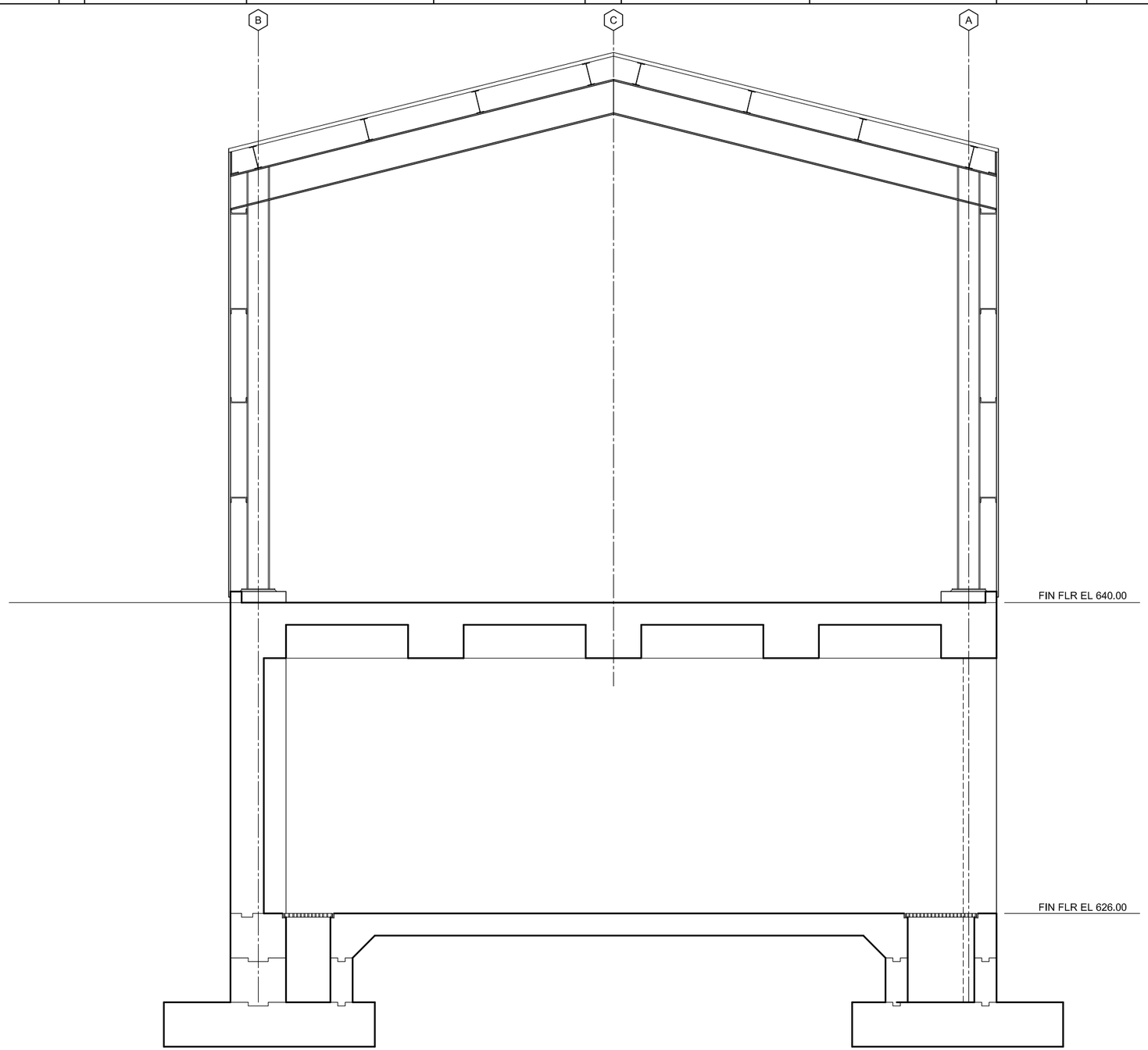
APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTION
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-12-07	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1207.dwg

FOLD
FOL
N1808



A SECTION
X
3/8" = 1'-0"

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

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

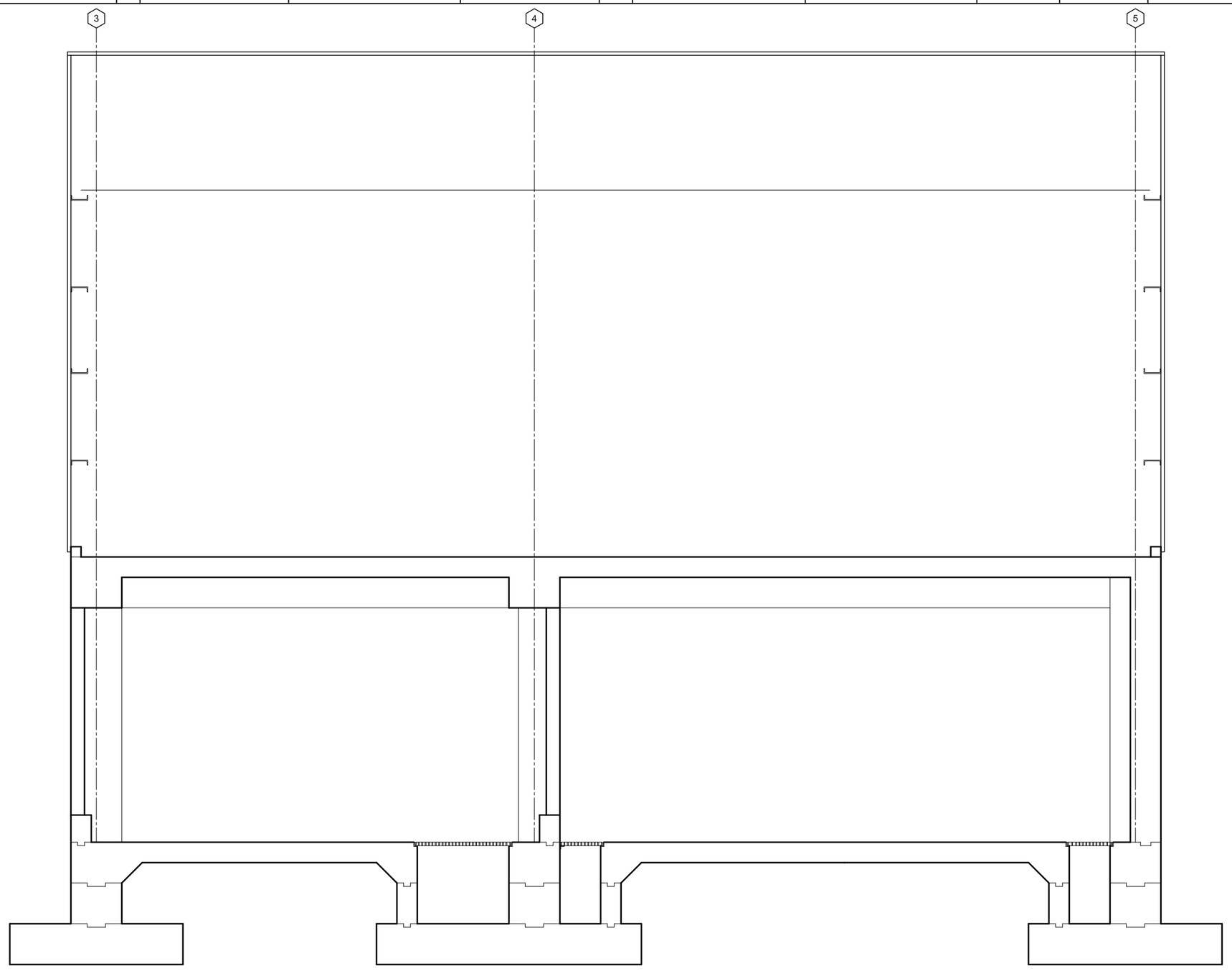
APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED WATER CONDITIONING PLANT BUILDING SECTION
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-12-08	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1208.dwg

FOLD
FOL
N1808



A SECTION
3/8" = 1'-0"

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
		REVISIONS					

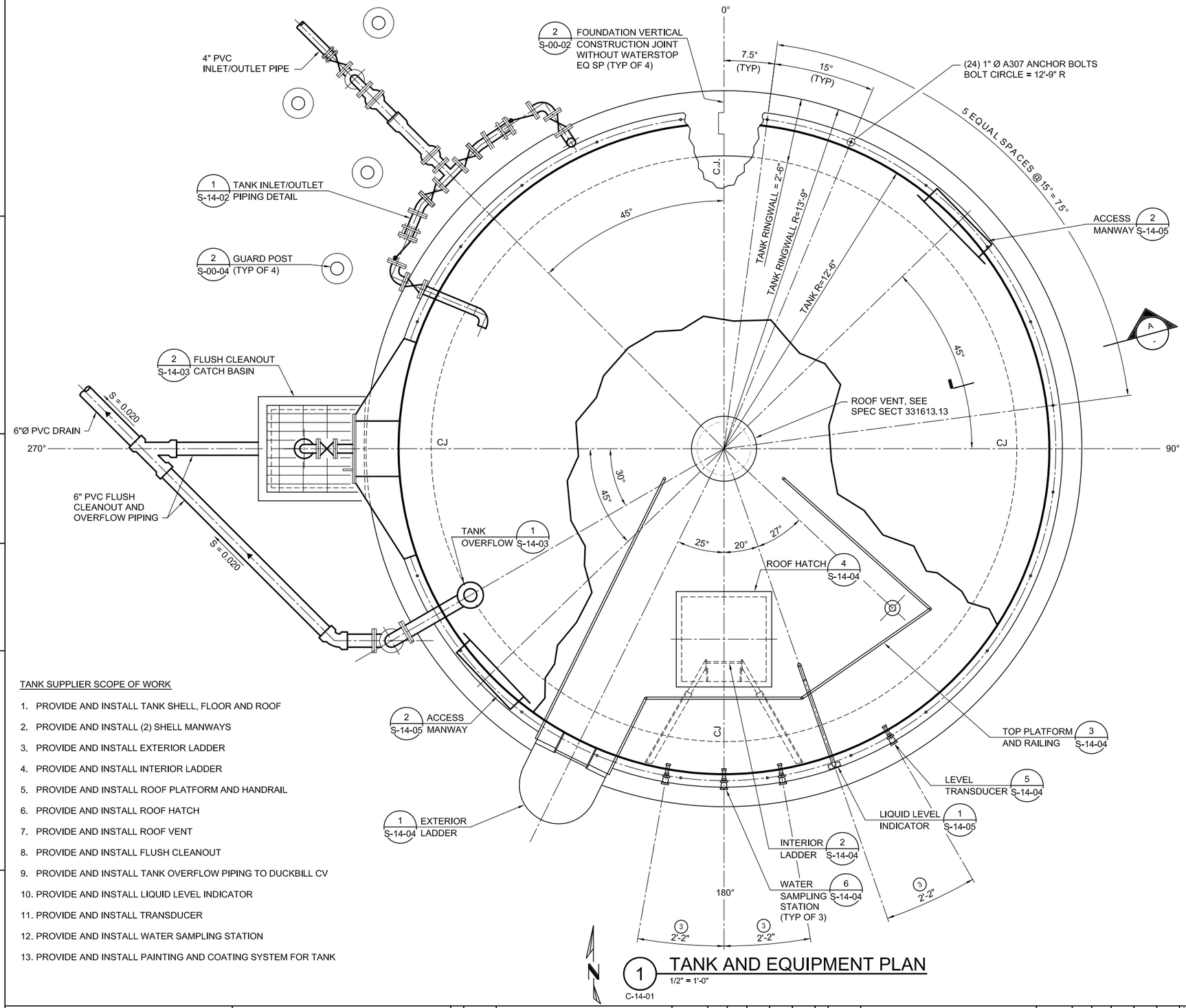
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD WTH
	OK PT
	DATE 4/5/13
	SCALES

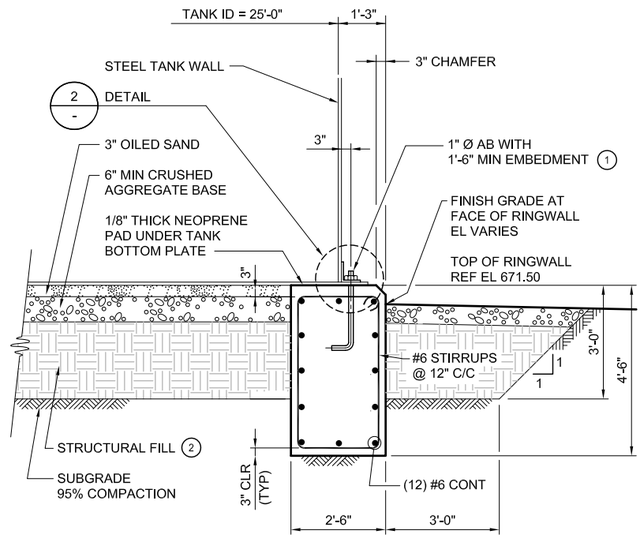
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY - PRODUCED
WATER CONDITIONING PLANT
BUILDING SECTION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
S-12-09	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1209.dwg



1 TANK AND EQUIPMENT PLAN
1/2" = 1'-0"
C-14-01



A SECTION
1/2" = 1'-0"
A -

2 DETAIL
1" = 1'-0"
-

TANK SUPPLIER SCOPE OF WORK

1. PROVIDE AND INSTALL TANK SHELL, FLOOR AND ROOF
2. PROVIDE AND INSTALL (2) SHELL MANWAYS
3. PROVIDE AND INSTALL EXTERIOR LADDER
4. PROVIDE AND INSTALL INTERIOR LADDER
5. PROVIDE AND INSTALL ROOF PLATFORM AND HANDRAIL
6. PROVIDE AND INSTALL ROOF HATCH
7. PROVIDE AND INSTALL ROOF VENT
8. PROVIDE AND INSTALL FLUSH CLEANOUT
9. PROVIDE AND INSTALL TANK OVERFLOW PIPING TO DUCKBILL CV
10. PROVIDE AND INSTALL LIQUID LEVEL INDICATOR
11. PROVIDE AND INSTALL TRANSDUCER
12. PROVIDE AND INSTALL WATER SAMPLING STATION
13. PROVIDE AND INSTALL PAINTING AND COATING SYSTEM FOR TANK

KEY NOTES:

(1) PROVIDE WASHER AND NUT. NUT SHALL BE FINGER TIGHT ONLY, DO NOT TORQUE IT.

(2) ALL EXISTING SOIL TO THE ELEVATION OF 668.50 SHALL BE REMOVED AND BACKFILLED WITH STRUCTURAL FILL MATERIAL PER SPECS AND AS INDICATED ON DRAWINGS.

(3) MEASURED ALONG OUTSIDE FACE OF TANK WALL.

DRAFT
NOT FOR
CONSTRUCTION

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

CH2MHILL®

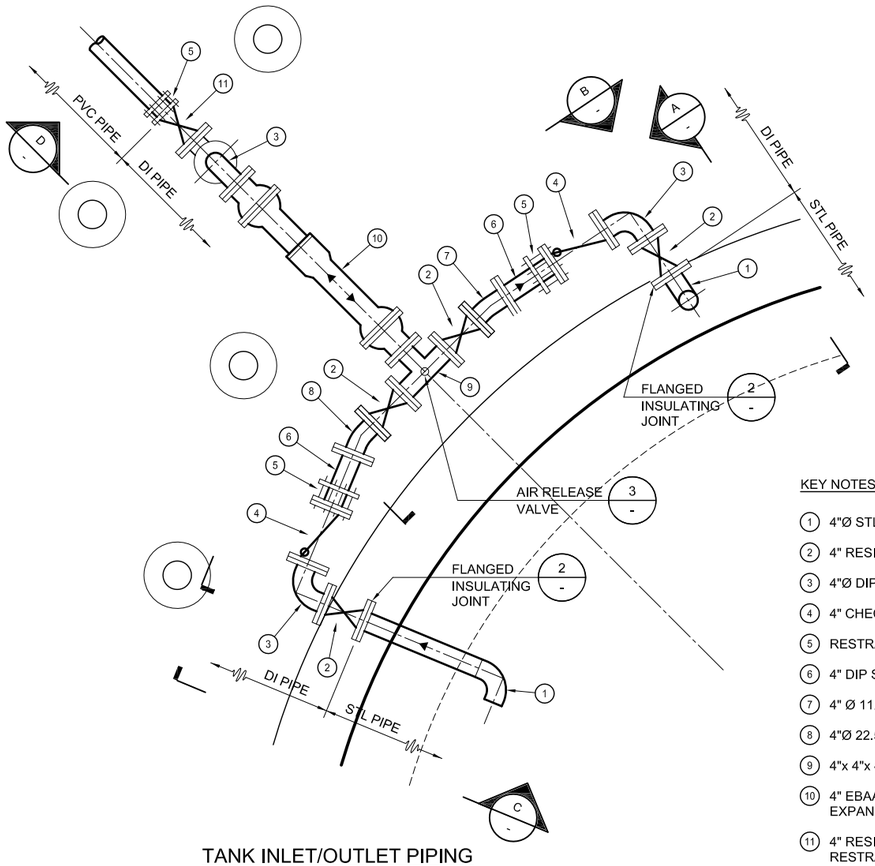
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY		
	SO	
	SUPV	
	DSGN	KJD
	DWN	WTH
	CHKD	VMB
	OK	PT
	DATE	4/5/13
	SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK MECHANICAL PLAN AND 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-14-01	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1401.dwg

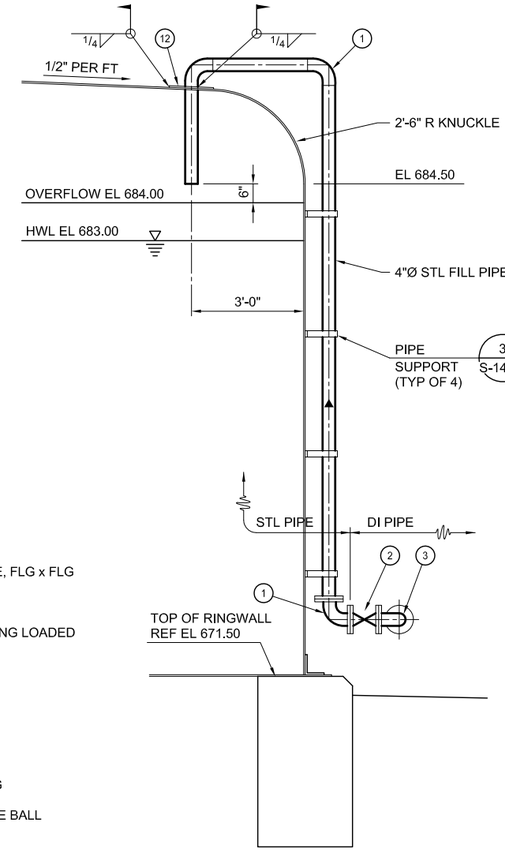


TANK INLET/OUTLET PIPING

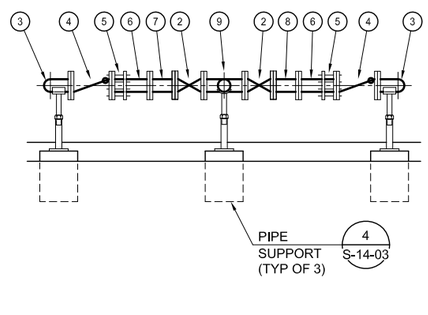
1 DETAIL
3/4" = 1'-0"
S-14-01

KEY NOTES:

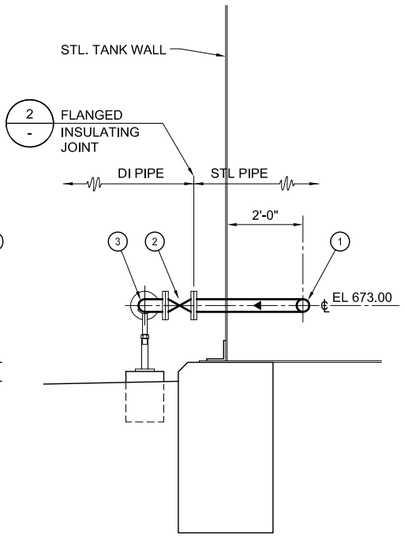
1. 4"Ø STL 90° LR ELL
2. 4" RESILIENT WEDGE GATE VALVE, FLG x FLG
3. 4"Ø DIP 90° ELL, FLG x FLG
4. 4" CHECK VALVE, EXTERNAL SPRING LOADED
5. RESTRAINED FCA
6. 4" DIP SPOOL PIECE
7. 4" Ø 11.25° ELL, FLG x FLG
8. 4"Ø 22.5° ELL, FLG x FLG
9. 4"x 4"x 4" DIP TEE, FLG x FLG x FLG
10. 4" EBAA IRON "FLEXTEND" DOUBLE BALL EXPANSION JOINT, FLG x FLG
11. 4" RESILIENT WEDGE GATE VALVE, FLG x MJ RESTRAINED
12. 3/8" MIN THICK STEEL PLATE, 14" OD



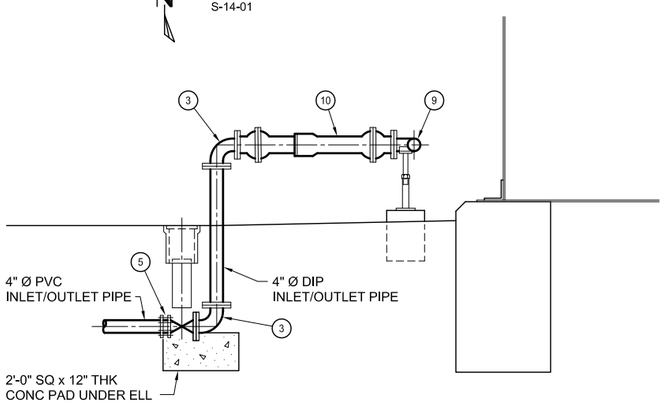
A SECTION
1/2" = 1'-0"



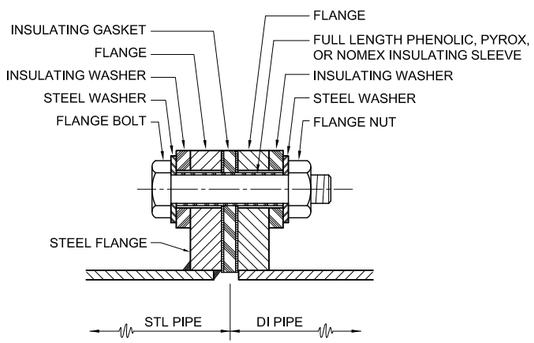
B SECTION
1/2" = 1'-0"



C SECTION
1/2" = 1'-0"

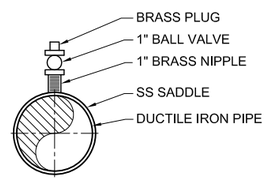


D SECTION
1/2" = 1'-0"



FLANGED INSULATING JOINT

2 DETAIL
NTS



AIR RELEASE VALVE

3 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

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

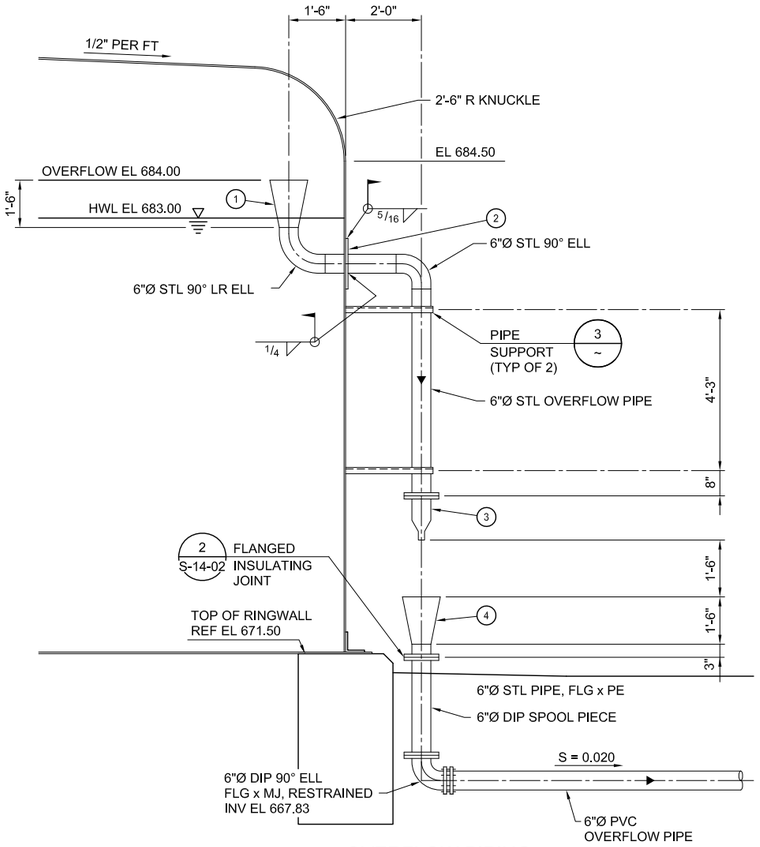
APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK SECTIONS AND 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-14-02	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1402.dwg

N180B



OVERFLOW PIPING

1 DETAIL — 1/2" = 1'-0"

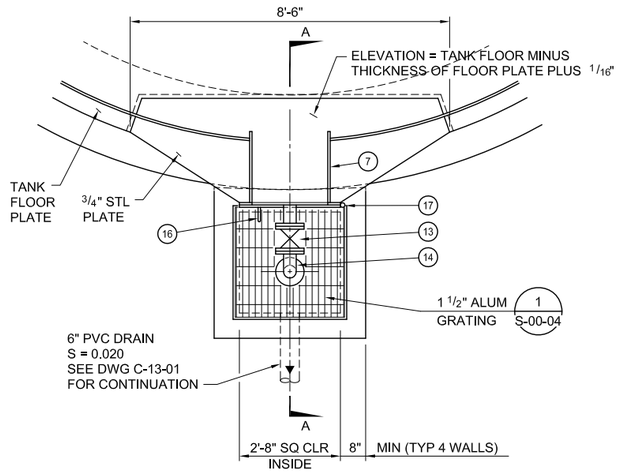
S-14-01

KEY NOTES:

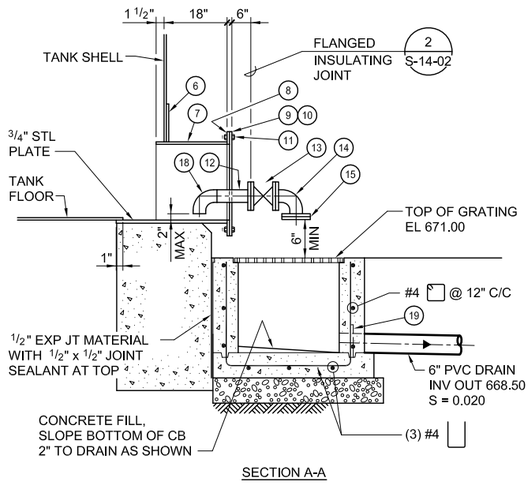
1. 12" x 6" STEEL CONE, 3/8" WALL
2. 3/8" MIN THK STL PLATE, 16" OD
3. ONYX VALVE CO 6" FLANGED "DUCKBILL" CHECK VALVE, SERIES DBCP
4. 12" x 6" STEEL CONE, 3/8" WALL, EPOXY COATED WITH SS 316 BIRDSCREEN ON WIDE END (TOP)
5. NOT USED
6. STL PLATE, 0.625"x 36"H x 72", CUT AS SHOWN
7. STL PLATE, 0.625"x 16 1/2"x 65", ROLL AND TRIM
8. STL PLATE, 1/2"x 31 3/4"x 32", CUT AND DRILL BOLT HOLES
9. FULL FACE GASKET, 1/8" WITH HOLES TO MATCH ITEM 8
10. STL PLATE, 5/8"x 31 3/4"x 32", OD AND BOLTHOLES MATCH ITEM NUMBER 8
11. (36) 3/4"Ø SS 316 BOLT, NUT AND FLAT WASHER, 3/4-10 UNC x 2 1/2" LONG
12. WELD TO FACE PLATE: STL PIPE, 6" SCH 80 x 9 3/4" LONG WITH 4" 150# FLANGE
13. 6" GATE VALVE, FLG x FLG
14. 6" DIP 90° ELL, FLG x FLG
15. 6" OPEN FLANGE WITH SS 316 MESH BIRDSCREEN BOLTED BETWEEN FLANGES
16. STL. ROUND BAR HANDLE, 3/4"x 13" LONG BENT AS SHOWN
17. SS HEAVY DUTY HINGE
18. 6" STL 90° ELL, PE x PE
19. PRE-FORMED PLASTIC ADHESIVE WATERSTOP WRAPPED AROUND PIPE

NOTES:

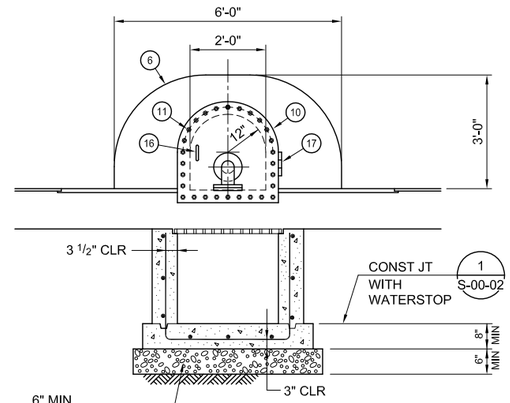
1. DIMENSIONS, WELDING, AND DETAILS NOT SHOWN SHALL BE AS PER TANK MANUFACTURER'S APPROVED SUBMITTALS.



PLAN VIEW



SECTION A-A

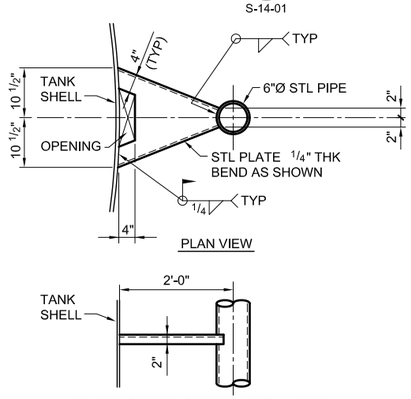


FRONT VIEW

FLUSH CLEANOUT

2 DETAIL — 1/2" = 1'-0"

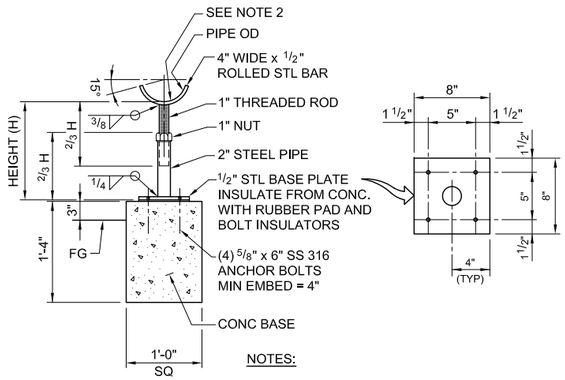
S-14-01



PIPE SUPPORT SIDE VIEW

3 DETAIL — 3/4" = 1'-0"

-



NOTES:

1. GALVANIZE ENTIRE ASSEMBLY AFTER FABRICATION.
2. PROVIDE 1/8" THK. NEOPRENE PAD BETWEEN DI PIPE AND SUPPORT.

PIPE SUPPORT - PS-1

4 DETAIL — 3/4" = 1'-0"

S-14-02

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

REVISIONS

APPROVED BY		
	SO	
	SUPV	
	DSGN	KJD
	DWN	WTH
	CHKD	VMB
	OK	PT
	DATE	4/5/13
	SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK
SECTIONS AND DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

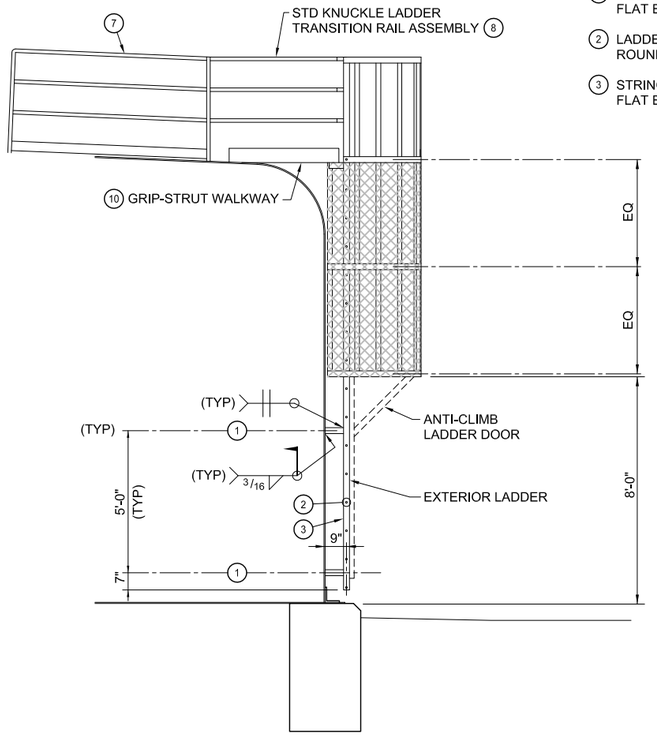
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
S-14-03	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1403.dwg

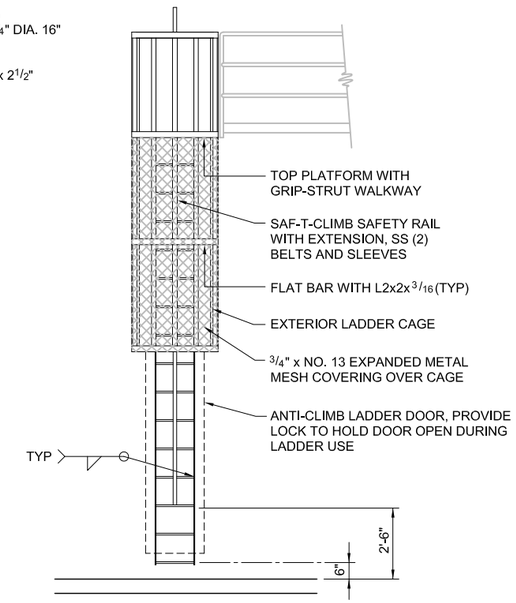
FOLD
N1808

KEY NOTES:

1. 4 SETS, LADDER LEG FLAT BAR $^3/_8$" x 2$^1/_2$" x 7$^3/_4$"
2. LADDER RUNG ROUND BAR $^3/_4$" DIA. 16"
3. STRINGER FLAT BAR $^3/_8$" x 2$^1/_2$"



SIDE VIEW



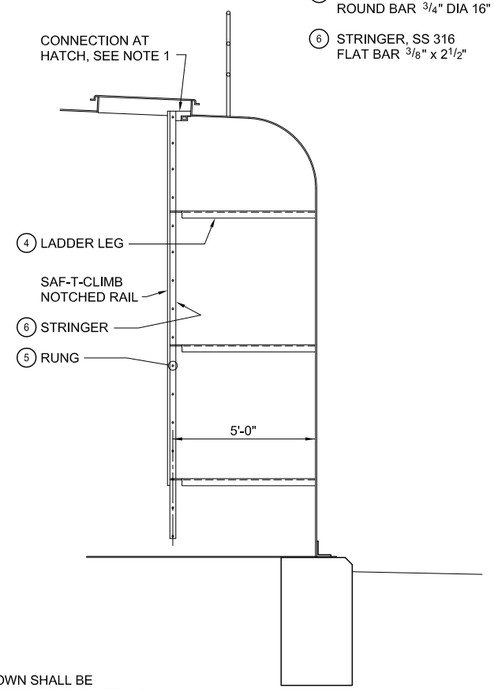
FRONT VIEW

NOTES:

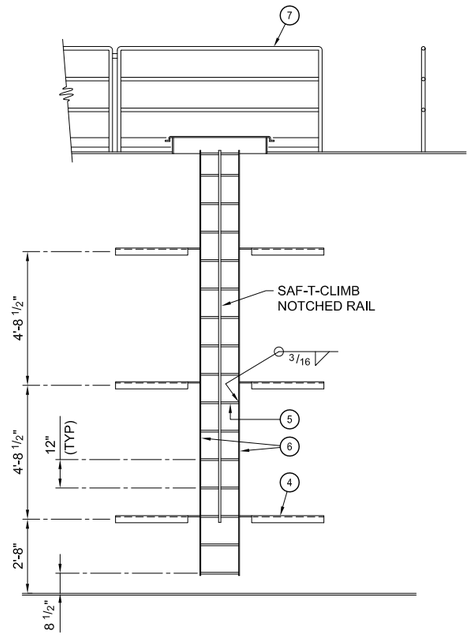
1. DIMENSIONS AND DETAILS NOT SHOWN SHALL BE AS PER TANK MANUFACTURER'S APPROVED SUBMITTALS.

KEY NOTES:

4. 3 SETS, LADDER LEG, SS 316 FLAT BAR $^3/_8$" x 2$^1/_2$" x 7$^3/_4$"
5. LADDER RUNG, SS 316 ROUND BAR $^3/_4$" DIA 16"
6. STRINGER, SS 316 FLAT BAR $^3/_8$" x 2$^1/_2$"



SIDE VIEW



FRONT VIEW

EXTERIOR LADDER

1 DETAIL
3/8" = 1'-0"
S-14-01

INTERIOR LADDER

2 DETAIL
3/8" = 1'-0"
S-14-01

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK SECTIONS AND DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

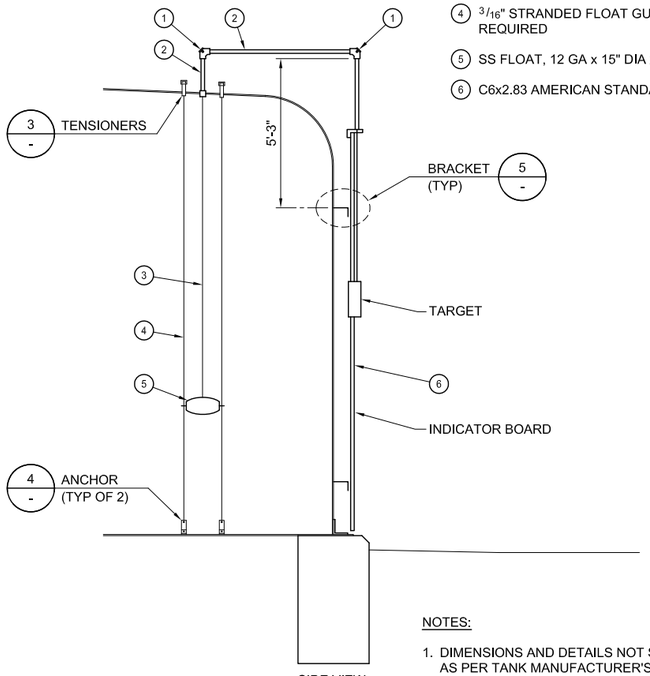
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
S-14-04	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1404.dwg

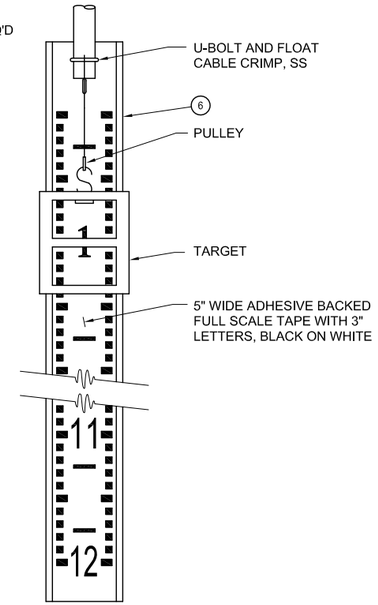
N1808

KEY NOTES:

1. 1 1/2" TANK PRODUCTS SS 90° SHEAVE ELBOW
2. 1 1/2" SS SCH 40 PIPE NIPPLE
3. 3/64" STRANDED FLOAT CABLE SS, LENGTH AS REQ'D
4. 3/16" STRANDED FLOAT GUIDE WIRES, LENGTH AS REQUIRED
5. SS FLOAT, 12 GA x 15" DIA x 6 1/2"
6. C6x2.83 AMERICAN STANDARD CHANNEL ALUM



SIDE VIEW



FRONT VIEW

NOTES:

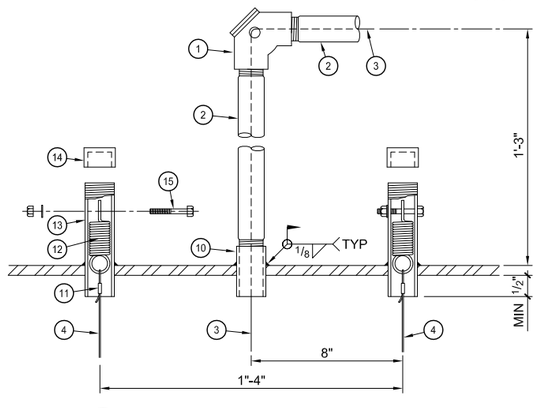
1. DIMENSIONS AND DETAILS NOT SHOWN SHALL BE AS PER TANK MANUFACTURER'S APPROVED SUBMITTALS.
2. ALL STAINLESS STEEL SHALL BE SS 316.

LIQUID LEVEL INDICATOR (HALF SCALE LEVEL GAUGE)

1 DETAIL
3/8" = 1'-0"
S-14-01

KEY NOTES:

7. SS FLAT BAR, 1/4" x 1 1/2 " x 3 1/2" LONG
8. A36 FLAT BAR, 1/4" x 1 1/2" x 2" LONG
9. ISOLATION KIT WITH 1/2" x 1 1/2" BOLT AND NUT, SS/NYLON
10. 1 1/2" x 150# SS HALF COUPLING
11. SS CABLE CRIMP, (2) REQUIRED
12. 1" OD x 3 1/2" x .105 SS EXTENSION SPRING (2) REQUIRED
13. 1 1/4" SS SCH 40 PIPE x 6" LONG (2) REQUIRED)
14. 1 1/4" x 150# SS THREADED PIPE CAP (2) REQUIRED
15. SS BOLT AND NUT 1/4" x 2" LONG WITH LOCK WASHER, (2) REQUIRED



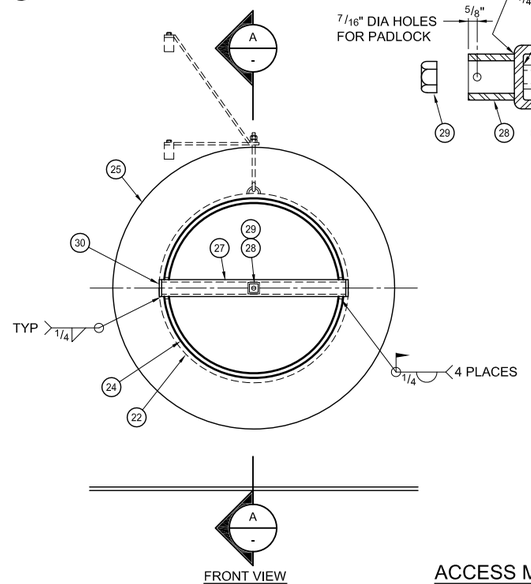
3 DETAIL - TENSIONERS
3" = 1'-0"

NOTES:

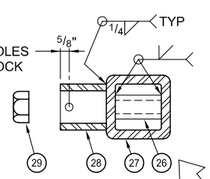
1. ALL STAINLESS STEEL SHALL BE SS 316.

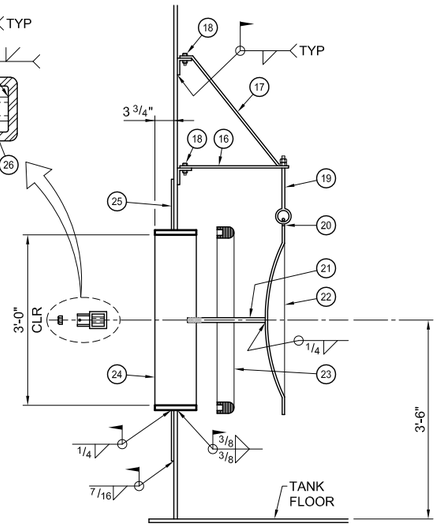
KEY NOTES:

16. FLAT BAR SS 316 3/8"x 28" LONG
17. FLAT BAR SS 316 3/8"x 45" LONG
18. ANGLE SS 316, 3"x 3"x 3/8"x 2" LONG WITH: BOLT SS 316, 1/2"-13 NC x 1 1/2" LONG WITH NYLOCK NUT AND WASHER
19. EYEBOLT SS 316, 3/8"x 12" WITH (2) NUTS
20. HALF RING SS 316, 5/16"x 2 1/4"
21. ROUND BAR STL, 3/4" DIA x LENGTH AS REQ'D WITH 3" NC TOE
22. 40 x 32 FLARED AND DISHED STL PLATE HEAD, 3/8"x 32" DISH RADIUS, 4" FLANGE
23. C RING GASKET, 1/4"x 35" ID 60 DURO-HARD
24. STL PLATE, 1"x 8 1/2"x 9'-8 1/4" LONG ROLLED TO 36" ID
25. STL PLATE, 7/16"x 59 1/2" OD x SHOP TRACE ID (ITEM NO. 9 OD)
26. PIPE SS 304, 3/4"x STD WT x 3" LONG
27. STL TUBE STRUCT, 3"x 3"x 1/4"x 39" LONG
28. STL TUBE SQ, 2 1/2"x 2 1/2"x 3/16"x 3" LONG WITH 7/16"Ø HOLES
29. BRONZE NUT, 3/4" HEAVY HEX AND WASHER
30. STL FLAT BAR, 2 1/2 "x 1/4 "x 2 1/2 " LONG



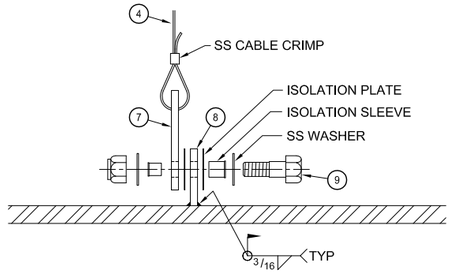
ACCESS MANWAY



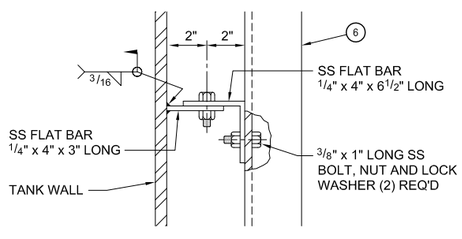


SECTION A-A

2 DETAIL
3/4" = 1'-0"
S-14-01



4 DETAIL - ANCHOR
3" = 1'-0"



5 DETAIL - BRACKET
3" = 1'-0"

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

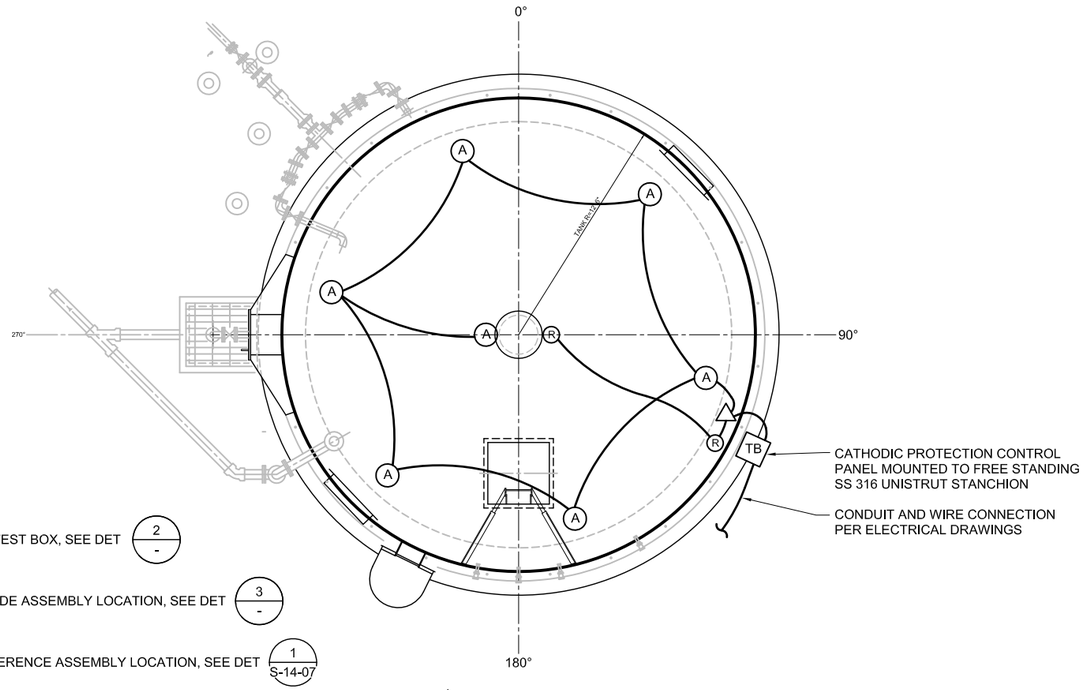
REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER
STORAGE TANK
SECTIONS AND 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-14-05	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1405.dwg
N1808



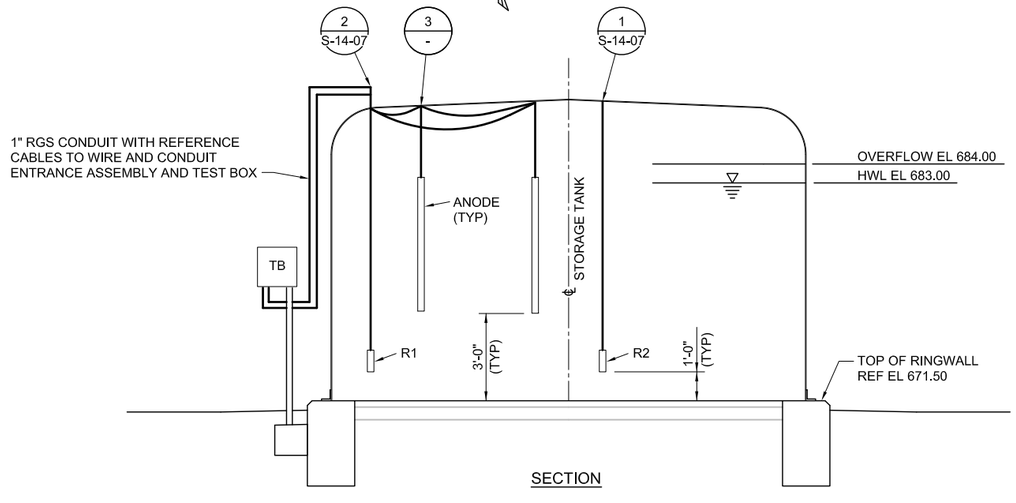
CATHODIC PROTECTION CONTROL PANEL MOUNTED TO FREE STANDING SS 316 UNISTRUT STANCHION

CONDUIT AND WIRE CONNECTION PER ELECTRICAL DRAWINGS

LEGEND

- TB — CP TEST BOX, SEE DET 2/-
- A — ANODE ASSEMBLY LOCATION, SEE DET 3/-
- R — REFERENCE ASSEMBLY LOCATION, SEE DET 1/S-14-07
- △ — WIRE AND CONDUIT ENTRANCE ASSEMBLY 2/S-14-07

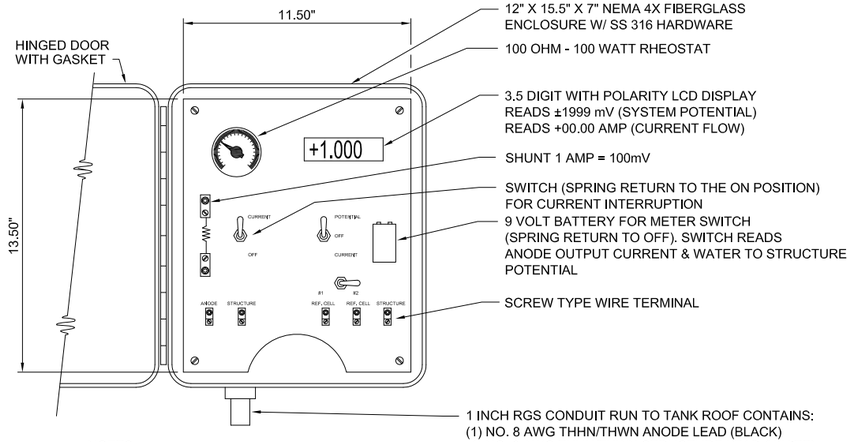
PLAN



SECTION

CATHODIC PROTECTION

1 DETAIL
1/4" = 1'-0"



12" X 15.5" X 7" NEMA 4X FIBERGLASS ENCLOSURE W/ SS 316 HARDWARE

100 OHM - 100 WATT RHEOSTAT

3.5 DIGIT WITH POLARITY LCD DISPLAY
READS ±1999 mV (SYSTEM POTENTIAL)
READS +00.00 AMP (CURRENT FLOW)

SHUNT 1 AMP = 100mV

SWITCH (SPRING RETURN TO THE ON POSITION) FOR CURRENT INTERRUPTION

9 VOLT BATTERY FOR METER SWITCH (SPRING RETURN TO OFF). SWITCH READS ANODE OUTPUT CURRENT & WATER TO STRUCTURE POTENTIAL

SCREW TYPE WIRE TERMINAL

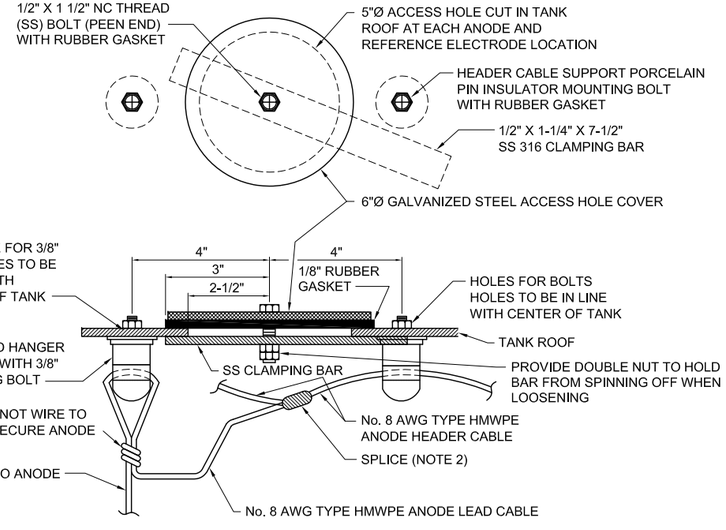
1 INCH RGS CONDUIT RUN TO TANK ROOF CONTAINS:
(1) NO. 8 AWG THHN/THWN ANODE LEAD (BLACK)
(1) NO. 8 AWG THHN/THWN STRUCTURE LEAD (WHITE)
(2) NO. 14 AWG HMWPE ELECTRODE LEAD (BLACK)
(1) NO. 12 AWG THHN/THWN STRUCTURAL SENSE (WHITE)

NOTES:

1. CABINET IS NEMA 4X FIBERGLASS WITH STAINLESS STEEL HINGE AND LATCH SUITABLE FOR PADLOCK.
2. FOR TEST BOX INSTALLATION SEE DETAIL 3, DWG S-14-07.

TEST BOX

2 DETAIL
NTS



NOTES:

1. 5"Ø HANDHOLES AND TEST HOLES CUT, GROUND SMOOTH AND COATED.
2. COPPER ALLOY C-TAP CRIMP CONNECTOR, COVER CONNECTION WITH (2) LAYERS OF HALF-LAPPED RUBBER SEALING TAPE AND (2) LAYERS OF HALF LAPPED VINYL ELECTRIC TAPE.
3. ALL HARDWARE SHALL BE SS 316.

ANODE SUPPORT HANGER AND HANDHOLE ASSEMBLY

3 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

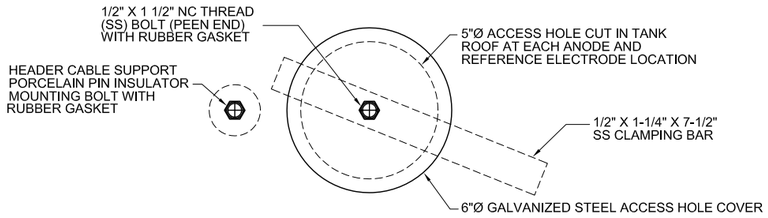
REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	WTH
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK CATHODIC PROTECTION
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-14-06	REV

FILENAME: E2-S-XXX-1406.dwg
PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FOLD
N1808

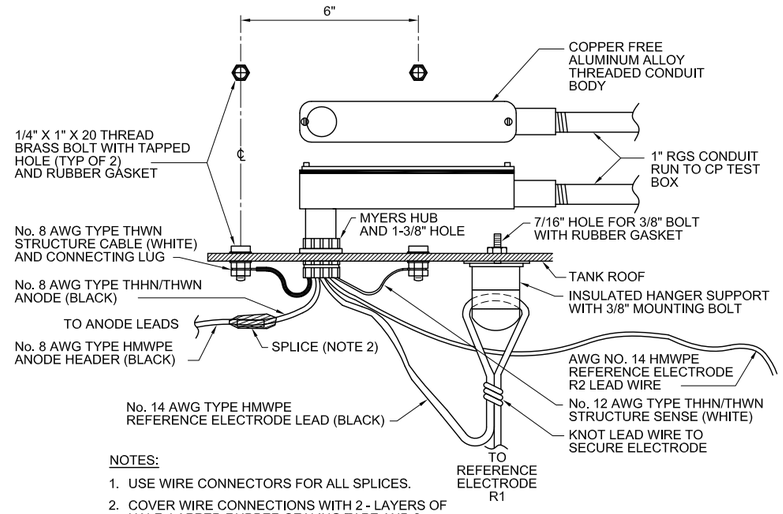


NOTES:

1. 5"Ø HANDHOLES AND TEST HOLES CUT, GROUND SMOOTH AND COATED.
2. ALL HARDWARE SHALL BE SS 316.

REFERENCE ELECTRODE SUPPORT HANGER ASSEMBLY

1 DETAIL NTS
S-14-06

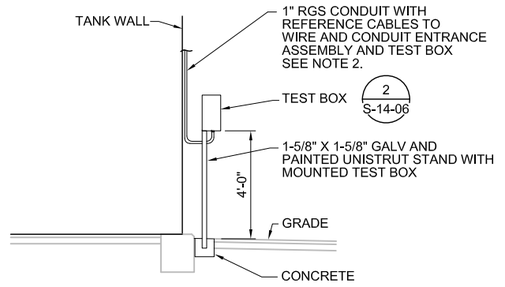


NOTES:

1. USE WIRE CONNECTORS FOR ALL SPLICES.
2. COVER WIRE CONNECTIONS WITH 2 - LAYERS OF HALF LAPPED RUBBER SEALING TAPE AND 2 - LAYERS OF HALF LAPPED VINYL ELECTRIC TAPE.
3. PROVIDE 1-3/8" HOLE FOR MYERS HUB.
4. PROVIDE A HANDHOLE AND COVER AT EACH REFERENCE ELECTRODE HANGER AS PER DETAIL 1, DWG M-8.
5. ALL HARDWARE SHALL BE SS 316 WITH RUBBER GASKETS AS REUIRED.

WIRE AND CONDUIT ENTRANCE ASSEMLY

2 DETAIL NTS
S-14-06



NOTES:

1. TEST BOX SHALL BE LOCATED ON SOUTH SIDE OF THE LIGHT POLE AND FREE OF OBSTRUCTION A MINIMUM OF 20" ON EACH SIDE OF BOX.
2. LADDER STAND-OFFS USED TO SUPPORT CONDUIT TO TANK ROOF.
3. UNISTRUT TO BE PLACED IN 18" SQ x 18" DEEP CONCRETE.

TEST BOX INSTALLATION

3 DETAIL NTS
S-14-06

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

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN KJD
	DWN WTH
	CHKD VMB
	OK PT
	DATE 4/5/13
	SCALES

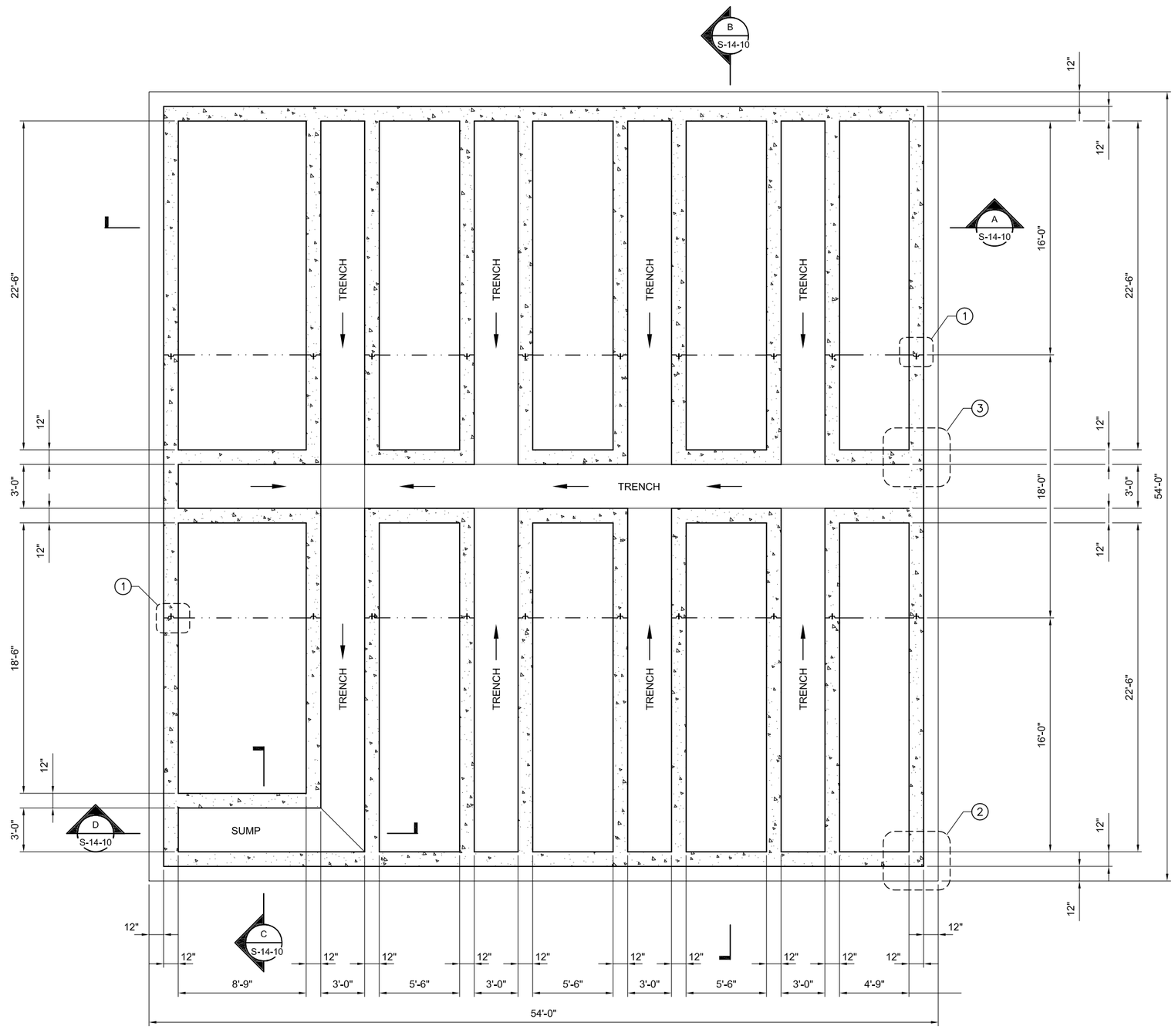
TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK CATHODIC PROTECTION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
S-14-07	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1407.dwg

NOTES:

1. WALL VERTICAL CONSTRUCTION JOINT WITH PVC WATERSTOP. SEE DETAIL 3 / S-00-02
2. CORNER REINFORCING, SEE DETAIL 5 / S-00-02
3. T-CORNER REINFORCING, SEE DETAIL 5 / S-00-02



FOUNDATION PLAN

1/4" = 1'-0"

0 4' 8' 12'

SCALE: 1/4"=1'

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

REVISIONS

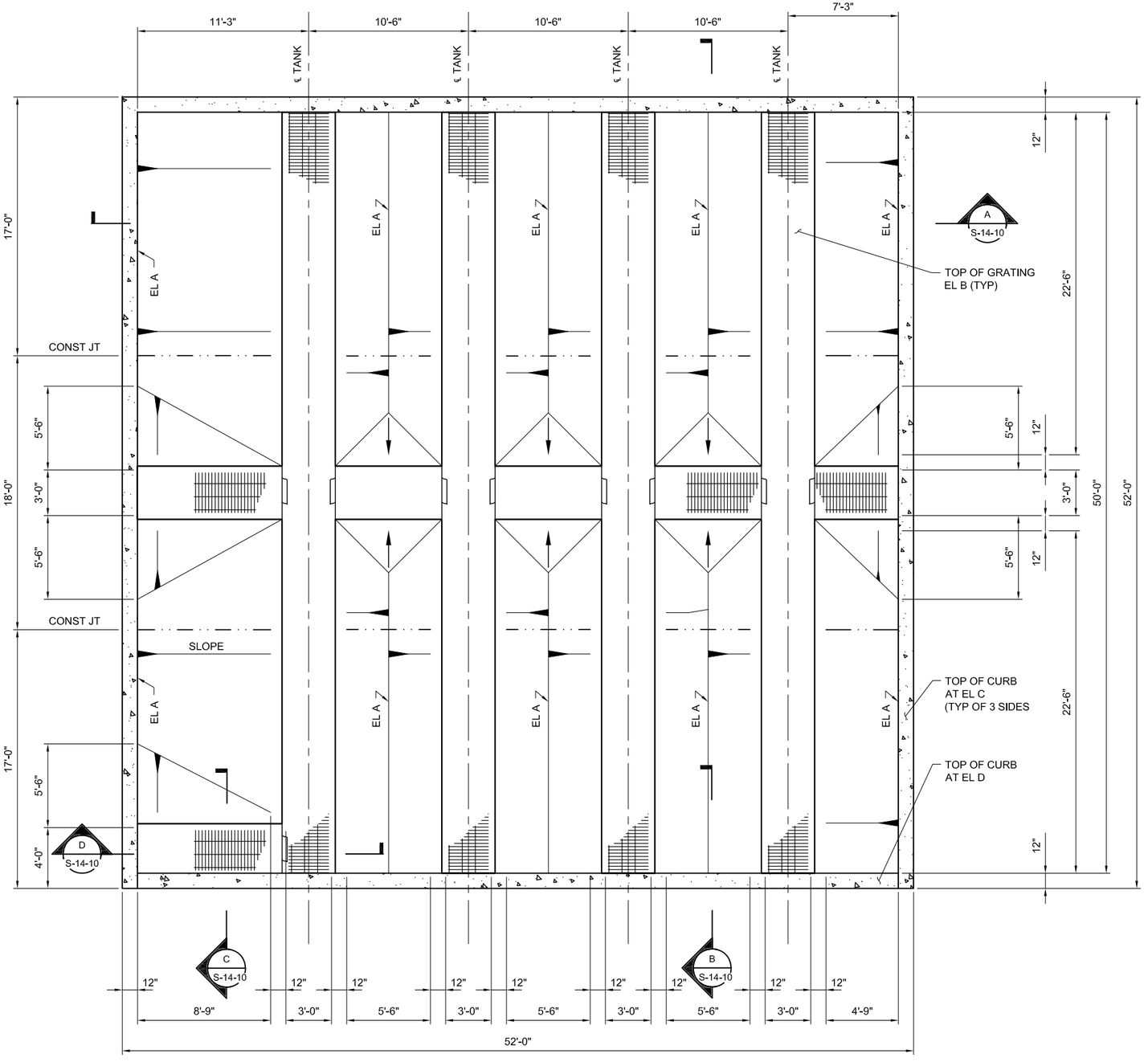
APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	1/4"=1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK FARM
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-14-08	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1408AD.dwg

TABLE OF ELEVATIONS		
EL.	ELEVATIONS(FT)	REMARKS
A	609.17	TOP OF CONCRETE
B	609.00	TOP OF GRATING
C	609.50	TOP OF CURB
D	609.17	TOP OF CURB
E	608.00	BOTTOM OF SLAB ON GRADE



FLOOR PLAN

1/4" = 1'-0"

0 4' 8' 12'

SCALE: 1/4"=1'

DRAFT
NOT FOR
CONSTRUCTION

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

CH2MHILL®

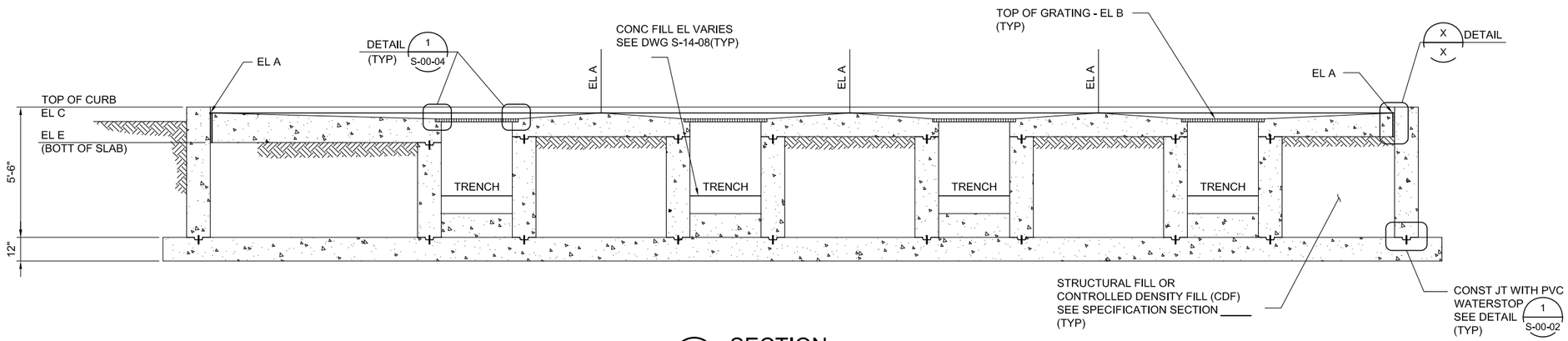
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
		REVISIONS					

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	9/12/12
SCALES	1/4"=1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK FARM FLOOR 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-14-09	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-SXXX-1409AD.dwg



A SECTION

3/8" - 1'-0"

S-14-08
S-14-09

0 3' 6' 9'

SCALE: 3/8"=1'

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

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	KJD
DWN	MD
CHKD	VMB
OK	PT
DATE	4/5/13
SCALES	1/4"=1'-0"

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE
TANK FARM
SECTIONS AND 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-14-10	REV

PLOT DATE: $PLOTDATE PLOT TIME: $PLOTTIME
FILENAME: E2-S-XXX-1410AD.dwg

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

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

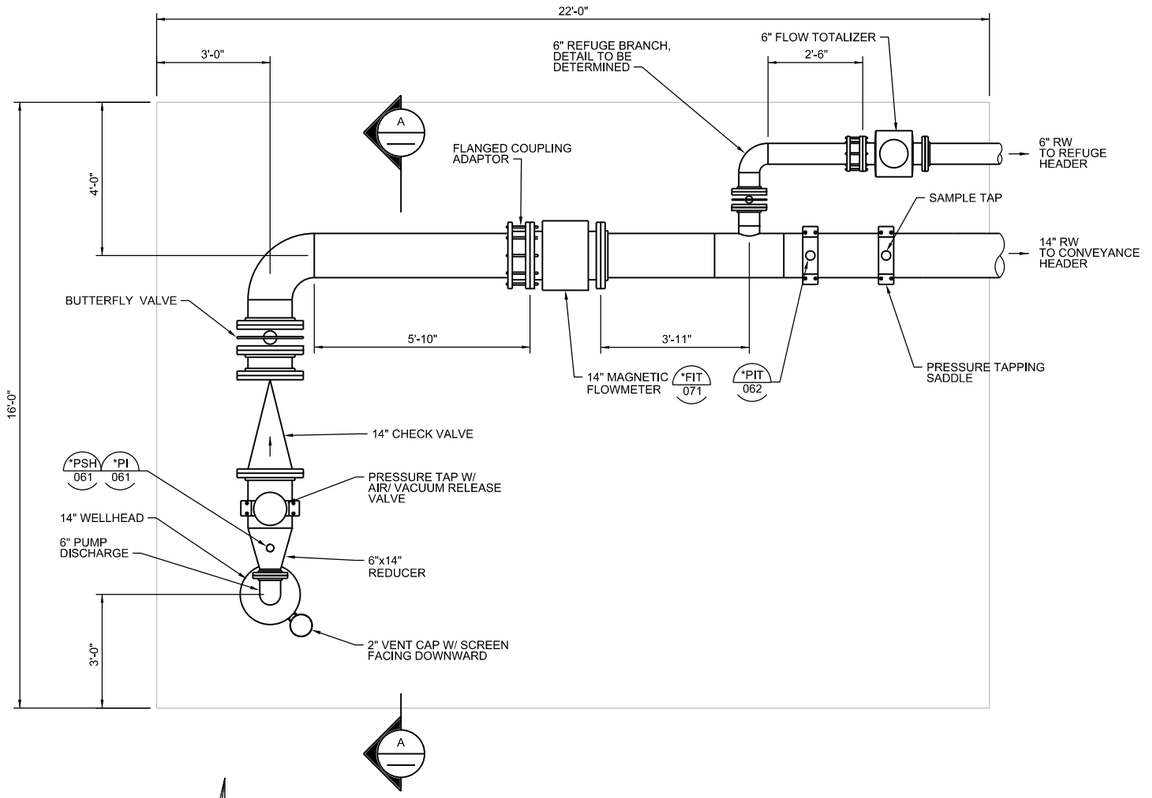
WELL CONSTRUCTION SCHEDULE

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-00-01	REV

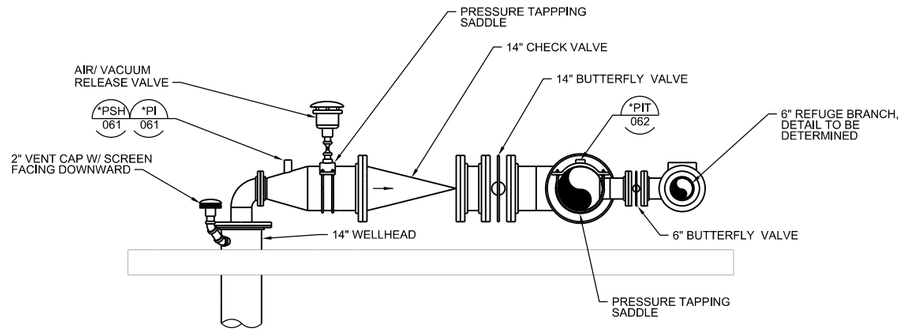
03/27/2013, 08:04, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\MECH\ANCALS\Well Construction Details.dwg, Tab: M-00-01

N1808



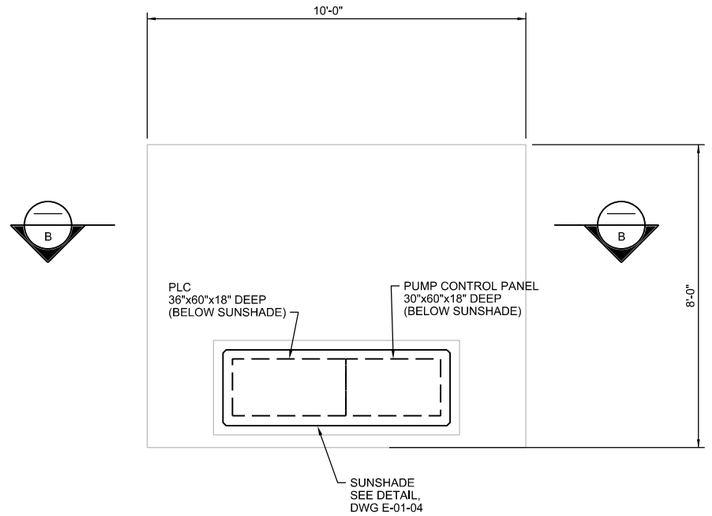
WELL HEAD PIPING PAD PLAN

1/2"=1'-0"



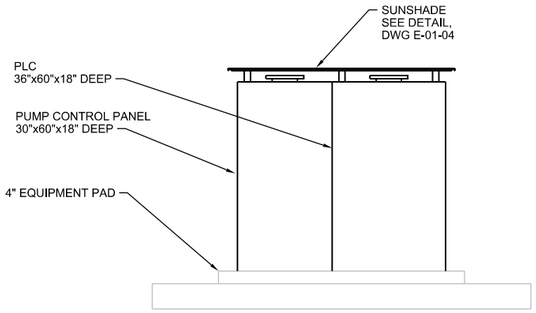
A SECTION

1/2"=1'-0"



ELECTRICAL PAD PLAN

1/2"=1'-0"



NOTES:

1. SEE DWG E-01-04 FOR ELECTRICAL PAD DETAIL AND DWG C-01-01 FOR CIVIL LAYOUT.

B SECTION

1/2"=1'-0"

SCALE: 1/2"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		GJ			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
DSGN	RH
DWN	GJ
CHKD	ML
OK	JP
DATE	2012/09/12
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

HNWR-1 WELL HEAD PIPING AND ELECTRICAL PAD PLAN AND SECTION

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

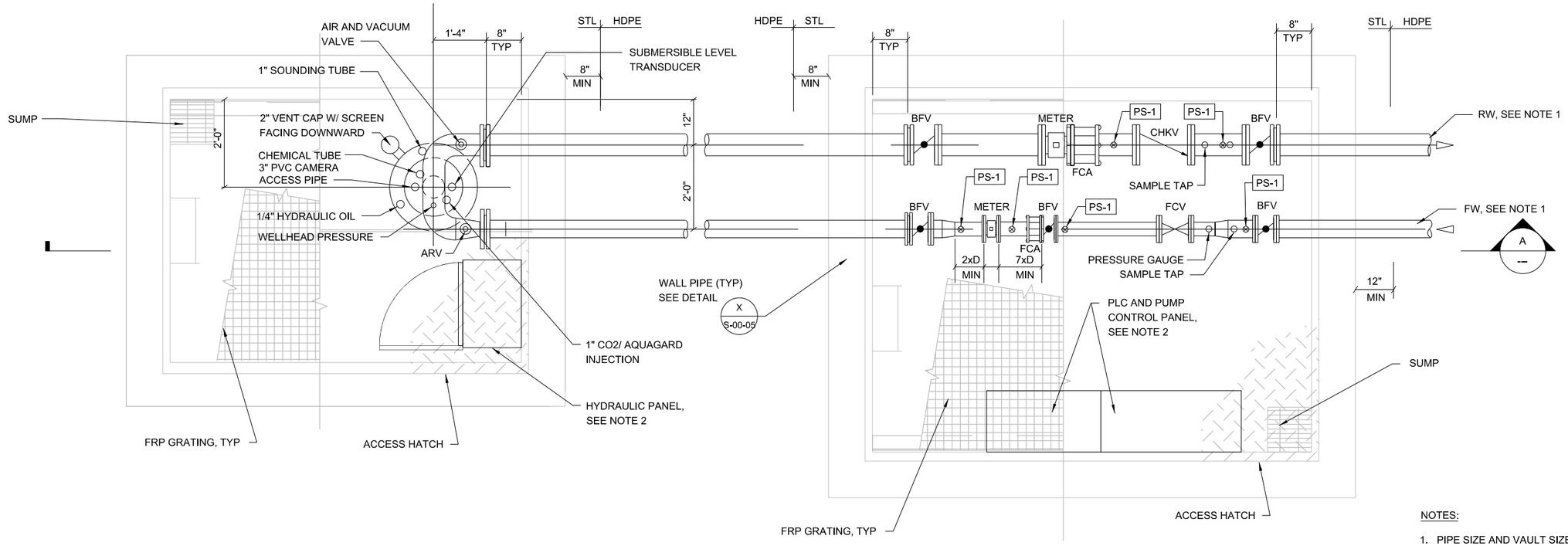
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-01-01	REV

FILENAME: CH-M-XXX-0101AD.dgn

PLOT DATE: 2013\04\05 PLOT TIME: 9:26:09 AM

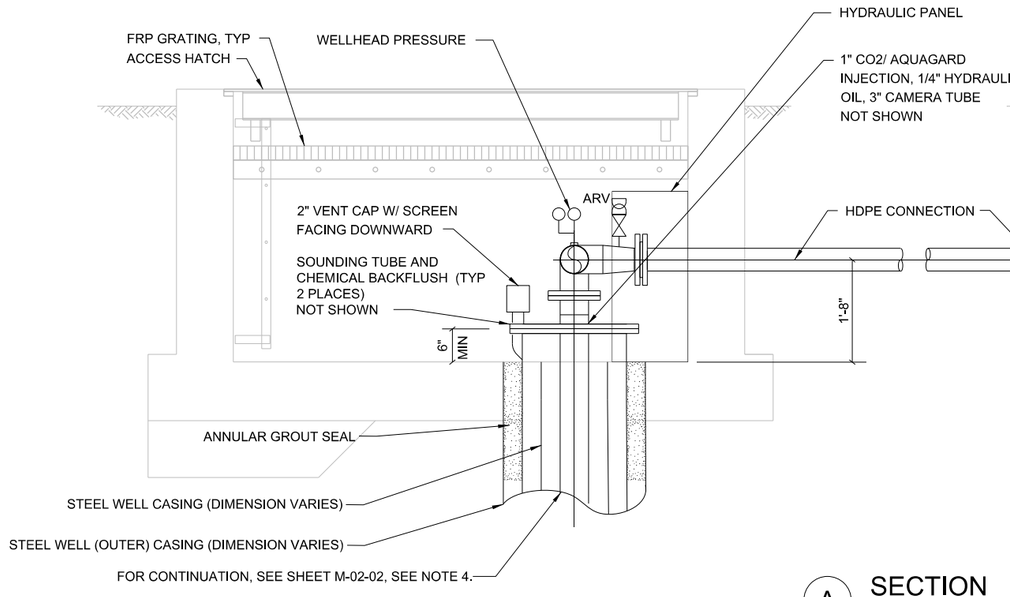
FILENAME: _____.DGN __-__-04 ____

N1808



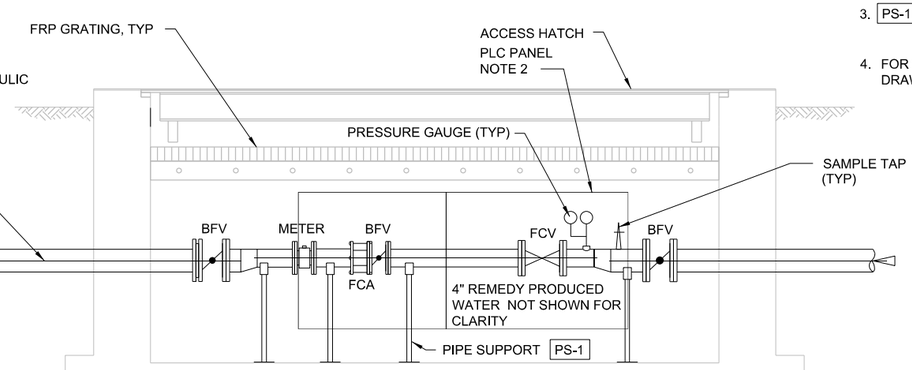
WELL VAULT PLAN

NOTE 1



METER VAULT PLAN

NOTE 1



A SECTION

3/4" = 1'-0"

NOTES:

1. PIPE SIZE AND VAULT SIZES VARY ACCORDING TO LOCATION, SEE TABLE 2 ON DWG M-02-02, TYP OF 6 SETS OF VAULTS.
2. FOR CONTROL PANEL PLACEMENT SEE ELECTRICAL DRAWING E-02-01-A
3. PS-1 PIPE SUPPORT, SEE DETAIL 2 / S-00-05
4. FOR STRUCTURAL VAULT DIMENSIONS SEE DRAWINGS S-02-01 AND S-02-02.

0 1 2 3

SCALE: 3/4"=1'

DRAFT NOT FOR CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		GJ			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RH
	DWN GJ
	CHKD ML
	OK JP
	DATE 9/12/12
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

FRESHWATER INJECTION WELL AND METER VAULT PLAN AND 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-02-01	REV

FILENAME: CH-M-XXX-02201AD.dwg

PLOT DATE: 20130403 PLOT TIME: 4:46:45 PM

N1808

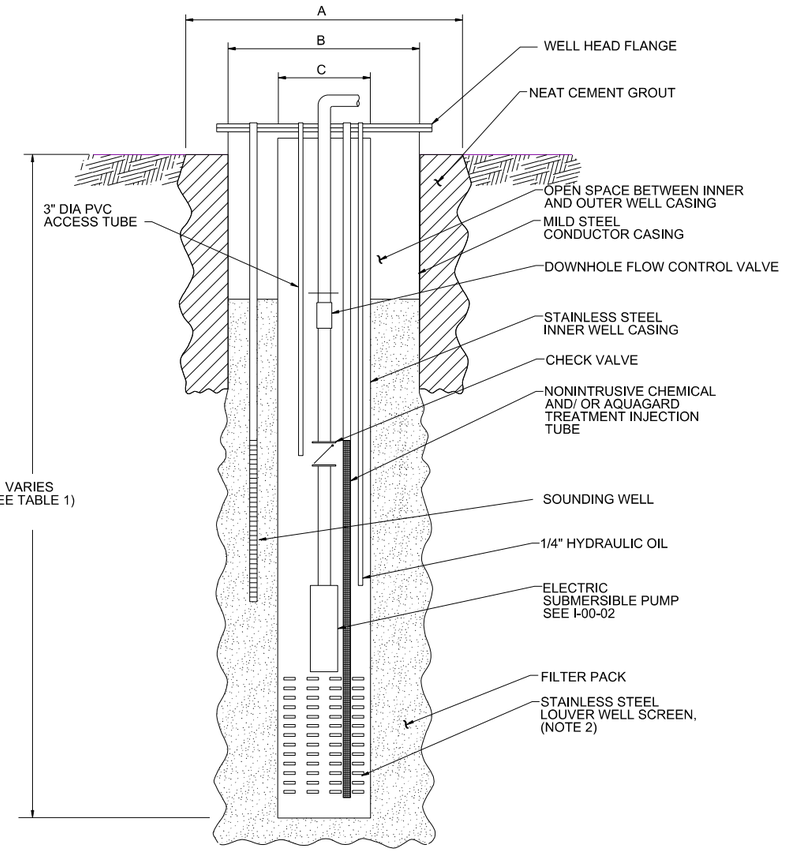


TABLE 1

			A		B	C						
Well ID	**Depth of Conductor Casing (ft)**	**Surface Elevation (ft , msl)**	**Diameter of Conductor Borehole (inches)**	**Depth of Borehole (ft)**	**Borehole Diameter (in)**	**Well Casing Diameter (inches)**	**Model Saturated Thickness (ft)**	**Depth to Water (ft)**	**Depth to Pump (ft)**	**Well Depth (ft)**	**Well Screen Length (ft)**	**Pump Submergence (ft)**
FW-001	50	561	32	376	24	14	250	106	168.5	356	187.5	62.5
FW-002 *Note 1*	50	546	32	171	24	14	60	91	136	151	45	45
IRL-001	50	501	32	336	24	14	270	46	113.5	316	202.5	67.5
IRL-002	50	547	32	372	24	14	260	92	157	352	195	65
IRL-003	50	555	32	350	24	14	230	100	157.5	330	172.5	57.5
IRL-004	50	561	32	326	24	14	200	106	156	306	150	50

Note 1. It is assumed that pump in FW-002 will be equipped with a cooling shroud so that pump can be installed deeper in the well to increase pump submergence.

TABLE 2

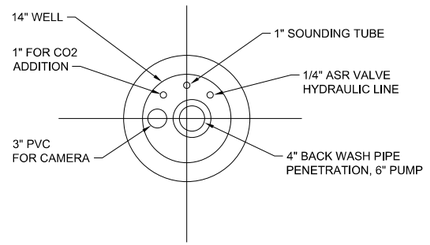
Pipe Sizes/MOC/Civil Drawing Reference								
	FW Into Meter Vault	**FW Inside Meter Vault**	**FW Out of Meter Vault/Into Well Vault**	**FW Inside Well Vault**	**RW Out of Well Vault/Into Meter Vault**	**RW In Meter Vault**	**RW Out of Meter Vault**	***Reference to Civil Site Plan***
MOC	***HPDE***	***CPVC***	***HDPE***	***CPVC***	***Double Contained HDPE***	***CPVC***	***Double Contained HDPE***	
FW-001	4"	4"	4"	4"	6" in 10"	6"	6" in 10"	C-02-03
FW-002	2"	3"	2"	3"	4" in 8"	4"	4" in 8"	C-02-04
IRL-001	4"	4"	4"	4"	6" in 10"	6"	6" in 10"	C-05-04
IRL-002	4"	4"	4"	4"	6" in 10"	6"	6" in 10"	C-05-05
IRL-003	4"	4"	4"	4"	6" in 10"	6"	6" in 10"	C-05-06
IRL-004	4"	4"	4"	4"	6" in 10"	6"	6" in 10"	C-05-07
NOTE: Six Vaults are represented by this drawing.								
RW (remedy water) pipe is double contained leaving the vaults.								
All HDPE piping is Standard Dimension Ratio - SDR-11								
All CPVC piping is Schedule 80								

NOTE:

1. WELL DEPTH AND WELL CASING DIMENSIONS (A,B & C) SHOWN IN TABLE 1 ON THIS SHEET
2. ENGINEER WILL DESIGN LOUVER SLOT SIZE AND FILTER PACK GRADE BASED ON GRAIN SIZE DISTRIBUTION ANALYSIS OF FORMATION SAMPLES

FRESH WATER INJECTION WELL WITH BACKWASH PUMP

NTS



WELL FLANGE DETAIL

NTS

NOTES:

1. FOR DISTANCE BETWEEN VAULTS, SEE TABLE 2 FOR CIVIL DRAWING REFERENCE.

PRELIMINARY PLANS-NOT FOR CONSTRUCTION

DRAFT NOT FOR CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		GJ			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN GJ
	DWN GJ
	CHKD EL
	OK JHP
	DATE 9/12/12
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

FRESHWATER INJECTION WELL CONSTRUCTION DETAILS

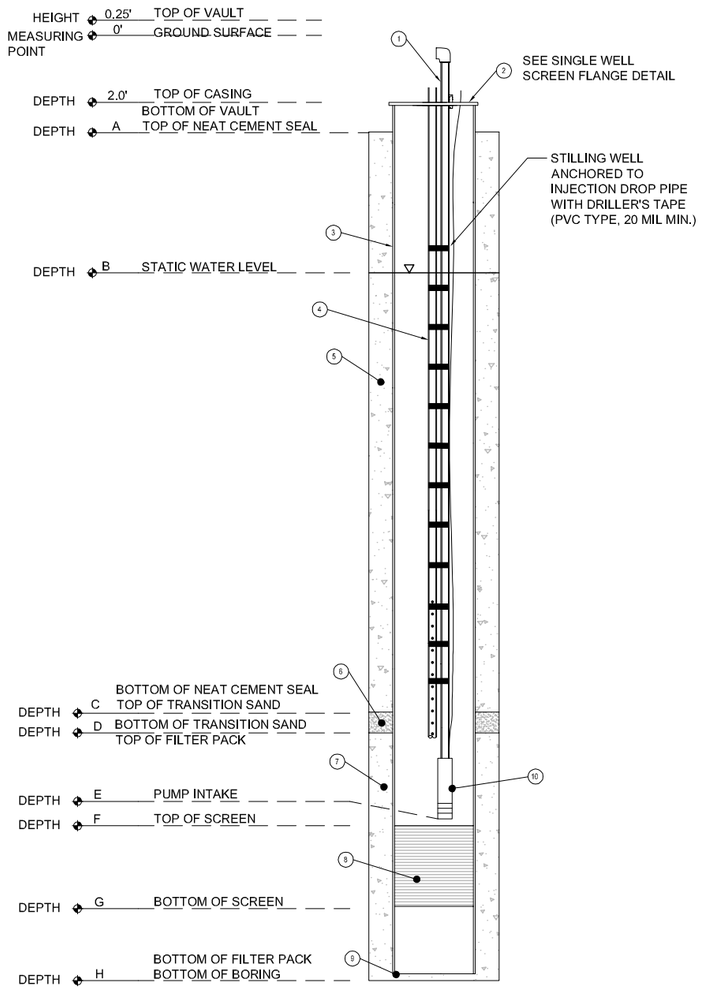
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: 20130403 PLOT TIME: 4:51:13 PM

FILENAME: CH-M-XXX-0202AD.dwg

N1808



A SINGLE SCREEN EXTRACTION WELL DETAIL

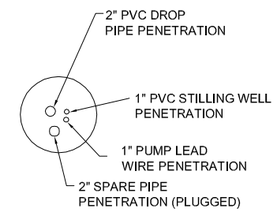
NO SCALE

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

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JPB	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN JPB
DWN AJW
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

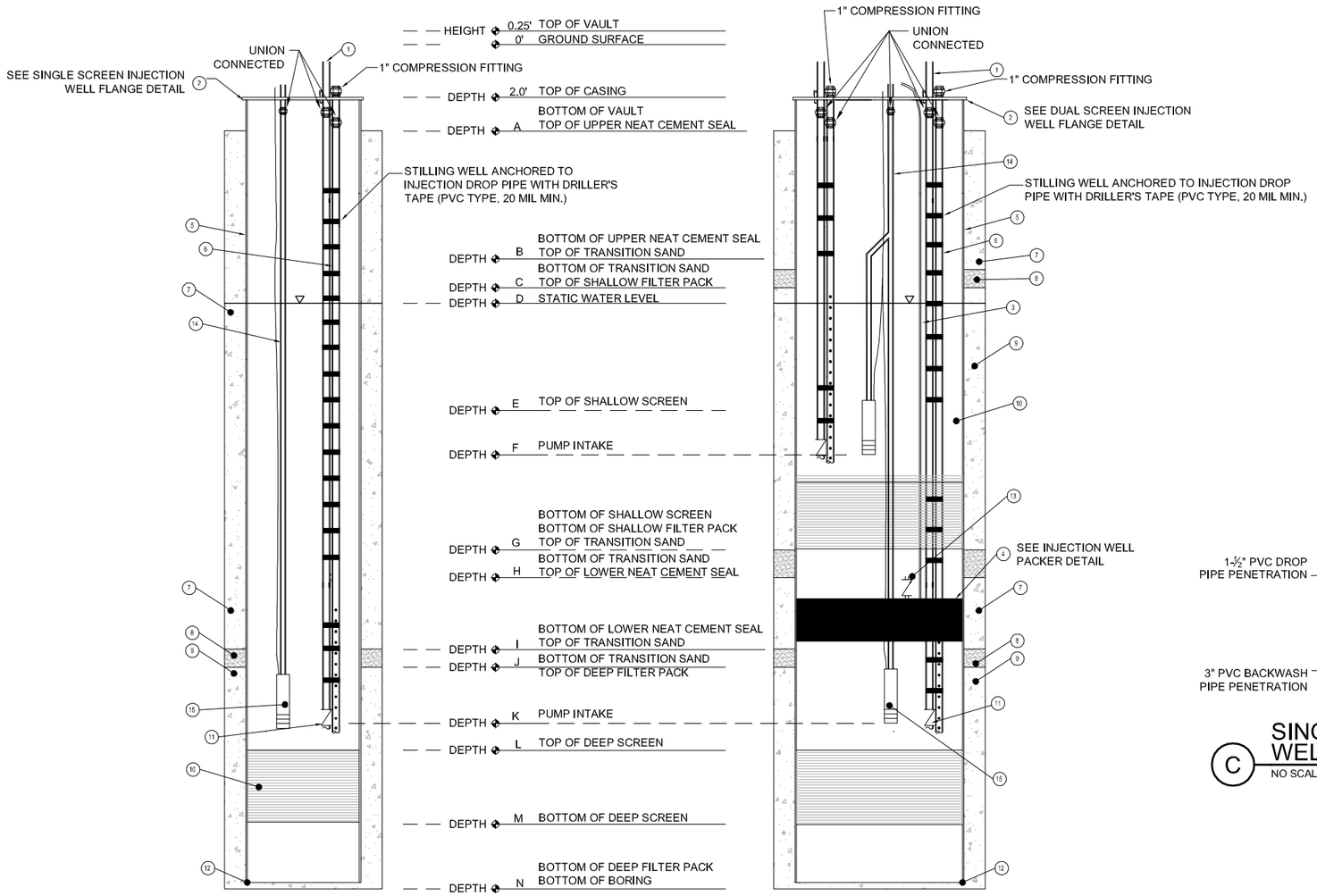
TCS LOOP EXTRACTION WELL CONSTRUCTION DETAILS

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-03-01
REV

N1808

03/26/2013, 18:33, G:\Graphics\ARITOPOCK-01\Submittal-60%_March2013\MECHANICALS\Well Construction Details.dwg, Tab: M-03-01



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

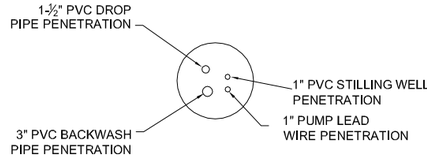
NO SCALE

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

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

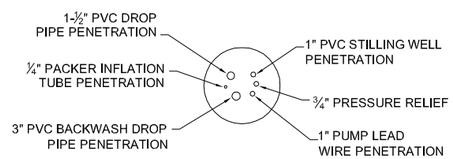
NOTES:

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



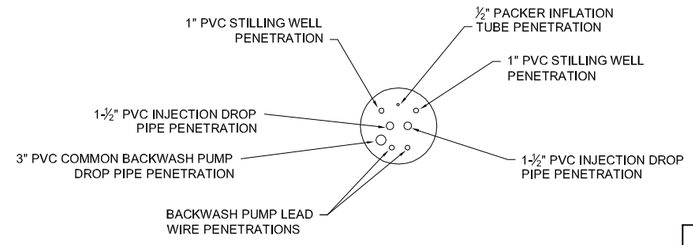
C SINGLE SCREEN WELL FLANGE DETAIL

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

REVISIONS

APPROVED BY	SO
	SUPV JPB
JEF	DSGN JPB
	DWN AJW
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS NOTED

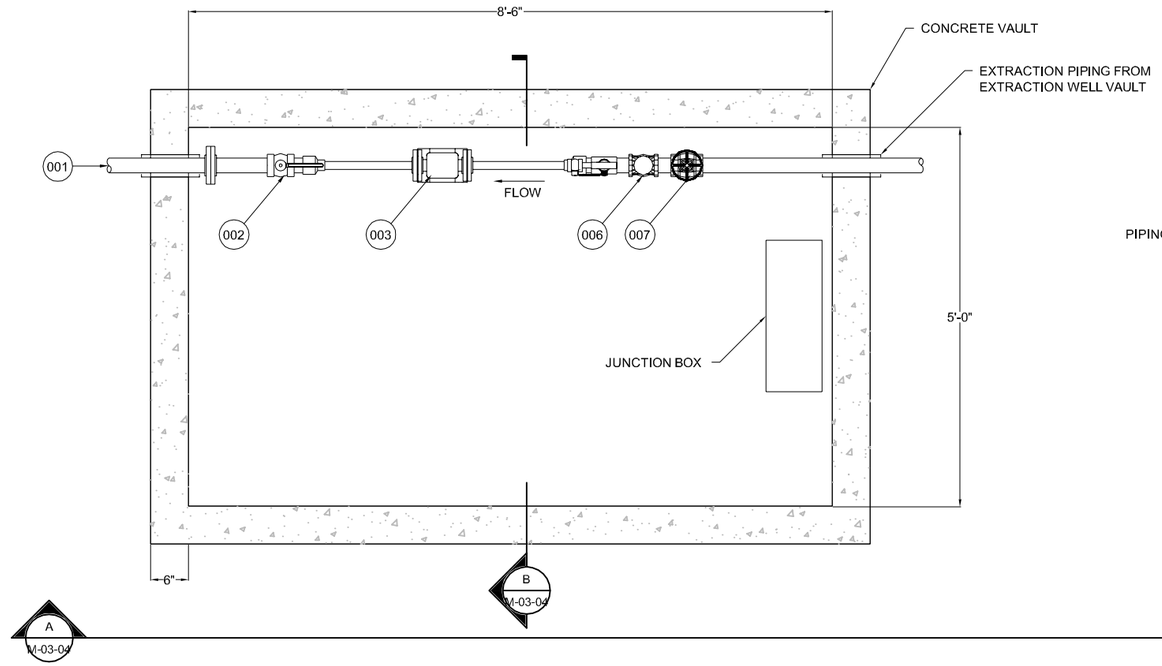
TOPOCK GROUNDWATER REMEDIATION PROJECT

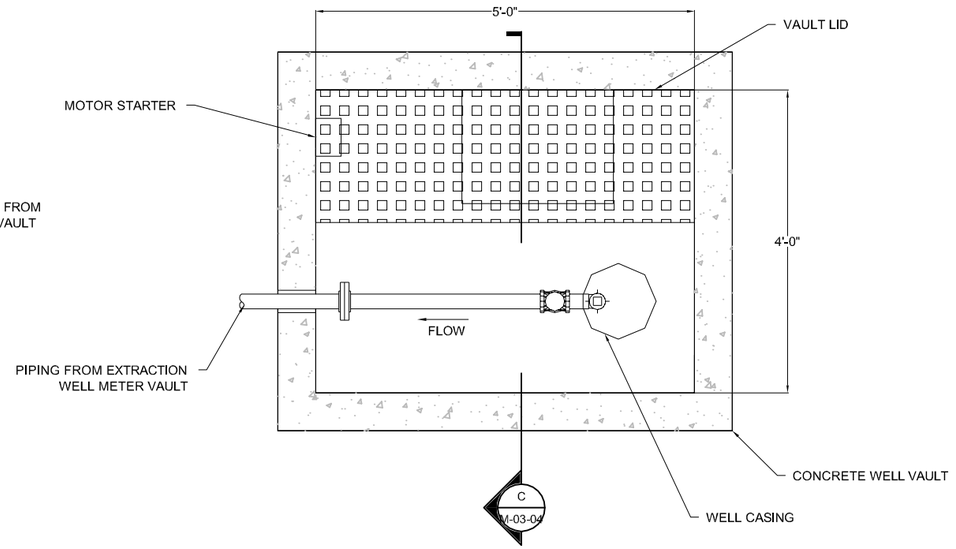
TCS LOOP INJECTION WELL CONSTRUCTION DETAILS

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

03/26/2013, 18:53, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\MECH\NICALS\Well Construction Details.dwg, Tab: M-03-02





EXTRACTION WELL METER VAULT AND WELL VAULT PLAN

NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-03-03

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	CPVC	GROUNDWATER	
2	2"	CPVC	GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
3	2"	TEFLON	GROUNDWATER	MAGNETIC FLOWMETER
4	1/2"	TBD	GROUNDWATER	PRESSURE GAUGE ASSEMBLY
5	1/4"	TBD	GROUNDWATER	SAMPLE PORT
6	2"	CPVC	GROUNDWATER	CHECK VALVE
7	2"	CPVC	GROUNDWATER	GLOBE VALVE
8	1 1/2"	CPVC	EXTRACTED GROUNDWATER	

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

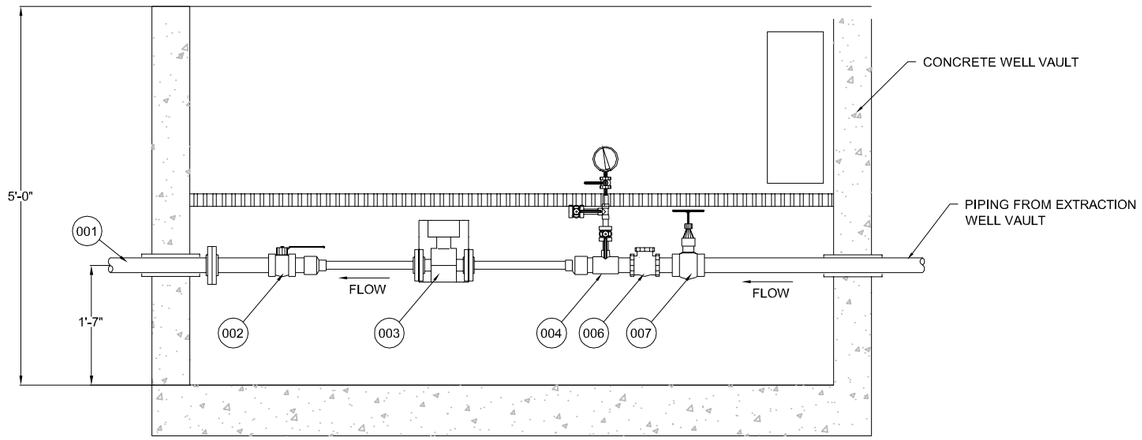
TOPOCK GROUNDWATER REMEDIATION PROJECT

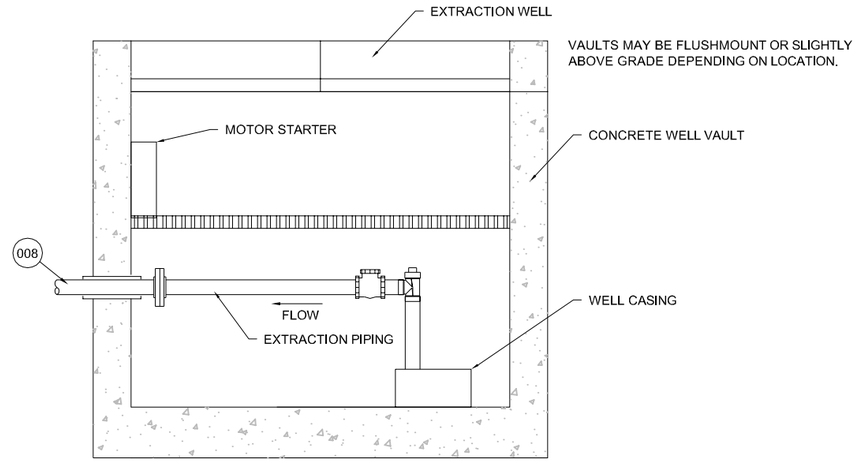
TCS LOOP EXTRACTION WELL VAULT MECHANICAL DETAILS

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

N180B

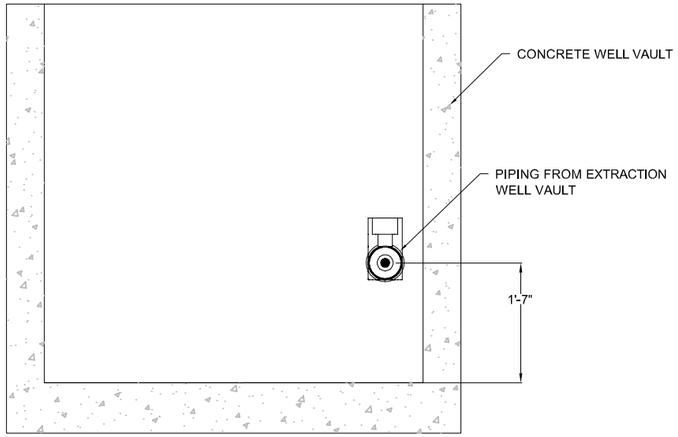




A EXTRACTION WELL METER VAULT AND WELL VAULT SECTION

NO SCALE

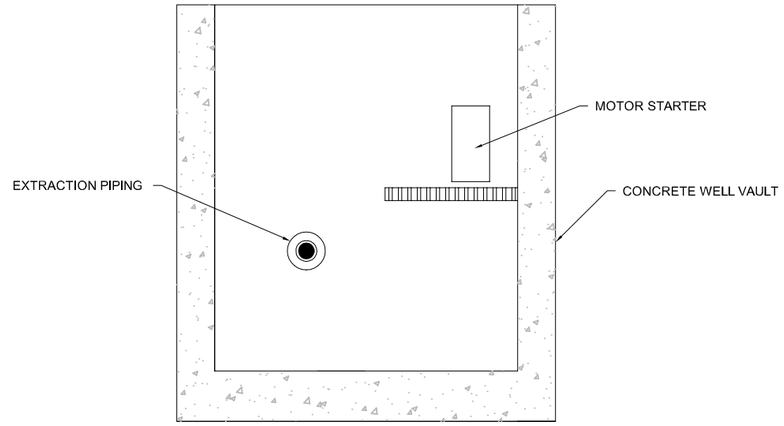
M-03-03



B EXTRACTION WELL METER VAULT SECTION

NO SCALE

M-03-03



C EXTRACTION WELL METER VAULT SECTION

NO SCALE

M-03-03

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-03-03

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN JPB
	DWN LUK
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS LOOP EXTRACTION WELL VAULT MECHANICAL SECTIONS

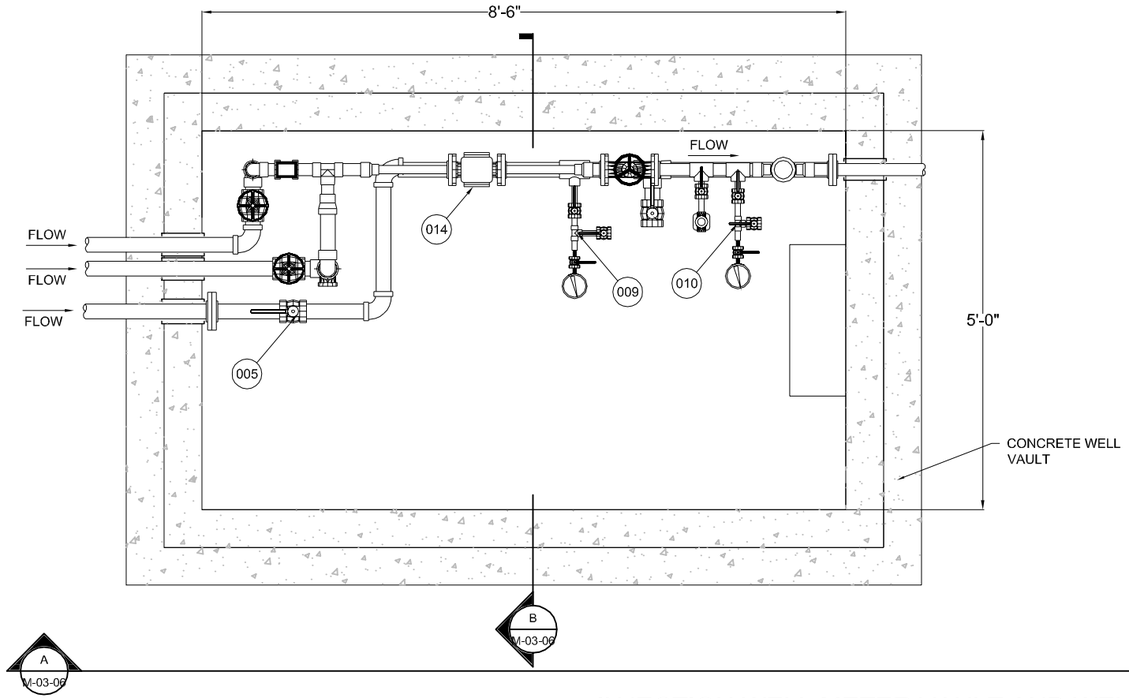
GAS TRANSMISSION & DISTRIBUTION

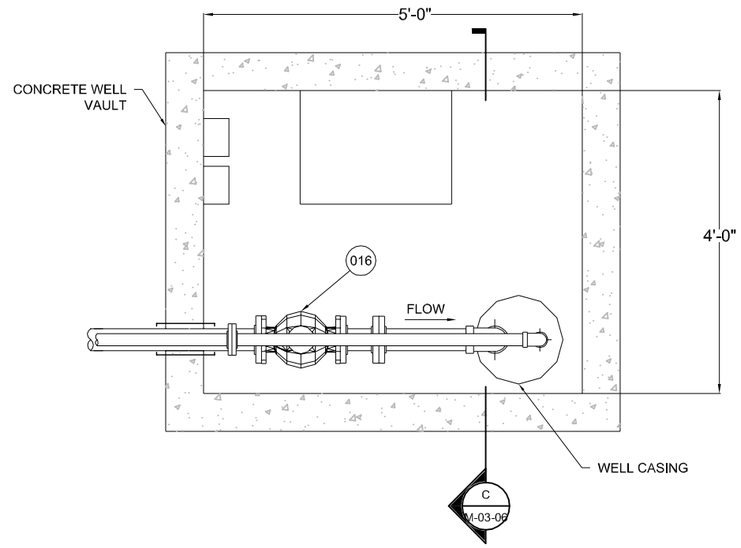
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

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

N180B





INJECTION WELL METER VAULT AND WELL VAULT PLAN

NO SCALE

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	HDPE	CARBON AMENDED GROUNDWATER	
2	2"	HDPE	CARBON AMENDED GROUNDWATER	
3	3"	HDPE	BACKWASH	
4	3"	HDPE	SPARE/BACKWASH RETURN	
5	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
6	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
7	3"	CPVC	BACKWASH	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
8	3"	CPVC	SPARE/BACKWASH RETURN	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
9	1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY
10	1/2"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY
11	1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT
12	N/A	N/A	N/A	CONTROL/COMM. PANEL
13	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE
14	1	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOWMETER
15	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	PROPORTIONAL ACTUATED BALL VALVE
16	3"	CPVC	BACKWASH	CHECK VALVE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-03-05

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN JPB
	DWN LUK
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

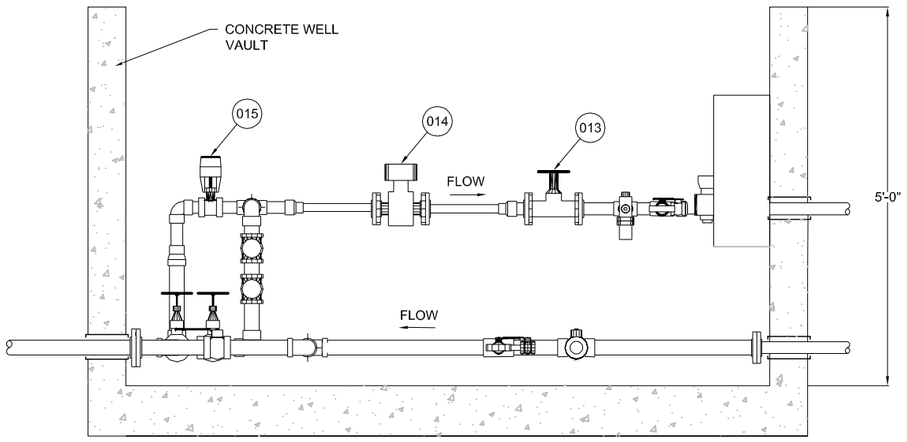
TOPOCK GROUNDWATER REMEDIATION PROJECT

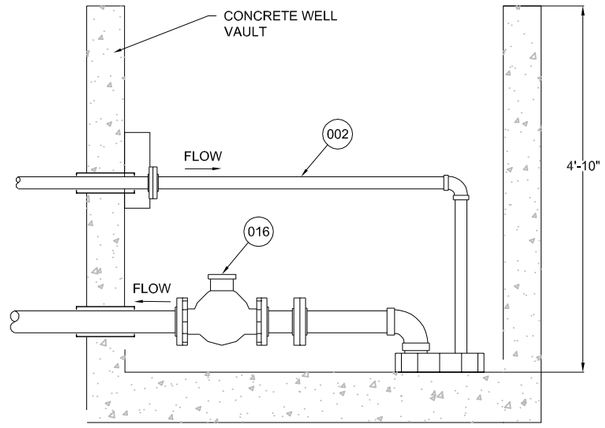
TCS LOOP INJECTION WELL VAULTS MECHANICAL DETAILS

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-03-05	REV

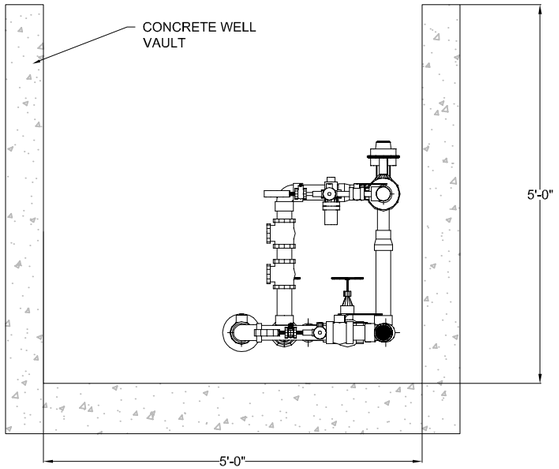
N180B



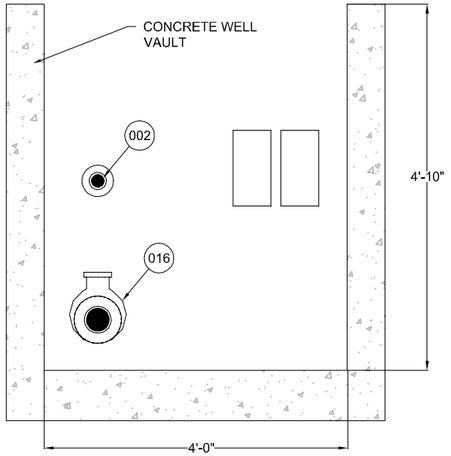


A M-03-05 **INJECTION WELL METER VAULT AND WELL VAULT SECTION**
NO SCALE

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.



B M-03-05 **INJECTION WELL METER VAULT SECTION**
NO SCALE



C M-03-05 **INJECTION WELL METER VAULT SECTION**
NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-03-05

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	LUK	JPB	JPB	JEF	

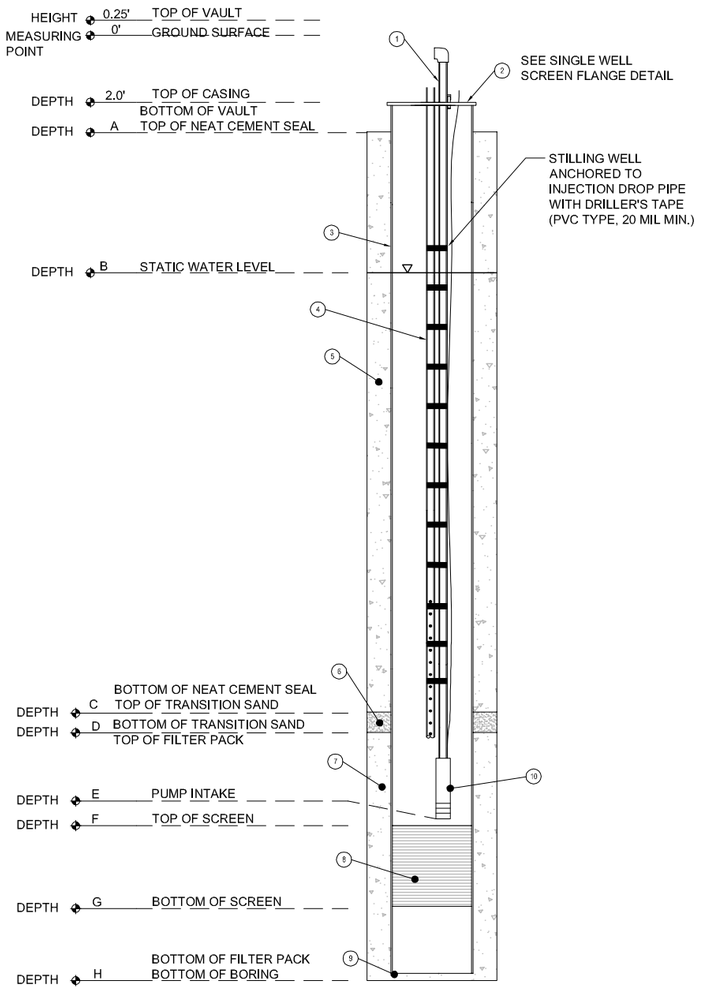
REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN JPB
	DWN LUK
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS LOOP INJECTION WELL 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-03-06	REV

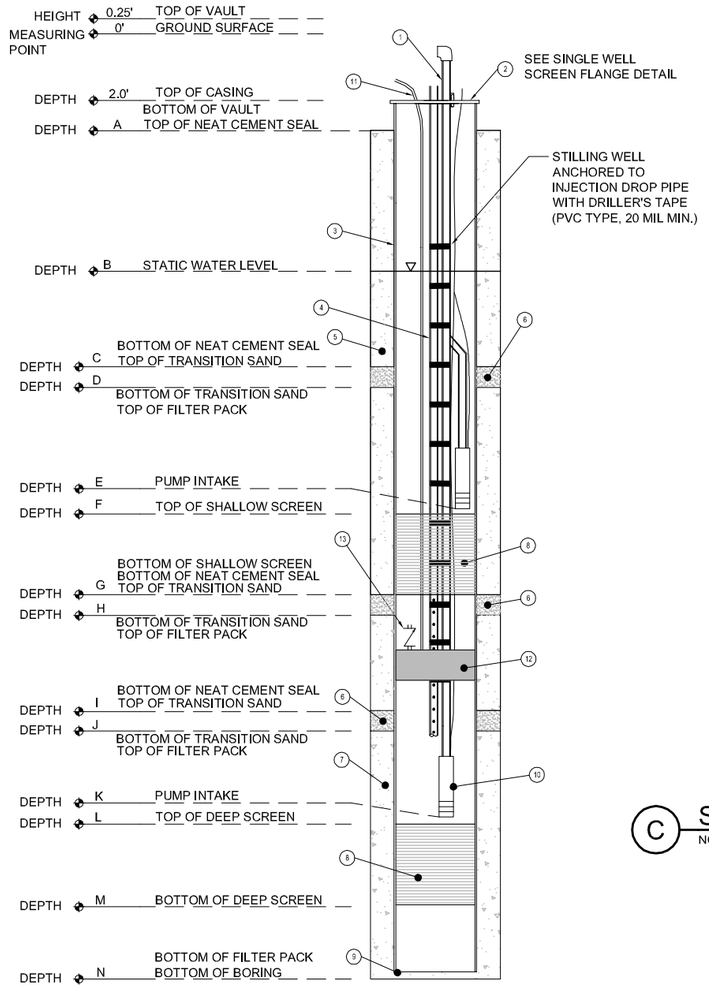
N180B



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.



B DUAL SCREEN EXTRACTION WELL DETAIL

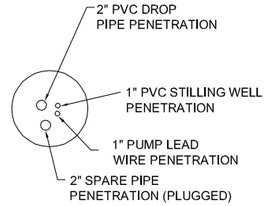
NO SCALE

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
11	1/4" DIAMETER HOSE FROM PACKER TO FILL ASSEMBLY
12	PNEUMATIC WELL PACKER
13	3/4" PACKER PRESSURE RELIEF SAFETY VALVE

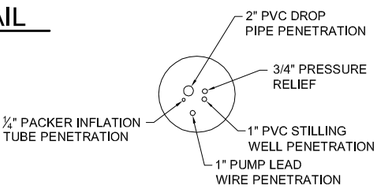
NOTES:

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



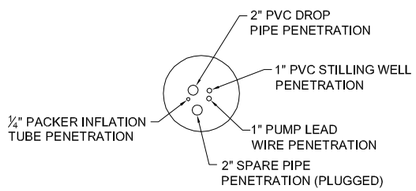
C SINGLE SCREEN WELL FLANGE DETAIL

NO SCALE



E EXTRACTION WELL PACKER DETAIL

NO SCALE



D DUAL SCREEN WELL FLANGE DETAIL

NO SCALE

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	JPB	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS NOTED

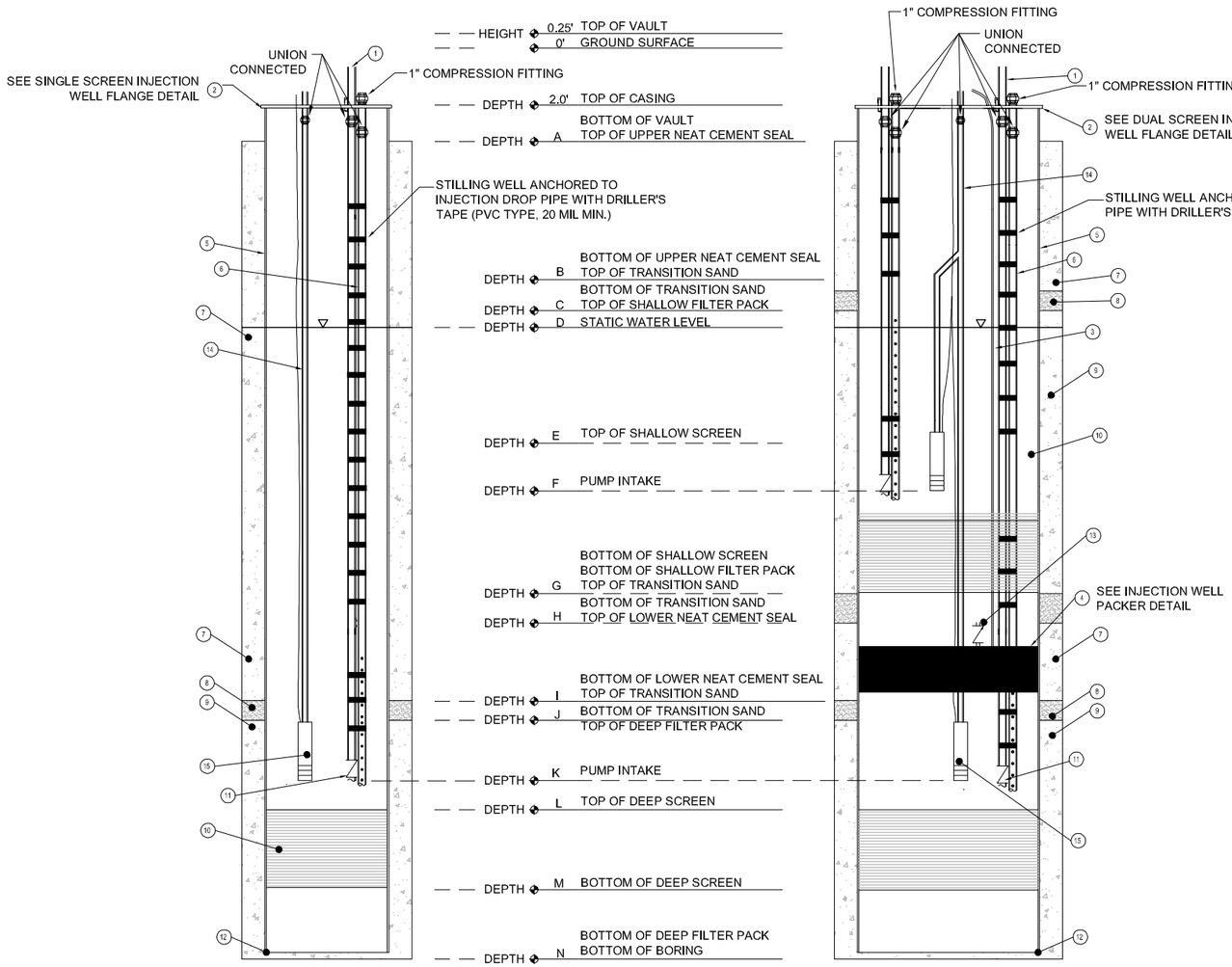
TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ EXTRACTION 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-04-01	REV

03/26/2013, 18:53, G:\Graphics\ARITOPOCK\01\Submittal-60%_March2013\MECHANICALS\Well Construction Details.dwg, Tab: M-04-01



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.

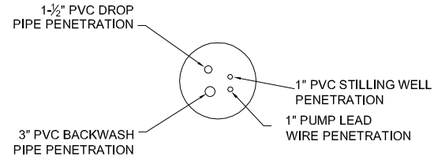
B DUAL SCREEN INJECTION WELL WITH BACKWASH PUMPS DETAIL

NO SCALE

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

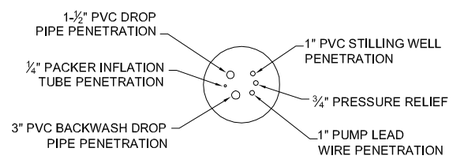
1	1-½" PVC DROP PIPE (MATERIALS TBD)
2	CUSTOM TAPPED WELL FLANGE
3	¼" DIAMETER HOSE FROM PACKER TO FILL ASSEMBLY
4	PNEUMATIC WELL PACKER
5	WELL CASING (MATERIALS TBD)
6	1" PVC TUBING (STILLING WELL WITH PRESSURE TRANSDUCER)
7	ANNULAR SPACE, 100% NEAT CEMENT GROUT
8	ANNULAR SPACE, TRANSITION SAND (SIZE 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



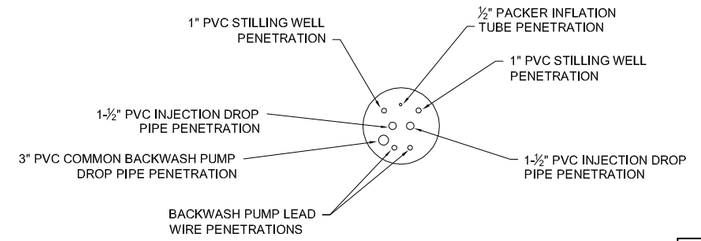
C SINGLE SCREEN WELL FLANGE DETAIL

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

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

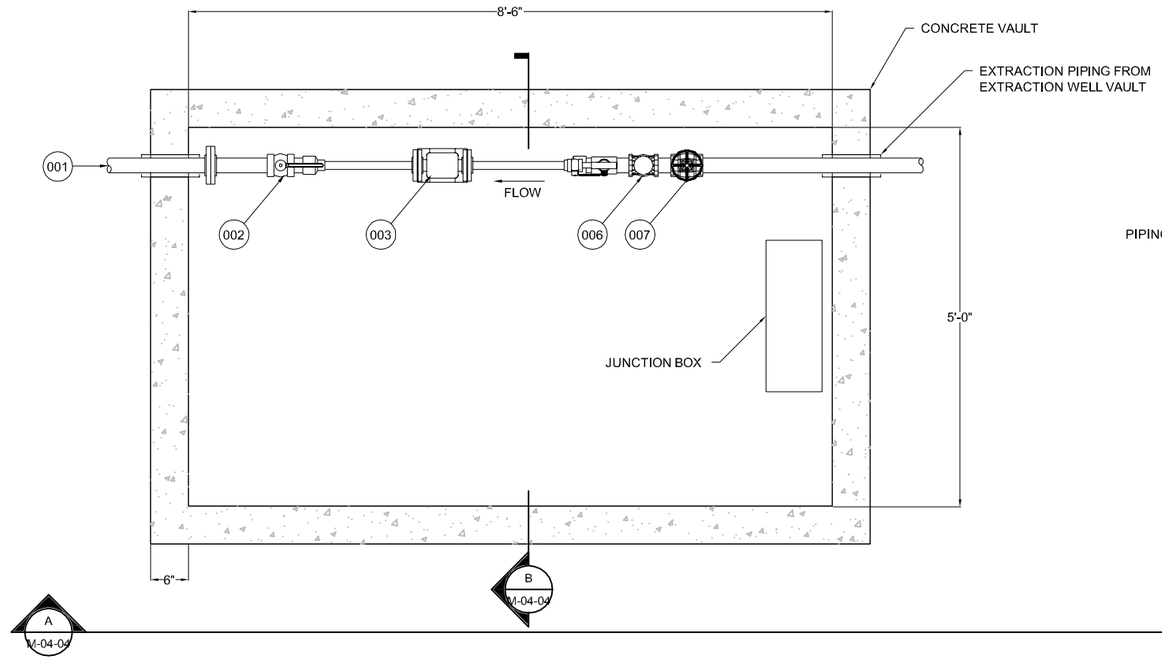
IRZ INJECTION WELL CONSTRUCTION DETAILS

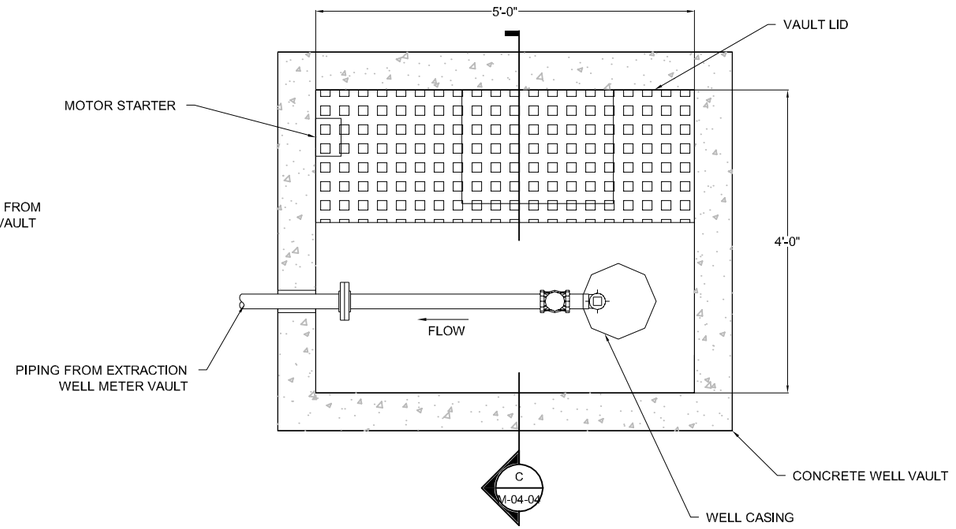
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-04-02	REV

03/26/2013, 18:53, C:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\MECH\ANCALS\Well Construction Details.dwg, Tab: M-04-02

N1808





EXTRACTION WELL METER VAULT AND WELL VAULT PLAN

NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-03

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	CPVC	GROUNDWATER	
2	2"	CPVC	GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
3	2"	TEFLON	GROUNDWATER	MAGNETIC FLOWMETER
4	1/2"	TBD	GROUNDWATER	PRESSURE GAUGE ASSEMBLY
5	1/4"	TBD	GROUNDWATER	SAMPLE PORT
6	2"	CPVC	GROUNDWATER	CHECK VALVE
7	2"	CPVC	GROUNDWATER	GLOBE VALVE
8	1 1/2"	CPVC	EXTRACTED GROUNDWATER	

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN JPB
DWN LUK
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS SHOWN

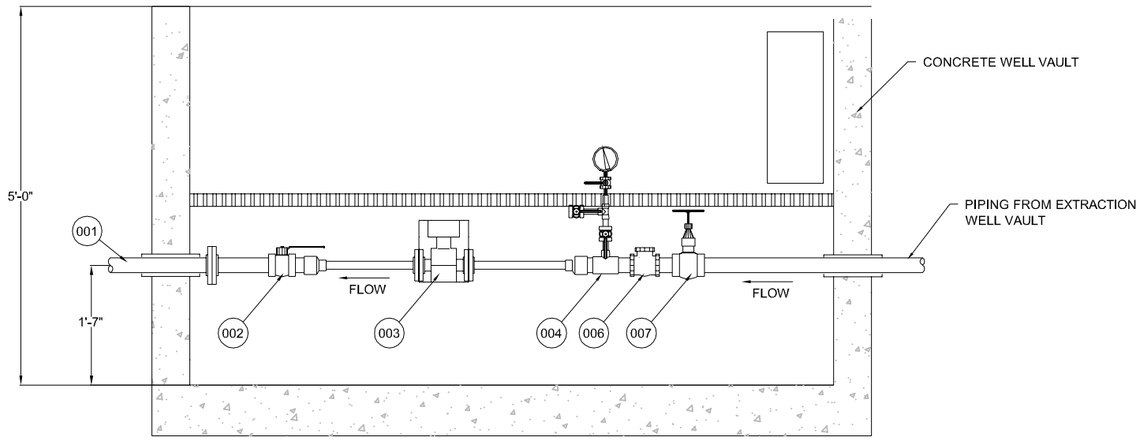
TOPOCK GROUNDWATER REMEDIATION PROJECT

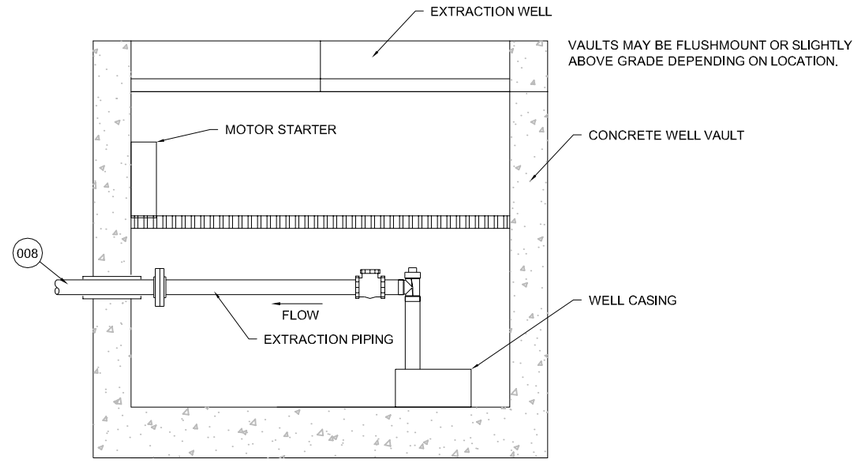
IRZ EXTRACTION WELL VAULT MECHANICAL DETAILS

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-04-03
REV

N180B

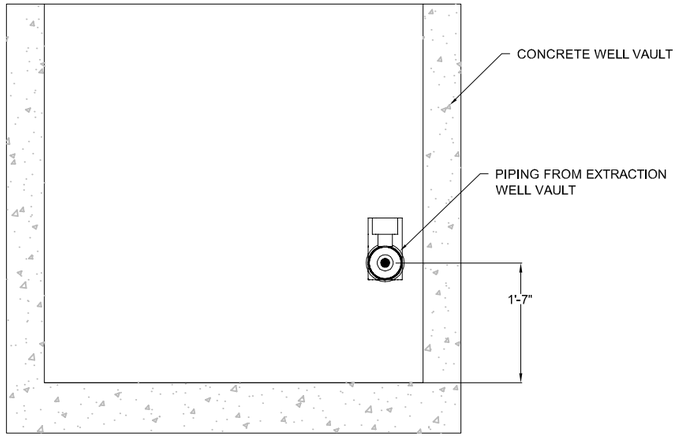




A EXTRACTION WELL METER VAULT AND WELL VAULT SECTION

NO SCALE

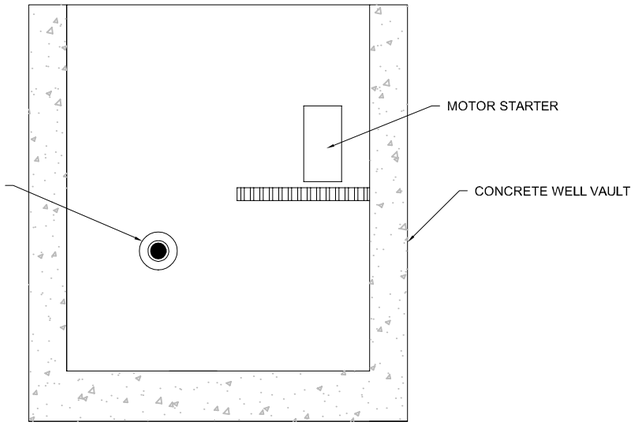
M-04-03



B EXTRACTION WELL METER VAULT SECTION

NO SCALE

M-04-03



C EXTRACTION WELL METER VAULT SECTION

NO SCALE

M-04-03

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-03

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN JPB
	DWN LUK
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

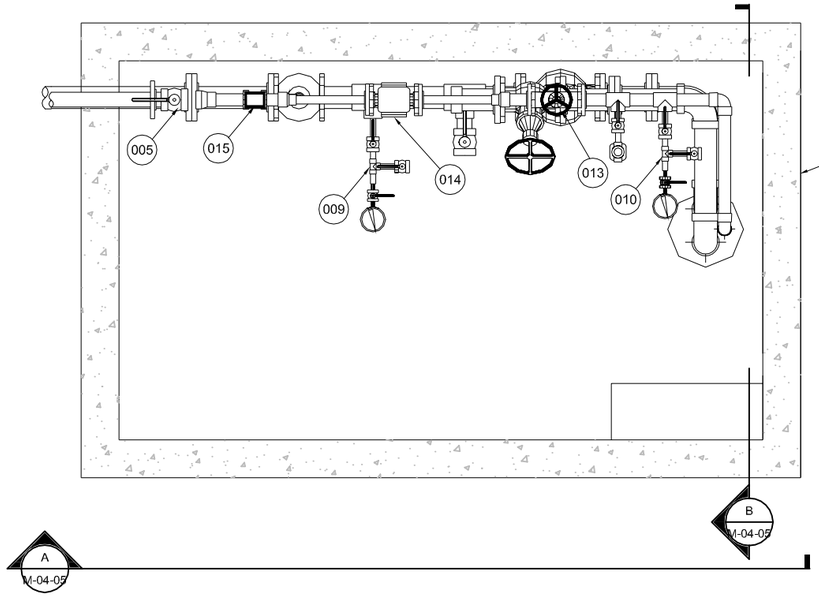
IRZ EXTRACTION WELL VAULT MECHANICAL SECTIONS

GAS TRANSMISSION & DISTRIBUTION

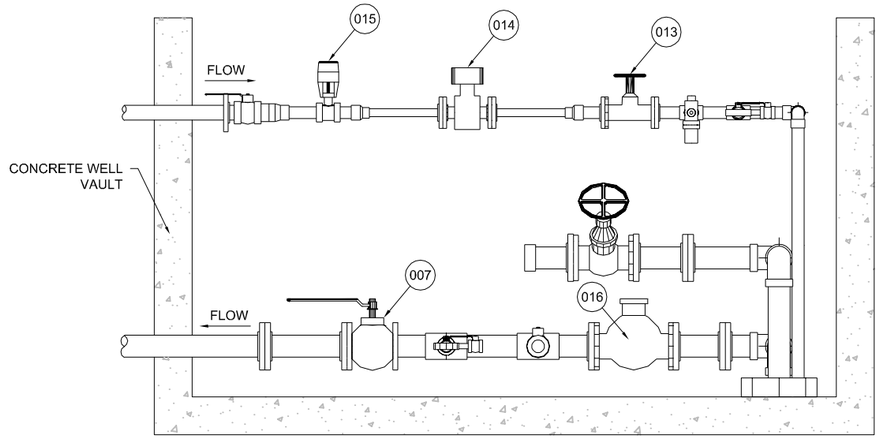
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

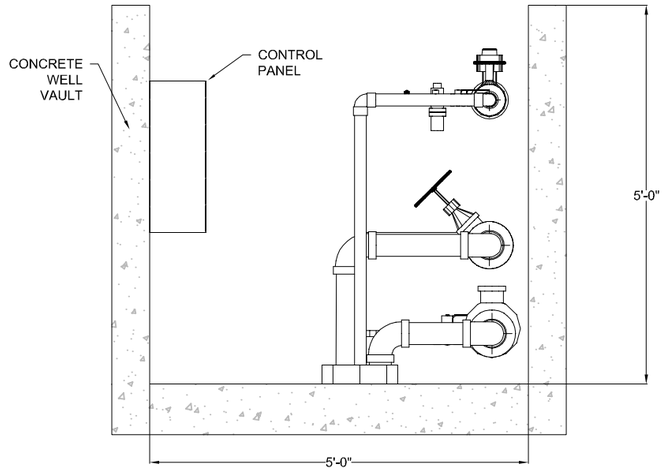
N180B



INJECTION WELL METER VAULT AND WELL VAULT PLAN
NO SCALE



A
M-04-05
INJECTION WELL METER VAULT AND WELL VAULT SECTION
NO SCALE



B
M-04-05
INJECTION WELL METER VAULT AND WELL VAULT SECTION
NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-05

WELL VAULT SCHEDULE				
ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	HDPE	CARBON AMENDED GROUNDWATER	
2	2"	HDPE	CARBON AMENDED GROUNDWATER	
3	3"	HDPE	BACKWASH	
4	3"	HDPE	SPARE/BACKWASH RETURN	
5	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
6	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
7	3"	CPVC	BACKWASH	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
8	3"	CPVC	SPARE/BACKWASH RETURN	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
9	1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY
10	1/2"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY
11	1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT
12	N/A	N/A	N/A	CONTROL/COMM. PANEL
13	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE
14	1	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOWMETER
15	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	PROPORTIONAL ACTUATED BALL VALVE
16	3"	CPVC	BACKWASH	CHECK VALVE

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

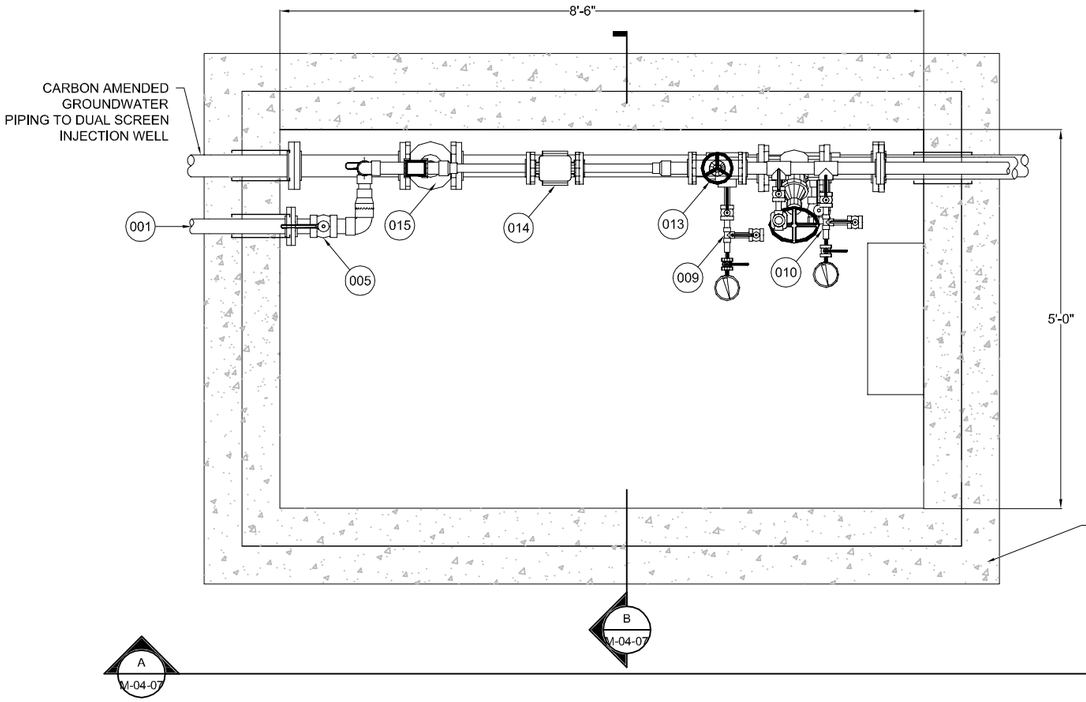
APPROVED BY: JEF

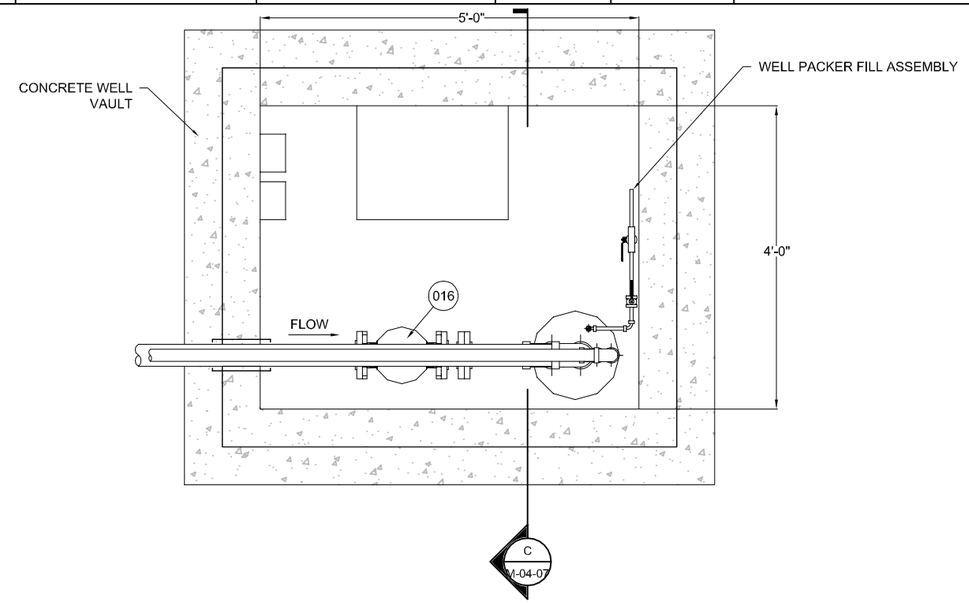
SO
SUPV JPB
DSGN JPB
DWN LUK
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT
IRZ SINGLE SCREEN INJECTION WELL VAULTS MECHANICAL DETAILS AND SECTIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. M-04-05 of SHEETS
REV

N1808





INJECTION WELL METER VAULT AND INJECTION WELL VAULT PLAN

NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-06

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	HDPE	CARBON AMENDED GROUNDWATER	
2	2"	HDPE	CARBON AMENDED GROUNDWATER	
3	3"	HDPE	BACKWASH	
4	3"	HDPE	SPARE/BACKWASH RETURN	
5	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
6	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
7	3"	CPVC	BACKWASH	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
8	3"	CPVC	SPARE/BACKWASH RETURN	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
9	1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY
10	1/2"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY
11	1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT
12	N/A	N/A	N/A	CONTROL/COMM. PANEL
13	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE
14	1	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOWMETER
15	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	PROPORTIONAL ACTUATED BALL VALVE
16	3"	CPVC	BACKWASH	CHECK VALVE

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

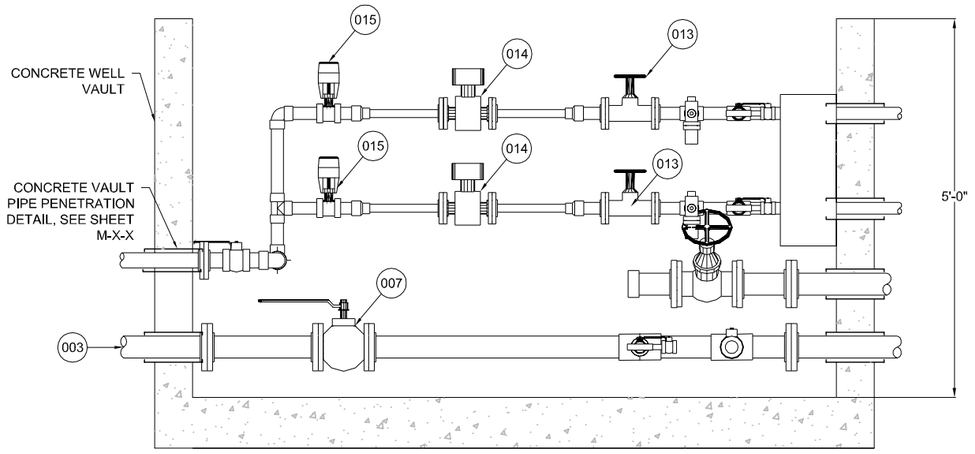
APPROVED BY: JEF

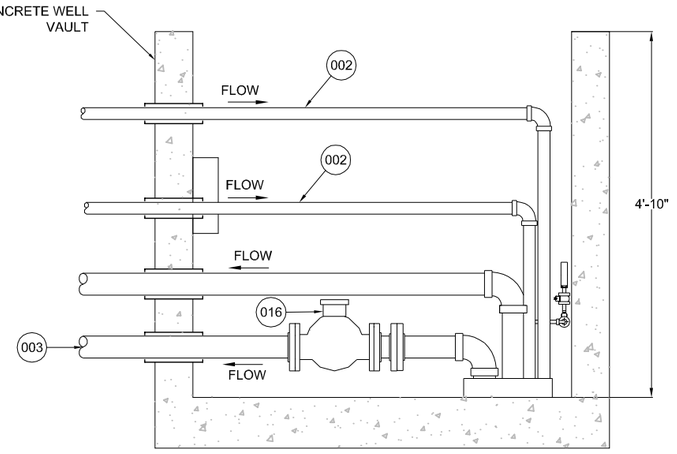
SO
SUPV JPB
DSGN JPB
DWN LUK
CHKD JPB
OK JEF
DATE 04/05/13
SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT
IRZ DUAL SCREEN 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. M-04-06 of SHEETS
REV

N1808



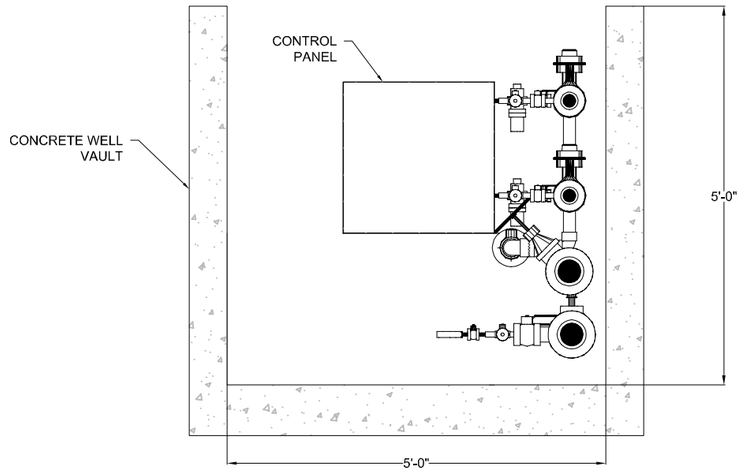


A INJECTION WELL METER VAULT AND WELL VAULT SECTION
NO SCALE
M-04-06

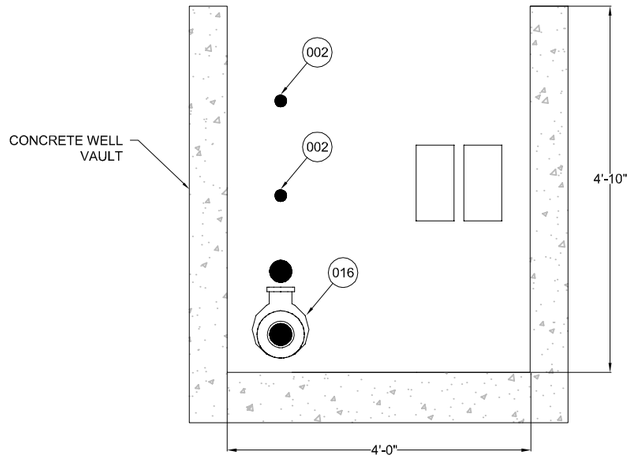
NOTES:
1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
2. ALL PIPING AND INSTRUMENTATION SHALL BE INSTALLED PER P&IDs.
3. INSTALLATION OF ELECTRIC COMPONENTS SHALL COMPLY WITH ALL APPLICABLE NEC AND LOCAL CODES.
4. CROSS SECTIONS SHOW ONLY 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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-06



B INJECTION WELL METER VAULT SECTION
NO SCALE
M-04-06



C INJECTION WELL METER VAULT SECTION
NO SCALE
M-04-06

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	LUK	JPB	JPB	JEF	

REVISIONS

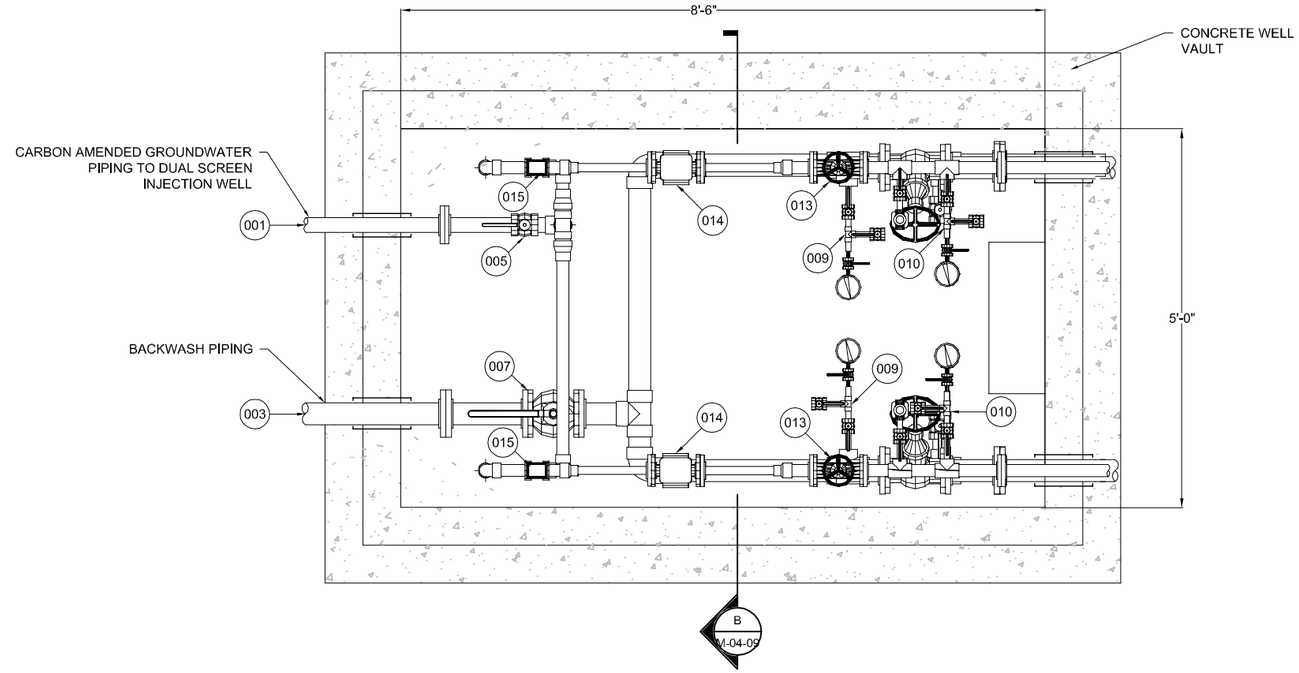
APPROVED BY: JEF

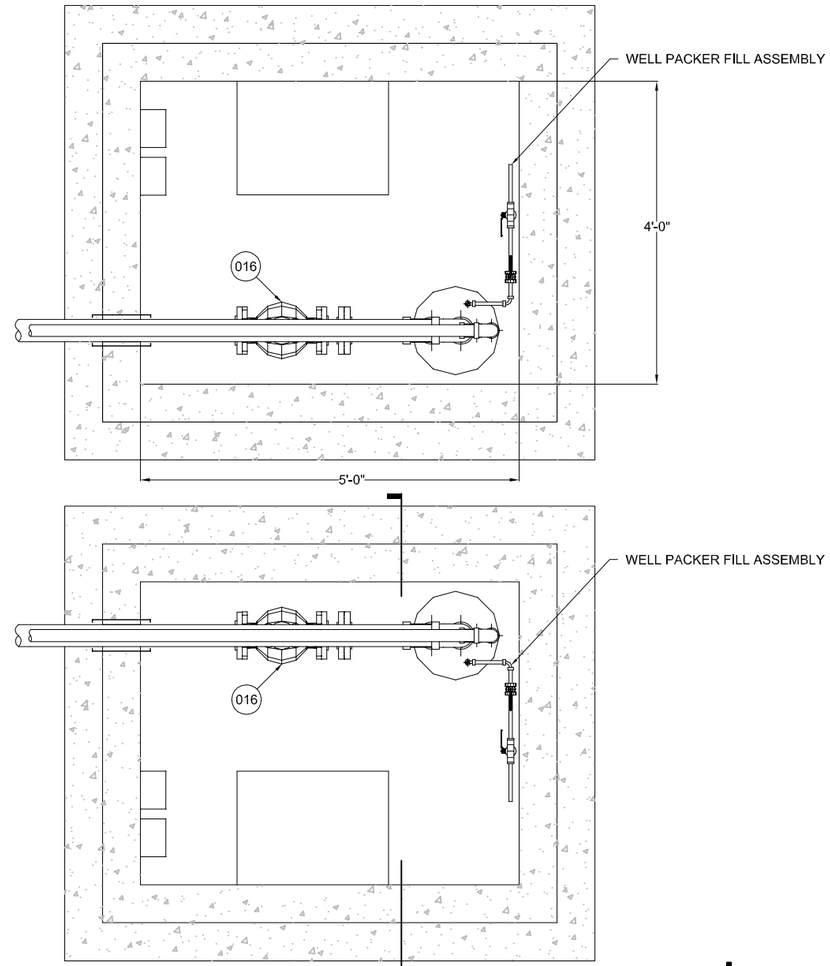
SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT
IRZ DUAL SCREEN INJECTION WELL 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-04-07	REV

N180B







WELL VAULT SCHEDULE				
ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	HDPE	CARBON AMENDED GROUNDWATER	
2	2"	HDPE	CARBON AMENDED GROUNDWATER	
3	3"	HDPE	BACKWASH	
4	3"	HDPE	SPARE/BACKWASH RETURN	
5	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
6	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
7	3"	CPVC	BACKWASH	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
8	3"	CPVC	SPARE/BACKWASH RETURN	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
9	1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY
10	1/2"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY
11	1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT
12	N/A	N/A	N/A	CONTROL/COMM. PANEL
13	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE
14	1	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOWMETER
15	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	PROPORTIONAL ACTUATED BALL VALVE
16	3"	CPVC	BACKWASH	CHECK VALVE

INJECTION VALVE VAULT AND INJECTION WELL VAULT PLAN

NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-08

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	LUK	JPB	JPB	JEF	

REVISIONS

APPROVED BY
JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ DUAL SCREEN CLUSTER INJECTION WELL VAULTS MECHANICAL DETAILS

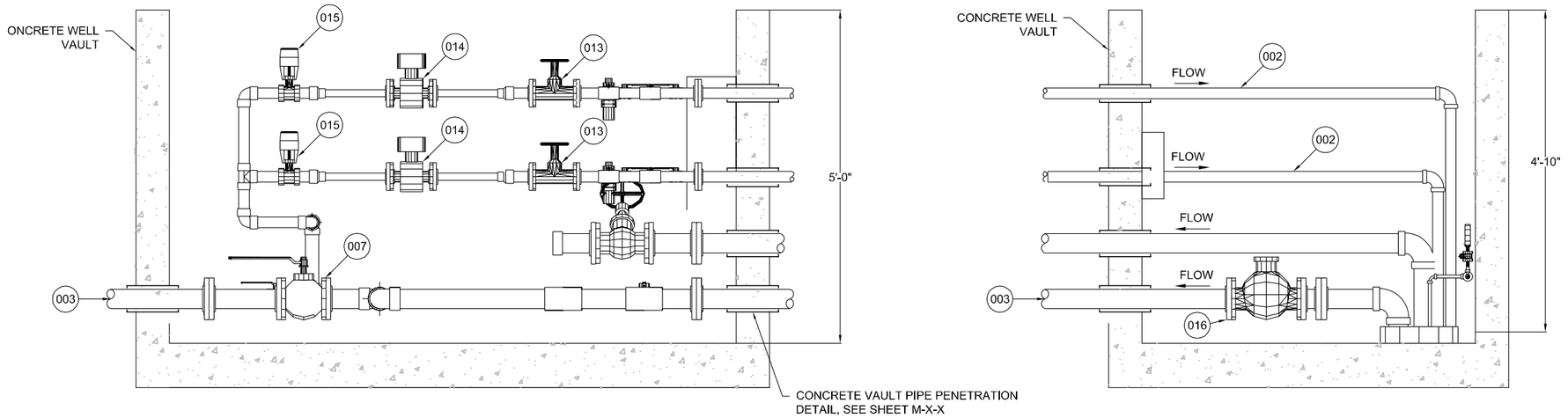
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-04-08	REV

N180B

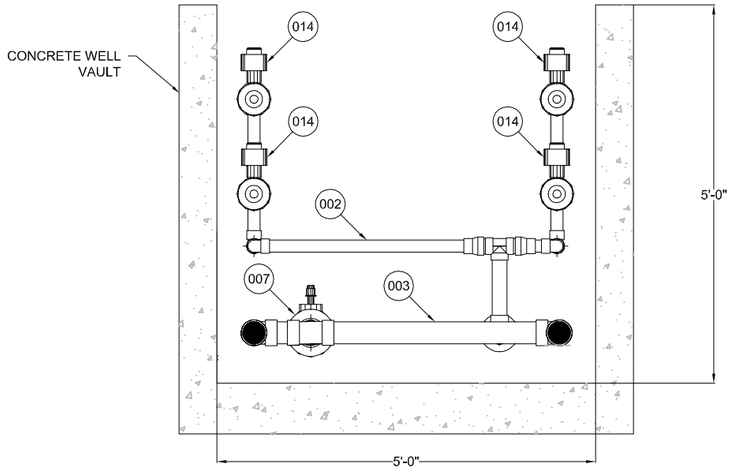


NOTES:
1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
2. ALL PIPING AND INSTRUMENTATION SHALL BE INSTALLED PER P&IDs.
3. INSTALLATION OF ELECTRIC COMPONENTS SHALL COMPLY WITH ALL APPLICABLE NEC AND LOCAL CODES.
4. CROSS SECTIONS SHOW ONLY 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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

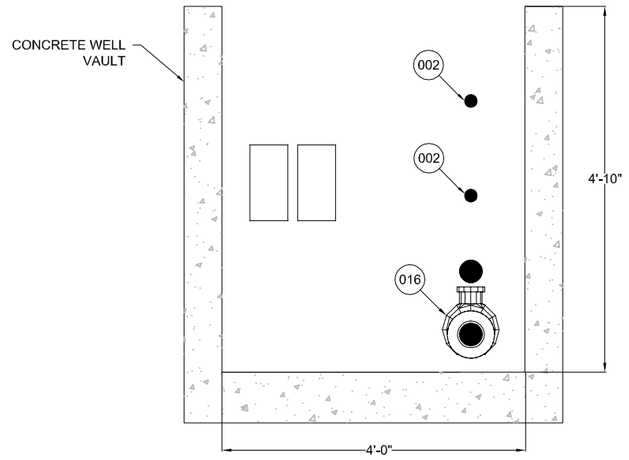
LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-04-08

A INJECTION VALVE VAULT AND INJECTION WELL VAULT SECTION
NO SCALE
M-04-08



B INJECTION WELL VAULT SECTION
NO SCALE
M-04-08



C INJECTION WELL VAULT SECTION
NO SCALE
M-04-08

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

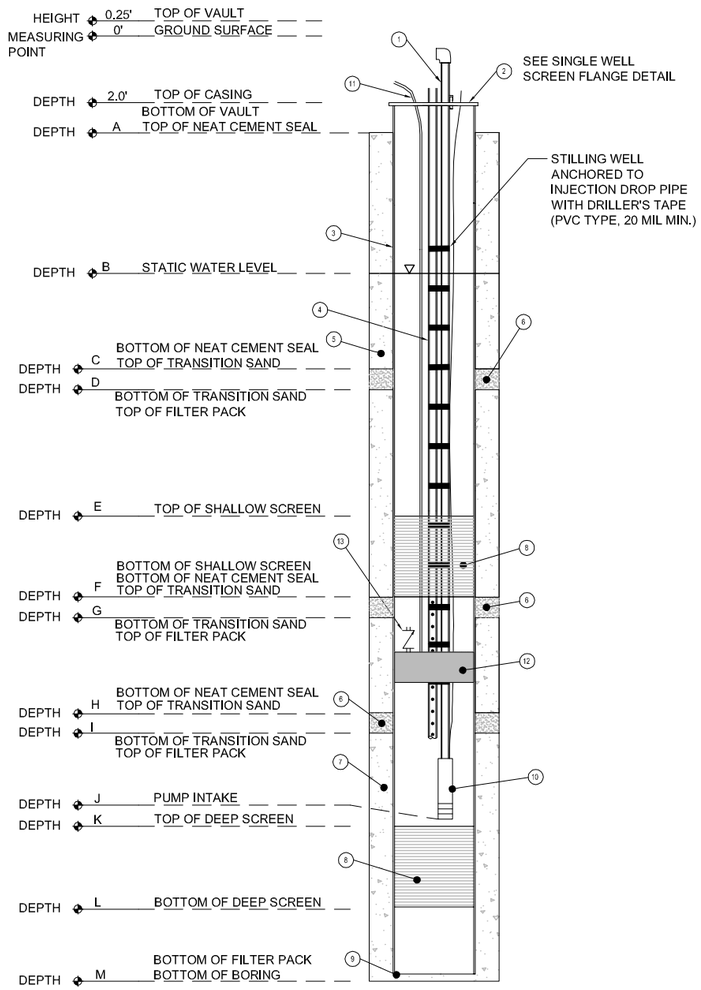
APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT
IRZ DUAL SCREEN CLUSTER
INJECTION WELL 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-04-09	REV

N1808



A RIVERBANK DUAL SCREEN EXTRACTION WELL DETAIL

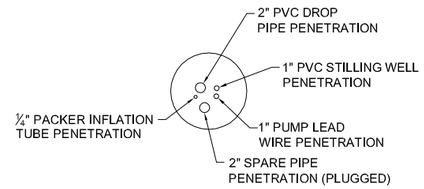
NO SCALE

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
11	1/4" DIAMETER HOSE FROM PACKER TO FILL ASSEMBLY
12	PNEUMATIC WELL PACKER
13	3/4" PACKER PRESSURE RELIEF SAFETY VALVE

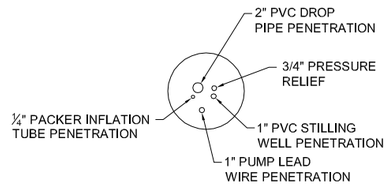
NOTES:

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 DUAL SCREEN WELL FLANGE DETAIL

NO SCALE



C EXTRACTION WELL PACKER DETAIL

NO SCALE

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JPB	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP EXTRACTION WELL CONSTRUCTION DETAILS

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

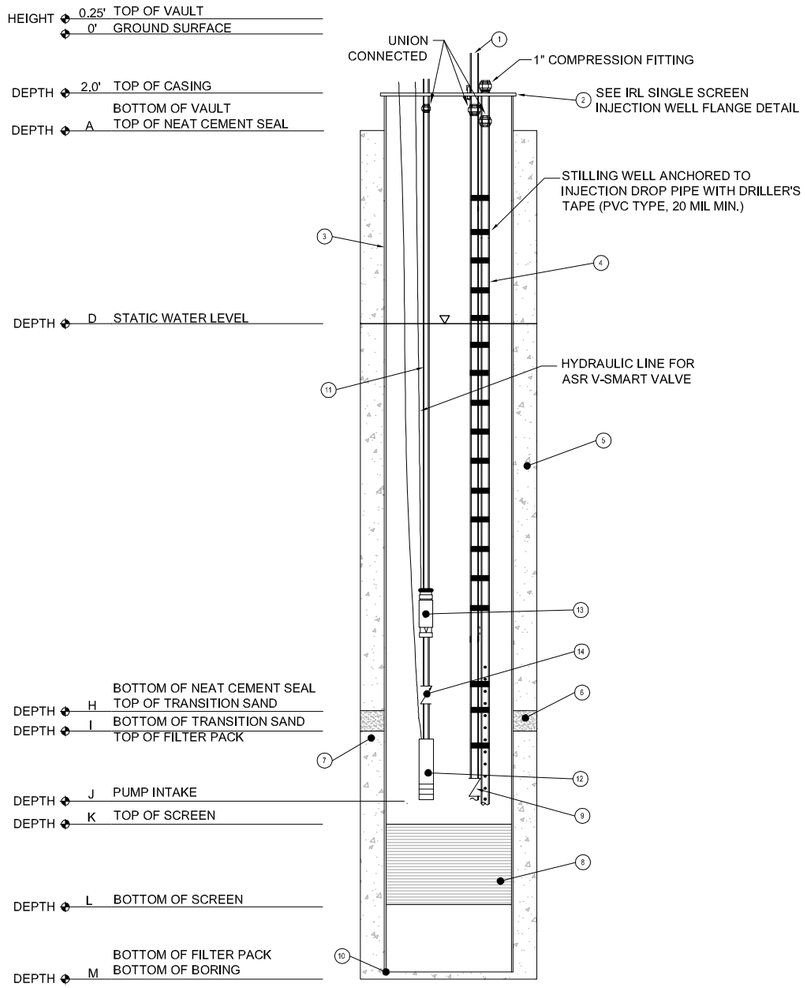
SAN FRANCISCO, CALIFORNIA

- DRAFT - NOT FOR CONSTRUCTION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-05-01	REV

03/26/2013, 16:53, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\MECH\NCALS\Well Construction Details.dwg, Tab: M-05-01

N1808



A IRL SINGLE SCREEN INJECTION WELL WITH BACKWASH PUMP DETAIL

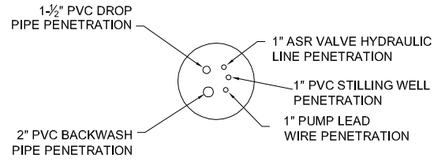
NO SCALE

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

1	1-½" PVC DROP PIPE (MATERIALS TBD)
2	CUSTOM TAPPED 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 (TYPE TBD)
8	WELL SCREEN (MATERIALS TBD)
9	SPRING CHECK VALVE (TYPE AND MATERIALS TBD)
10	SUMP
11	3" BACKWASH PIPING
12	BACKWASH PUMP
13	3" ASR V-SMART VALVE
14	3" CHECK VALVE

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 IRL SINGLE SCREEN WELL FLANGE DETAIL

NO SCALE

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JPB	JPB	JEF

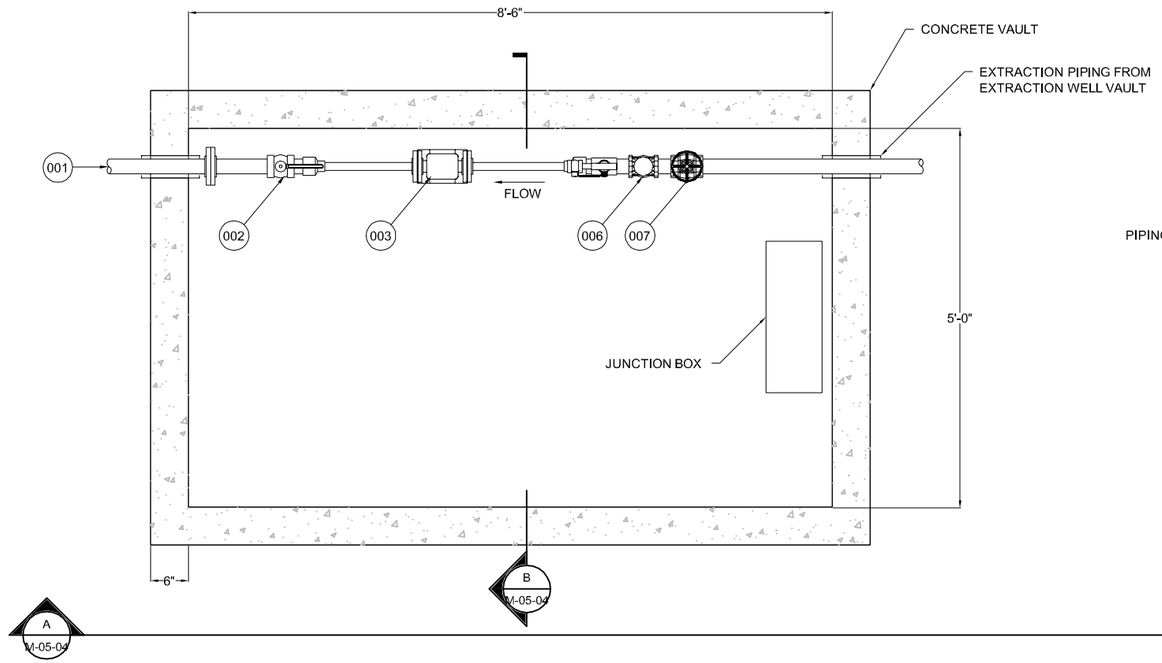
REVISIONS

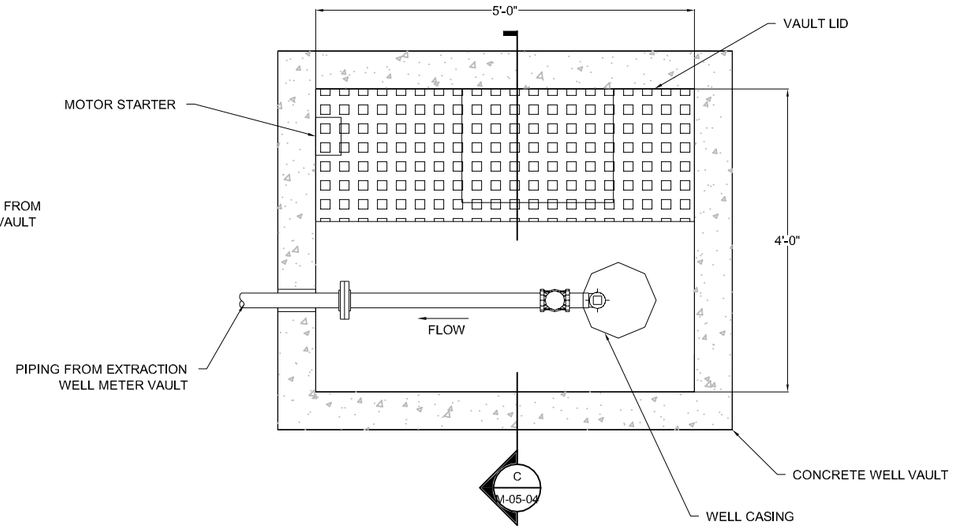
APPROVED BY	SO
JEF	SUPV JPB
	DSGN JPB
	DWN AJW
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS NOTED

TOPOCK GROUNDWATER REMEDIATION PROJECT
INNER RECIRCULATION 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-05-02	REV

03/26/2013, 18:54, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\MECHANICALS\Well Construction Details.dwg, Tab: M-05-02





EXTRACTION WELL METER VAULT AND WELL VAULT PLAN

NO SCALE

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-05-03

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	CPVC	GROUNDWATER	
2	2"	CPVC	GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
3	2"	TEFLON	GROUNDWATER	MAGNETIC FLOWMETER
4	1/2"	TBD	GROUNDWATER	PRESSURE GAUGE ASSEMBLY
5	1/4"	TBD	GROUNDWATER	SAMPLE PORT
6	2"	CPVC	GROUNDWATER	CHECK VALVE
7	2"	CPVC	GROUNDWATER	GLOBE VALVE
8	1 1/2"	CPVC	EXTRACTED GROUNDWATER	

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

RIVERBANK EXTRACTION WELL VAULT MECHANICAL DETAILS

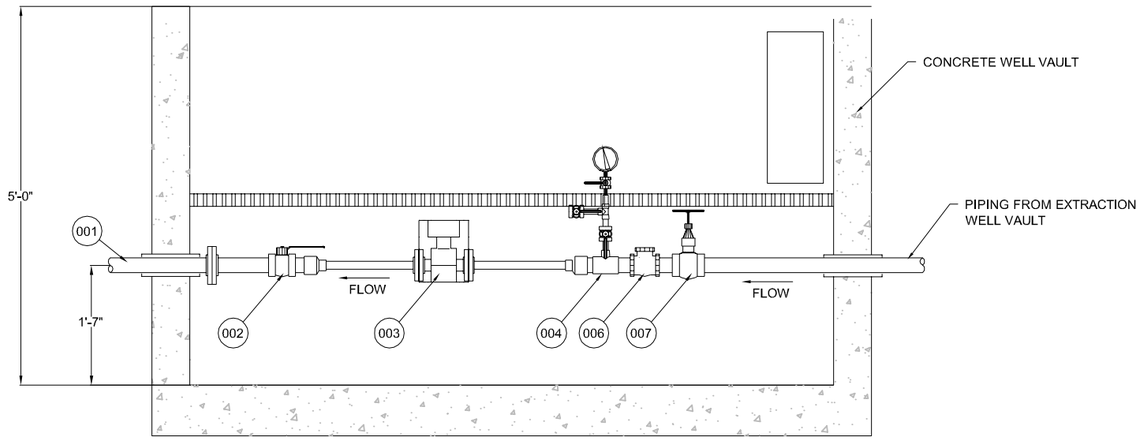
GAS TRANSMISSION & DISTRIBUTION

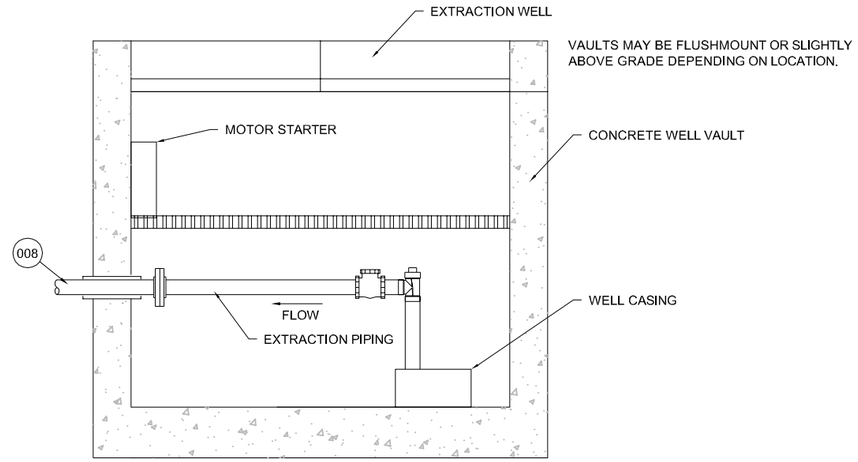
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

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

N180B

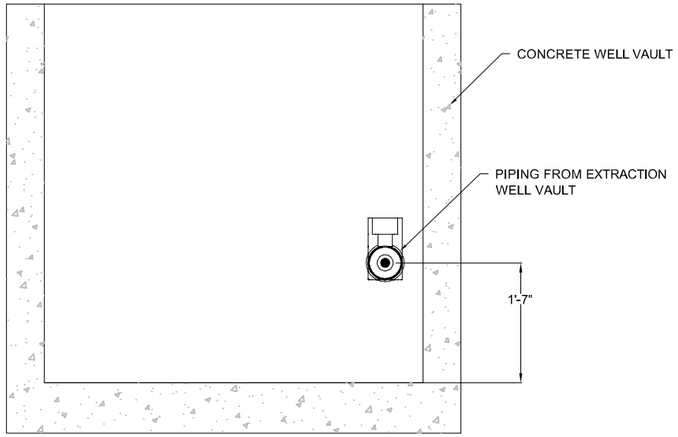




A EXTRACTION WELL METER VAULT AND WELL VAULT SECTION

NO SCALE

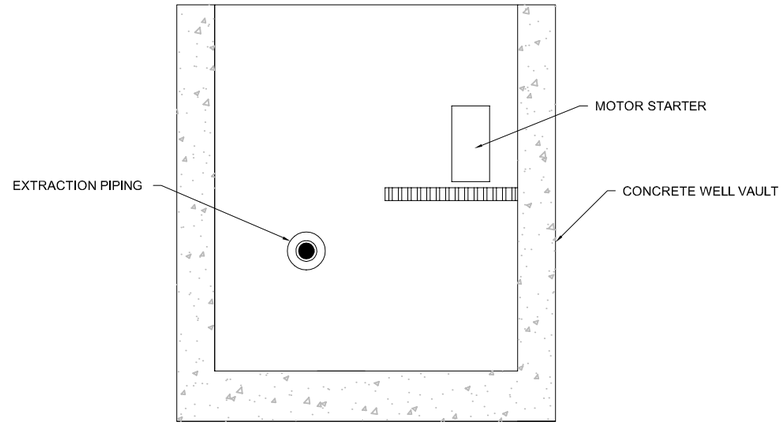
M-05-03



B EXTRACTION WELL METER VAULT SECTION

NO SCALE

M-05-03



C EXTRACTION WELL METER VAULT SECTION

NO SCALE

M-05-03

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-05-03

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	
JEF	SO
	SUPV JPB
	DSGN JPB
	DWN LUK
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

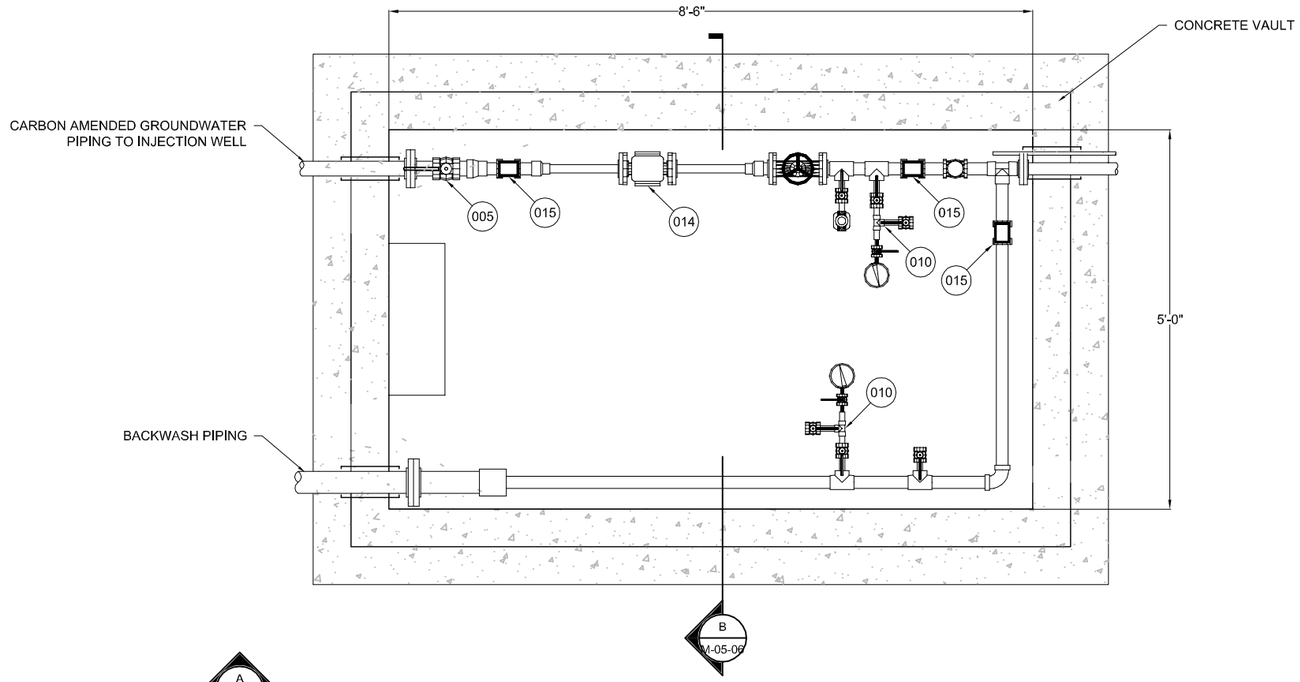
RIVERBANK EXTRACTION WELL VAULT MECHANICAL SECTIONS

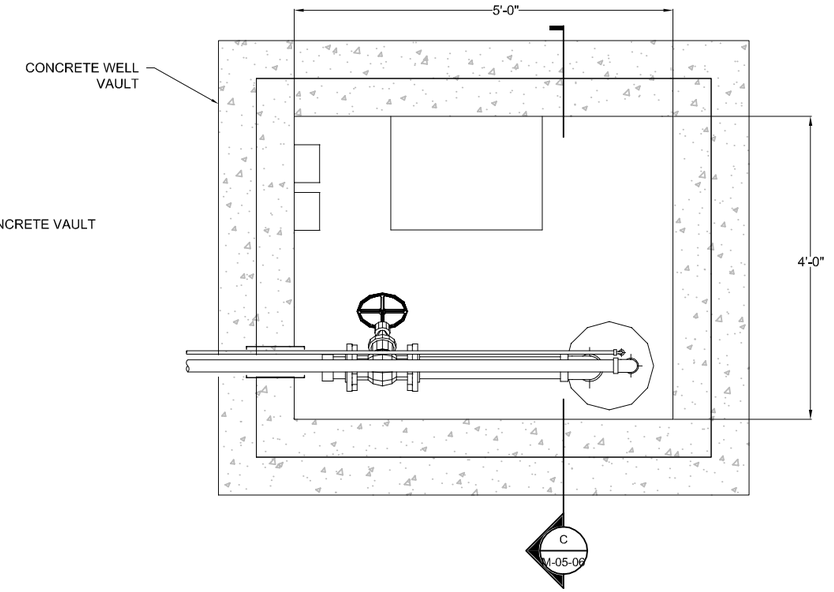
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-05-04	REV

N180B





LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-05-05

INJECTION WELL METER VAULT AND INJECTION WELL VAULT PLAN

NO SCALE

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1	2"	HDPE	CARBON AMENDED GROUNDWATER	
2	2"	HDPE	CARBON AMENDED GROUNDWATER	
3	3"	HDPE	BACKWASH	
4	3"	HDPE	SPARE/BACKWASH RETURN	
5	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
6	2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
7	3"	CPVC	BACKWASH	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
8	3"	CPVC	SPARE/BACKWASH RETURN	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE THE VAULT
9	1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY
10	1/2"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY
11	1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT
12	N/A	N/A	N/A	CONTROL/COMM. PANEL
13	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE
14	1	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOWMETER
15	1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	PROPORTIONAL ACTUATED BALL VALVE
16	3"	CPVC	BACKWASH	CHECK VALVE

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

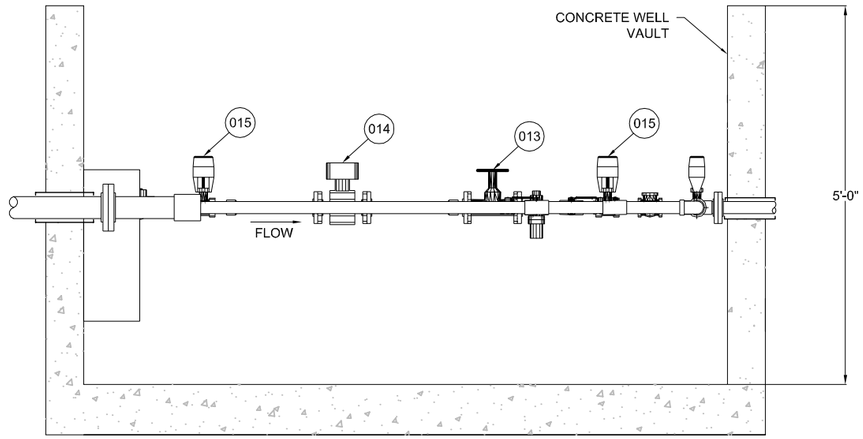
APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

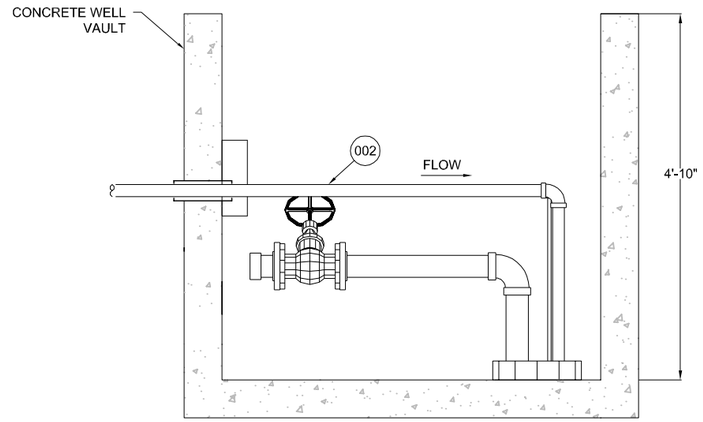
TOPOCK GROUNDWATER REMEDIATION PROJECT
INNER RECIRCULATION LOOP
INJECTION WELL VAULTS
MECHANICAL DETAILS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

N180B



A INJECTION WELL METER VAULT AND INJECTION WELL VAULT SECTION
NO SCALE
M-05-05

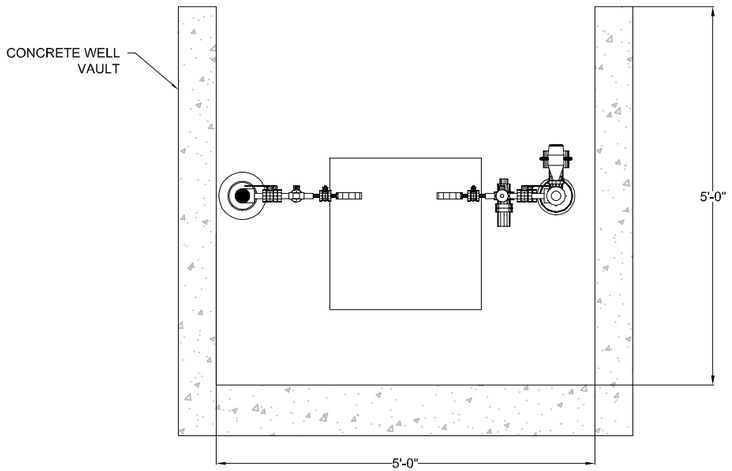


NOTES:
1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
2. ALL PIPING AND INSTRUMENTATION SHALL BE INSTALLED PER P&IDs.
3. INSTALLATION OF ELECTRIC COMPONENTS SHALL COMPLY WITH ALL APPLICABLE NEC AND LOCAL CODES.
4. CROSS SECTIONS SHOW ONLY 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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

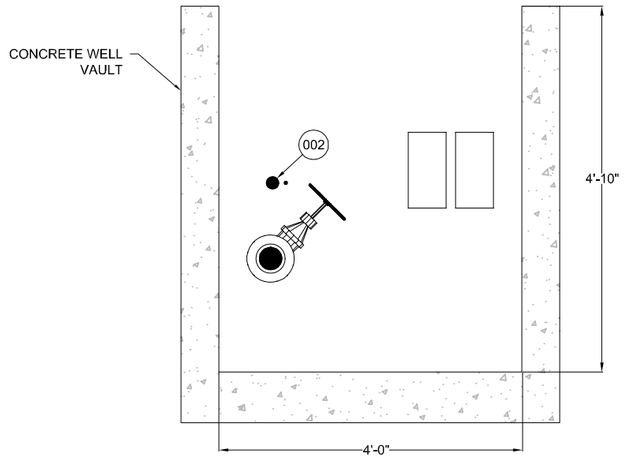
LEGEND:

(003) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-05-05

FLOW DIRECTION



B INJECTION WELL VAULT SECTION
NO SCALE
M-05-05



C INJECTION WELL VAULT SECTION
NO SCALE
M-05-05

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	LUK	JPB	JPB	JEF	

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

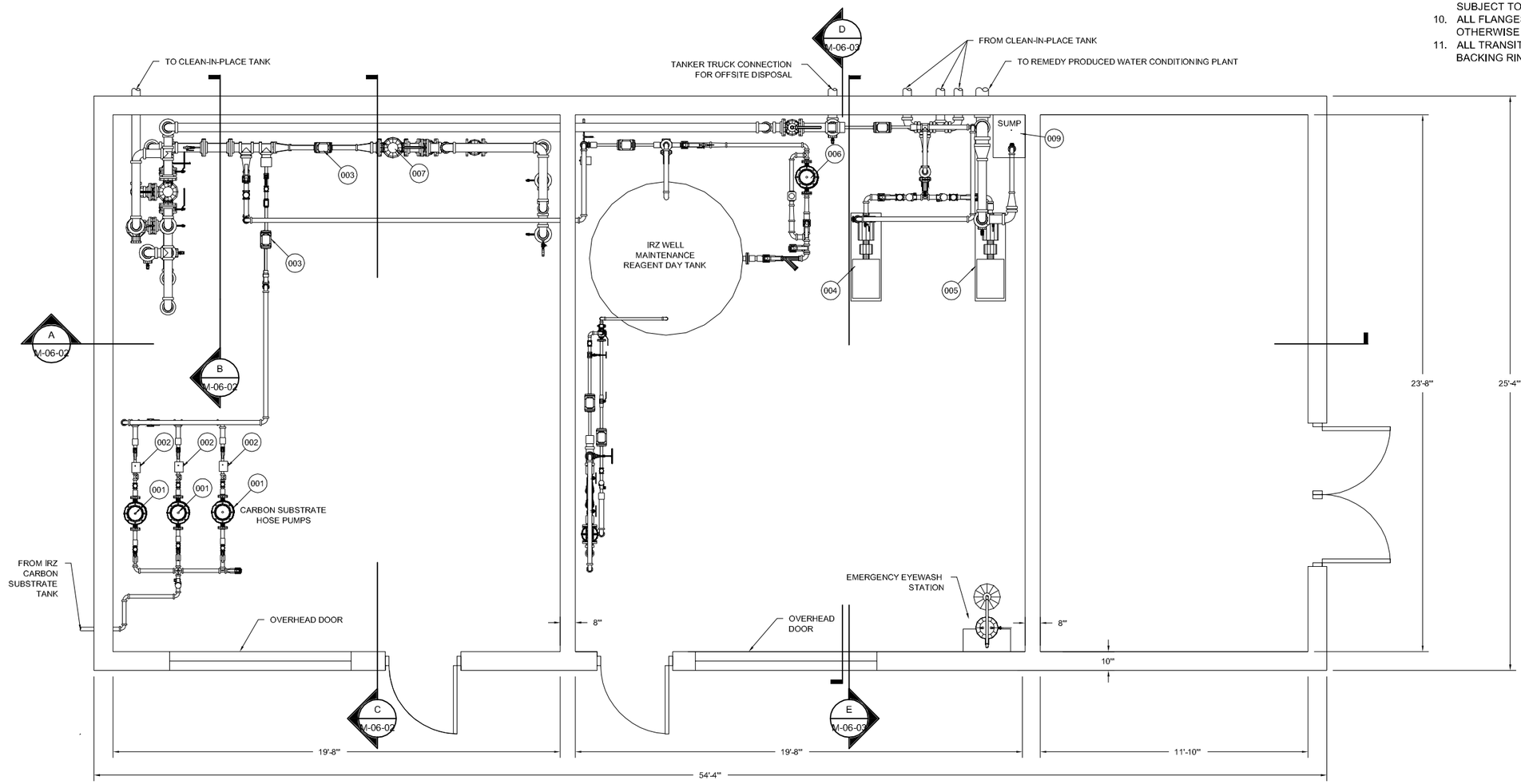
TOPOCK GROUNDWATER REMEDIATION PROJECT
INNER RECIRCULATION LOOP
INJECTION WELL VAULTS
MECHANICAL SECTIONS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-05-06	REV

N1808

IRZ CARBON AMENDMENT BUILDING SCHEDULE				
ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1			CARBON SUBSTRATE	CARBON SUBSTRATE HOSE PUMP
2	1"		CARBON SUSBSTRATE	CHECK VALVE
3	1"		CARBON SUBSTRATE	FLOW METER
4			CLEAN-IN-PLACE REAGENT	CLEAN-IN-PLACE REAGENT PUMP
5			PRODUCED WATER	PRODUCED WATER TRANSFER PUMP
6			WELL MAINTENANCE REAGENT	WELL MAINTENANCE REAGENT HOSE PUMP
7	2"		CARBON SUBSTRATE	GLOBE VALVE
8	4"		CARBON SUBSTRATE	DIAPHRAGM VALVE
9				SUMP PUMP

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.



LEGEND:

(007) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-06-01

IRZ CARBON AMENDMENT BUILDING

3/8" = 1'-0"

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY: JEF

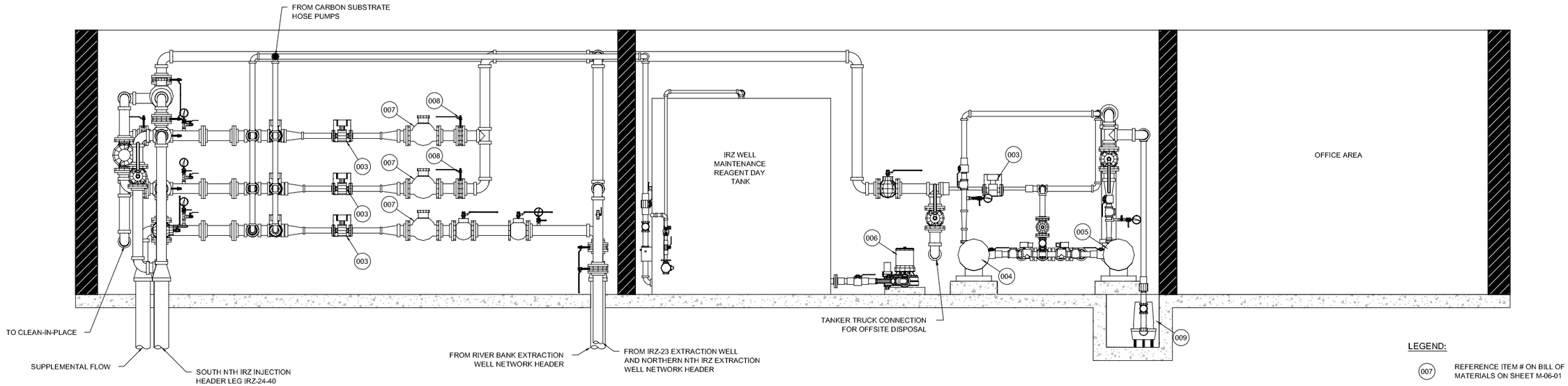
SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ CARBON AMENDMENT BUILDING MECHANICAL LAYOUT

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

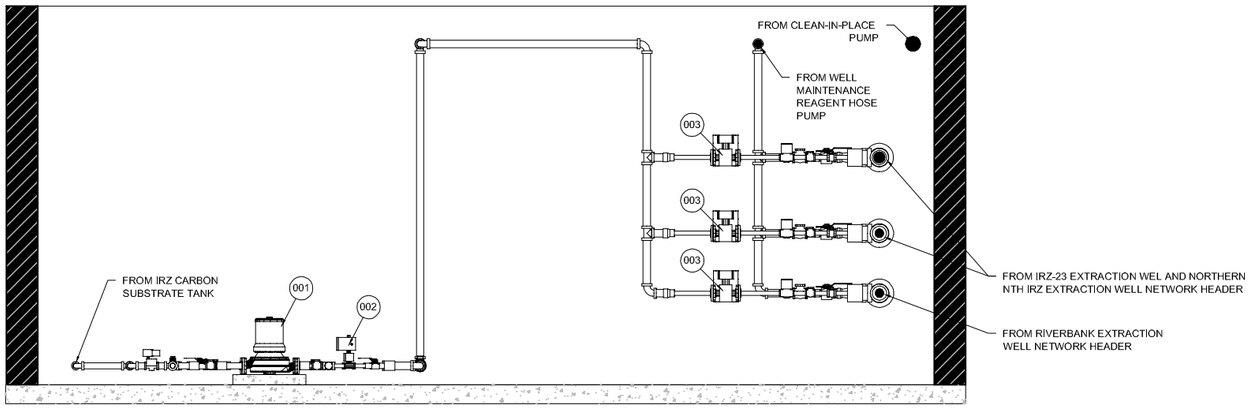
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-06-01	REV



A IRZ CARBON AMENDMENT BUILDING SECTION

1/2" = 1'-0"

M-06-01

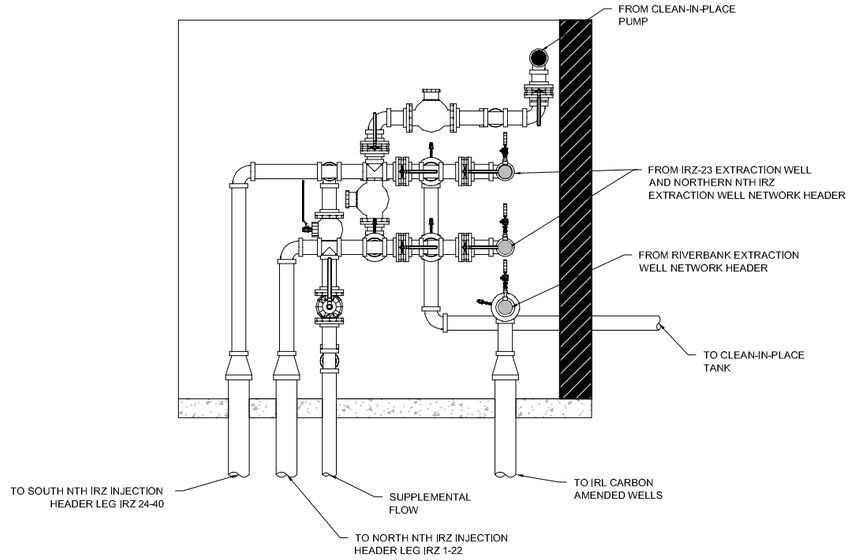


NOTE: BACKGROUND PIPING EXCLUDED FOR CLARITY.

B IRZ CARBON AMENDMENT ROOM SECTION

1/2" = 1'-0"

M-06-01



C IRZ CARBON AMENDMENT ROOM SECTION

1/2" = 1'-0"

M-06-01

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ CARBON AMENDMENT BUILDING SECTIONS AND DETAILS SHEET 1 OF 2

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

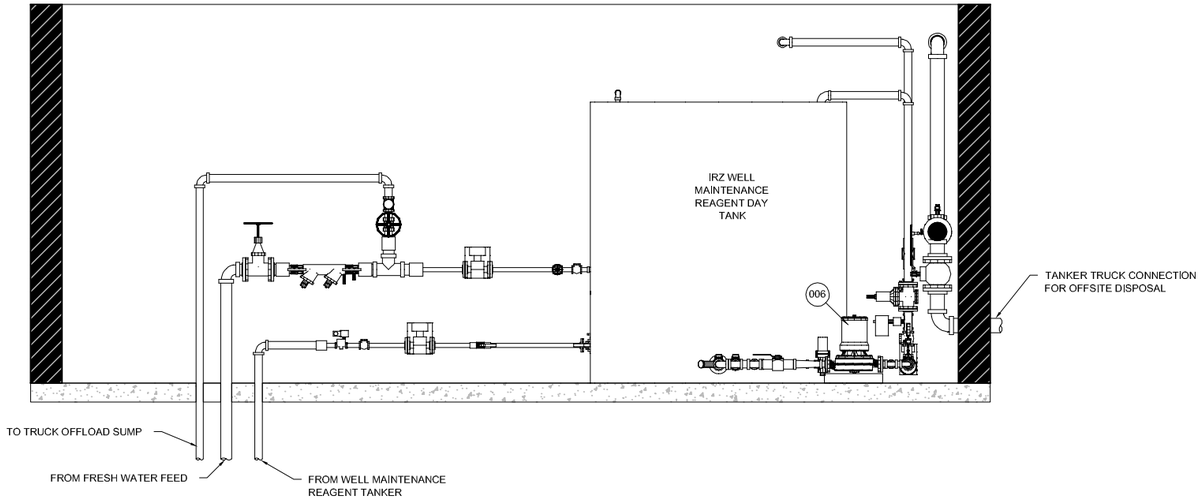
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	M-06-02 of SHEETS
REV	

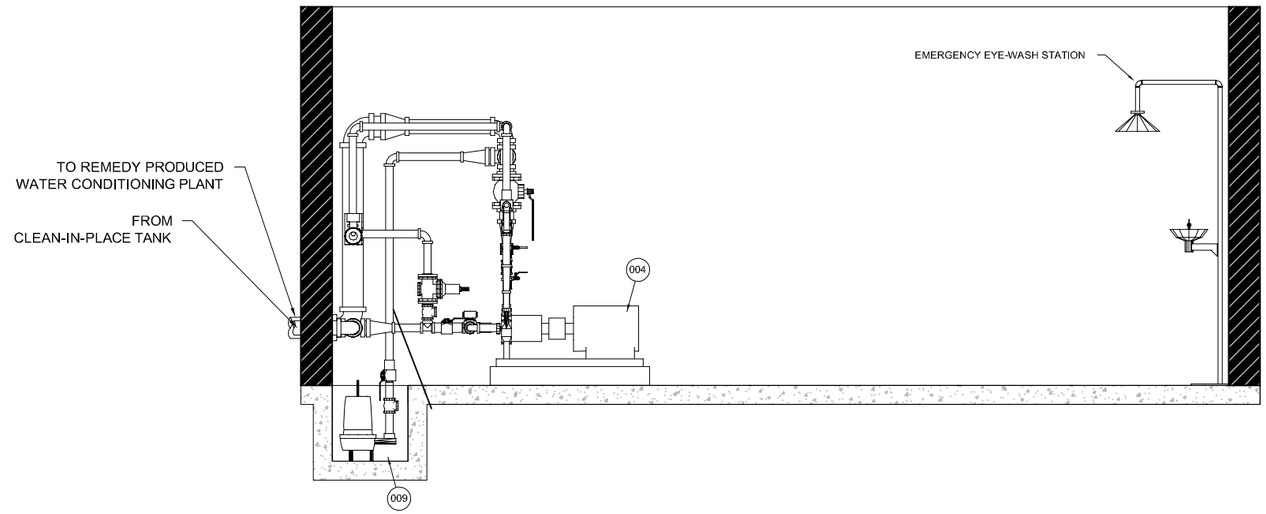
N180B

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.



D M-06-01 IRZ WELL MAINTENANCE REAGENT ROOM SECTION
1/2" = 1'-0"



E M-06-01 IRZ WELL MAINTENANCE REAGENT ROOM SECTION
1/2" = 1'-0"

LEGEND:

(007) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-06-01

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	LUK	JPB	JPB	JEF	

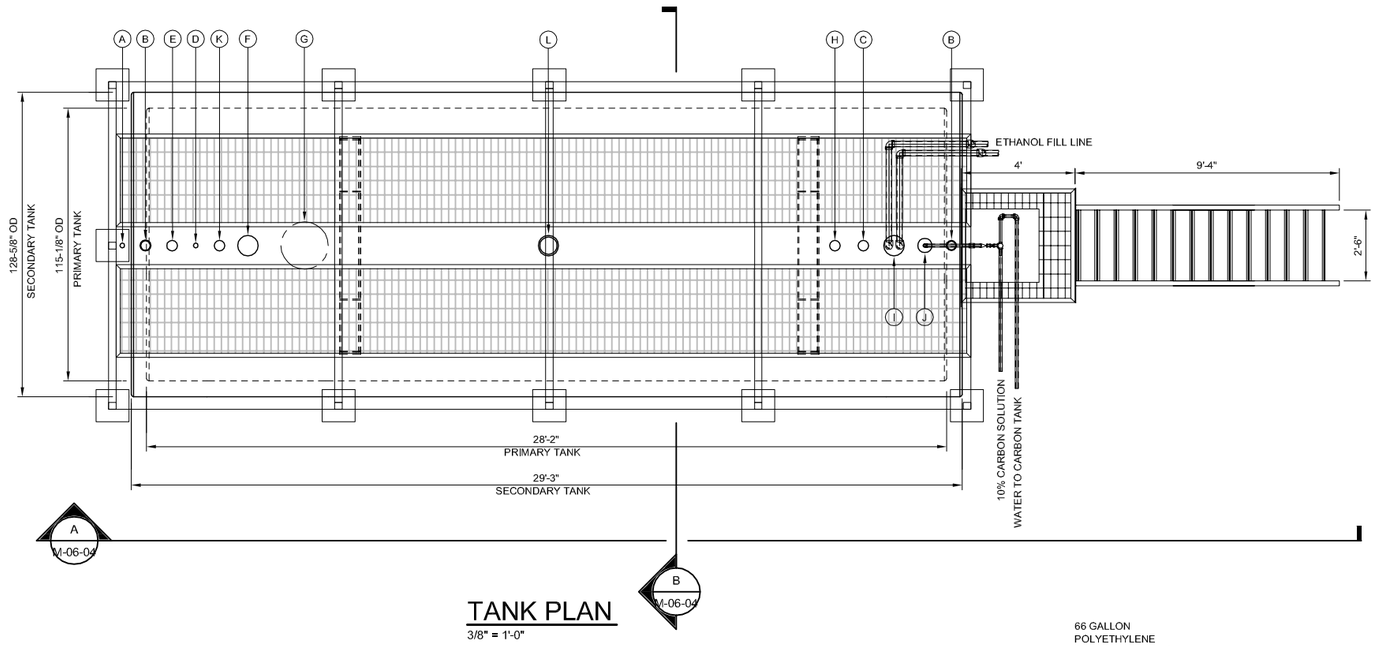
REVISIONS

APPROVED BY	SO
JEF	SUPV JPB
	DSGN JPB
	DWN LUK
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT
IRZ CARBON AMENDMENT BUILDING
SECTIONS AND DETAILS
SHEET 2 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
M-06-03	REV

N180B



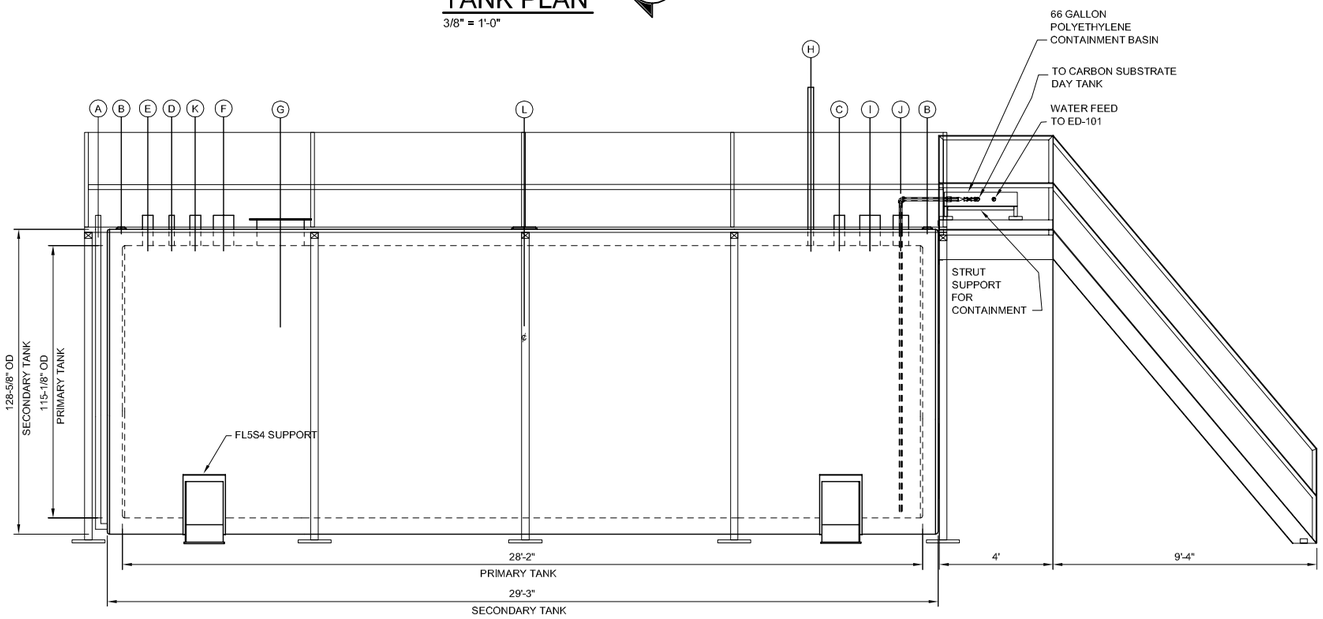
TANK PLAN

3/8" = 1'-0"

NOZZLE SCHEDULE						
NOZZLE	SIZE	RATING	SCH	FLANGE		EXISTING NOZZLE DESCRIPTION
				SLIP-ON	F.F.	
A	2"	150#	80	SLIP-ON	F.F.	INTERSTITIAL MONITOR
B	4"	150#	80	SLIP-ON	F.F.	AGGREGATE FILL
C	4"	150#	80	SLIP-ON	F.F.	SPARE
D	2"	150#	80	SLIP-ON	F.F.	TEMPERATURE TRANSMITTER
E	4"	150#	80	SLIP-ON	F.F.	LEVEL TRANSMITTER
F	8"	150#	80	SLIP-ON	F.F.	EMERCENCY VENT
G	20"	150#	80	SLIP-ON		ACCESS PORT
H	2"	150#	80	SLIP-ON	F.F.	PRESSURE/VACUUM (P/V) VENT
I	8"	150#	80	SLIP-ON	F.F.	FILL OPENING
J	6"	150#	80	SLIP-ON	F.F.	SUCTION OPENING
K	4"	150#	80	SLIP-ON	F.F.	SPARE
L	8"	150#	80	SLIP-ON	F.F.	SECONDARY EMERGENCY VENT

NOTES:

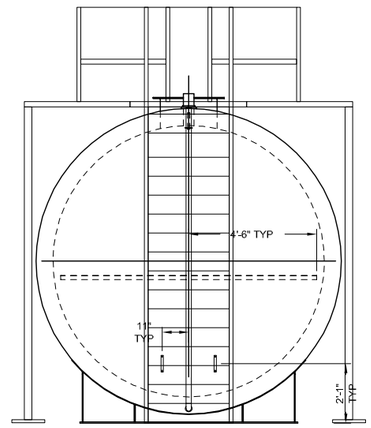
1. TANK MUST MEET ALL SEISMIC ZONE IV REQUIREMENTS.
2. FABRICATOR SHALL PROVIDE CONTRACTOR WITH TANK ANCHORING DETAILS TO CONCRETE SLAB.
3. 3" AND SMALLER NOZZLES SHALL PROJECT 4" (MIN) FROM VESSEL SHELL.
4. 4" NOZZLES AND LARGER SHALL PROJECT 6" (MIN) FROM VESSEL SHELL.
5. FABRICATOR SHALL PROVIDE HANDLES ON ACCESS PORTS.
6. FLANGE BOLT HOLES TO STRADDLE PRINCIPAL VESSEL CENTERLINE UNLESS OTHERWISE INDICATED.
7. FABRICATOR TO PROVIDE REINFORCING PLATES FOR NOZZLES AS REQUIRED.
8. FABRICATOR TO PROVIDE LIFTING LUGS OR PROVIDE INSTRUCTIONS FOR SETTING TANK (E.G., STRAPS WITH SPREADER BAR).
9. CONTRACTOR TO PROCURE, OFFLOAD, AND INSTALL.
10. FABRICATOR SHALL PROVIDE PLATFORM AND STAIRS TO ACCESS TOP OF TANK.



A TANK SECTION

3/8" = 1'-0"

M-06-04



B TANK SECTION

3/8" = 1'-0"

M-06-04

CARBON SUBSTRATE STORAGE TANK PLAN AND SECTION VIEWS

3/8" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO
SUPV JPB
DSGN JPB
DWN LUK
CHKD JPB
QK JEF
DATE 04/05/13
SCALES AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRZ CARBON SUBSTRATE STORAGE TANK MECHANICAL DETAILS

GAS TRANSMISSION & DISTRIBUTION

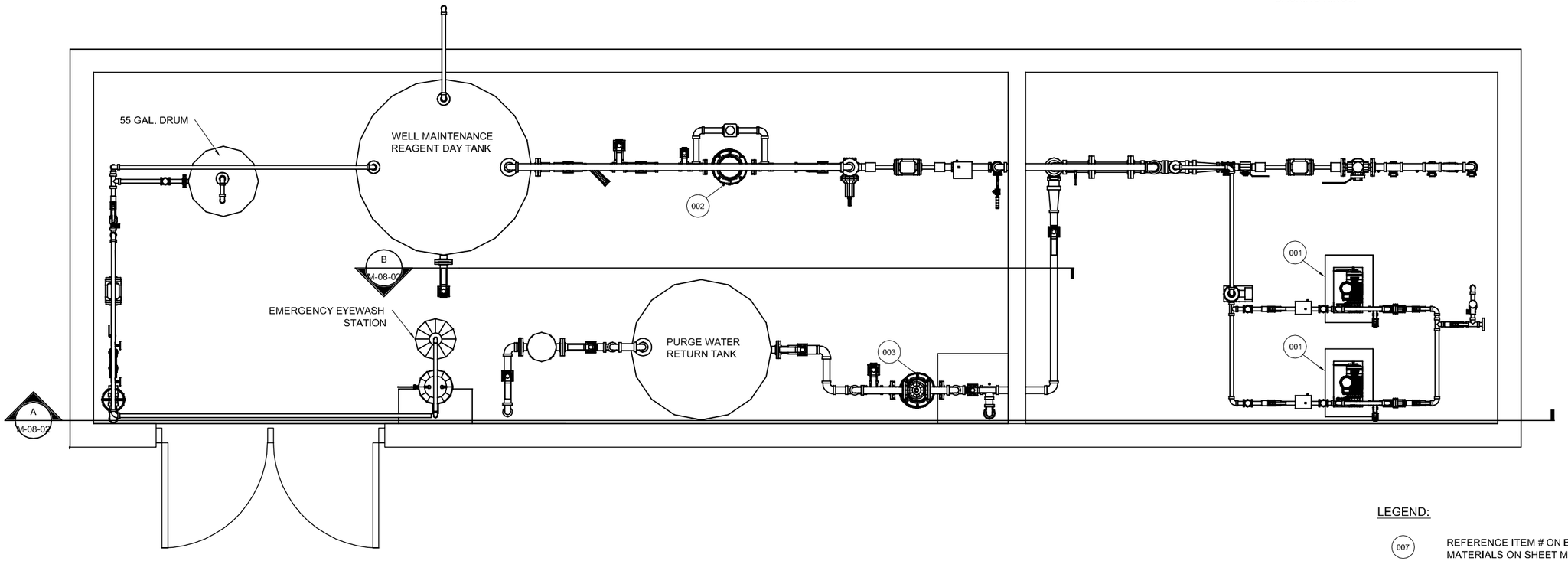
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. M-06-04 of SHEETS
REV

04/03/2013, 15:44, G:\Graphics\ARI\TOPOCK-01\Submittal-60%_March2013\MECHANICALS\TankDetails.dwg, Tab: M-06-04

TW BENCH CARBON AMENDMENT BUILDING SCHEDULE				
ITEM	PIPE SIZE	MATERIAL	PROCESS FLOW	DESCRIPTION
1			CARBON SUBSTRATE	CARBON SUBSTRATE HOSE PUMP
2			WELL MAINTENANCE REAGENT	WELL MAINTENANCE REAGENT PUMP
3			PURGE WATER	PURGE WATER PUMP
4				SUMP PUMP

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.



LEGEND:

(007) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-08-01

TW BENCH CARBON AMENDMENT BUILDING

NO SCALE

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

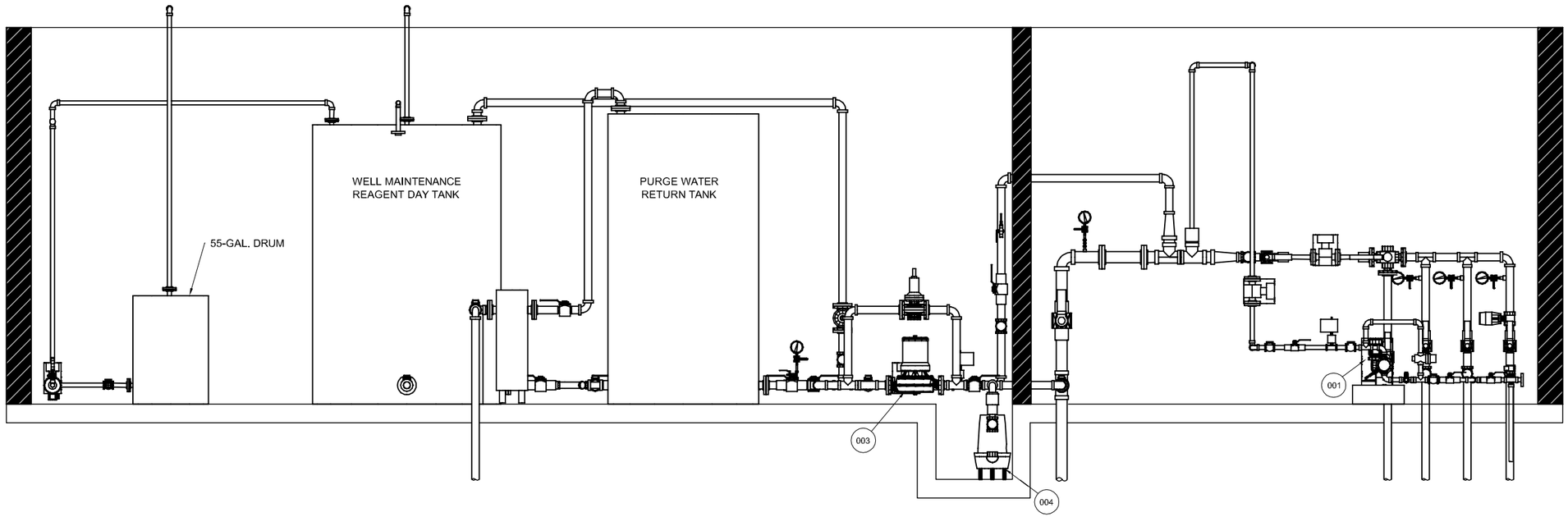
TOPOCK GROUNDWATER REMEDIATION PROJECT

TW BENCH CARBON AMENDMENT BUILDING MECHANICAL 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
M-08-01	REV

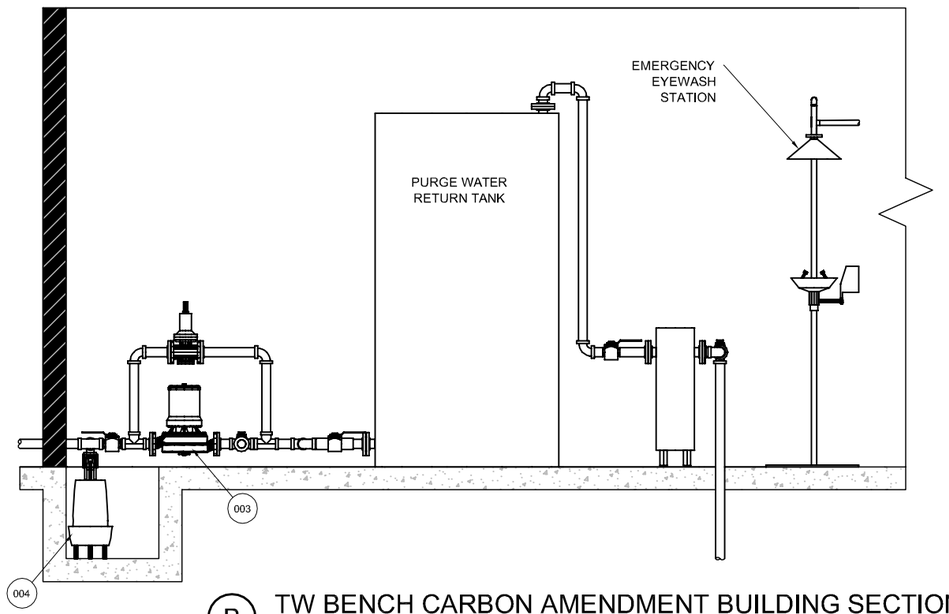
N180B



A
M-08-01

TW BENCH CARBON AMENDMENT BUILDING SECTION

NO SCALE



B
M-08-01

TW BENCH CARBON AMENDMENT BUILDING SECTION

NO SCALE

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 RATED FACE FLANGES UNLESS OTHERWISE SPECIFIED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.

LEGEND:

(007) REFERENCE ITEM # ON BILL OF MATERIALS ON SHEET M-08-01

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		LUK	JPB	JPB	JEF

REVISIONS

APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

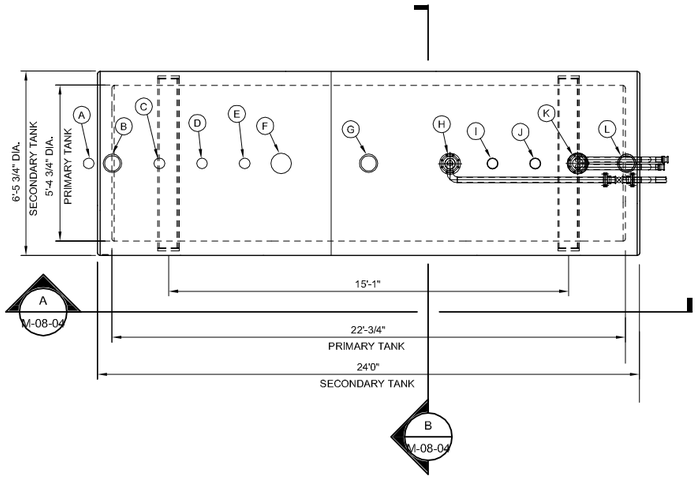
TOPOCK GROUNDWATER REMEDIATION PROJECT

TW BENCH CARBON AMENDMENT BUILDING SECTIONS AND 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-08-02	REV

N180B



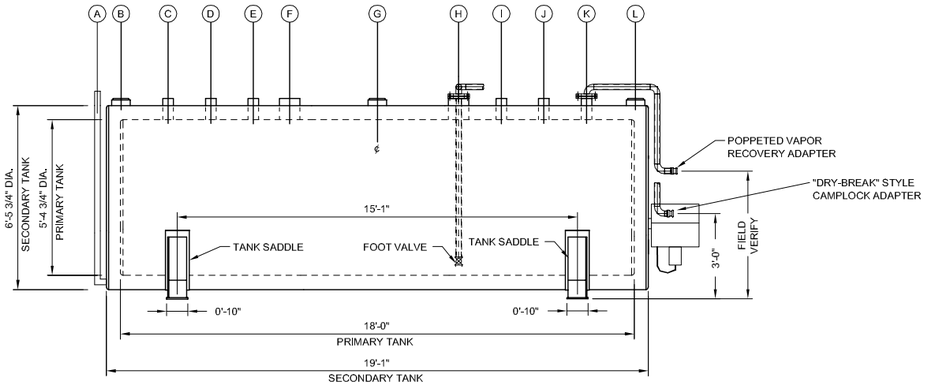
TANK PLAN

3/8" = 1'-0"

NOZZLE SCHEDULE						
NOZZLE	SIZE	RATING	SCH	FLANGE		EXISTING NOZZLE DESCRIPTION
				SLIP-ON	F.F.	
A	2"	NPT	40	SLIP-ON	F.F.	INTERSTITIAL MONITOR
B	6"	NPT	80	SLIP-ON	F.F.	SECONDARY EMERGENCY VENT
C	2"	NPT	80	SLIP-ON	F.F.	CARB APPROVED VACUUM/PRESSURE VENT (8" W.C. VAC / 3" W.C. PRESSURE)
D	2"	NPT	80	SLIP-ON	F.F.	SPARE
E	2"	NPT	80	SLIP-ON	F.F.	SPARE
F	6"	NPT	80	SLIP-ON	F.F.	EMERCENCY VENT
G	6"	NPT	80	SLIP-ON		SECONDARY EMERGENCY VENT
H	4"	NPT	80	SLIP-ON	F.F.	PRODUCT WITHDRAWAL
I	2"	NPT	80	SLIP-ON	F.F.	SPARE
J	2"	NPT	80	SLIP-ON	F.F.	SPARE
K	4"	150#	80	SLIP-ON	F.F.	AGGREGATE FILL (PRODUCT AND VAPOR RECOVERY)
L	6"	150#	80	SLIP-ON	F.F.	SECONDARY EMERGENCY VENT

NOTES:

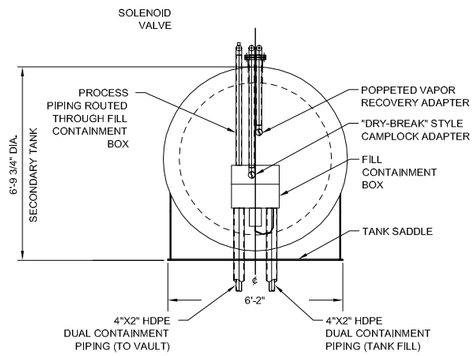
1. TANK MUST MEET ALL SEISMIC ZONE IV REQUIREMENTS.
2. FABRICATOR SHALL PROVIDE CONTRACTOR WITH TANK ANCHORING DETAILS TO CONCRETE SLAB.
3. 3" AND SMALLER NOZZLES SHALL PROJECT 4" (MIN) FROM VESSEL SHELL.
4. 4" NOZZLES AND LARGER SHALL PROJECT 6" (MIN) FROM VESSEL SHELL.
5. FABRICATOR SHALL PROVIDE HANDLES ON ACCESS PORTS.
6. FLANGE BOLT HOLES TO STRADDLE PRINCIPAL VESSEL CENTERLINE UNLESS OTHERWISE INDICATED.
7. FABRICATOR TO PROVIDE REINFORCING PLATES FOR NOZZLES AS REQUIRED.
8. FABRICATOR TO PROVIDE LIFTING LUGS OR PROVIDE INSTRUCTIONS FOR SETTING TANK (E.G., STRAPS WITH SPREADER BAR).
9. CONTRACTOR TO PROCURE, OFFLOAD, AND INSTALL.
10. FABRICATOR SHALL PROVIDE PLATFORM AND STAIRS TO ACCESS TOP OF TANK.



A TANK SECTION

3/8" = 1'-0"

M-08-04



B TANK SECTION

3/8" = 1'-0"

M-08-04

CARBON SUBSTRATE STORAGE TANK PLAN AND SECTION VIEWS

3/8" = 1'-0"

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	LUK	JPB	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JPB
DWN	LUK
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	AS SHOWN

TOPOCK GROUNDWATER REMEDIATION PROJECT

TW BENCH CARBON SUBSTRATE STORAGE TANK MECHANICAL DETAILS

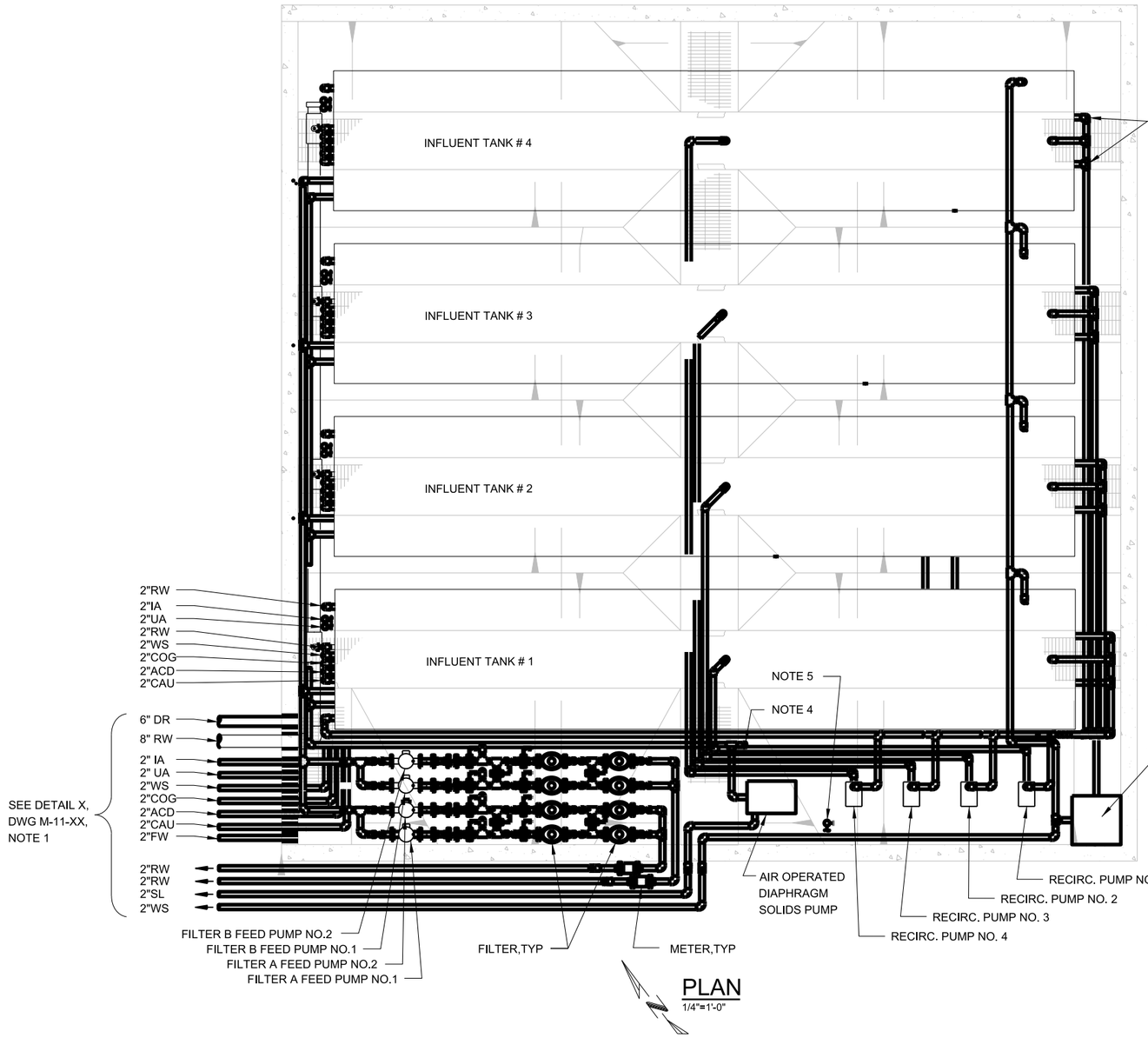
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-08-04	REV

04/03/2013, 15:44, G:\Graphics\ARITOPOCK-01\Submittal-60%_March-2013\MECHANICALS\TankDetails.dwg, Tab: M-08-04

N1808



PLAN
1/4"=1'-0"

NOTES:

1. INVERT ELEVATION OF INLET AND OUTLET PIPING IS 624.5'
2. PROVIDE 4" FIBER AND 4" ELECTRICAL INTO THIS AREA.
3. SEE DRAWING S-11-01, 02, 03 FOR STRUCTURAL DETAILS AND C-10-02, C-11-01 FOR CIVIL DETAILS.
4. FOR FUTURE DEWATERING USE.
5. HOSE BIBB

0 1 2 3
SCALE: 1/4"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL	GJ			JP	

REVISIONS

APPROVED BY		
	SO	
	SUPV	
	DSGN	RH
	DWN	GJ
	CHKD	JP
	OK	JP
	DATE	
	SCALES	

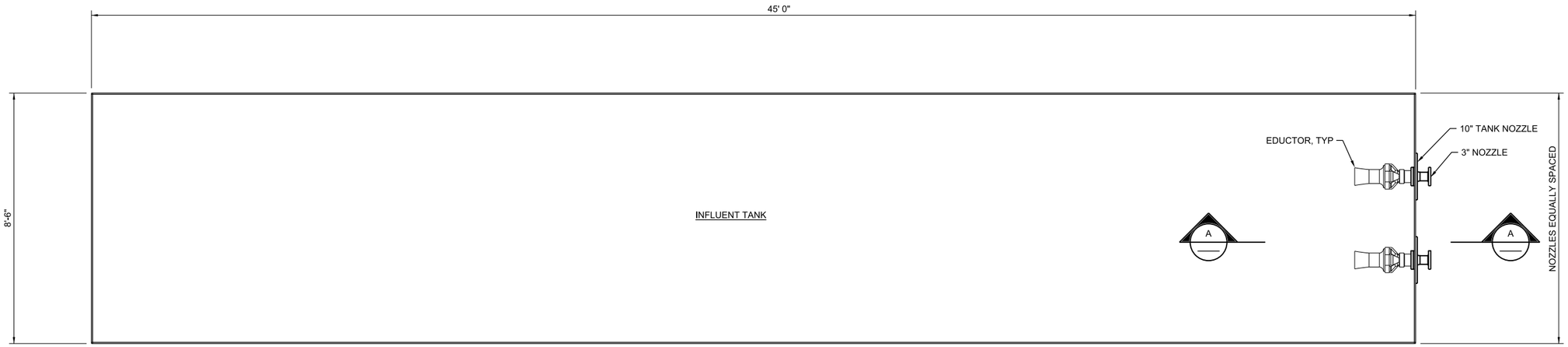
TOPOCK GROUNDWATER REMEDIATION PROJECT

INFLUENT TANK FARM PLAN

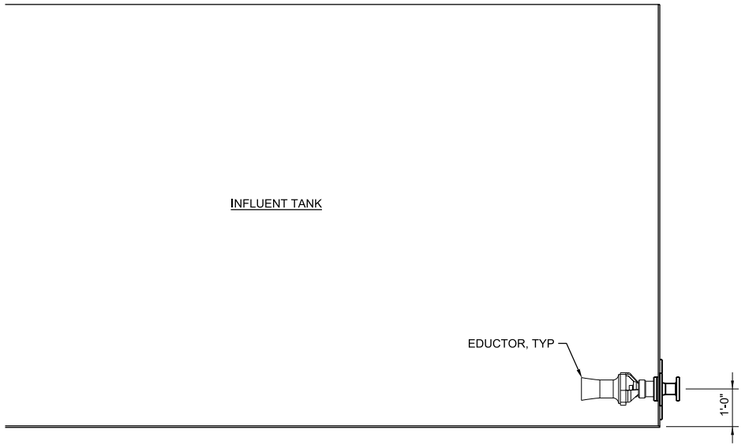
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
M-11-01	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:36:56 PM
FILENAME: CH-M-XXX-1101AD.dwg



TANK PLAN
1/2"=1'-0"



A SECTION
1/2"=1'-0"

SCALE: 1/2"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		GJ			JP

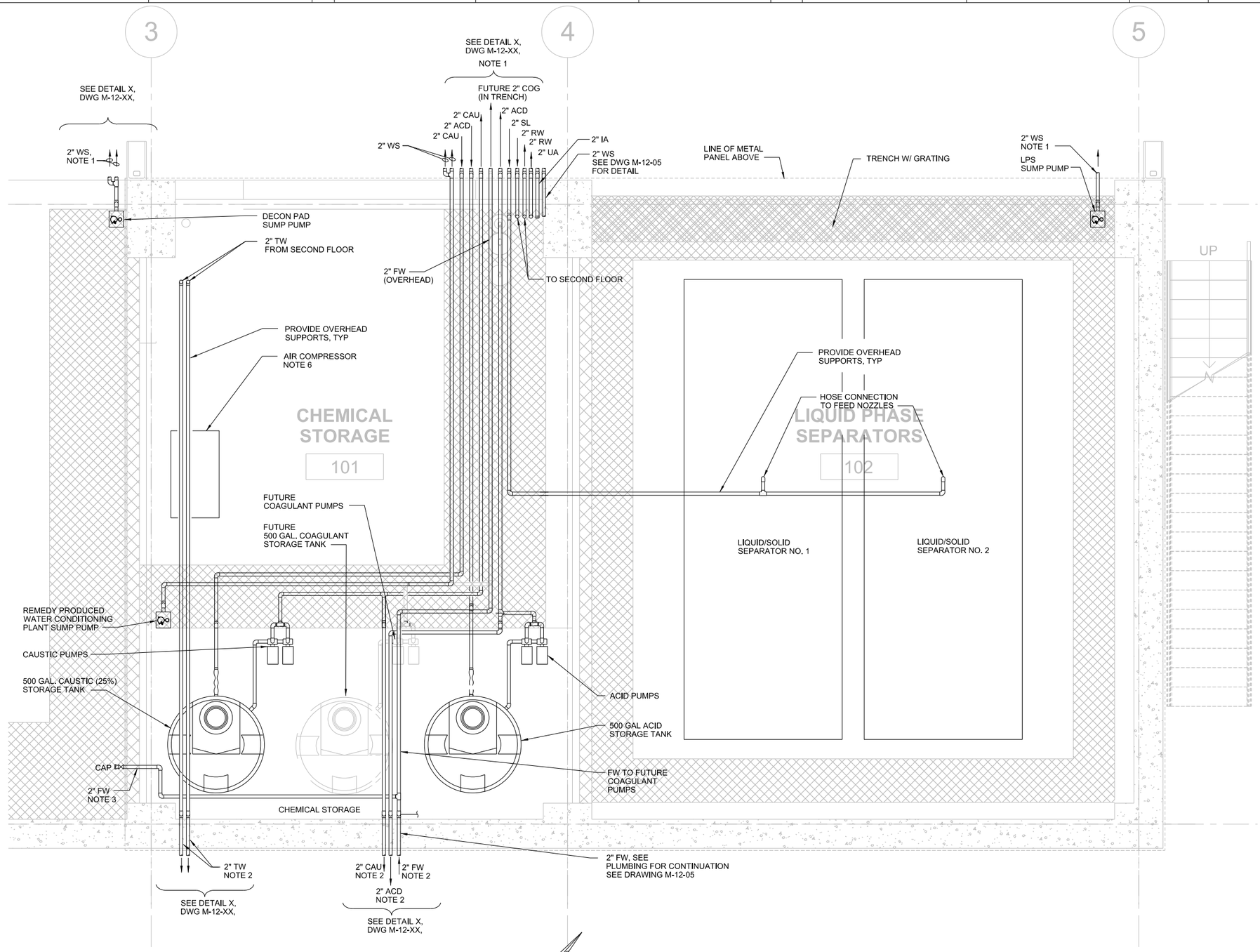
REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RH
	DWN GJ
	CHKD JP
	OK JP
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
INFLUENT TANK EDUCTOR MOUNTING DETAIL
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-11-02	REV

PLOT DATE: 3/26/2013 PLOT TIME: 11:29:03 PM
FILENAME: CH-M-XXX-1102AD.dgn
FILENAME: .DGN - -04
N1808



PIPE LEGEND

ACD	ACID (19% HCL)
CA	RIVERBANK EXTRACTION WATER
CAU	25% CAUSTIC
COG	COAGULANT (FUTURE)
EW	EMERGENCY WATER
EX	EXTRACTED GROUNDWATER (TRANSWESTERN OR EAST RAVINE)
FW	FRESH WATER
IA	INSTRUMENT AIR
LW	LAB WASTE
RW	REMEDY PRODUCED WATER
SL	SLURRY
TW	TREATED (FILTERED) REMEDY PRODUCED WATER
UA	UTILITY AIR
WS	WASTE STREAM

NOTES:

1. INVERT ELEVATION IS AT 624.5' MSL.
2. INVERT ELEVATION IS AT 636.0' MSL.
3. INVERT ELEVATION IS AT 629.0' MSL.
4. SEE A-12-02, S-12-02 THRU 12-04 AND C-10-02, C-12-01 FOR MORE DETAIL.
5. FUTURE DEWATERING AID, CHEMICAL & CLEANING REAGENT STORAGE CONTAINERS NOT SHOWN.
6. AIR COMPRESSOR FOR UA AND IA DETAILS TBD.
7. REFER TO FUTURE SECTIONS AND DETAILS TBD IN 90% DESIGN.

FIRST FLOOR PLAN

3/8"=1'-0"

SCALE: 3/8"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL	GJ			BB	

REVISIONS

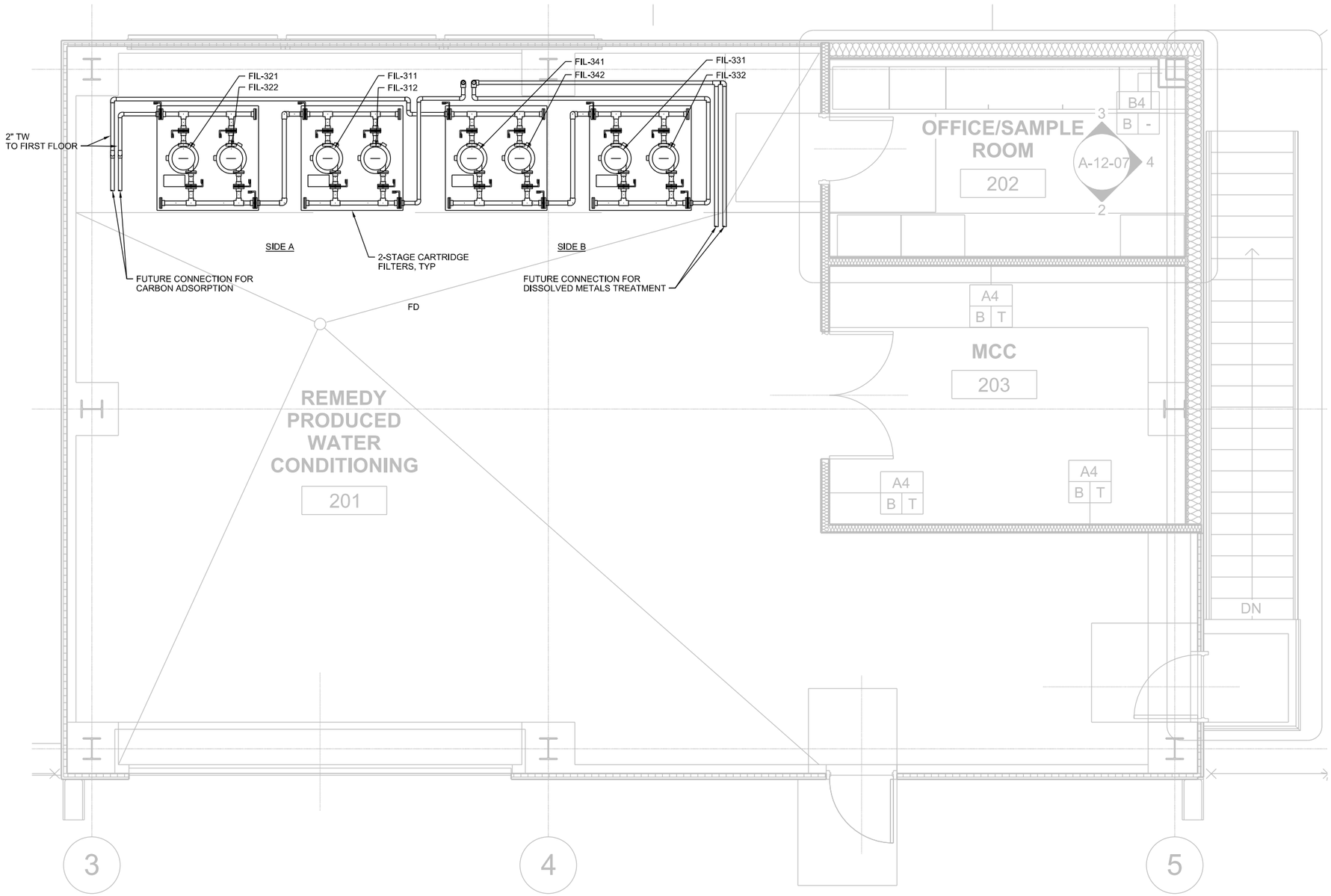
APPROVED BY		
	SO	
	SUPV	
	DSGN	RH
	DWN	GJ
	CHKD	BB
	OK	JP
	DATE	
	SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
FIRST FLOOR 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
M-12-01	REV

PLOT DATE: 2013\04\03 PLOT TIME: 3:00:17 PM
FILENAME: CH-M-XXX-1207AD.dwg

N1808
1/4"=1'-0"



PIPE LEGEND

ACD	ACID (19% HCL)
CA	RIVERBANK EXTRACTION WATER
CAU	25% CAUSTIC
COG	COAGULANT (FUTURE)
EW	EMERGENCY WATER
EX	EXTRACTED GROUNDWATER (TRANSWESTERN OR EAST RAVINE)
FW	FRESH WATER
LW	LAB WASTE
RW	REMEDY PRODUCED WATER
SL	SLURREY
TW	TREATED (FILTERED) REMEDY PRODUCED WATER
UA	UTILITY AIR
WS	WASTE STREAM

NOTES:

1. SEE DRAWINGS A-12-02 AND A-12-07 AND S-12-03 FOR BUILDING DETAILS.

SECOND FLOOR PLAN

3/8"=1'-0"

SCALE: 3/8"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	Intermediate (60%) Design Submittal					

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		GJ			JP

REVISIONS

APPROVED BY	SO
	SUPV
	DSGN RH
	DWN GJ
	CHKD BB
	OK JP
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

REMEDY PRODUCED WATER CONDITIONING PLANT
SECOND FLOOR PLAN

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

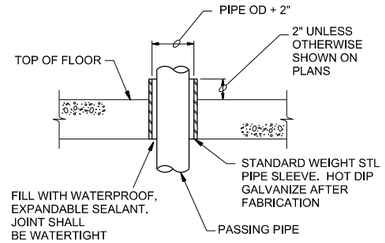
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
M-12-02	REV

PLOT DATE: 20130403 PLOT TIME: 4:00:58 PM

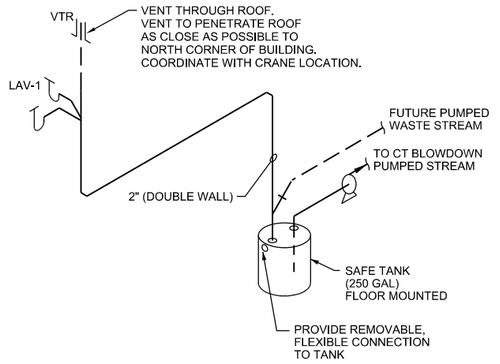
FILENAME: CH-M-XXX-1202AD.dgn

FILENAME: _____.DGN __-__-04 ____

N1808



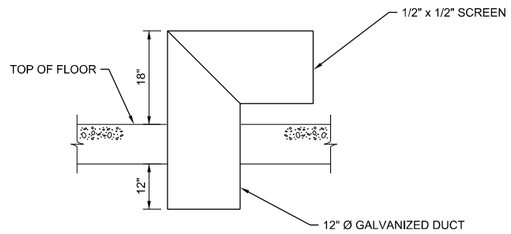
1 FLOOR SLEEVE
NTS
M-12-05



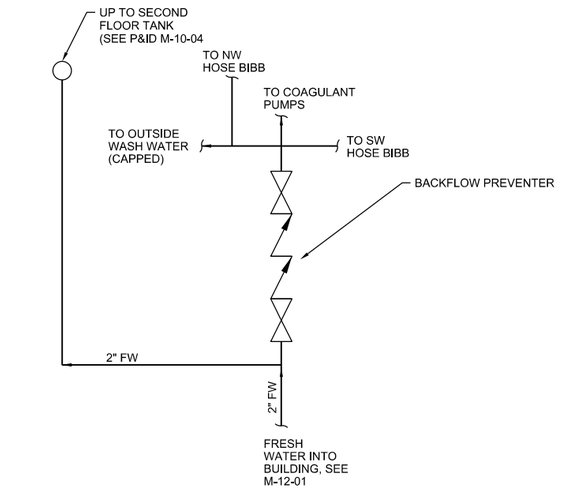
NOTES:

1. PROVIDE HI AND HI-HI LOCAL ALARMS FOR TANK LEVEL.
2. PROVIDE IN-LINE PUMP FOR DISCHARGE TO CT BLOWDOWN SYSTEM.

2 LAB DRAIN
NTS
M-12-05



3 VENTILATION DUCT
NTS
M-12-06



4 FRESH WATER SUPPLY
NTS
M-12-05

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		YMF			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN JQ
	DWN YMF
	CHKD BB
	OK JP
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY-PRODUCED WATER CONDITIONING PLANT HVAC & PLUMBING 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-12-04	REV

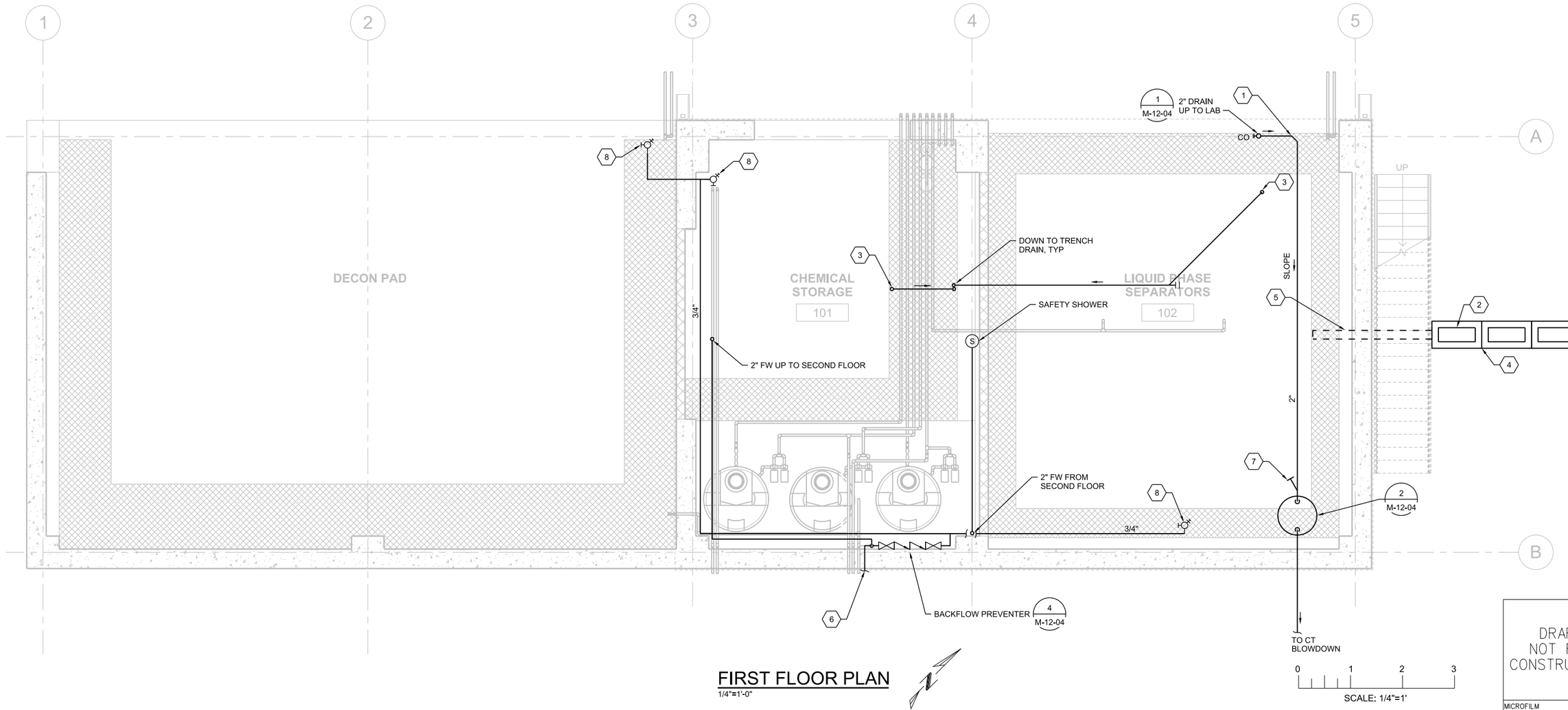
PLOT DATE: 2013\04\03 PLOT TIME: 4:12:33 PM
FILENAME: P:\PGE_Topock\Drawings\M\M-12-04.DGN

N1808

FILENAME: _____DGN __-__-04 ____

SHEET KEYNOTES

1. 250 GALLON CAPACITY DOUBLE WALLED POLYETHYLENE SAFE-TANK.
2. CONDENSING UNIT, TYP 3
3. 2" DRAIN FROM SECOND FLOOR, ROUTE TO TRENCH DRAIN AND TERMINATE 6" ABOVE FLOOR
4. HVAC CONTRACTOR TO PROVIDE CONCRETE PAD FOR EACH CONDENSER. CONTRACTOR TO GRADE EACH PAD TO A LEVEL ELEVATION.
5. PROVIDE NOMINAL 8" PVC SLEEVE UNDER STAIRS AND THROUGH INSIDE WALL AS A ROUTE FOR THE CONDENSER TUBING/WIRING SETS.
6. SEE DRAWING M-1201 FOR FW PIPING INTERFACE.
7. FULL SIZE SANITARY TEE WITH BLIND FLANGE FOR CONNECTION OF FUTURE PUMPED WASTE STREAM.
8. HOSE BIBB



FIRST FLOOR PLAN

1/4"=1'-0"

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		YMF			JP

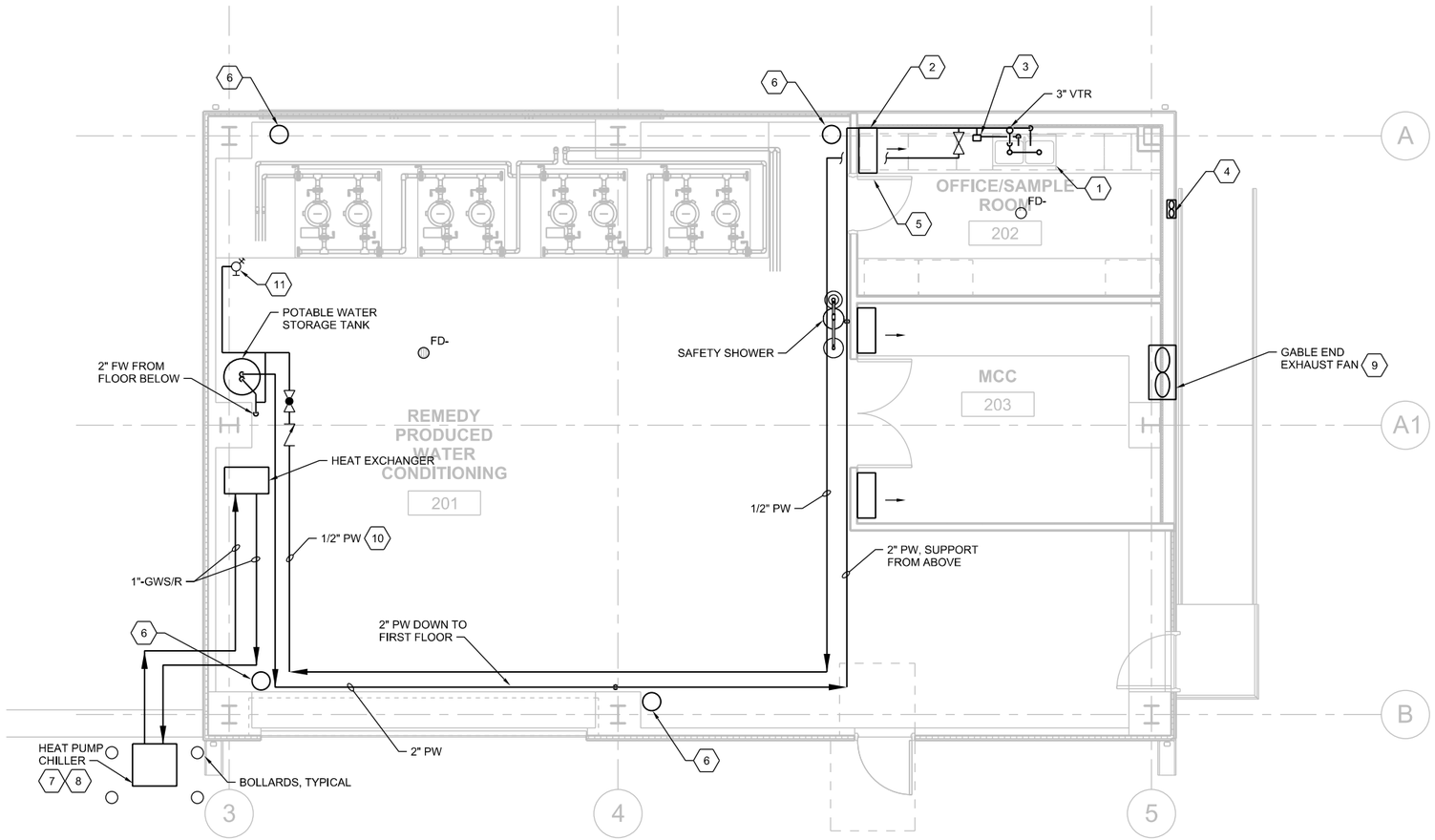
REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN JQ
	DWN YF
	CHKD BB
	OK JP
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY-PRODUCED WATER CONDITIONING PLANT
HVAC & PLUMBING 1ST FLOOR 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	
M-12-05	REV

PLOT DATE: 3/26/2013 PLOT TIME: 10:29:11 PM
FILENAME: CH-M-XXX-1002MD.DGN
FILENAME: .DGN - -04
N1808



SHEET KEYNOTES

1. TYPE 304 STAINLESS STEEL, DOUBLE COMPARTMENT LAB SINK, MODEL #X BY EAGLE GROUP WITH FAUCET
2. WALL MOUNTED DUCTLESS MINI-SPLIT AIR CONDITIONER
3. INSTANTANEOUS WATER HEATER BELOW COUNTER
4. 50 CFM WALL MOUNTED VENTILATION FAN TO OUTSIDE. WIRE INTO LIGHTING CONTROLS.
5. PROVIDE UNDERCUT AT DOOR FOR FRESH AIR ENTRY.
6. PROVIDE 12" Ø DUCT THROUGH FLOOR AT EACH CORNER OF ROOM. SEE DETAIL 3 ON SHEET M-12-04. COORDINATE WITH OWNER FOR FINAL LOCATION BEFORE POURING FLOOR.
7. CONTRACTOR TO PROVIDE CONCRETE PAD FOR HEAT PUMP CHILLER AT GRADE. GRADE AS NECESSARY FOR LEVEL ELEVATION.
8. RUN 1" COPPER PIPING FOR SUPPLY/RETURN LINES BETWEEN HEAT PUMP AND HEAT EXCHANGER, SEE M-12-07.
9. EXHAUST FAN TO BE LOCATED IN GABLE END ABOVE THE MCC ROOM CEILING, THE OVER HEAD CRANE RAILS AND CRANE ASSEMBLY.
10. FRESH WATER RECIRCULATION LINE RETURN PIPE.
11. HOSE BIBB

SECOND FLOOR PLAN

1/4"=1'-0"

SCALE: 1/4"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		YMF			JP

REVISIONS

APPROVED BY	SO
	SUPV
	DSGN JQ
	DWN YF
	CHKD BB
	OK JP
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY-PRODUCED WATER WATER CONDITIONING PLANT
HVAC & PLUMBING 2ND FLOOR 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
M-12-06	REV

N1808

FILENAME: _____DGN __-__-04 ____

PLOT DATE: 20130403 PLOT TIME: 3:50:49 PM

FILENAME: CH-M-XXX-1206MD.DGN

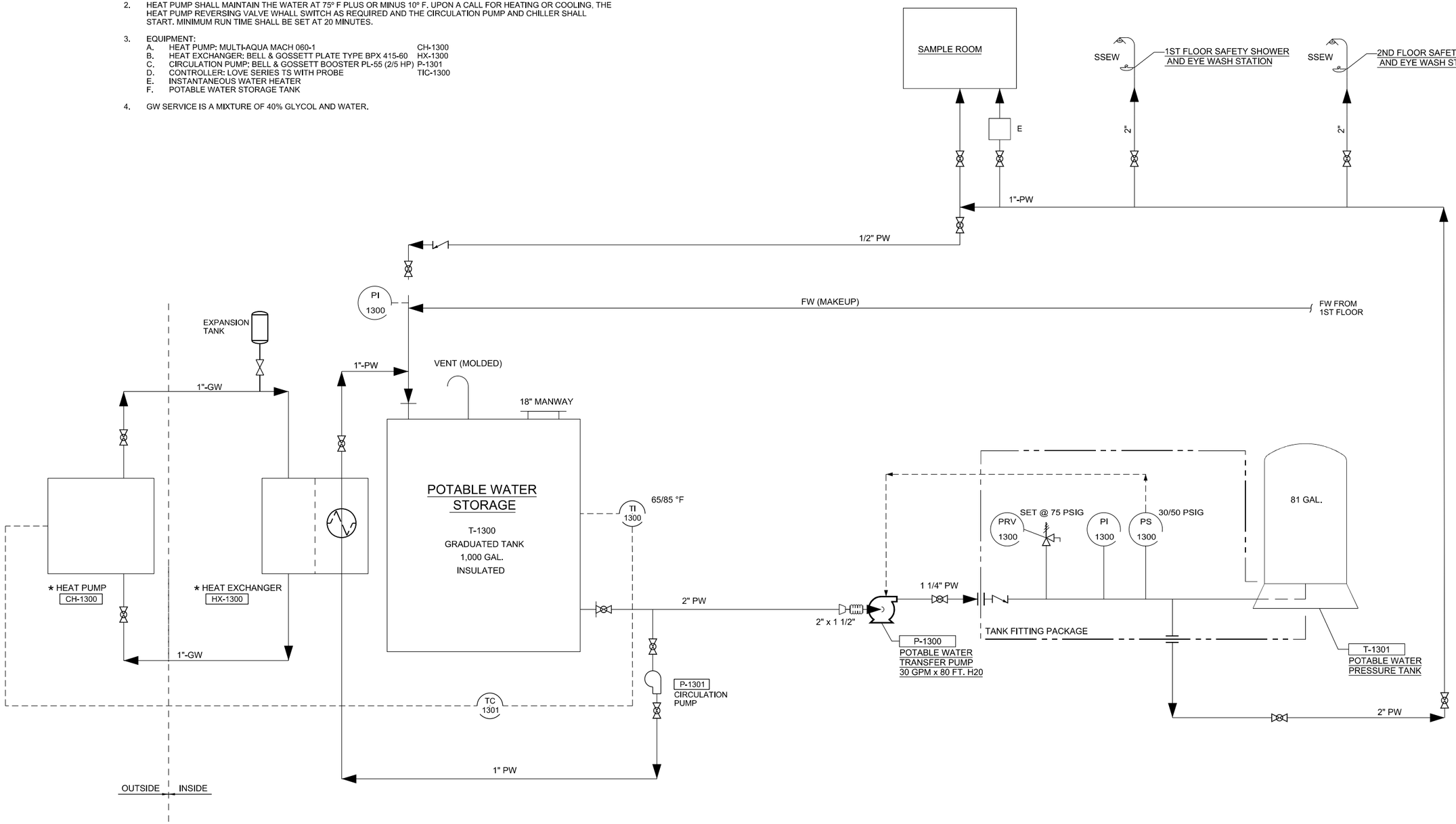
NOTES:

1. INSTALL A DIGITAL CONTROL SWITCH EQUIVALENT (LOVE SERIES TS). SWITCH SHALL BE CAPABLE OF CONTROLLING THE HEAT PUMP IN COOLING OR HEATING MODE. INSTALL A SUITABLE SENSOR BULB (INCLUDED WITH LOVE CONTROLLER) IN PORTABLE WATER CIRCULATING LOOP. FIELD FIT AS NECESSARY.

2. HEAT PUMP SHALL MAINTAIN THE WATER AT 75° F PLUS OR MINUS 10° F. UPON A CALL FOR HEATING OR COOLING, THE HEAT PUMP REVERSING VALVE WHALL SWITCH AS REQUIRED AND THE CIRCULATION PUMP AND CHILLER SHALL START. MINIMUM RUN TIME SHALL BE SET AT 20 MINUTES.

3. EQUIPMENT:
   - A. HEAT PUMP: MULTI-AQUA MACH 060-1 — CH-1300
   - B. HEAT EXCHANGER: BELL & GOSSETT PLATE TYPE BPX 415-60 — HX-1300
   - C. CIRCULATION PUMP: BELL & GOSSETT BOOSTER PL-55 (2/5 HP) — P-1301
   - D. CONTROLLER: LOVE SERIES TS WITH PROBE — TIC-1300
   - E. INSTANTANEOUS WATER HEATER
   - F. POTABLE WATER STORAGE TANK

4. GW SERVICE IS A MIXTURE OF 40% GLYCOL AND WATER.



* PROVIDE REDUCERS AS REQUIRED TO MATCH FITTINGS ON CH-1300

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	9/12/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		YMF			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN JQ
	DWN YF
	CHKD BB
	OK JP
	DATE
	SCALES

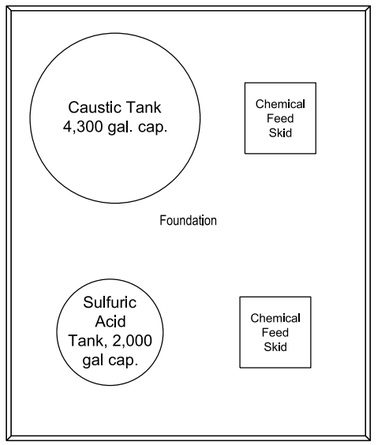
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY-PRODUCED WATER CONDITIONING PLANT
POTABLE WATER
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
M-12-07
REV

PLOT DATE: 20130403 PLOT TIME: 3:15:01 PM
FILENAME: CH-M-XXX-1004MD.DGN
FILENAME: _____DGN __-__-04 ____
N1808

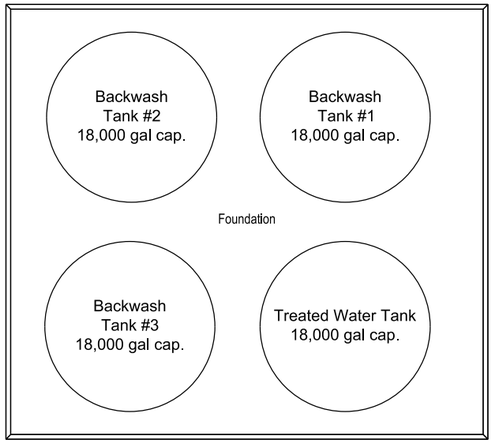
DRAFT

Chemical Storage Area

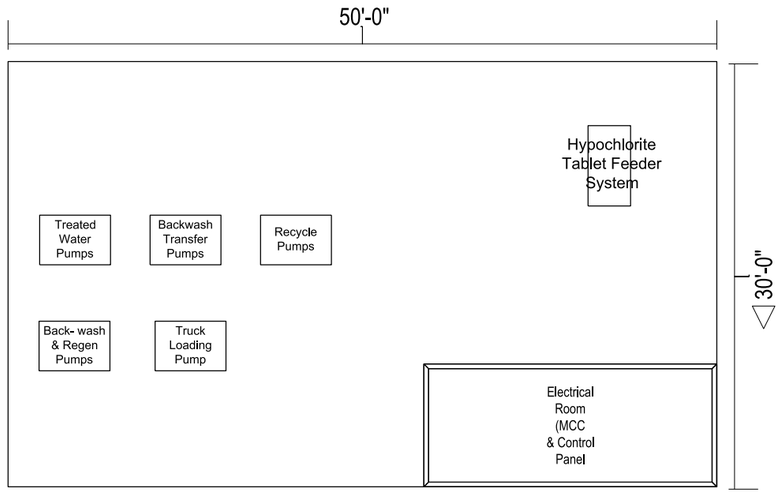


MW-69

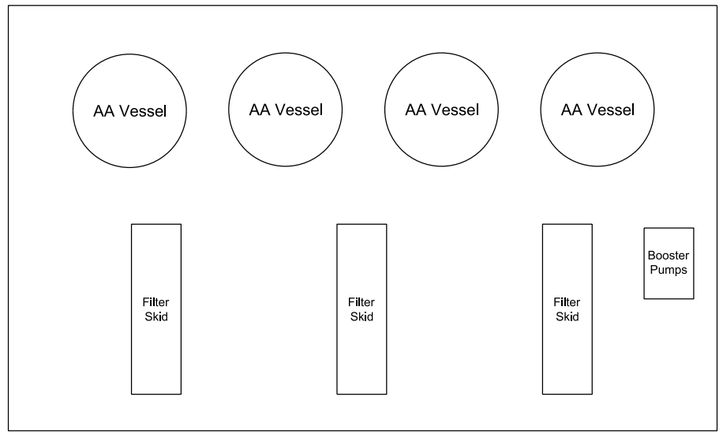
Process Tanks Area



Freshwater Pre-Injection Treatment System Building



1st floor



2nd floor

0 ft. 6 ft. 10 ft. 20 ft.

Note; Scale applies within buildings and on foundations. Space between structures is approximate.

N

Notes: Must maintain 14' clearance minimum around monitoring well MW-69

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

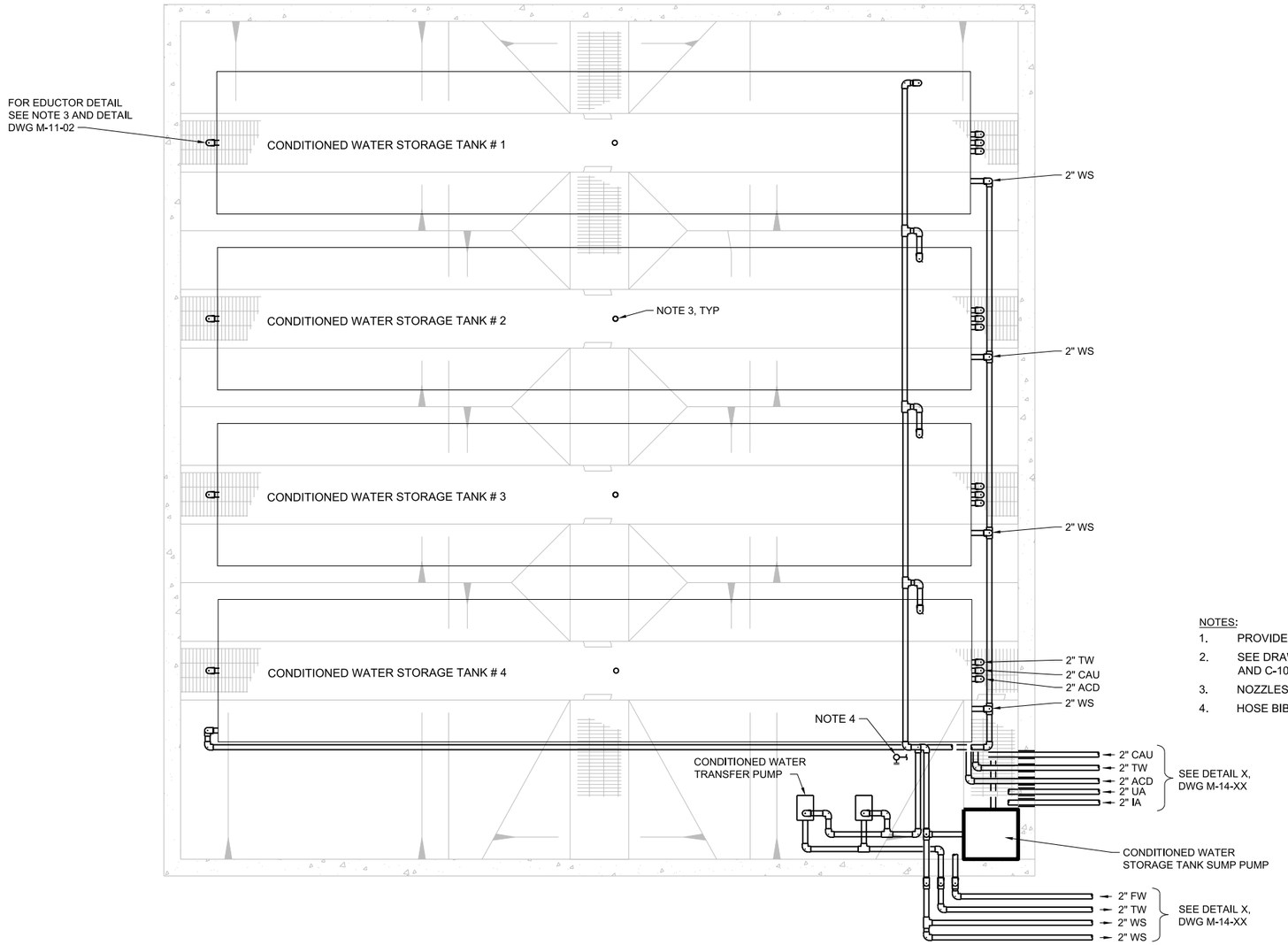
APPROVED BY	
SO	
SUPV	
DSGN	PT
DWN	PC
CHKD	PT
OK	
DATE	
SCALES	NTS

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER PRE-INJECTION TREATMENT SYSTEM EQUIPMENT GENERAL ARRANGEMENT
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-12-08	REV

PLOT TIME: 5:04:46 PM
PLOT DATE: 4/2/2013
FILENAME: CH-M-XXX-1208AD.dwg

N1808



PLAN
1/4"=1'-0"

NOTES:
1. PROVIDE 4" FIBER AND 4" ELECTRICAL INTO TANK FARM.
2. SEE DRAWINGS S-14-07,08 FOR STRUCTURAL DETAILS AND C-10-02, C-14-02 FOR CIVIL DETAILS.
3. NOZZLES FOR FUTURE EDUCTOR AND RECIRCULATION PUMP.
4. HOSE BIBB

0 1 2 3
SCALE: 1/4"=1'

DRAFT
NOT FOR
CONSTRUCTION

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	IINTERMEDIATE (60%) DESIGN SUBMITTAL		GJ			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RH
	DWN GJ
	CHKD JP
	OK JP
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
CONDITIONED WATER STORAGE TANK FARM
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
M-14-01	REV

PLOT DATE: 3/27/2013 PLOT TIME: 10:34:23 PM
FILENAME: CH-M-XXX-1401AD.dwg

N1808

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

SYMBOL	DESCRIPTION
	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 E J	THERMOSTAT EYS SEAL 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
100%	y: BREAKER FEATURES / OPTIONS
S	- SHUNT TRIP
K	- KIRK-KEY INTERLOCK
M	- MANUALLY CHARGED PUSHBUTTON OPERATION
E	- 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

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

APPROVED BY: TPF

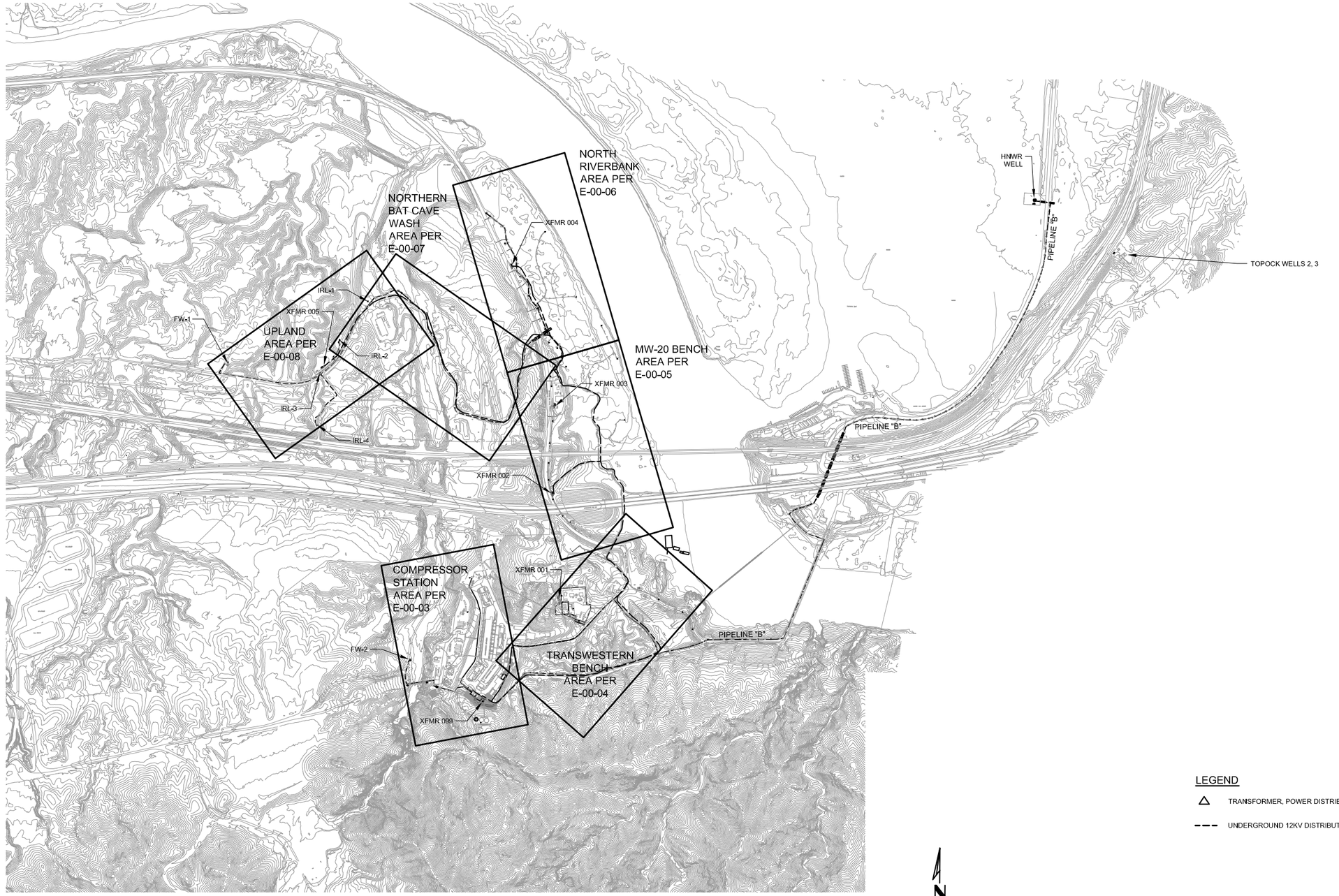
SO	
SUPV	
DSGN	TPF
DWN	MBY, NC
CHKD	TPF
OK	TPF
DATE	
SCALES	N/A

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

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

PLOT TIME: 11:00:41am
PLOT DATE: Apr 03, 2013
FILENAME: FI-E-XXX-0001AD.dwg

N180B



0 400 800 1200

SCALE: 1"=400'

OVERALL ELECTRICAL SITE PLAN

N

LEGEND

△ TRANSFORMER, POWER DISTRIBUTION, AND FIBER OPTIC BREAKOUT LOCATION (APPROX)

- - - UNDERGROUND 12KV DISTRIBUTION

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

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

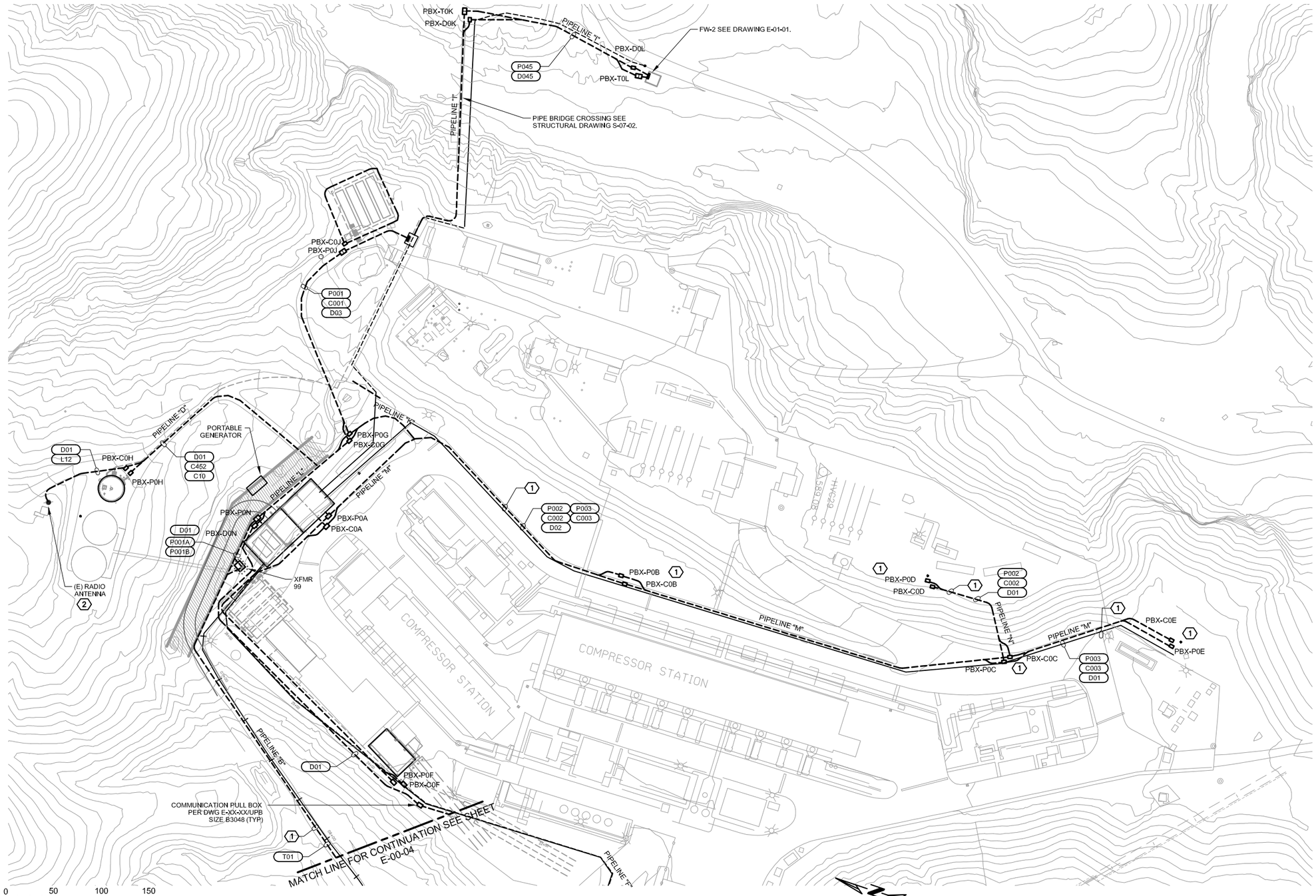
TOPOCK GROUNDWATER REMEDIATION PROJECT
GROUNDWATER REMEDY
OVERALL ELECTRICAL
SITEPLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:31:03am

FILENAME: FE-EXXX-0002AD.dwg

N1808



DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH AECOM DRAWINGS. SHEET C-07-81 THROUGH C-07-89
2. EXISTING RADIO ANTENNA TO BE RE-USED.

ELECTRICAL PLAN NOTES:

1. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

COMPRESSOR STATION AREA PLAN

DRAFT
NOT FOR CONSTRUCTION

PLOT TIME: 9:02:44am
PLOT DATE: Apr 04, 2013
FILENAME: FE-E-XXX-0002AD.dwg

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

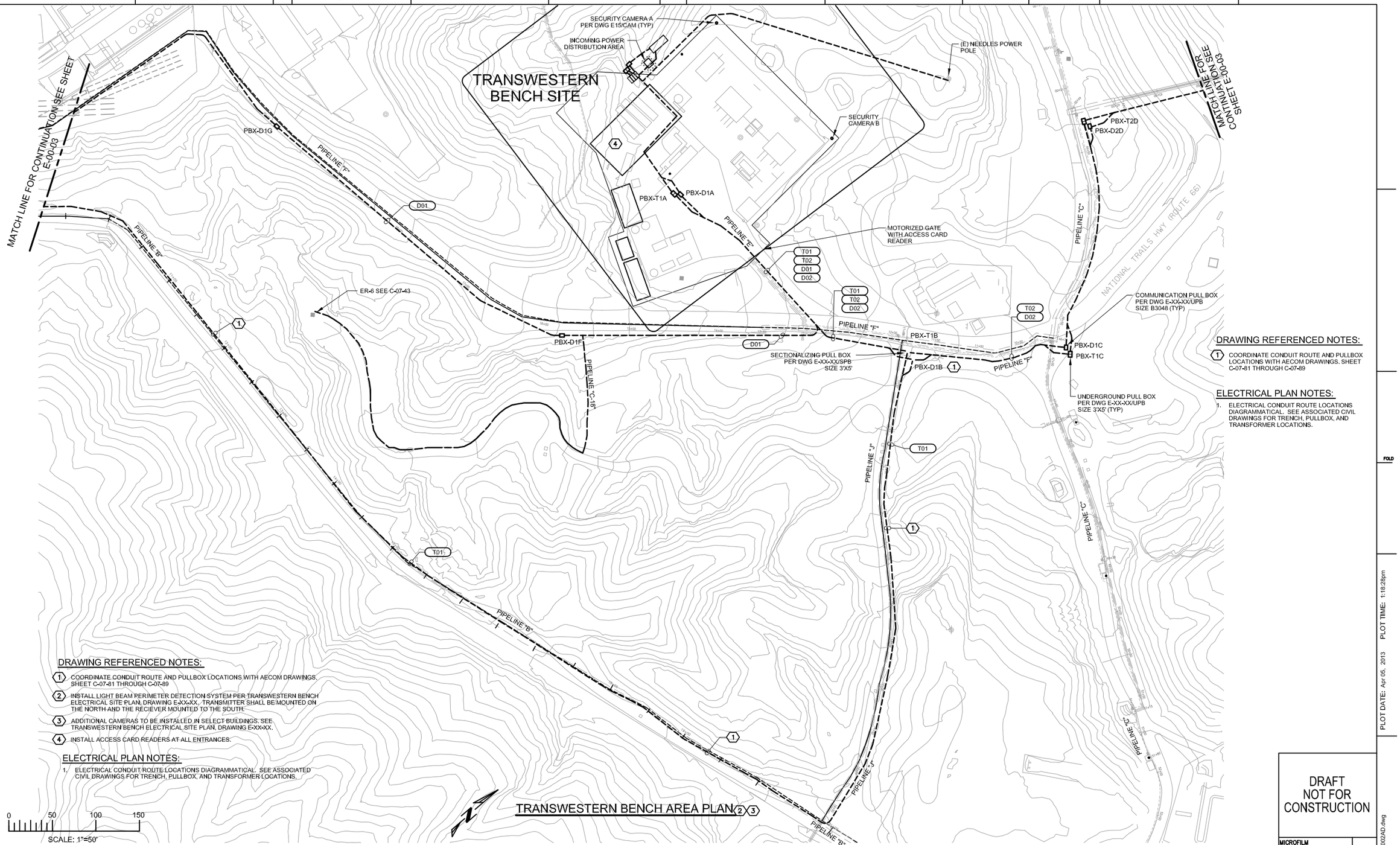
REVISIONS

APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	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

N1808



TRANSWESTERN BENCH AREA PLAN 2 3

0 50 100 150

SCALE: 1"=50'

DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH AECOM DRAWINGS, SHEET C-07-81 THROUGH C-07-89
2. INSTALL LIGHT BEAM PERIMETER DETECTION SYSTEM PER TRANSWESTERN BENCH ELECTRICAL SITE PLAN, DRAWING E-XX-XX. TRANSMITTER SHALL BE MOUNTED ON THE NORTH AND THE RECIEVER MOUNTED TO THE SOUTH.
3. ADDITIONAL CAMERAS TO BE INSTALLED IN SELECT BUILDINGS. SEE TRANSWESTERN BENCH ELECTRICAL SITE PLAN, DRAWING E-XX-XX.
4. INSTALL ACCESS CARD READERS AT ALL ENTRANCES.

ELECTRICAL PLAN NOTES:

1. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH AECOM DRAWINGS, SHEET C-07-81 THROUGH C-07-89

ELECTRICAL PLAN NOTES:

1. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
TRANSWESTERN 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-00-04	REV

PLOT DATE: Apr 05, 2013 PLOT TIME: 1:18:28pm
FILENAME: FE-EXXX-8002AD.dwg

DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH AECOM DRAWINGS. SHEET C-07-81 THROUGH C-07-89

ELECTRICAL PLAN NOTES:

1. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

PIPELINE "G"
PIPELINE "C"
COMMUNICATION PULL BOX PER DWG E-XX-XX/UPB SIZE B3048 (TYP)
UNDERGROUND PULL BOX PER DWG E-XX-XX/UPB SIZE 3'X5' (TYP)
SECTIONALIZING PULL BOX PER DWG E-XX-XX/SPB SIZE 3'X5'
PBX-T3B
PBX-D3B
PBX-D2C
PBX-T2C
PBX-D2B
PBX-T2B
PBX-D3A
PBX-T3A
PBX-D4C
PBX-T4C
PBX-D2A
PBX-T2A
T01
T02
D01
D02
D03
POWER AND COMMUNICATIONS NODE 3, SEE TYPICAL NODE SITE PLAN
POWER AND COMMUNICATIONS NODE 2, SEE TYPICAL NODE SITE PLAN
NATIONAL TRAILS HWY (ROUTE 66)
INTERSTATE FWY 40
HVC13 503/65
MATCH LINE FOR CONTINUATION SEE SHEET E-00-04
MATCH LINE FOR CONTINUATION SEE SHEET E-00-02

0 50 100 150
SCALE: 1"=50'

MW-20 BENCH AREA PLAN

DRAFT
NOT FOR
CONSTRUCTION

PLOT DATE: Apr 03, 2013 PLOT TIME: 4:35:01pm
FILENAME: FE-EXXX-0002AD.dwg

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

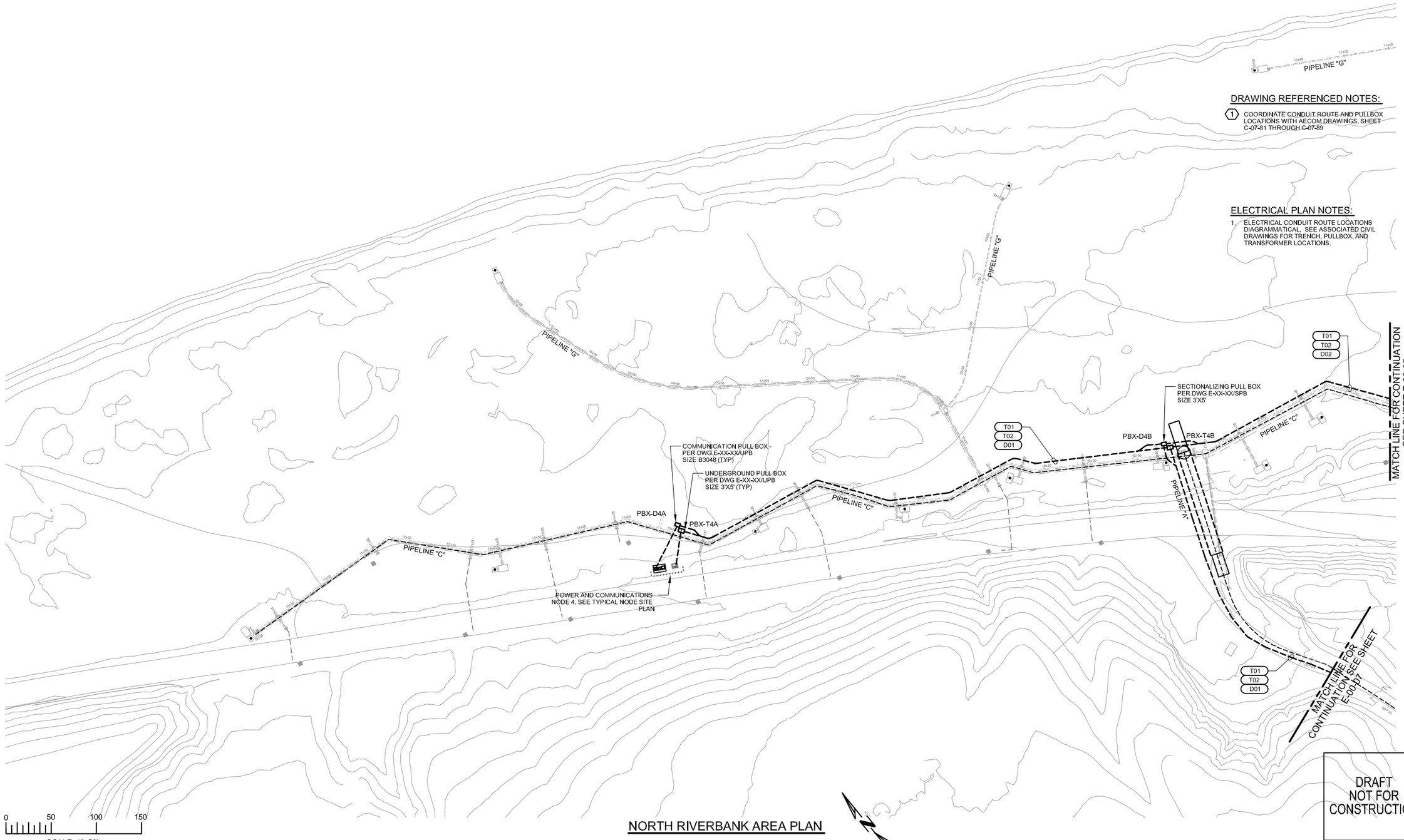
REVISIONS

APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	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

N1808



DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH AECOM DRAWINGS. SHEET C-07-81 THROUGH C-07-89

ELECTRICAL PLAN NOTES:

1. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

NORTH RIVERBANK AREA PLAN

DRAFT
NOT FOR CONSTRUCTION

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

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

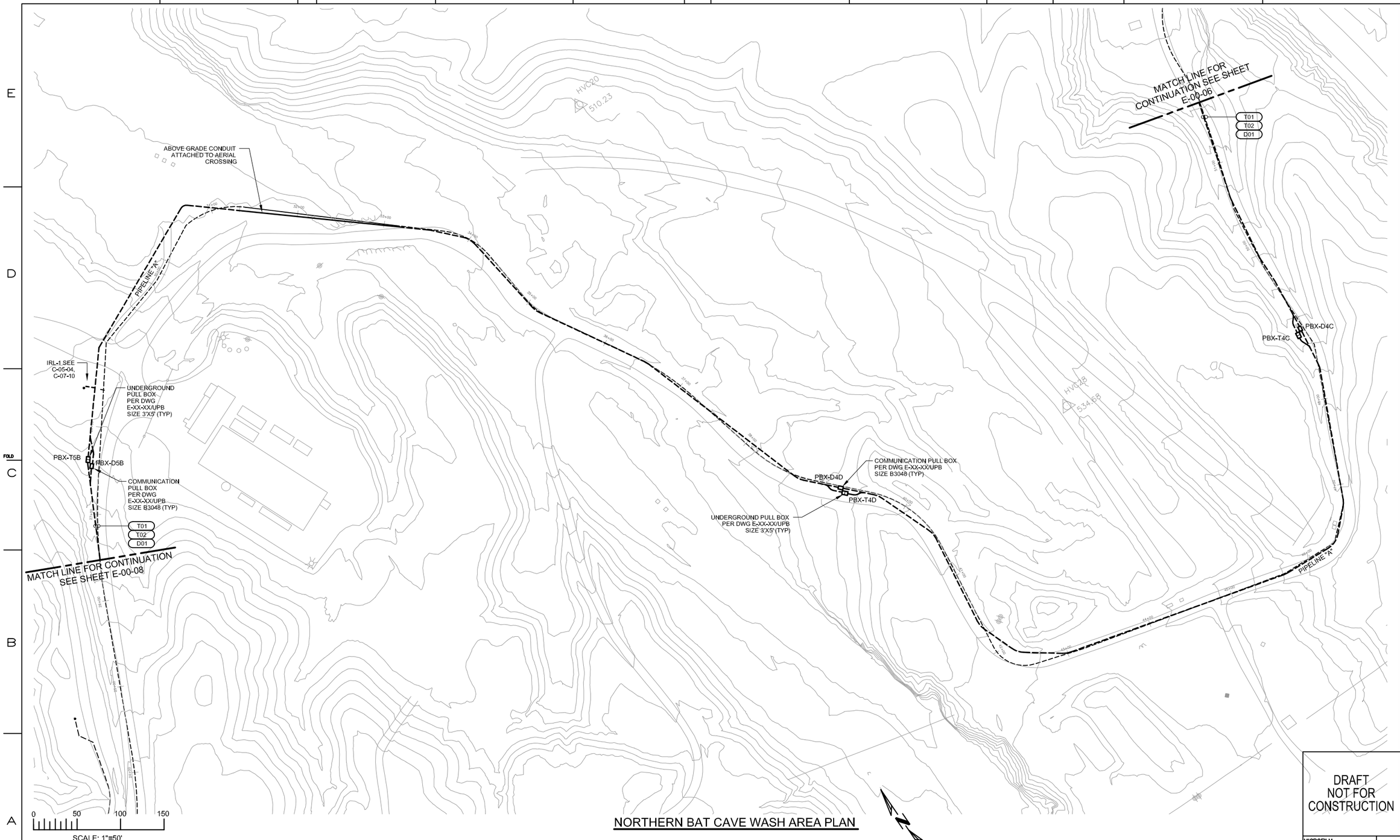
REVISIONS

APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	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

PLOT TIME: 10:33:28am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-XXX-0002AD.dwg

N1808



NORTHERN BAT CAVE WASH AREA PLAN

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

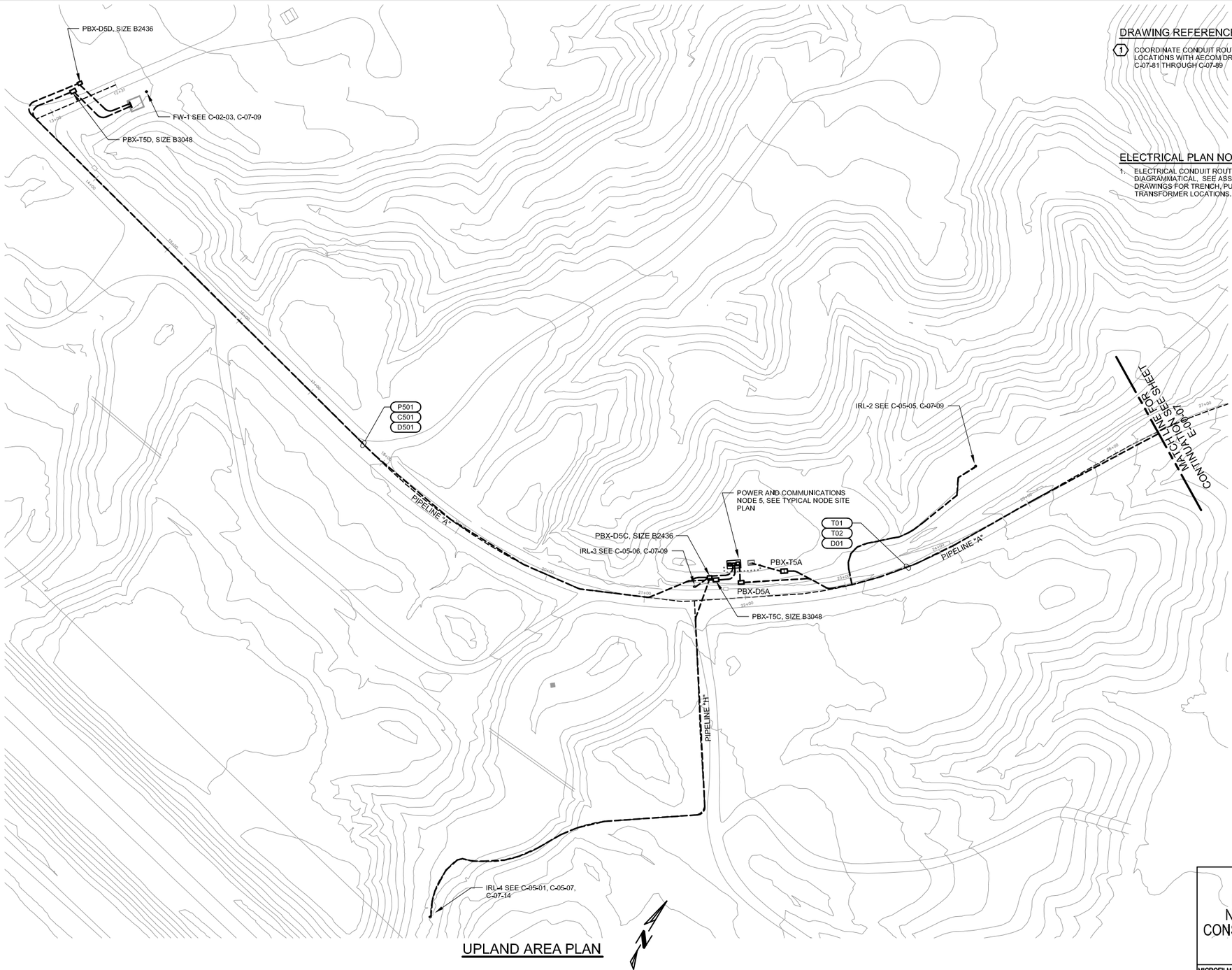
APPROVED BY	
	SO
TPF	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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

PLOT DATE: Apr 04, 2013 PLOT TIME: 9:03:15am
FILENAME: FE-E-XXX-0002AD.dwg



DRAWING REFERENCED NOTES:

1. COORDINATE CONDUIT ROUTE AND PULLBOX LOCATIONS WITH AECOM DRAWINGS. SHEET C-07-81 THROUGH C-07-89

ELECTRICAL PLAN NOTES:

1. ELECTRICAL CONDUIT ROUTE LOCATIONS DIAGRAMMATICAL. SEE ASSOCIATED CIVIL DRAWINGS FOR TRENCH, PULLBOX, AND TRANSFORMER LOCATIONS.

0 50 100 150

SCALE: 1"=50'

UPLAND AREA PLAN

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
UPLANDS
AREA PLAN

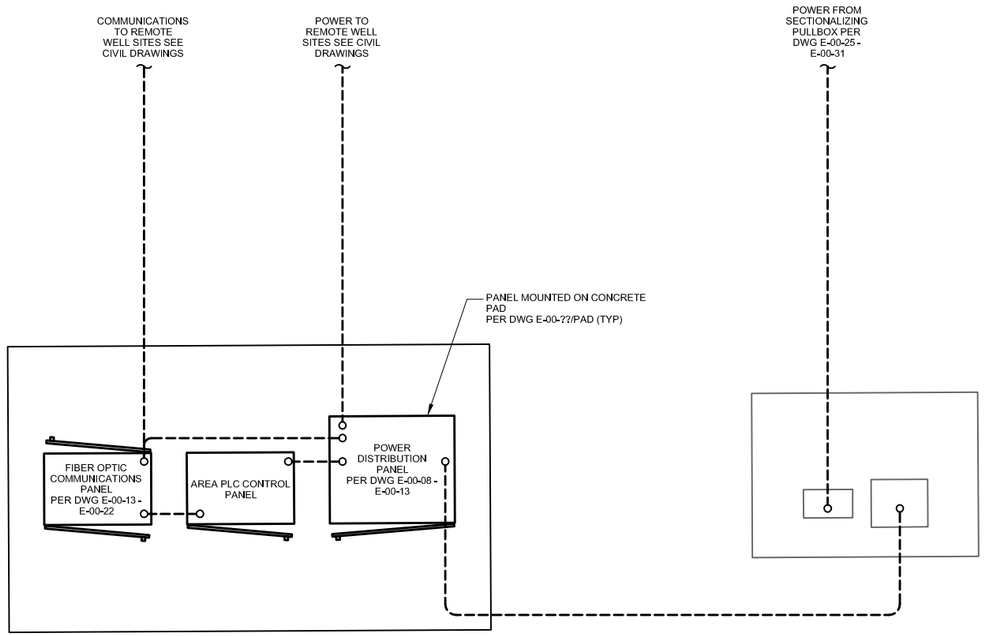
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:34:19am

FILENAME: FE-E-XXX-0002AD.dwg

N1808



TYPICAL NODE SITE PLAN

0 .5 1 1.5

SCALE: 1/2"=1'

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.NET

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

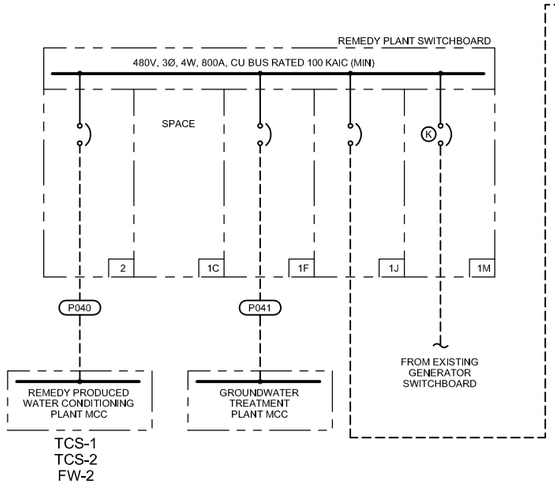
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

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

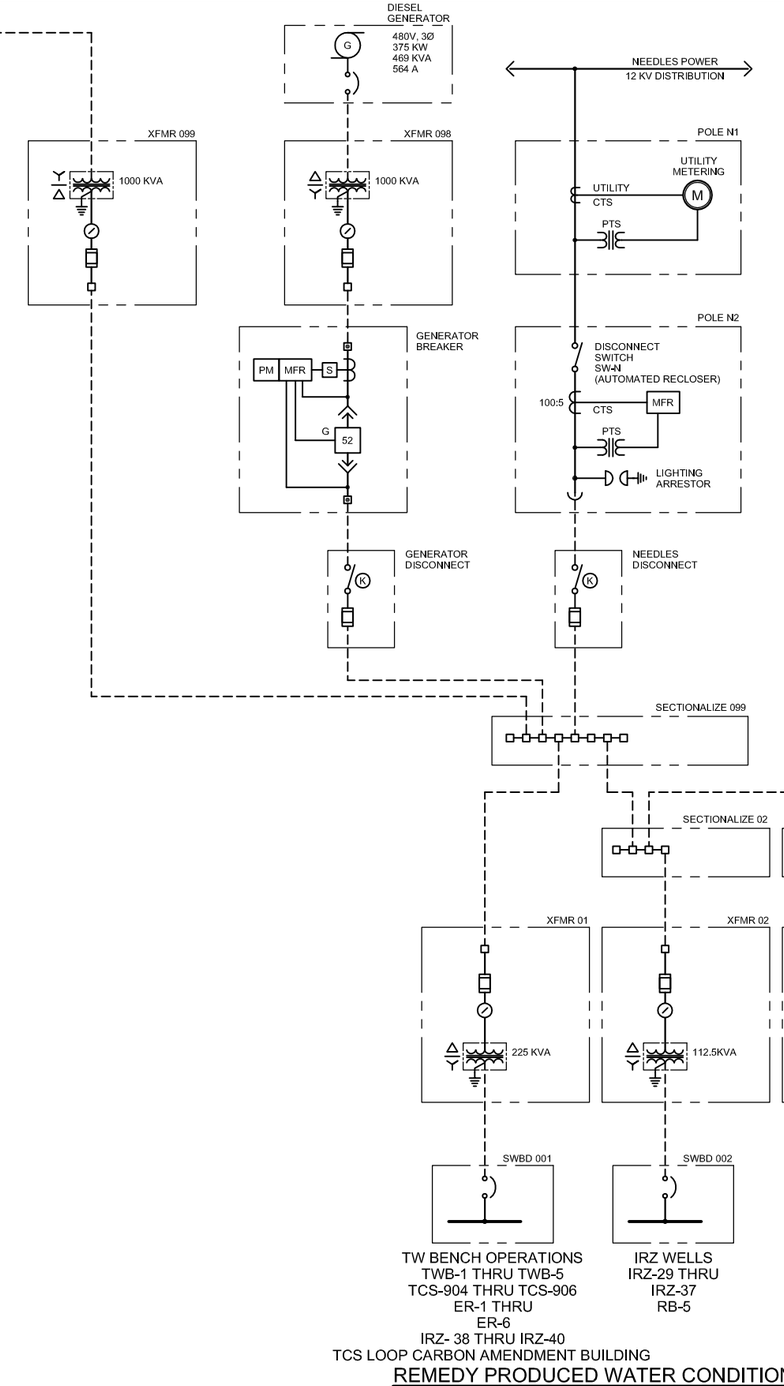
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-09	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 11:03:35am
FILENAME: FE-K-XXX-0002AD.dwg

N1808



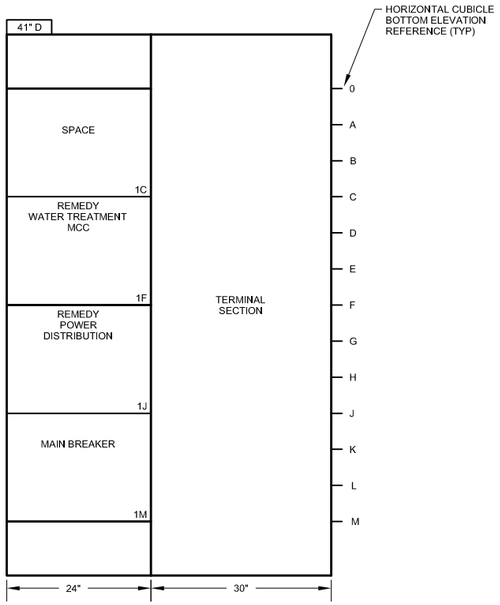
REMEDY PRODUCED WATER CONDITIONING PLANT SWITCHBOARD ONE-LINE DIAGRAM



REMEDY PRODUCED WATER CONDITIONING PLANT POWER DISTRIBUTION ONE-LINE DIAGRAM

LEGEND

- MFR — MULTI-FUNCTION PROTECTIVE RELAY
- PM — POWER MONITOR
- S — CT SHORTING TERMINAL BLOCK
- FUSE
- TAP CHANGER
- K — KIRK KEY
- TRANSFORMER
- FEED-THROUGH ELBOW JUNCTION CONNECT



REMEDY PRODUCED WATER CONDITIONING PLANT SWITCHBOARD ELEVATION

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRIAL POWER 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

PLOT DATE: Apr 03, 2013 PLOT TIME: 3:56:55pm
FILENAME: FE-E-XXX-00110AD.DWG

XFMR 001 (NODE 1), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
TWB01-P441	480	3	1.00	100%	15	2.10	2.10	1.75
TWB02-P441	480	3	1.00	100%	15	2.10	2.10	1.75
TWB03-P441 [Future Provisional]	480	3	0.75	0.0%	15	1.60	0.00	0.00
TWB04-P441 [Future Provisional]	480	3	0.75	0.0%	15	1.60	0.00	0.00
TWB05-P441 [Future Provisional]	480	3	0.75	0.0%	15	1.60	0.00	0.00
ER01-P440	480	3	0.50	100%	15	1.10	1.10	0.91
ER02-P440	480	3	0.50	100%	15	1.10	1.10	0.91
ER03-P440	480	3	0.50	100%	15	1.10	1.10	0.91
ER04-P440	480	3	0.50	100%	15	1.10	1.10	0.91
ER05-P440 [Future Provisional]	480	3	0.50	0.0%	15	1.10	0.00	0.00
ER06-P440	480	3	0.50	100%	15	1.10	1.10	0.91
IRZ39-P543	480	3	3.00	100%	15	4.80	4.80	3.99
IRZ38-P543 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ40-P540 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
TCS00-P940	480	3	3.00	100%	15	4.80	4.80	3.99
TCS00-P941	480	3	3.00	0.0%	15	4.80	0.00	0.00
TCS00-P942	480	3	3.00	0.0%	15	4.80	0.00	0.00
TCS00-P943	480	3	3.00	0.0%	15	4.80	0.00	0.00
TCS00-P944	480	3	0.50	100%	15	1.10	1.10	0.91
45 kVA TRANSFORMER	480	3	---	80%	100	54.13	43.30	36.00
MCC-1 CONTROLS	480	3	---	75%	5	0.80	0.60	0.50
TOTAL 10 KVA WELLS CPT/120VAC	480	3	---	75.0%	---	9.62	7.22	6.00
					TOTALS :	**115**	**72**	**59**

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.

XFMR 002 (NODE 2), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
RB05-P640	480	3	30.0	100%	100	40.0	40.0	33.26
IRZ29-P544	480	3	3.00	100%	15	4.80	4.80	3.99
IRZ29-P545	480	3	3.00	100%	15	4.80	4.80	3.99
IRZ31-P544	480	3	3.00	100%	15	4.80	4.80	3.99
IRZ31-P545	480	3	3.00	100%	15	4.80	4.80	3.99
IRZ33-P544	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ33-P545	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ35-P543	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ37-P543	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ30-P544 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ30-P545 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ32-P544 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ32-P545 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ34-P544 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ34-P545 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ36-P543 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
TOTAL 10 KVA WELLS CPT/120VAC	480	3	---	75.0%	---	9.62	7.22	6.00
					TOTALS :	**122**	**66**	**55**

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) 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.

XFMR 003 (NODE 3), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
RB03-P640	480	3	30	100%	100	40.00	40.00	33.26
RB04-P640	480	3	30	100%	100	40.00	40.00	33.26
IRZ16-P546	480	3	5.00	100%	15	7.60	7.60	6.32
IRZ16-P547	480	3	5.00	100%	15	7.60	7.60	6.32
IRZ16-P548	480	3	5.00	100%	15	7.60	7.60	6.32
IRZ16-P549	480	3	5.00	100%	15	7.60	7.60	6.32
IRZ17-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ17-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ17-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ17-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ19-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ19-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ19-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ19-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ20-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ20-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ20-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ20-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ21-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ21-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ21-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ21-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ23-P540	480	3	20.00	100%	70	27.00	27.00	22.45
IRZ25-P544	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ25-P545	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ27-P544	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ27-P545	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ18-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ18-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ18-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ18-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ22-P546 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ22-P547 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ22-P548 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ22-P549 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ24-P544 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ24-P545 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ26-P544 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ26-P545 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ28-P544 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IRZ28-P545 [Future Provisional]	480	3	3.00	0.0%	15	4.80	0.00	0.00
IR200-P740	480	3	3.00	0.0%	15	4.80	0.00	0.00
IR200-P741	480	3	3.00	0.0%	15	4.80	0.00	0.00
IR200-P742	480	3	3.00	0.0%	15	4.80	0.00	0.00
IR200-P743	480	3	3.00	0.0%	15	4.80	0.00	0.00
IR200-P744	480	3	15	100%	40	21.0	21.00	17.46
IR200-P745	480	3	15	100%	40	21.0	21.00	17.46
IR200-P746	480	3	0.50	100%	15	1.10	1.10	0.91
IR200-P747	480	3	0.50	0.0%	15	1.10	0.00	0.00
IR200-P1026 [Spare]								
45 kVA TRANSFORMER	480	3	---	80.0%	100	54.13	43.30	36.00
TOTAL 15 KVA WELLS CPT/120VAC	480	3	---	75.0%	---	14.43	10.83	9.00
					TOTALS :	**489**	**234.6**	**195**

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) 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.

XFMR 004 (NODE 4), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
RB01-P640	480	3	30.0	100%	100	40.00	40.00	33.26
RB02-P640	480	3	30.0	100%	100	40.00	40.00	33.26
IRZ01-P541	480	3	15.0	100%	40	21.00	21.00	17.46
IRZ01-P542	480	3	15.0	100%	40	21.00	21.00	17.46
IRZ05-P541	480	3	15.0	100%	40	21.00	21.00	17.46
IRZ05-P541	480	3	15.0	100%	40	21.00	21.00	17.46
IRZ09-P541	480	3	15.0	100%	40	21.00	21.00	17.46
IRZ09-P542	480	3	15.0	100%	40	21.00	21.00	17.46
IRZ11-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ11-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ11-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ11-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ13-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ13-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ13-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ13-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ15-P546	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ15-P547	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ15-P548	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ15-P549	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ02-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ02-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ02-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ02-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ03-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ03-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ03-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ03-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ04-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ04-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ04-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ04-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ06-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ06-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ06-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ06-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ07-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ07-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ07-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ07-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ08-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ08-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ08-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ08-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ10-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ10-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ10-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ10-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ12-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ12-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ12-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ12-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ14-P546 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ14-P547 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ14-P548 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
IRZ14-P549 [Future Provisional]	480	3	5.00	0.0%	15	7.60	0.00	0.00
TOTAL 15 KVA WELLS CPT/120VAC	480	3	---	75%	---	14.43	10.83	9.00
					TOTALS :	**585**	**217**	**180**

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) 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.

XFMR 005 (NODE 5), LOAD SCHEDULE

DEVICE	VOLTAGE	PHASE	HP	DEMAND FACTOR	BREAKER SIZE (AMPS)	CONNECTED LOAD - 480V (AMPS) (1)	DEMAND - 480V (AMPS) (1)	RUNNING kVA
IRL01-P641	480	3	30	100%	100	40.00	40.00	33.26
IRL02-P641	480	3	30	0.0%	100	40.00	0.00	0.00
IRL03-P641	480	3	30	0.0%	100	40.00	0.00	0.00
IRL04-P641	480	3	40	100%	125	52.00	52.00	43.23
IRL05-P641 [Future Provisional]	480	3	30	0.0%	100	40.00	0.00	0.00
IRL06-P641 [Future Provisional]	480	3	40	0.0%	125	52.00	0.00	0.00
IRL07-P641 [Future Provisional]	480	3	40	0.0%	125	52.00	0.00	0.00
FW01	480	3	40	0.0%	200	52.00	0.00	0.00
TOTAL 5 KVA WELLS CPT/120VAC	480	3	---	75.0%	---	4.81	3.61	3.00
					TOTALS :	**373**	**95.6**	**79**

NOTES:
(1) VALUES TAKEN FROM 2011 NEC.
(2) A MAXIMUM OF TWO (2) 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.

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
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

N1808

04/05/2013, 12:11, G:\Graphics\ARIITOPOCK\11Submittal-60%_March2013\HILL Formatted\OneLine.dwg, Tab: E-00-11

NODE 01 CONDUIT & CABLE SCHEDULE						
CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P1-1	A	2"	HH1-1	HH1-2	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-1B
P1-1	B	2"	HH1-1	HH1-2	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-1A
P1-1	C	2"	HH1-1	HH1-2	N/A	SPARE W/ PULL LINE
P1-1	D	2"	HH1-1	HH1-2	N/A	SPARE W/ PULL LINE
P1-2	A	2"	HH1-2	HH1-3	(3) #10, (1) #10 G.	
P1-2	C	2"	HH1-2	HH1-3	N/A	SPARE W/ PULL LINE
P1-2	D	2"	HH1-2	HH1-3	N/A	SPARE W/ PULL LINE
P1-3	A	2"	HH1-3	HH1-4	(3) #10, (1) #10 G.	
P1-3	C	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-3	D	2"	HH1-3	HH1-4	N/A	SPARE W/ PULL LINE
P1-4	A	2"	HH1-4	HH1-5	(3) #10, (1) #10 G.	
P1-4	C	2"	HH1-4	HH1-5	N/A	SPARE W/ PULL LINE
P1-4	D	2"	HH1-4	HH1-5	N/A	SPARE W/ PULL LINE
P1-5	E	2"	HH1-1	HH1-6	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F,G,H
P1-5	F	2"	HH1-1	HH1-6	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,G,H
P1-5	G	2"	HH1-1	HH1-6	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F,H
P1-5	H	2"	HH1-1	HH1-6	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F,G
P1-5	I	2"	HH1-1	HH1-6	(3) #10, (1) #10 G.	
P1-5	J	2"	HH1-1	HH1-6	N/A	SPARE W/ PULL LINE
P1-5	K	2"	HH1-1	HH1-6	N/A	SPARE W/ PULL LINE
P1-5	L	2"	HH1-1	HH1-6	N/A	SPARE W/ PULL LINE
P1-5	M	2"	HH1-1	HH1-6	N/A	SPARE W/ PULL LINE
P1-5	N	2"	HH1-1	HH1-6	N/A	SPARE W/ PULL LINE
P1-5	O	2"	HH1-1	HH1-6	N/A	SPARE W/ PULL LINE
P1-5	P	2"	HH1-1	HH1-17	(3) #10, (1) #10 G.	
P1-6	E	2"	HH1-6	HH1-7	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F,G,H
P1-6	F	2"	HH1-6	HH1-7	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,G,H
P1-6	G	2"	HH1-6	HH1-7	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F,H
P1-6	H	2"	HH1-6	HH1-7	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F,G
P1-6	I	2"	HH1-6	HH1-7	(3) #10, (1) #10 G.	
P1-6	J	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-6	K	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-6	L	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-6	M	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-6	N	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-6	O	2"	HH1-6	HH1-7	N/A	SPARE W/ PULL LINE
P1-7	E	2"	HH1-7	HH1-8	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F,G,H
P1-7	F	2"	HH1-7	HH1-8	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,G,H
P1-7	G	2"	HH1-7	HH1-8	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F,H
P1-7	H	2"	HH1-7	HH1-8	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F,G
P1-7	J	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-7	K	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-7	L	2"	HH1-7	HH1-8	N/A	SPARE W/ PULL LINE
P1-8	E	2"	HH1-8	HH1-9	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F,G
P1-8	F	2"	HH1-8	HH1-9	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,G
P1-8	G	2"	HH1-8	HH1-9	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E,F
P1-8	J	2"	HH1-8	HH1-9	N/A	SPARE W/ PULL LINE
P1-8	K	2"	HH1-8	HH1-9	N/A	SPARE W/ PULL LINE
P1-8	L	2"	HH1-8	HH1-9	N/A	SPARE W/ PULL LINE
P1-9	E	2"	HH1-9	HH1-10	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F
P1-9	F	2"	HH1-9	HH1-10	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E
P1-9	J	2"	HH1-9	HH1-10	N/A	SPARE W/ PULL LINE
P1-9	K	2"	HH1-9	HH1-10	N/A	SPARE W/ PULL LINE
P1-9	L	2"	HH1-9	HH1-10	N/A	SPARE W/ PULL LINE
P1-10	E	2"	HH1-10	HH1-11	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F
P1-10	F	2"	HH1-10	HH1-11	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E
P1-10	J	2"	HH1-10	HH1-11	N/A	SPARE W/ PULL LINE
P1-10	K	2"	HH1-10	HH1-11	N/A	SPARE W/ PULL LINE
P1-10	L	2"	HH1-10	HH1-11	N/A	SPARE W/ PULL LINE
P1-11	E	2"	HH1-11	HH1-12	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5F
P1-11	F	2"	HH1-11	HH1-12	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P1-5E
P1-11	J	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1-11	K	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1-11	L	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1-12	E	2"	HH1-11	HH1-12	(3) #10, (1) #10 G.	
P1-12	J	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1-12	K	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1-12	L	2"	HH1-11	HH1-12	N/A	SPARE W/ PULL LINE
P1-13	I	2"	HH1-7	HH1-13	(3) #10, (1) #10 G.	
P1-13	M	2"	HH1-7	HH1-13	N/A	SPARE W/ PULL LINE
P1-13	N	2"	HH1-7	HH1-13	N/A	SPARE W/ PULL LINE
P1-13	O	2"	HH1-7	HH1-13	N/A	SPARE W/ PULL LINE

CONTINUED

NODE 01 CONTINUED

P1-14	I	2"	HH1-13	HH1-14	(3) #10, (1) #10 G.	
P1-14	M	2"	HH1-13	HH1-14	N/A	SPARE W/ PULL LINE
P1-14	N	2"	HH1-13	HH1-14	N/A	SPARE W/ PULL LINE
P1-14	O	2"	HH1-13	HH1-14	N/A	SPARE W/ PULL LINE
P1-15	I	2"	HH1-14	HH1-15	(3) #10, (1) #10 G.	
P1-15	M	2"	HH1-14	HH1-15	N/A	SPARE W/ PULL LINE
P1-15	N	2"	HH1-14	HH1-15	N/A	SPARE W/ PULL LINE
P1-15	O	2"	HH1-14	HH1-15	N/A	SPARE W/ PULL LINE
P1-16	N	2"	HH1-15	HH1-16	N/A	SPARE W/ PULL LINE
P1-16	O	2"	HH1-15	HH1-16	N/A	SPARE W/ PULL LINE
P1-17	P	2"	HH1-17	HH1-18	(3) #10, (1) #10 G.	
P1-18	P	2"	HH1-18	HH1-19	(3) #10, (1) #10 G.	
P1-19	P	2"	HH1-19	HH1-20	(3) #10, (1) #10 G.	

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

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
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-00-12	REV

N1808

03/27/2013,11:31, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL F\Formatted\OneLine.dwg, Tab: E-00-12

NODE 02 CONDUIT & CABLE SCHEDULE

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P2-1	A	2"	PNL-2A	HH2-1	(3) #1/0, (1) #6 G.	
P2-1	B	2"	PNL-2A	HH2-1	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P2-1C
P2-1	C	2"	PNL-2A	HH2-1	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P2-1B
P2-1	D	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	E	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	F	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-1	G	2"	PNL-2A	HH2-1	N/A	SPARE W/ PULL LINE
P2-2	A	2"	HH2-1	HH2-2	(3) #1/0, (1) #6 G.	
P2-2	B	2"	HH2-1	HH2-2	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P2-2C
P2-2	C	2"	HH2-1	HH2-2	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P2-2B
P2-2	D	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	E	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	F	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-2	G	2"	HH2-1	HH2-2	N/A	SPARE W/ PULL LINE
P2-3	B	2"	HH2-2	HH2-3	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P2-3C
P2-3	C	2"	HH2-2	HH2-3	(3) #10, (1) #10 G.	COMMON CONDUIT W/ P2-3B
P2-3	D	2"	HH2-2	HH2-3	N/A	SPARE W/ PULL LINE
P2-3	E	2"	HH2-2	HH2-3	N/A	SPARE W/ PULL LINE
P2-3	F	2"	HH2-2	HH2-3	N/A	SPARE W/ PULL LINE
P2-4	B	2"	HH2-3	HH2-4	(3) #10, (1) #10 G.	
P2-4	D	2"	HH2-3	HH2-4	N/A	SPARE W/ PULL LINE
P2-4	E	2"	HH2-3	HH2-4	N/A	SPARE W/ PULL LINE
P2-4	F	2"	HH2-3	HH2-4	N/A	SPARE W/ PULL LINE
P2-5	B	2"	HH2-4	HH2-5	(3) #10, (1) #10 G.	
P2-5	D	2"	HH2-4	HH2-5	N/A	SPARE W/ PULL LINE
P2-6	H	2"	PNL-2A	HH2-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-6I,J
P2-6	I	2"	PNL-2A	HH2-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-6H,J
P2-6	J	2"	PNL-2A	HH2-6	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-6H,I
P2-6	K	2"	PNL-2A	HH2-6	N/A	SPARE W/ PULL LINE
P2-6	L	2"	PNL-2A	HH2-6	N/A	SPARE W/ PULL LINE
P2-6	M	2"	PNL-2A	HH2-6	N/A	SPARE W/ PULL LINE
P2-7	H	2"	HH2-6	HH2-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7I
P2-7	I	2"	HH2-6	HH2-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7H
P2-7	K	2"	HH2-6	HH2-7	N/A	SPARE W/ PULL LINE
P2-7	L	2"	HH2-6	HH2-7	N/A	SPARE W/ PULL LINE
P2-7	M	2"	HH2-6	HH2-7	N/A	SPARE W/ PULL LINE
P2-8	H	2"	HH2-7	HH2-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7I
P2-8	I	2"	HH2-7	HH2-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P2-7H
P2-8	K	2"	HH2-7	HH2-8	N/A	SPARE W/ PULL LINE
P2-8	L	2"	HH2-7	HH2-8	N/A	SPARE W/ PULL LINE
P2-8	M	2"	HH2-7	HH2-8	N/A	SPARE W/ PULL LINE
P2-9	H	2"	HH2-9	HH2-10	(3) #8, (1) #8 G.	
P2-9	K	2"	HH2-9	HH2-10	N/A	SPARE W/ PULL LINE
P2-9	L	2"	HH2-9	HH2-10	N/A	SPARE W/ PULL LINE
P2-9	M	2"	HH2-9	HH2-10	N/A	SPARE W/ PULL LINE
P2-10	H	2"	HH2-10	HH2-11	(3) #8, (1) #8 G.	
P2-10	K	2"	HH2-10	HH2-11	N/A	SPARE W/ PULL LINE
P2-11	A	2"	HH2-2	HH2-11	(3) #1/0, (1) #6 G.	
P2-11	G	2"	HH2-2	HH2-11	N/A	SPARE W/ PULL LINE
P2-12	A	2"	HH2-11	HH2-12	(3) #1/0, (1) #6 G.	
P2-12	G	2"	HH2-11	HH2-12	N/A	SPARE W/ PULL LINE
P2-13	A	2"	HH2-12	HH2-13	(3) #1/0, (1) #6 G.	
P2-13	G	2"	HH2-12	HH2-13	N/A	SPARE W/ PULL LINE
P2-14	A	2"	HH2-13	HH2-14	(3) #1/0, (1) #6 G.	
P2-14	G	2"	HH2-13	HH2-14	N/A	SPARE W/ PULL LINE
P2-15	A	2"	HH2-14	HH2-15	(3) #1/0, (1) #6 G.	
P2-15	G	2"	HH2-14	HH2-15	N/A	SPARE W/ PULL LINE

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

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	2"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1D,E
P3-1	D	2"	PNL-3A	HH3-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1C,E
P3-1	E	2"	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
P3-2	A	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1B
P3-2	B	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1A
P3-2	C	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1D
P3-2	D	2"	HH3-1	HH3-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1C
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
P3-3	A	2"	HH3-2	HH3-3	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1B
P3-3	B	2"	HH3-2	HH3-3	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1A
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	HH3-4	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1B
P3-4	B	2"	HH3-3	HH3-4	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1A
P3-4	G	2"	HH3-3	HH3-4	N/A	SPARE W/ PULL LINE
P3-4	H	2"	HH3-3	HH3-4	N/A	SPARE W/ PULL LINE
P3-4	I	2"	HH3-3	HH3-4	N/A	SPARE W/ PULL LINE
P3-5	A	2"	HH3-4	HH3-5	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1B
P3-5	B	2"	HH3-4	HH3-5	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P3-1A
P3-5	G	2"	HH3-4	HH3-5	N/A	SPARE W/ PULL LINE
P3-6	A	2"	HH3-5	HH3-6	(3) #4, (1) #6 G.	
P3-6	G	2"	HH3-5	HH3-6	N/A	SPARE W/ PULL LINE
P3-7	J	2"	PNL-3A	HH3-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-7K,L
P3-7	K	2"	PNL-3A	HH3-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-1J,L
P3-7	L	2"	PNL-3A	HH3-7	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-1J,K
P3-7	M	2"	PNL-3A	HH3-7	N/A	SPARE W/ PULL LINE
P3-7	N	2"	PNL-3A	HH3-7	N/A	SPARE W/ PULL LINE
P3-7	O	2"	PNL-3A	HH3-7	N/A	SPARE W/ PULL LINE
P3-8	J	2"	HH3-7	HH3-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-7K
P3-8	K	2"	HH3-7	HH3-8	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-1J
P3-8	M	2"	HH3-7	HH3-8	N/A	SPARE W/ PULL LINE
P3-8	N	2"	HH3-7	HH3-8	N/A	SPARE W/ PULL LINE
P3-8	O	2"	HH3-7	HH3-8	N/A	SPARE W/ PULL LINE
P3-9	J	2"	HH3-8	HH3-9	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-7K
P3-9	K	2"	HH3-8	HH3-9	(3) #8, (1) #8 G.	COMMON CONDUIT W/ P3-1J
P3-9	M	2"	HH3-8	HH3-9	N/A	SPARE W/ PULL LINE
P3-9	N	2"	HH3-8	HH3-9	N/A	SPARE W/ PULL LINE
P3-9	O	2"	HH3-8	HH3-9	N/A	SPARE W/ PULL LINE
P3-10	J	2"	HH3-9	HH3-10	(3) #8, (1) #8 G.	
P3-10	M	2"	HH3-9	HH3-10	N/A	SPARE W/ PULL LINE
P3-10	N	2"	HH3-9	HH3-10	N/A	SPARE W/ PULL LINE
P3-10	O	2"	HH3-9	HH3-10	N/A	SPARE W/ PULL LINE
P3-11	J	2"	HH3-10	HH3-11	(3) #8, (1) #8 G.	
P3-11	M	2"	HH3-10	HH3-11	N/A	SPARE W/ PULL LINE
P3-11	N	2"	HH3-10	HH3-11	N/A	SPARE W/ PULL LINE
P3-11	O	2"	HH3-10	HH3-11	N/A	SPARE W/ PULL LINE
P3-11	N	2"	HH3-11	HH3-12	N/A	SPARE W/ PULL LINE
P3-11	O	2"	HH3-11	HH3-12	N/A	SPARE W/ PULL LINE
P3-13	P	3"	PNL-3A	HH3-13	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P3-13P
P3-13	Q	3"	PNL-3A	HH3-13	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P3-13Q
P3-13	R	3"	PNL-3A	HH3-13	N/A	SPARE W/ PULL LINE
P3-14	P	3"	HH3-13	HH3-14	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P3-14P
P3-14	Q	3"	HH3-13	HH3-14	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P3-14Q
P3-14	R	3"	HH3-13	HH3-14	N/A	SPARE W/ PULL LINE
P3-15	P		HH3-14	HH3-15	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	
P3-15	Q		HH3-14	HH3-15	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	
P3-16	P		HH3-15	HH3-16	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	
P3-16	Q		HH3-15	HH3-16	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	
P3-17	P		HH3-16	HH3-17	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	
P3-18	Q		HH3-16	HH3-18	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	

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

REVISIONS

APPROVED BY	
	JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
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-00-13	REV

N1808

03/27/2013,11:31, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL Flipmatted\OneLine.dwg, Tab: E-00-13

NODE 04 CONDUIT & CABLE SCHEDULE

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P4-1	A	2"	PNL-4	HH4-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-1B
P4-1	B	2"	PNL-4	HH4-1	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-1A
P4-1	C	2"	PNL-4	HH4-1	N/A	SPARE W/ PULL LINE
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
P4-2	A	2"	HH4-1	HH4-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-1B
P4-2	B	2"	HH4-1	HH4-2	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-1A
P4-2	C	2"	HH4-1	HH4-2	N/A	SPARE W/ PULL LINE
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
P4-3	A	2"	HH4-2	HH4-3	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-1B
P4-3	B	2"	HH4-2	HH4-3	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-1A
P4-3	C	2"	HH4-2	HH4-3	N/A	SPARE W/ PULL LINE
P4-3	D	2"	HH4-2	HH4-3	N/A	SPARE W/ PULL LINE
P4-3	E	2"	HH4-2	HH4-3	N/A	SPARE W/ PULL LINE
P4-4	A	2"	HH4-3	HH4-4	(3) #4, (1) #6 G.	
P4-4	C	2"	HH4-3	HH4-4	N/A	SPARE W/ PULL LINE
P4-4	D	2"	HH4-3	HH4-4	N/A	SPARE W/ PULL LINE
P4-4	E	2"	HH4-3	HH4-4	N/A	SPARE W/ PULL LINE
P4-5	A	2"	HH4-4	HH4-5	(3) #4, (1) #6 G.	
P4-5	C	2"	HH4-4	HH4-5	N/A	SPARE W/ PULL LINE
P4-5	D	2"	HH4-4	HH4-5	N/A	SPARE W/ PULL LINE
P4-5	E	2"	HH4-4	HH4-5	N/A	SPARE W/ PULL LINE
P4-6	A	2"	HH4-5	HH4-6	(3) #4, (1) #6 G.	
P4-6	C	2"	HH4-5	HH4-6	N/A	SPARE W/ PULL LINE
P4-6	D	2"	HH4-5	HH4-6	N/A	SPARE W/ PULL LINE
P4-6	E	2"	HH4-5	HH4-6	N/A	SPARE W/ PULL LINE
P4-7	A	2"	HH4-6	HH4-7	(3) #4, (1) #6 G.	
P4-7	C	2"	HH4-6	HH4-7	N/A	SPARE W/ PULL LINE
P4-18	F	3"	PNL-4	HH4-18	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8G
P4-18	G	3"	PNL-4	HH4-18	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8F
P4-18	H	2"	PNL-4	HH4-18	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-8I
P4-18	I	2"	PNL-4	HH4-18	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8H
P4-18	J	2"	PNL-4	HH4-18	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8K
P4-18	K	2"	PNL-4	HH4-18	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8J
P4-18	L	2"	PNL-4	HH4-18	N/A	SPARE W/ PULL LINE
P4-18	M	2"	PNL-4	HH4-18	N/A	SPARE W/ PULL LINE
P4-18	N	2"	PNL-4	HH4-18	N/A	SPARE W/ PULL LINE
P4-18	O	2"	PNL-4	HH4-18	N/A	SPARE W/ PULL LINE
P4-18	P	3"	PNL-4	HH4-18	N/A	SPARE W/ PULL LINE
P4-8	F	3"	HH4-18	HH4-8	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8G
P4-8	G	3"	HH4-18	HH4-8	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8F
P4-8	H	2"	HH4-18	HH4-8	(3) #4, (1) #6 G.	COMMON CONDUIT W/ P4-8I
P4-8	I	2"	HH4-18	HH4-8	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8H
P4-8	J	2"	HH4-18	HH4-8	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8K
P4-8	K	2"	HH4-18	HH4-8	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8J
P4-8	L	2"	HH4-18	HH4-8	N/A	SPARE W/ PULL LINE
P4-8	M	2"	HH4-18	HH4-8	N/A	SPARE W/ PULL LINE
P4-8	N	2"	HH4-18	HH4-8	N/A	SPARE W/ PULL LINE
P4-8	O	2"	HH4-18	HH4-8	N/A	SPARE W/ PULL LINE
P4-8	P	3"	HH4-18	HH4-8	N/A	SPARE W/ PULL LINE
P4-9	F	3"	HH4-8	HH4-19	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8G
P4-9	G	3"	HH4-8	HH4-19	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8F
P4-9	I	2"	HH4-8	HH4-19	(3) #6, (1) #8 G.	
P4-9	J	2"	HH4-8	HH4-19	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8K
P4-9	K	2"	HH4-8	HH4-19	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8J
P4-9	L	2"	HH4-8	HH4-19	N/A	SPARE W/ PULL LINE
P4-9	M	2"	HH4-8	HH4-19	N/A	SPARE W/ PULL LINE
P4-9	N	2"	HH4-8	HH4-19	N/A	SPARE W/ PULL LINE
P4-9	O	2"	HH4-8	HH4-19	N/A	SPARE W/ PULL LINE
P4-9	P	3"	HH4-8	HH4-19	N/A	SPARE W/ PULL LINE
P4-19	F	3"	HH4-19	HH4-9	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8G
P4-19	G	3"	HH4-19	HH4-9	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8F
P4-19	I	2"	HH4-19	HH4-9	(3) #6, (1) #8 G.	
P4-19	J	2"	HH4-19	HH4-9	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8K
P4-19	K	2"	HH4-19	HH4-9	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8J
P4-19	M	2"	HH4-19	HH4-9	N/A	SPARE W/ PULL LINE
P4-19	N	2"	HH4-19	HH4-9	N/A	SPARE W/ PULL LINE
P4-19	O	2"	HH4-19	HH4-9	N/A	SPARE W/ PULL LINE
P4-19	P	3"	HH4-19	HH4-9	N/A	SPARE W/ PULL LINE
P4-10	F	3"	HH4-9	HH4-10	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8G
P4-10	G	3"	HH4-9	HH4-10	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8F
P4-10	J	2"	HH4-9	HH4-10	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8K
P4-10	K	2"	HH4-9	HH4-10	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8J
P4-10	M	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-10	N	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-10	O	2"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE
P4-10	P	3"	HH4-9	HH4-10	N/A	SPARE W/ PULL LINE

CONTINUED

NODE 04 CONTINUED

P4-11	J	2"	HH4-10	HH4-11	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8K
P4-11	K	2"	HH4-10	HH4-11	(3) #6, (1) #8 G.	COMMON CONDUIT W/ P4-8J
P4-11	M	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE
P4-11	N	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE
P4-11	O	2"	HH4-10	HH4-11	N/A	SPARE W/ PULL LINE
P4-12	J	2"	HH4-11	HH4-12	(3) #6, (1) #8 G.	
P4-12	M	2"	HH4-11	HH4-12	N/A	SPARE W/ PULL LINE
P4-12	N	2"	HH4-11	HH4-12	N/A	SPARE W/ PULL LINE
P4-12	O	2"	HH4-11	HH4-12	N/A	SPARE W/ PULL LINE
P4-13	J	2"	HH4-12	HH4-13	(3) #6, (1) #8 G.	
P4-13	M	2"	HH4-12	HH4-13	N/A	SPARE W/ PULL LINE
P4-14	F	3"	HH4-10	HH4-14	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8G
P4-14	G	3"	HH4-10	HH4-14	(3) #1/0, (1) #6 G.	COMMON CONDUIT W/ P4-8F
P4-14	P	3"	HH4-10	HH4-14	N/A	SPARE W/ PULL LINE
P4-15	F	3"	HH4-14	HH4-15	(3) #1/0, (1) #6 G.	
P4-15	P	3"	HH4-14	HH4-15	N/A	SPARE W/ PULL LINE
P4-16	F	3"	HH4-15	HH4-16	(3) #1/0, (1) #6 G.	
P4-16	P	3"	HH4-15	HH4-16	N/A	SPARE W/ PULL LINE
P4-17	G		HH4-14	HH4-17	(3) #1/0, (1) #6 G. DUCT CABLE, DIRECT BURY	

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

NODE 06 CONDUIT & CABLE SCHEDULE

CONDUIT SECTION	CONDUIT TAG	CONDUIT SIZE	ORIGIN	DESTINATION	CONDUCTOR	NOTES
P5-1	A	2"	PNL-5	HH5-1	(3) #1/0, (1) #6 G.	
P5-1	B	2"	PNL-5	HH5-1	N/A	SPARE W/ PULL LINE
P5-2	A	2"	HH5-1	HH5-2	(3) #1/0, (1) #6 G.	
P5-2	B	2"	HH5-1	HH5-2	N/A	SPARE W/ PULL LINE
P5-3	A	2"	HH5-2	HH5-3	(3) #1/0, (1) #6 G.	
P5-3	B	2"	HH5-2	HH5-3	N/A	SPARE W/ PULL LINE
P5-4	C	2"	PNL-5	HH5-4	(3) #1/0, (1) #6 G.	
P5-4	D	2"	PNL-5	HH5-4	(3) #1/0, (1) #6 G.	
P5-4	E	2"	PNL-5	HH5-4	N/A	SPARE W/ PULL LINE
P5-4	F	2"	PNL-5	HH5-4	N/A	SPARE W/ PULL LINE
P5-5	D	2"	HH5-4	HH5-5	(3) #1/0, (1) #6 G.	
P5-5	F	2"	HH5-4	HH5-5	N/A	SPARE W/ PULL LINE
P5-6	G	2"	PNL-5	HH5-6	(3) #1/0, (1) #6 G.	
P5-6	H	2"	PNL-5	HH5-6	(3) #1/0, (1) #6 G.	
P5-6	I	2"	PNL-5	HH5-6	N/A	SPARE W/ PULL LINE
P5-6	J	2"	PNL-5	HH5-6	N/A	SPARE W/ PULL LINE
P5-6	K	2"	PNL-5	HH5-6	N/A	SPARE W/ PULL LINE
P5-6	L	2"	PNL-5	HH5-6	N/A	SPARE W/ PULL LINE
P5-7	H	2"	HH5-6	HH5-7	(3) #1/0, (1) #6 G.	
P5-7	J	2"	HH5-6	HH5-7	N/A	SPARE W/ PULL LINE
P5-7	K	2"	HH5-6	HH5-7	N/A	SPARE W/ PULL LINE
P5-7	L	2"	HH5-6	HH5-7	N/A	SPARE W/ PULL LINE
P5-8	H	2"	HH5-7	HH5-8	(3) #1/0, (1) #6 G.	
P5-8	J	2"	HH5-7	HH5-8	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
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

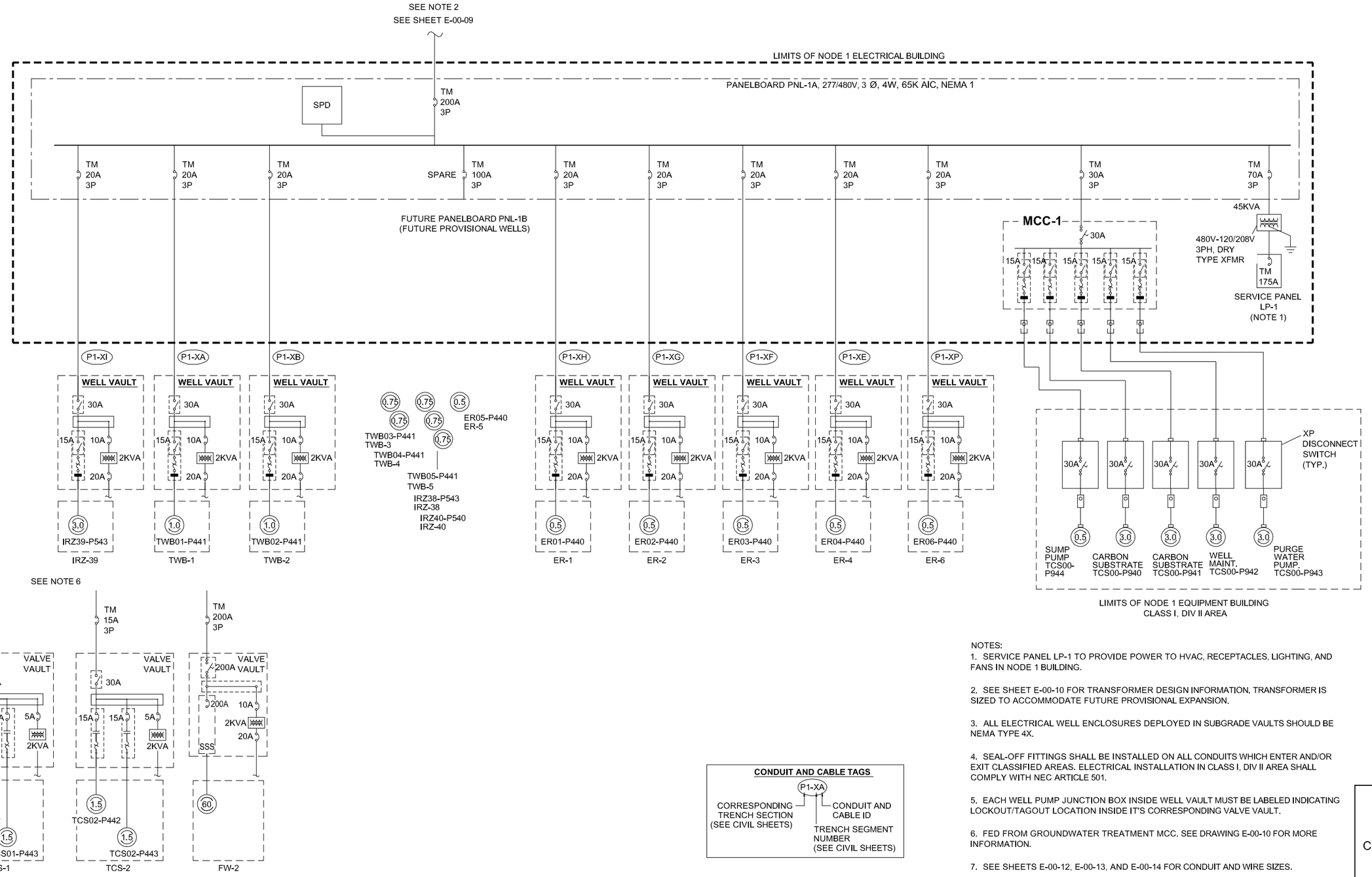
CONDUIT & CABLE SCHEDULES

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

03/27/2013, 1:13:31, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL F\Formatted\OneLine.dwg, Tab: E-00-14

N1808



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-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. FED FROM GROUNDWATER TREATMENT MCC. SEE DRAWING E-00-10 FOR MORE INFORMATION.
7. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	
SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

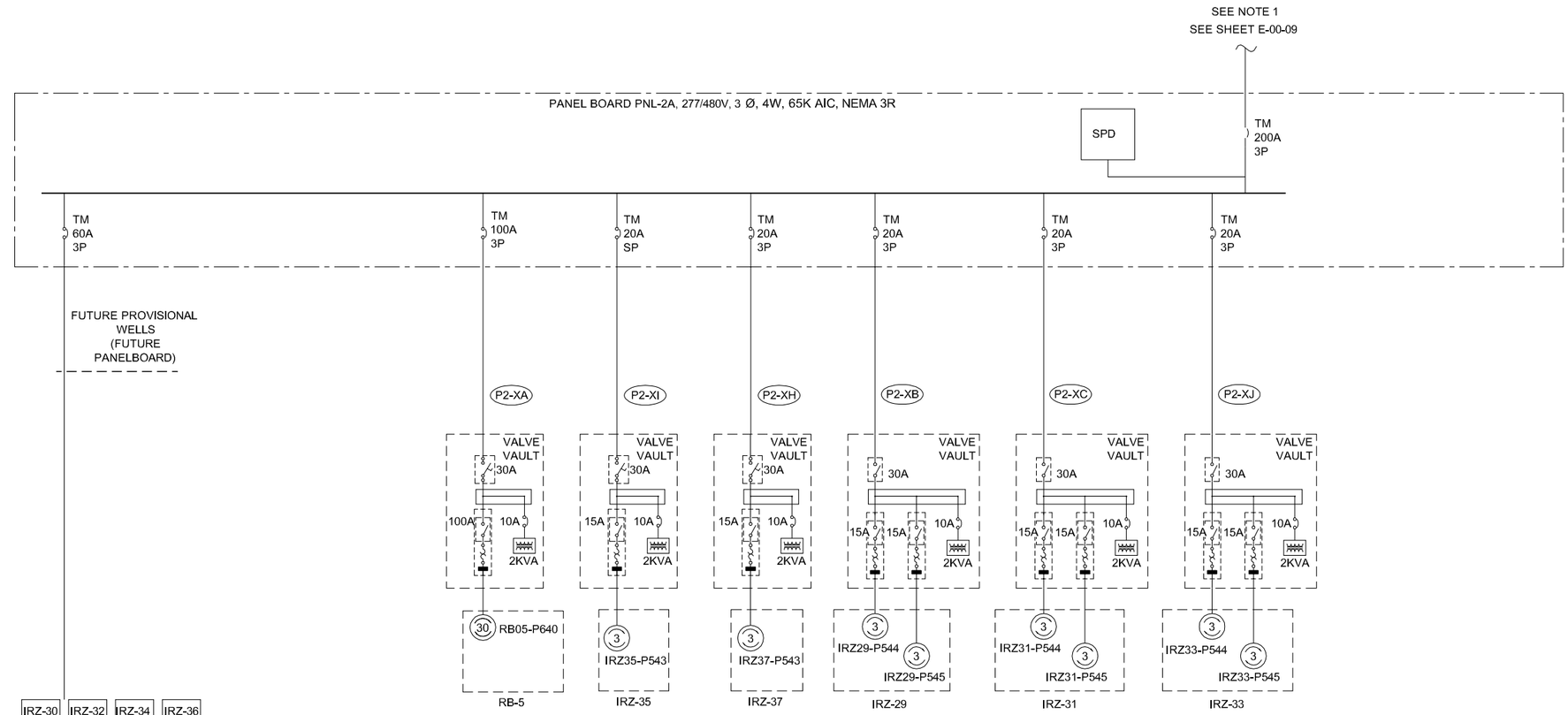
TOPOCK GROUNDWATER REMEDIATION PROJECT

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

03/27/2013, 1:13:31, G:\Graphics\ART\TOPOCK-01\Submittal-60%_Mar-in\2013\HILL Flarmatted\OneLine.dwg, Tab: E-00-15



NOTES:

1. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.

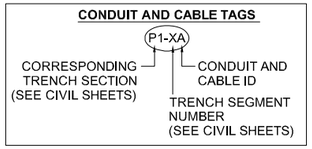
2. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.

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.

CONDUIT AND CABLE TAGS



- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

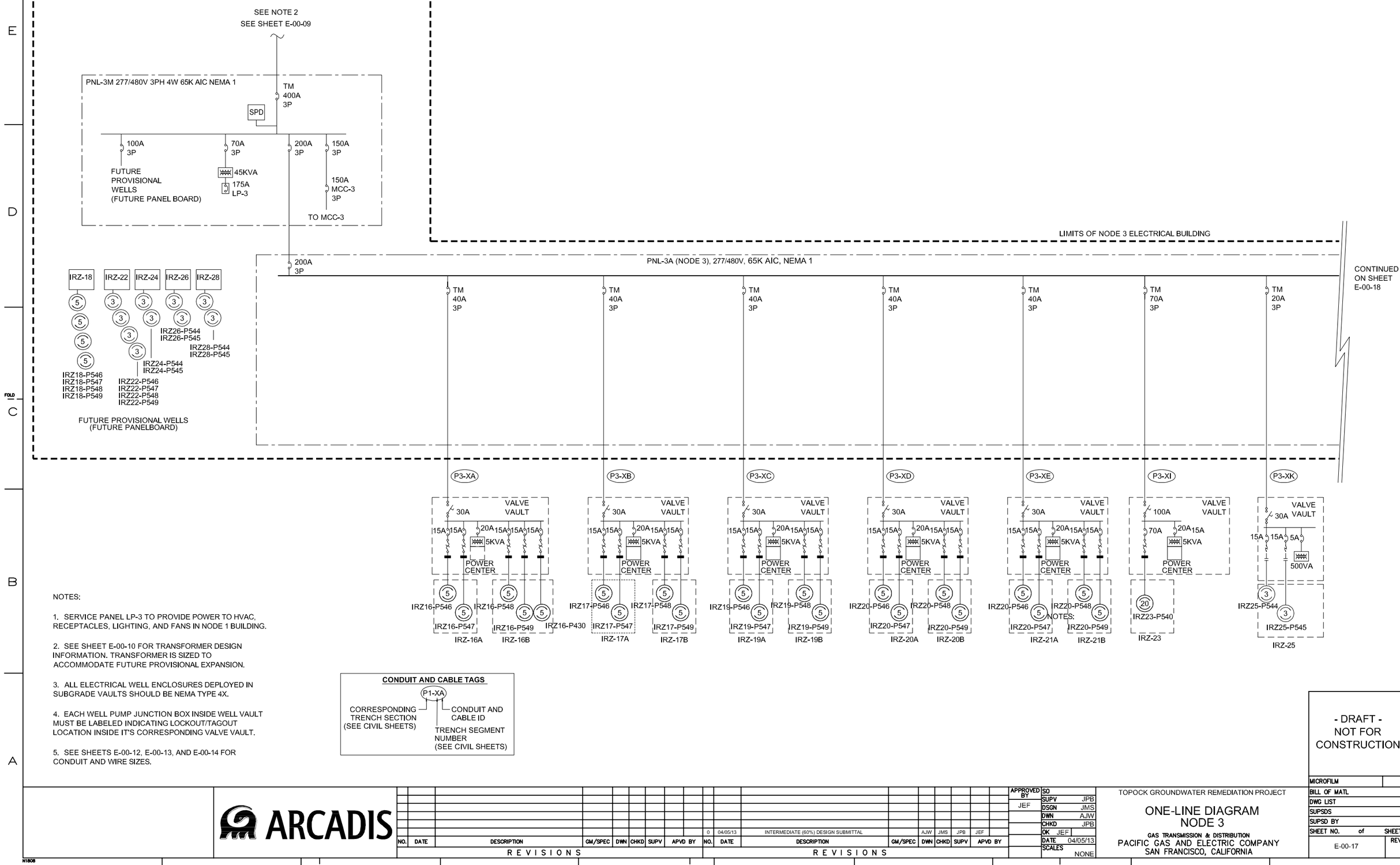
TOPOCK GROUNDWATER REMEDIATION PROJECT

ONE-LINE DIAGRAM
NODE 2

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

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-16	REV

03/27/2013,1:13:31, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Filmatted\OneLine.dwg, Tab: E-00-16



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.

CONDUIT AND CABLE TAGS

- DRAFT -
NOT FOR
CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	
SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

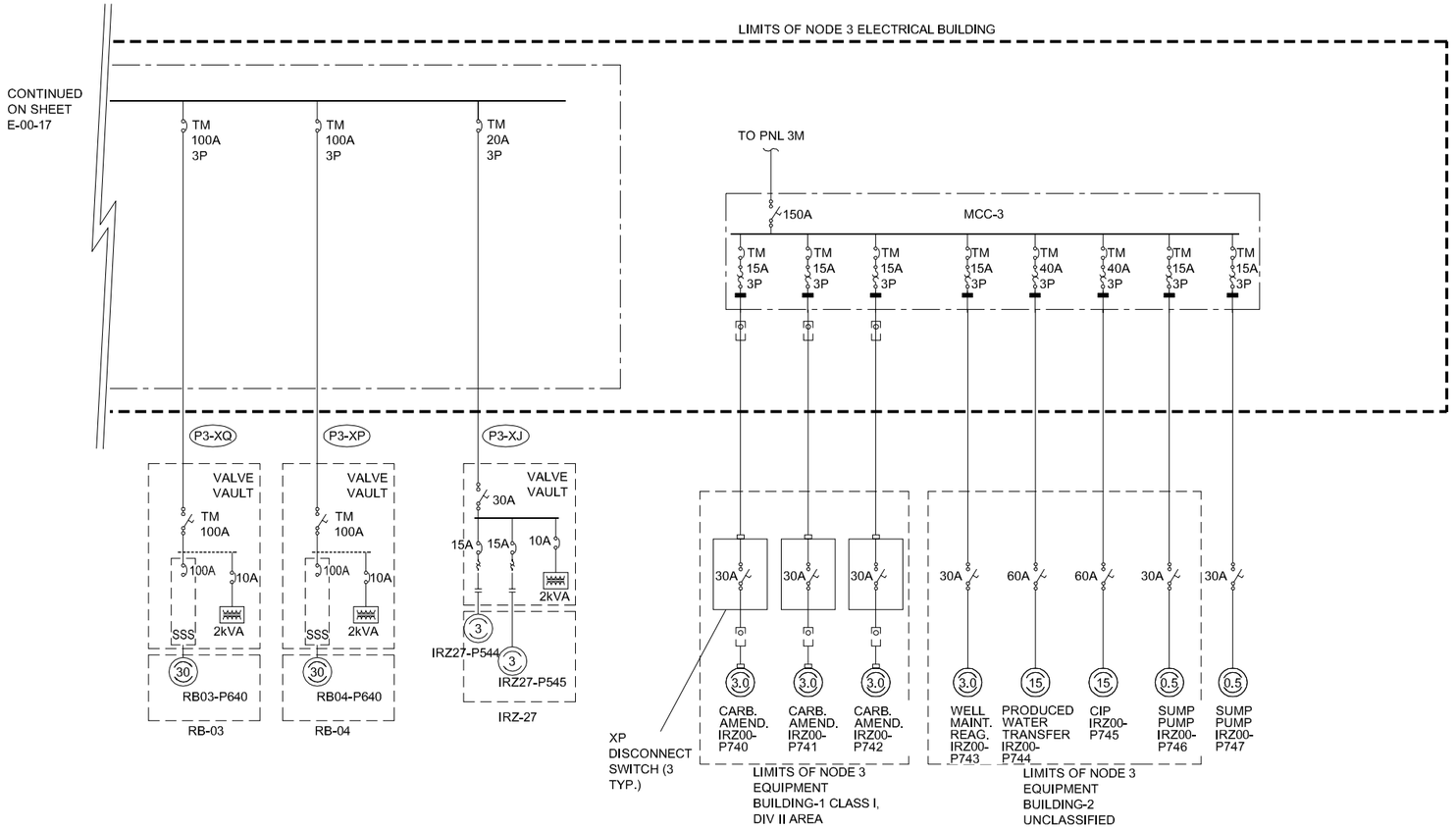
ONE-LINE DIAGRAM
NODE 3

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

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

03/27/2013, 11:31, G:\Graphics\ART\TOPOCK\401Submittal-60%_March2013\WILL Formatted\OneLine.dwg, Tab: E-00-17

N1808



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.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY	
	JEF

SO		
SUPV	JPB	
DSGN	JMS	
DWN	AJW	
CHKD	JPB	
OK	JEF	
DATE	04/05/13	
SCALES	NONE	

TOPOCK GROUNDWATER REMEDIATION PROJECT

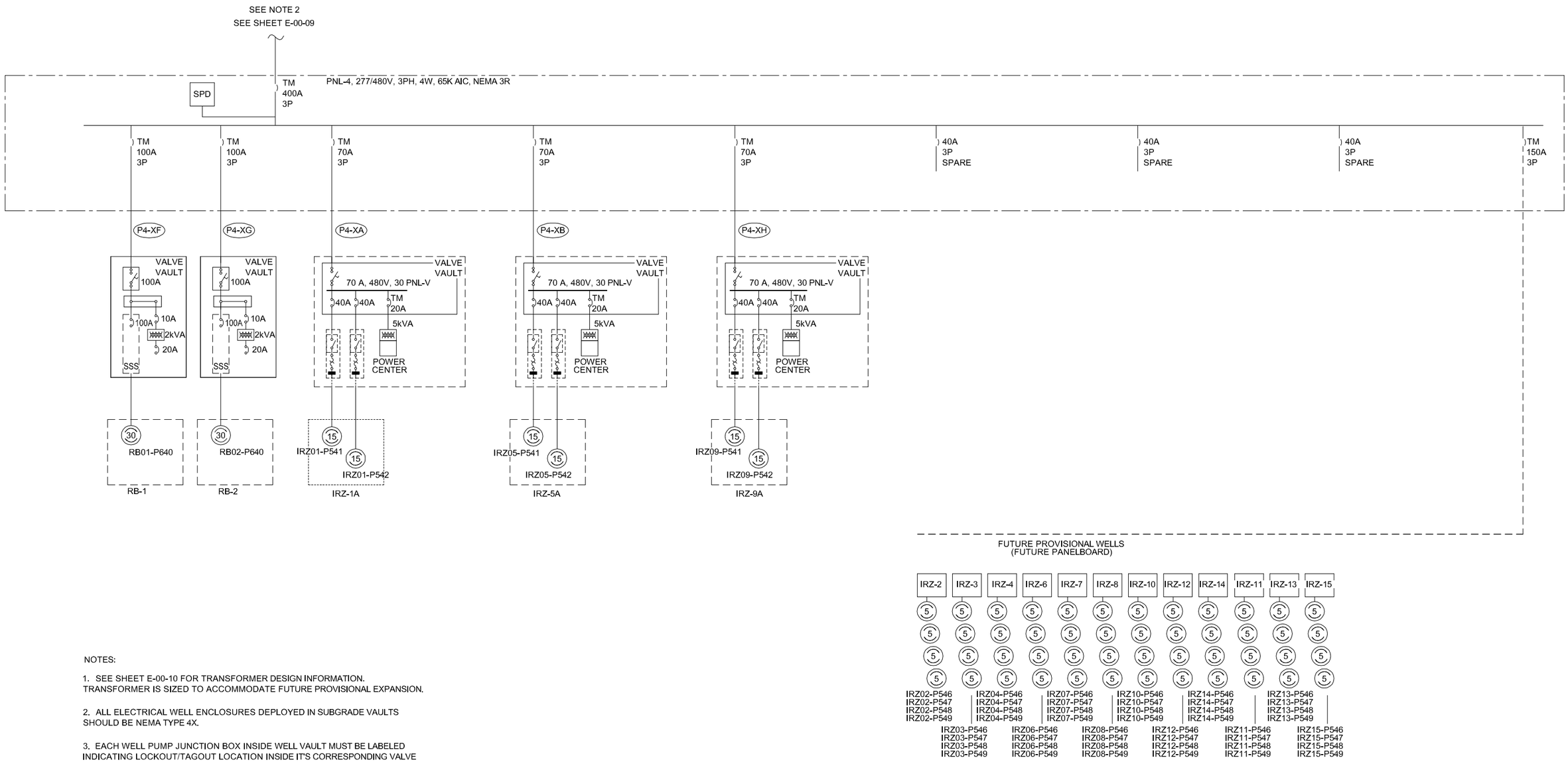
ONE-LINE DIAGRAM NODE 3

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

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-00-18	REV

N1808

03/27/2013,11:31, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL Formatted\OneLine.dwg, Tab: E-00-18



NOTES:

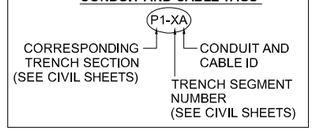
1. SEE SHEET E-00-10 FOR TRANSFORMER DESIGN INFORMATION. TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.

2. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 4X.

3. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE IT'S CORRESPONDING VALVE VAULT.

4. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.

CONDUIT AND CABLE TAGS



- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	JMS	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

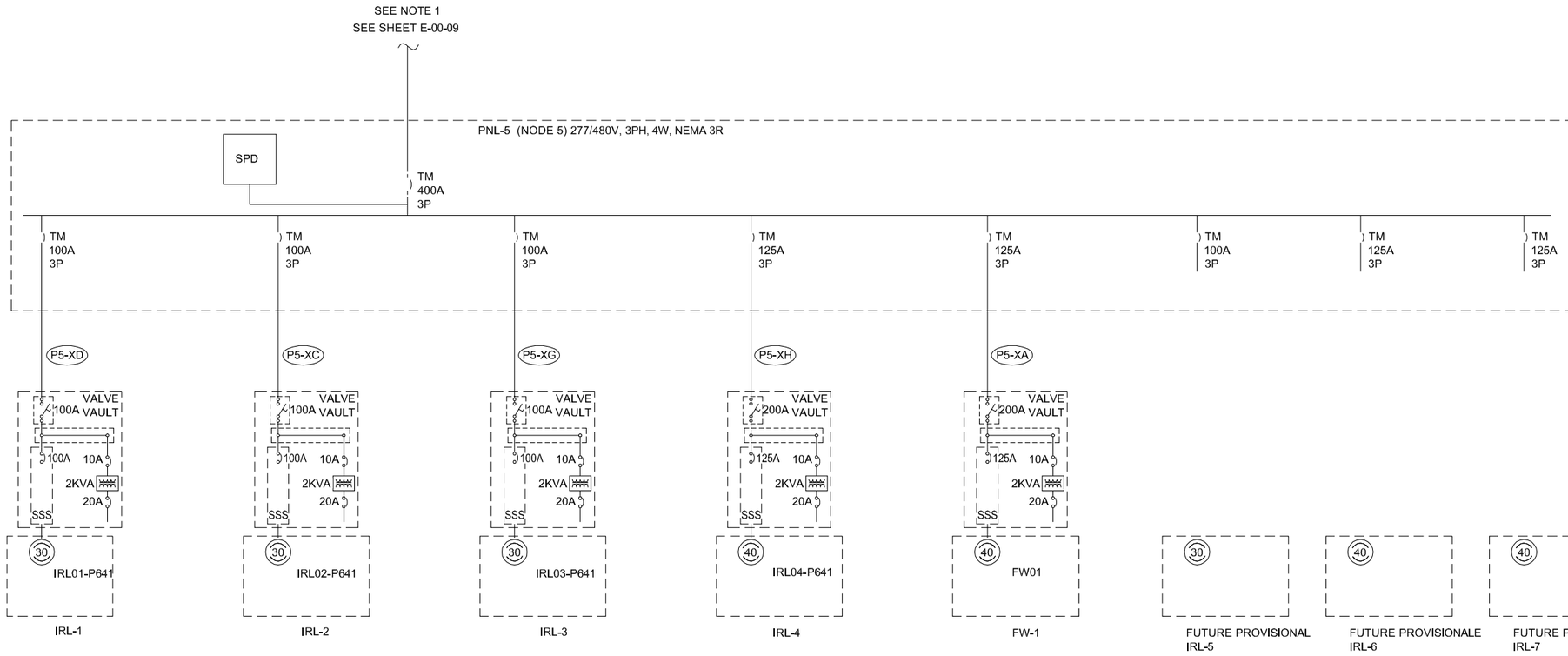
ONE-LINE DIAGRAM
NODE 4

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

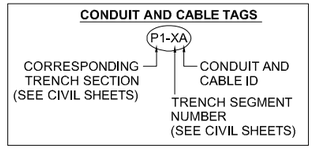
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-00-19	REV

N1808

03/27/2013, 11:31, G:\Graphics\ART\TOPOCK-01\Submittal-80%_March2013\HILL Formatted\OneLine.dwg, Tab: E-00-19



CONDUIT AND CABLE TAGS



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. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE ITS CORRESPONDING VALVE VAULT.

4. SEE SHEETS E-00-12, E-00-13, AND E-00-14 FOR CONDUIT AND WIRE SIZES.

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	JMS	JPB	JEF	

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	JMS
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

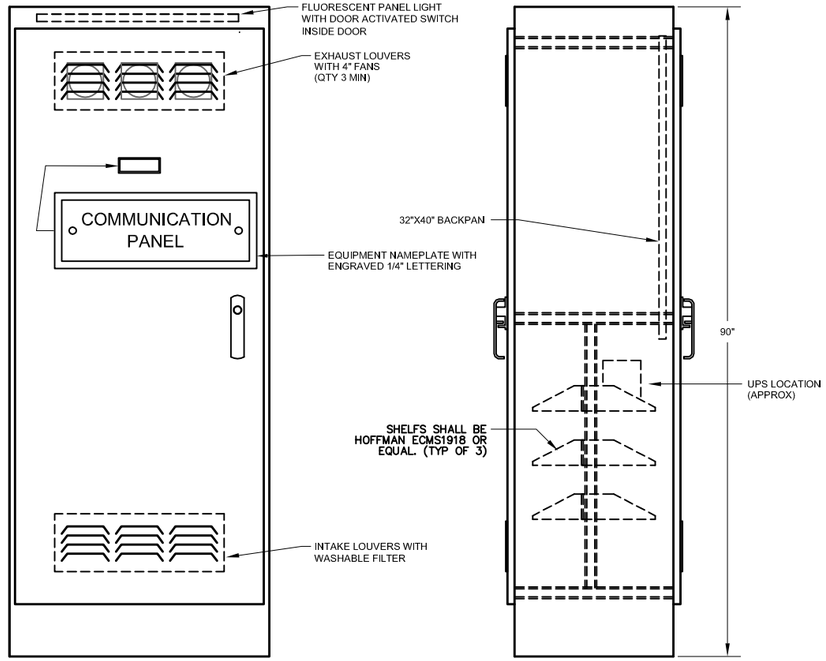
ONE-LINE DIAGRAM NODE 5

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-00-20	REV

N1808

03/27/2013, 11:32, G:\Graphics\ART\TOPOCK\41S\submittal-60%_March2013\HILL Formatted\OneLine.dwg, Tab: E-00-20

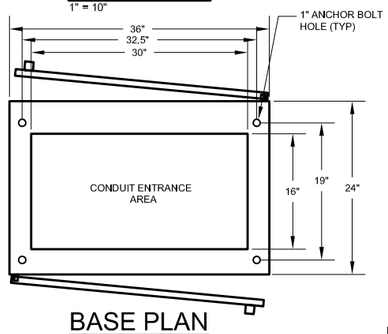


FRONT ELEVATION

SIDE ELEVATION

ELEVATION

1" = 10"

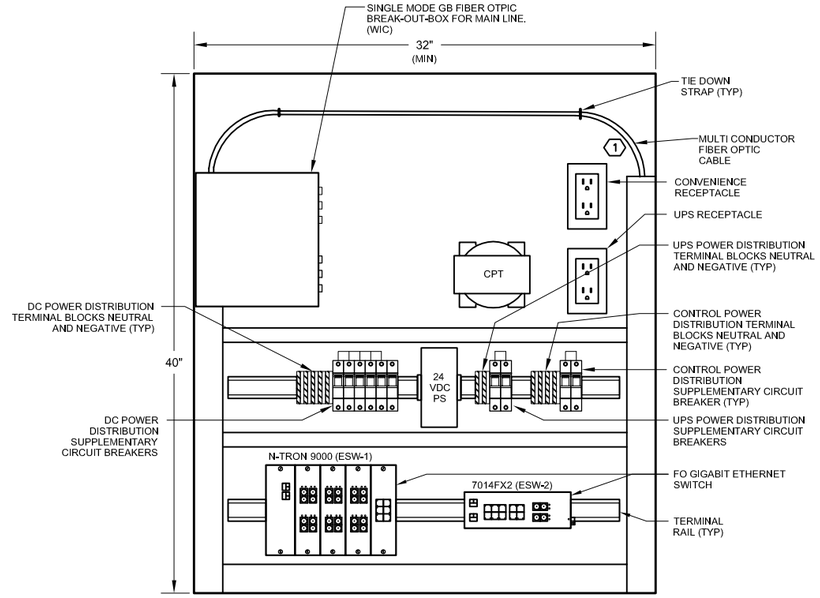


BASE PLAN

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.

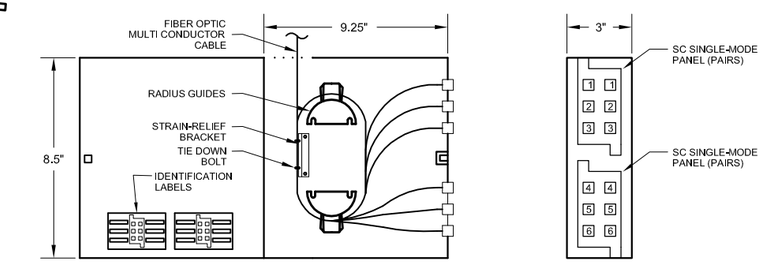


BACKPAN LAYOUT

1" = 10"

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.

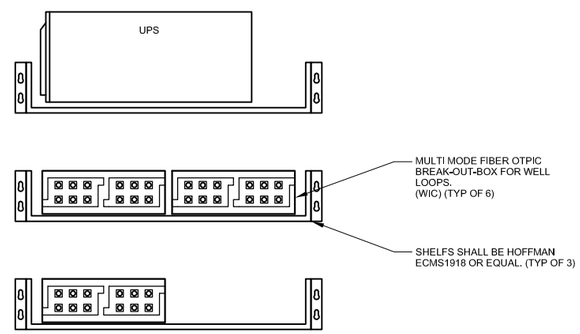


DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION

FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION



SHELF LAYOUT

1" = 10"

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
113 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

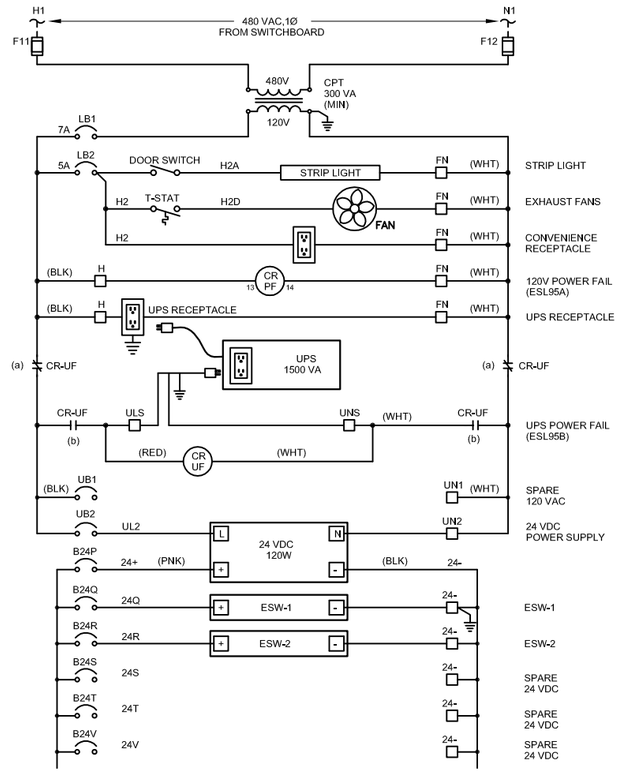
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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

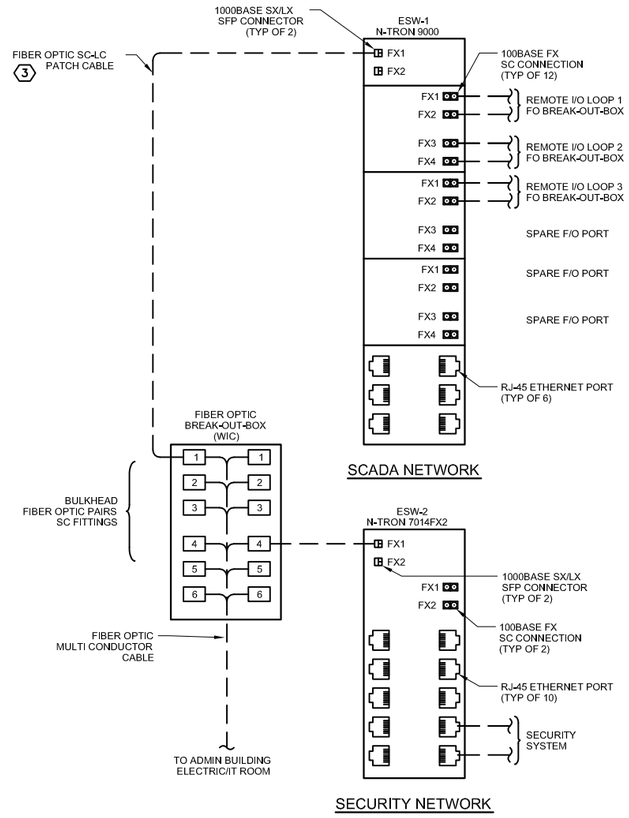
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-21	REV

PLOT TIME: 9:17:14am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-0021AD.dwg

N1808



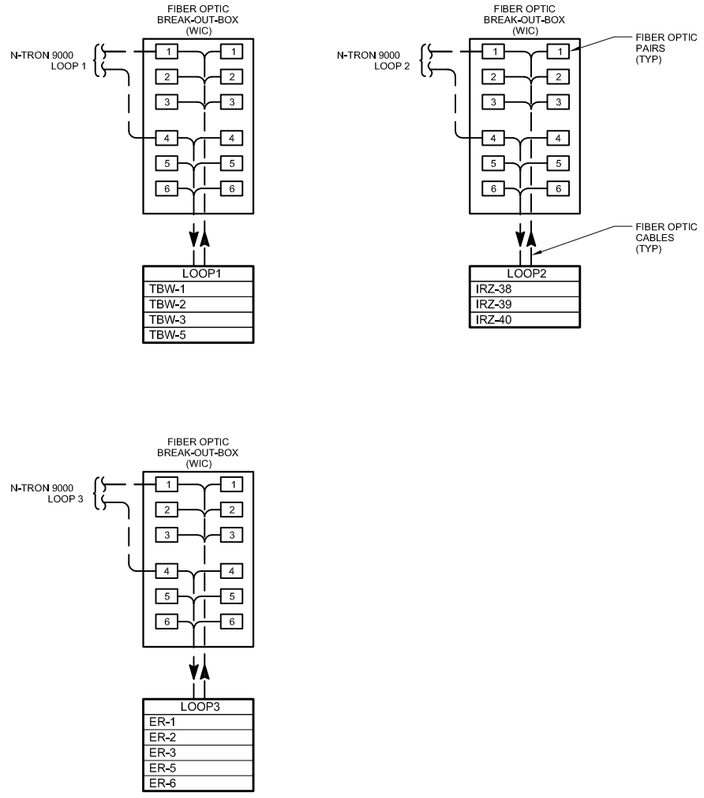
COMMUNICATION PANEL POWER DISTRIBUTION DIAGRAM



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.



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

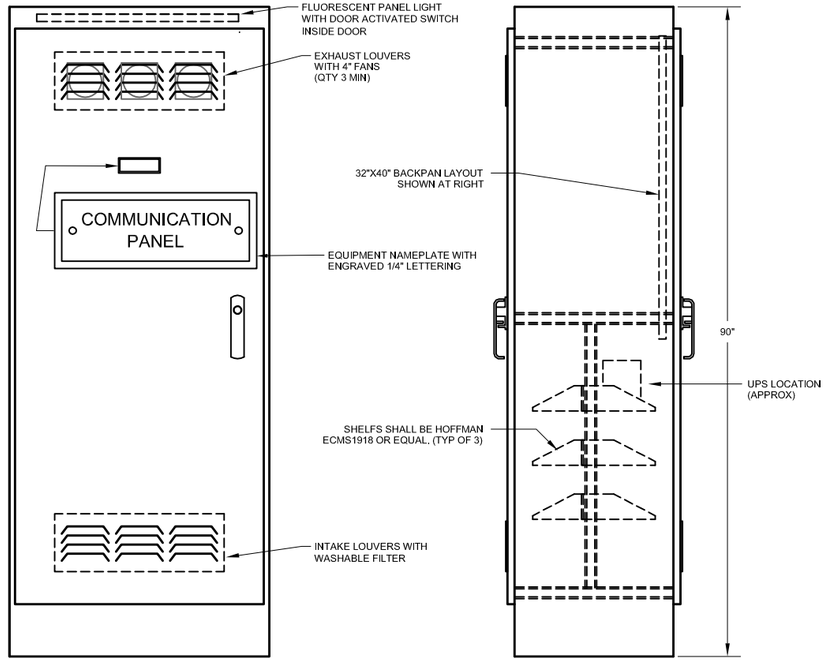
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMOTE WELL COMMUNICATION PANEL 1 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-00-22	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:10:16am
FILENAME: FE-E-xxxx-0022AD.dwg

N1808

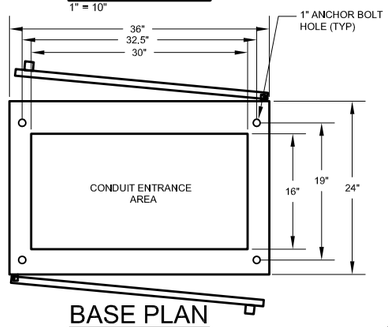


FRONT ELEVATION

SIDE ELEVATION

ELEVATION

1" = 10"

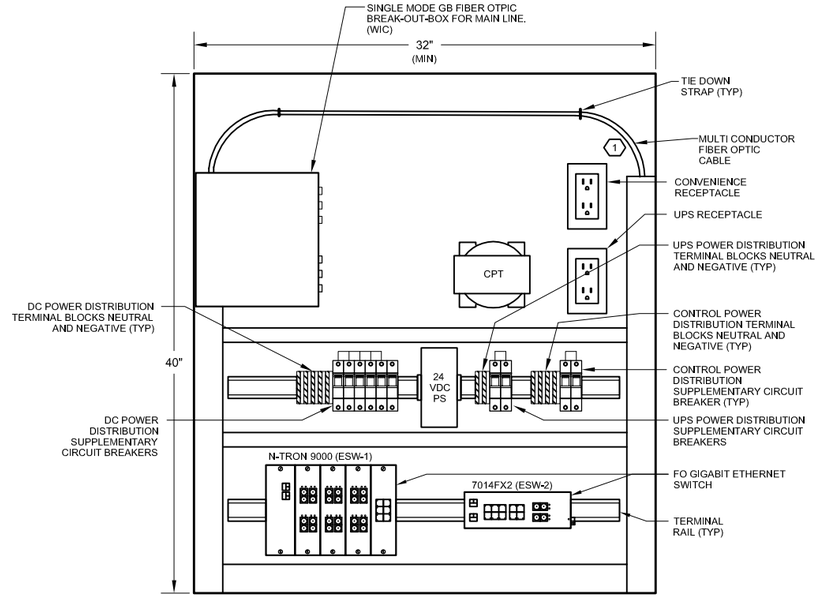


BASE PLAN

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.
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.

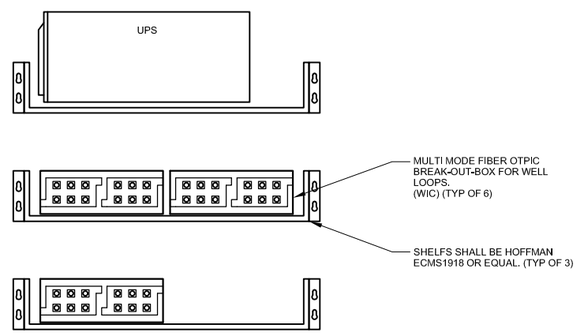


BACKPAN LAYOUT

1" = 10"

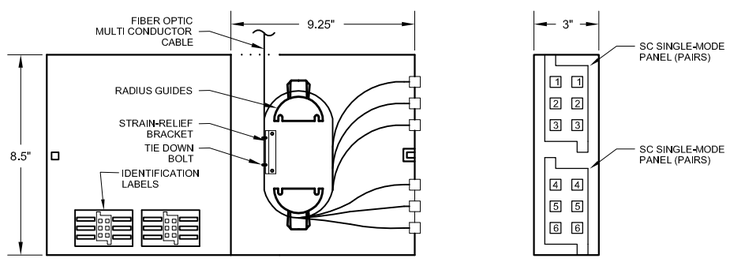
DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.



SHELF LAYOUT

1" = 10"



DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION

FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
113 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

APPROVED BY: TPF

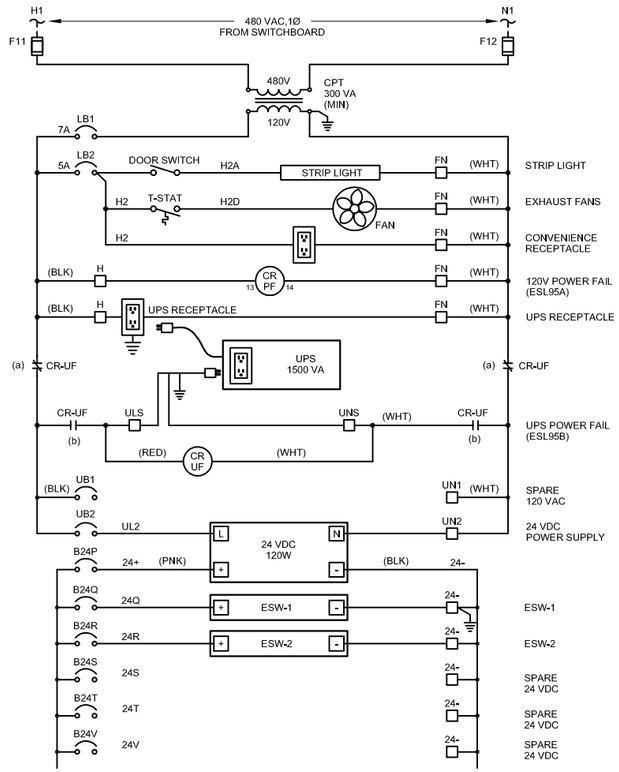
SO	
SUPV	
DSGN	TPF
DWN	MBY, NC
CHKD	TPF
QK	TPF
DATE	
SCALES	N/A

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

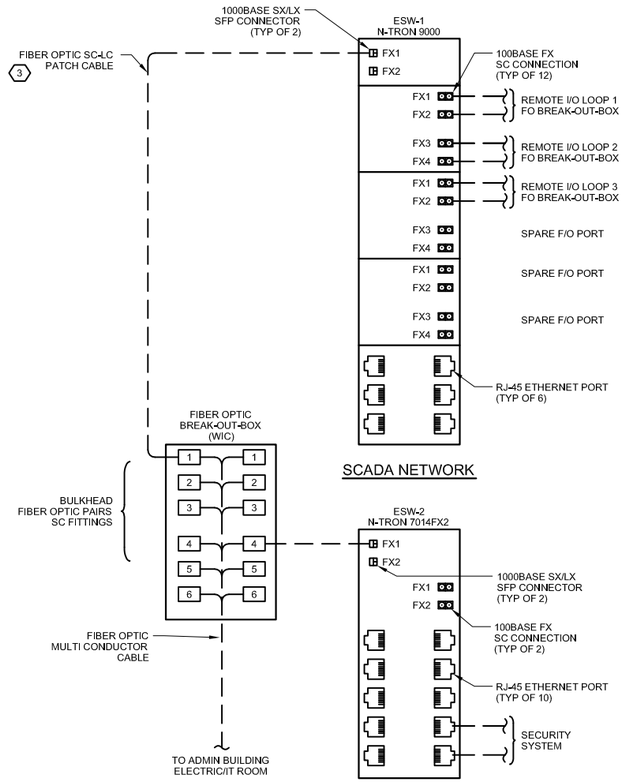
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-23	REV

PLOT TIME: 9:17:41am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-0023AD.dwg

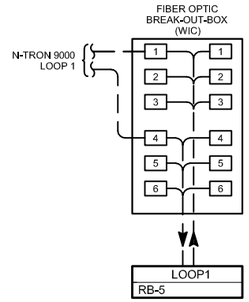
N1808

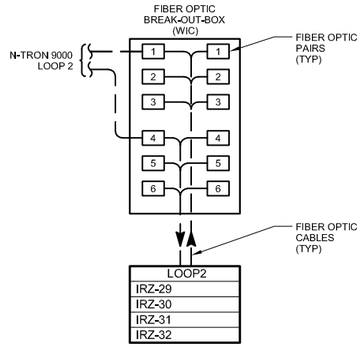


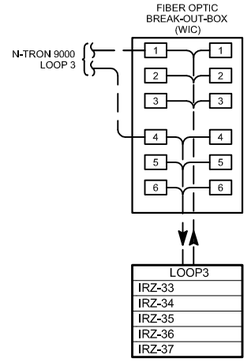
COMMUNICATION PANEL POWER DISTRIBUTION DIAGRAM



FIBER OPTIC SWITCH DIAGRAM







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.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

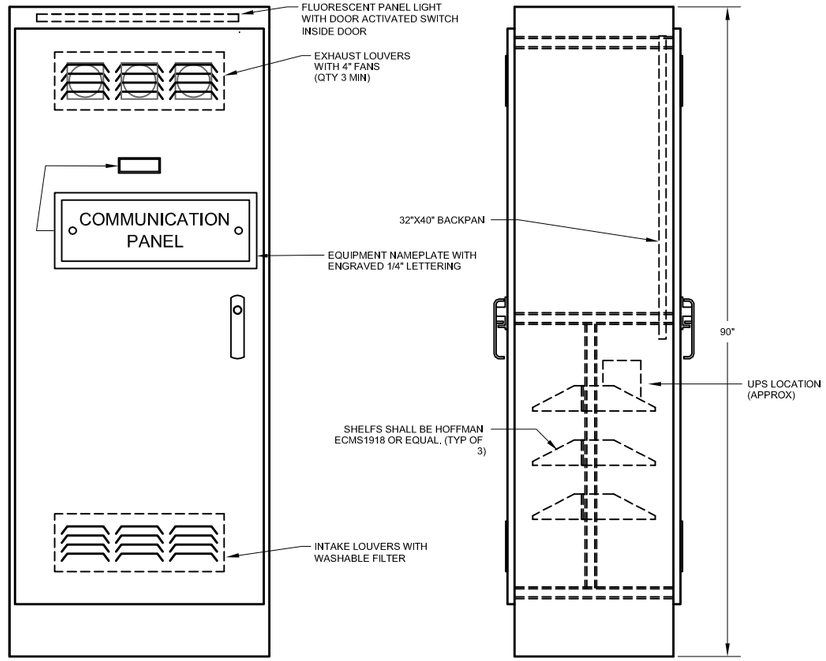
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

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-00-24	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:18:02am
FILENAME: FE-E-xxxx-0024AD.dwg

N1808

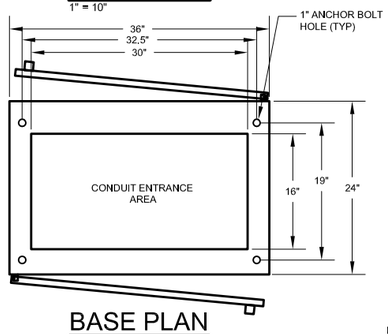


FRONT ELEVATION

SIDE ELEVATION

ELEVATION

1" = 10"

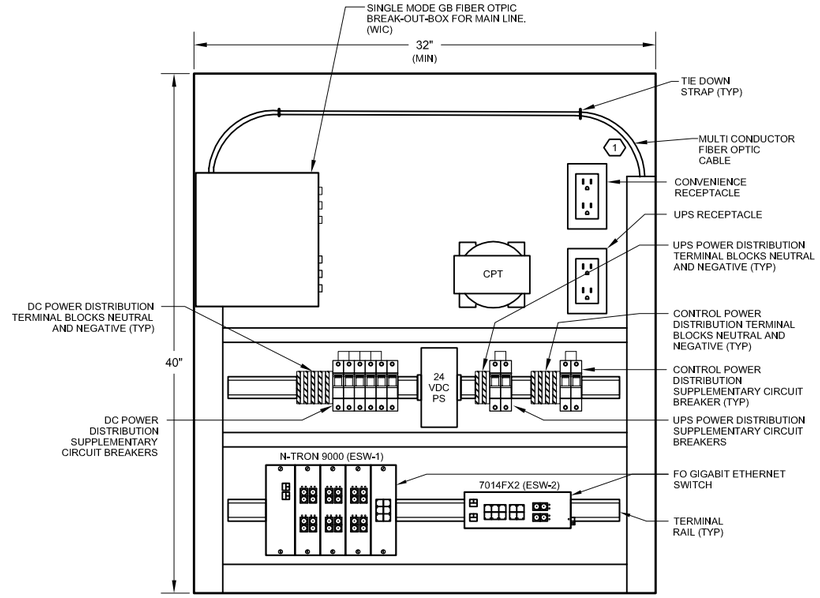


BASE PLAN

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.
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.

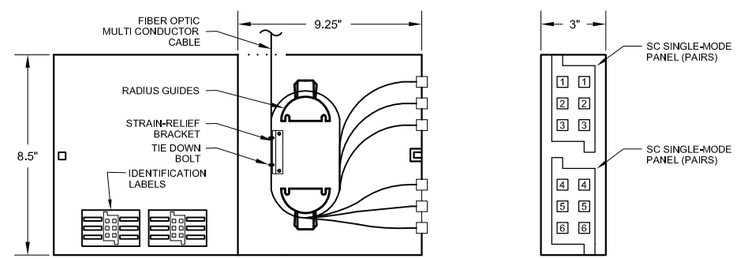


BACKPAN LAYOUT

1" = 10"

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.

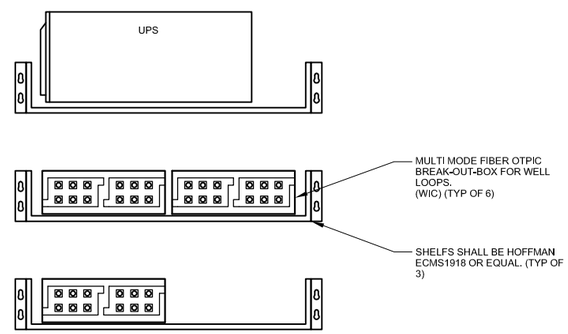


DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION

FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION



SHELF LAYOUT

1" = 10"

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

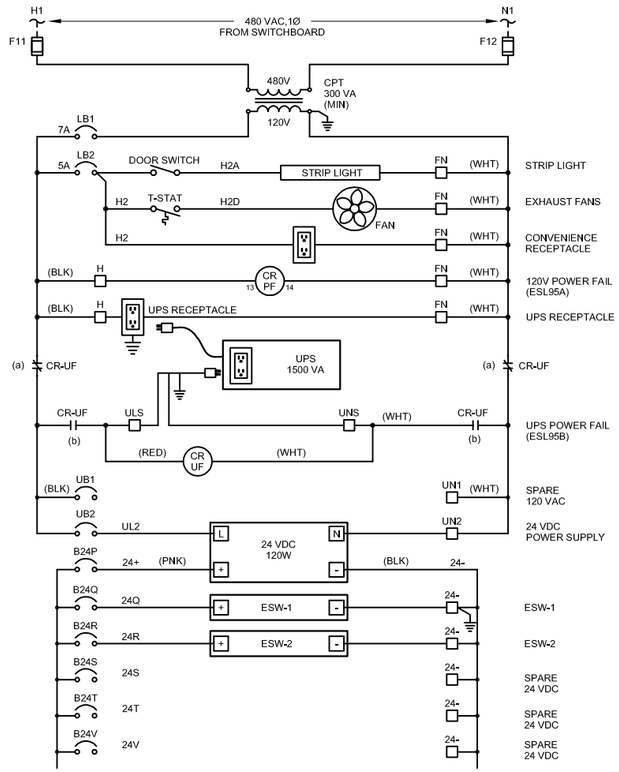
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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

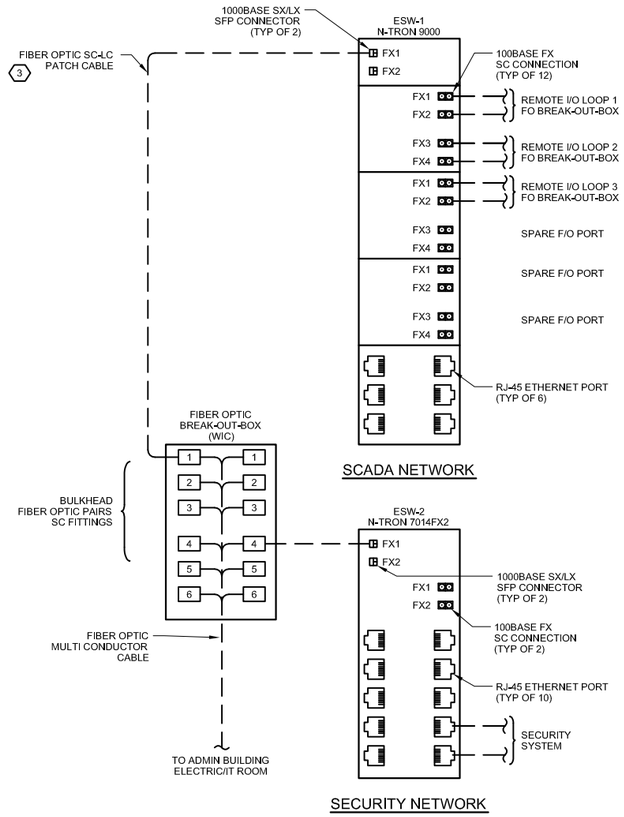
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-25	REV

PLOT TIME: 9:18:24am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-0025AD.dwg

N1808



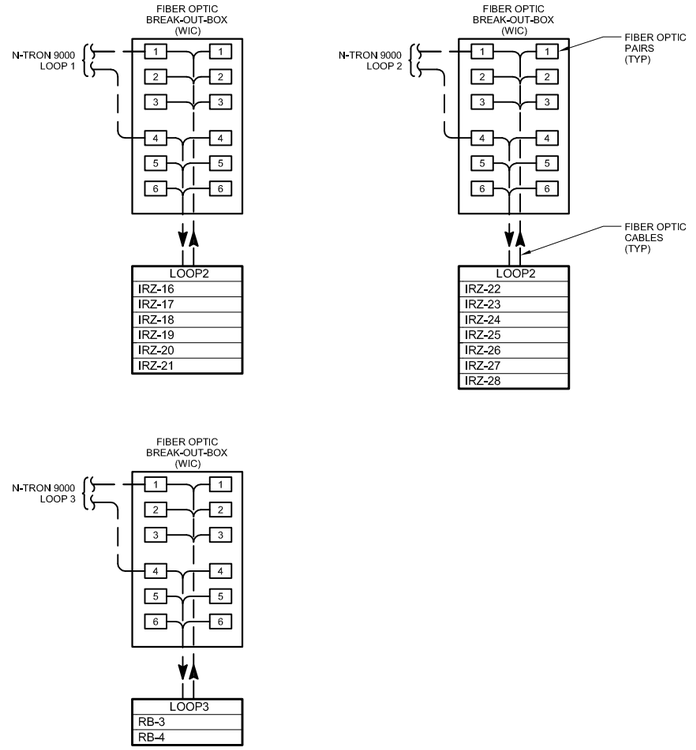
COMMUNICATION PANEL POWER DISTRIBUTION DIAGRAM



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.



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

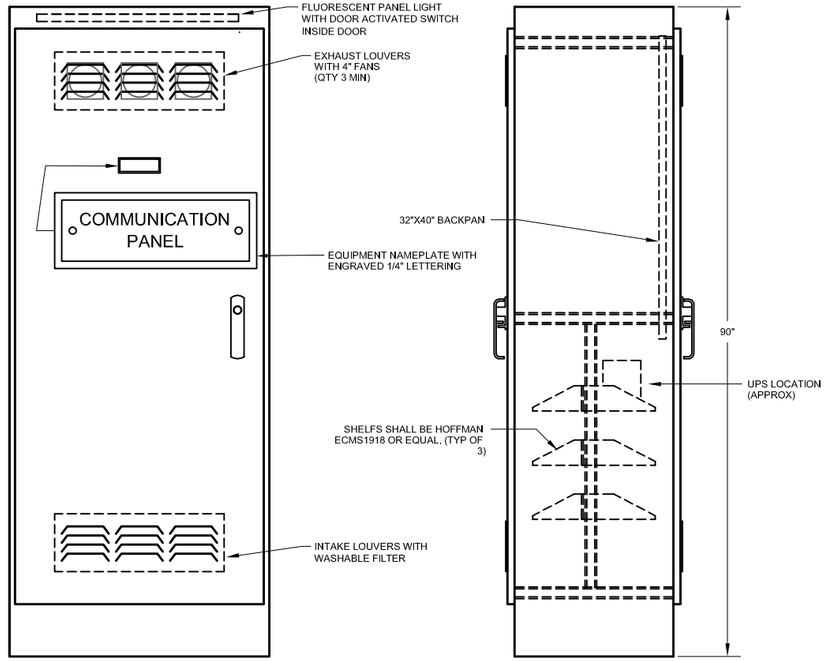
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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-00-26	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:18:47am
FILENAME: FE-E-xxx-0026AD.dwg

N1808

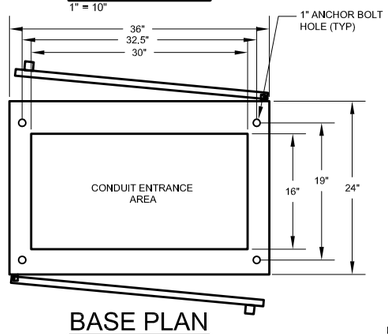


FRONT ELEVATION

SIDE ELEVATION

ELEVATION

1" = 10"

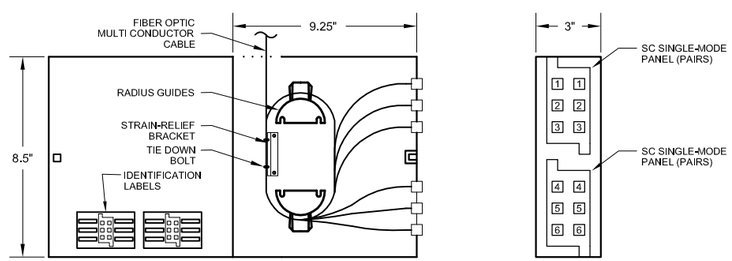


BASE PLAN

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.
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.

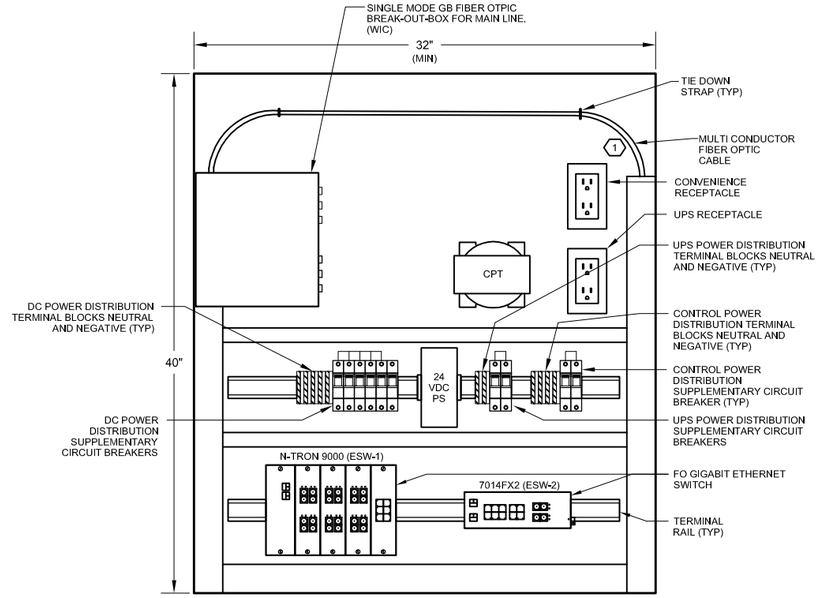


DOOR REAR ELEVATION

FRONT ELEVATION

SIDE ELEVATION

FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

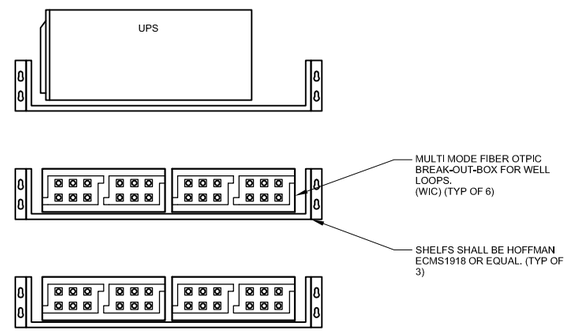


BACKPAN LAYOUT

1" = 10"

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.



SHELF LAYOUT

1" = 10"

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
113 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

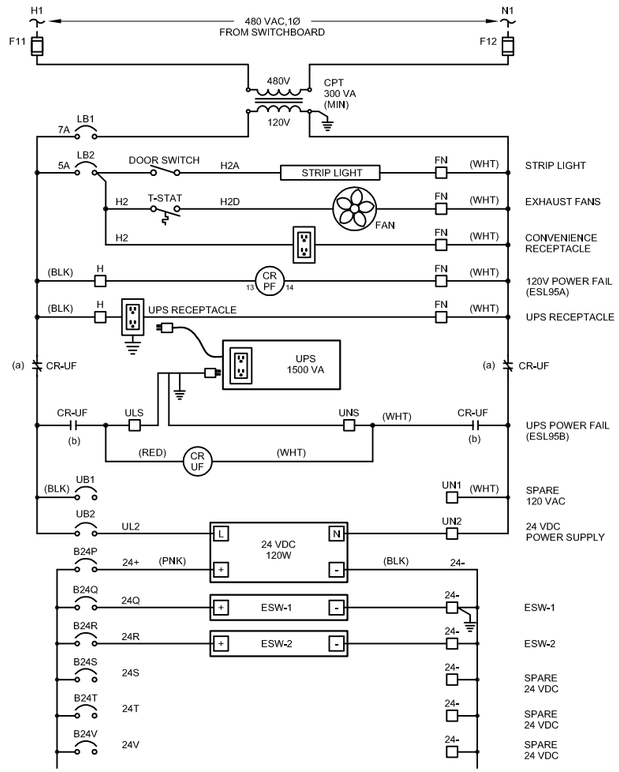
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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

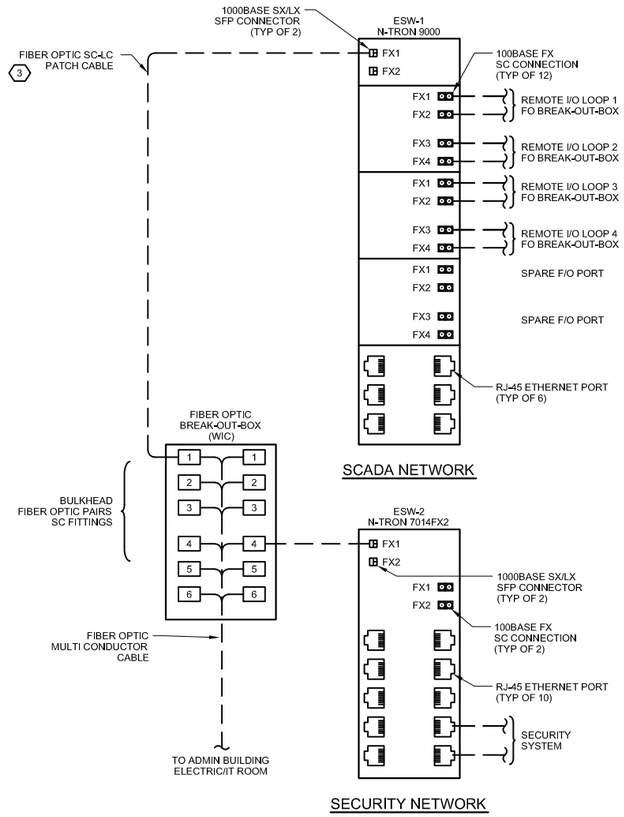
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-27	REV

PLOT TIME: 9:20:14am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-0027AD.dwg

N1808



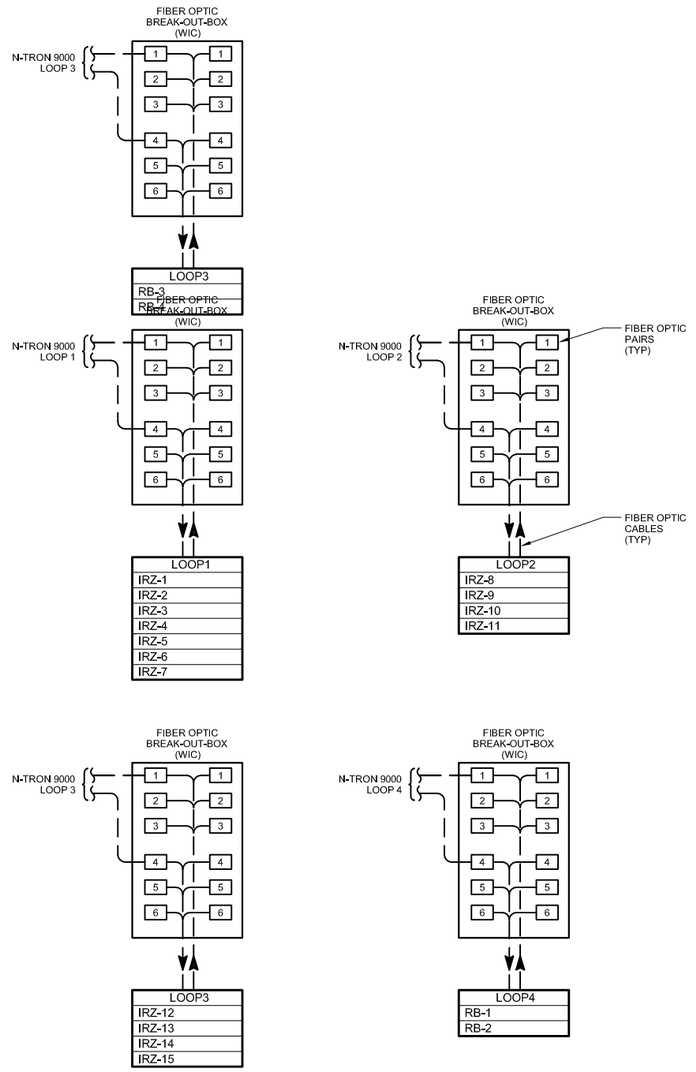
COMMUNICATION PANEL POWER DISTRIBUTION DIAGRAM



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.



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

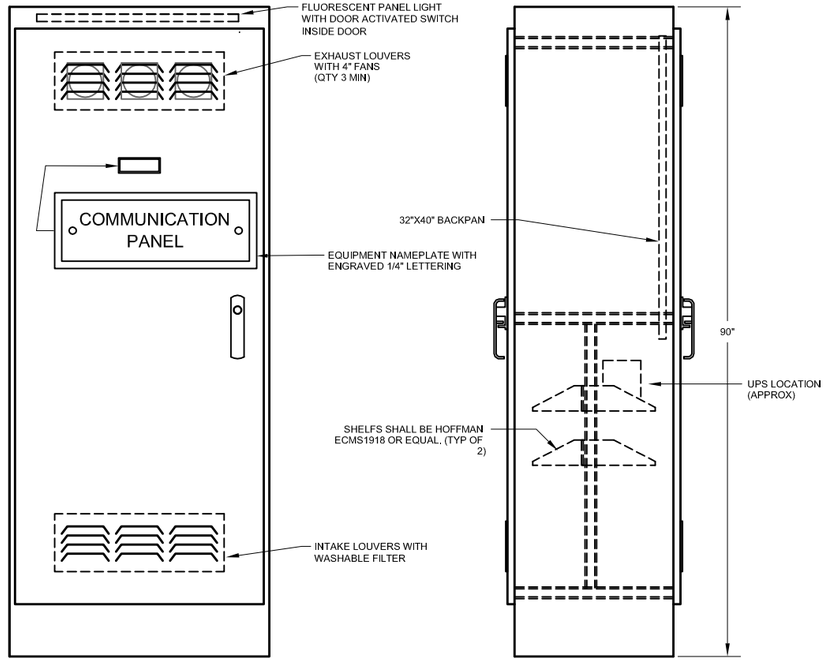
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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-00-28	REV

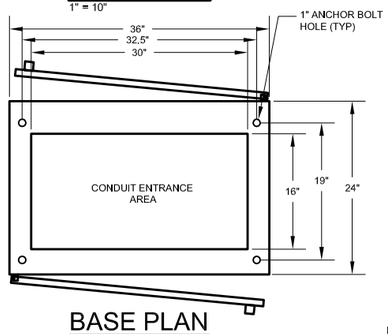
PLOT DATE: Apr 03, 2013 PLOT TIME: 9:20:34am
FILENAME: FE-E-xxx-0028AD.dwg

N1808



ELEVATION

1" = 10"

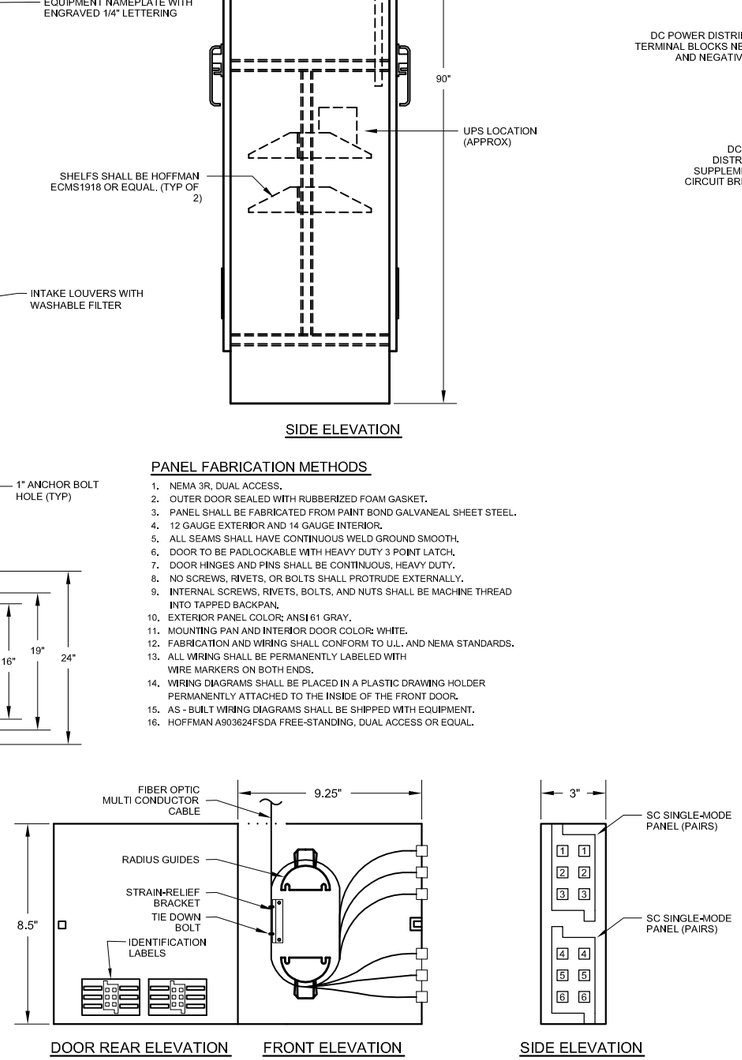


BASE PLAN

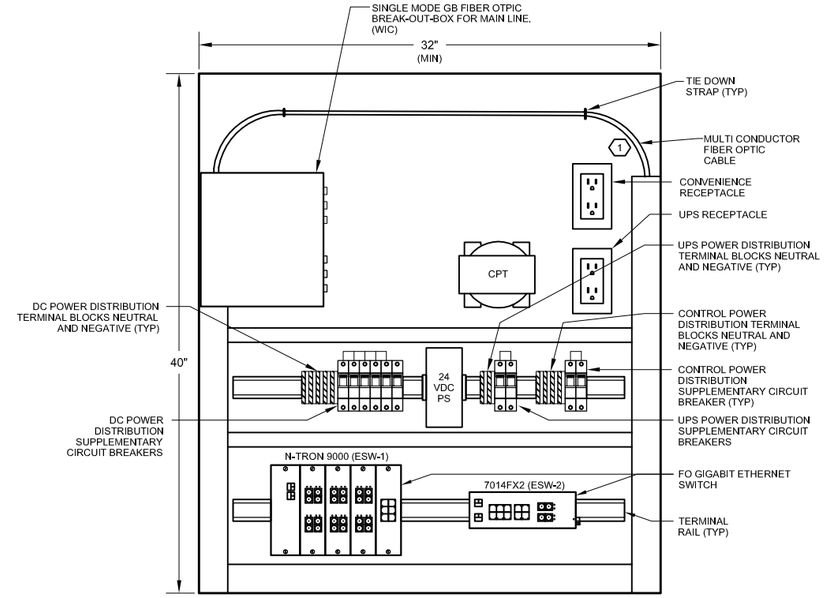
1" = 10"

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.



FIBER OPTIC BREAK-OUT-BOX (WIC) ELEVATION

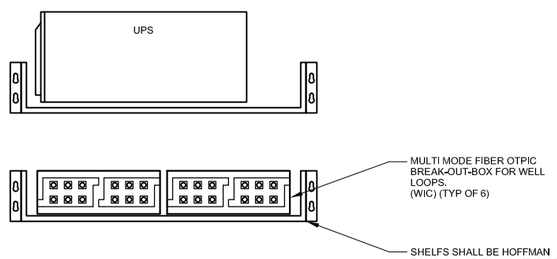


BACKPAN LAYOUT

1" = 10"

DRAWING REFERENCED NOTES:

1. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.



SHELF LAYOUT

1" = 10"

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

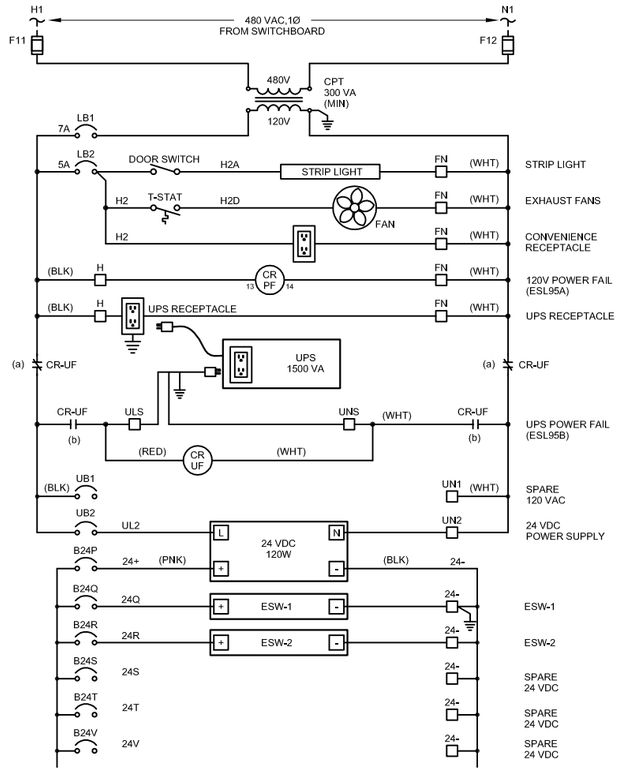
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

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

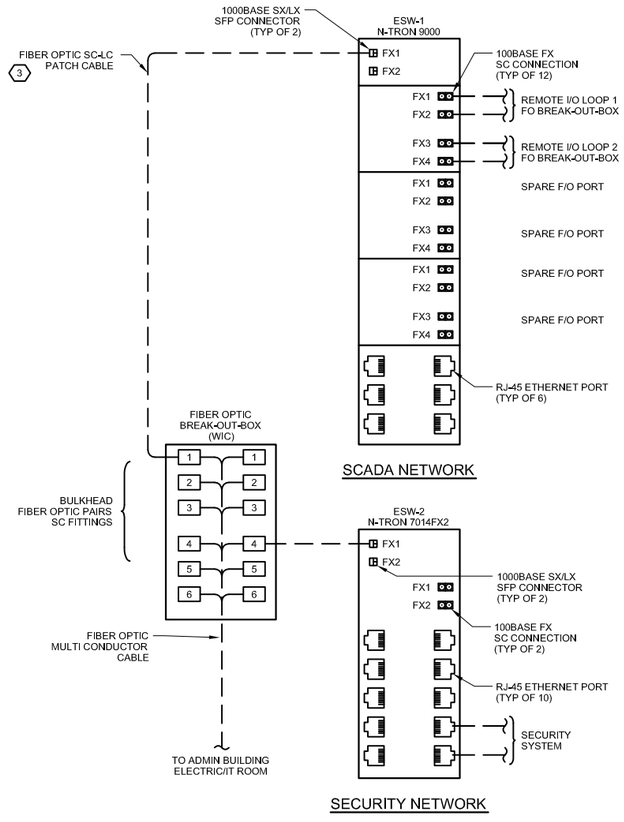
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-00-29	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:20:57am
FILENAME: FE-E-xxx-0029AD.dwg

N1808



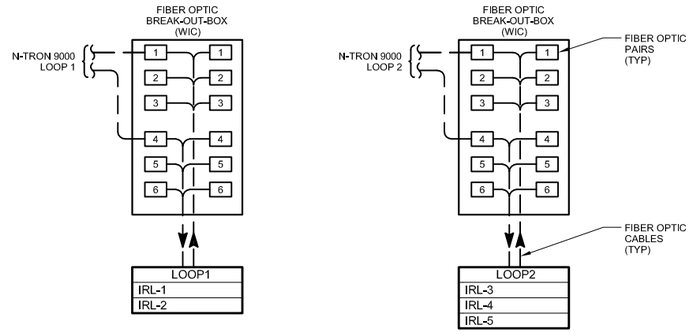
COMMUNICATION PANEL POWER DISTRIBUTION DIAGRAM



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.



FIBER OPTIC BREAK-OUT-BOX (WIC) DIAGRAMS

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK 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-00-30	REV

PLOT TIME: 9:21:21am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxxx-0030AD.dwg

N1808

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 LC SFP MODULE GIGABIT CONNECTION
	RJ-45 ETHERNET (CAT6) GIGABIT CONNECTION
	SINGLE MODE FIBER OPTIC CABLE
	MULTI-MODE FIBER OPTIC CABLE

NOTES:

1. CAT-5 ETHERNET CABLE CONNECTION
2. FIBER OPTIC (SINGLEMODE) CABLE CONNECTION

10/100/1000 MB FO ESW

TO EXISTING PG&E SUPERVISORY SCADA NETWORK

OPERATIONS SCADA TERMINAL 1 (INTELLUTION)

OPERATIONS SCADA TERMINAL 2 (INTELLUTION)

OPERATIONS SCADA HISTORIAN (INTELLUTION)

10/100/1000 MB FO ESW

REMOTE SITE RADIO

RADIO

(PLC-011) FW-HNWR-1

(PLC-012) FW-TP-2,3

FO ESW 2 PORT 1000BASESX/LX 12 PORT FX 6 PORT TX

FO WIC

PLC

HMI

WI-FI 802.11

1 (TYP)

LOOPED FO CABLES TO REMOTE SITES 6 LOOPS MAXIMUM

(REMEDY WTP) (PLC-099)

PLC-099 - REMOTE I/O SITES
TRANSWESTERN BENCH
TCS-1
TCS-2
FW-2

(TW BENCH) (PLC-01)

PLC-001 - REMOTE I/O SITES
TBW-1
TWB-2
TWB-3
TWB-4
TWB-5
MID-EX-1
IRZ-38
IRZ-39
IRZ-40
ER-1
ER-2
ER-3
ER-4
ER-5
ER-6

(SOUTH NTH) (PLC-02)

PLC-002 - REMOTE I/O SITES
IRZ-29
IRZ-30
IRZ-31
IRZ-32
IRZ-33
IRZ-34
IRZ-35
IRZ-36
IRZ-37
RB-5

(MW-20 BENCH) (PLC-03)

PLC-003 - REMOTE I/O SITES
M-20 BENCH
IRZ-16
IRZ-17
IRZ-18
IRZ-19
IRZ-20
IRZ-21
IRZ-22
IRZ-23
IRZ-24
IRZ-25
IRZ-26
IRZ-27
IRZ-28
RB-3
RB-4

(NORTH NTH) (PLC-04)

PLC-004 - REMOTE I/O SITES
NORTH RIVERBANK
IRZ-1
IRZ-2
IRZ-3
IRZ-4
IRZ-5
IRZ-6
IRZ-7
IRZ-8
IRZ-9
IRZ-10
IRZ-11
IRZ-12
IRZ-13
IRZ-14
IRZ-15
RB-1
RB-2

(UPLAND) (PLC-05)

PLC-005 - REMOTE I/O SITES
IRL-1
IRL-2
IRL-3
IRL-4
IRL-5
FW-1

DRAFT NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

SCADA BLOCK 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-00-31	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 4:35:56pm

FILENAME: FE-2-XXX-4031AD.dwg

N1808

SUMMARY		
TRANSFORMER	kW	kW-hr/yr
REMEDY MCC	128.5	258103.8
PRE-INJECTION MCC	101.2	401890.0
TRANSFORMER 001	152.2	858080.5
TRANSFORMER 002	50.7	189919.1
TRANSFORMER 003	210.3	680777.9
TRANSFORMER 004	220.1	726482.3
TRANSFORMER 005	191.0	11808.1
SUBTOTAL	1054.0	3127061.7
(2) ELECTRICAL INEFFICIENCIES	0.85	0.85
TOTAL	1240.0	3678896.2

REMEDY MCC, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
TCS-1	10.00	9.87	3.0%	7.36	1934.26
TCS-2	10.00	9.99	3.0%	7.45	1957.77
FW-2	30.00	29.62	3.0%	22.09	5804.72
NFLUENT TANK RECIRC PUMPS 1	20.00	19.20	20.0%	14.32	25084.56
NFLUENT TANK RECIRC PUMPS 2	20.00	19.20	20.0%	14.32	25084.56
NFLUENT TANK RECIRC PUMPS 3	20.00	19.20	20.0%	14.32	25084.56
NFLUENT TANK RECIRC PUMPS 4	20.00	19.20	20.0%	14.32	25084.56
CONDITIONED WATER TRANSFER PUMP 1	2.00	0.90	30.0%	0.67	1763.76
CONDITIONED WATER TRANSFER PUMP 2	2.00	0.90	30.0%	0.67	1763.76
FILTER FEED PUMPS	2.00	2.00	10.0%	1.49	1306.49
TCS TRUCK FILL PUMP	3.00	4.89	5.0%	3.65	1597.18
AIR COMPRESSOR	15.00	13.20	20.0%	9.84	17245.64
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	128.5	258103.8

PRE-INJECTION MCC, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
RECYCLE PUMP 1	5.00	4.50	10.0%	3.36	2939.60
RECYCLE PUMP 2	5.00	4.50	10.0%	3.36	2939.60
BACKWASH TRANSFER PUMP 1	2.00	1.80	30.0%	1.34	3527.52
BACKWASH TRANSFER PUMP 2	2.00	1.80	30.0%	1.34	3527.52
BOOSTER PUMP 1	30.00	27.00	50.0%	20.13	88187.92
BOOSTER PUMP 2	30.00	27.00	50.0%	20.13	88187.92
BACKWASH & REGEN PUMP 1	25.00	22.50	30.0%	16.78	44093.96
BACKWASH & REGEN PUMP 2	25.00	22.50	30.0%	16.78	44093.96
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	101.2	401890.0

XFMR 001, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
TWB01-P441	1.00	0.90	100.0%	0.67	5900.88
TWB02-P441	1.00	0.90	100.0%	0.67	5900.88
TWB03-P441 [Future Provisional]	0.75	0.90	0.0%	0.67	0.00
TWB04-P441 [Future Provisional]	0.75	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	0.50	0.90	100.0%	0.67	5900.88
RZ39-P543	3.00	2.60	0.3%	1.94	50.41
RZ38-P543 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
RZ40-P540 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
TCS00-P940	3.00	2.60	10.0%	1.94	1698.43
TCS00-P941	3.00	2.60	10.0%	1.94	1698.43
TCS00-P942	3.00	2.60	10.0%	1.94	1698.43
TCS00-P943	3.00	2.60	10.0%	1.94	1698.43
Remedy Operations Building	–	–	75.0%	37.50	246375.00
HVAC	–	–	80.0%	28.00	196224.00
HVAC	–	–	20.0%	28.00	49056.00
PANEL LOADS	–	–	100.0%	37.00	324120.00
MCC-1 CONTROLS	–	–	100.0%	0.68	5957.00
			SUBTOTAL:	152.2	858080.5

XFMR 002, ESTIMATED LOAD SCHEDULE

LOAD DESCRIPTION	HP	BHP	DUTY FACTOR	kW	kW-hr/yr
RB05-P640	30.00	27.00	100.0%	20.13	176375.84
IRZ29-P544	3.00	2.60	0.3%	1.94	50.41
IRZ29-P545	3.00	2.60	0.3%	1.94	50.41
IRZ31-P544	3.00	2.60	0.3%	1.94	50.41
IRZ31-P545	3.00	2.60	0.3%	1.94	50.41
IRZ33-P544	3.00	2.60	0.3%	1.94	50.41
IRZ33-P545	3.00	2.60	0.3%	1.94	50.41
IRZ35-P543	3.00	2.60	0.3%	1.94	50.41
IRZ37-P543	3.00	2.60	0.3%	1.94	50.41
IRZ30-P544 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ30-P545 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ32-P544 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ32-P545 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ34-P544 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ34-P545 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ36-P543 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
PANELBOARD TRANSFORMER	–	–	100.0%	1.50	13140.00
			SUBTOTAL	50.7	189919.1

XFMR 003, 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
IRZ16-P546	5.00	3.27	0.3%	2.44	63.40
IRZ16-P547	5.00	3.27	0.3%	2.44	63.40
IRZ16-P548	5.00	3.27	0.3%	2.44	63.40
IRZ16-P549	5.00	3.27	0.3%	2.44	63.40
IRZ17-P546	5.00	3.27	0.3%	2.44	63.40
IRZ17-P547	5.00	3.27	0.3%	2.44	63.40
IRZ17-P548	5.00	3.27	0.3%	2.44	63.40
IRZ17-P549	5.00	3.27	0.3%	2.44	63.40
IRZ19-P546	5.00	3.27	0.3%	2.44	63.40
IRZ19-P547	5.00	3.27	0.3%	2.44	63.40
IRZ19-P548	5.00	3.27	0.3%	2.44	63.40
IRZ19-P549	5.00	3.27	0.3%	2.44	63.40
IRZ20-P546	5.00	3.27	0.3%	2.44	63.40
IRZ20-P547	5.00	3.27	0.3%	2.44	63.40
IRZ20-P548	5.00	3.27	0.3%	2.44	63.40
IRZ20-P549	5.00	3.27	0.3%	2.44	63.40
IRZ21-P546	5.00	3.27	0.3%	2.44	63.40
IRZ21-P547	5.00	3.27	0.3%	2.44	63.40
IRZ21-P548	5.00	3.27	0.3%	2.44	63.40
IRZ21-P549	5.00	3.27	0.3%	2.44	63.40
IRZ23-P540	20.00	19.20	100.0%	14.32	125422.82
IRZ25-P544	3.00	2.60	0.3%	1.94	50.41
IRZ25-P545	3.00	2.60	0.3%	1.94	50.41
IRZ27-P544	3.00	2.60	0.3%	1.94	50.41
IRZ27-P545	3.00	2.60	0.3%	1.94	50.41
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]	3.00	2.60	0.0%	1.94	0.00
IRZ22-P547 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ22-P548 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ22-P549 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ24-P544 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ24-P545 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ26-P544 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ26-P545 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ28-P544 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ28-P545 [Future Provisional]	3.00	2.60	0.0%	1.94	0.00
IRZ00-P740 (MW-20 BENCH)	3.00	2.60	10.0%	1.94	1698.43
IRZ00-P741 (MW-20 BENCH)	3.00	2.60	10.0%	1.94	1698.43
IRZ00-P742 (MW-20 BENCH)	3.00	2.60	10.0%	1.94	1698.43
IRZ00-P743 (MW-20 BENCH)	3.00	2.60	10.0%	1.94	1698.43
IRZ00-P745 (MW-20 BENCH)	15.00	13.70	10.0%	10.22	8949.44
IRZ00-P744 (MW-20 BENCH)	20.00	15.60	10.0%	11.63	10190.60
IRZ00-P1026 [Spare]	0.00	0.00	0.0%	0.00	0.00
PANEL LOADS	–	–	100.0%	20.00	175200.00
			SUBTOTAL	210.3	680777.9

XFMR 004, ESTIMATED LOAD SCHEDULE

	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	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
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
IRZ11-P546 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ11-P547 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ11-P548 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ11-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
IRZ13-P546 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ13-P547 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ13-P548 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ13-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
IRZ15-P546 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ15-P547 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ15-P548 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
IRZ15-P549 [Future Provisional]	5.00	3.27	0.0%	2.44	0.00
PANELBOARD TRANSFORMER	–	–	100.0%	1.50	13140.00
			SUBTOTAL	220.1	726482.3

XFMR 005, 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-P641	30.00	29.99	0.3%	22.36	581.46
IRL04-P641	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
PANELBOARD TRANSFORMER	–	–	100.0%	1.00	8760.00
			SUBTOTAL	191.0	11808.1

DRAWING REFERENCED NOTES:

(1) ENERGY USAGE CALCULATIONS ONLY INCLUDE REMEDY PROJECT FACILTIES 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
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
REVISIONS							
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	
REVISIONS							

APPROVED BY: TPF
SO
SUPV
DSGN TPF
DWN MBY, NC
CHKD TPF
QK 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. E-00-32 of SHEETS
REV

PLOT TIME: 10:53:20am
PLOT DATE: Apr 05, 2013
FILENAME: FE-E-XXX-0032AD.dwg

N1808

TOTAL REMEDY LOAD CALCULATIONS

LOAD DESCRIPTION	CONNECTED LOAD LOAD	QTY	TOTAL	DEMAND LOAD LOAD	QTY	TOTAL	GENERATOR LOAD LOAD	QTY	TOTAL
REMEDY MCC	277.49 A	1	230704.4 VA	248.28 A	1	206416.3 VA	49.48 A	1	41137.0 VA
TRANSFORMER 001	302.0 A	1	251049.1 VA	258.23 A	1	68022.0 VA	258.23 A	1	56.7 VA
TRANSFORMER 002	175.7 A	1	146115.1 VA	109.72 A	1	91218.0 VA	109.72 A	1	91218.0 VA
TRANSFORMER 003	492.4 A	1	409340.7 VA	193.28 A	1	160691.3 VA	193.28 A	1	160691.3 VA
TRANSFORMER 004	585.2 A	1	486554.2 VA	153.83 A	1	127888.0 VA	153.83 A	1	127888.0 VA
TRANSFORMER 005	583.8 A	1	485371.6 VA	197.61 A	1	164288.6 VA	197.61 A	1	164288.6 VA
TOTAL LOAD =	2468.61 A		2052367.0 VA	1036.53 A		861756.0 VA	755.98 A		628511.5 VA
LOAD CORRECTION FACTORS									
LARGEST MOTOR LOAD x 25%									
60 HP HP => 0.25 x 10808.0 VA =	3.25 A		2702.0 VA	3.25 A		2702.0 VA			
80% BREAKER DERATING = TOTAL x 0.25 =	617.97 A		513767.3 VA	259.95 A		216114.5 VA			
FOR CONTINUOUS LOADS NEC 210-20									
SERVICE SIZE (MIN) =	3089.83 A		2568836.3VA	1299.73 A		1080572.6VA			
MAIN BREAKER SIZE REQUIRED =				1200 AMP					
480V, 3 PHASE, 4 WIRE									

GENERATOR SIZE
SIZE = 750 KW
937.5 KVA

AMPERAGE = 1128 A
UTLIZATION % = 67 %
MAX VOLT DIP % = 5 %

LOAD CALCULATIONS – REMEDY WWTP MCC

LOAD DESCRIPTION	CONNECTED LOAD LOAD	QTY	TOTAL	DEMAND LOAD LOAD	QTY	TOTAL	GENERATOR LOAD LOAD	QTY	TOTAL
5 HP TCS-1	7.6 A	1	6318.5 VA	7.60 A	1	6318.5 VA	7.60 A	1	6318.5 VA
5 HP TCS-2	7.6 A	1	6318.5 VA	7.60 A	1	6318.5 VA	7.60 A	1	6318.5 VA
20 HP FW-2	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	0	0.0 VA
20 HP INFLUENT TANK RECIRC PUMPS 1	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	0	0.0 VA
20 HP INFLUENT TANK RECIRC PUMPS 2	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	0	0.0 VA
20 HP INFLUENT TANK RECIRC PUMPS 3	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	0	0.0 VA
20 HP INFLUENT TANK RECIRC PUMPS 4	27.00 A	1	22447.4 VA	27.00 A	1	22447.4 VA	27.00 A	0	0.0 VA
2 HP CONDITIONED WATER TRANSFER PUMP 1	3.40 A	4	11306.8 VA	3.40 A	1	2826.7 VA	3.40 A	0	0.0 VA
2 HP CONDITIONED WATER TRANSFER PUMP 2	3.40 A	4	11306.8 VA	3.40 A	1	2826.7 VA	3.40 A	0	0.0 VA
2 HP CONDITIONED WATER TRANSFER PUMP 3	3.40 A	4	11306.8 VA	3.40 A	1	2826.7 VA	3.40 A	0	0.0 VA
2 HP CONDITIONED WATER TRANSFER PUMP 4	3.40 A	4	11306.8 VA	3.40 A	1	2826.7 VA	3.40 A	0	0.0 VA
2 HP FILTER FEED PUMPS	3.40 A	2	5653.4 VA	3.40 A	1	2826.7 VA	3.40 A	0	0.0 VA
3 HP TCS TRUCK FILL PUMP	4.80 A	1	3990.6 VA	4.80 A	1	3990.6 VA	4.80 A	0	0.0 VA
15 HP AIR COMPRESSOR	21.00 A	1	17459.1 VA	21.00 A	2	34918.1 VA	21.00 A	0	0.0 VA
5 KW HVAC	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA
5 KW HVAC	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA	6.01 A	0	5000.0 VA
5 KW HVAC	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA
5 KW HVAC	6.01 A	1	5000.0 VA	6.01 A	1	5000.0 VA	6.01 A	0	5000.0 VA
30 KVA MCC TRANSFORMER	16.24 A	1	13500.0 VA	10.22 A	1	8500.0 VA	10.22 A	1	8500.0 VA
TOTAL LOAD =	277.49 A		230704.4 VA	248.28 A		206416.3 VA	49.48 A		41137.0 VA
LOAD CORRECTION FACTORS									
LARGEST MOTOR LOAD x 25%									
20 HP HP => 0.25 x 5611.8 VA =	1.69 A		1403.0 VA	1.69 A		1403.0 VA			
80% BREAKER DERATING = TOTAL x 0.25 =	69.80 A		58026.8 VA	62.49 A		51954.8 VA			
FOR CONTINUOUS LOADS NEC 210-20									
SERVICE SIZE (MIN) =	348.98 A		290134.2VA	312.46 A		259774.0VA			
MAIN BREAKER SIZE REQUIRED =	400 AMP								
480V, 3 PHASE, 4 WIRE									

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY		TPF	

APPROVED BY: TPF

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
LOAD CALCULATIONS

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

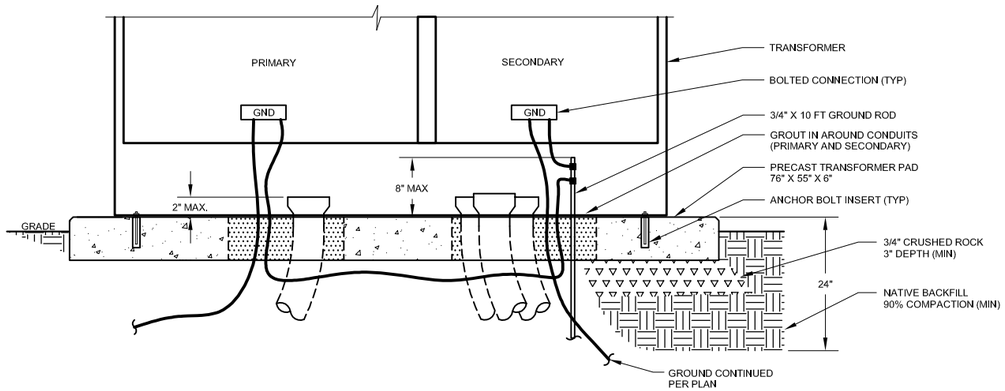
MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS

E-00-33 REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:22:32am

FILENAME: FI-E-XXX-0033AD.dwg

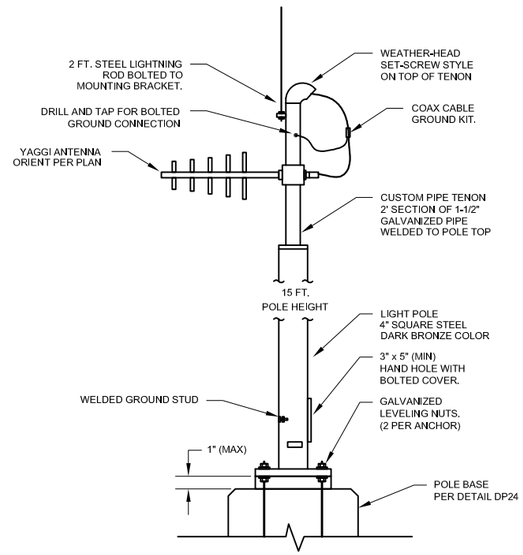
N180B



12KV TRANSFORMER PAD

1 DETAIL NTS

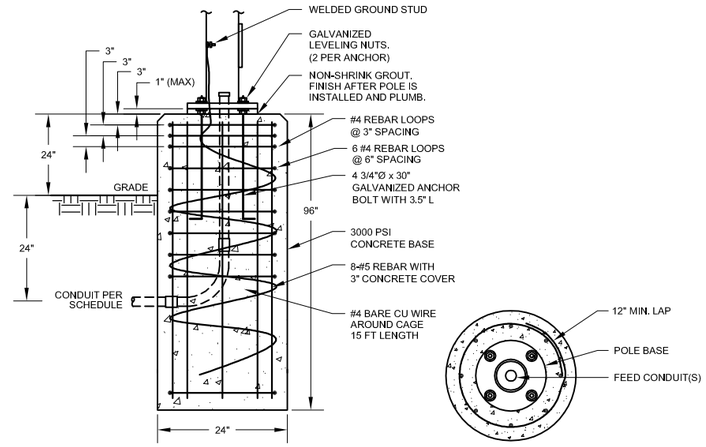
TP



ANTENNA MAST

2 DETAIL NTS

ANT



ELEVATION

TOP VIEW

DRILLED PIER

3 DETAIL NTS

DP24

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

ELECTRICAL
DETAILS 1

GAS TRANSMISSION & DISTRIBUTION

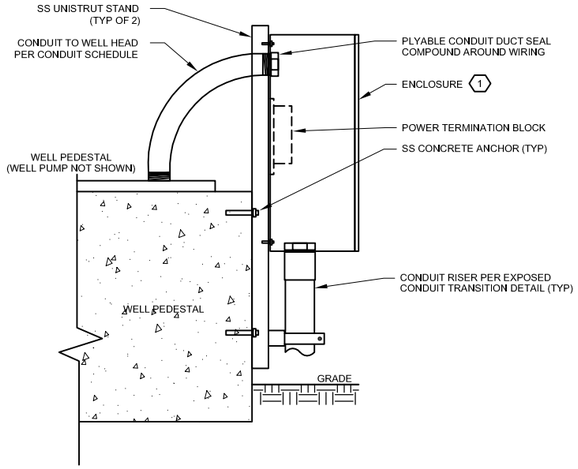
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:24:13am

FILENAME: FE-E-XXX-0051AD.dwg

N1808

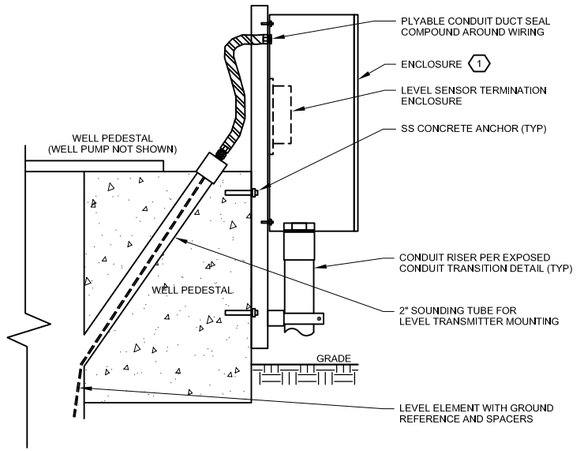


WELL TERMINATION

1 DETAIL NTS

WTP

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.

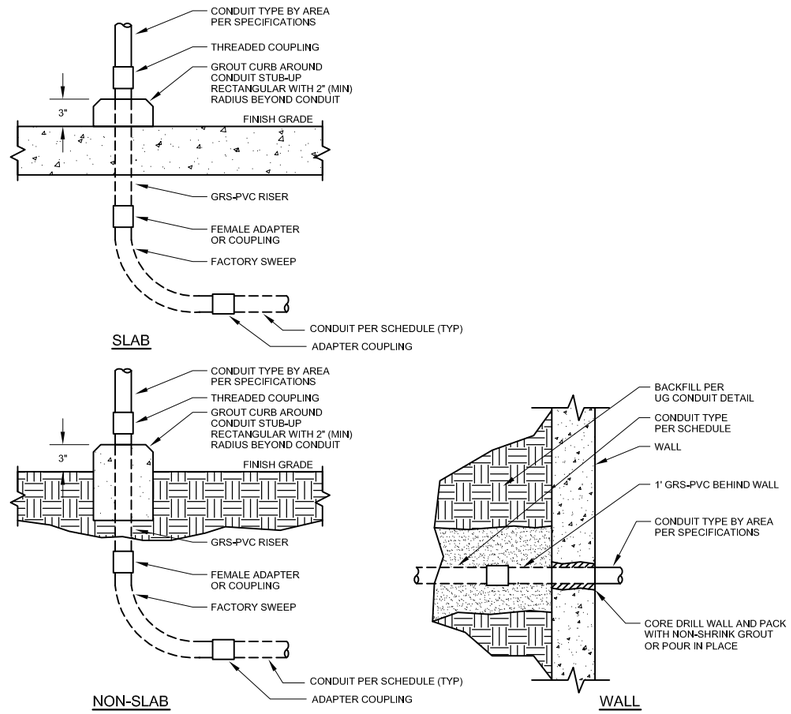


WELL LEVEL TRANSMITTER

2 DETAIL NTS

WLT

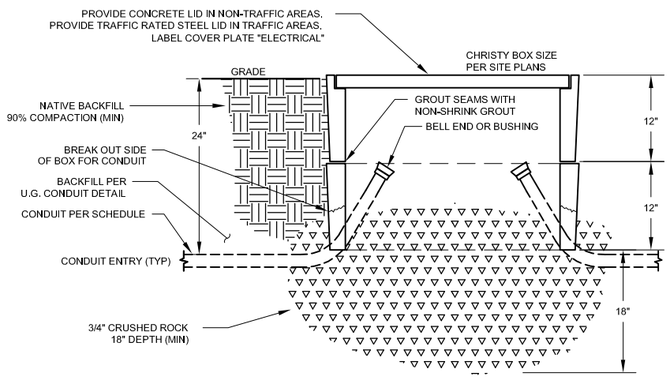
NOTES: 1 16"H x 14"W x 6"D NEMA 12 PAINTED STEEL ENCLOSURE. MECHANICALLY FASTEN TRANSMITTER CABLE TO PANEL FOR STRESS RELIEF. PROVIDE HOFFMAN CONCEPT OR APPROVED EQUAL.



EXPOSED CONDUIT TRANSITION

2 DETAIL NTS

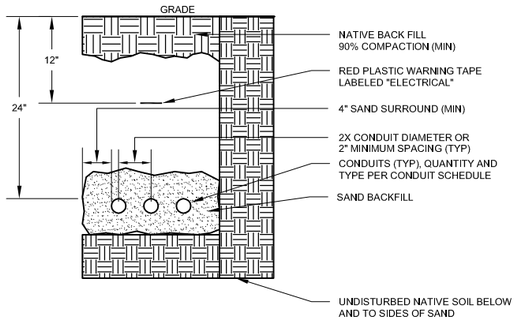
ECT



UNDERGROUND PULL BOX

4 DETAIL NTS

UPB



UNDERGROUND CONDUIT

5 DETAIL NTS

UCD

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

ELECTRICAL DETAILS 2

GAS TRANSMISSION & DISTRIBUTION

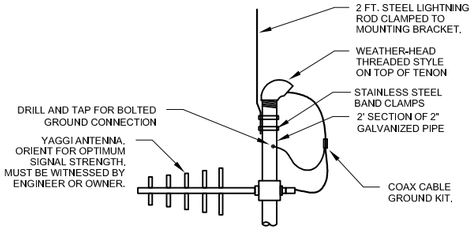
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:23:42am

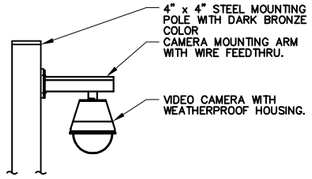
FILENAME: FE-E-XXX-0052AD.dwg

N1808



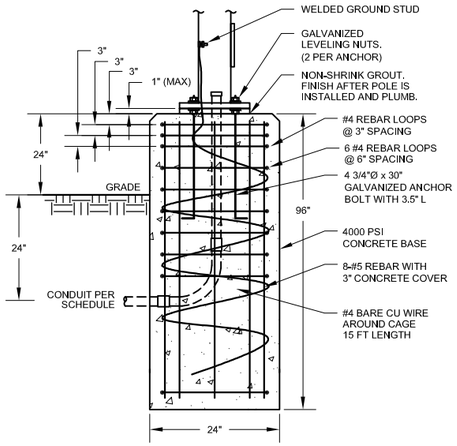
ANT - ANTENNA MAST DETAIL

NOT TO SCALE



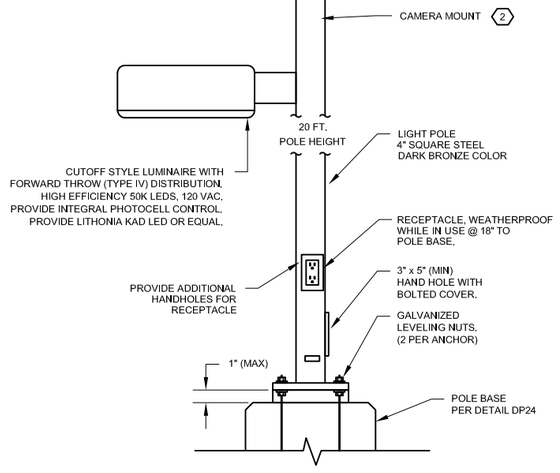
CAM - CAMERA MOUNT DETAIL

NOT TO SCALE



DP24 - POLE DRILLED PIER DETAIL 24

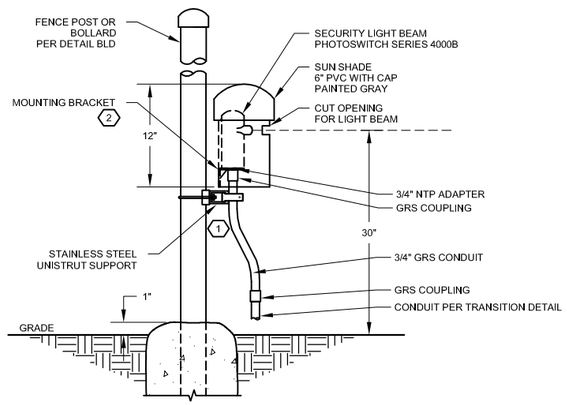
NOT TO SCALE



ALP - LIGHT POLE DETAIL

NOT TO SCALE

NOTES:
1. ANTENNA MAST ON LIGHT POLE PRE DETAIL ANT, AS REQUIRED PER PLAN
2. CAMERA MOUNT ON LIGHT POLE PER DETAIL CAM, NUMBER OF CAMERAS AS REQUIRED PER PLAN



SLB - SECURITY LIGHT BEAM DETAIL

NOT TO SCALE

NOTES:
1. MOUNT UNISTRUT SUPPORT TO POST, WALL OR PANEL WITH STAINLESS STEEL HARWARE AS NEEDED.
2. SECURE SUN SHADE TO MOUNTING BRACKET WITH S.S. HARDWARE AS NEEDED.

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
ELECTRICAL DETAILS 3

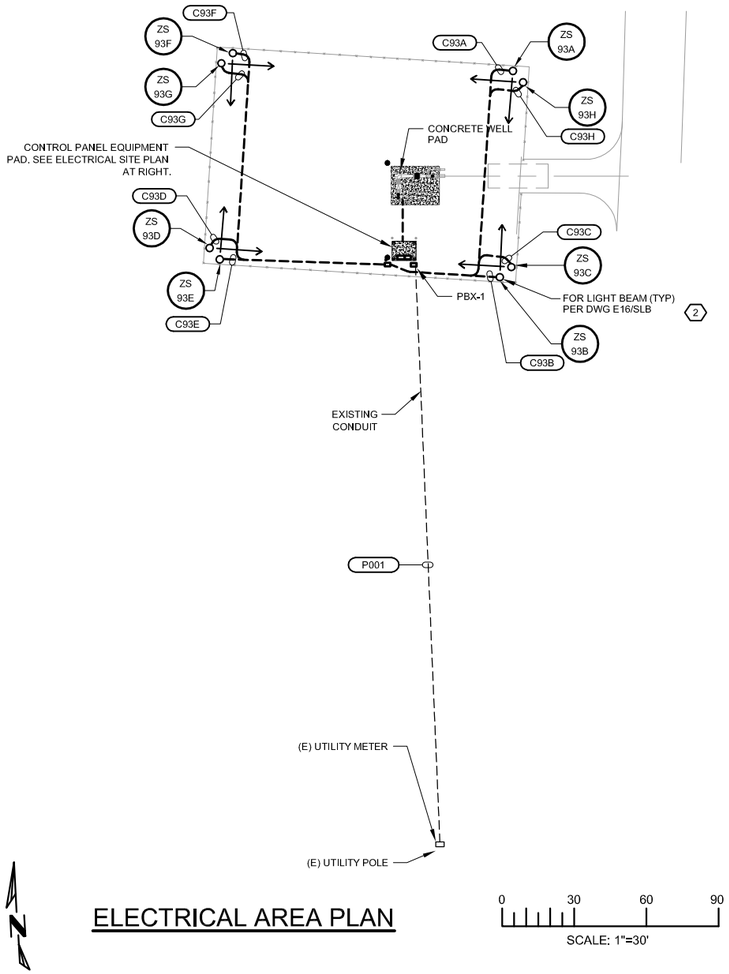
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: Apr 03, 2013 PLOT TIME: 11:34:24am

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

N1808



ELECTRICAL AREA PLAN

0 30 60 90

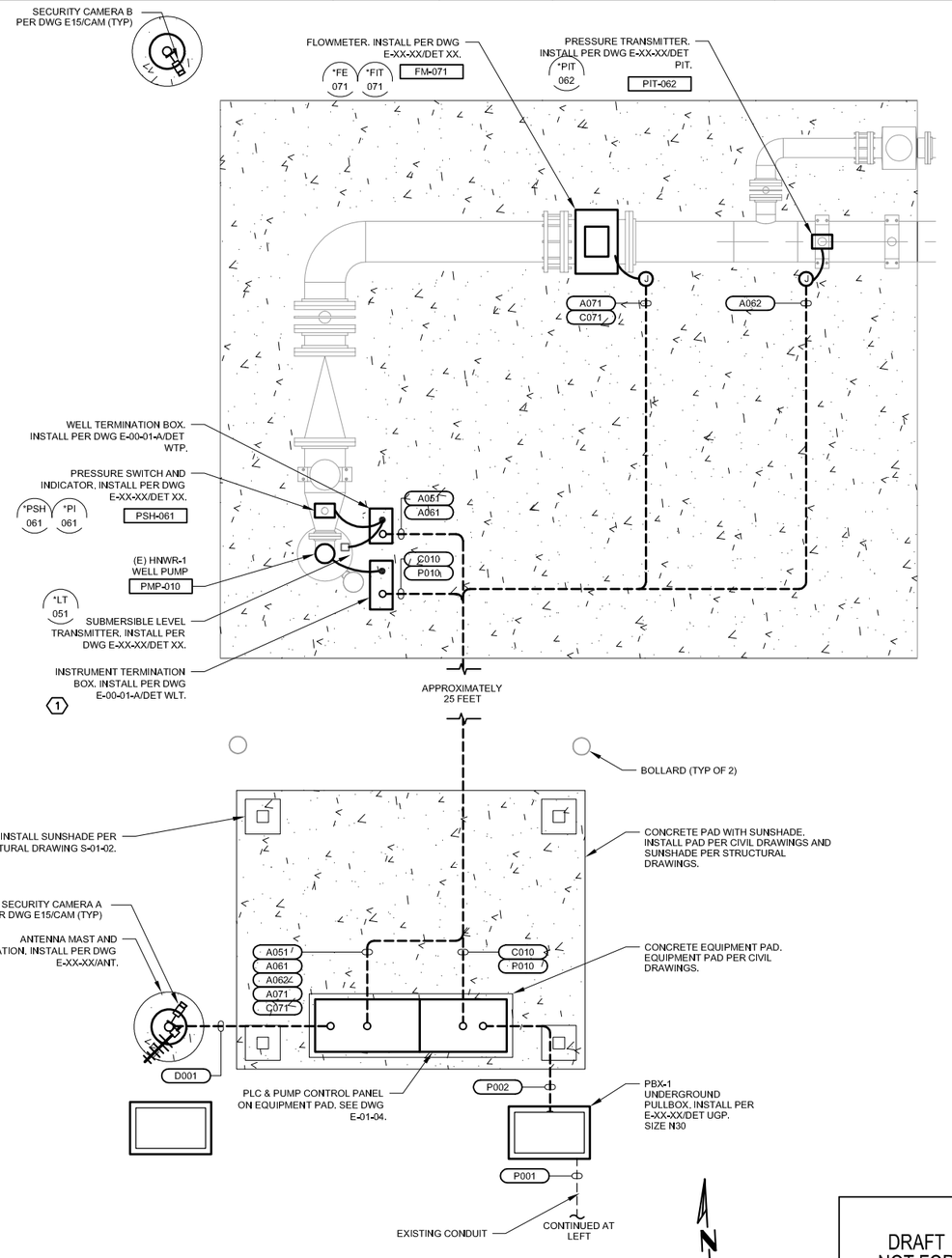
SCALE: 1"=30'

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 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, DWG EXXX .
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 XXXXX .
6. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL EXX/XXX .
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 DEFINITION.
12. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE .

DRAWING REFERENCED NOTES:

1. CONDUIT TRANSITION FROM BELOW GRADE TO ABOVE GRADE SHALL BE PER DWG E-XX-XX/DET ECT (TYPICAL).
2. ATTACH AND CONNECT LIGHT BEAM DETECTORS WHERE SHOWN 2.5 FT ABOVE FINISH GRADE, POINT LIGHT BEAMS TOWARDS EACH OTHER. THE LIGHT SOURCE TRANSMITTER SHALL BE MOUNTED ON THE NORTH AND THE RECIEVER MOUNTED TO THE SOUTH.



ELECTRICAL SITE PLAN

0 .5 1 1.5

SCALE: 1/2"=1'

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

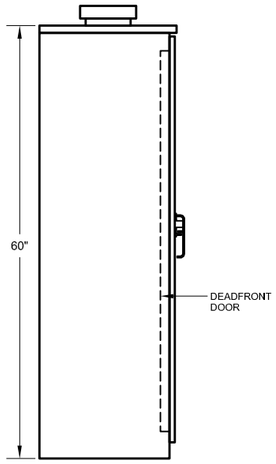
FRESHWATER WELL (HNWR-1)
ELECTRICAL SITE PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

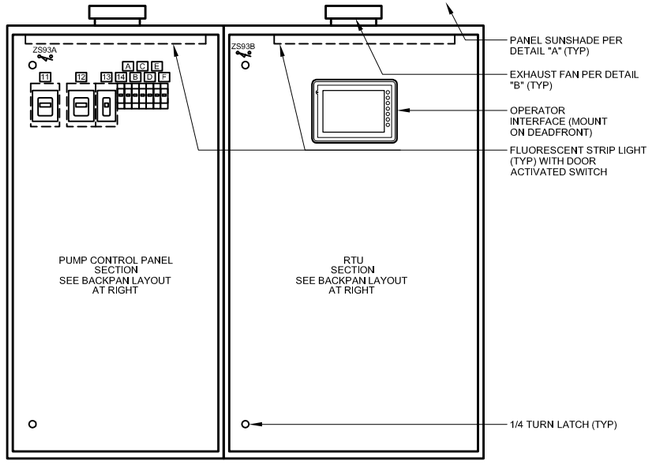
PLOT DATE: Apr 03, 2013 PLOT TIME: 11:07:34am

FILENAME: FE-E-XXX-01101AD.DWG

NTSOB



SIDE ELEVATION



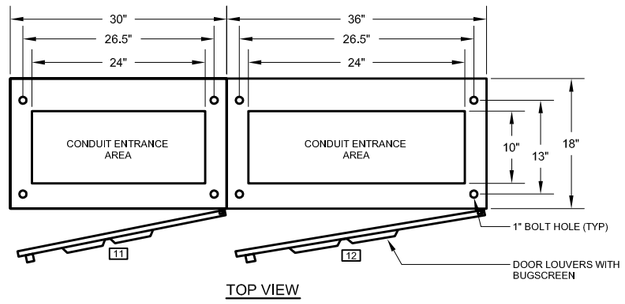
1 FRONT ELEVATION

OUTER DOORS REMOVED FOR CLARITY

PEDESTAL ELEVATION

PEDESTAL FABRICATION METHODS

1. NEMA 3R WEATHER-PROOF FOR OUTDOOR INSTALLATION.
2. OUTER DOORS SHALL BE SEALED WITH RUBBERIZED FOAM GASKET.
3. EXTERIOR FABRICATED FROM STAINLESS STEEL SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS SHALL HAVE CONTINUOUS WELD GROUND SMOOTH.
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. POWER METERING SHALL PER USERC AND SERVING UTILITY'S REQUIREMENTS.
11. 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. INTERIOR DEADFRONT DOOR COLOR: WHITE.
    - E. EXTERIOR COLOR SHALL BE: AUTUMN WHITE
12. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL OUTER DOOR SECTIONS AND DEVICES ON DEADFRONT.
13. FABRICATION AND WIRING SHALL CONFORM TO UL, NEC AND NEMA STANDARDS.
14. ALL WIRING SHALL BE LABELLED ON BOTH ENDS OF WIRE.
15. AS-BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.
16. PROVIDE DRAWING POCKET ON INSIDE OF CONTROL PANEL DOOR.
17. UPS SHELF SHALL BE 14 GA WELDED STEEL BOLTED TO BACKPAN.

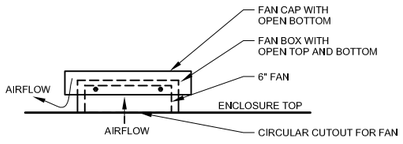


TOP VIEW

PEDESTAL BASE PLAN

DRAWING REFERENCED NOTES:

1. ITEMS DRAWN IN DASHED LINES ARE TO BE LOCATED BEHIND DEADFRONT DOORS OUTER DOORS ARE NOT SHOWN ON FRONT VIEWS FOR ELEVATION CLARITY
2. PROVIDE METER PER SERVING UTILITY REQUIREMENTS.

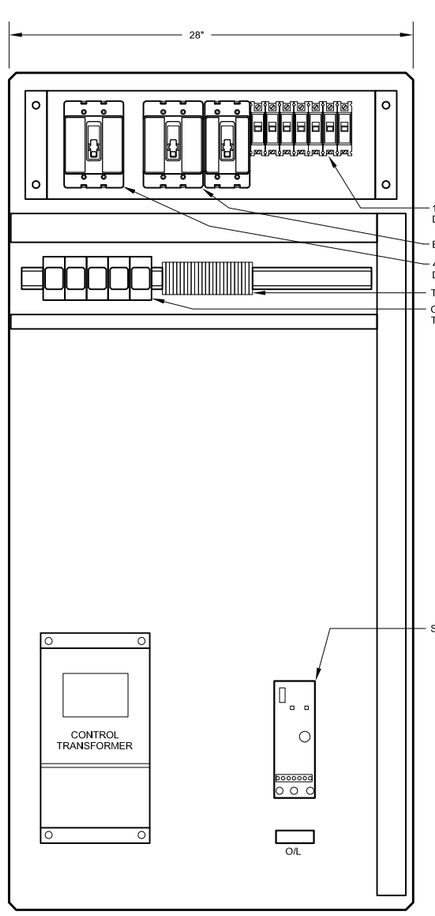


NOTES:
1. FAN CAP AND BOX SHALL BE CONSTRUCTED FROM 14GA GALVANIZED STEEL AND PAINTED WITH CONTROL PANEL.
2. PROVIDE CIRCULAR CUTOUT IN TOP OF ENCLOSURE. SEAL FAN BOX TO ENCLOSURE WITH SILICONE SEALANT.

EXHAUST FAN

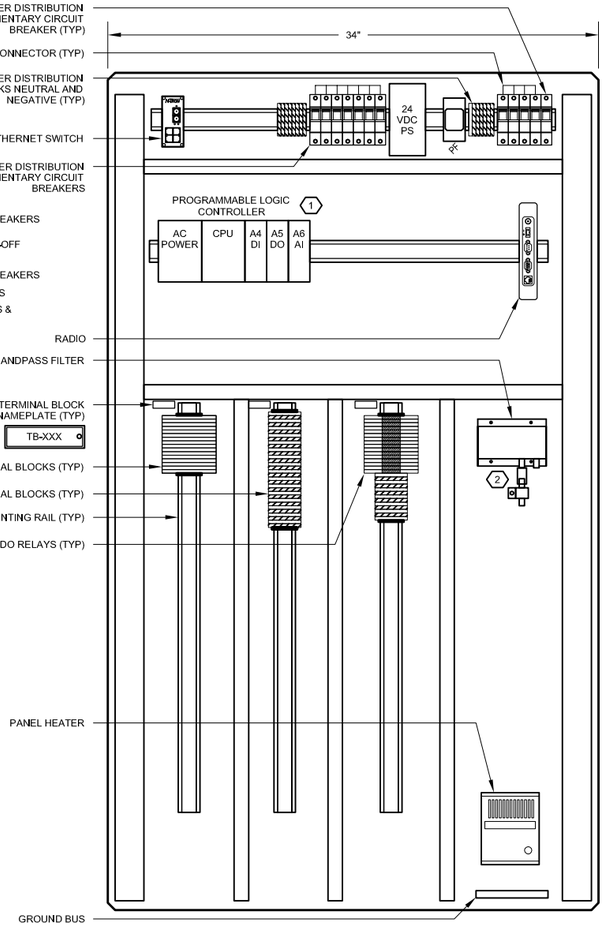
B DETAIL

NTS



PUMP CONTROL PANEL BACKPAN LAYOUT

ARCADIS –



PLC PANEL BACKPAN LAYOUT

1. WIRE I/O TO TERMINAL BLOCK PER EXAMPLE I/O WIRING DIAGRAMS.
2. RUN #12 GROUND WIRE DIRECT TO GROUND BUS.

NAMEPLATE SCHEDULE

KEY	ENGRAVING LINE 1	ENGRAVING LINE 2	LETTER HEIGHT
11	MAIN	DISCONNECT	3/16"
12	PUMP	DISCONNECT	3/16"
13	TRANSFORMER	DISCONNECT	3/16"
14	PANEL LP	DISCONNECT	3/16"
A	RTU	DISCONNECT	3/16"
B	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
C	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
D	MOTOR CONTROL		3/16"
E	SPARE BREAKER		3/16"
F	SPARE BREAKER		3/16"

DRAFT
NOT FOR CONSTRUCTION

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:39:17am

FILENAME: FE-E-XXX-0102AD.dwg

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
1110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.CM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

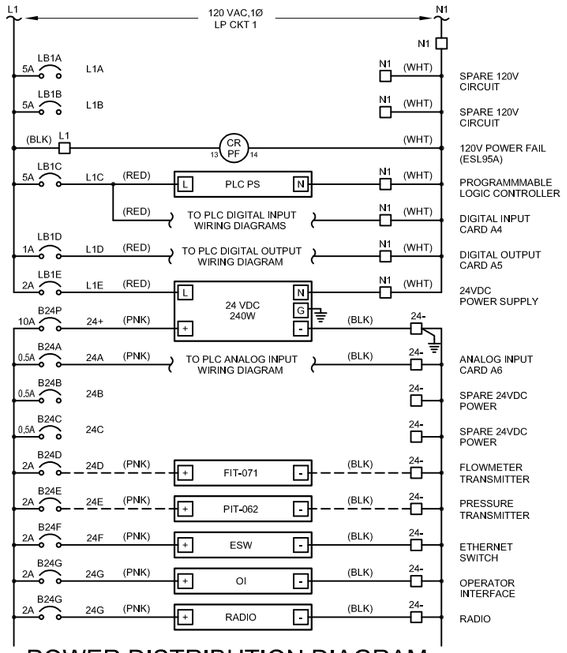
REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER WELL (HNWR-1)
PLC CONTROL PANEL
ELEVATION & BACKPAN 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-01-02	REV

N1608



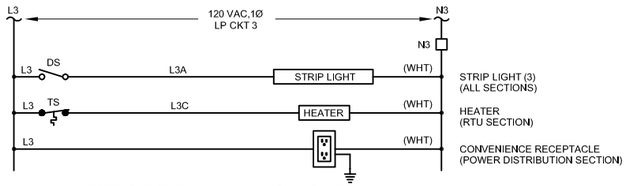
POWER DISTRIBUTION DIAGRAM (1)

SCHEMATIC REFERENCED NOTES:

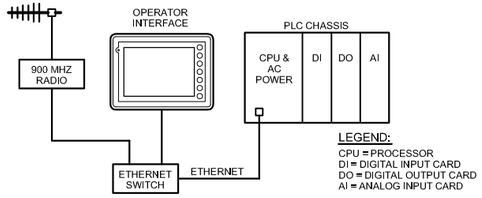
(1) DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS AND COMPONENT CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM.

GENERAL NOTES:

1. REMAINING WIRES AND TERMINALS SHALL BE NUMBERED BY MANUFACTURER DURING SUBMITTAL.



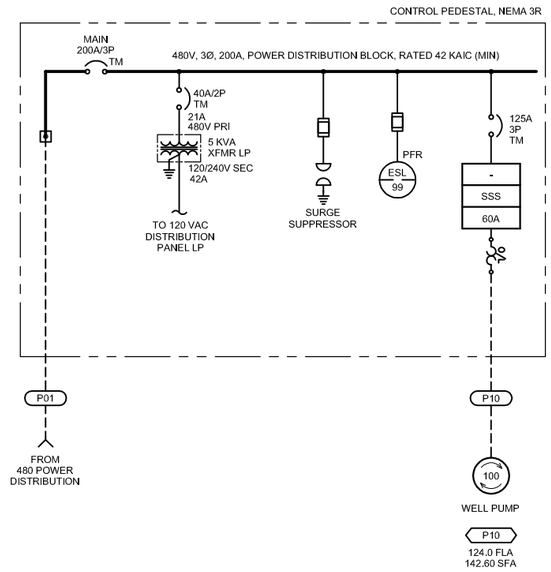
PEDESTAL AUXILLIARY POWER DISTRIBUTION DIAGRAM



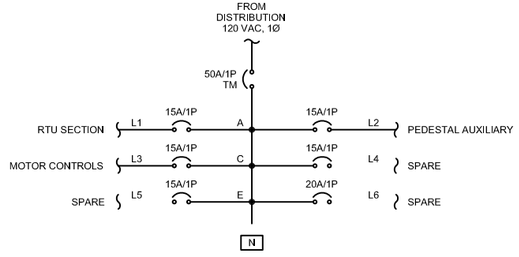
PLC BLOCK DIAGRAM

LOAD CALCULATIONS

LOAD DESCRIPTION			LOAD		QTY	TOTAL	
100 HP	INJECTION WELL		124.00	A	1	103091.7	VA
5	KVA PANELBOARD TRANSFORMER		51.46	A	1	24700.0	VA
		TOTAL LOAD =	153.71	A		127791.7	VA
LOAD CORRECTION FACTORS							
	LARGEST MOTOR LOAD x 25%:						
100	HP => 0.25 x 22447.4 VA	=	6.75	A		5611.8	VA
	80% BREAKER DERATING = TOTAL x 0.25 =		40.11	A		33350.9	VA
	FOR CONTINUOUS LOADS NEC 210-20						
		UTILITY SERVICE SIZE (MIN) =	200.57	A		166754.4	VA
		480 V, 3 PHASE, 4 WIRE					
		UTILITY SERVICE SIZE REQUIRED =	200	AMP			



ONE-LINE DIAGRAM



PANEL LP

120/240 VAC DISTRIBUTION DIAGRAM
NEUTRALS NOT SHOWN

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

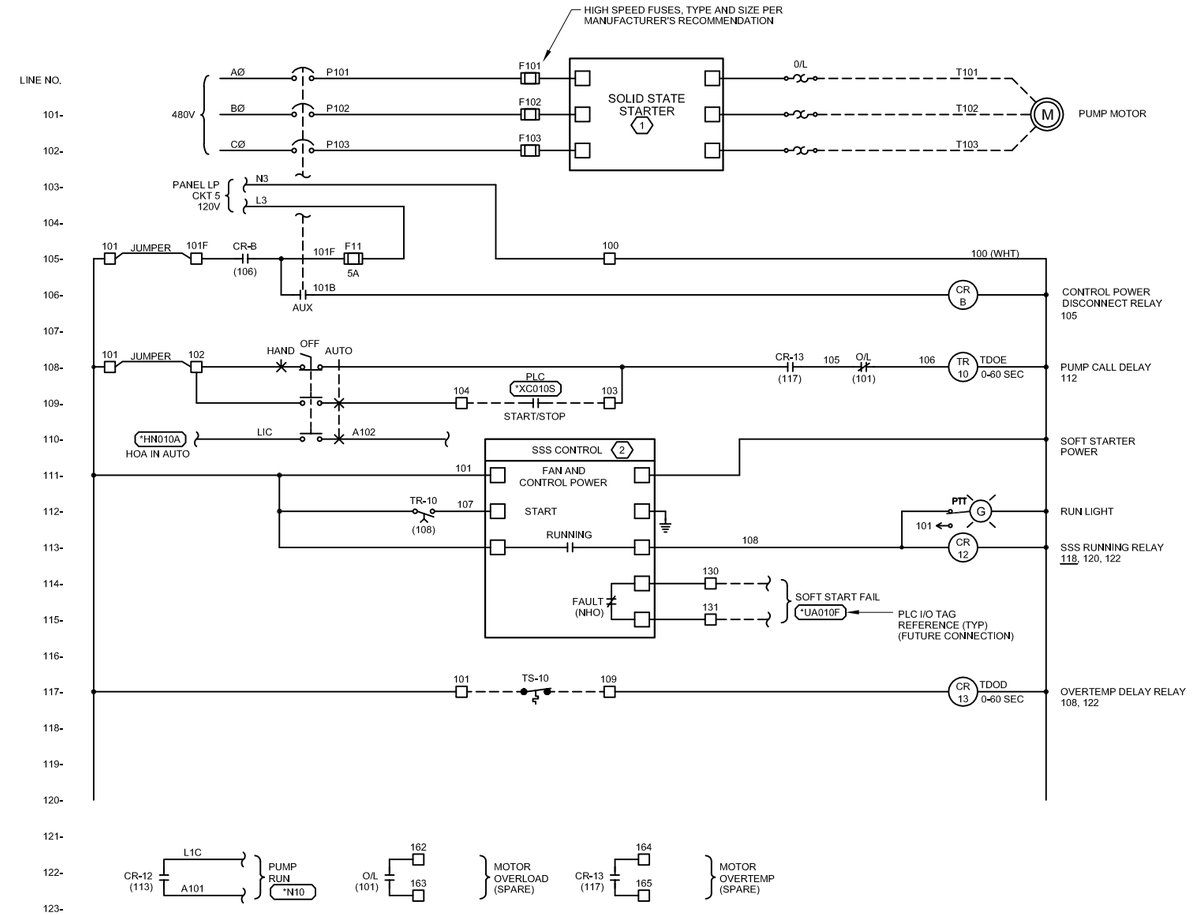
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER WELL (HNWR-1)
CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

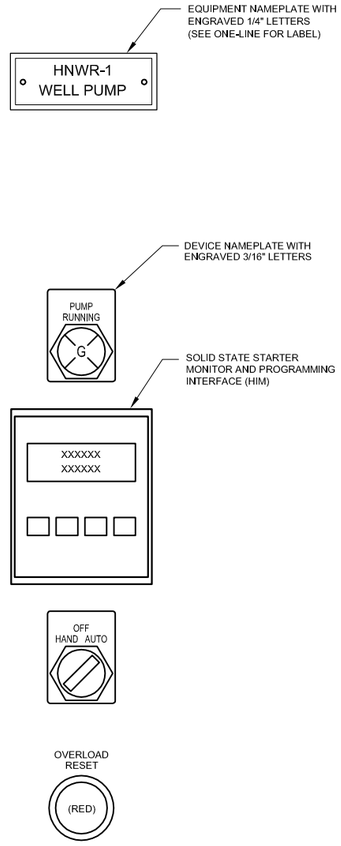
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-01-03	REV

PLOT TIME: 9:39:44am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-XXX-0103AD.DWG

N1808



WELL PUMP ELEMENTARY DIAGRAM



DOOR LAYOUT (PARTIAL)

NOTES REFERENCED IN DRAWING:

1. SOLID STATE STARTER SHALL PROVIDE THE FOLLOWING MOTOR PROTECTION PARAMETERS:

VOLTAGE	CURRENT	MOTOR PARAMETERS
PHASE REVERSAL	OVERLOAD	OVERLOAD CLASS
	UNBALANCE	FULL LOAD CURRENT

2. 120 VAC CONTROL INTERFACE, NO EXCEPTIONS.

GENERAL NOTES:

1. TERMINAL BLOCKS AND WIRES SHALL BE LABELED SAME EXCEPTION: WIRES TO PLC SHALL BE NUMBERED PER CONTROL PANEL TERMINAL BLOCK NUMBER.

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

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

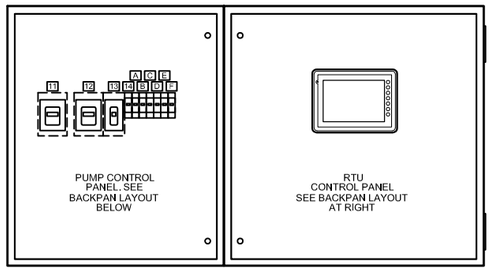
TOPOCK GROUNDWATER REMEDIATION PROJECT

FRESHWATER WELL (HNWR-1) PUMP ELEMENTARY DIAGRAM

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

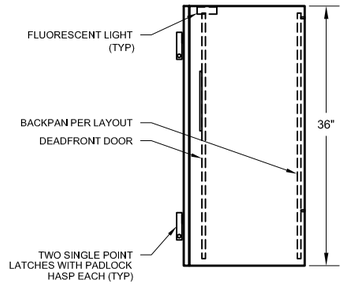
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-01-04	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:40:04am
FILENAME: FI-E-XXX-0104AD.DWG
N180B



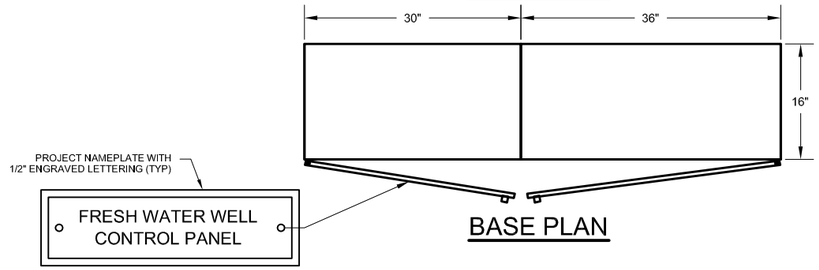
DEADFRONT DOOR ELEVATION

(SHOWN WITH OUTER DOOR REMOVED)

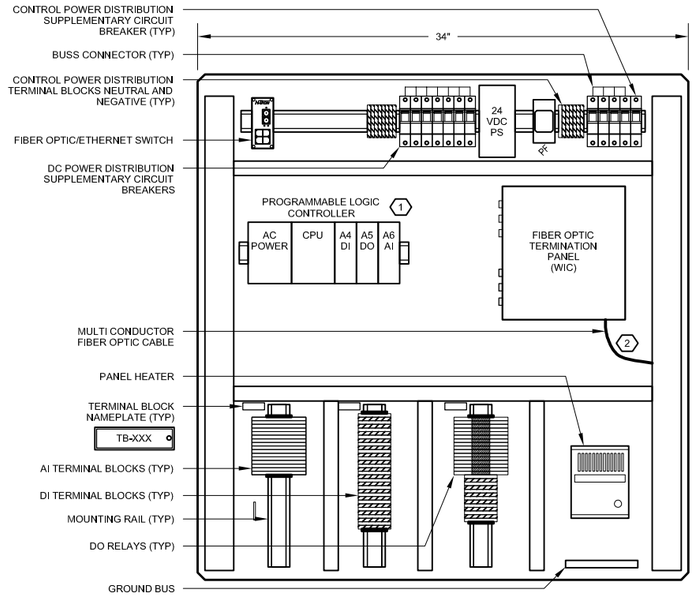


SIDE ELEVATION

ELEVATION

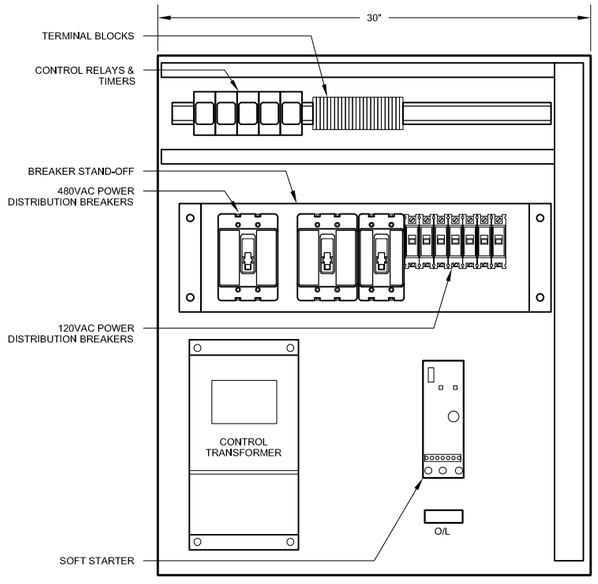


BASE PLAN



PLC PANEL BACKPAN LAYOUT

1. WIRE I/O TO TERMINAL BLOCK PER EXAMPLE I/O WIRING DIAGRAMS.
2. OBSERVE FIBER OPTIC CABLE MINIMUM BEND RADIUS.



PUMP CONTROL PANEL BACKPAN LAYOUT

NAMEPLATE SCHEDULE

KEY	ENGRAVING LINE 1	ENGRAVING LINE 2	LETTER HEIGHT
11	MAIN	DISCONNECT	3/16"
12	PUMP	DISCONNECT	3/16"
13	TRANSFORMER	DISCONNECT	3/16"
14	PANEL LP	DISCONNECT	3/16"
A	RTU	DISCONNECT	3/16"
B	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
C	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
D	MOTOR CONTROL		3/16"
E	SPARE BREAKER		3/16"
F	SPARE BREAKER		3/16"

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.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT

FRESHWATER INJECTION WELL PLC CONTROL PANEL ELEVATION & BACKPAN LAYOUT

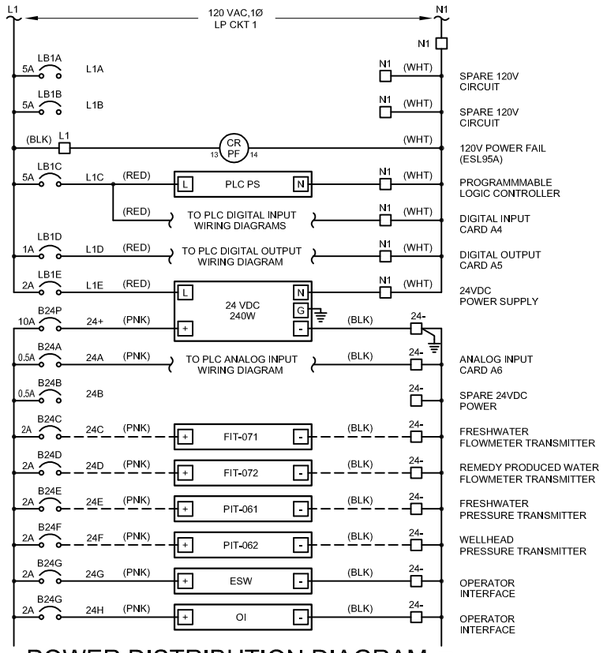
GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-01-05	REV

PLOT TIME: 9:40:25am
PLOT DATE: Apr 03, 2013
FILENAME: FE-6-XXX-0105AD.DWG

N1808



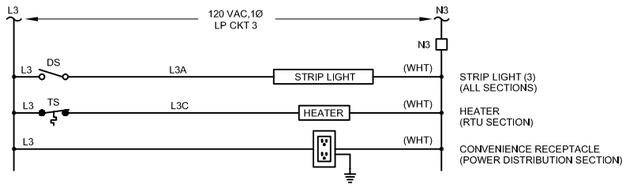
POWER DISTRIBUTION DIAGRAM ①

SCHEMATIC REFERENCED NOTES:

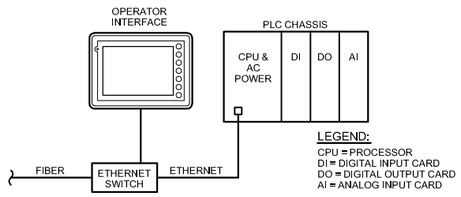
① DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS AND COMPONENT CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM.

GENERAL NOTES:

1. REMAINING WIRES AND TERMINALS SHALL BE NUMBERED BY MANUFACTURER DURING SUBMITTAL.



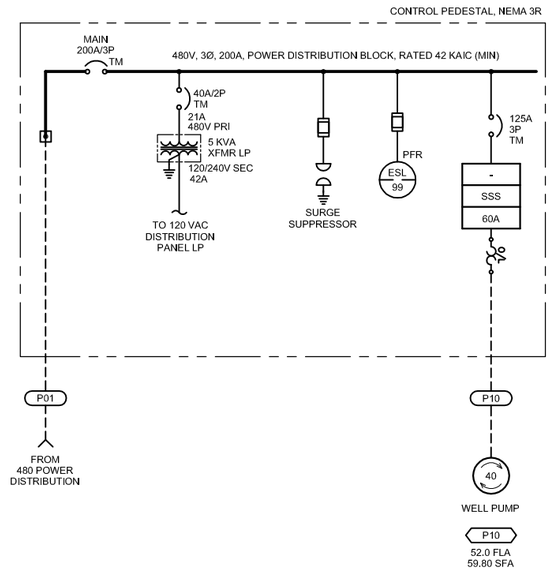
PEDESTAL AUXILLIARY POWER DISTRIBUTION DIAGRAM



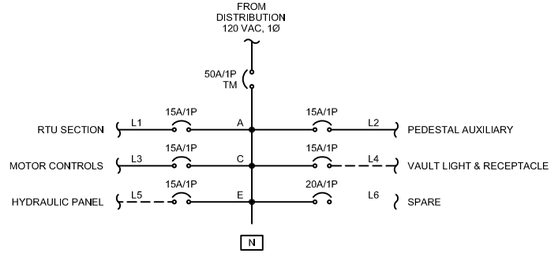
PLC BLOCK DIAGRAM

LOAD CALCULATIONS

LOAD DESCRIPTION			LOAD		QTY	TOTAL	
40 HP	INJECTION WELL		52.00	A	1	43232.0	VA
5	KVA PANELBOARD TRANSFORMER		0.00	A	1	0.0	VA
		TOTAL LOAD =	52.00	A		43232.0	VA
LOAD CORRECTION FACTORS							
	LARGEST MOTOR LOAD x 25%:						
40	HP => 0.25 x 22447.4 VA	=	6.75	A		5611.8	VA
	80% BREAKER DERATING = TOTAL x 0.25 =		14.69	A		12211.0	VA
	FOR CONTINUOUS LOADS NEC 210-20						
		UTILITY SERVICE SIZE (MIN) =	73.44	A		61054.8	VA
		480 V, 3 PHASE, 4 WIRE					
		UTILITY SERVICE SIZE REQUIRED =	200	AMP			



ONE-LINE DIAGRAM



PANEL LP

120/240 VAC DISTRIBUTION DIAGRAM
NEUTRALS NOT SHOWN

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

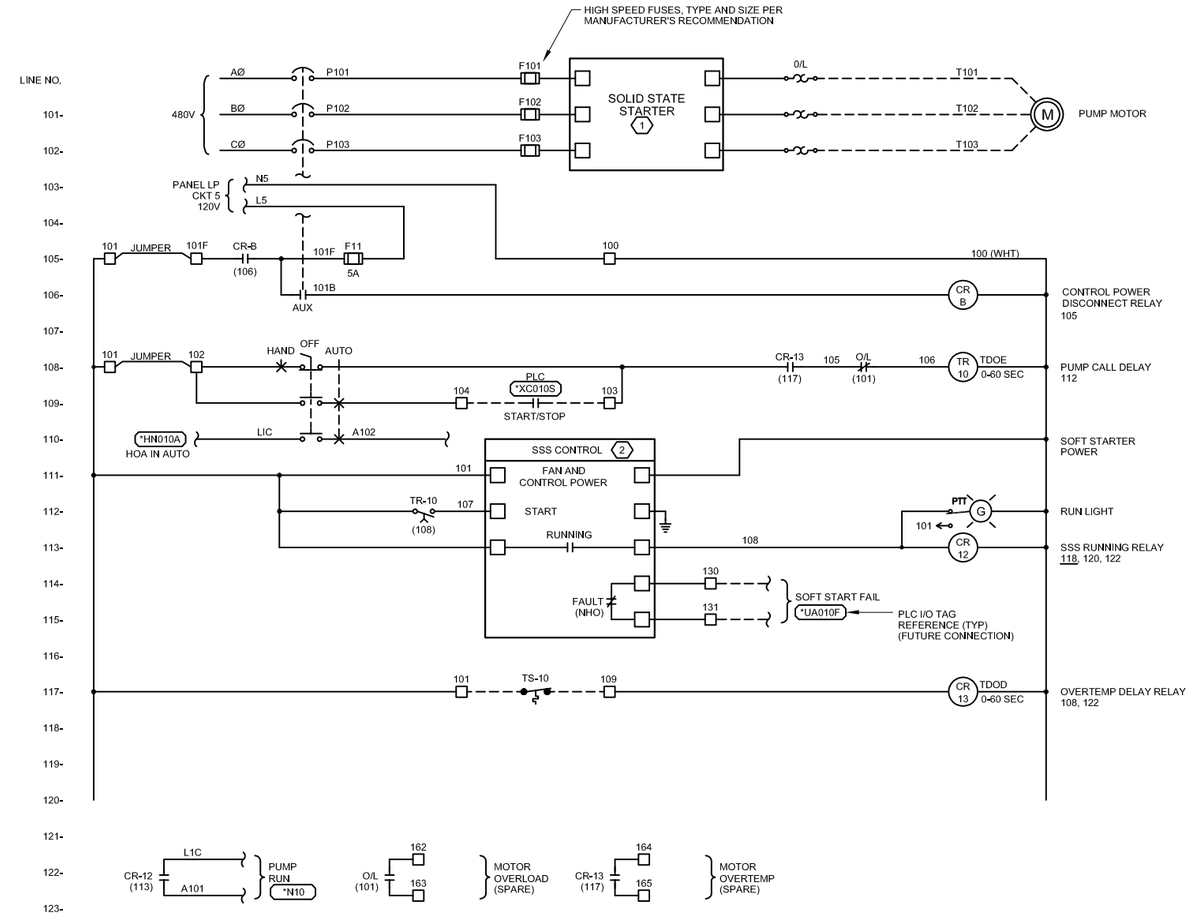
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER INJECTION WELL CONTROL PANEL POWER DISTRIBUTION & PLC DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

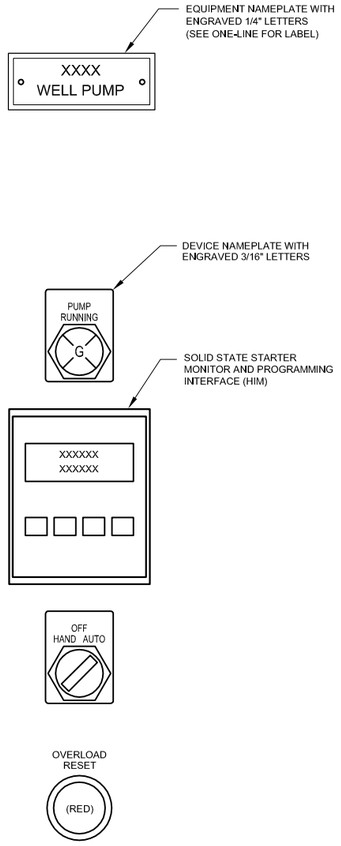
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-01-06	REV

PLOT TIME: 9:41:13am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-XXX-0106AD.DWG

N1808



WELL PUMP ELEMENTARY DIAGRAM



DOOR LAYOUT (PARTIAL)

NOTES REFERENCED IN DRAWING:

1. SOLID STATE STARTER SHALL PROVIDE THE FOLLOWING MOTOR PROTECTION PARAMETERS:

VOLTAGE	CURRENT	MOTOR PARAMETERS
PHASE REVERSAL	OVERLOAD	OVERLOAD CLASS
	UNBALANCE	FULL LOAD CURRENT

2. 120 VAC CONTROL INTERFACE, NO EXCEPTIONS.

GENERAL NOTES:

1. TERMINAL BLOCKS AND WIRES SHALL BE LABELED SAME EXCEPTION: WIRES TO PLC SHALL BE NUMBERED PER CONTROL PANEL TERMINAL BLOCK NUMBER.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

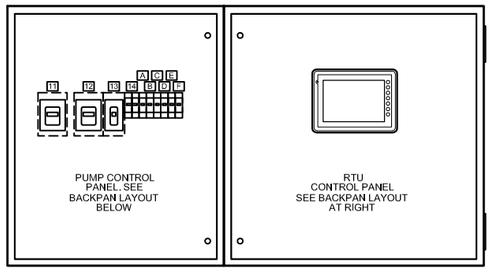
REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER INJECTION WELL PUMP ELEMENTARY DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

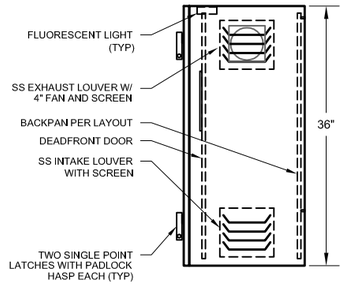
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-01-07	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:41:41am
FILENAME: FI-E-XXX-0107AD.DWG
N180B



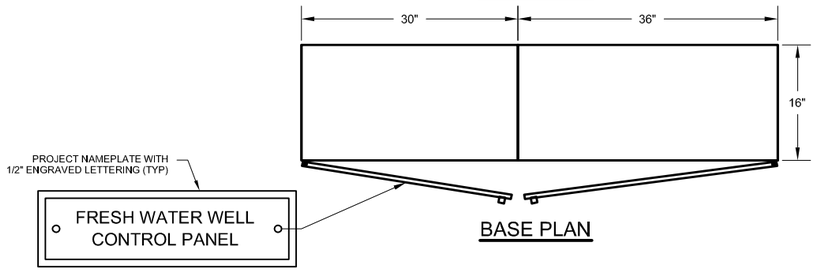
DEADFRONT DOOR ELEVATION

(SHOWN WITH OUTER DOOR REMOVED)

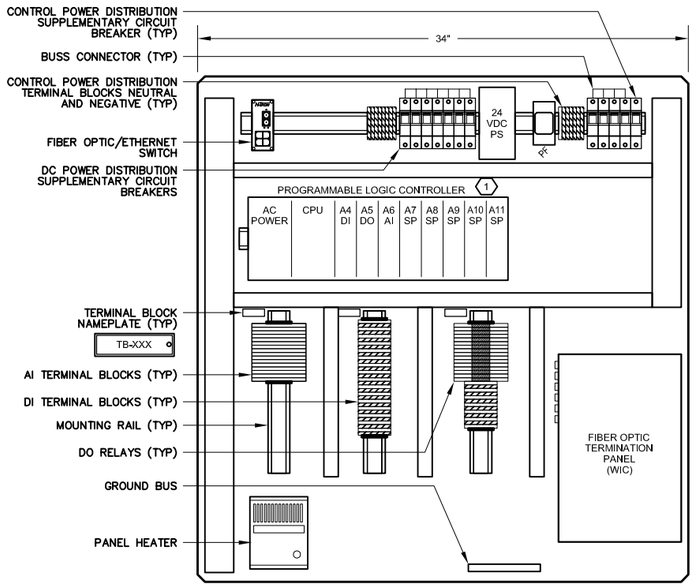


SIDE ELEVATION

ELEVATION

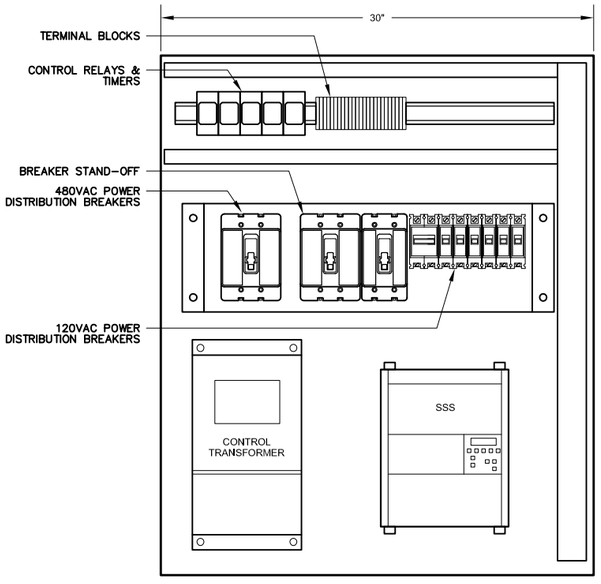


BASE PLAN



PLC PANEL BACKPAN LAYOUT

1 WIRE I/O TO TERMINAL BLOCK PER EXAMPLE I/O WIRING DIAGRAMS.



PUMP CONTROL PANEL BACKPAN LAYOUT

NAMEPLATE SCHEDULE

KEY	ENGRAVING LINE 1	ENGRAVING LINE 2	LETTER HEIGHT
11	MAIN	DISCONNECT	3/16"
12	PUMP	DISCONNECT	3/16"
13	TRANSFORMER	DISCONNECT	3/16"
14	PANEL LP	DISCONNECT	3/16"
A	RTU	DISCONNECT	3/16"
B	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
C	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
D	MOTOR CONTROL		3/16"
E	SPARE BREAKER		3/16"
F	SPARE BREAKER		3/16"

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.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

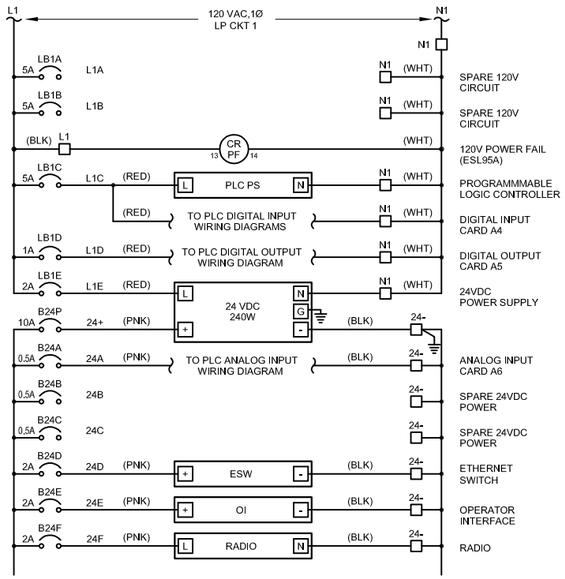
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER WELL (TOPOCK-2/3)
PLC CONTROL PANEL
ELEVATION & BACKPAN 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-01-08	REV

PLOT TIME: 9:45:11am
PLOT DATE: Apr 03, 2013
FILENAME: FE-6-XXX-0112AD.DWG

N1808



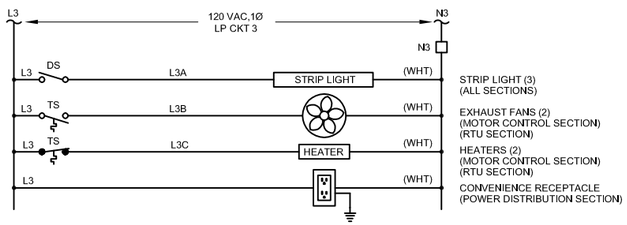
POWER DISTRIBUTION DIAGRAM ①

SCHEMATIC REFERENCED NOTES:

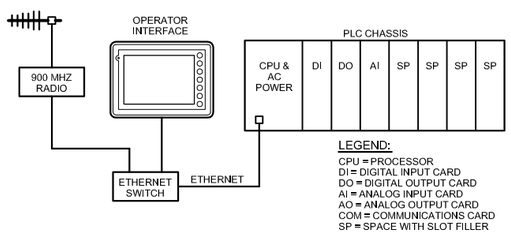
① DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS AND COMPONENT CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM.

GENERAL NOTES:

1. REMAINING WIRES AND TERMINALS SHALL BE NUMBERED BY MANUFACTURER DURING SUBMITTAL.

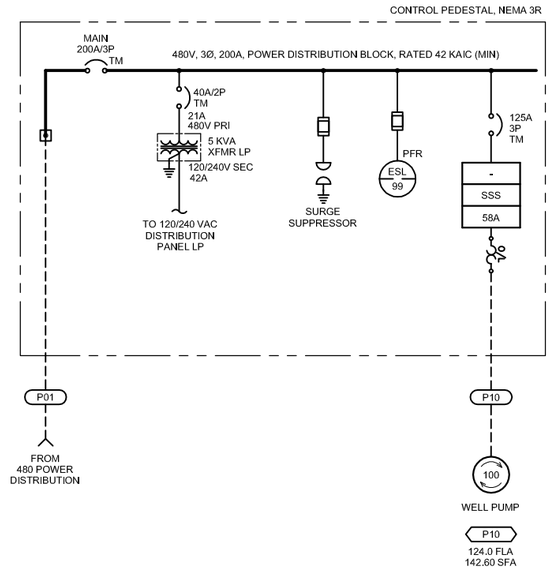


PEDESTAL AUXILLIARY POWER DISTRIBUTION DIAGRAM

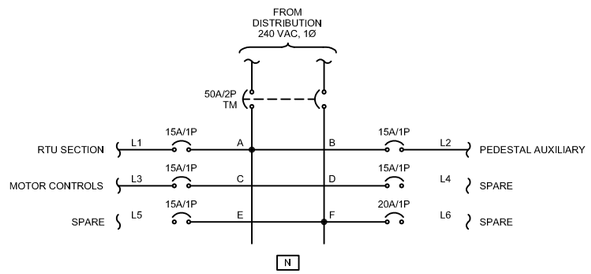


PLC BLOCK DIAGRAM

LOAD CALCULATIONS						
LOAD DESCRIPTION			LOAD		QTY	TOTAL
100 HP	INJECTION WELL		124.00	A	1	103091.7 VA
5	KVA PANELBOARD TRANSFORMER		51.46	A	1	24700.0 VA
		TOTAL LOAD =	153.71	A		127791.7 VA
LOAD CORRECTION FACTORS						
	LARGEST MOTOR LOAD x 25%:					
100	HP => 0.25 x 22447.4 VA	=	6.75	A		5611.8 VA
	80% BREAKER DERATING = TOTAL x 0.25 =		40.11	A		33350.9 VA
	FOR CONTINUOUS LOADS NEC 210-20					
		UTILITY SERVICE SIZE (MIN) =	200.57	A		166754.4 VA
		480 V, 3 PHASE, 4 WIRE				
		UTILITY SERVICE SIZE REQUIRED =	200	AMP		



ONE-LINE DIAGRAM



PANEL LP

120/240 VAC DISTRIBUTION DIAGRAM
NEUTRALS NOT SHOWN

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

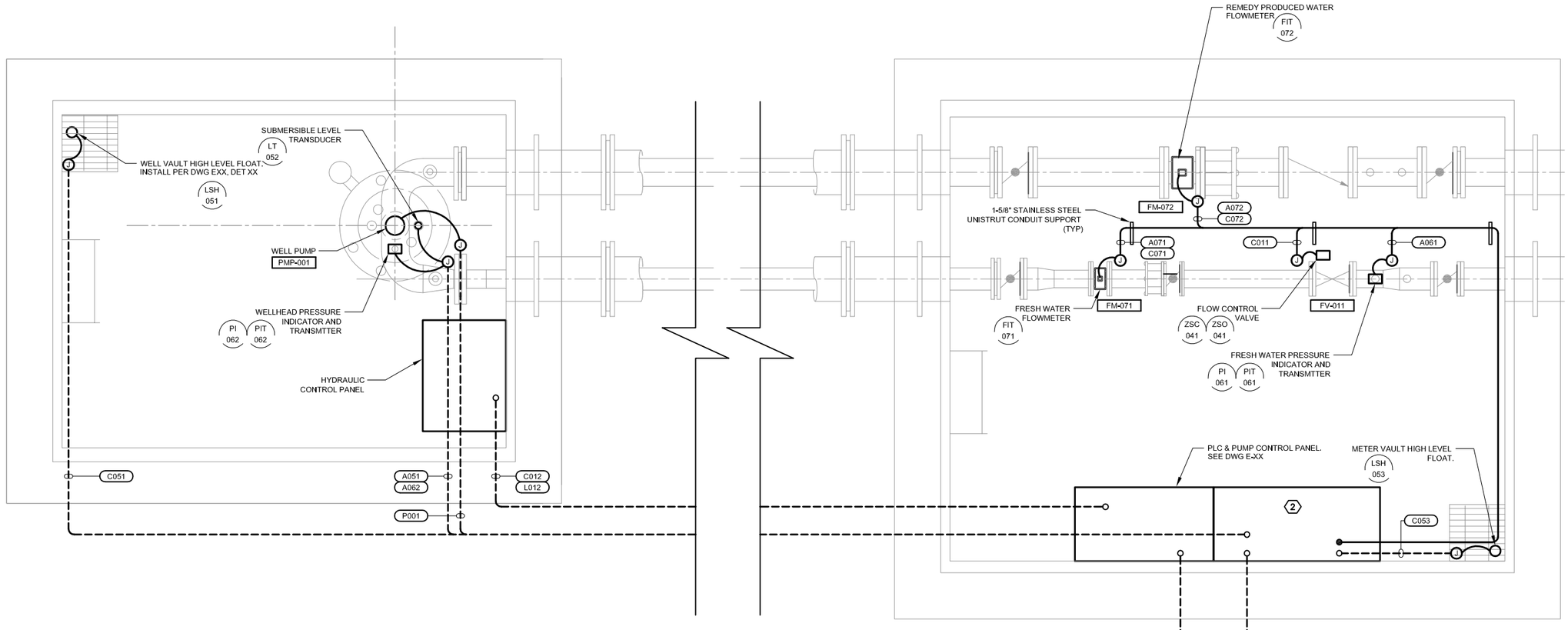
REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESHWATER WELL (TOPOCK-2/3) CONTROL PANEL POWER DISTRIBUTION & PLC 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-01-09	REV

PLOT TIME: 9:45:46am
PLOT DATE: Apr 03, 2013
FILENAME: FI-E-XXX-0113AD.DWG



WELL AND METER VAULTS ELECTRICAL PLAN ⟨1⟩

0 1 2 3

SCALE: 1"=1'

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 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, DWG EXXX.
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 XXXXX .
6. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL EXX/XXX .
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 DEFINITION.
12. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE .

DRAWING REFERENCED NOTES:

⟨1⟩ DRAWING TYPICAL FOR EQUIPMENT REQUIREMENTS AND LAYOUT WITHIN THE VAULTS, VAULT ORIENTATIONS ARE SITE SPECIFIC. SEE CIVIL DRAWINGS AND ELECTRICAL SITE PLANS FOR ORIENTATION.

⟨2⟩ SEE DRAWINGS E-01-08, E-01-09, E-01-10 & E-01-11 FOR IRL-4 PLC & PUMP CONTROL PANEL.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY		TPF	

REVISIONS

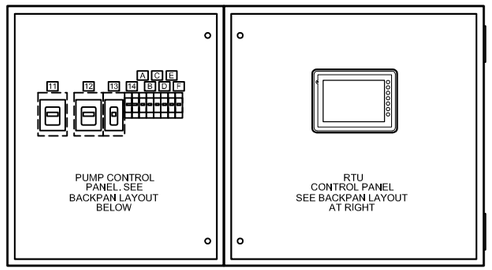
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL
WELL AND METER VAULTS
ELECTRICAL PLAN (TYPICAL)
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-02-01	REV

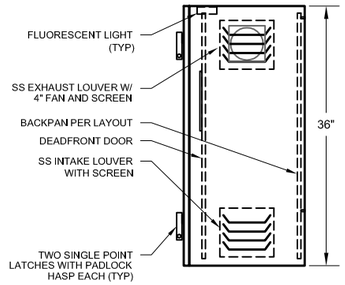
PLOT DATE: Apr 03, 2013 PLOT TIME: 9:55:34am
FILENAME: FE-EXXX-0201AD.DWG

N1808



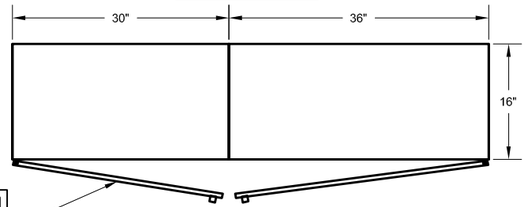
DEADFRONT DOOR ELEVATION

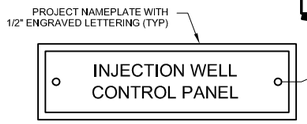
(SHOWN WITH OUTER DOOR REMOVED)



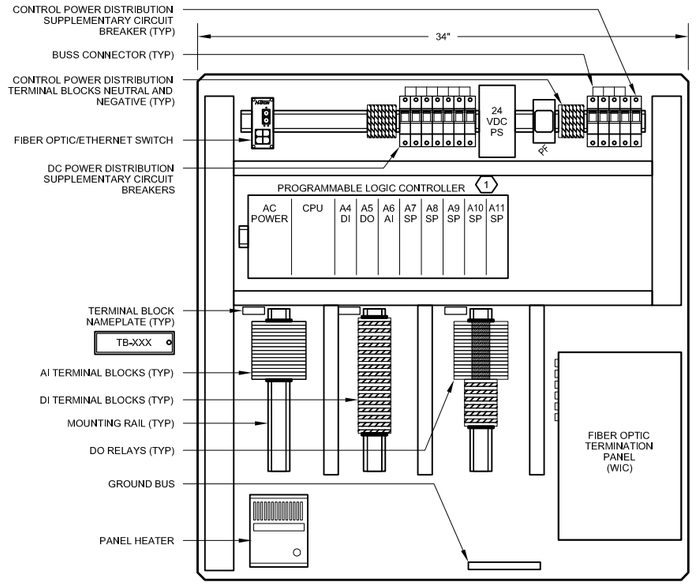
SIDE ELEVATION

ELEVATION (4)



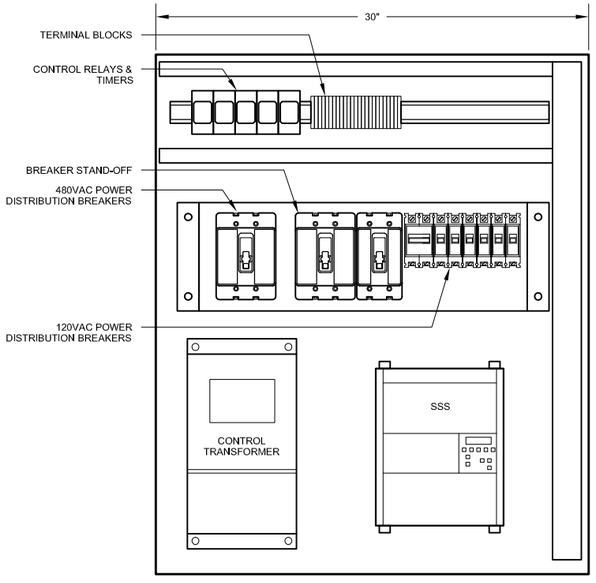


BASE PLAN



PLC PANEL BACKPAN LAYOUT

(1) WIRE I/O TO TERMINAL BLOCK PER EXAMPLE I/O WIRING DIAGRAMS.



PUMP CONTROL PANEL BACKPAN LAYOUT

NAMEPLATE SCHEDULE

KEY	ENGRAVING LINE 1	ENGRAVING LINE 2	LETTER HEIGHT
11	MAIN	DISCONNECT	3/16"
12	PUMP	DISCONNECT	3/16"
13	TRANSFORMER	DISCONNECT	3/16"
14	PANEL LP	DISCONNECT	3/16"
A	RTU	DISCONNECT	3/16"
B	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
C	PEDESTAL AUXILIARY	POWER DISTRIBUTION	3/16"
D	MOTOR CONTROL		3/16"
E	SPARE BREAKER		3/16"
F	SPARE BREAKER		3/16"

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.

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

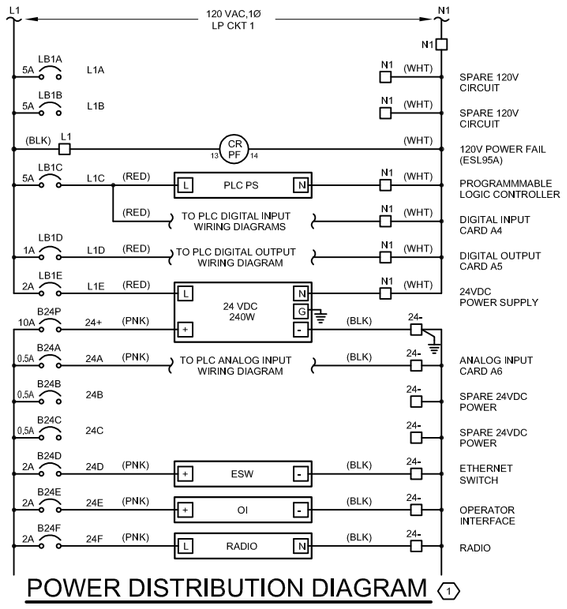
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL
PLC CONTROL PANEL
ELEVATION & BACKPAN 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-02-02	REV

PLOT TIME: 9:51:11am
PLOT DATE: Apr 03, 2013
FILENAME: FE-6-XXX-0202AD.DWG

N1808



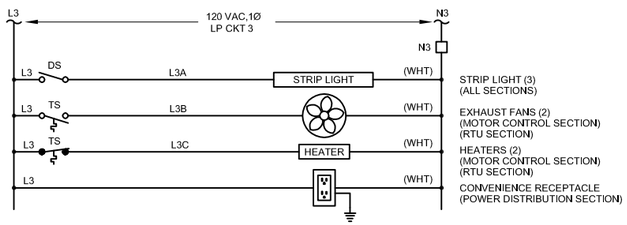
POWER DISTRIBUTION DIAGRAM ①

SCHEMATIC REFERENCED NOTES:

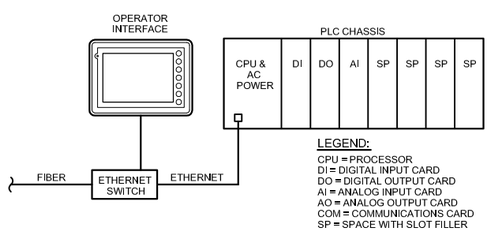
① DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS AND COMPONENT CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM.

GENERAL NOTES:

1. REMAINING WIRES AND TERMINALS SHALL BE NUMBERED BY MANUFACTURER DURING SUBMITTAL.

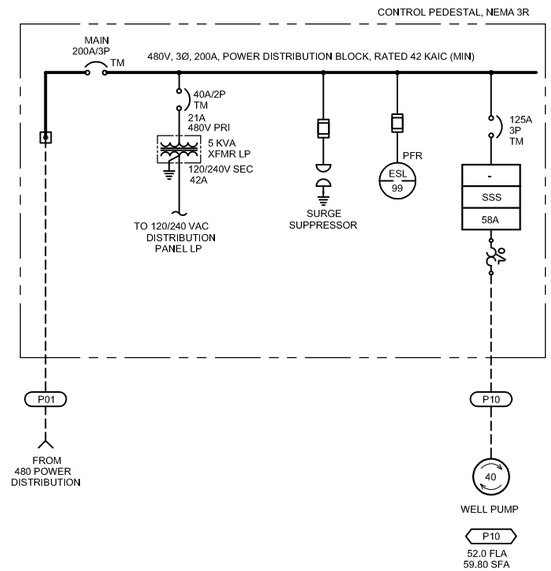


PEDESTAL AUXILLIARY POWER DISTRIBUTION DIAGRAM

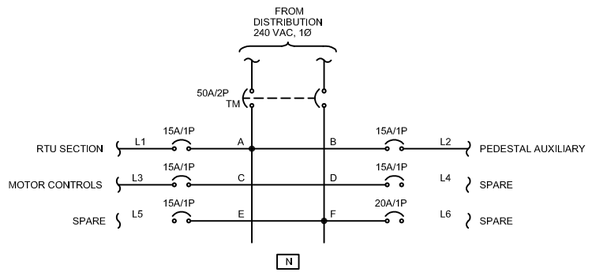


PLC BLOCK DIAGRAM

LOAD CALCULATIONS						
LOAD DESCRIPTION			LOAD		QTY	TOTAL
40 HP	INJECTION WELL		52.00	A	1	43232.0 VA
5	KVA PANELBOARD TRANSFORMER		0.00	A	1	0.0 VA
		TOTAL LOAD =	52.00	A		43232.0 VA
LOAD CORRECTION FACTORS						
	LARGEST MOTOR LOAD x 25%:					
40	HP => 0.25 x 22447.4 VA	=	6.75	A		5611.8 VA
	80% BREAKER DERATING = TOTAL x 0.25 =		14.69	A		12211.0 VA
	FOR CONTINUOUS LOADS NEC 210-20					
	UTILITY SERVICE SIZE (MIN) =		73.44	A		61054.8 VA
	480 V, 3 PHASE, 4 WIRE					
	UTILITY SERVICE SIZE REQUIRED =		200	AMP		



ONE-LINE DIAGRAM



PANEL LP

120/240 VAC DISTRIBUTION DIAGRAM
NEUTRALS NOT SHOWN

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

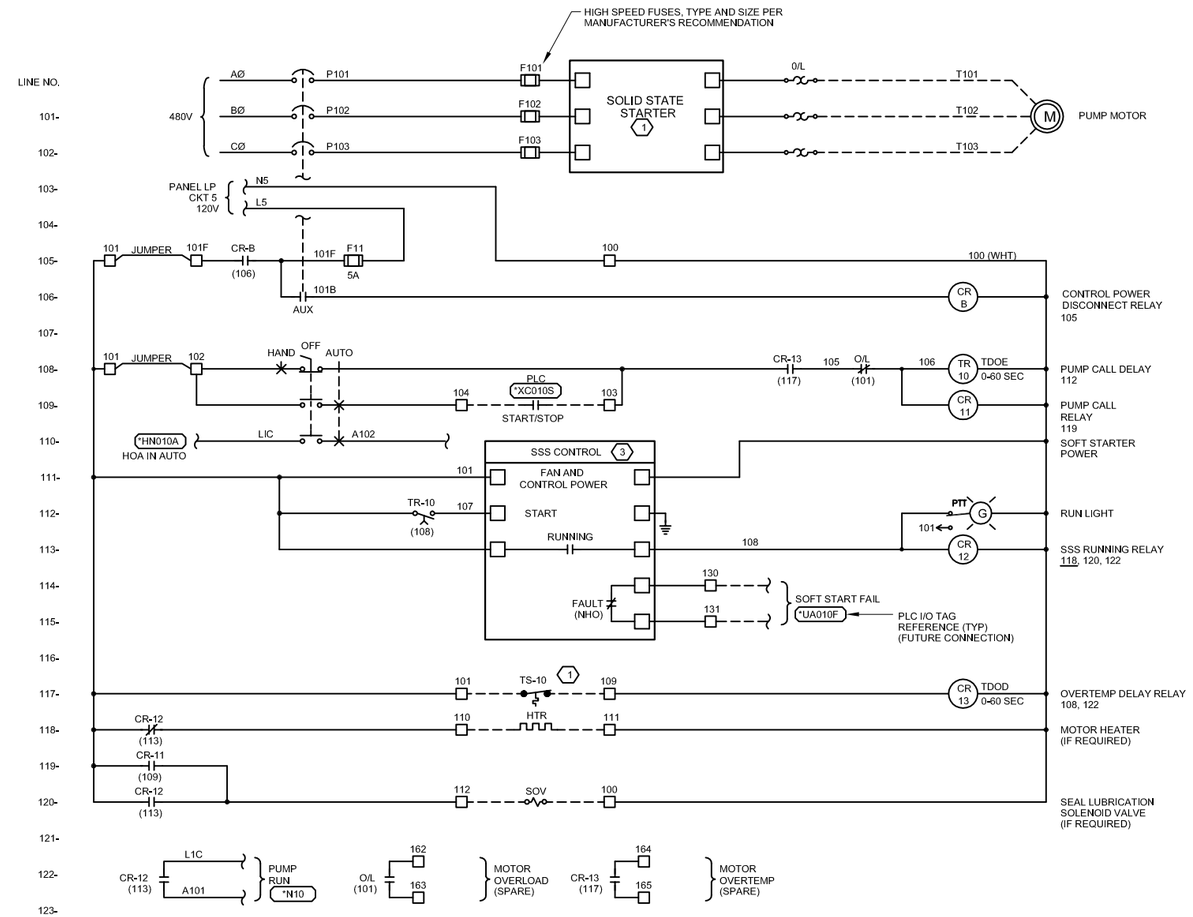
REVISIONS

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

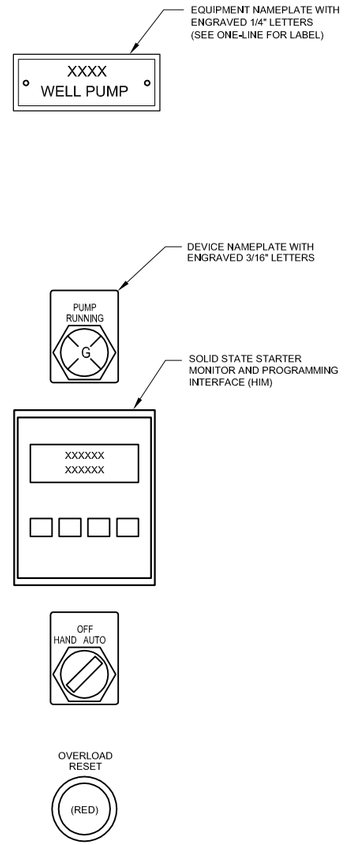
TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL CONTROL PANEL POWER DISTRIBUTION & PLC BLOCK DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT DATE: Apr 03, 2013 PLOT TIME: 9:51:56am
FILENAME: FI-E-XXX-0203AD.DWG



WELL PUMP ELEMENTARY DIAGRAM



DOOR LAYOUT (PARTIAL)

NOTES REFERENCED IN DRAWING:

1. SOLID STATE STARTER SHALL PROVIDE THE FOLLOWING MOTOR PROTECTION PARAMETERS:

VOLTAGE	CURRENT	MOTOR PARAMETERS
PHASE REVERSAL	OVERLOAD	OVERLOAD CLASS
	UNBALANCE	FULL LOAD CURRENT

2. TIME CLOCK CONTROL CONTACT
3. 120 VAC CONTROL INTERFACE, NO EXCEPTIONS.

GENERAL NOTES:

1. TERMINAL BLOCKS AND WIRES SHALL BE LABELED SAME EXCEPTION: WIRES TO PLC SHALL BE NUMBERED PER CONTROL PANEL TERMINAL BLOCK NUMBER.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

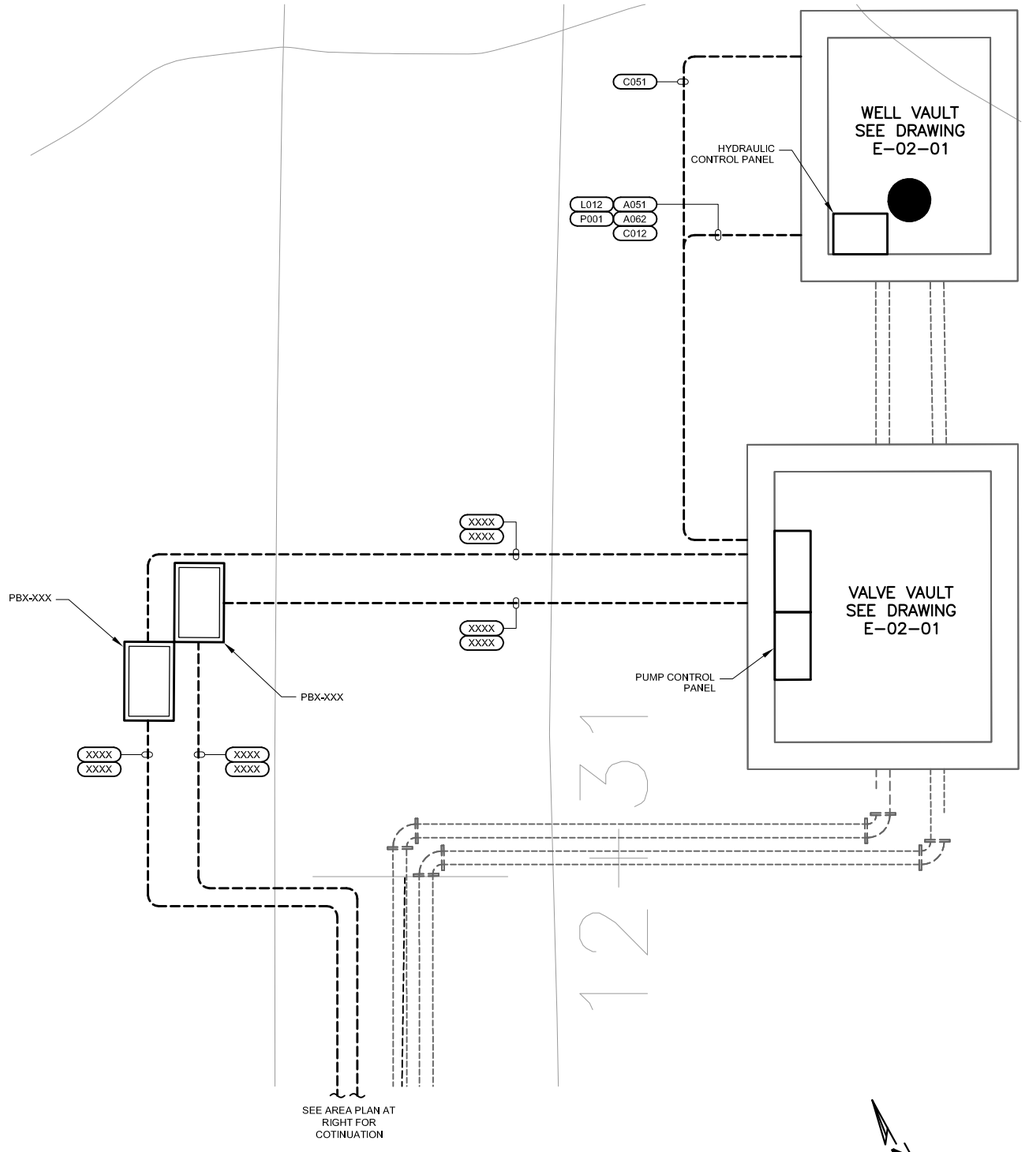
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL
WELL PUMP
ELEMENTARY 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-02-04	REV

PLOT TIME: 9:52:19am
PLOT DATE: Apr 03, 2013
FILENAME: FE-6-XXX-0204AD.DWG

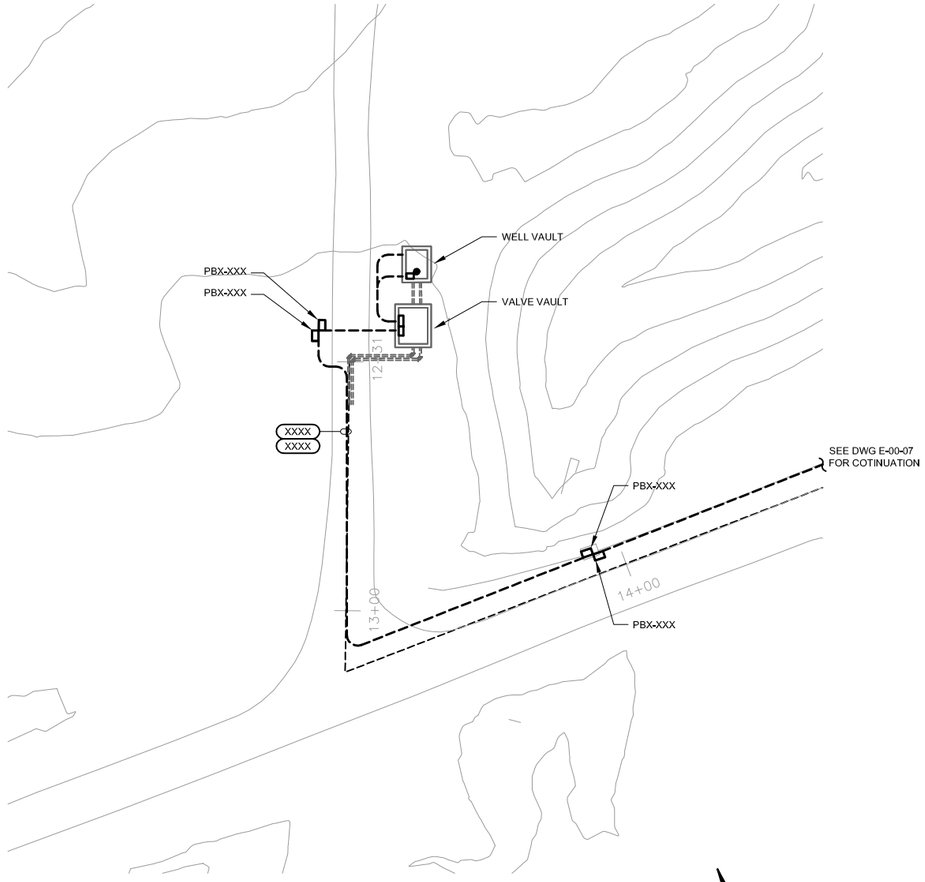
N1808



0 2.6 5.2 7.8

SCALE: 3/8"=1'

FRESHWATER INJECTION WELL FW-1 AREA PLAN



FRESHWATER INJECTION WELL FW-1 AREA PLAN

0 20 40 60

SCALE: 1"=20'

ELECTRICAL PLAN NOTES:

1. INSTALL NON-UTILITY CONDUITS PER DRAWING DETAILS AND SPECIFICATIONS.
2. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, DWG E-XX-XX.
3. 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 THE CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
4. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL E-XX-XX/ECT.
5. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
6. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH OTHER DISCIPLINES.
7. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES.
8. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.
9. RECEPTACLES TO BE GROUND FAULT INTERRUPTER (GFI) TYPE AND WEATHERPROOF (WP) WHERE SHOWN.
10. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITIONS.
11. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

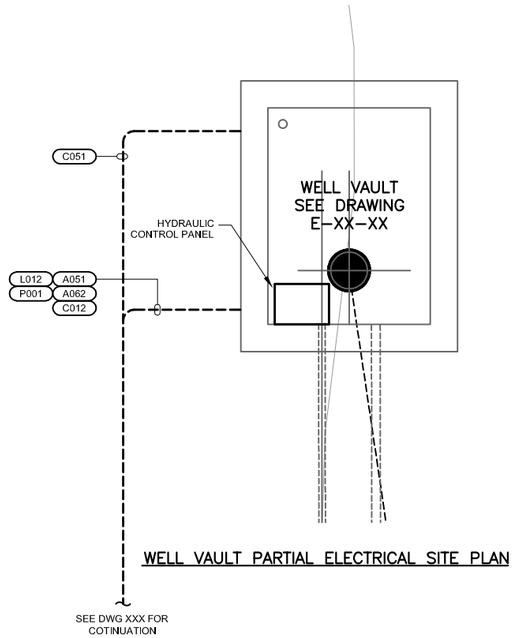
REVISIONS

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

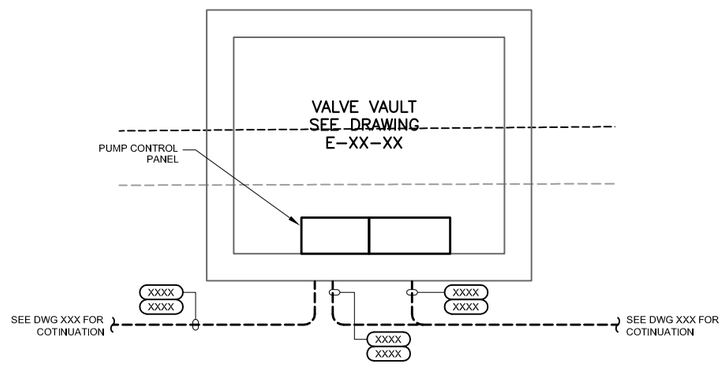
TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESH WATER
INJECTION WELL FW-1
SITE PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-02-05	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 11:23:56am
FILENAME: FE-E-XXX-0205AD.dwg
N1808



WELL VAULT PARTIAL ELECTRICAL SITE PLAN

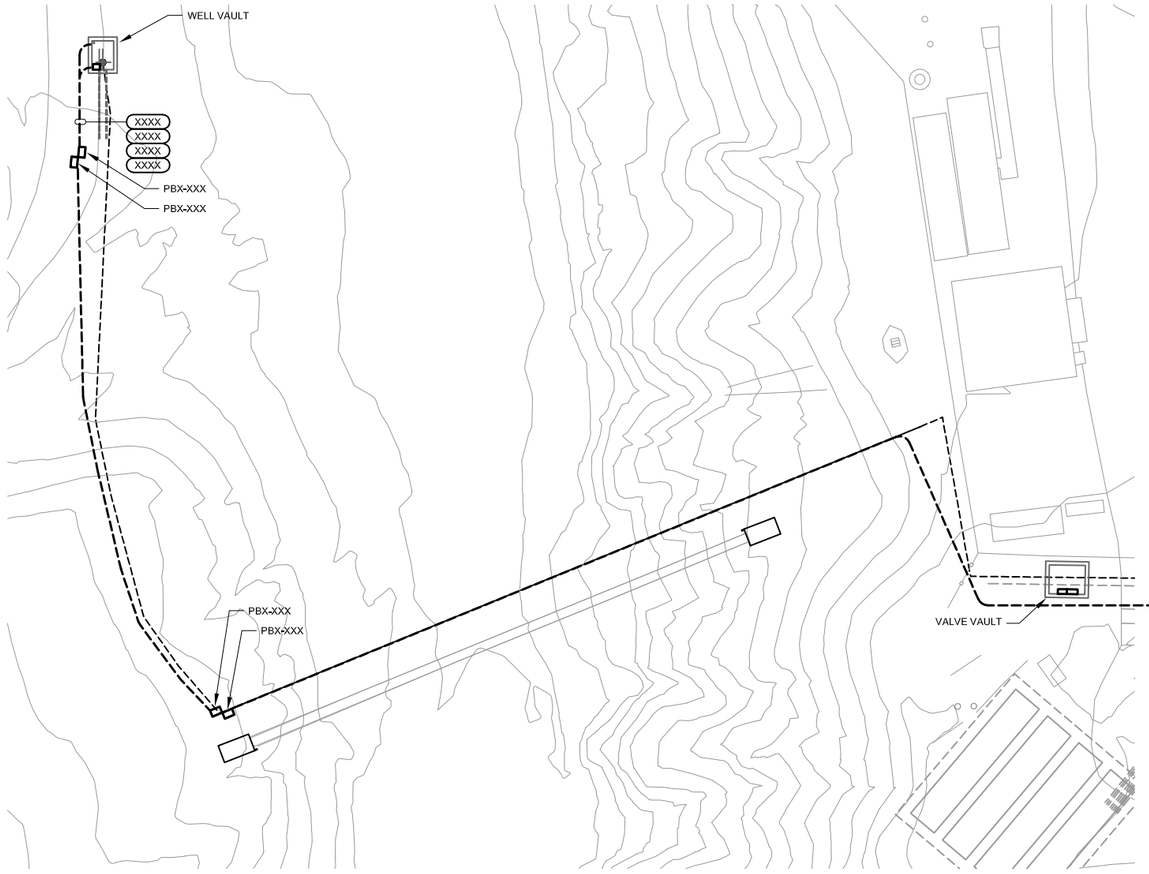


VALVE VAULT PARTIAL ELECTRICAL SITE PLAN

FRESHWATER INJECTION WELL FW-2 ELECTRICAL SITE PLAN

0 2.6 5.2 7.8

SCALE: 3/8"=1'



FRESHWATER INJECTION WELL FW-2 AREA PLAN

0 20 40 60

SCALE: 1"=20'

ELECTRICAL PLAN NOTES:

1. INSTALL NONUTILITY CONDUITS PER DRAWING DETAILS AND SPECIFICATIONS.
2. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, DWG E-XX-XX.
3. 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 THE CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
4. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL E-XX-XX/ECT.
5. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
6. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH OTHER DISCIPLINES.
7. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES.
8. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.
9. RECEPTACLES TO BE GROUND FAULT INTERRUPTER (GFI) TYPE AND WEATHERPROOF (WP) WHERE SHOWN.
10. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITIONS.
11. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

REVISIONS

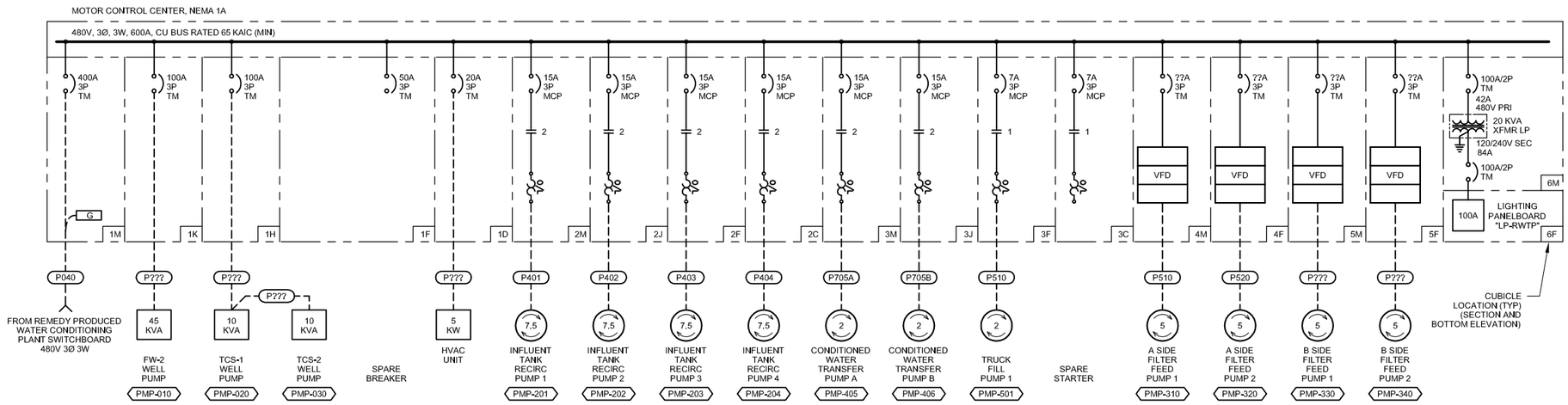
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
FRESH WATER INJECTION WELL FW-2 SITE 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-02-06	REV

PLOT TIME: 1:12:11pm
PLOT DATE: Apr 04, 2013
FILENAME: FE-E-XXX-02(05AD.dwg

N1808



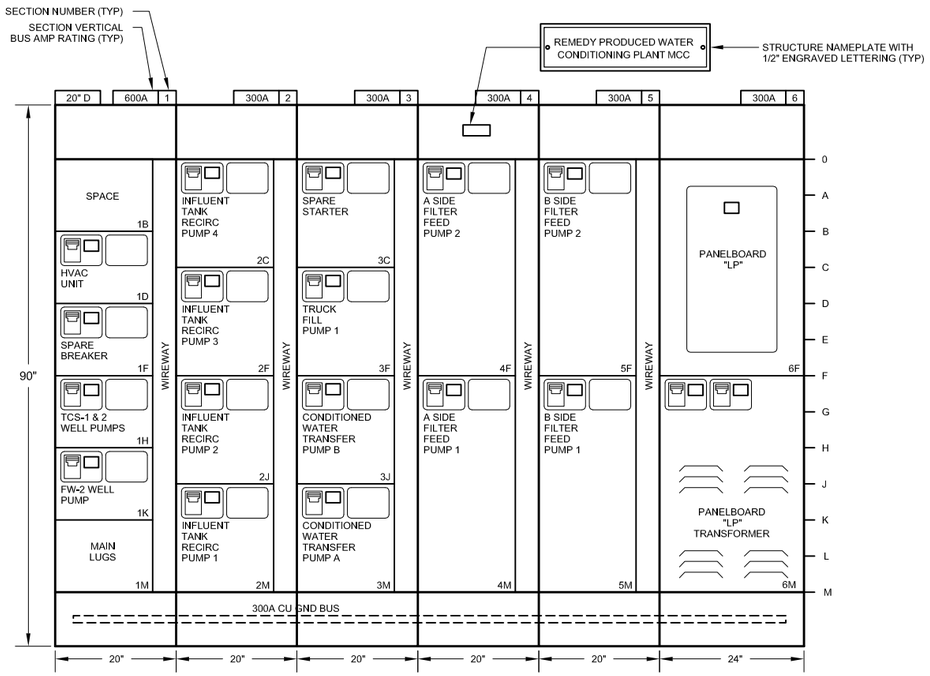
MOTOR CONTROL CENTER ONE-LINE

GENERAL NOTES:

1. ALL DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE PER MANUFACTURER APPROVED IN SUBMITTAL.

NOTES REFERENCED IN DRAWING:

1. PROVIDE NEMA 1 ENCLOSURE FOR MCC.
2. PROVIDE MINIMUM CUBICLE SIZING AS SHOWN.
3. PROVIDE 12" BREAKER OPERATING CHAIN FOR BREAKERS LOCATED AT THE TOP OF EACH SECTION.
4. PROVIDE NAMEPLATES PER SCHEDULE THIS PAGE.



MCC ELEVATION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY				TPF

REVISIONS

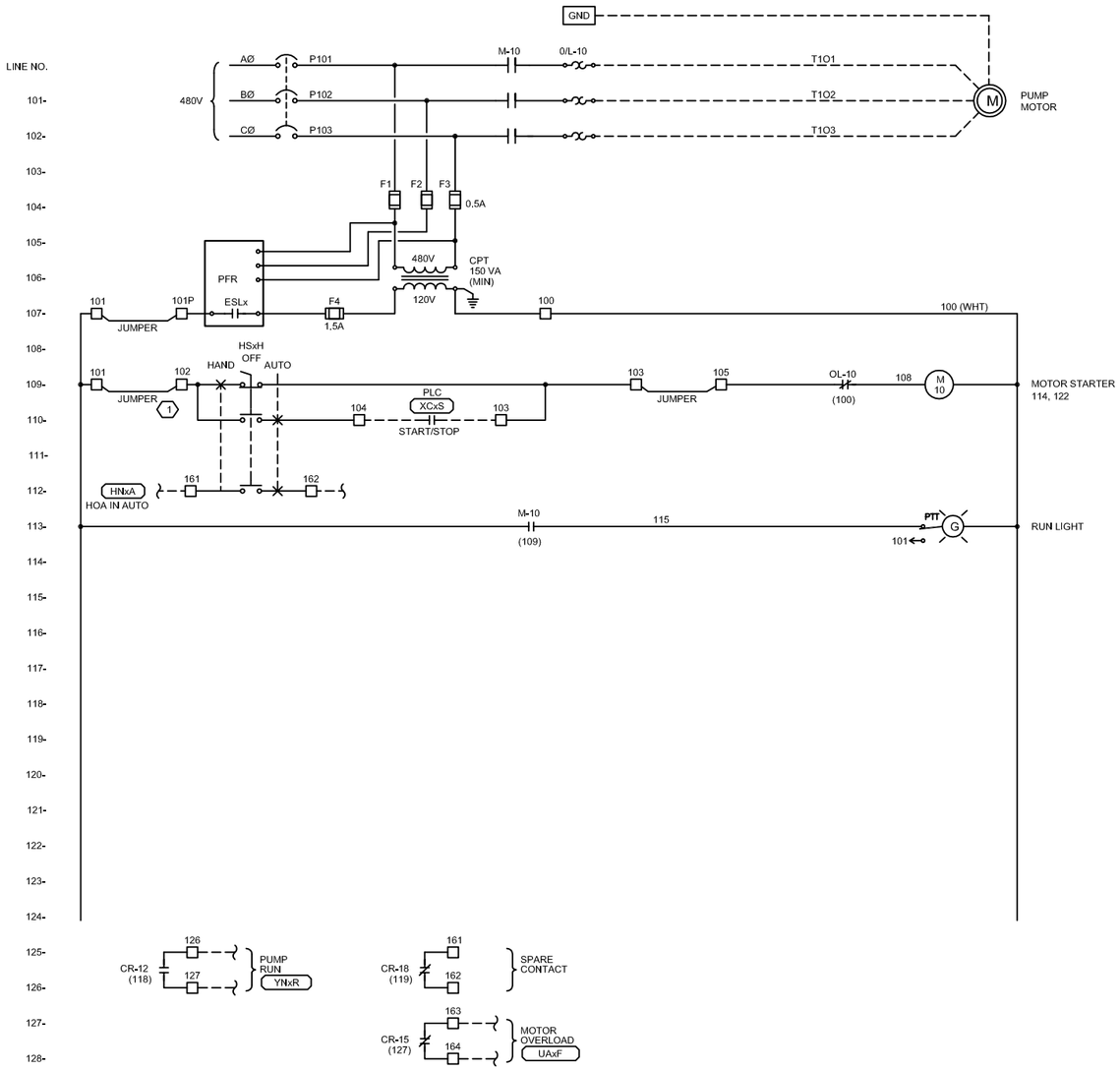
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
MCC ONE-LINE & ELEVATION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

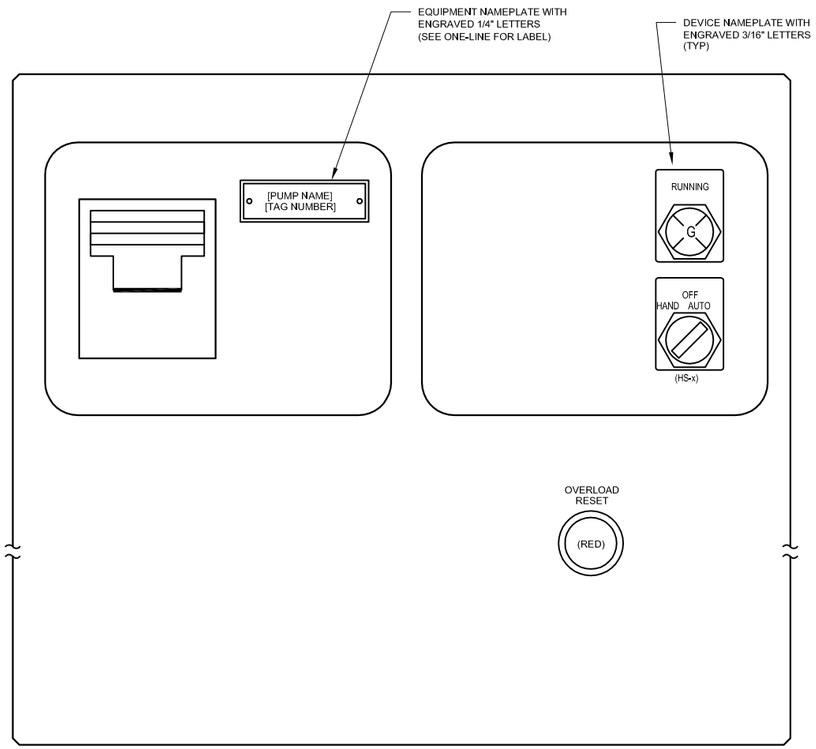
DRAFT
NOT FOR CONSTRUCTION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-12-01	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:07:13am
FILENAME: FE-E-xxx-1201AD.dwg
N1808



FVNR MOTOR ELEMENTARY DIAGRAM



CUBICLE DOOR LAYOUT

NOTES REFERENCED IN DRAWING:

1. REMOVE JUMPER FOR DEVICE WHEN CONNECTED.

GENERAL NOTES:

1. SIMILAR DIAGRAM FOR PUMPS LISTED AND PER P&IDS.
2. TERMINAL BLOCKS AND WIRES SHALL BE LABELED SAME EXCEPTION: WIRES TO PLC SHALL BE NUMBERED PER CONTROL PANEL TERMINAL BLOCK NUMBER.

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

REFERENCE (TYP)

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY			TPF	

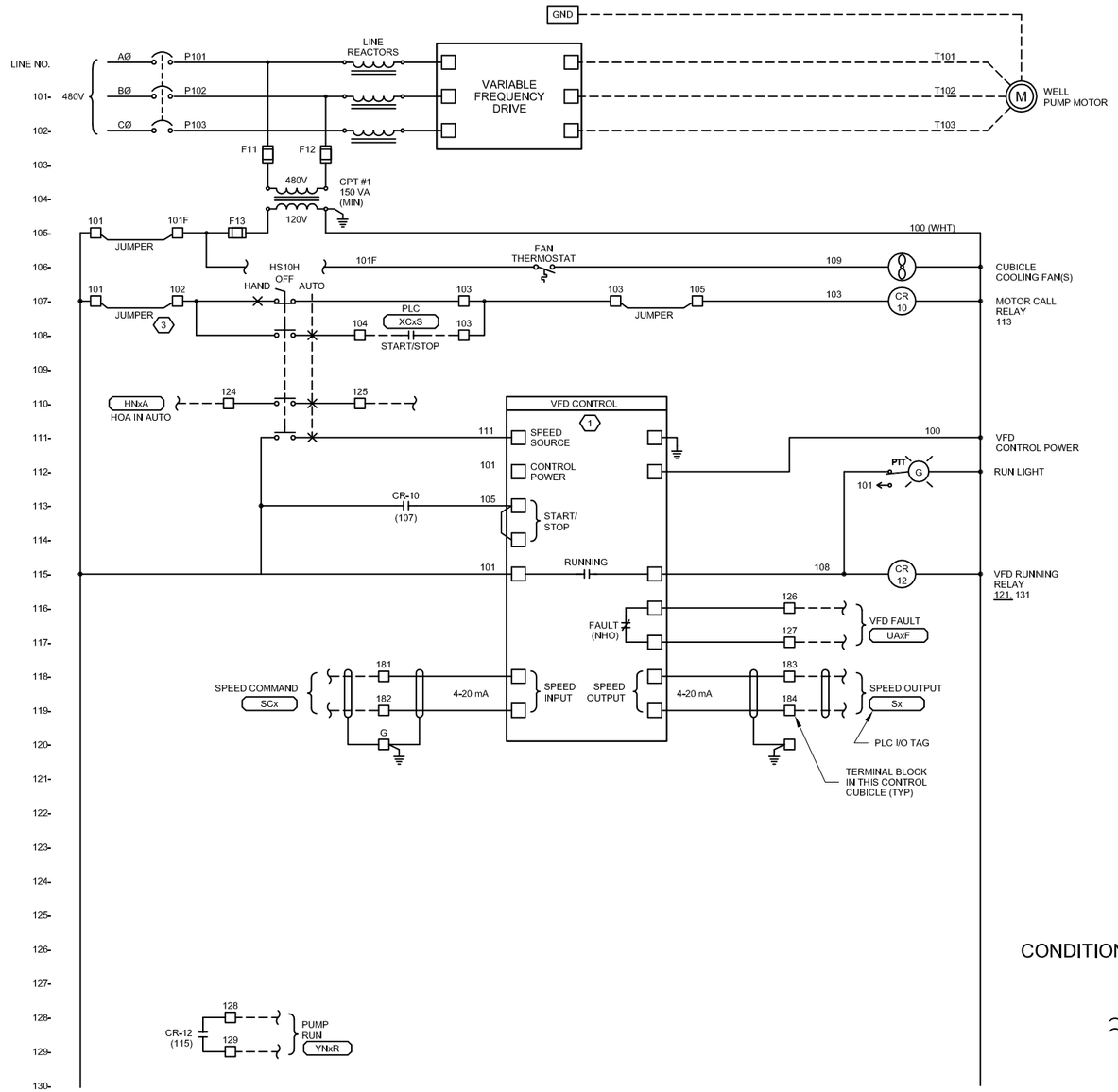
REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
FVNR ELEMENTARY 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-12-02	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:07:44am
FILENAME: FE-E-xxx-1202AD.dwg



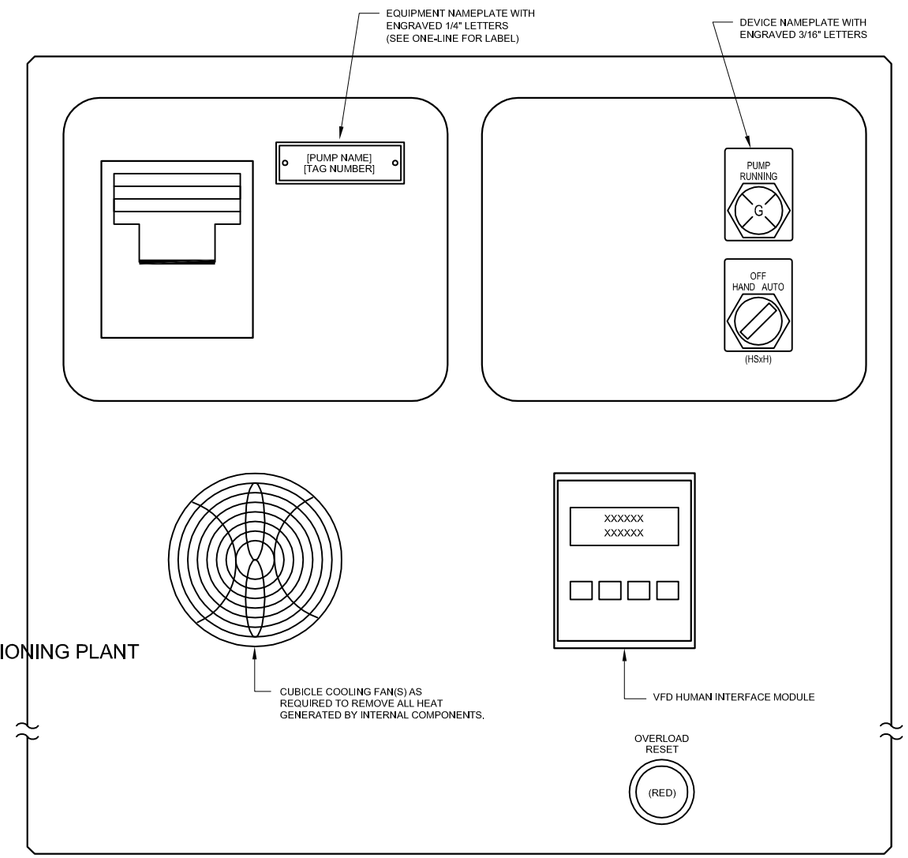
VFD ELEMENTARY DIAGRAM

NOTES REFERENCED IN DRAWING:

1. PROVIDE VFD WITH 120 VAC CONTROL CIRCUIT INTERFACE AND ELECTRONIC OVERLOAD PROTECTION.
2. REMOVE JUMPER FOR DEVICE WHEN CONNECTED.

GENERAL NOTES:

1. TERMINAL BLOCKS AND WIRES SHALL BE LABELED SAME EXCEPTION: WIRES TO PLC SHALL BE NUMBERED PER CONTROL PANEL TERMINAL BLOCK NUMBER.
2. SIMILAR DIAGRAM FOR ALL VFD MOTORS AS SHOWN IN ONE-LINE DIAGRAM



DOOR LAYOUT

NOT TO SCALE

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

REFERENCE (TYP)

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

APPROVED BY: TPF

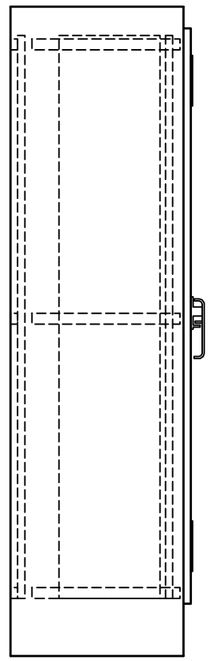
SO
SUPV
DSGN TPF
DWN MBY, NC
CHKD TPF
QK TPF
DATE
SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
VFD ELEMENTARY DIAGRAM
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

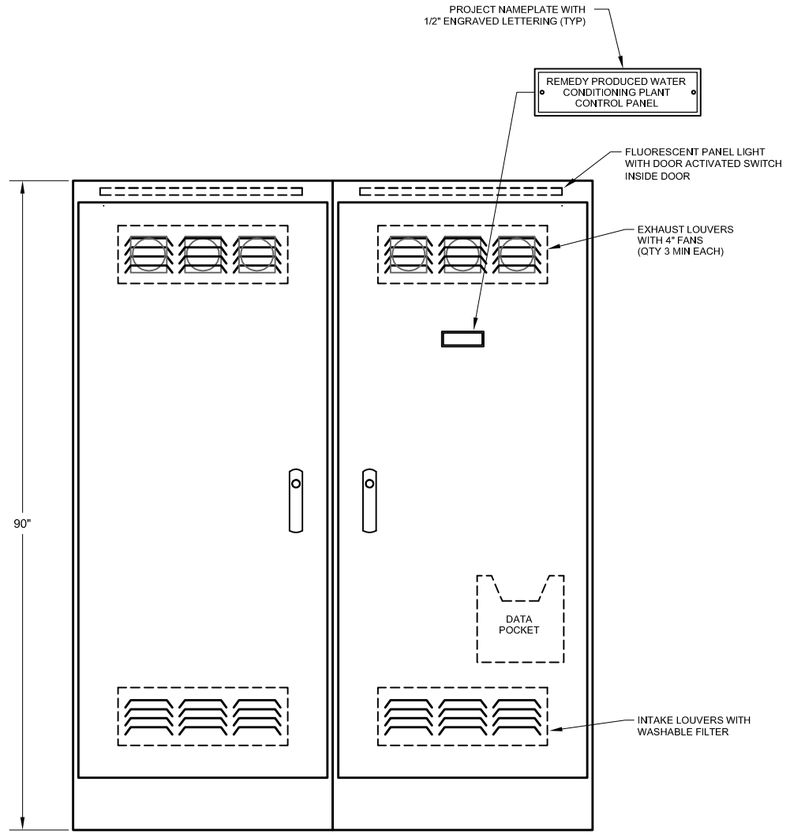
MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
E-12-03
REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:08:08am
FILENAME: FE-E-xxxx-1203AD.dwg

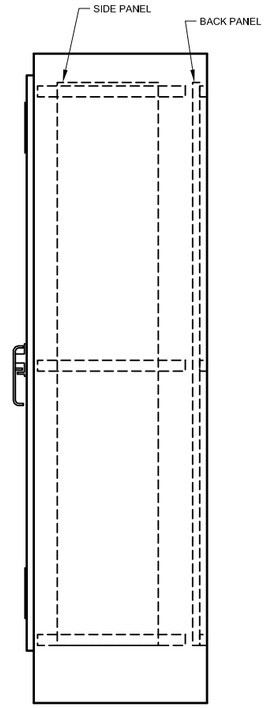
N1808



SIDE ELEVATION



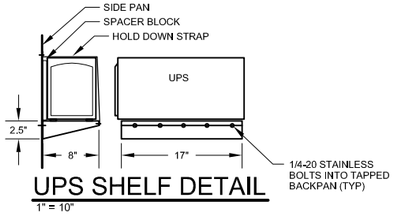
FRONT ELEVATION



SIDE ELEVATION

ELEVATION

1" = 20"

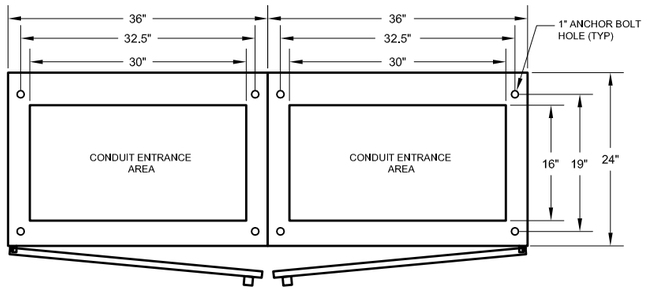


UPS SHELF DETAIL

1" = 10"

DETAIL NOTES:

1. DO NOT BLOCK VENTS WITH SPACER BLOCK. USE TWO.
2. FABRICATED FROM 14 GA (MIN) PAINTED GALVANEAL OR STAINLESS STEEL SOLID SIDES, TOP, BACK AND FRONT WITH CONTINUOUS WELDED SEAMS.



BASE PLAN

1" = 20"

PANEL FABRICATION METHODS

1. NEMA 12, OPEN BOTTOM.
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. UPS SHELF SHALL BE 14GA PAINTED STEEL BOLTED TO SIDEPAN.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

APPROVED BY: TPF

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT CONTROL PANEL ELEVATION
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-12-04	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 2:44:41pm
FILENAME: FE-E-xxx-1204AD.dwg

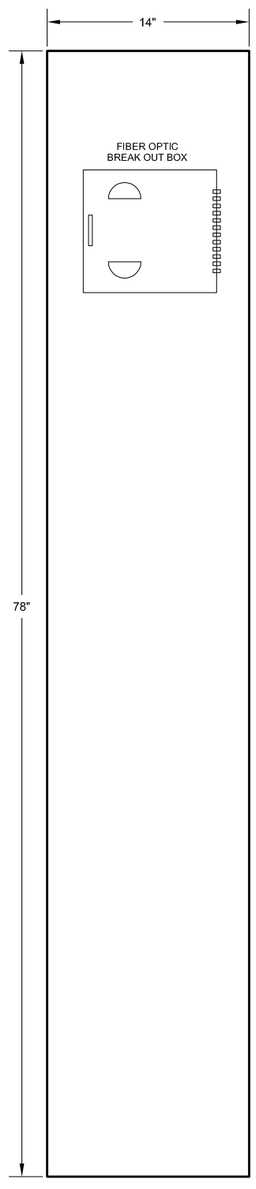
N1808

LAYOUT REFERENCED NOTES:

1. WIRE I/O TO TERMINAL BLOCK PER EXAMPLE I/O WIRING DIAGRAMS.

GENERAL NOTES:

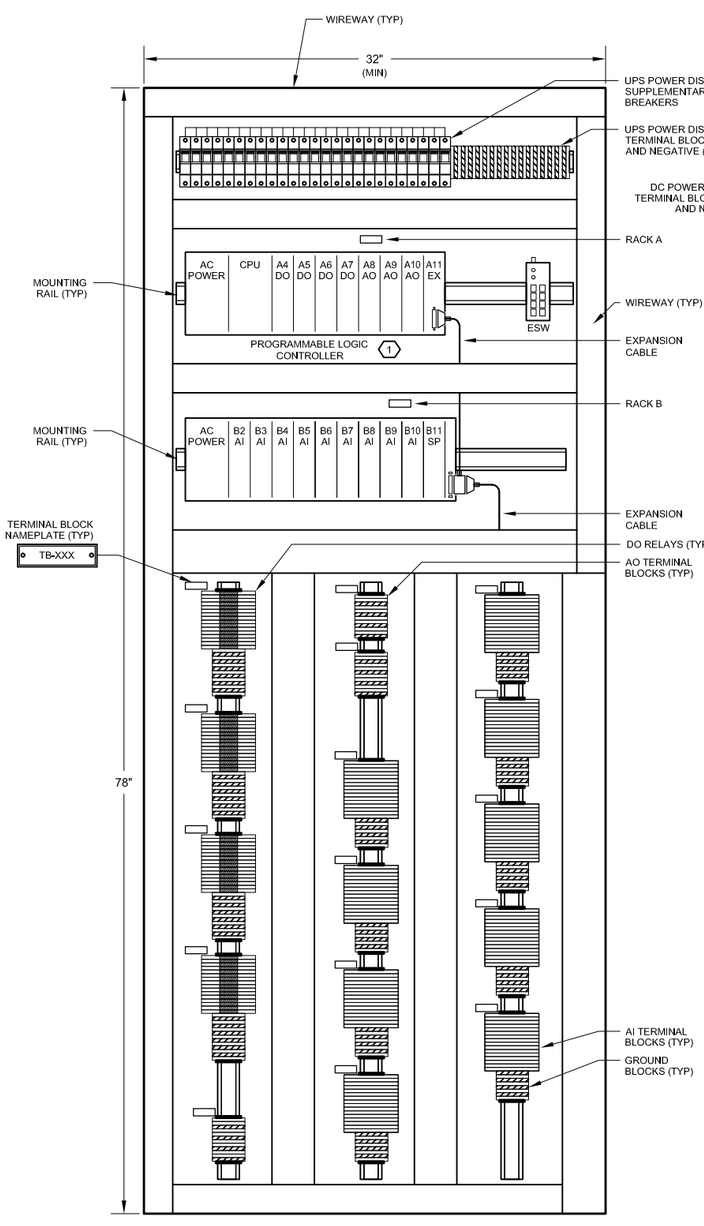
1. REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ACTUAL BACKPAN LAYOUT SHALL BE SIMILAR TO LAYOUT SHOWN. SUBMIT SCALED BACKPAN LAYOUT FOR REVIEW BY ENGINEER.
2. QUANTITY OF TERMINAL BLOCKS AND RELAYS SHALL BE AS DETERMINED BY P&IDS AND EXAMPLE I/O WIRING DIAGRAM, DWG E-11.



LEFT

SIDEPAN LAYOUT

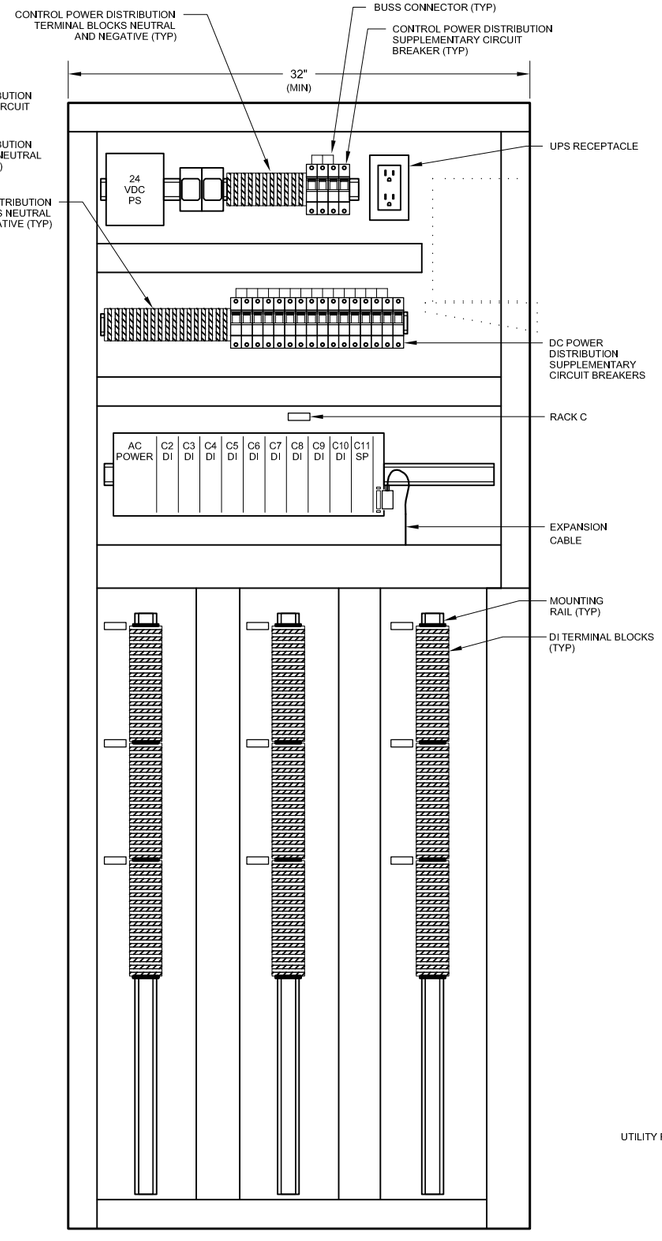
1" = 10"



LEFT CENTER 1

BACKPAN LAYOUT

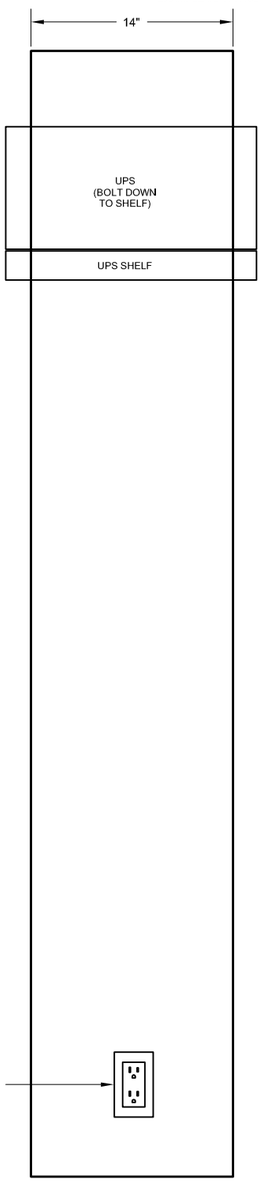
1" = 10"



RIGHT CENTER 1

BACKPAN LAYOUT

1" = 10"



RIGHT

SIDEPAN LAYOUT

1" = 10"

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

REFERENCE (TYP)

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

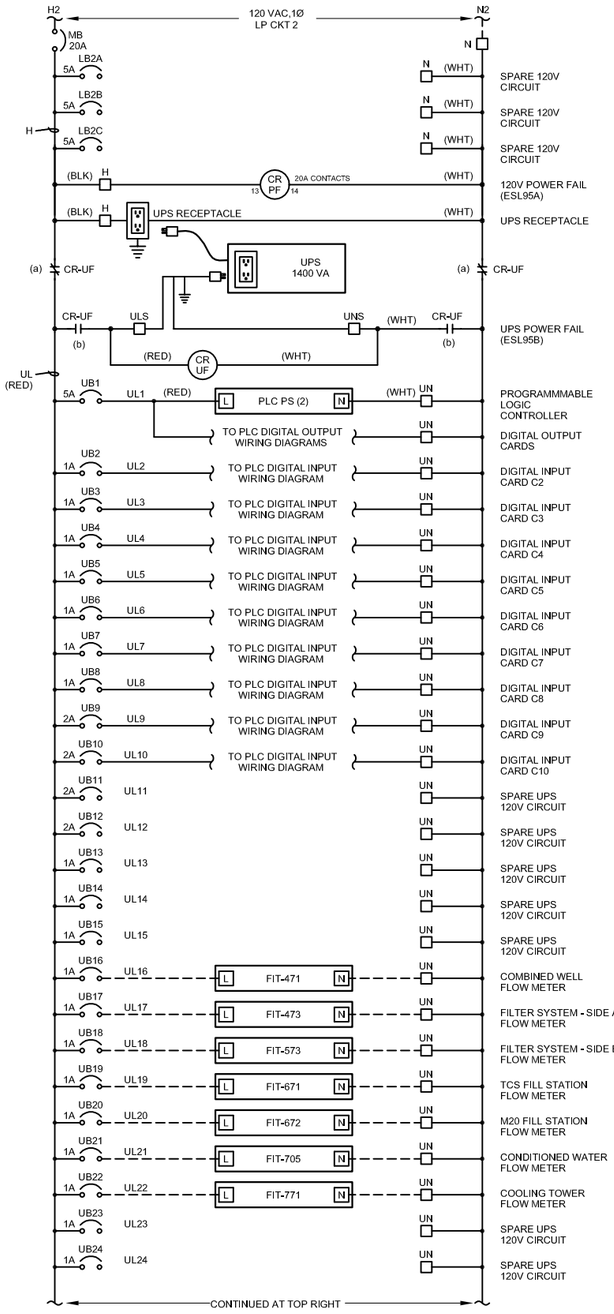
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
CONTROL PANEL BACKPAN LAYOUT
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

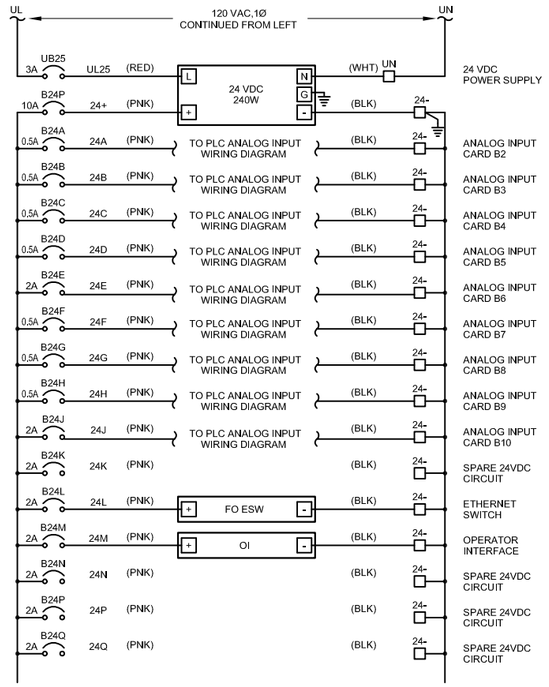
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of	SHEETS
E-12-05	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:08:56am
FILENAME: FE-Exxx-1205AD.dwg

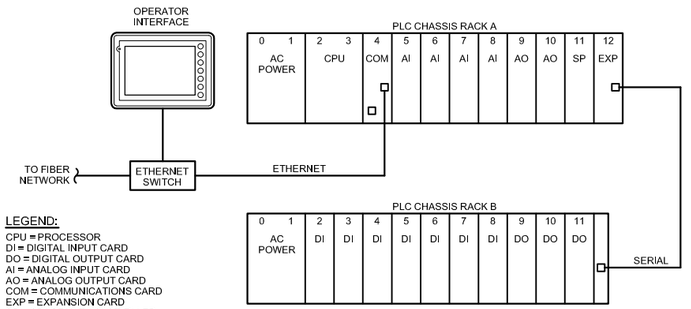
N1808



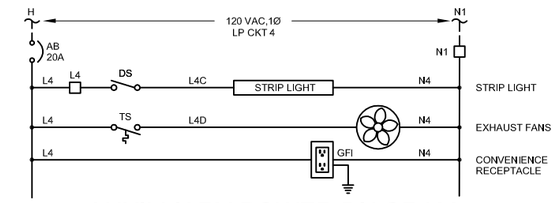
POWER DISTRIBUTION DIAGRAM



POWER DISTRIBUTION DIAGRAM - CONTINUED



PLC BLOCK DIAGRAM



AUXILLIARY POWER DIAGRAM

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
112 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

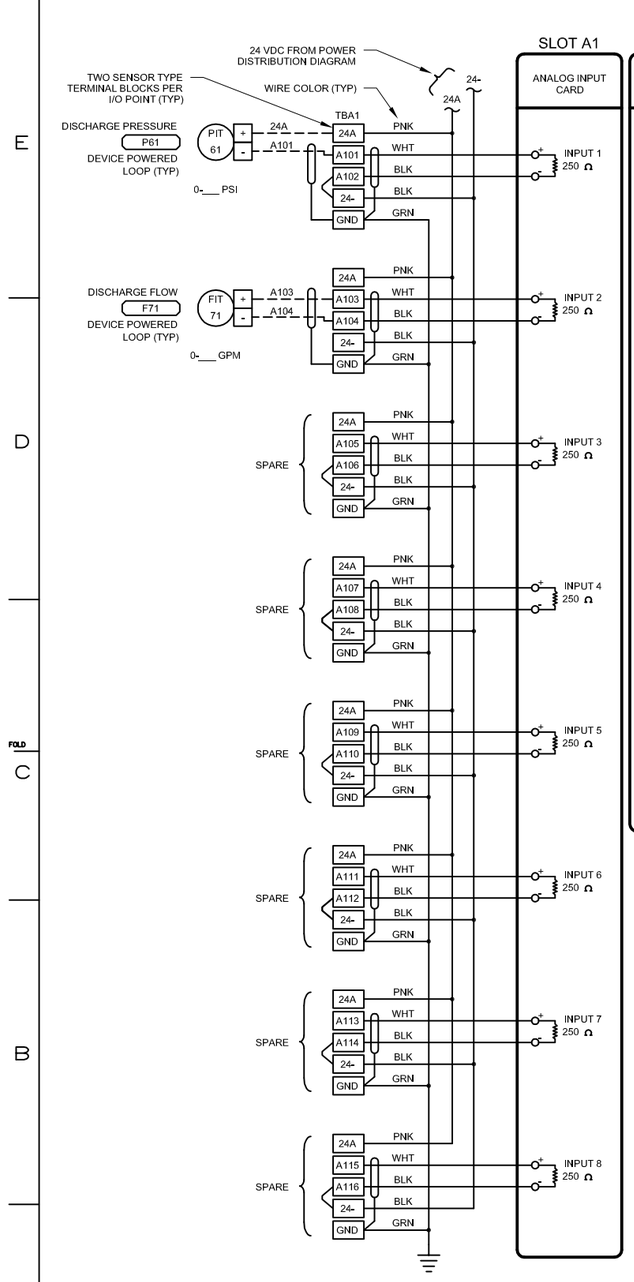
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	QK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
POWER DISTRIBUTION 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-12-06	REV

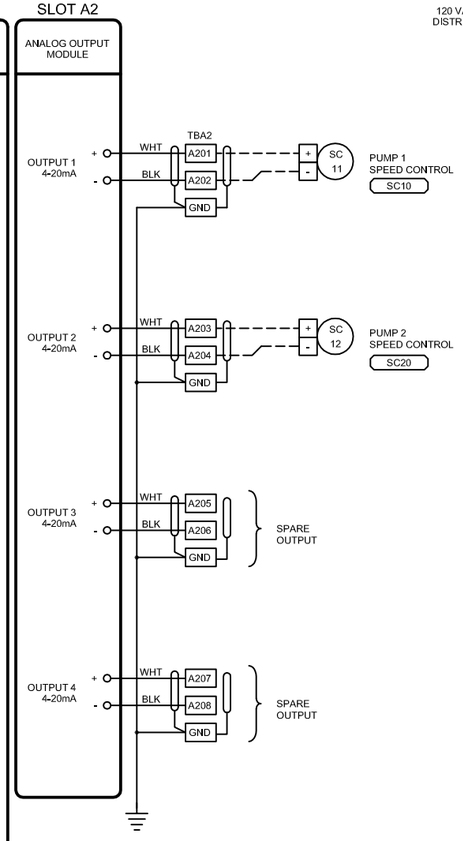
PLOT TIME: 10:09:15am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-1206AD.dwg

N1808



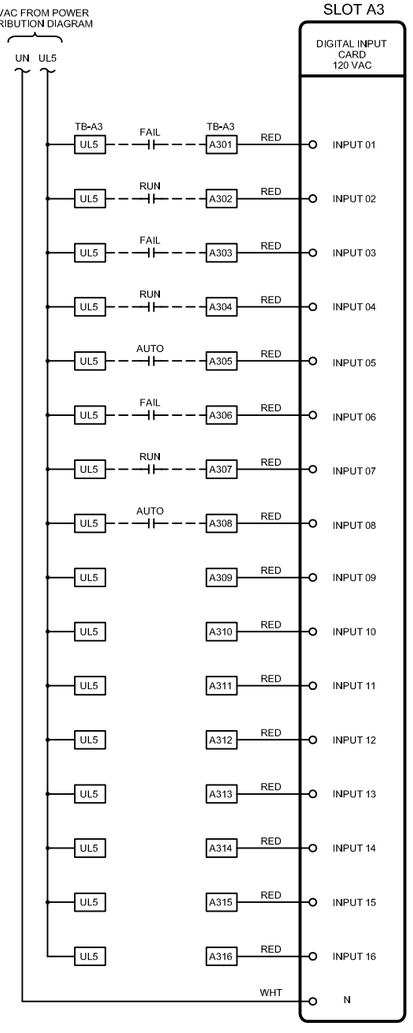
AI CARD

NOTES: 1. TWO CARDS PER DRAWING MAXIMUM.
2. USE MANUFACTURED TERMINAL BLOCK JUMPERS WHERE POSSIBLE



AO CARD

NOTES: 1. TWO CARDS PER DRAWING MAXIMUM.



DI CARD

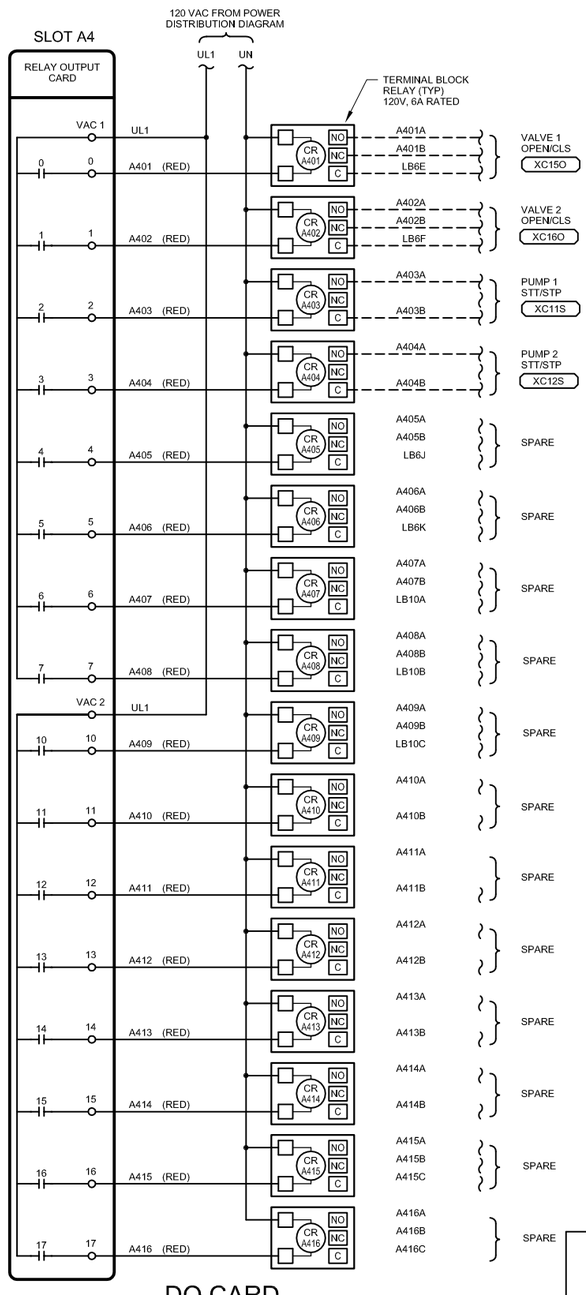
NOTES: 1. TWO CARDS PER DRAWING MAXIMUM.

PUMP 1 RUNNING	YN11R
PUMP 1 AUTO	HN11A
PUMP 1 HIGH TEMP	UA11T
PUMP 1 MOISTURE	UA11M
PUMP 2 RUNNING	YN12R
PUMP 2 AUTO	HN12A
PUMP 2 HIGH TEMP	UA12T
PUMP 2 MOISTURE	UA12M
SPARE	
SPARE	
SPARE	
SPARE	
SPARE	
SPARE	
SPARE	
SPARE	

EXAMPLE PLC I/O WIRING DIAGRAMS

NOTES:
1. WIRE SPARE I/O POINTS TO TERMINAL BLOCKS.
2. EXAMPLE I/O POINTS SHOWN. THIS DRAWING INTENDED TO SHOW I/O WIRING ONLY.
3. I/O TYPE AND NUMBER OF POINTS AND CARDS REQUIRED IS DETERMINED BY P&ID DRAWINGS.
4. MINIMUM 20% SPARE I/O POINTS PER I/O TYPE.
5. PLC I/O CARD WIRE NUMBERS SHALL BE BUILT AS SHOWN IN EXAMPLE BELOW. FIELD WIRES SHALL HAVE SAME NUMBER AS TERMINAL NUMBER.

A101
- RACK LETTER
- SLOT NUMBER
- INPUT NUMBER



DO CARD

NOTES: 1. TWO CARDS PER DRAWING MAXIMUM.

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

REFERENCE (TYP)

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY		TPF	

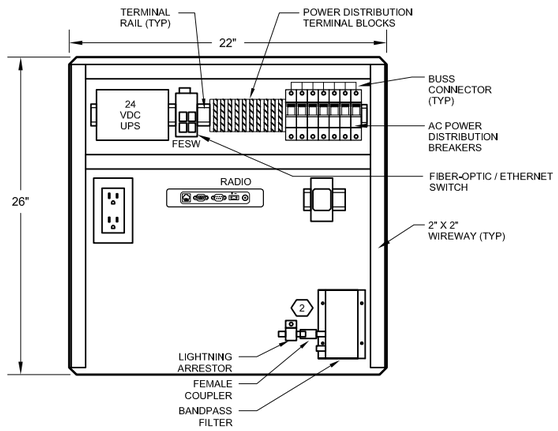
REVISIONS

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

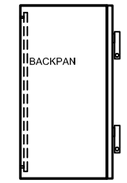
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT
EXAMPLE PLC I/O WIRING DIAGRAMS
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-12-07	REV

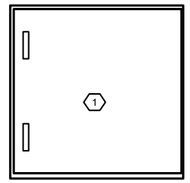
PLOT TIME: 10:09:44am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-1207AD.dwg



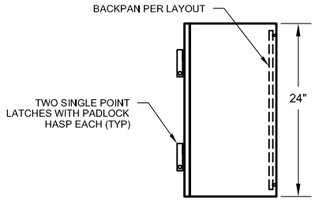
BACKPAN LAYOUT
NTS



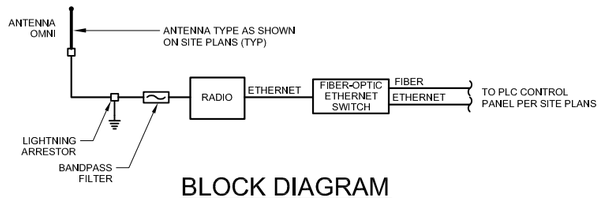
SIDE ELEVATION



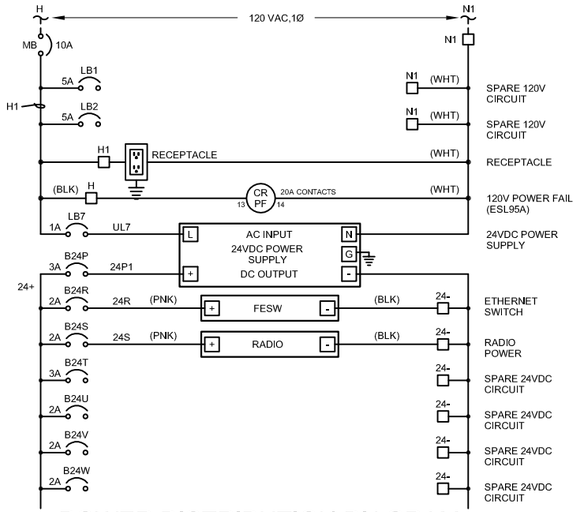
INNER DOOR FRONT VIEW
(SHOWN WITH OUTER DOOR REMOVED)



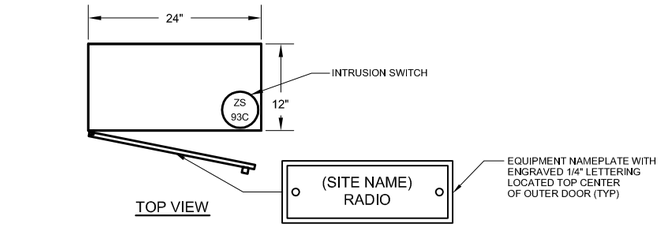
SIDE ELEVATION



BLOCK DIAGRAM

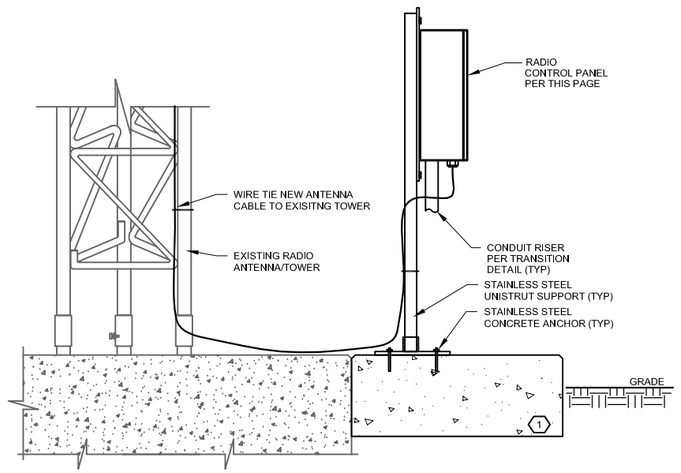


POWER DISTRIBUTION DIAGRAM



TOP VIEW

RADIO PANEL ELEVATION



DISCONNECTION PANEL

NOTES: (1) 30" X 20" X 6" CONCRETE PAD WITH CHAMFERED CORNERS.

1 DETAIL
NTS
DP2

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.

GENERAL NOTES:

1. LAYOUT REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ACTUAL BACKPAN LAYOUT SHALL BE SIMILAR TO LAYOUT SHOWN. SUBMIT SCALED BACKPAN LAYOUT FOR REVIEW.
2. QUANTITY OF TERMINAL BLOCKS, FUSES, AND RELAYS SHALL BE AS DETERMINED BY I/O SCHEDULE, EXAMPLE I/O WIRING DIAGRAMS AND POWER DISTRIBUTION DIAGRAM.
3. DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS, AND COMPONENTS CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM. ADDITIONAL WIRES, TERMINAL BLOCKS, ETC., SHALL BE LABELLED BY MANUFACTURER AND SHOWN IN THE SUBMITTAL.

DRAWING REFERENCED NOTES:

(1) CONTROL ENCLOSURE SHALL BE HOFFMAN CONCEPT MODEL NUMBER C-SD242412 PAINTED STEEL CONSTRUCTION OR EQUAL. DOOR LATCHES, BACKPAN, AND OTHER PARTS WILL BE PROVIDED TO COMPLETE PANEL.

(2) RUN #12 WIRE DIRECT TO GROUND BUS. LIGHTNING ARRESTOR SHALL BE MALE/MALE TYPE.

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

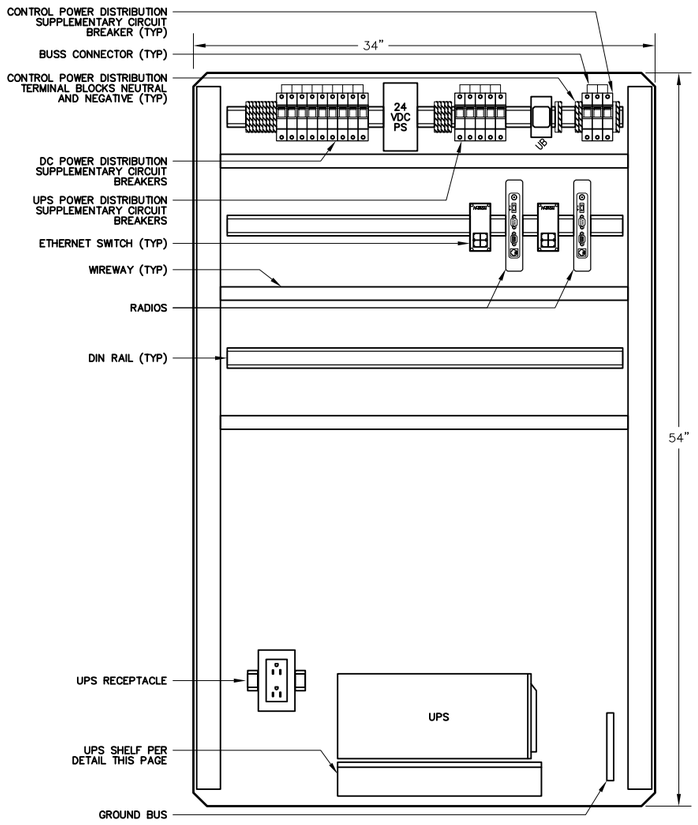
TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS REMOTE RADIO PANEL

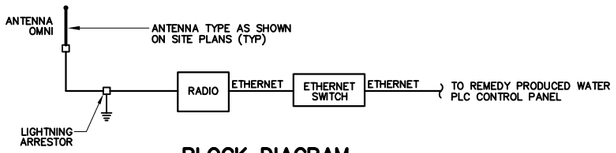
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-12-08	REV

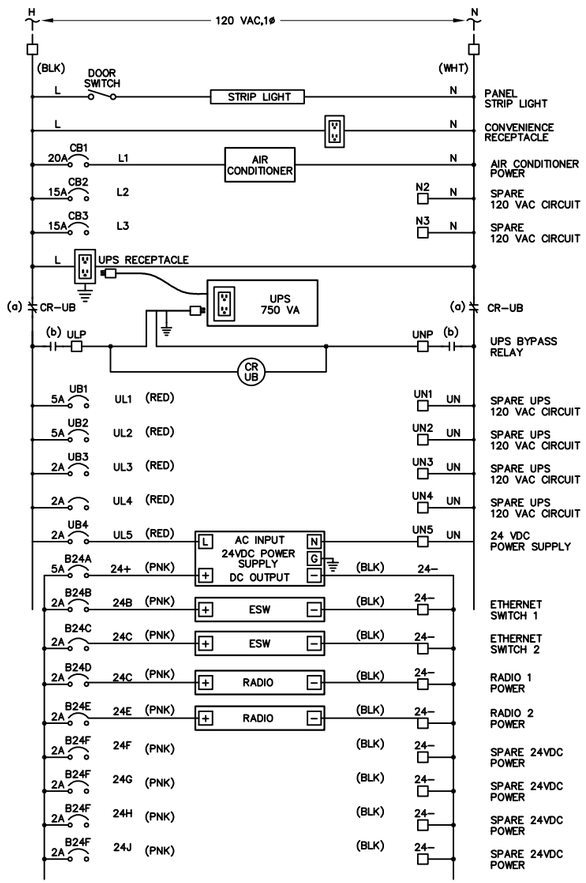
PLOT DATE: Apr 03, 2013 PLOT TIME: 10:11:43am
FILENAME: FE-E-xxx-1208AD.dwg
N1808



PLC PANEL BACKPAN LAYOUT ①



BLOCK DIAGRAM



POWER DISTRIBUTION SCHEMATIC

GENERAL NOTES:

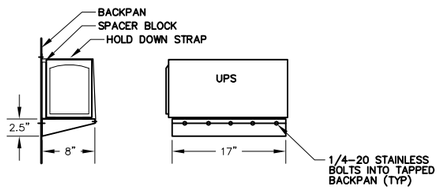
1. LAYOUT REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ACTUAL BACKPAN LAYOUT SHALL BE SIMILAR TO LAYOUT SHOWN. SUBMIT SCALED BACKPAN LAYOUT FOR REVIEW.
2. QUANTITY OF TERMINAL BLOCKS, FUSES, AND RELAYS SHALL BE AS DETERMINED BY I/O SCHEDULE, EXAMPLE I/O WIRING DIAGRAMS AND POWER DISTRIBUTION DIAGRAM.
3. DISTRIBUTION DIAGRAM REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ADDITIONAL FUSES, CIRCUITS, AND COMPONENTS CONNECTIONS MAY BE REQUIRED FOR A FUNCTIONAL SYSTEM. ADDITIONAL WIRES, TERMINAL BLOCKS, ETC., SHALL BE LABELLED BY MANUFACTURER AND SHOWN IN THE SUBMITTAL.

DRAWING REFERENCED NOTES:

① RUN #12 WIRE DIRECT TO GROUND BUS. LIGHTNING ARRESTOR SHALL BE MALE/MALE TYPE.

② DO NOT BLOCK VENTS WITH SPACER BLOCK. USE TWO.

③ FABRICATED FROM 14 GA (MIN) PAINTED GALVANEAL OR STAINLESS STEEL SOLID SIDES, TOP, BACK AND FRONT WITH CONTINUOUS WELDED SEAMS.



②③ UPS SHELF DETAIL

SCALE: 1" = 10"

DRAFT NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916.353.1025 FX 916.353.1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY		TPF	

REVISIONS

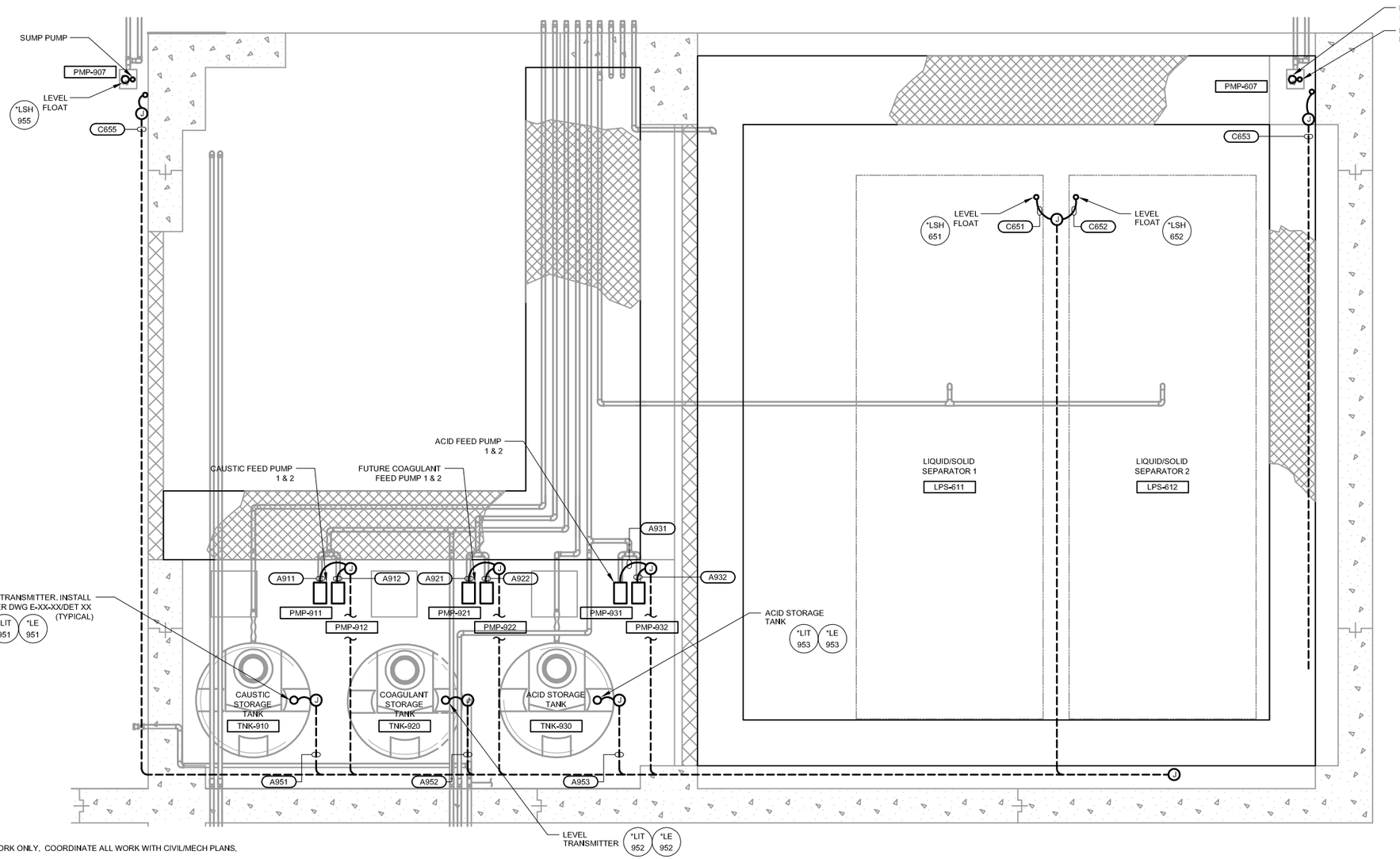
APPROVED BY: TPF

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS RADIO COMMUNICATION CONTROL PANEL BACKPAN LAYOUT & POWER DISTRIBUTION
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-12-09	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:12:06am
FILENAME: FE-E-xxx-1209AD.dwg



ELECTRICAL PLAN NOTES:

1. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH CIVIL/MECH PLANS.
2. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, DWG E-XX-XX.
3. 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 XXXXX.
4. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL E-XX-XX.
5. EXPOSED CONDUIT TYPE TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
6. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
7. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER E-XX-XX/XXX.
8. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES.
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 DEFINITION.
12. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE.

FIRST FLOOR POWER AND CONTROL PLAN

0 30 60 90

SCALE: 1"=30'

DRAFT
NOT FOR CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

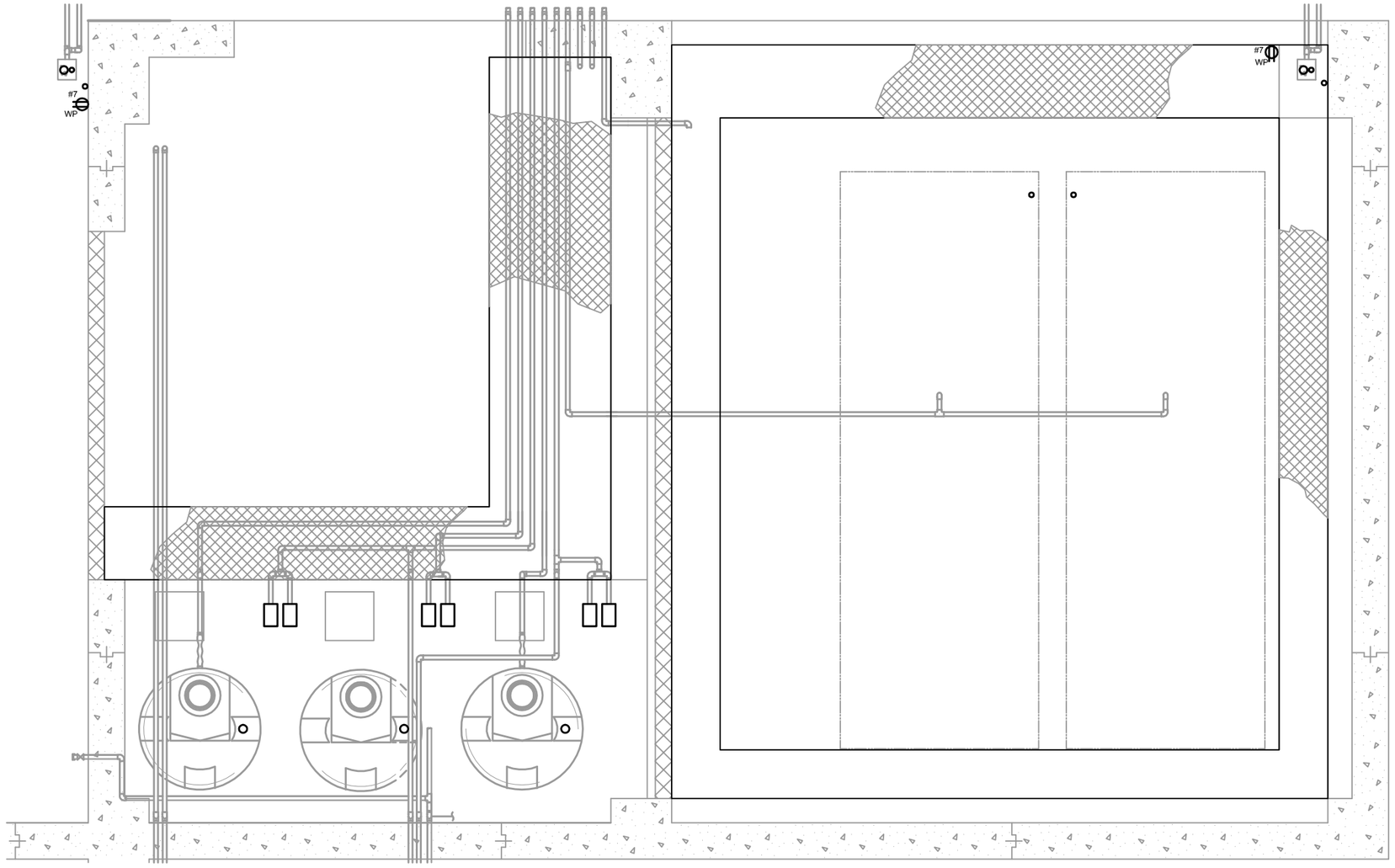
REVISIONS

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

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT 1ST FLOOR POWER & CONTROL 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-12-20	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:51:22am
FILENAME: FE-Exxx-1220AD.dwg



ELECTRICAL PLAN NOTES:

1. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH CIVIL/MECH PLANS.
2. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, DWG FE-X-XXX-XXXX.
3. 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 XXXXX.
4. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL FE-X-XXX-XXXX/XXX.
5. EXPOSED CONDUIT TYPE TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
6. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
7. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER FE-X-XXX-XXXX/XXX.
8. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES.
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 DEFINITION.
12. STUB UP CONDUITS BENEATH GENERATOR FRAME PER MANUFACTURER RECOMMENDATIONS. USE FLEXIBLE CONDUIT FOR TRANSITION BETWEEN EXPOSED CONDUIT TRANSTION AND ELECTRICAL CONNECTION BOX AND GENERATOR CONTROL PANEL.
13. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE.

FIRST FLOOR LIGHTING AND RECEPTACLE PLAN

0 30 60 90

SCALE: 1"=30'

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY		TPF	

REVISIONS

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

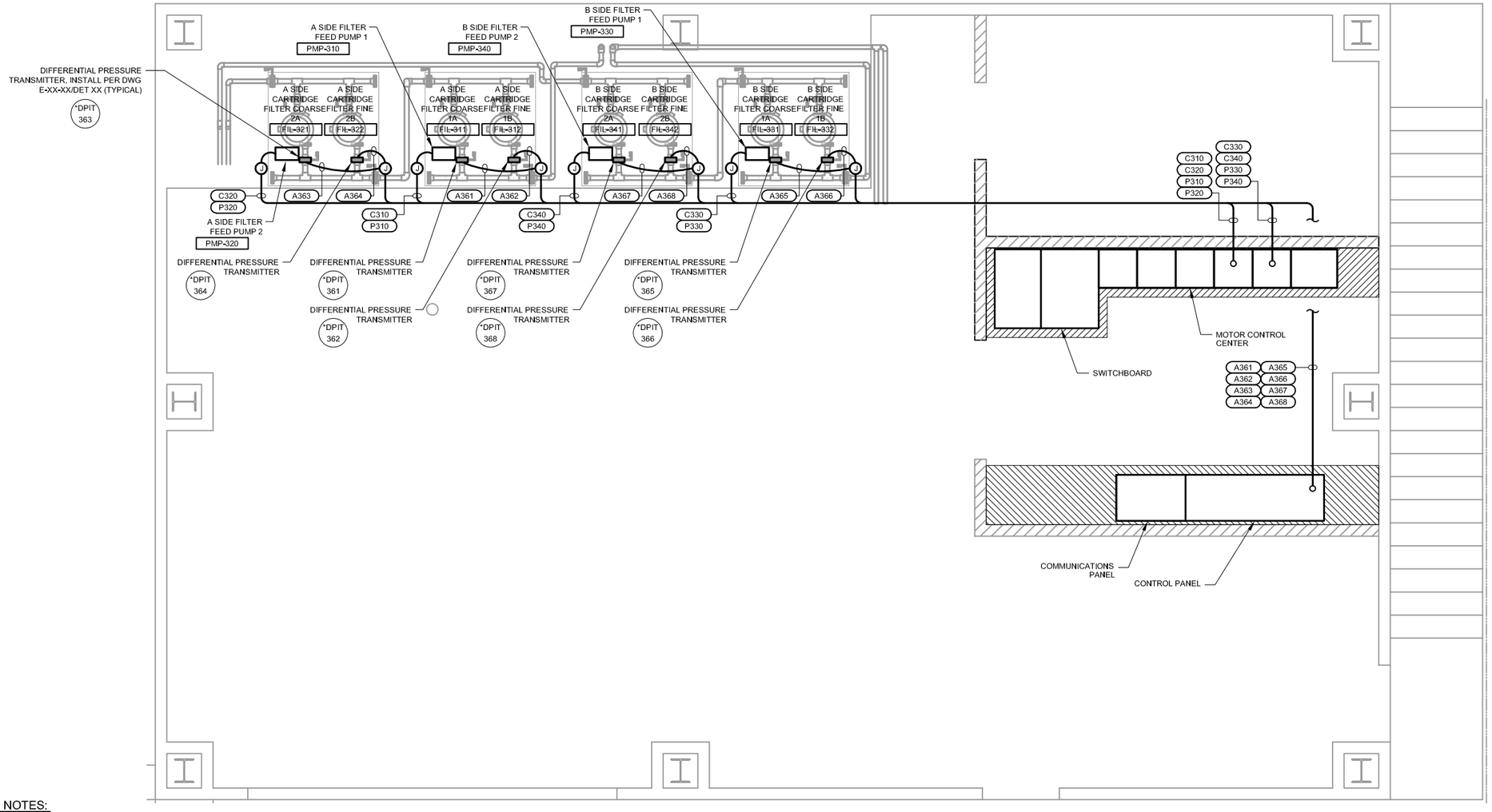
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT 1ST FLOOR LIGHTING AND RECEPTACLE PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. of SHEETS	
E-12-21	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:26:55am

FILENAME: FE-E-xxx-1220AD.dwg

N1606



ELECTRICAL PLAN NOTES:

1. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH CIVIL/MECH PLANS.
2. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, DWG FE-X-XXX-XXXX.
3. 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 XXXXX.
4. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL FE-X-XXX-XXXX/XXX.
5. EXPOSED CONDUIT TYPE TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
6. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
7. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER FE-X-XXX-XXXX/XXX.
8. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES.
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 DEFINITION.
12. STUB UP CONDUITS BENEATH GENERATOR FRAME PER MANUFACTURER RECOMMENDATIONS. USE FLEXIBLE CONDUIT FOR TRANSITION BETWEEN EXPOSED CONDUIT TRANSTION AND ELECTRICAL CONNECTION BOX AND GENERATOR CONTROL PANEL.
13. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE.

SECOND FLOOR POWER AND CONTROL PLAN

0 30 60 90
SCALE: 1"=30'

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

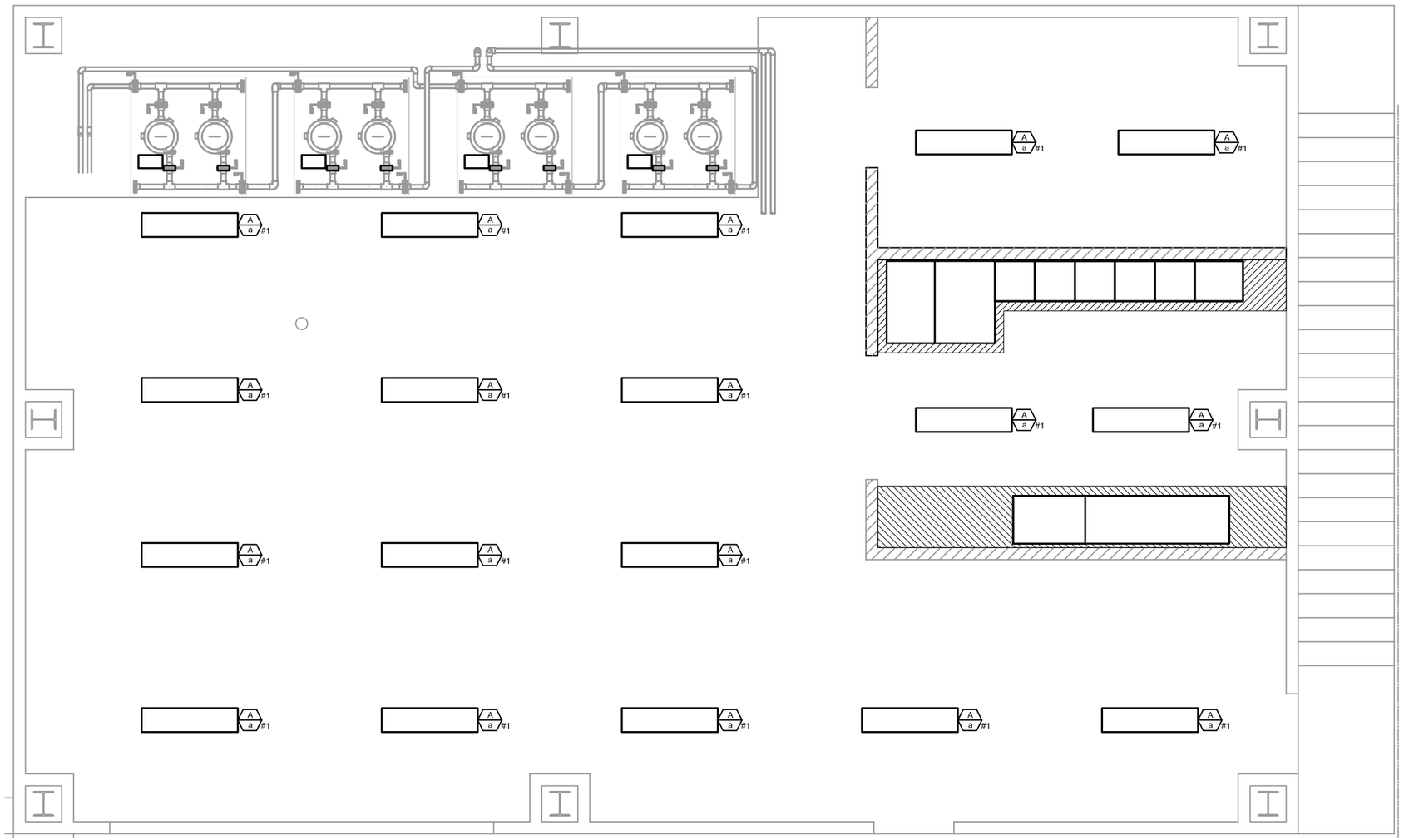
APPROVED BY	
TPF	SO
	SUPV
	DSGN TPF
	DWN MBY, NC
	CHKD TPF
	OK TPF
	DATE
	SCALES N/A

TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT 2ND FLOOR POWER & CONTROL 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-12-22	REV

PLOT TIME: 10:26:19am
PLOT DATE: Apr 03, 2013
FILENAME: FE-E-xxx-1222AD.dwg

N1808



ELECTRICAL PLAN NOTES:

1. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE ALL WORK WITH CIVIL/MECH PLANS.
2. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT SCHEDULE, DWG FE-X-XXX-XXXX.
3. 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 XXXXX.
4. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL FE-X-XXX-XXXX/XXX.
5. EXPOSED CONDUIT TYPE TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
6. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE CONDUIT SPECIFICATIONS.
7. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER FE-X-XXX-XXXX/XXX.
8. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES.
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 DEFINITION.
12. STUB UP CONDUITS BENEATH GENERATOR FRAME PER MANUFACTURER RECOMMENDATIONS. USE FLEXIBLE CONDUIT FOR TRANSITION BETWEEN EXPOSED CONDUIT TRANSTION AND ELECTRICAL CONNECTION BOX AND GENERATOR CONTROL PANEL.
13. ALL WORK SHALL CONFORM TO LOCAL CODES AND 2010 NATIONAL ELECTRIC CODE.

SECOND FLOOR LIGHTING AND RECEPTACLE PLAN

0 30 60 90

SCALE: 1"=30'

N

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

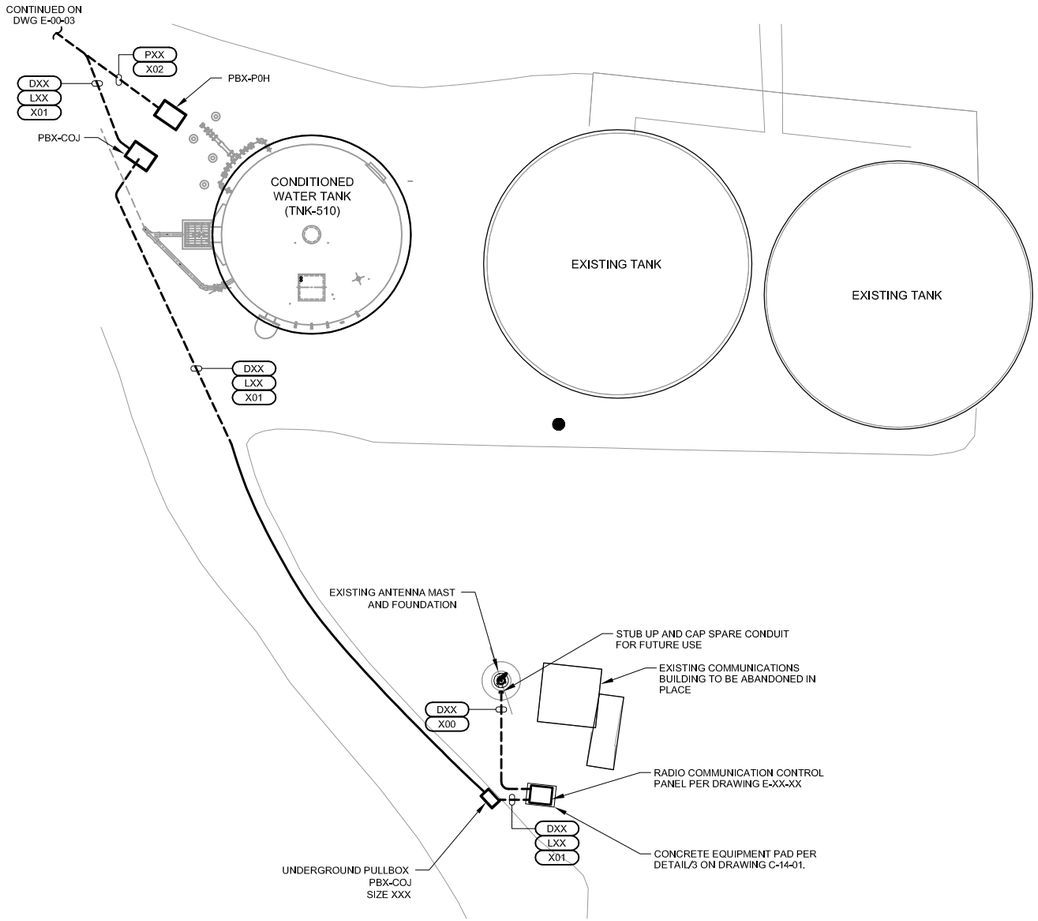
TOPOCK GROUNDWATER REMEDIATION PROJECT
REMEDY PRODUCED WATER CONDITIONING PLANT 2ND FLOOR LIGHTING AND RECEPTACLE PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-12-23	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:26:29am

FILENAME: FE-E-xxx-1222AD.dwg

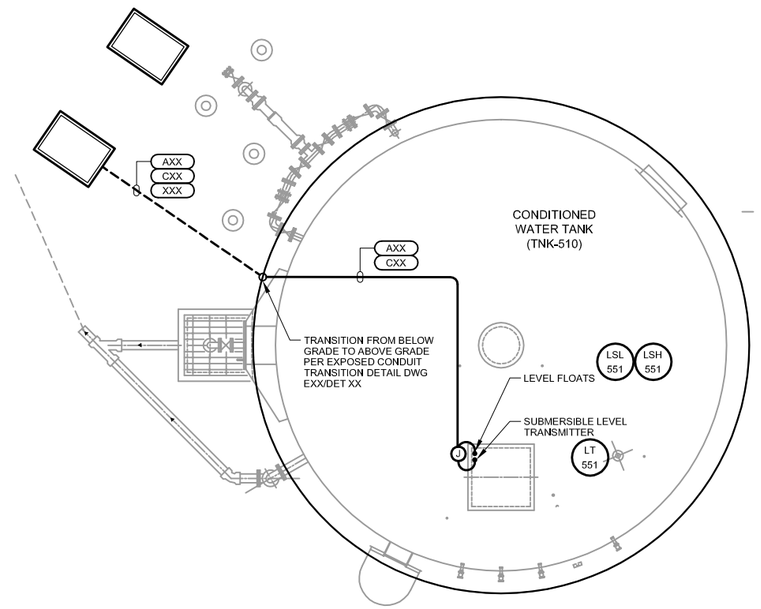
N1808



CONDITIONED WATER STORAGE TANK AREA PLAN

0 10 20 30

SCALE: 1"=10'



CONDITIONED WATER STORAGE TANK ELECTRICAL PLAN

0 .25 .5 .75

SCALE: 1/4"=1'

DRAFT
NOT FOR
CONSTRUCTION

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	2012/09/12	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			TPF

REVISIONS

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

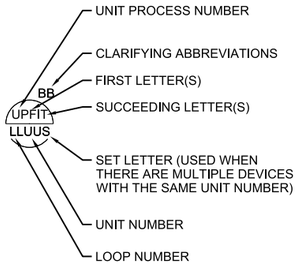
TOPOCK GROUNDWATER REMEDIATION PROJECT
TCS CONDITIONED WATER STORAGE TANK AREA PLAN
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
E-12-24	REV

PLOT DATE: Apr 03, 2013 PLOT TIME: 10:20:35am
FILENAME: FE-E-xxxx-1224AD.dwg
N1808

INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS



DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- $\triangle_X$ DISCRETE INPUT
- ∇_X DISCRETE OUTPUT

ANALOG IND.

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



- FIELD MOUNTED
- REAR-OF-PANEL MOUNTED (OPERATOR INACCESSIBLE)
- PANEL MOUNTED (OPERATOR ACCESSIBLE)
- MCC MOUNTED
- COMPUTER FUNCTION
- PLC FUNCTION
- SHARED DISPLAY, SHARED CONTROL

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).

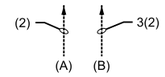


STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

LINE LEGEND

- PRIMARY PROCESS (CLOSED CONDUIT, DASHED LINE INDICATES ALTERNATE FLOW STREAM)
- SECONDARY PROCESS
- BYPASS PROCESS
- ANALOG SIGNAL (4 TO 20 mAdc, ETC.)
- DISCRETE (ON/OFF, ETC.)
- PNEUMATIC SIGNAL
- FILLED SYSTEM SIGNAL
- HYDRAULIC SYSTEM SIGNAL
- DATA LINK
- BUILDING OR FACILITY BOUNDARY
- PACKAGE SYSTEM EQUIPMENT
- TYPICAL BREAK
- FUTURE
- EXISTING

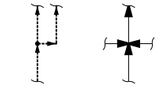
PARALLELING LINES



(A) TOTAL OF 2 SIGNALS

(B) 3 TYPICAL SETS OF 2 SIGNALS EACH. TOTAL OF 6 SIGNALS.

CONNECTING LINES



NON-CONNECTING LINES



INTERFACE SYMBOLS

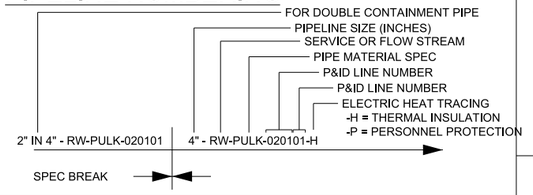


D DESTINATION DRAWING NO.

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

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
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
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
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
$\triangle$	DIFFERENCE
Σ	SUM
$\times$	MULTIPLY
$\div$	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 ($\ast$) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK ($\ast\ast$) 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.

DRAFT
NOT FOR
CONSTRUCTION

MICROFILM

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY				JP

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	RCH
DWN	MBY
CHKD	KM
OK	JP
DATE	
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INSTRUMENTATION SYMBOLS AND ABBREVIATIONS 1
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

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

PLOT TIME: 9:38:20 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-0001AD.dwg

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 (FLOAT)
- GENERIC
- LEVEL (BUBBLER TUBE)
- ROTAMETER
- LEVEL
- DENSITY METER

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	RW	REMEDY PRODUCED WATER
CA	RIVERBANK EXTRACTION WATER (MAY BE CARBON AMENDED)	SL	SLURRY/SOLIDS
CAU	25% CAUSTIC	TW	TREATED (FILTERED) REMEDY PRODUCED WATER
CO2	CARBON DIOXIDE		
COG	COAGULANT	UA	UTILITY AIR
DR	DRAIN	VT	VENT
EW	EMERGENCY/FIRE WATER	WS	WASTE STREAM
EX	EXTRACTED GROUNDWATER (TRANSWESTERN OR EAST RAVINE)	LW	LAB WASTE
FW	FRESH WATER	PW	POTABLE WATER
IA	INSTRUMENT AIR		

PUMP AND COMPRESSOR SYMBOLS

- CENTRIFUGAL PUMP
- SUBMERSIBLE SUMP PUMP
- AIR DIAPHRAGM PUMP
- METERING PUMP (POSITIVE DISPLACEMENT)
- WELL PUMP
- CENTRIFIGAL COMPRESSOR

DRAFT
NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY				JP

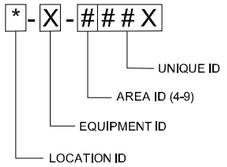
REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	RCH
DWN	MBY
CHKD	KM
OK	JP
DATE	
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID INSTRUMENTATION SYMBOLS AND ABBREVIATIONS 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
I-00-02	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:41:59 PM
FILENAME: FE-I-XXX-0002AD.dwg



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

- DRAFT -
NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

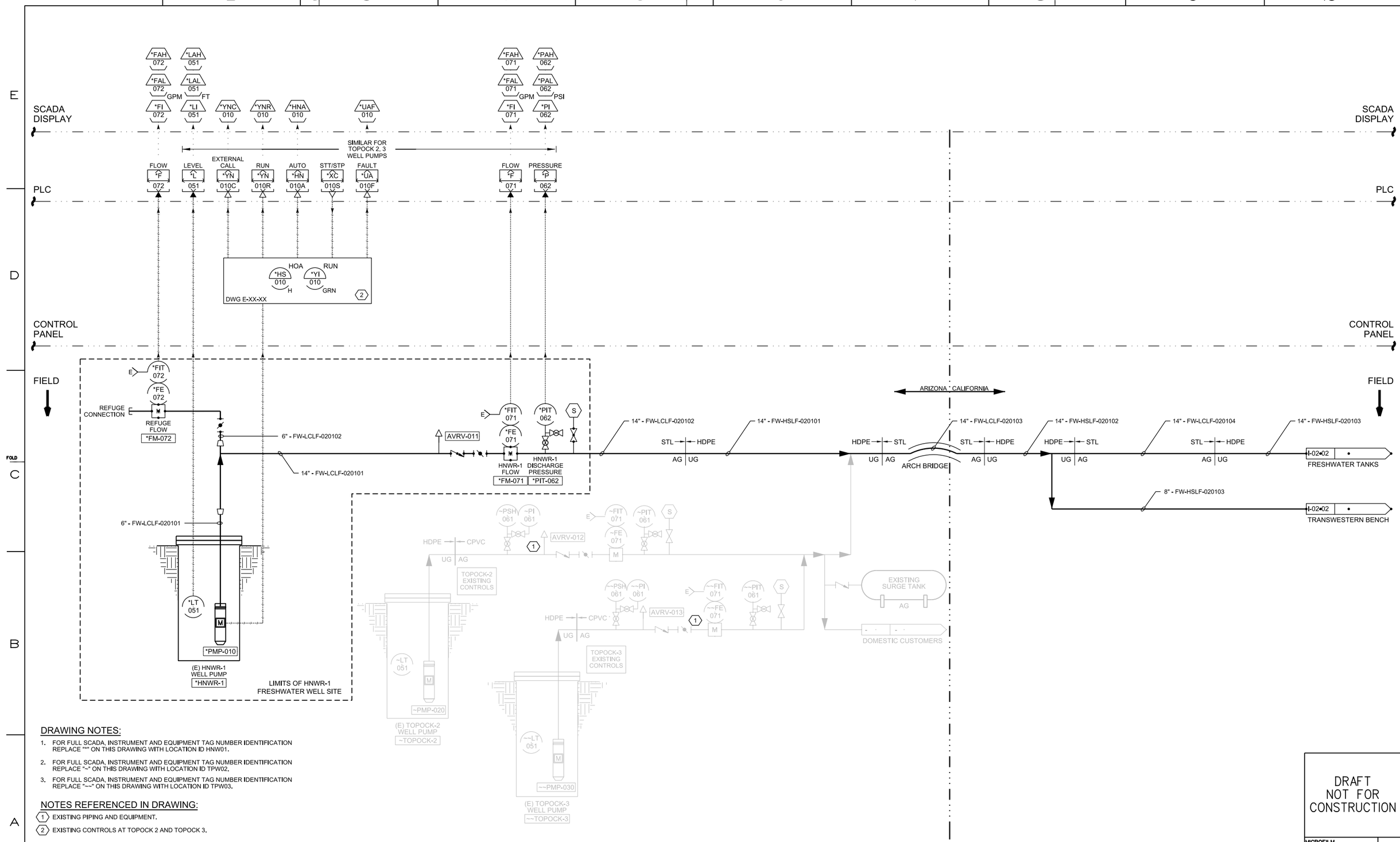
REMEDY WELL ID SCHEDULE

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-00-03
REV

03/27/2013, 14:43, G:\Graphics\ARI\TOPOCK\01\Submittal-60%_March2013\HILL Formatted P&ID.dwg, Tab: I-00-03

N1808



DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID HNW01.
2. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "~" ON THIS DRAWING WITH LOCATION ID TPW02.
3. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "~~" ON THIS DRAWING WITH LOCATION ID TPW03.

NOTES REFERENCED IN DRAWING:

1. EXISTING PIPING AND EQUIPMENT.
2. EXISTING CONTROLS AT TOPOCK 2 AND TOPOCK 3.

DRAFT
NOT FOR
CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

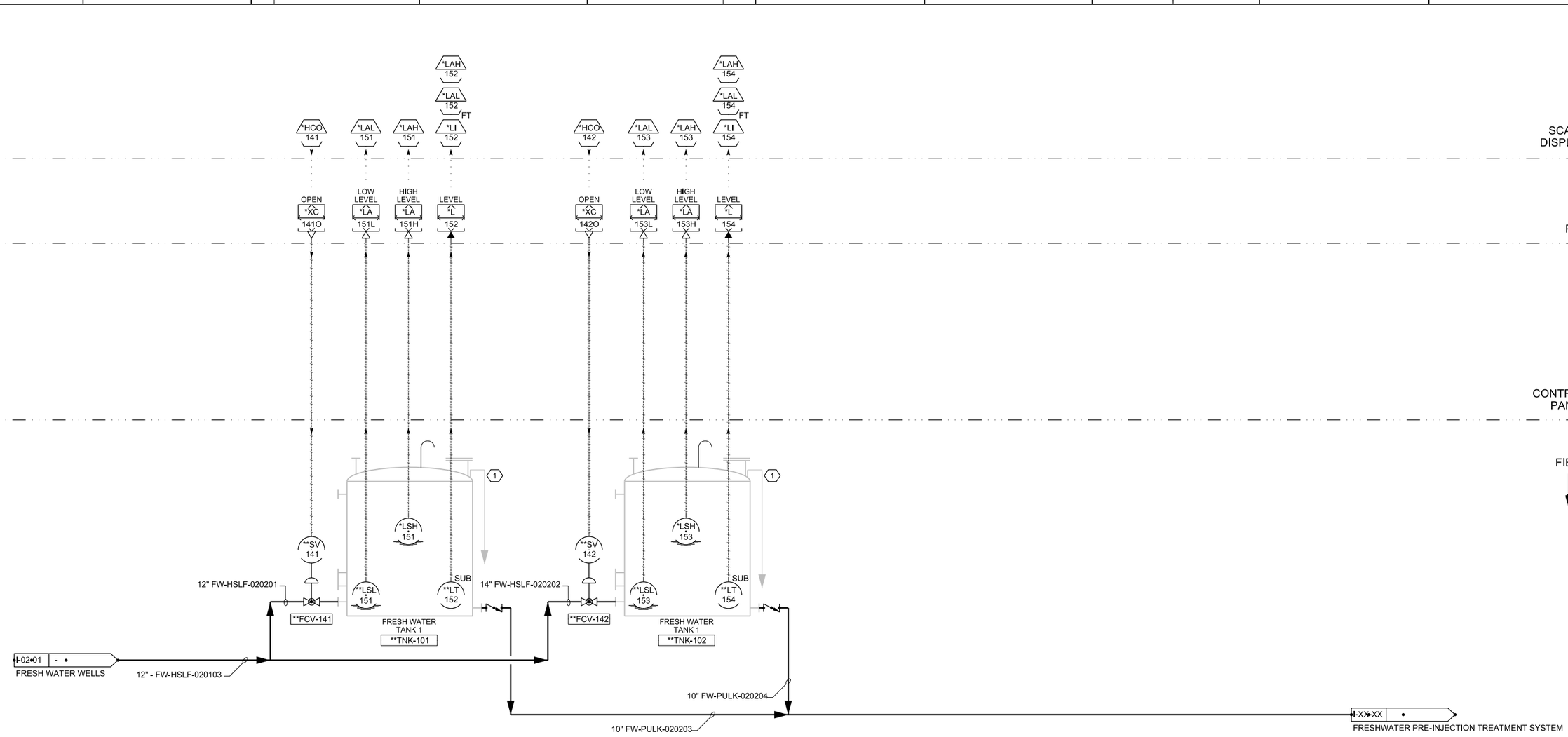
APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TFP
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
FRESH WATER SUPPLY WELLS
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-02-01	REV

PLOT TIME: 9:38:53 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-0202AD.dwg

N1508



DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE *** ON THIS DRAWING WITH LOCATION ID FW01.

NOTES REFERENCED IN DRAWING:

1. EXISTING PIPING AND EQUIPMENT.

DRAFT
NOT FOR
CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
FRESH WATER TANKS
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-02-02	REV

PLOT TIME: 9:39:54 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-0202AD.dwg

N1808

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

SIMILAR FOR ALL MOTORIZED VALVES

DWG E-XX-XX

HOA RUN

4" - FW-LCLF-020206

FRESH WATER PIPELINE

FRESH WATER PRESSURE *PIT-061

*FV-011

FRESH WATER FLOW *FM-071

2" - FW-PULK-020301

4" - FW-PULK-020301

REMEDY PRODUCED WATER FLOW *FM-072

METER AND VALVE VAULT

6"-RW-LCLF-020301

INFLUENT TANK FARM

6"-RW-PULK-020301

HYDRAULIC CONTROL PANEL

WELLHEAD PRESSURE *PIT-061

INJECTION WELL *FW-001 (INJ-001)

WELL VAULT

INJECTION WELL (1)(2)(3)

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID FW-01, FW-02 AND IRL-01, IRL-02, IRL-03, IRL-04.

NOTES REFERENCED IN DRAWING:

(1) DRAWING TYPICAL FOR FW-002, AND IRL-1-4.
(2) FW-002 INLET IS 2" AND OUTLET TO MAIN LINE IS 4".
(3) FW-003 AND IRL-5 THROUGH 7 ARE FUTURE.
(4) CO2/AQUA-GARD CHEMICAL INJECTION 1" STAINLESS STEEL AT WELL HEAD.
(5) 3" PVC ACCESS TUBE FOR DOWNHOLE CAMERA ACCESS.
(6) 1" SOUNDING TUBE.
(7) ASR FLOW CONTROL VALVE FOR INJECTION AND RECOVERY

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INJECTION WELL
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-02-03	REV

PLOT TIME: 9:35:50 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-0203AD.dwg

N1808

SCADA
PLC NODE 2
LOCAL PANEL
FIELD
SEE NOTE 2

HOA HS XXX
*LAH 45XX
*PAL 462D
*YI 404
*ZC 404
*ZI 404
400
402
401
901
1
2
3 4 5
HOA HS XXX
*FIQR 47XA
*FIQ 47XA
*FIR 47XA
*FI 47XA
6 7
*YI 44X
8
*PI 46XX
*PIR 46XX
*PAL 46XX
*PAH 46XX
9
*PI 46XX
*PIR 46XX
*PAL 46XX
10

SEE NOTE 1

I-08-01
CARBON AMENDED GROUNDWATER TO TCS INJECTION WELLS

I-02-01
FRESHWATER

3"X2"
TCS DUAL SCREEN INJECTION WELL
I-11-01
BACKWASH TO REMEDY PRODUCED WATER CONDITIONING PLANT

*V404A 2"
*V404B 2"
*V404C 2"
*V403A 2"
*V405B 2"
*FV407
*FV408
1-1/2"
M
1-1/2"X1"
1"X1-1/2"
1-1/2"X1/2"
1-1/2"X1/4"
*FIT 472A
*FE 472A
*FIT 472B
*FI 472B
*V403B
*V403C
*V404F
*V404G
*V403D
*V403H
*V405C
*V405A
*V404I
*V406
*V403E
0-100 PSI
*PI 462A
*PI 462E
*PI 462B
*PI 462C
*PS 462D
*PT 462E
*PE 462E
*PT 462F
*PE 462F
1/4"
SAMPLE PORT
1
*LS 452A
LEAK DETECTION
*LS 452B
2
*V405C
8
*P442
WELL PUMP
*P443
LIMITS OF INJECTION WELL METER VAULT
LIMITS OF INJECTION WELL CASING
WELL VAULT
WELL *A

EAST RAVINE SINGLE SCREEN EXTRACTION WELLS
*FIT 470A
*FE 470A
*PI 460A
*PI 462B
*V401D 1"
*V401C 1"
*V401B 1"
*V401A 1"
*LS 450A
*PT 460B
*PE 460B
LIMITS OF EXTRACTION WELL METER VAULT
LIMITS OF EXTRACTION WELL CASING
WELL PUMP *P440
WELL *A
2"X1"
I-08-01
EAST RAVINE EXTRACTION WELL NETWORK HEADER

TRANSWESTERN BENCH SINGLE SCREEN EXTRACTION WELLS
*V402D 2"
*FIT 471A
*FE 471A
*LS 451A
1"X2"
2"X1"
*PI 461A
*V402C 2"
*V402B 2"
1-1/2"X2"
*V402A 2"
*PT 461B
*PE 461B
WELL PUMP *P441
WELL *A
I-08-01
TRANSWESTERN BENCH EXTRACTION WELL NETWORK HEADER

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

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

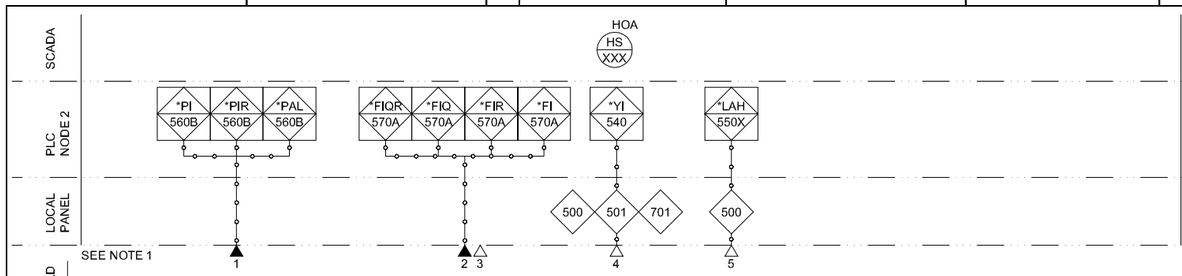
TCS LOOP EXTRACTION AND INJECTION WELLS P&ID

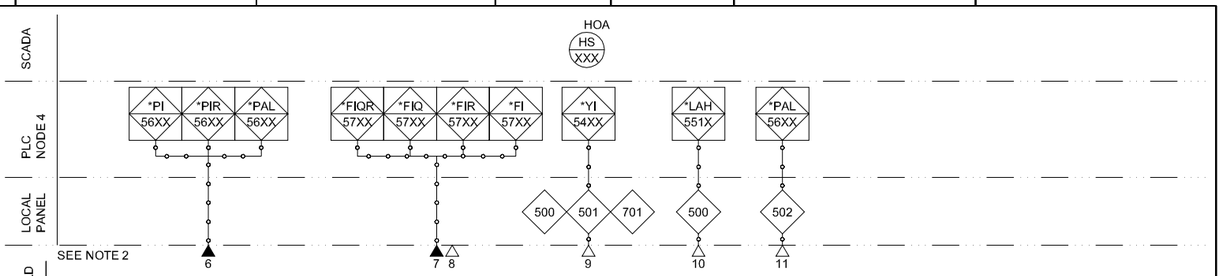
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

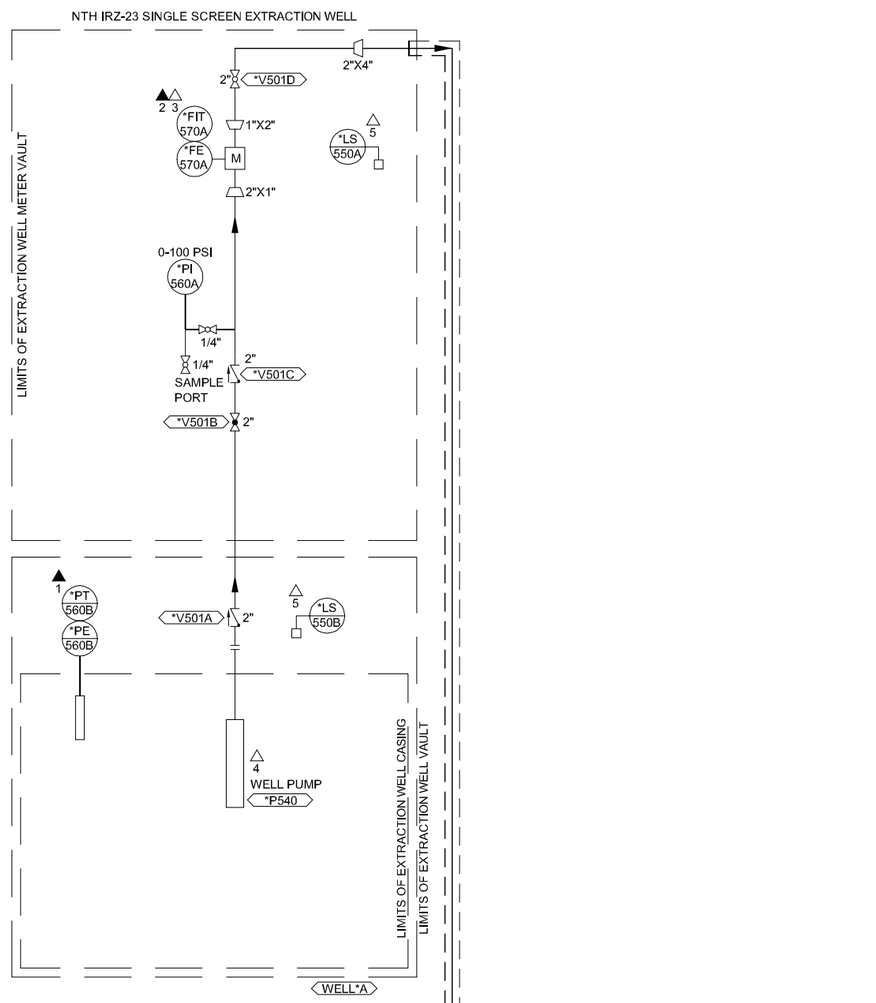
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-03-01	REV

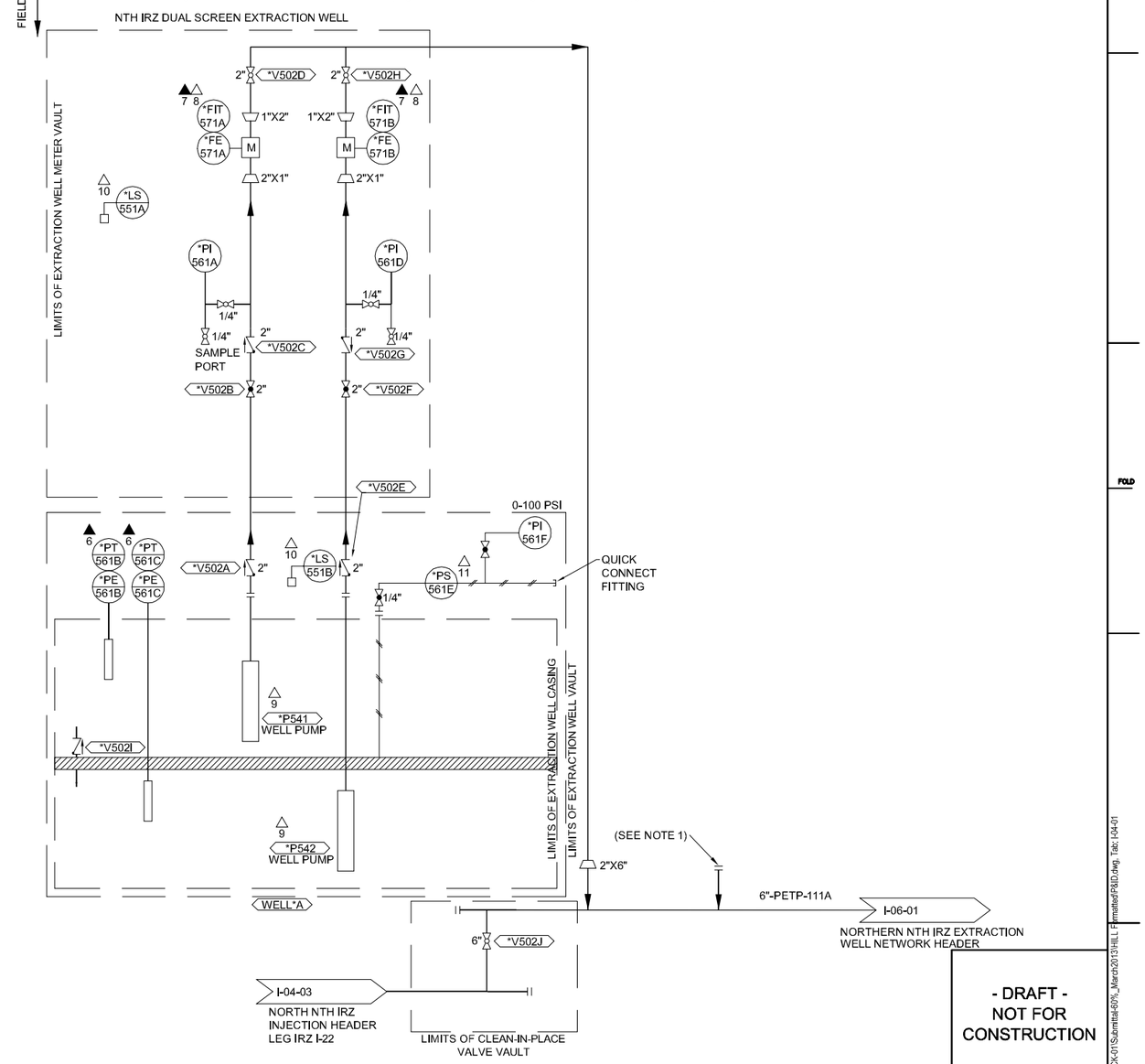
N1808

03/27/2013, 14:43, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL FilmsttedP&ID.dwg, Tab: I-03-01









NOTES

1. EXTRACTION WELL CONNECTIONS FOR FUTURE PROVISIONAL EXTRACTION WELLS. SEE CIVIL SHEETS FOR LOCATIONS.
2. SIMILAR FOR EACH INTERVAL.
3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ-23 EXTRACTION WELL IS "IRZ23-". FOR THE NORTHERN NTH IRZ EXTRACTION WELLS THE LOCATION IS "IRZXX-". EXCHANGE "IRZ23-" OR "IRZXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
4. SEE SHEET I-00-03 FOR INTERLOCK TABLE.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

NTH IRZ 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-04-01	REV

03/27/2013, 14:43, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Fil\matter\P&ID.dwg, Tab: I-04-01

N1808

SCADA
PLC NODE 2
LOCAL PANEL
FIELD
SEE NOTE 2

*LAH 55XX
*PAL 56XX
*PI 56XX
*PIR 56XX
*PAL 56XX
*PAH 56XX
HOA HS XXX
*YI 54X
*FIQR 57XX
*FIQ 57XX
*FIR 57XX
*FI 57XX
HOA HS XXX
*YI 50X
*ZC 50X
*ZI 50X

500 502 500 501 701 500 501 701

(SEE NOTE 1)

I-06-01
SOUTH NTH IRZ INJECTION HEADER LEG IRZ 24-40

4"X2" 4"X2" 4"X2" 4"X2"

*V512 4" 4"X2"
LIMITS OF CLEAN-IN-PLACE VALVE VAULT

I-06-02
BACKWASH

NTH IRZ SINGLE SCREEN INJECTION WELL

LIMITS OF INJECTION WELL METER VAULT

*LS 552A
LEAK DETECTION

*V503A 2"
1-1/2" M *FV504
*FE 572A
*FIT 572A
*V503C
*V503B 1-1/2" 1/2"
1-1/2"X1/2" 1/2"
0-100 PSI *PI 562A
SAMPLE PORT 1/4"
1-1/2"X1/4"

2" *V505B
0-100 PSI *PI 562B
SAMPLE PORT 1/4" 1/4"
1-1/2"X1/4"
2" *V505C

*V505A 2"
*PT 562E
*PE 562E

4 *P542

*V503D 1-1/2"

LIMITS OF INJECTION WELL CASING

WELL *A

NTH IRZ DUAL SCREEN INJECTION WELL

*V507A 2"
2" *V510C

LIMITS OF INJECTION WELL METER VAULT

1-1/2" M *FV508
*FE 573A
*FIT 573A
*V507C
*V507B 1-1/2" 1/2"
1-1/2"X1/2" 1/2"
*PI 563A 0-100 PSI
1/4" SAMPLE PORT
1/4"
1-1/2"X1/4"

*PI 563C 0-100 PSI
1/4" SAMPLE PORT
1-1/2"X1/4"
2" *V510B

*LS 553A

*V510A 2"
*LS 553B
LEAK DETECTION
*PT 563H
*PE 563H

4 *P544

*V507E 1-1/2"

*V511A

4 *P545

*V507G 1-1/2"

1-1/2" M *FV509
*FIT 573B
*FE 573B
*V507F
*V507E 1-1/2" 1/2"
1-1/2"X1/2" 1/2"
*PI 563B 0-100 PSI
1/4" SAMPLE PORT
1/4"
1-1/2"X1/4"

*PE 563J
*PT 563I
*PS 563G 2
1/4" *PI 563D 0-100 PSI
QUICK CONNECT FITTING
1/4"

LIMITS OF INJECTION WELL CASING
LIMITS OF INJECTION WELL VAULT

NOTES
1. WELL CONNECTIONS FOR FUTURE PROVISIONAL WELLS. SEE CIVIL SHEETS FOR LOCATIONS.
2. SIMILAR FOR EACH INTERVAL.
3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ INJECTION WELLS IS "IRZXX-". EXCHANGE "IRZXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
4. SEE SHEET I-00-03 FOR INTERLOCK TABLE.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY		
JEF	SO	
	SUPV	JPB
	DSGN	MWM
	DWN	AJW
	CHKD	JPB
	OK	JEF
	DATE	04/05/13
	SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
SOUTH NTH IRZ 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-04-02	REV

03/27/2013, 14:43, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\P&ID.dwg, Tab: I-04-02

NT808

SCADA
PLC NODE 3
LOCAL PANEL
FIELD

*LAH 554X
*PAL 56XX
*PI 56XX
*PIR 56XX
*PAL 56XX
*PAH 56XX
HOA HS XXX
*YI 54X
*FIQR 57XX
*FIQ 57XX
*FIR 57XX
*FI 57XX
HOA HS XXX
*YI 51X
*ZC 51X
*ZI 51X

500
502
500 501 701
500 501 701

SEE NOTE 2
SEE NOTE 2 (SEE NOTE 1)

I-06-01
NORTH NTH IRZ INJECTION HEADER LEG IRZ I-22

6"X2"
6"X2"

*V502J 6"
*V523 6"
6"X2"
LIMITS OF CLEAN-IN-PLACE VALVE VAULT

I-04-01
NORTHERN NTH IRZ EXTRACTION WELL NETWORK HEADER

I-06-02
BACKWASH RETURN NORTH IRZ LEG IRZ 1-22

NTH IRZ DUAL SCREEN INJECTION WELL CLUSTERS

*V513A 2"
2" *V519C
2" *V520C

1-1/2" M *FV514 *FIT 574A *FE 574A *V513C *V513B 1-1/2" 1-1/2"X1/2" *PI 564A 0-100 PSI 1/4" SAMPLE PORT 1/4" 1-1/2"X1/4"
*PI 564C 0-100 PSI 1/4" SAMPLE PORT 1/4" 1-1/2"X1/4" 2" *V519D
1-1/2" M *FV515 *FE 574B *FIT 574B *V513E *V513F 1-1/2" 1-1/2"X1/2" *PI 564B 0-100 PSI 1/4" SAMPLE PORT 1/4" 1-1/2"X1/4"
1-1/2" M *FV516 *FIT 575A *FE 575A *V518A *V518B 1-1/2" 1-1/2"X1/2" *PI 565A 0-100 PSI 1/4" SAMPLE PORT 1/4" 1-1/2"X1/4"
*PI 565C 0-100 PSI 1/4" SAMPLE PORT 1/4" 1-1/2"X1/4" 2" *V520D
1-1/2" M *FV517 *FIT 575B *FE 575B *V518D *V518E 1-1/2" 1-1/2"X1/2" *PI 565B 0-100 PSI 1/4" SAMPLE PORT 1/4" 1-1/2"X1/4"

LIMITS OF INJECTION WELL METER VAULT

*LS 554A LEAK DETECTION

QUICK CONNECT FITTING

*PT 564H *PE 564H *PE 564I *PT 564I
*LS 554B
*V519B 2"
*PI 564E 1/4" *PS 564G 1/4"
*V513D 1-1/2"
*P546
*V521C
*P547
*V513G
LIMITS OF INJECTION WELL CASING
LIMITS OF INJECTION WELL VAULT
WELL *A

*LS 554C
2" *V520A
*P548
*V518C 1-1/2"
*V522C
*P549
WELL *B

*PT 565H *PE 565H *PE 565I *PT 565I
QUICK CONNECT FITTING
*PI 565E 1/4" *PS 565G 1/4"
*V518F 1-1/2"
LIMITS OF INJECTION WELL CASING
LIMITS OF INJECTION WELL VAULT

NOTES
1. WELL CONNECTIONS FOR FUTURE PROVISIONAL WELLS. SEE CIVIL SHEETS FOR LOCATIONS.
2. SIMILAR FOR EACH INTERVAL.
3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ INJECTION WELLS IS "IRZXX-". EXCHANGE "IRZXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
4. SEE SHEET I-00-03 FOR INTERLOCK TABLE.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY JEF

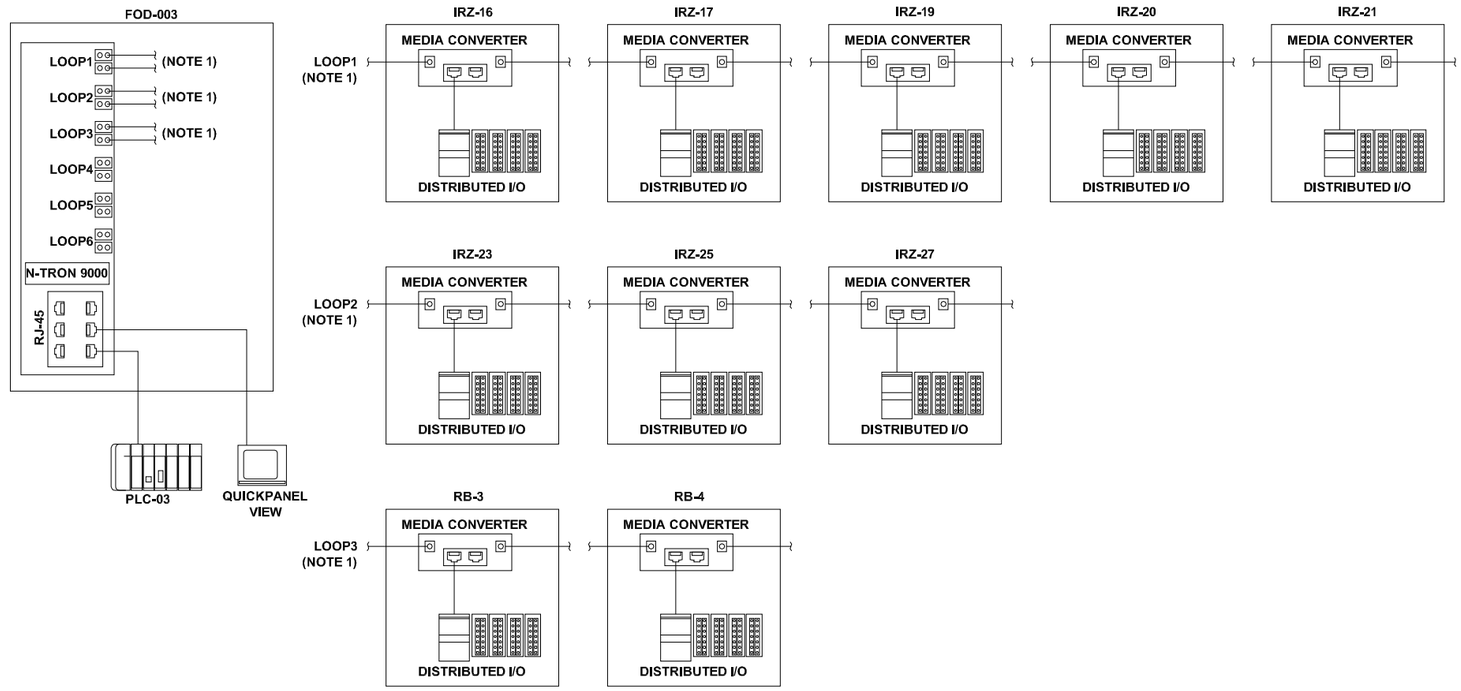
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
QK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
NORTH NTH IRZ 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-04-03	REV

N180B

03/27/2013, 14:43, G:\Graphics\ARIT\OPOCK\01\Submittal\60%_March2013\HILL P\matted\P&ID.dwg, Tab: I-04-03



LEGEND

FOD	FIBER OPTIC DROP
PLC	PROGRAMMABLE LOGIC CONTROLLER
I/O	INPUT/OUTPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

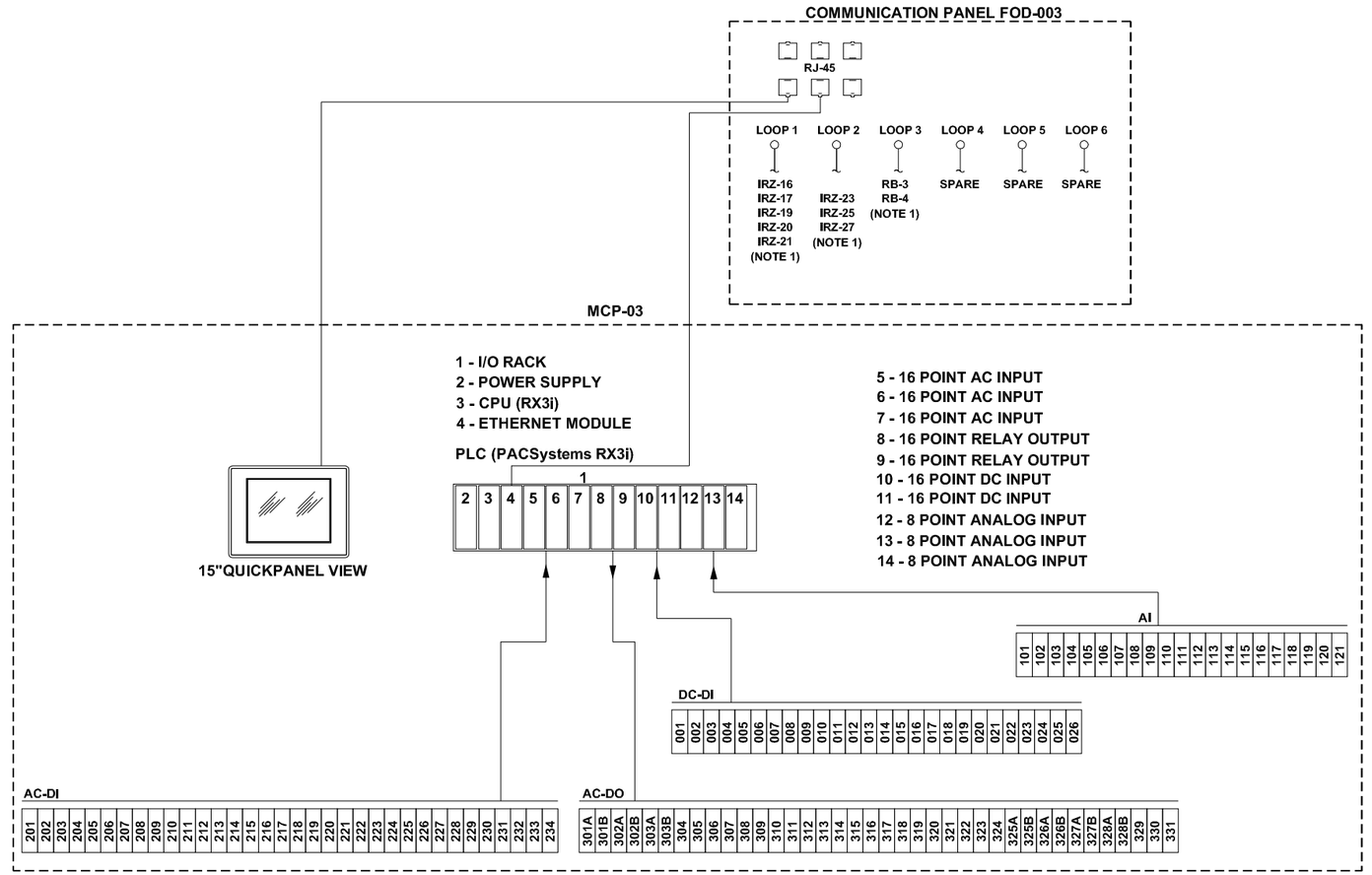
NORTH NTH IRZ NODE 03 FIBER OPTIC NETWORK

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-04-04	REV

N180B

03/26/2013, 18:41, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: I-04



LEGEND

AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC	DIRECT CURRENT
PLC	PROGRAMMABLE LOGIC CONTROLLER
FOD	FIBER OPTIC DROP
I/O	INPUT/OUTPUT
MCP	MAIN CONTROL PANEL

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT -
NOT FOR
CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

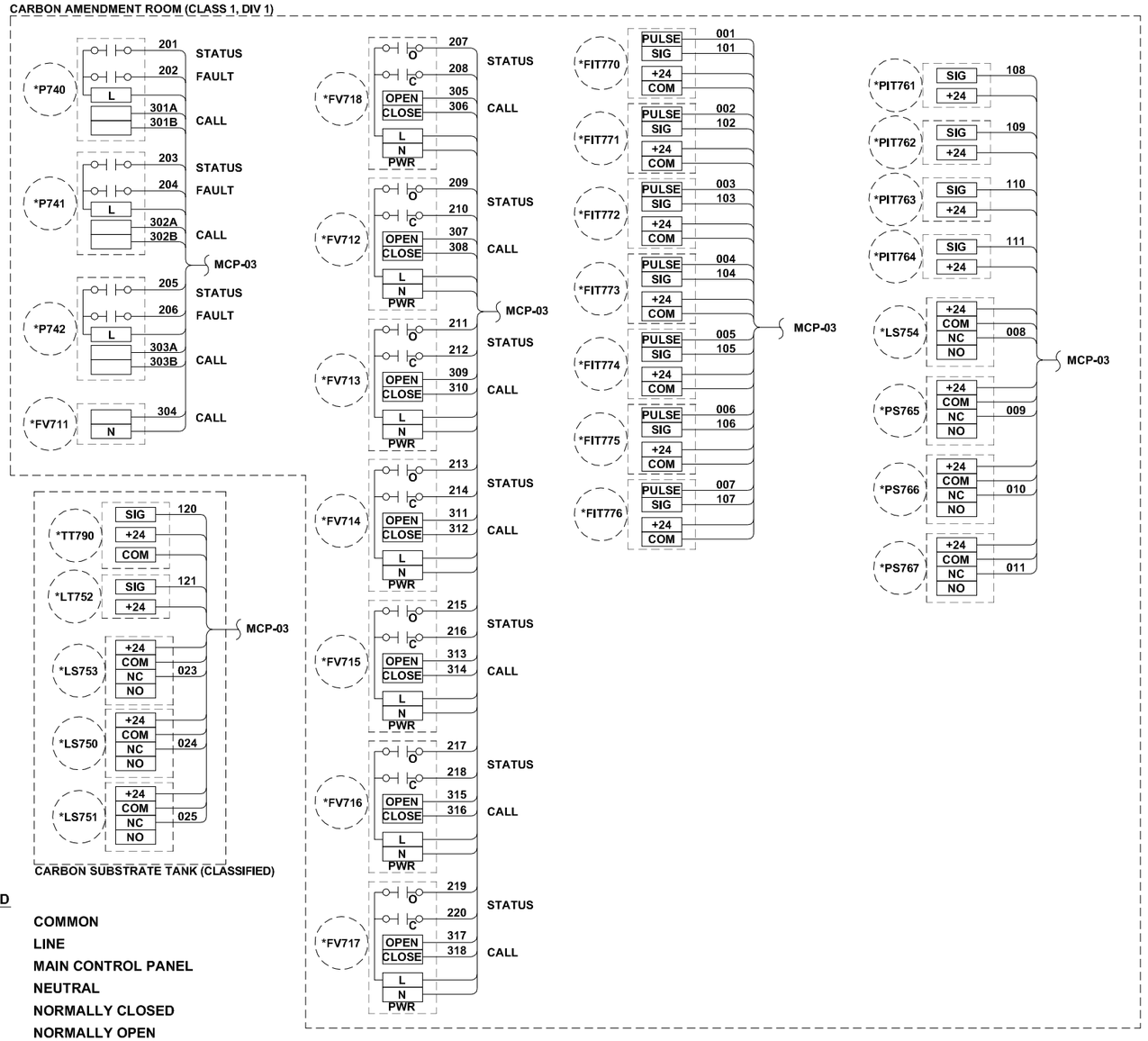
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
NORTH NTH IRZ NODE 03
MCP-03 INSTRUMENTATION CONNECTION
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-04-05
REV

N1808

03/26/2013, 18:41, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 4-05



LEGEND

COM	COMMON
L	LINE
MCP	MAIN CONTROL PANEL
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
PWR	POWER
SIG	SIGNAL

NOTES

1) ALL CONDUITS ENTERING AND EXITING CLASSIFIED AREA MUST BE INSTALLED IN ACCORDANCE WITH CLASS I, DIV. 1 REQUIREMENTS.

- DRAFT -
NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY: JEF

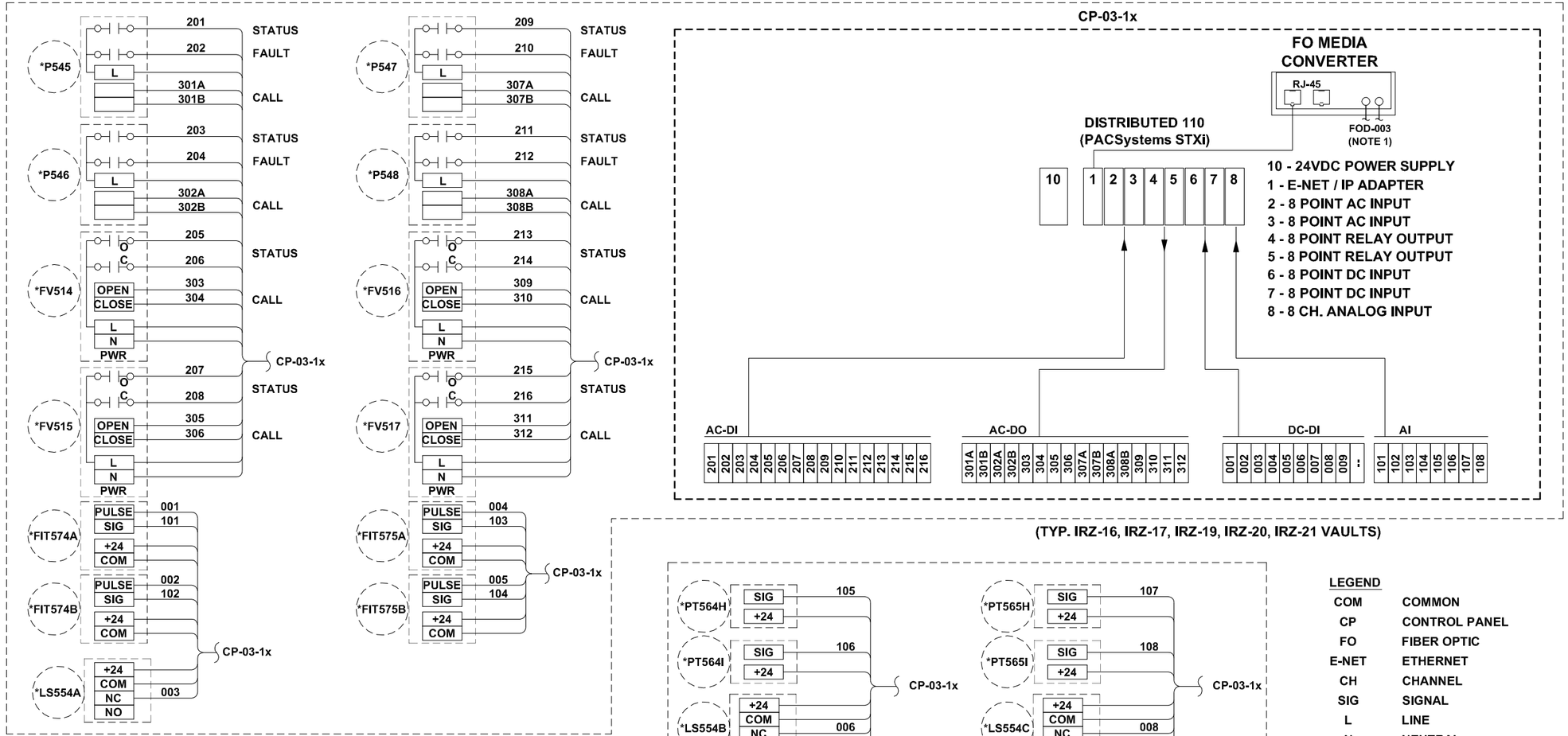
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
NORTH NTH IRZ NODE 03
MCP-03 INSTRUMENTATION CONNECTION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. I-04-06 of SHEETS
REV

N180B

03/26/2013, 18:41, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 4-06



(TYP. IRZ-16, IRZ-17, IRZ-19, IRZ-20, IRZ-21 VAULTS)

(TYP. IRZ-16, IRZ-17, IRZ-19, IRZ-20, IRZ-21 WELLS)

LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

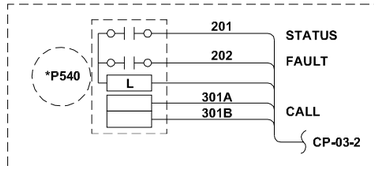
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

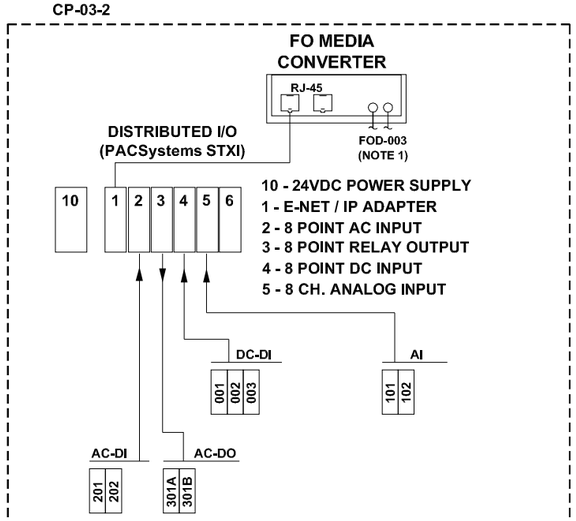
TOPOCK GROUNDWATER REMEDIATION PROJECT
NORTH NTH IRZ NODE 03
CP-03-xx INSTRUMENTATION CONNECTION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

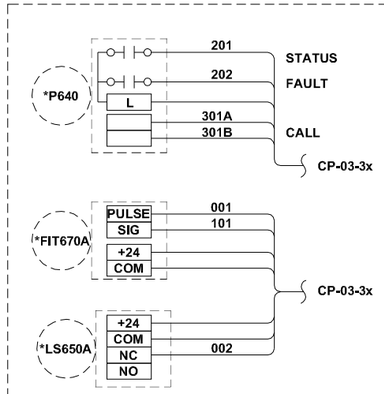
MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
I-04-07
REV

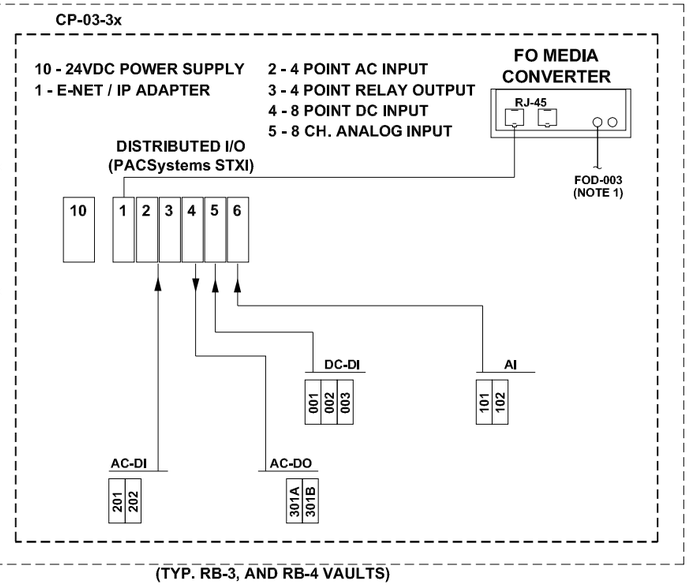
N180B

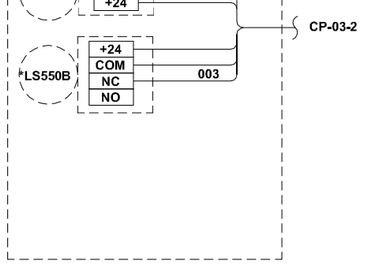
03/28/2013, 18:41, G:\Graphics\ARITOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: I-07

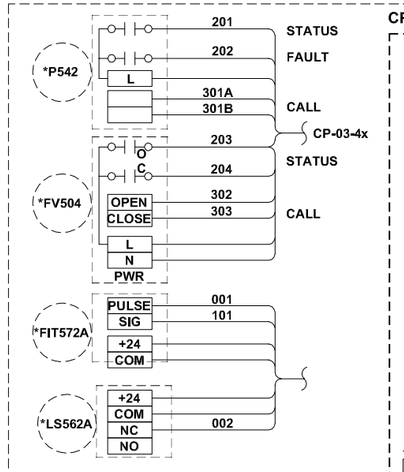


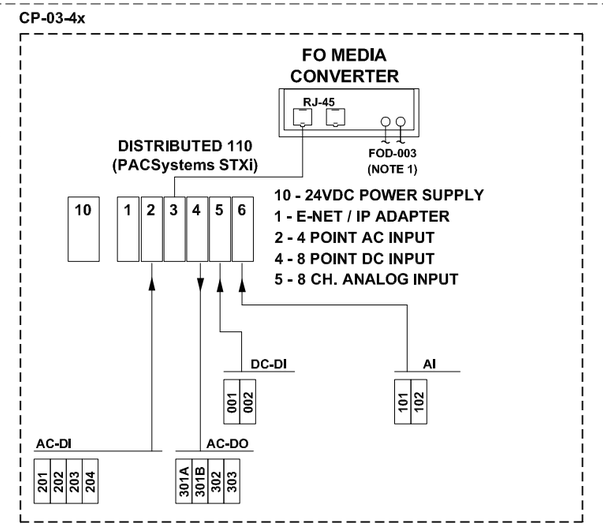


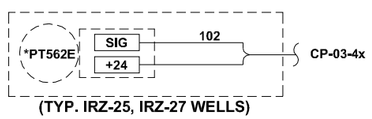












LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY	SO
JEF	SUPV JPB
	DSGN MWM
	DWN AJW
	CHKD JPB
	OK JEF
	DATE 04/05/13
	SCALES NONE

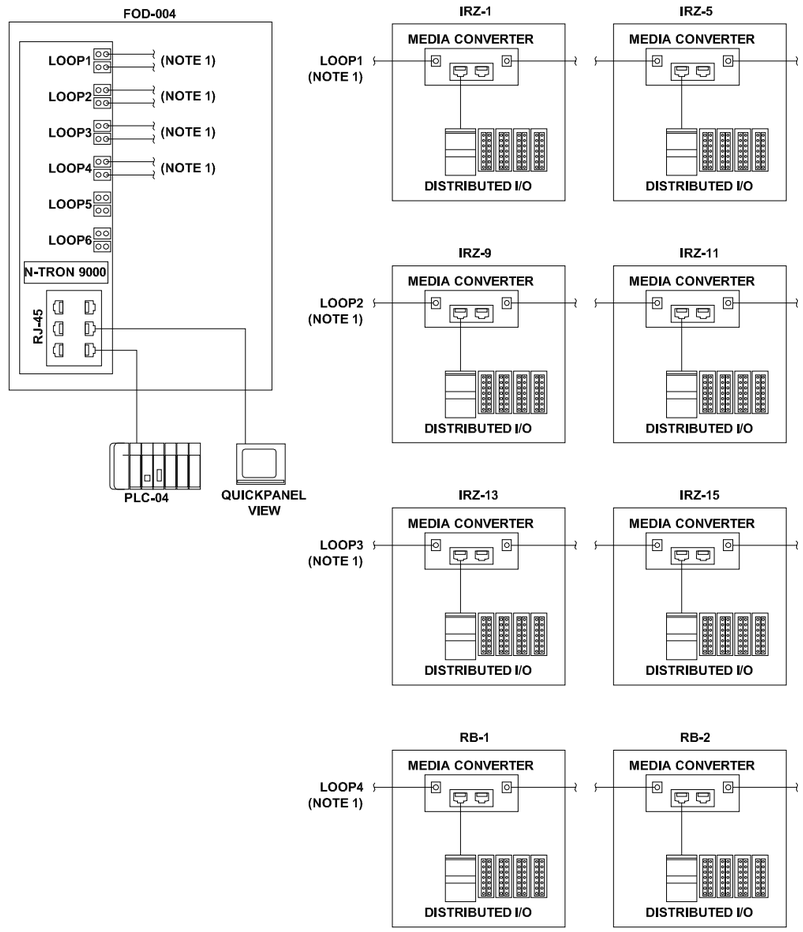
TOPOCK GROUNDWATER REMEDIATION PROJECT

NORTH NTH IRZ NODE 03
CP-03-xx INSTRUMENTATION CONNECTION

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-04-08	REV

03/26/2013, 18:41, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL Flirmatted\Controls.dwg, Tab: 4-08



LEGEND

FOD	FIBER OPTIC DROP
PLC	PROGRAMMABLE LOGIC CONTROLLER
I/O	INPUT/OUTPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

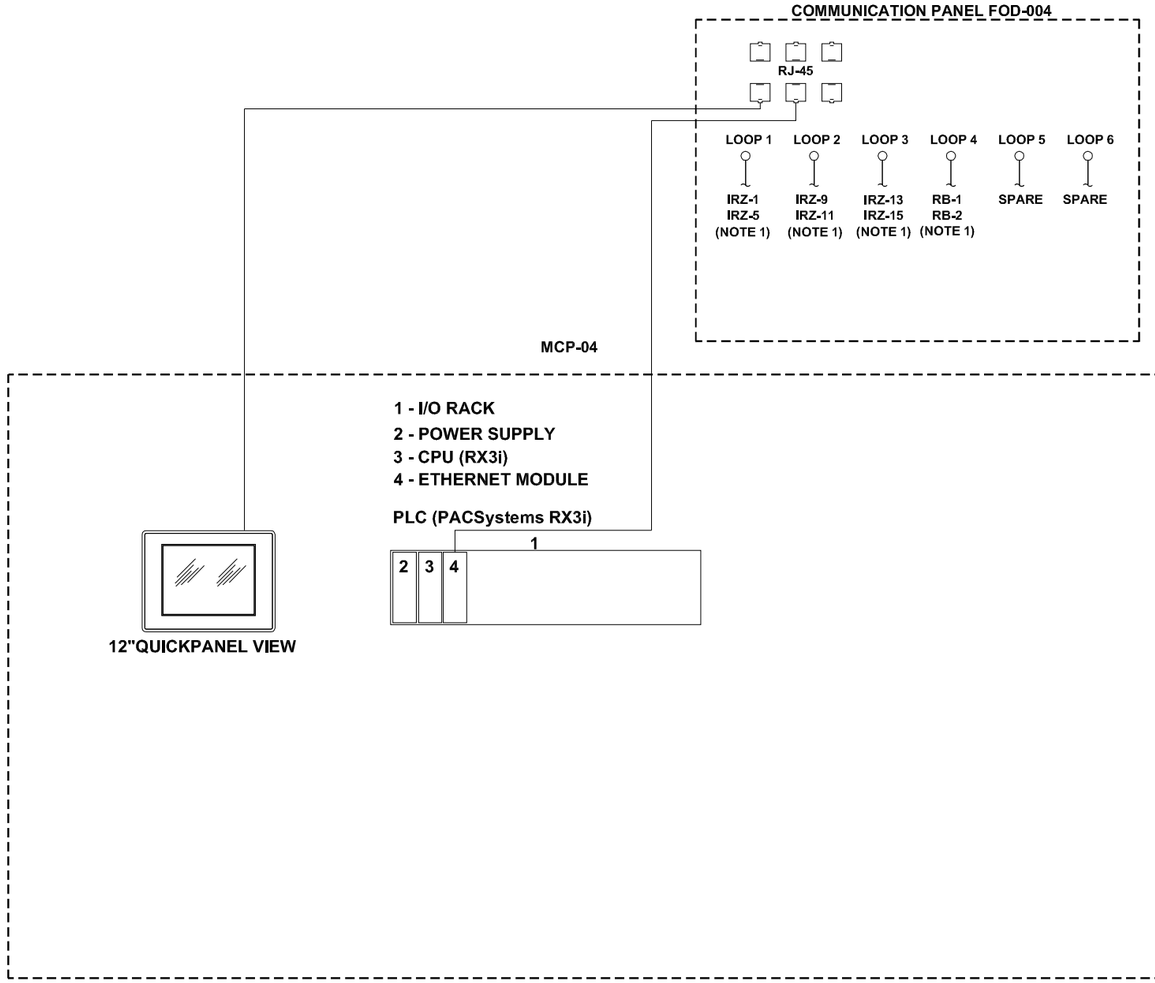
SOUTH NTH IRZ NODE 04 FIBER OPTIC NETWORK

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-04-09	REV

N180B

03/26/2013, 18:42, G:\Graphics\ART\TOPOCK-011\Submittal-60%_March2013\HILL Formatted Controls.dwg, Tab: I-09



LEGEND

AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC	DIRECT CURRENT
PLC	PROGRAMMABLE LOGIC CONTROLLER
FOD	FIBER OPTIC DROP
I/O	INPUT/OUTPUT
MCP	MAIN CONTROL PANEL

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

SOUTH NTH IRZ NODE 04 MCP-04 INSTRUMENTATION CONNECTION

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

- DRAFT -
NOT FOR CONSTRUCTION

MICROFILM

BILL OF MATL

DWG LIST

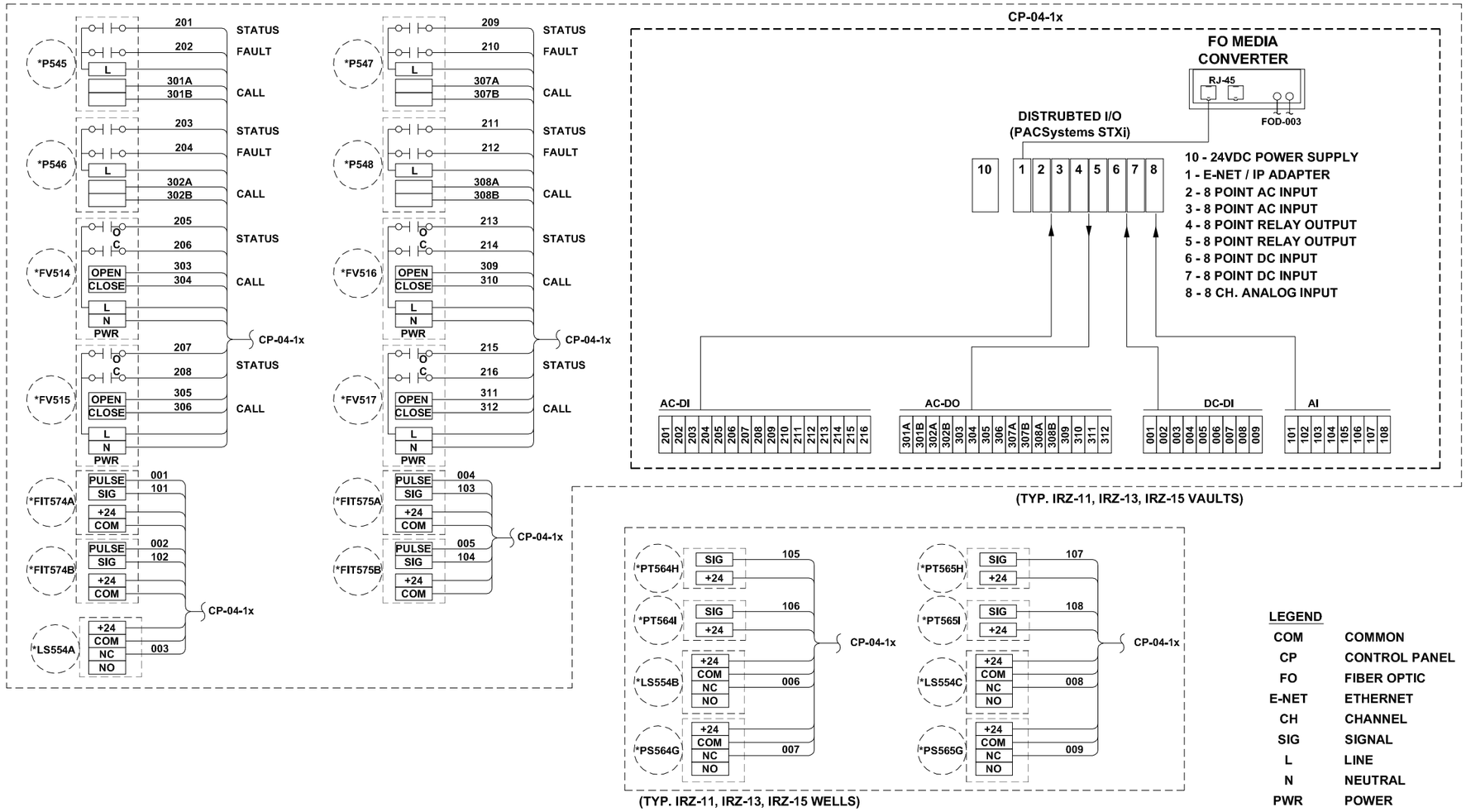
SUPSDS

SUPSD BY

SHEET NO. I-04-10 of SHEETS

REV

03/26/2013, 18:42, G:\Graphics\ARIT\TOPOCK\01\Submittal\60%_March2013\HILL Formatted\Controls.dwg, Tab: I-1-10



LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) **MULTI-MODE FIBER OPTIC CABLE**

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

SOUTH NTH IRZ NODE 04 CP-04-xx INSTRUMENTATION CONNECTION

GAS TRANSMISSION & DISTRIBUTION

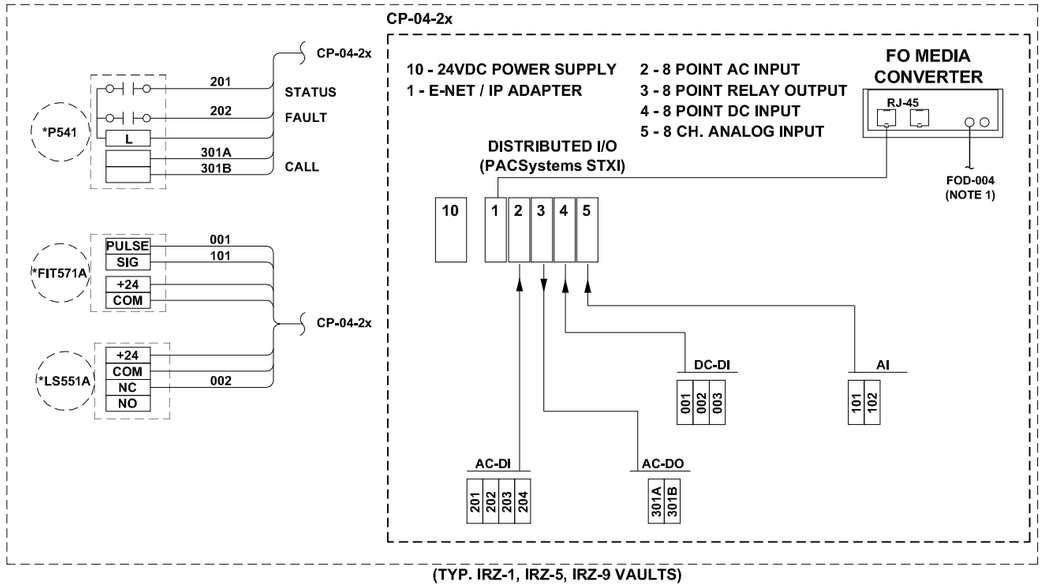
PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

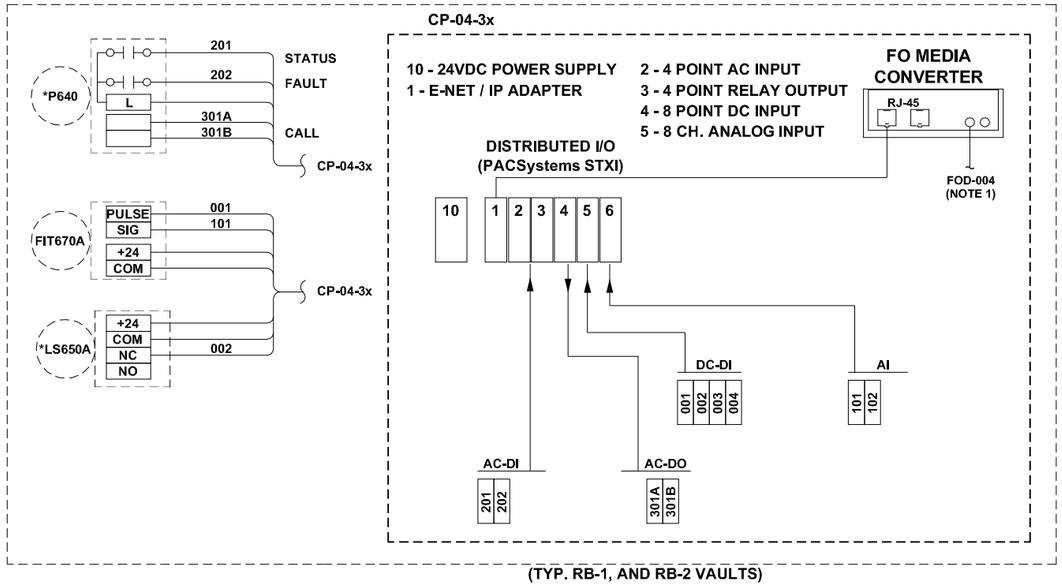
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-04-11	REV

03/26/2013, 18:42, G:\Graphics\ARIT\OPOCK\01\Submittal 60%_March2013\HILL Formatted\Controls.dwg, Tab: I-11

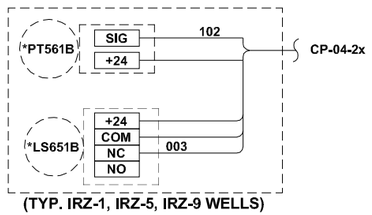
N180B



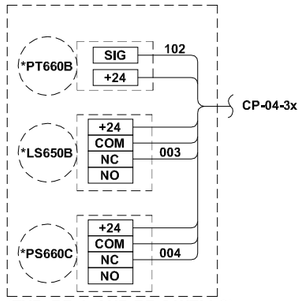
(TYP. IRZ-1, IRZ-5, IRZ-9 VAULTS)



(TYP. RB-1, AND RB-2 VAULTS)



(TYP. IRZ-1, IRZ-5, IRZ-9 WELLS)



(TYP. RB-1, AND RB-2 WELLS)

LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY: JEF

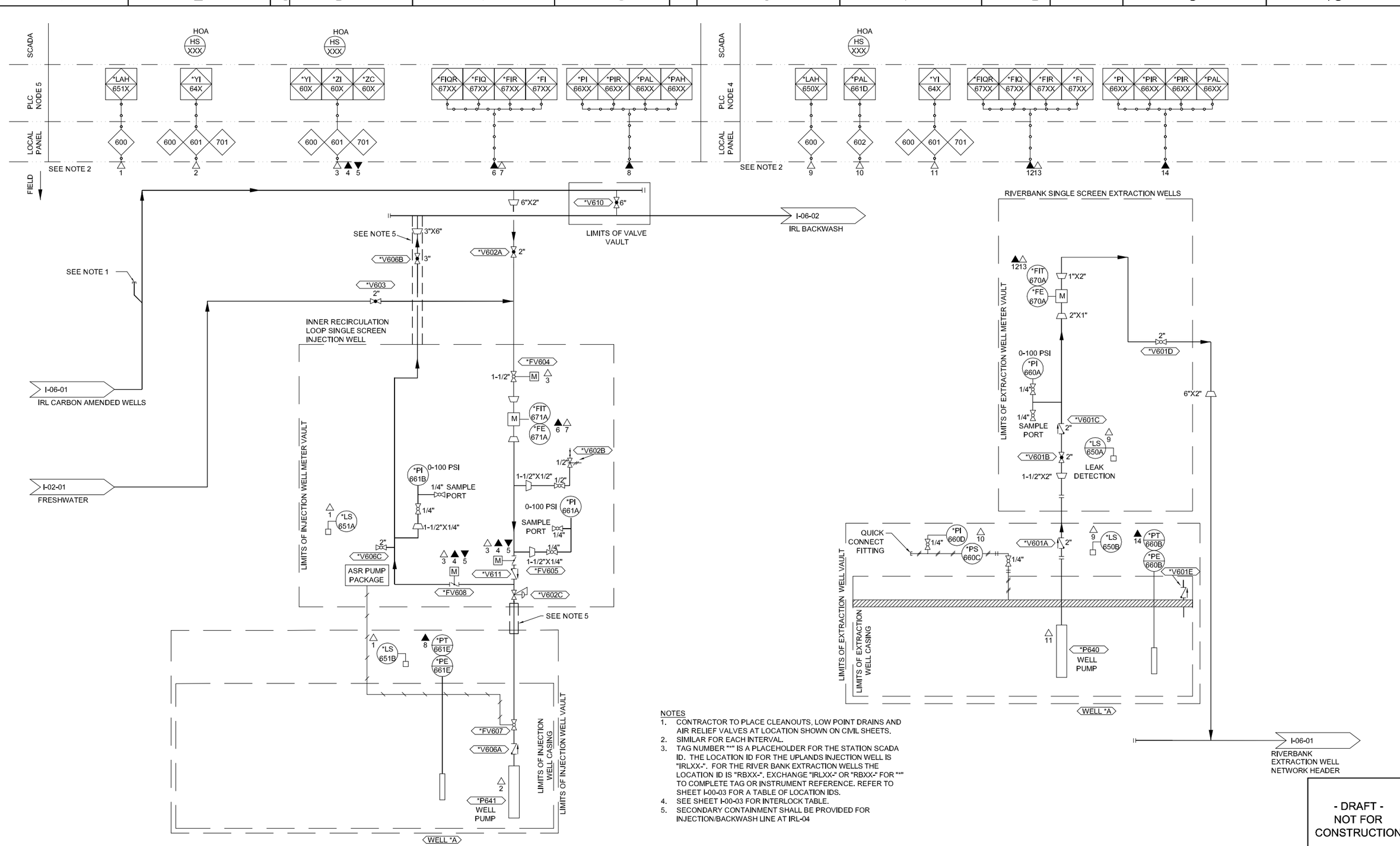
SO
SUPV JPB
DSGN MWM
DWN AJW
CHKD JPB
OK JEF
DATE 04/05/13
SCALES NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
SOUTH NTH IRZ NODE 04
CP-04-xx INSTRUMENTATION CONNECTION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. I-04-12 of SHEETS
REV

03/26/2013, 18:42, G:\Graphics\ART\TOPOCK\01\Submittal 60%_March2013\HILL Formatted\Controls.dwg, Tab: 4-12

N180B



NOTES

1. CONTRACTOR TO PLACE CLEANOUTS, LOW POINT DRAINS AND AIR RELIEF VALVES AT LOCATION SHOWN ON CIVIL SHEETS.
2. SIMILAR FOR EACH INTERVAL.
3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE UPLANDS INJECTION WELL IS "IRLXX-". FOR THE RIVER BANK EXTRACTION WELLS THE LOCATION ID IS "RBXX-". EXCHANGE "IRLXX-" OR "RBXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-00-03 FOR A TABLE OF LOCATION IDS.
4. SEE SHEET I-00-03 FOR INTERLOCK TABLE.
5. SECONDARY CONTAINMENT SHALL BE PROVIDED FOR INJECTION/BACKWASH LINE AT IRL-04

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

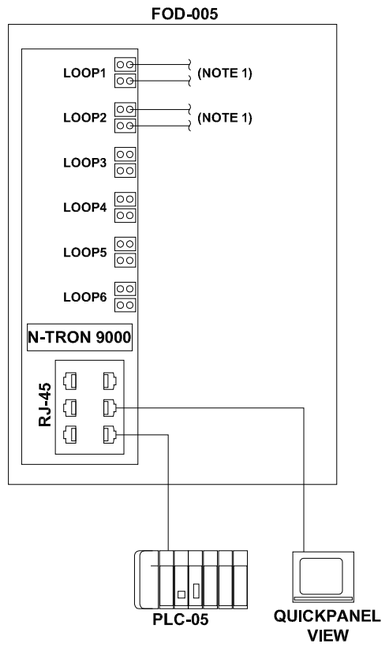
TOPOCK GROUNDWATER REMEDIATION PROJECT

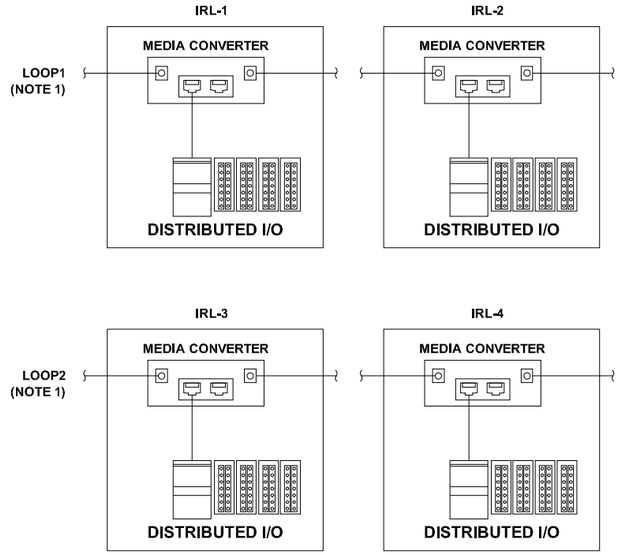
RIVER BANK EXTRACTION AND UPLAND INJECTION WELLS P&ID

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-05-01	REV

03/27/2013, 14:44, G:\Graphics\ARIITOPOCK\01\Submittal\60%_March2013\HILL Formatted\P&ID.dwg, Tab: I-05-01





LEGEND

FOD	FIBER OPTIC DROP
PLC	PROGRAMMABLE LOGIC CONTROLLER
I/O	INPUT/OUTPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT -
NOT FOR
CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

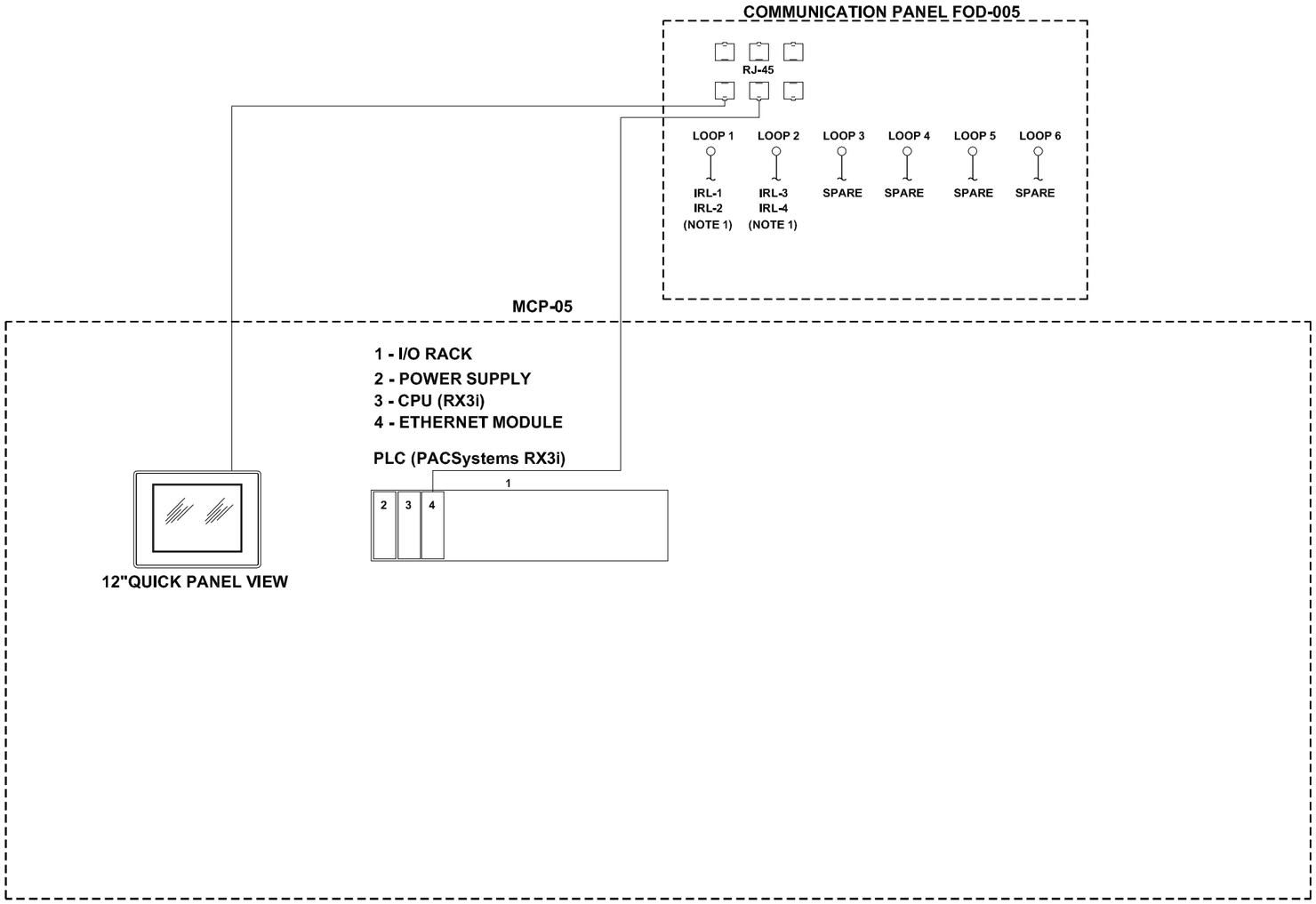
INNER RECIRCULATION LOOP NODE 05 FIBER OPTIC NETWORK

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-05-02	REV

N180B

03/26/2013, 18:42, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 5-02



LEGEND

AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC	DIRECT CURRENT
PLC	PROGRAMMABLE LOGIC CONTROLLER
FOD	FIBER OPTIC DROP
I/O	INPUT/OUTPUT
MCP	MAIN CONTROL PANEL

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

INNER RECIRCULATION LOOP MCP-05 INSTRUMENTATION CONNECTION

GAS TRANSMISSION & DISTRIBUTION

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

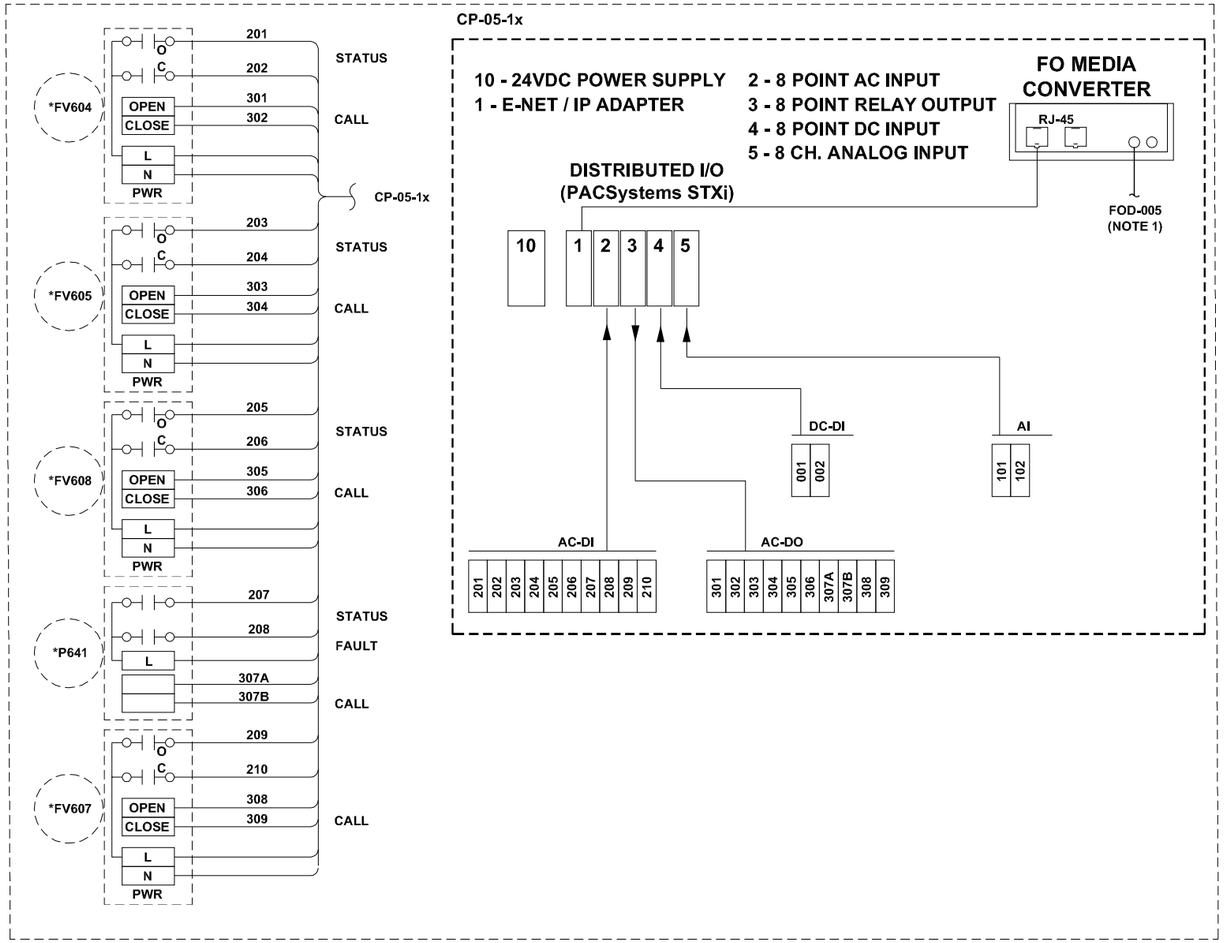
- DRAFT -
NOT FOR CONSTRUCTION

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

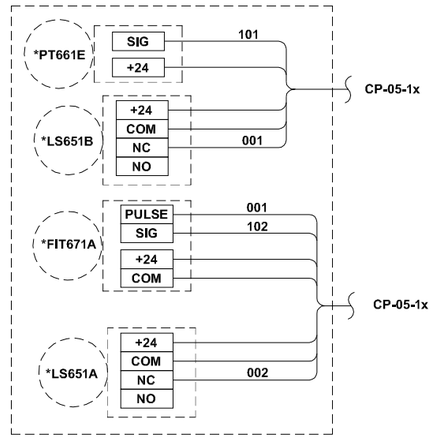
I-05-03 REV

N1808

03/26/2013, 18:42, G:\Graphics\ARTI\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 5-03



(TYP. IRL-1, IRL-2, IRL-3, IRL-4 VAULTS)



(TYP. IRL-1, IRL-2, IRL-3, IRL-4 WELLS)

LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

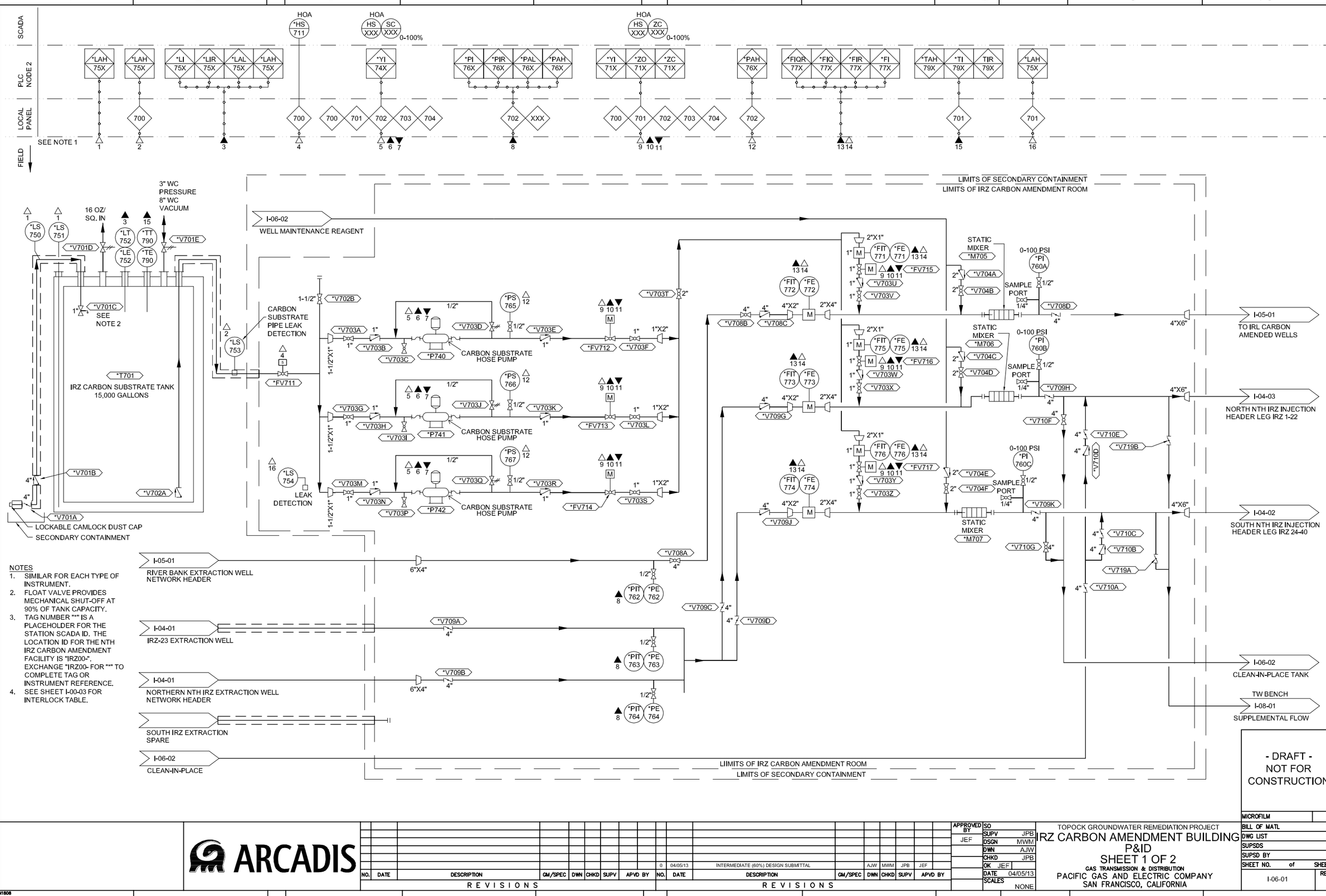
APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
INNER RECIRCULATION LOOP
CP-05-xx INSTRUMENTATION CONNECTION
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-05-04	REV

N180B

03/28/2013, 18:42, G:\Graphics\AR\TOPOCK\c01\Submittal-60%_March2013\HILL Formatted Controls.dwg, Tab: 5-04



NOTES

1. SIMILAR FOR EACH TYPE OF INSTRUMENT.
2. FLOAT VALVE PROVIDES MECHANICAL SHUT-OFF AT 90% OF TANK CAPACITY.
3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ CARBON AMENDMENT FACILITY IS "IRZ00-". EXCHANGE "IRZ00- FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.
4. SEE SHEET I-00-03 FOR INTERLOCK TABLE.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY	
JEF	

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

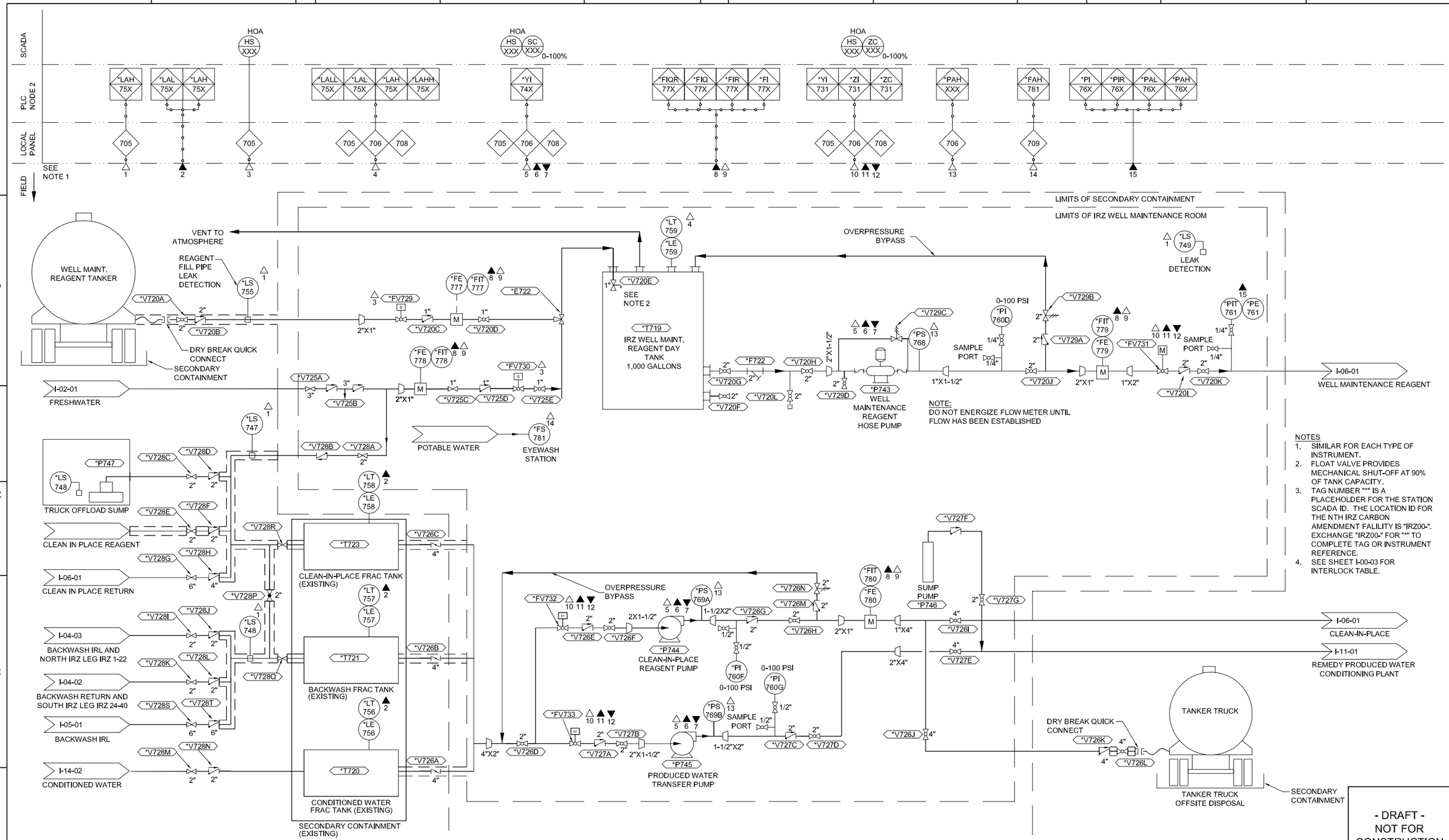
IRZ CARBON AMENDMENT BUILDING P&ID SHEET 1 OF 2

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

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-06-01	REV

N1808

03/27/2013, 14:44, G:\Graphics\ARITOPOCK-01\Submittal-60%_March2013\HILL Formatted P&ID.dwg, Tab: I-06-01



NOTES
1. SIMILAR FOR EACH TYPE OF INSTRUMENT.
2. FLOAT VALVE PROVIDES MECHANICAL SHUT-OFF AT 90% OF TANK CAPACITY.
3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ CARBON AMENDMENT FALILITY IS "IRZ00-". EXCHANGE "IRZ00-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.
4. SEE SHEET I-00-03 FOR INTERLOCK TABLE.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

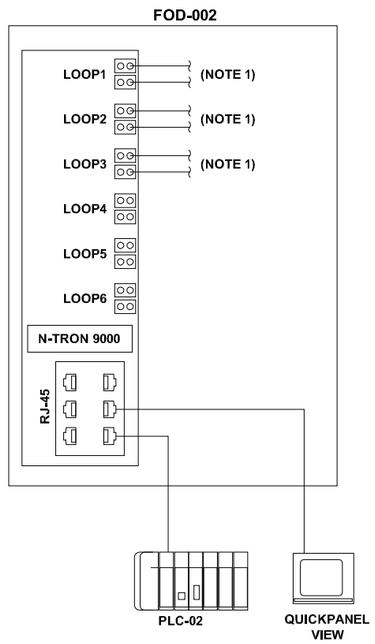
APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

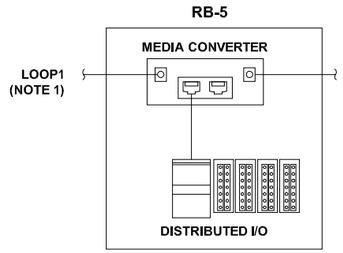
TOPOCK GROUNDWATER REMEDIATION PROJECT
IRZ CARBON AMENDMENT BUILDING P&ID SHEET 2 OF 2
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

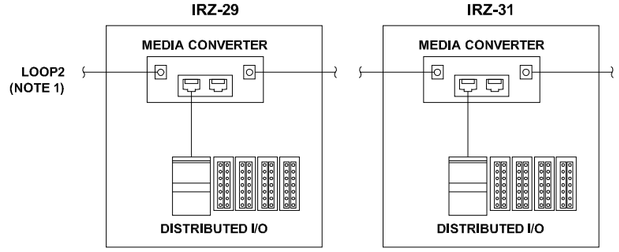
MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-06-02	REV

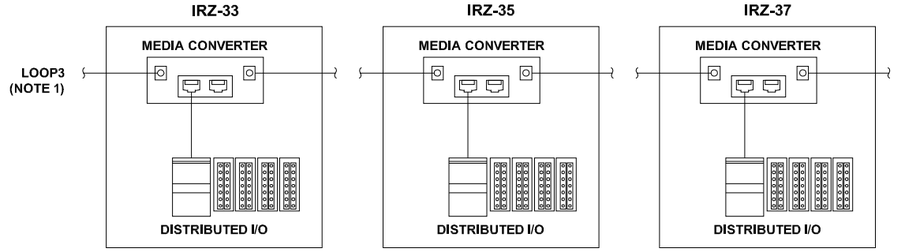
N1808

03/27/2013, 14:44, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL Formatted\P&ID.dwg, Tab: I-06-02









LEGEND

FOD	FIBER OPTIC DROP
PLC	PROGRAMMABLE LOGIC CONTROLLER
I/O	INPUT/OUTPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT -
NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

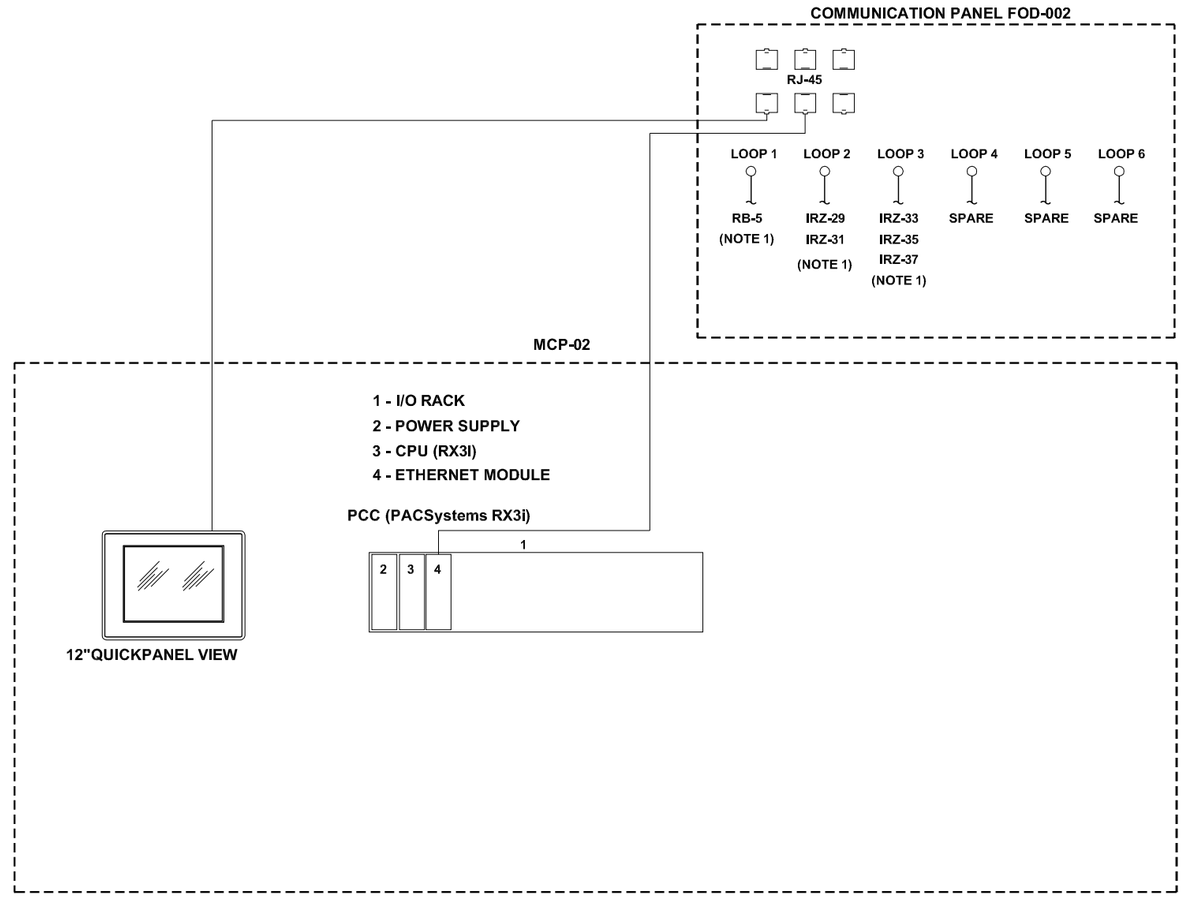
MW-20 BENCH NODE 02 FIBER OPTIC NETWORK

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-06-03	REV

N1808

03/26/2013, 18:43, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Finmatted\Controls.dwg, Tab: E-03



LEGEND

AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC	DIRECT CURRENT
PLC	PROGRAMMABLE LOGIC CONTROLLER
FOD	FIBER OPTIC DROP
I/O	INPUT/OUTPUT
MCP	MAIN CONTROL PANEL

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

MW-20 BENCH NODE 02 MCP-02 INSTRUMENTATION CALIBRATION

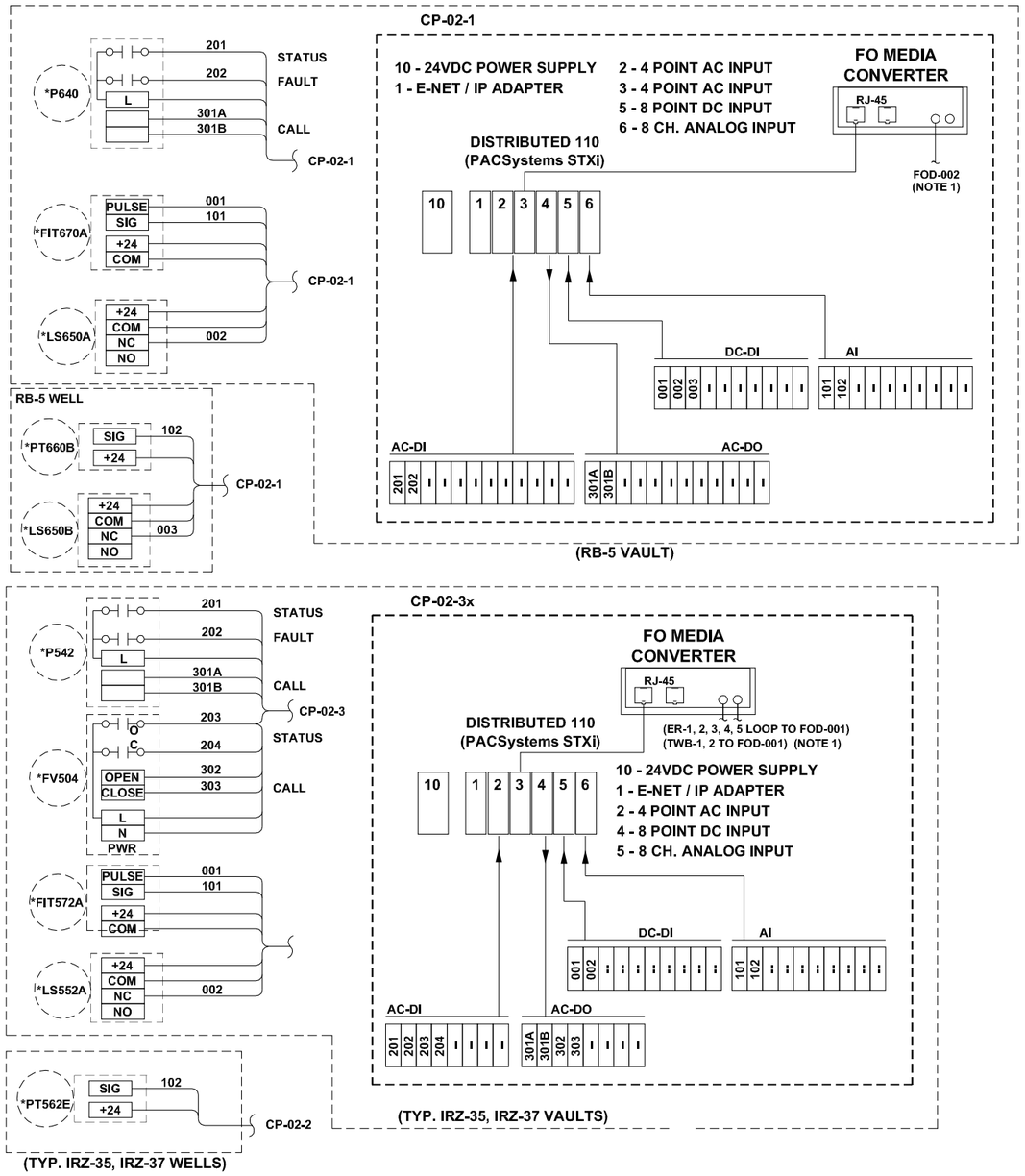
GAS TRANSMISSION & DISTRIBUTION

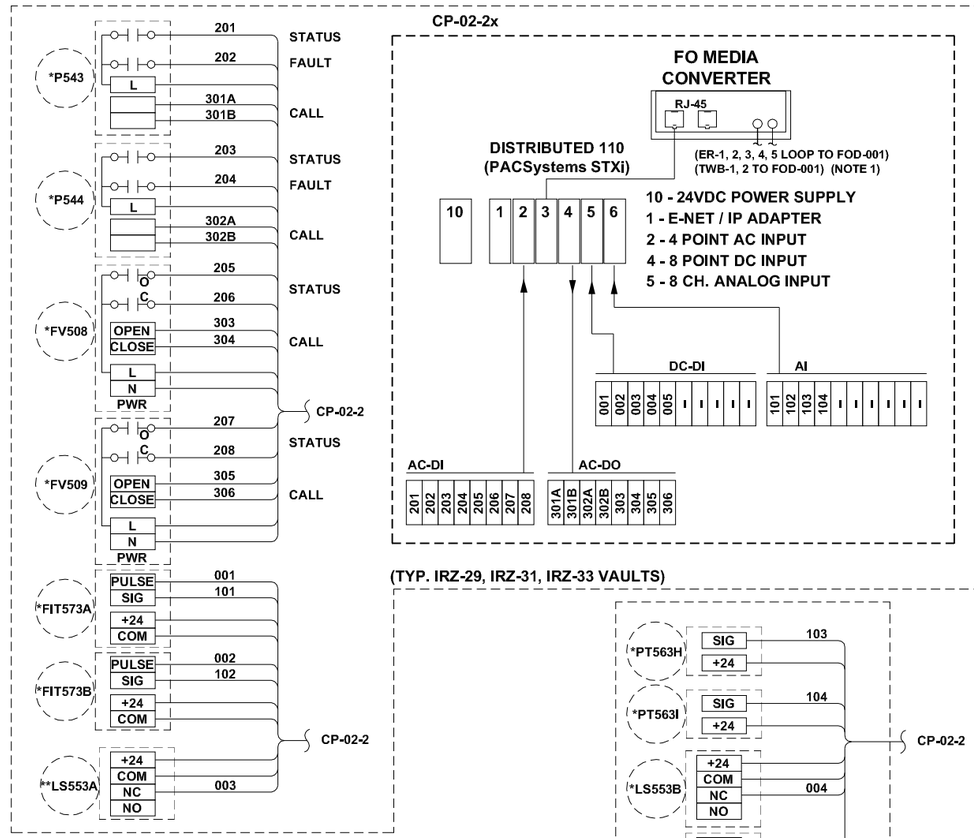
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

- DRAFT -
NOT FOR CONSTRUCTION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-06-04	REV

03/28/2013, 18:43, G:\Graphics\ARITOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 5-04





LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

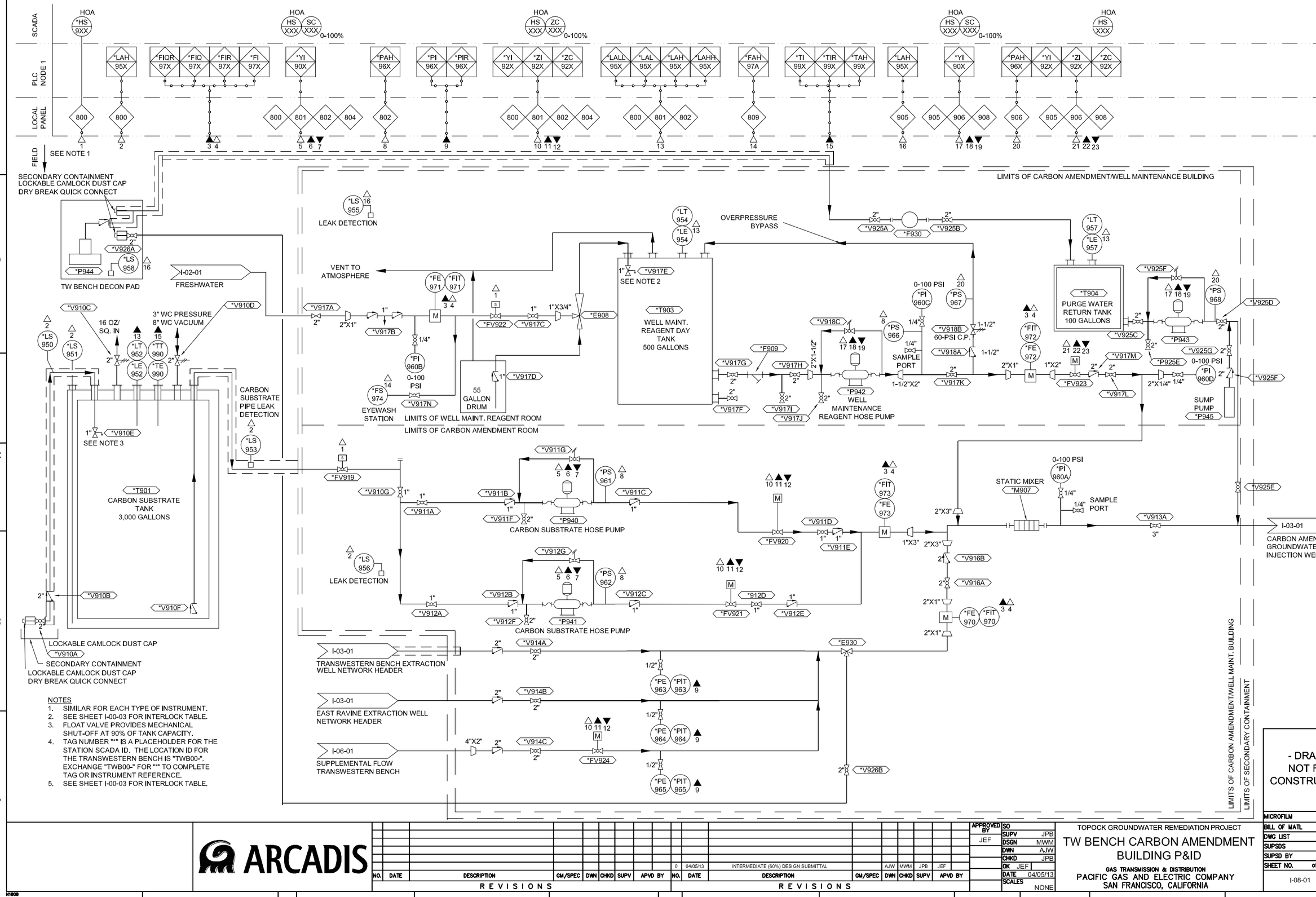
MW-20 BENCH NODE 02
CP-02-xx INSTRUMENTATION
CALIBRATION

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-06-05	REV

N1808

03/26/2013, 18:43, G:\Graphics\ARTOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 6-05



NOTES

1. SIMILAR FOR EACH TYPE OF INSTRUMENT.
2. SEE SHEET I-00-03 FOR INTERLOCK TABLE.
3. FLOAT VALVE PROVIDES MECHANICAL SHUT-OFF AT 90% OF TANK CAPACITY.
4. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE TRANSWESTERN BENCH IS "TWB00-". EXCHANGE "TWB00-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.
5. SEE SHEET I-00-03 FOR INTERLOCK TABLE.

- DRAFT - NOT FOR CONSTRUCTION

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY		
JEF	SO	
	SUPV	JPB
	DSGN	MWM
	DWN	AJW
	CHKD	JPB
	OK	JEF
	DATE	04/05/13
	SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

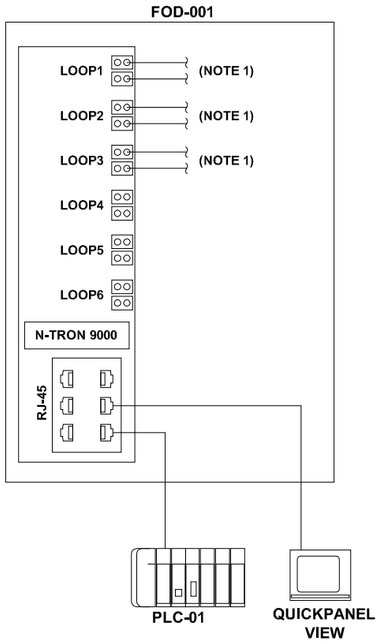
TW BENCH CARBON AMENDMENT BUILDING P&ID

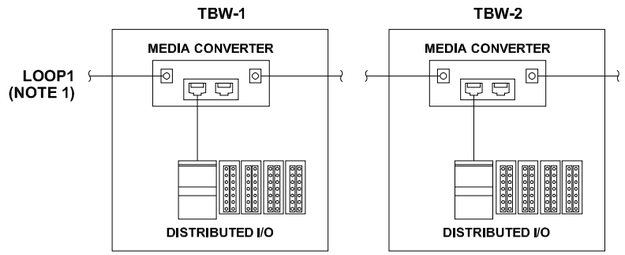
GAS TRANSMISSION & DISTRIBUTION

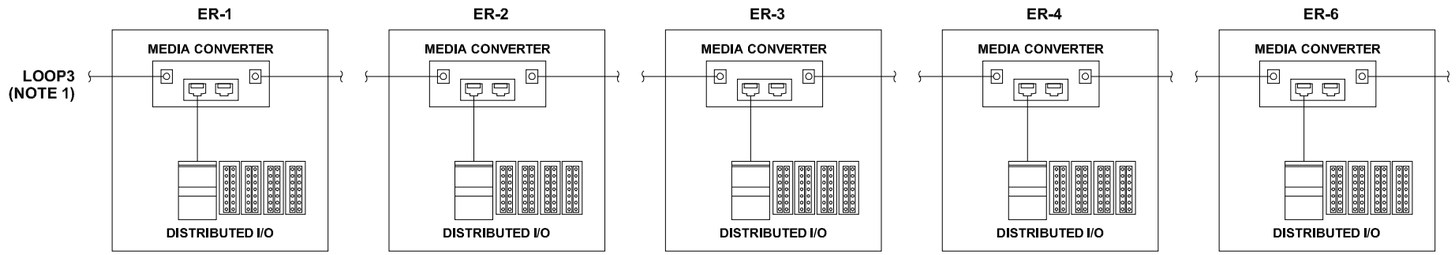
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
I-08-01	REV

03/27/2013, 14:44, G:\Graphics\ART\TOPOCK\01\Submittal 60%_March2013\HILL Formatted P&ID.dwg, Tab: I-08-01







LEGEND

FOD	FIBER OPTIC DROP
PLC	PROGRAMMABLE LOGIC CONTROLLER
I/O	INPUT/OUTPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT

TW BENCH NODE 01 FIBER OPTIC NETWORK

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

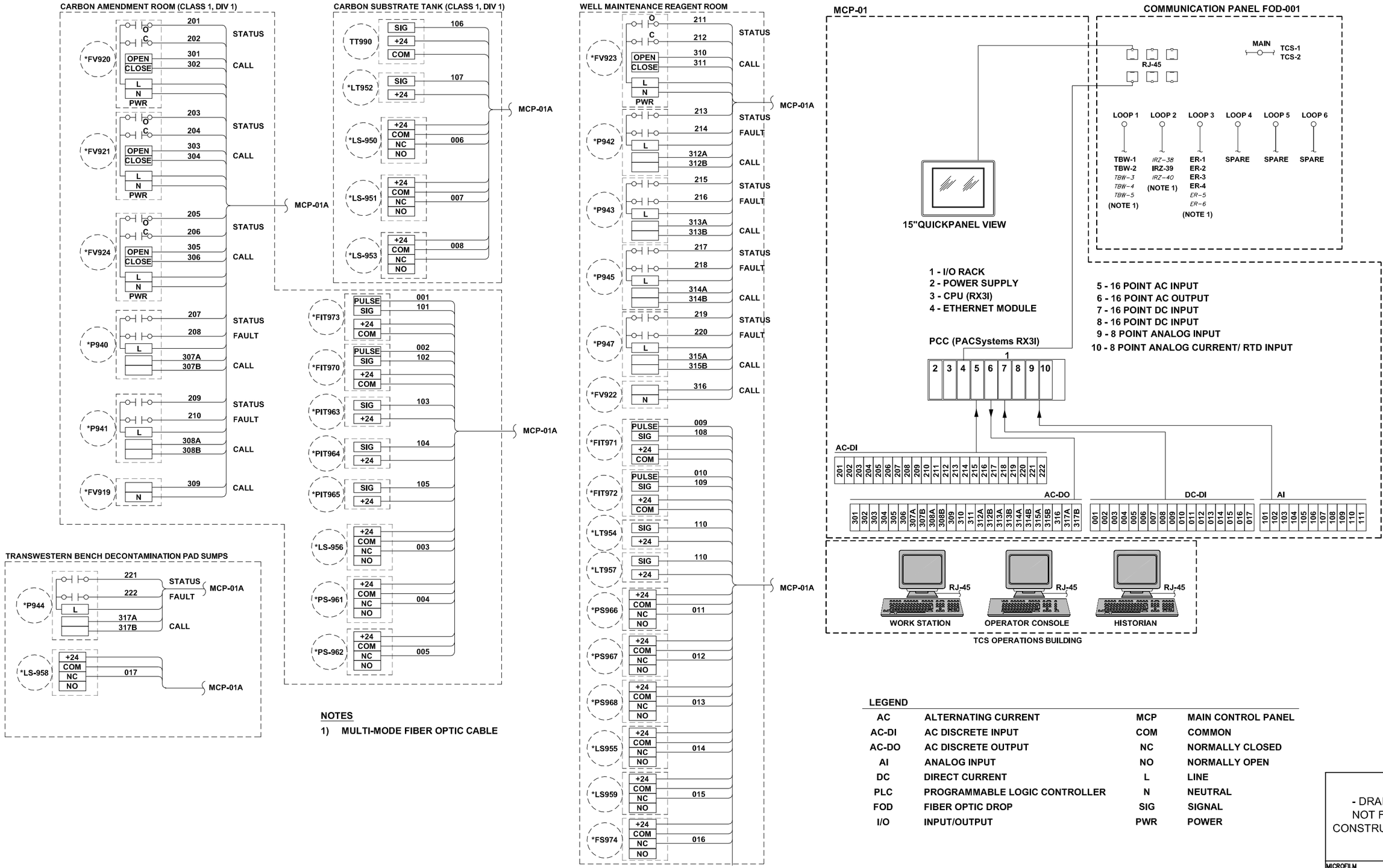
- DRAFT -
NOT FOR CONSTRUCTION

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

I-08-02 REV

N180B

03/26/2013, 18:43, G:\Graphics\ART\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 8-02



LEGEND			
AC	ALTERNATING CURRENT	MCP	MAIN CONTROL PANEL
AC-DI	AC DISCRETE INPUT	COM	COMMON
AC-DO	AC DISCRETE OUTPUT	NC	NORMALLY CLOSED
AI	ANALOG INPUT	NO	NORMALLY OPEN
DC	DIRECT CURRENT	L	LINE
PLC	PROGRAMMABLE LOGIC CONTROLLER	N	NEUTRAL
FOD	FIBER OPTIC DROP	SIG	SIGNAL
I/O	INPUT/OUTPUT	PWR	POWER

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

APPROVED BY: JEF

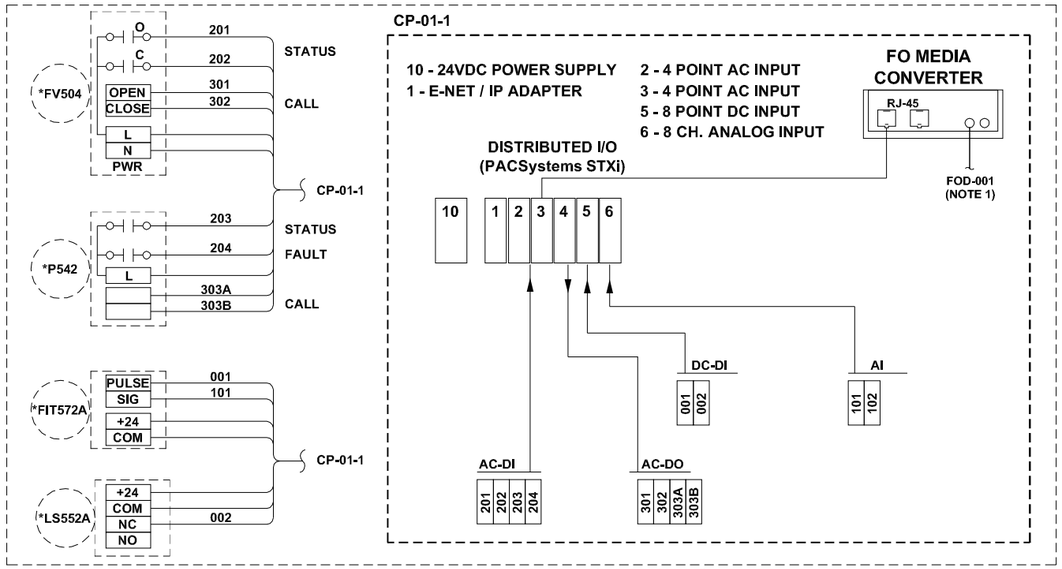
SO
SUPV JPB
DSGN MWM
DWN AJW
CHKD JPB
OK JEF
DATE 04/05/13
SCALES NONE

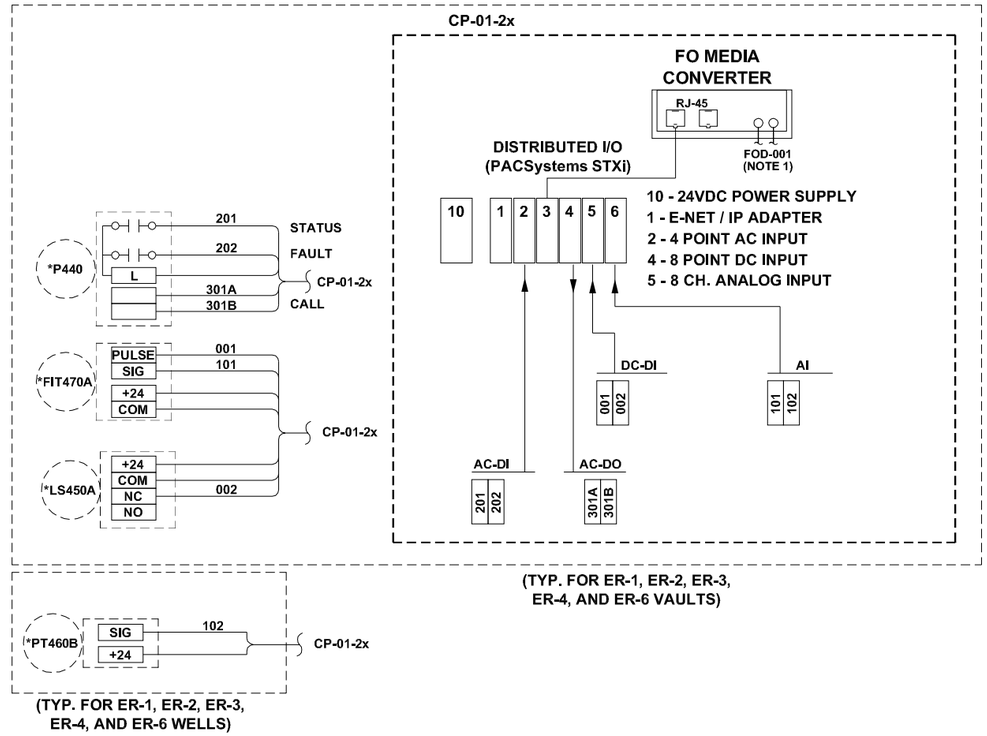
TOPOCK GROUNDWATER REMEDIATION PROJECT
TW BENCH NODE 01
MCP-01 INSTRUMENTATION CONNECTION
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

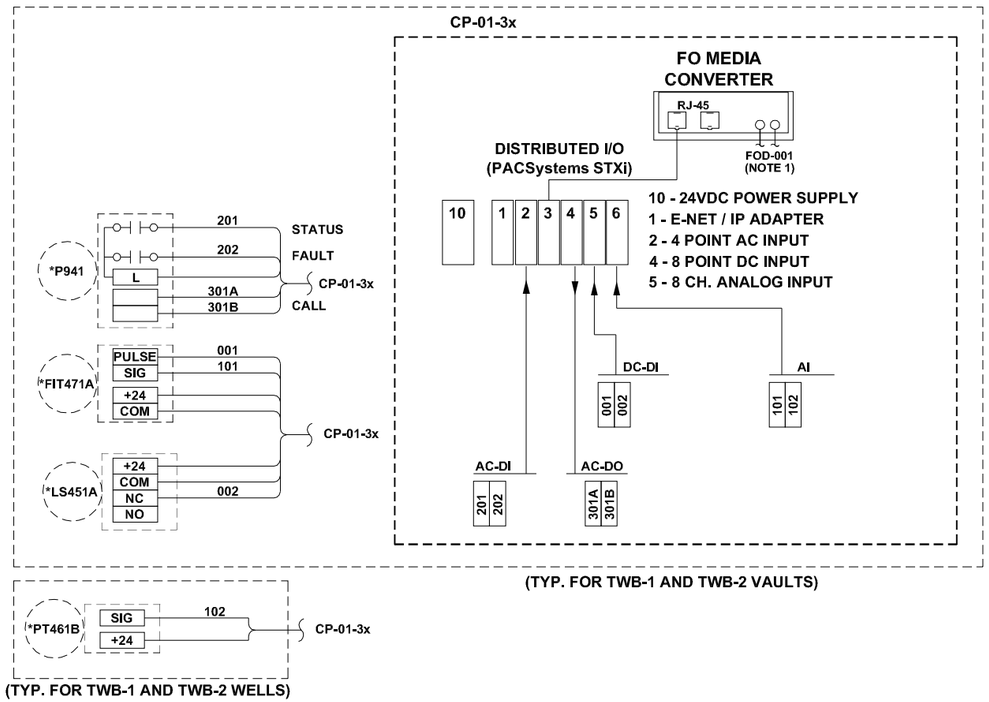
MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
I-08-03
REV

N180B

03/26/2013, 13:43, G:\Graphics\ART\TOPOCK-01\Submittal-60%_Mar2013\HILL Formatted\Controls.dwg, Tab: 8-03







LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) MULTI-MODE FIBER OPTIC CABLE

- DRAFT - NOT FOR CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL		AJW	MWM	JPB	JEF

REVISIONS

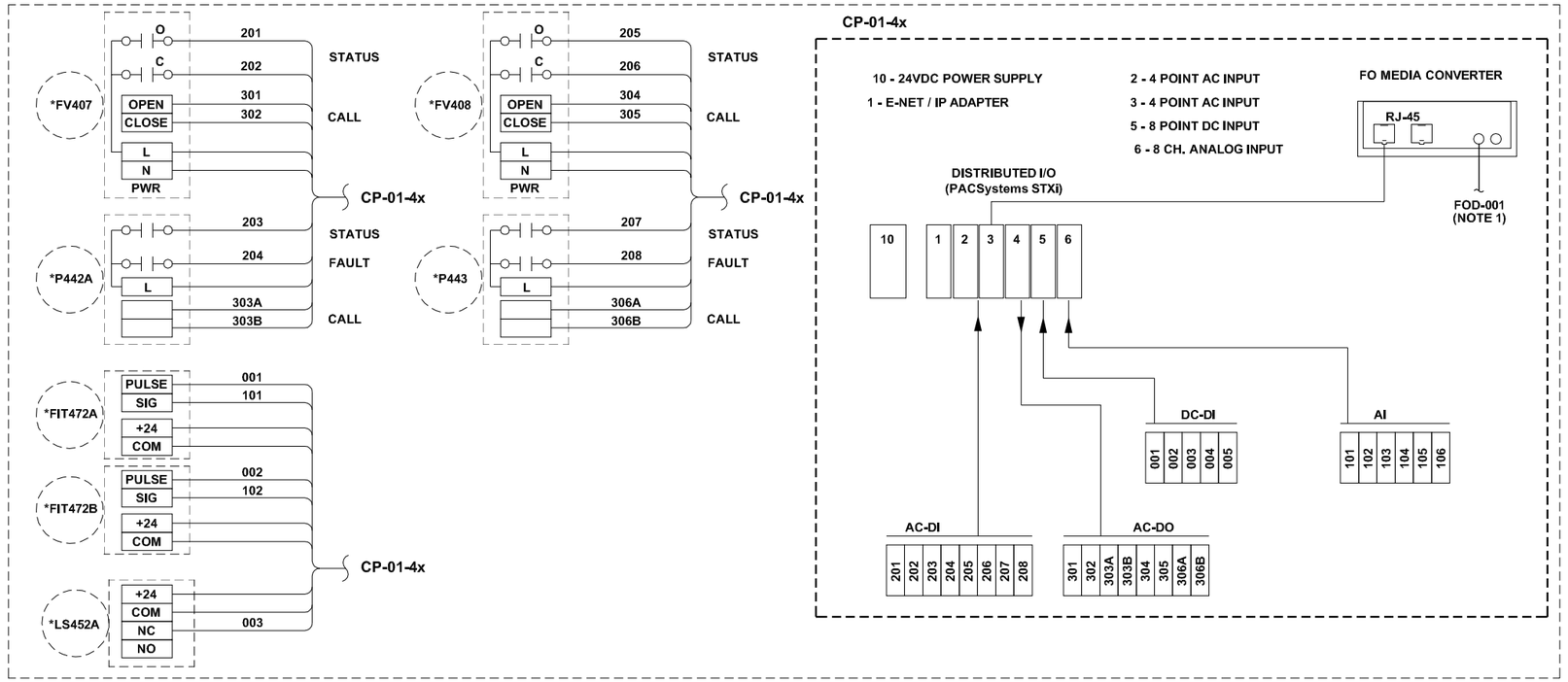
APPROVED BY	JEF
SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
TW BENCH NODE 01
CP-01-xx INSTRUMENTATION CONNECTION
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-08-04	REV

N180B

03/26/2013, 18:43, G:\Graphics\AR\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 8-04



LEGEND

COM	COMMON
CP	CONTROL PANEL
FO	FIBER OPTIC
E-NET	ETHERNET
CH	CHANNEL
SIG	SIGNAL
L	LINE
N	NEUTRAL
PWR	POWER
AC	ALTERNATING CURRENT
AC-DI	AC DISCRETE INPUT
AC-DO	AC DISCRETE OUTPUT
AI	ANALOG INPUT
DC-DI	DC DISCRETE INPUT

NOTES

1) **MULTI-MODE FIBER OPTIC CABLE**

- DRAFT -
NOT FOR
CONSTRUCTION

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	04/05/13	INTERMEDIATE (60%) DESIGN SUBMITTAL	AJW	MWM	JPB	JEF	

REVISIONS

APPROVED BY: JEF

SO	
SUPV	JPB
DSGN	MWM
DWN	AJW
CHKD	JPB
OK	JEF
DATE	04/05/13
SCALES	NONE

TOPOCK GROUNDWATER REMEDIATION PROJECT
TW BENCH NODE 01
TCS-1&2 CP-01-xx
INSTRUMENTATION CONNECTION
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-08-05	REV

03/28/2013, 18:43, G:\Graphics\ARIT\TOPOCK-01\Submittal-60%_March2013\HILL Formatted\Controls.dwg, Tab: 8-05

N180B

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*FAH 071
*FAL 071
*FI 071 GPM
FLOW *F 071

*HNA 217
*ZNO 217
*ZNC 217
OPEN/CLOSE *HN 217A
OPENED *ZN 217O
CLOSED *ZN 217C

SIMILAR FOR ALL PNEUMATIC VALVES

*LAL 251
*LAH 251
LOW LEVEL *LA 251L
HIGH LEVEL *LA 251H

*LAH 252
*LAL 252
*LI 252 FT
LEVEL *L 252

*YNR 201
*HNA 201
RUN *YN 201R
AUTO *HN 201A

HOA
*HS 201 H
RUN
*YI 201 GRN
DWG E-XX-XX

STT/STP *XC 201S

*UAF 201
OVERLOAD *UA 201F

*AAH 281A
*AAL 281A
*AI 281A PH
PH *A 281A

*AAH 281B
*AAL 281B
*AI 281B MSMN/CM
CONTINUITY *A 281B

*AAH 282
*AAL 282
*AI 282 NTU
TURBIDITY *A 282

I-12-04 - ACID FEED SYSTEM
3 1/2" IN 2" - ACD-PULK-120402-H

I-12-03 - CAUSTIC SYSTEM
3 1/2" IN 2" - CAU-PULK-120302-H

I-12-03 - COAGULANT FEED SYSTEM (FUTURE)
3 1/2" IN 2" - COG-PULK-120305-H

I-02-03 - FW002
4" - RW-PULK-020306

I-06-02 - NTH IRZ, IRL & FW001
4" 8" -RW-PULK-020101

I-03-01 - TCS INJECTION WELLS

I-08-01 - TRANSWESTERN BENCH

I-11-04 - FROM PMP-205 SUMP PUMP
2" - WS-PULK-110409

I-14-02 - OFF SPEC MATERIAL
2" - WS-PULK-140202

I-11-02 - INFLUENT TANK 2
2" - RW-PULK-110103

I-11-02 - INFLUENT TANK 2 SLURRY TO INFLUENT TANK 2
2" - SL-PULK-110104

I-12-04 - SUMP PUMP PMP-907
2" - WS-PULK-120416

I-12-05 - SUMP PUMP PMP-607
2" - WS-PULK-120505

I-14-01 - SUMP PUMP PMP-407
2" - WS-PULK-140103

I-14-02 - SUMP PUMP PMP-507
2" - WS-PULK-140201

*FIT 071
*FE 071
M
COMBINED WELL FLOW
*FM-071

S
6" - RW-PULK-110101

IA
*SOV 217

*XV-211
*XV-212

*ZSO 217
*ZSC 217

*LIT 252
LE 252

*LSH 251
*LSL 251

6"-RW-PULK-110107
2"-RW-PULK-110102
*XV-217
1

INFLUENT TANK 1
*TNK-201
4

EDT 211
2
EDUCTOR 1

EDT 212
EDUCTOR 2

*AIT 281
*AE 281A PH
*AE 281B COND

*AIT 282
*AE 282 TURB

1/2" IN 2" - COG-110108
1/2" IN 2" - CAU-110110
1/2" IN 2" - ACD-110104

*XV-213
*XV-214
PCV-201
6" - RW-PULK-110106

S
M
*PI 261
6" - RW-PULK-110105

INFLUENT TANK RECIRC PUMP 1
*PMP-201

I-11-02 - INFLUENT TANK 2

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

1. DOWN HILL ANGLE EXTENSION TO PREVENT SETTLING IN TANK PIPE. TAPS APPROXIMATELY 2' AND 6' FROM TANK BOTTOM.
2. EDUCTORS LOCATED AT 1' FROM BOTTOM OF TANK ON 8' LENGTH OF TANK.
3. DOUBLE CONTAINED PIPE. 1/2" INSIDE 2".
4. SEE SPECIFICATION SECTION 33 16 13.14 FOR NOZZLE TABLE.

INFLUENT TANK 1

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INFLUENT TANK 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
I-11-01	REV

PLOT DATE: 3/27/2013 PLOT TIME: 10:33:44 PM
FILENAME: FE-I-XXX-1101AD.dwg

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*HNA 227 | *ZNO 227 | *ZNC 227

SIMILAR FOR ALL PNEUMATIC VALVES

OPEN/CLOSE *HN 227A | OPENED *ZN 227O | CLOSED *ZN 227C

*LAL 253 | *LAH 253

LOW LEVEL *LA 253L | HIGH LEVEL *LA 253H

*LAH 254 | *LAL 254 | *LI 254 FT

LEVEL *L 254

*YNR 202

RUN *YN 202R

*HNA 202

AUTO *HN 202A

STT/STP *XC 202S

*UAF 202

OVERLOAD *UA 202F

*AAH 283A | *AAL 283A | *AI 283A PH

PH *A 283A

*AAH 283B | *AAL 283B | *AI 283B MSMN/CM

CONTINUITY *A 283B

*AAH 284 | *AAL 284 | *AI 284 NTU

TURBIDITY *A 284

HOA *HS 202 H | RUN *YI 202 GRN

DWG E-XX-XX

I-12-01 - ACID FEED SYSTEM (3) 1/2" IN 2" - ACD-PULK-120402-H

I-12-01 - CAUSTIC SYSTEM (3) 1/2" IN 2" - CAU-PULK-120302-H

I-12-01 - COAGULANT FEED SYSTEM (3) 1/2" IN 2" - COG-PULK-120305-H

I-11-01 - FRESHWATER INJECTION WELLS 6" -RW-PULK-110101

I-11-01 - INFLUENT TANK 1 2" - RW-PULK-110103

- I-11-03 INFLUENT TANK 3 2" - RW-PULK-110203

- I-11-03 INFLUENT TANK 3 2" - SL-PULK-110204

IA *SOV 227

*ZSO 227 | *ZSC 227

*XV-221 | *XV-222 | *XV-227

6" - RW-PULK-110207

2" - RW-PULK-110202

*LSH 253 | *LSL 253

*LIT 254 LE 254

INFLUENT TANK 2 TNK-202 (4)

EDT 221 (2) EDUCTOR 1

EDT 222 EDUCTOR 2

*AIT 283 | *AE 283A PH | *AE 283B COND

*AIT 284 | *AE 284 TURB

1/2" IN 2" - COG-110208

1/2" IN 2" - CAU-110210

1/2" IN 2" - ACD-110204

6" - RW-PULK-110206

*XV-223 | *XV-224 | PCV-202

6" - RW-PULK-110205

*PI 262

INFLUENT TANK RECIR PUMP 2 PMP-202

2" - SL-PULK-110104

- I-11-01 INFLUENT TANK 1

I-11-03 - INFLUENT TANK 3 (x3)

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

(1) DOWN HILL ANGLE EXTENSION TO PREVENT SETTLING IN TANK PIPE. TAPS APPROXIMATELY 2' AND 6' FROM TANK BOTTOM.

(2) EDUCTORS LOCATED AT 1' FROM BOTTOM OF TANK ON 8' LENGTH OF TANK.

(3) DOUBLE CONTAINED PIPE. 1/2" INSIDE 2".

(4) SEE SPECIFICATION SECTION 33 16 13.14 FOR NOZZLE TABLE.

INFLUENT TANK 2

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL	MBY				JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INFLUENT TANK 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
I-11-02	REV

PLOT TIME: 9:37:34 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-1102AD.dwg

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*HNA 237 | *ZNO 237 | *ZNC 237 — SIMILAR FOR ALL PNEUMATIC VALVES — OPEN/CLOSE *HN 237A | OPENED *ZN 237O | CLOSED *ZN 237C

*LAL 255 — LOW LEVEL *LA 255L

*LAH 255 — HIGH LEVEL *LA 255H

*LAH 256 | *LAL 256 — *LI 256 — LEVEL *L 256 — FT

*YNR 203 — RUN *YN 203R

*HNA 203 — AUTO *HN 203A

HOA *HS 203 H | RUN *YI 203 GRN

DWG E-XX-XX

*UAF 203 — STT/STP *XC 203S | OVERLOAD *UA 203F

*AAH 285A | *AAL 285A — PH *AI 285A — PH *A 285A

*AAH 285B | *AAL 285B — MSMN/CM *AI 285B — CONTINUITY *A 285B

*AAH 286 | *AAL 286 — NTU *AI 286 — TURBIDITY *A 286

I-12-02 - ACID FEED SYSTEM — 3 — 1/2" IN 2" - ACD-PULK-120402-H → I-11-04 - INFLUENT TANK 4

I-12-02 - CAUSTIC SYSTEM — 3 — 1/2" IN 2" - CAU-PULK-120302-H → I-11-04 - INFLUENT TANK 4

I-12-02 - COAGULANT FEED SYSTEM — 3 — 1/2" IN 2" - COG-PULK-120305-H → I-11-04 - INFLUENT TANK 4

1/2" IN 2" - COG-110308

IA — *SOV 237

I-11-02 - FRESHWATER INJECTION WELLS — 6" -RW-PULK-110101 → I-11-04 - INFLUENT TANK 4

*AIT 285 | *AE 285A PH | *AE 285B COND

*AIT 286 | *AE 286 TURB

*ZSO 237 | *ZSC 237

*LIT 256 | LE 256

*LSH 255 | *LSL 255

I-11-02 - INFLUENT TANK 2 — 2" - RW-PULK-110203

I-11-02 - INFLUENT TANK 4 — 2" - RW-PULK-110303

8" - RW-PULK-110307

2" - RW-PULK-110302

*XV-231 | *XV-232 | *XV-237

INFLUENT TANK 3 TNK-203 — 1 — 4

EDT 231 — 2 — EDUCTOR 1

EDT 232 — EDUCTOR 2

1/2" IN 2" - CAU-110310

1/2" IN 2" - ACD-110304

6" - RW-PULK-110306

*XV-233 | *XV-234 | PCV-203

2" - SL-PULK-110204 → - I-11-02 INFLUENT TANK 2

- I-11-04 SLURRY TO INFLUENT TANK 4 — 2" - SL-PULK-110304

6" - RW-PULK-110305

*PI 263

INFLUENT TANK RECIRC PUMP 3 PMP-203

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

1. DOWN HILL ANGLE EXTENSION TO PREVENT SETTLING IN TANK PIPE. TAPS APPROXIMATELY 2' AND 6' FROM TANK BOTTOM.
2. EDUCTORS LOCATED AT 1' FROM BOTTOM OF TANK ON 8' LENGTH OF TANK.
3. DOUBLE CONTAINED PIPE. 1/2" INSIDE 2".
4. SEE SPECIFICATION SECTION 33 16 13.14 FOR NOZZLE TABLE.

INFLUENT TANK 3

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INFLUENT TANK 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
I-11-03	REV

PLOT TIME: 9:37:07 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-1103AD.dwg

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*HNA 247 | *ZNO 247 | *ZNC 247 — SIMILAR FOR ALL PNEUMATIC VALVES
OPEN/CLOSE *HN 247A | OPENED *ZN 247O | CLOSED *ZN 247C

*LAL 257 | *LAH 257
LOW LEVEL *LA 257L | HIGH LEVEL *LA 257H

*LAH 258 | *LAL 258 | *LI 258 FT
LEVEL *L 258

*YNR 204
RUN *YN 204R

*HNA 204
AUTO *HN 204A

HOA RUN
*HS 204 H | *YI 204 GRN
DWG E-XX-XX

STT/STP *XC 204S

*UAF 204
OVERLOAD *UA 204F

*AAH 287A | *AAL 287A | *AI 287A PH
PH *A 287A

*AAH 287B | *AAL 287B | *AI 287B MSMN/CM
CONTINUITY *A 287B

*AAH 288 | *AAL 288 | *AI 288 NTU
TURBIDITY *A 288

*LAH 255
HIGH LEVEL *LA 255H

I-12-03 - ACID FEED SYSTEM — 3 — 1/2" IN 2" - ACD-PULK-120402-H
I-12-03 - CAUSTIC SYSTEM — 3 — 1/2" IN 2" - CAU-PULK-120302-H
I-12-03 - COAGULANT FEED SYSTEM — 3 — 1/2" IN 2" - COG-PULK-120305-H
I-11-03 - FRESHWATER INJECTION WELLS — 6" -RW-PULK-110101
I-11-03 - INFLUENT TANK 3 — 2" - RW-PULK-110303
I-12-01 FILTER FEED PUMPS - A SIDE — 2" - RW-PULK-110403
I-12-02 FILTER FEED PUMPS - B SIDE — 2" - RW-PULK-110407
BYPASS TO EVAPORATION PONDS — 2" - RW-PULK-110408
I-12-05 LIQUID PHASE SEPARATORS — 2" - SL-PULK-110404

IA
*SOV 247

*ZSO 247
*ZSC 247

S | *XV-241 | S
S | *XV-242 | S
2" - RW-PULK-110402
*XV-247

*AIT 287
*AE 287A PH
*AE 287B COND

*AIT 288
*AE 288 TURB

*LIT 258
LE 258

*LSH 257
*LSL 257

INFLUENT TANK 4
TNK-204
4

EDT 241 — 2 — EDUCTOR 1
EDT 242 — EDUCTOR 2

1/2" IN 2" - CAU-110410
1/2" IN 2" - ACD-110404
6" - RW-PULK-110406
2" - SL-PULK-110404
I-11-01 INFLUENT TANK 1
2" - WS-PULK-110410
I-11-01 - COOLING TOWER BLOWDOWN LINE
I-11-01 - INFLUENT TANK FARM
2" - WS-PULK-110409
1/2" IN 2" - COG-110408

*XV-243 | *XV-244
PCV-204

*PI 265
INFLUENT FARM TANK SUMP PUMP *PMP-205
M | (120V)

TRUCK CONNECTION
6" - SL-PULK-110405
6" - RW-PULK-110405

S | M | *PI 264
INFLUENT TANK RECIRC PUMP 4
PMP-204

*LSH 255

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE *** ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

1. DOWN HILL ANGLE EXTENSION TO PREVENT SETTLING IN TANK PIPE. TAPS APPROXIMATELY 2' AND 6' FROM TANK BOTTOM.
2. EDUCTORS LOCATED AT 1' FROM BOTTOM OF TANK ON 8' LENGTH OF TANK.
3. DOUBLE CONTAINED PIPE. 1/2" INSIDE 2".
4. SEE SPECIFICATION SECTION 33 16 13.14 FOR NOZZLE TABLE.

INFLUENT TANK 4

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	RCH
DWN	MBY
CHKD	TFP
OK	TPF
DATE	
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
INFLUENT TANK 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
I-11-04	REV

PLOT TIME: 9:37:51 PM
PLOT DATE: 3/27/2013
FILENAME: FE-I-XXX-1104AD.dwg

SCADA DISPLAY
PLC
CONTROL PANEL
FIELD

*YNR 310
*HNA 310
*UAF 310
*SI 310
SIMILAR FOR FILTER FEED PUMP 2
RUN *YN 310R
AUTO *HN 310
START *XC 310S
SPEED COMMAND *SC 310
FAULT *UA 310F
SPEED INDICATION S 310
HOA *HS 310 H
RUN *YI 310 GRN
DWG E-XX-XX

*PAH 363
*PAL 363 PSI
*PI 363
DIFFERENTIAL PRESSURE P 363
*PAH 361
*PAL 361 PSI
*PI 361
DIFFERENTIAL PRESSURE P 361

*HNA 310
*ZNO 310
*ZNC 310
SIMILAR FOR ALL PNEUMATIC VALVES
OPEN/CLOSE *HN 310A
OPENED *ZN 310O
CLOSED *ZN 310C

*PAH 362
*PAL 362 PSI
*PI 362
DIFFERENTIAL PRESSURE P 362
*PAH 364
*PAL 364 PSI
*PI 364
DIFFERENTIAL PRESSURE P 364

*FAH 371
*FAL 371 GPM
*FI 371
FLOW F 371

IA
*SOV 310
*ZSO 310
*ZSC 310
*XV-310

2" -RW-PULK-120104
2" -RW-PULK-120106
2" -RW-PULK-120103
2" -RW-PULK-110403
I-11-04
INFLUENT TANKS
*PI 361
FILTER FEED PUMP 1
*PMP-310
*DPIT 361
DIFFERENTIAL PRESSURE *DPIT-361
CARTRIDGE FILTER COARSE 1A
*FIL-311
*DPIT 362
DIFFERENTIAL PRESSURE *DPIT-362
CARTRIDGE FILTER FINE 1B
*FIL-312

L/R
*HS 311
OPN *HC 311
CLS *HC 311
*ZSO 311
*ZSC 311
2" -RW-PULK-120109
*XV-311

2" -RW-PULK-120111
2" -RW-PULK-120105
2" -RW-PULK-120108
*PI 362
2" -RW-PULK-120103
FILTER FEED PUMP 2
*PMP-320
*DPIT 363
DIFFERENTIAL PRESSURE *DPIT-363
CARTRIDGE FILTER COARSE 2A
*FIL-321
*ZSO 320
*ZSC 320
*XV-320
*DPIT 364
DIFFERENTIAL PRESSURE *DPIT-364
CARTRIDGE FILTER FINE 2B
*FIL-322

*FIT 371
*FE 371
FILTER SYSTEM FLOW *FM-371
2" -TW-PULK-120107
I-14-01
A SIDE CONDITIONED WATER STORAGE TANK FARM
2" -RW-PULK-120101
2" -RW-PULK-120110
BYPASS TO COOLING TOWER BLOWDOWN

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE *** ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

1. DRAIN SLOPES TO SECONDARY CONTAINMENT

FILTER SYSTEM - A SIDE

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
FILTER SYSTEM A SIDE
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-12-01	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:37:06 PM
FILENAME: FE-I-XXX-1201AD.dwg

SCADA DISPLAY
PLC
CONTROL PANEL
FIELD

*YNR 330
*HNA 330
*UAF 330
*SI 330
SIMILAR FOR FILTER FEED PUMP 2
RUN *YN 330R
AUTO *HN 330
START *XC 330S
SPEED COMMAND *SC 330
FAULT *UA 330F
SPEED INDICATION *S 330
HOA
*HS 330 H
RUN
*YI 330 GRN
DWG E-XX-XX

*PAH 367
*PAL 367 PSI
*PI 367
DIFFERENTIAL PRESSURE *P 367
*PAH 365
*PAL 365 PSI
*PI 365
DIFFERENTIAL PRESSURE *P 365

*HNA 330
*ZNO 330
*ZNC 330
SIMILAR FOR ALL PNEUMATIC VALVES
OPEN/ CLOSE *HN 330A
OPENED *ZN 330O
CLOSED *ZN 330C
*PAH 366
*PAL 366 PSI
*PI 366
DIFFERENTIAL PRESSURE *P 366
*PAH 368
*PAL 368 PSI
*PI 368
DIFFERENTIAL PRESSURE *P 368

*FAH 372
*FAL 372 GPM
*FI 372
FLOW *F 372

IA
*SOV 330
*ZSO 330
*ZSC 330
*FV-330

*PI 363
2" -RW-PULK-120202
I-11-04 INFLUENT TANKS
2" RW-PULK-110407
FILTER FEED PUMP 1 *PMP-330
2" RW-PULK-120201
*PI 364
2" -RW-PULK-120203
FILTER FEED PUMP 2 *PMP-340

*DPIT 365
DIFFERENTIAL PRESSURE *DPIT-365
CARTRIDGE FILTER COARSE 1A *FIL-331
2" RW-PULK-120204
L/R
*HS 312 OPN
*HC 312
*HC 312 CLS
*ZSO 312
*ZSC 312
2" RW-PULK-120209
*MOV-312
*DPIT 366
DIFFERENTIAL PRESSURE *DPIT-366
CARTRIDGE FILTER FINE 1B *FIL-332
2" RW-PULK-120206
*FIT 372
*FE 372
FILTER SYSTEM FLOWMETER *FM-372
2" - TW-PULK-120207
I-14-02 B SIDE CONDITIONED WATER STORAGE TANK
1

*DPIT 367
DIFFERENTIAL PRESSURE *DPIT-367
CARTRIDGE FILTER COARSE 2A *FIL-341
2" -RW-PULK-120208
2" RW-PULK-120205
*ZSO 340
*ZSC 340
*FV-340
*DPIT 368
DIFFERENTIAL PRESSURE *DPIT-368
CARTRIDGE FILTER FINE 2B *FIL-342

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE *** ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

1 DRAIN SLOPES TO SECONDARY CONTAINMENT

FILTER SYSTEM - B SIDE

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

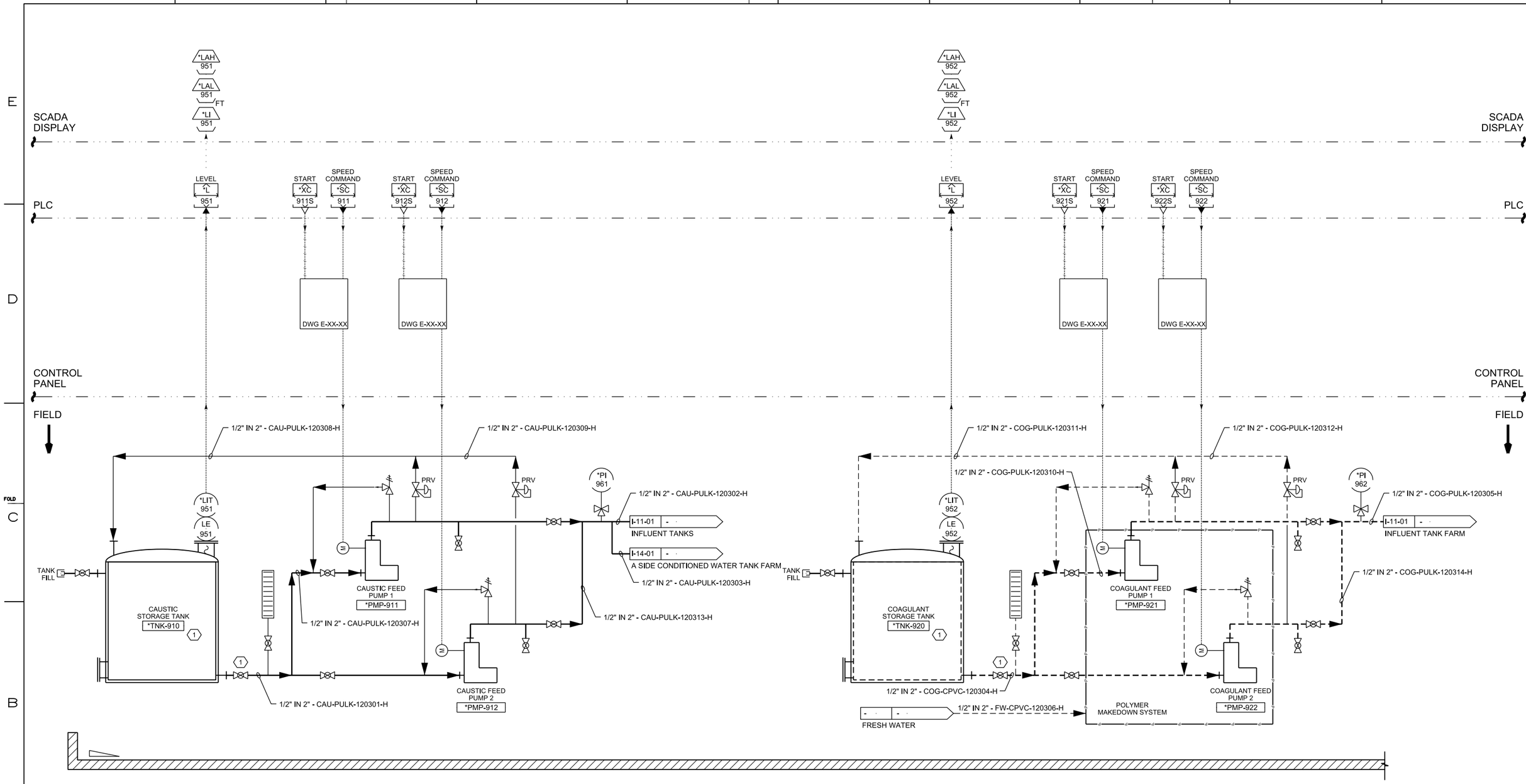
REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
FILTER SYSTEM B SIDE
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-12-02	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:37:36 PM
FILENAME: FE-I-XXX-1202AD.dwg



CAUSTIC SYSTEM

COAGULANT SYSTEM

NOTES REFERENCED IN DRAWING:

1. TANKS AND LINES ARE HEAT TRACED AND DOUBLE-CONTAINED.

DRAFT
NOT FOR
CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD. SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

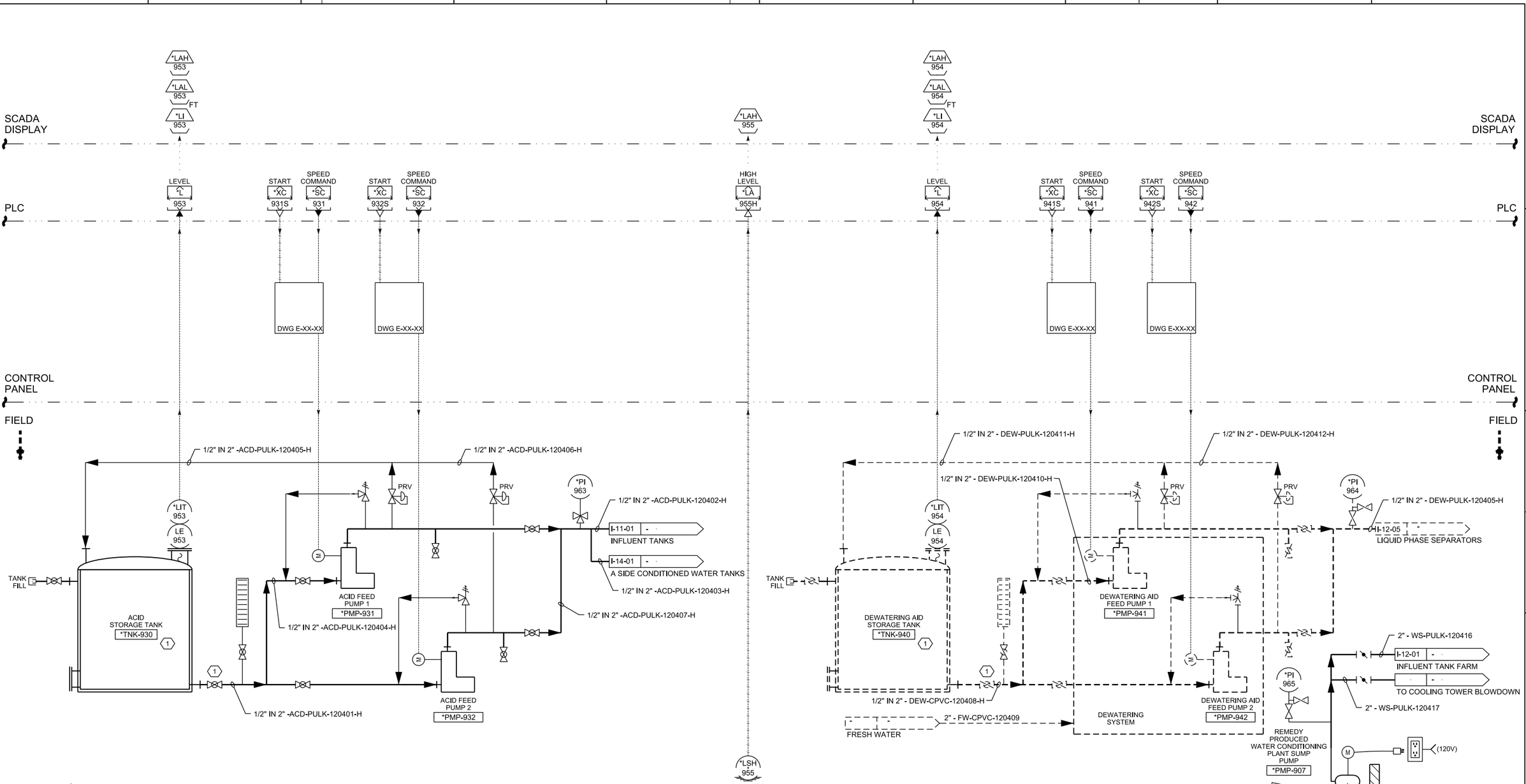
REVISIONS

APPROVED BY	
SO	
SUPV	
DSGN	RCH
DWN	RCH
CHKD	TPF
OK	TPF
DATE	
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
CAUSTIC AND
COAGULANT SYSTEM
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-12-03	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:38:48 PM
FILENAME: FE-I-XXX-1203AD.dwg
N1808



ACID SYSTEM ②

FUTURE DEWATERING AID SYSTEM ②

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

① TANKS AND LINES ARE HEAT TRACED AND DOUBLE-CONTAINED.

② CLEANING & WATER CONDITIONING REAGANT CONTAINERS ARE FUTURE AND NOT SHOWN HERE.

DRAFT
NOT FOR
CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD. SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
ACID AND DEWATERING AID SYSTEMS
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-12-04	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:39:27 PM
FILENAME: FE-I-XXX-1204AD.dwg
N1808

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*LAH 651

*LAH 652

*LAH 653

HIGH LEVEL *LA 651H

HIGH LEVEL *LA 652H

HIGH LEVEL *LA 653H

UTILITY AIR

2" - UA-HEAD-120504

I-11-04 -

INFLUENT TANK FARM

2" - SL-PULK-110404

2" - SL-PULK-120501

2" - SL-PULK-120503

SOLIDS PUMP PMP-601

I-12-04 -

DEWATERING AID

2" - DEW-PULK-120411

*LSH 651

*LSH 652

LIQUID PHASE SEPARATOR 1 *LPS-611

LIQUID PHASE SEPARATOR 2 *LPS-612

*LSH 653

I-11-01

INFLUENT TANKS SUMP PUMP

2" - WS-PULK-120502

(120V)

*PI 653

LIQUID PHASE SEPARATOR SUMP PUMP *PMP-607

LIQUID PHASE SEPARATOR

AIR

AIR COMPRESSOR *CMP-101

AIR DRYER/FILTER *X-102

RECEIVER *DRM-103

UA USERS

IA USERS

AIR COMPRESSOR

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
LIQUID PHASE SEPARATOR & AIR COMPRESSOR
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-12-05	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:42:46 PM

FILENAME: FE-I-XXX-1205AD.dwg

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*AAH 482 / *AAL 482 / *AI 482 — NTU
*AAH 481A / *AAL 481A / *AI 481A — PH
*AAH 481B / *AAL 481B / *AI 481B — MSMN/CM
SIMILAR FOR ALL ANALYZERS
TURBIDITY *A 482
PH *A 481A
CONDUCTIVITY *A 481B

*HNA 411 / *ZNO 411 / *ZNC 411 — SIMILAR FOR ALL PNEUMATIC VALVES
OPEN/CLOSE *HN 411A
OPENED *ZN 411O
CLOSED *ZN 411C

*LAH 452 / *LAL 452 / *LI 452 — FT
*LAL 451 / *LAH 451 — SIMILAR FOR ALL TANKS
LOW LEVEL *LA 451L
HIGH LEVEL *LA 451H
LEVEL *L 452

*YNR 401A / *HNA 401A / *UAF 401A — SIMILAR FOR TRANSFER PUMP B
RUN *YN 401AR
AUTO *HN 401AA
STT/STP *XC 401AS
OVERLOAD *UA 401AF

*FAH 471 / *FAL 471 — GPM
*FI 471
FLOW *F 471

*LAH 455
HIGH LEVEL *LA 455H

HOA *HS 401 H
RUN *YI 401 GRN
DWG E-XX-XX

I-12-03 - CAUSTIC SYSTEM
1/2" IN 2" - CAU-PULK-120303-H
*XV-415
*AIT 481 / *AE 481A — PH
*AIT 482 / *AE 482 — TURB
*AE 481B — COND

I-12-01 - FILTER SYSTEM A SIDE
2" - TW-PULK-120107
MIXER MXR 407
2
I-12-04 - ACID ADDITION
1/2" IN 2" - ACD-PULK-121003-H

IA
*SOV 411

2" - TW-PULK-140110
2" - TW-PULK-140111
2" - TW-PULK-140112

*ZSO 411 / *ZSC 411
*LIT 452 / LE 452
*LSH 451 / *LSL 451
CONDITIONED WATER STORAGE TANK 1 *TNK-401
*XV-411
DR
1

*ZSO 412 / *ZSC 412
*LIT 454 / LE 454
*LSH 453 / *LSL 453
CONDITIONED WATER STORAGE TANK 2 *TNK-402
*XV-412
DR
1

*ZSO 413 / *ZSC 413
*LIT 456 / LE 456
*LSH 455 / *LSL 455
CONDITIONED WATER STORAGE TANK 3 *TNK-403
*XV-413
DR
1

*ZSO 414 / *ZSC 414
*LIT 458 / LE 458
*LSH 457 / *LSL 457
CONDITIONED WATER STORAGE TANK 4 *TNK-404
*XV-414
DR
1

2" - TW-PULK-140113
2" - TW-PULK-140114
2" - TW-PULK-140115
2" - TW-PULK-140116
2" - TW-PULK-140117
2" - TW-PULK-140118

*ZSO 416 / *ZSC 416
2" - TW-PULK-140102
I-14-02 - CONDITIONED WATER B SIDE
*XV-416

*ZSO 415 / *ZSC 415
*FIT 471 / *FE 471
M
CONDITIONED WATER FLOW *FM-471
*XV-415
- - COOLING TOWER BLOWDOWN
2" - TW-PULK-140101

*PI 461
*PI 462
S
M
CONDITIONED WATER TRANSFER PUMP 2 *PMP-405
CONDITIONED WATER TRANSFER PUMP 1 *PMP-406

*LSH 459

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

NOTES REFERENCED IN DRAWING:

1. NOZZLES PROVIDED FOR FUTURE RECIRCULATION PUMP AND EDUCTORS, PH, CONDUCTIVITY AND TURBIDITY ANALYZERS AND CHEMICAL FEED TO TANKS.
2. MINIMUM DISTANCE TO BE DETERMINED.

- - COOLING TOWER BLOWDOWN
2" - WS-PULK-140119
I-11-01 INFLUENT TANK FARM SUMP PUMP
2" - WS-PULK-140103
(120V)
M
*PI 463
CONDITIONED WATER TANK FARM SUMP PUMP *PMP-407

CONDITIONED WATER TANK FARM A SIDE

DRAFT NOT FOR CONSTRUCTION

MICROFILM

BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. of SHEETS
I-14-01
REV

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY: SO, SUPV, DSGN RCH, DWN MBY, CHKD TPF, OK TPF, DATE, SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
CONDITIONED WATER STORAGE TANK FARM A SIDE
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

PLOT DATE: 3/30/2013 PLOT TIME: 12:02:58 AM
FILENAME: FE-I-XXX-1401AD.dwg

SCADA DISPLAY

PLC

CONTROL PANEL

FIELD

*FAH 571
*FAL 571
*FI 571
GPM
*HCO 511
OPEN
*XC 511O
*HCC 511
CLOSE
*XC 511C
FLOW
*F 571
DWG E-XX-XX

*LAL 551
LOW LEVEL
*LA 551L
*LAH 551
HIGH LEVEL
*LA 551H
*LAH 581B
*LAL 581B
COND
*LI 581B
*AAH 581A
*AAL 581A
PH
*AI 581A
*LAH 552
*LAL 552
FT
*LI 552

*HNA 512
OPEN/ CLOSE
*HN 512A
*ZNO 512
OPENED
*ZN 512O
*ZNC 512
CLOSED
*ZN 512C
SIMILAR FOR ALL PNEUMATIC VALVES

*YNR 501
RUN
*YN 501R
*HNA 501
AUTO
*HN 501A
*UAF 501
OVERLOAD
*UA 501F
STT/STP
*XC 501S
SIMILAR FOR FILL PUMP 2
HOA
RUN
*HS 501 H
*YI 501 GRN
DWG E-XX-XX

*LAL 555
LOW LEVEL
*LA 555

*LAH 554
HIGH LEVEL
*LA 554H
LOADING START
*HN 502S
LOADING STOP
*HN 502P

*AIT 581
*AE 581A PH
*AE 581B COND
*LI 553
*LSH 551
CONDITIONED WATER STORAGE TANK
*TNK-510
*LSL 551
SUB
*LT 552
DR

IA
*SOV 512
*ZSO 512
*ZSC 512
*XV-512

*PI 561
M
TCS TRUCK FILL PUMP
*PMP-501
*LSL 555

*HC 502 S
*HC 502 P
TCS FILL STATION
*CS-502
*LSH 554
HOSE
TRUCK FILL - TCS STATION
DECONTAMINATION PAD/SECONDARY CONTAINMENT
*PI 562
DECON PAD SUMP PUMP
*PMP-507

*SVO 511
*SVC 511
*FCV-511
*FIT 571
*FE 571
M
COOLING TOWER FLOW
*FM-571

*ZSO 514
*ZSC 514
*XV-514

2" -TW-PULK-120207
I-12-02
FILTER SYSTEM B SIDE
2" x 4"
6" -DR-PULK-140212
I-11-01
OFF-SPEC RETURN
2" -WS-PULK-140202
2" -WS-PULK-140204
COOLING TOWER BASIN BY GRAVITY
I-14-01
CONDITIONED WATER TANK FARM
2" -TW-PULK-140102
2" -TW-PULK-140203
2" -TW-PULK-140209
2" -WS-PULK-140211
INDUSTRIAL SEWAGE SYSTEM
I-11-01
INFLUENT TANK FARM
2" -WS-PULK-140201
2" -TW-PULK-140206
NTH IRZ WELLS
I-06-02
*T720 CONDITIONED WATER FRAC TANK
2" -TW-PULK-140207
FUTURE INFILTRATION GALLERY (TERMINATE AT BAT CAVE WASH)
2" -TW-PULK-140208
FUTURE MOABI REGIONAL PARK (TERMINATE AT MW-20 BENCH)
2" -TW-PULK-140205
I-06-02
IRZ CARBON AMENDMENT AREA

DRAWING NOTES:

1. FOR FULL SCADA, INSTRUMENT AND EQUIPMENT TAG NUMBER IDENTIFICATION REPLACE "*" ON THIS DRAWING WITH LOCATION ID RTP01.

CONDITIONED WATER DISTRIBUTION

DRAFT NOT FOR CONSTRUCTION

frisch engineering, inc.
CONSULTING ELECTRICAL ENGINEERS
110 BLUE RAVINE RD, SUITE 101
FOLSOM, CA 95630
PH 916 353 1025 FX 916 353 1028
WWW.FRISCHENGINEERING.COM

CH2MHILL®

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	09/2012	INTERMEDIATE (60%) DESIGN SUBMITTAL		MBY			JP

REVISIONS

APPROVED BY	
	SO
	SUPV
	DSGN RCH
	DWN MBY
	CHKD TPF
	OK TPF
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT
P&ID
CONDITIONED WATER
B SIDE
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-14-02	REV

PLOT DATE: 3/27/2013 PLOT TIME: 9:37:57 PM
FILENAME: FE-I-XXX-1402AD.dwg