UTILITY RELOCATION PLAN

San Francisquito Creek Flood Reduction, Ecosystem Restoration, & Recreation Project:

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SAN FRANCISQUITO CREEK
JOINT POWERS AUTHORITY

Utility Relocation Plan

1 BACKGROUND AND PURPOSE

This plan is required by the Regional Water Quality Control Board, San Francisco Bay Region (Water Board) as part of Section 401 permit approval for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, & Recreation Project (Water Board, 2015). Specifically, Condition 401-16 requires the following:

> *No later than 60 days before the beginning of work, the JPA shall prepare and submit a utility relocation plan, acceptable to the Executive Officer, that identifies, at a minimum, appropriate measures to prevent impacts during horizontal directional drilling, elevations of live and abandoned utilities, proposed disposal locations or methods for excess sediment, proposed sediment reuse, and related information. In addition, the plan shall document the locations of any utilities abandoned in place.*

In addition, this plan is written to comply with Water Board permit condition 401-18, which specifies that the relocation of the sanitary sewer identify the depth below the channel that the sanitary sewer is to be relocated and demonstrate that the line cannot be constructed at a deeper depth. This plan is also in compliance with Water Board permit condition 401-19 that specifies removal of the gas pipeline to be abandoned from beneath the creek channel and levees.

The overall scope of the San Francisquito Creek Flood Reduction, Ecosystem Restoration, & Recreation Project is to provide 100-year creek flood protection in the Cities of East Palo Alto, Palo Alto and Menlo Park, California. Additionally, it will reduce flood risks from Bay tides and 50 years of future Sea Level Rise within the creek in concert with the SFCJPA's planned coastal levee system for the region.

The final 100% Design documents were completed April 2016. The Santa Clara Valley Water District (SCVWD), a member agency of the SFCJPA, will manage construction. The schedule for construction within the creek is June 15 through October 15, with two to three seasons of construction estimated for 2016 to 2018.

This plan covers the following utilities that will be relocated prior to the start of the project:

- Gas, by Pacific Gas and Electric (PG&E)
- Electric, by PG&E
- Sanitary sewer, by East Palo Alto Sanitary District (EPASD)

It should be noted that horizontal drilling is no longer planned as part of utility relocation. Therefore, this plan does not include measures to alleviate impacts from horizontal drilling as specified in the Section 410 Permit. Instead this document describes measures associated with preventing adverse environmental effects from micro-tunneling, micro-pile borings and open trenching, which are the methods that will be used for the utility relocation projects.

The attached engineering plans (Attachments A-C) provide specifications to perform the work. Specifically related to Water Board Section 401 permit approval, Condition 401-16, 18 and 19 described above, Attachments A-C document the locations and elevations of live and abandoned utilities. The plans also describe methods by which gas and sewer lines will be abandoned or removed. Electric lines will be moved and therefore not abandoned.

2 GAS

2.1 DESCRIPTION

PG&E, Gas Transmission and Distribution, San Francisco, California, will be implementing a gas line relocation project that will install 3,350 feet of 24-inch steel pipe, and retire in place approximately 2,950 feet of 20-inch steel pipe installed in 1931 and 1959. The new pipe will be approximately 10 feet below the low flow channel of San Francisquito Creek. Outside of the channel, the new pipe will be approximately 5 feet below ground surface (Attachment A).

As required by Water Board Permit Condition 401-19, the abandoned gas lines beneath the creek and new levee areas will be removed later during construction of the San Francisquito Creek Flood Reduction, Ecosystem Restoration, & Recreation Project.

The new pipeline will be installed by micro-tunneling and open trench methods. The majority of the project will be installed using open trench, with micro-tunneling under the creek. Micro-tunneling combines tunnel boring and hydraulic jacks (pipe jacking method) with a remotely controlled steerable system to guide construction. Micro-tunneling will cause less disruption to the sensitive environmental habitat in San Francisquito Creek. This is due to the following advantages:

1. More direct route and little surface disturbance
2. Significantly less drill spoil materials than horizontal directional drilling
3. No liquid surfacing from drilling muds compared to horizontal drilling
4. Minimizes dewatering needs due to continuous extraction as the bore advances
5. Minimizes the potential for releases, and if a release occurs, it would be smaller and more contained and thus easier to prevent inadvertent discharges.

The primary environmental issues to be addressed from micro-tunneling and open trenching are:

- Groundwater from dewatering
- Soil management, including fill, native materials, drill cuttings and spent drilling fluids.
- Storm water erosion and runoff must be prevented from entering San Francisquito creek or marsh areas.

Each of these items is described below.

2.2 DEWATERING

All groundwater generated during project dewatering activities will be placed into 20,000 gallon portable tanks (i.e., Baker Tanks) and then discharged or disposed of in accordance with the Diversion

Plan (SCVWD 2016). Creek dewatering discharges, accumulated groundwater or stormwater removed during dewatering of excavations, and diverted creek and stormwater flows will be analyzed for the following discharge and receiving water limitations specified in Water Board permit condition 401-15:

a. Discharge pH - the instantaneous discharge pH shall be in the range of 6.5 to 8.5 and shall not vary from ambient pH by more than 0.5 pH units.
b. Discharge Dissolved Oxygen - the discharge dissolved oxygen concentration shall be no less than 5.0 milligrams per liter (mg/L) as an hourly average for discharging into tidal water and 7.0 mg/L (hourly average) for discharging into non-tidal receiving waters.
c. Discharge Dissolved Sulfide shall not be greater than 0.1 mg/L.
d. Receiving Water Turbidity – increases in the receiving water turbidity measured as nephelometric turbidity units (NTU) shall not be greater than 10 percent over baseline conditions in areas where natural turbidity is greater than 50 NTU.. All Project discharge plans shall identify an acceptable location or locations at which to measure background turbidity. The JPA shall monitor receiving water and discharge turbidity at least one time every 8 hours on days when discharges from excavations or any other dewatering processes may occur.
e. Nutrients - the receiving waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
f. There shall be no violation of any water quality standard for receiving waters adopted by the Regional Water Board or the State Water Resources Control Board.

Background locations for turbidity will be collected on up to five occasions at the planned project discharge location area prior to the start of construction activities. The sample(s) must be representative of ambient conditions prior to construction. The background turbidity will be used as the basis of comparison for turbidly discharges described under (b) above.

The discharge location is provided in the Diversion Plan's Monitoring Plan, Attachment G (SCVWD 2016). Water detained behind the upstream cofferdam will be pumped and piped past the work area and be discharged below the downstream cofferdam.

2.3 Soil and Waste Management

The materials generated as a result of micro-tunneling and open trenching will consist of fill native materials (primarily Bay Mud), and a slurry of fill, native materials and bentonite drilling fluid. These materials will be stored onsite at the designated staging areas for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, & Recreation Project, which include the parking lot of the Baylands Athletic Center and the inactive portion of the Palo Alto Golf Course.

Exploratory borings will be performed prior to mobilization to collect groundwater and soil samples near the micro tunnel pit locations for disposal characterization. These data will be used to determine proper handling and disposal methods. The wet micro tunnel spoils will be placed into water tight containment/bins prior to off-haul for disposal. Soil spoils generated during excavation are expected to be used for backfill purposes. Excess soil and the micro tunnel spoils will be off-hauled for disposal based on the soil analytical data when obtained from the exploratory borings. The backfill locations will be

managed and have best management practices applied similarly to any construction site including seeding, stabilization, and sediment controls (See Section 2.4).

If the presence of contaminated soil is observed via smell or visual during micro-tunneling activities, all activities will be stopped until the exact nature of the contamination is determined. Once the hazards associated with the contaminant(s) are determined, an action plan will be developed. At a minimum, the plan will include health and safety considerations, including appropriate personnel protection equipment (PPE), methods for removal and disposal.

Contaminated soil will be segregated from clean soil/cuttings and profiled for appropriate disposal.

2.4 Stormwater Management and Spill Prevention to Protect San Francisquito Creek and Sensitive Habitats

The contractor will be obtaining coverage under the Construction General Permit (Water Board Order No. DWQ-2009-0009, as amended by Order Nos. 2010-0014-DWQ and 2012-006-DWQ). In accordance with permit requirements and with PG&E *R-349 L-101 Contingency Plans,* spill prevention procedures will be followed. Spill containment materials will be onsite, and best management practices will be implemented.

2.5 Documentation

Documentation for gas line relocation will include as-built diagrams that will provide the surveyed elevations of live and abandoned utilities, as well as the locations of any utilities abandoned in place. In addition, the project will not be considered complete until testing and inspection of the new line is performed and documented.

3 Electric

3.1 Description

The Department of Engineering, PG&E, San Francisco, California will be completing upgrades for an electrical and telecommunications tower. PG&E has completed upgrades to five other towers in the vicinity, and the final project is for Tower 2/22, that will be located within the San Francisquito Creek widened creek bed. The primary purpose of this project is to raise the height of the tower to meet requirements to support overhead electrical and telecommunications cables, and construct new footings for the tower such that they are suitable for a submerged environment.

In order to accomplish this, the following sequence of work will be followed:

- Community notification and fact sheet for posting/mailing
- Complete biological surveys within 14 days of performing construction work and adhere to appropriate mitigation measures.
- Develop SWPPP

- Coordinate with City of Palo Alto and other pre-construction utility work in area.
- USA alert

Once the above activities have been completed, drilling for the new foundation will commence. Two temporary poles and braces, known as shooflys, will be constructed to support the wires from the tower during tower moving. The new foundation piles will be drilled to 40 feet below ground surface and the pile cap installed. The approximate 15-foot new heightening section will be secured to the new pile cap. The existing tower above the existing 7' lattice base will be moved to the new location, which is adjacent to the existing location, by a large crane. The wires will be reattached. Electrical service will be maintained at all times by de-energizing and moving one set of wires at a time. The project is expected to be completed in four weeks from mobilization.

3.2 Dewatering

Dewatering is not needed for electrical upgrade work.

3.3 Soil and Waste Management

Very little soil or other waste material will be generated during tower relocation. The drill cuttings from micro-pile foundation installation will be allowed to settle, with the liquid being tested and disposed at an appropriate off site location. The remaining soil is expected to be reused or on/offsite, using procedures similar to Section 2.3. The staging area for the electrical project will be on the Palo Alto Golf Course, near where the project will be implemented.

Shoofly installation

For all soils generated in pot holing and drilling holes for the poles for the shoofly poles: The soils will be stockpiled on site and tested and if non-hazardous will be used to fill the potholes and pole holes at the end of the job. If the soils test hazardous they will be hauled off site to an approved PG&E designated site.

Micro Pile installation

Micro piles are displacement piles so no soils are expected to be generated, however the drilling mud used will be contained and will be hauled of site for disposal.

New tower Foundation/Pile cap

Any soils generated will be stockpiled and tested; if non-hazardous they will be retained for use in backfilling if required after demolition of the existing foundation. If the soil tests hazardous, it will be hauled off site to a PG&E designated site.

Existing Tower Foundation demolition

The existing foundation will be demolished to 2' below the existing grade. Concrete and rebar will be hauled off site to a PG&E designated site. Soil generated will be tested and if non-hazardous will be placed back into the excavation. If material is profiled as Class II, clean fill will be imported to bring back

to the existing grade. Alternatively, the excavation may be left below grade and filled as part of the regrading when the existing levee is relocated.

3.4 Stormwater Management and Spill Prevention to Protect San Francisquito Creek and Sensitive Habitats

The contractor will be obtaining coverage under the Construction General Permit (Water Board Order No. DWQ-2009-0009, as amended by Order Nos. 2010-0014-DWQ and 2012-006-DWQ). In accordance with permit requirements, Best Management Practices, including stormwater management, erosion and sediment control and spill prevention and control procedures will be followed.

3.5 Documentation

Documentation will consist of as-built diagrams. As-builts will consist of engineered drawings showing final depths and surveyed locations.

4 Sanitary Sewer

4.1 Description

The East Palo Alto Sanitary District (EPASD) will be replacing approximately 800 feet of 24-inch diameter asbestos cement pipe sanitary sewer piping by installing approximately 1,000 feet of new 30-inch outer diameter high-density polyethylene (HDPE) piping. The project also includes installation of five new concrete manholes with cast iron frames and covers. Piping will be installed via open trench methods. Some of the existing piping will be removed based on location, with remaining piping to be abandoned in place.

Approximately 500 feet of sewer pipeline (out of the 1,000 feet of new pipeline length) will be an inverted siphon beneath San Francisquito Creek and its adjacent banks to replace the existing siphon required due to the widening of the channel. For flow and maintenance reasons, the section will include up to two pipelines, one 30-inch HDPE and one section of 22-inch HDPE.

As required by Water Board Permit Condition 401-19, the abandoned sanitary sewer lines beneath the creek and new levee areas will be removed. The existing sewer flows will be maintained during the project via contractor bypass pumps and piping, with no service shutdowns planned (Freyer & Laureta, Inc., March 2016, Attachment C).

Water Board permit condition 401-18 requires the SFCJPA to identify the depth below the channel that the sanitary sewer is to be relocated and demonstrate that the line cannot be constructed at a deeper depth.

Because EPASD must connect the relocated section of the sewer line to existing lines outside of the proposed channel on both sides of the Creek, and because those existing lines are at a higher elevation than the creek channel invert, the relocated section under the Creek must dip down to provide cover beneath the Creek, and will function as an inverted siphon.

Geotechnical investigations performed by EPASD indicate that the relocated portion of the line below the channel will require "over excavation" down to an elevation needed to provide a stable substrate to prevent differential settlement of the relocated portion of the line. As such, the designed elevation of the relocated portion of the line (5.3 feet of cover below the invert of the low flow channel) is at a greater depth than what would otherwise be designed for optimal performance of the inverted siphon.

Placing the relocated portion of the line any deeper would diminish the hydraulic performance of the inverted siphon, significantly compromising flow within the line and creating a need to perform frequent maintenance activities to remove accumulated solids within the line.

Unlike common exposure of a subsurface utility line due to erosion in upland stream reaches, where downcutting of the channel invert can be a fluvial geomorphic effect of natural channel gradient or human impacts, the relocated section of the line beneath the creek channel is at a location where the tides of San Francisco Bay act as the hydraulic control and stabilize the elevation of the low flow channel at 0.0 NAVD88. Progressive downcutting of the channel in this location would only be possible hydraulically if sea level were to fall significantly, which is counter to projected sea level rise that has been universally accepted by the scientific community.

4.2 DEWATERING

The sanitary sewer siphon replacement project requires dewatering since groundwater may be encountered approximately two feet below ground surface based on project planning investigations. Dewatering tanks are to be placed near the south side of the channel approximately 850 feet from the new sanitary sewer manhole (Attachment C). The groundwater is to be tested and treated as needed to meet effluent limitations in accordance with the Water Diversion Plan prepared by SCVWD (SCVWD, April 2016).

Creek dewatering discharges, accumulated groundwater or stormwater removed during dewatering of excavations, and diverted creek and stormwater flows will be analyzed for the following discharge and receiving water limitations specified in Water Board permit condition 401-15:

a. Discharge pH - the instantaneous discharge pH shall be in the range of 6.5 to 8.5 and shall not vary from ambient pH by more than 0.5 pH units.
b. Discharge Dissolved Oxygen - the discharge dissolved oxygen concentration shall be no less than 5.0 milligrams per liter (mg/L) as an hourly average for discharging into tidal water and 7.0 mg/L (hourly average) for discharging into non-tidal receiving waters.
c. Discharge Dissolved Sulfide shall not be greater than 0.1 mg/L.
d. Receiving Water Turbidity - increases in the receiving water turbidity measured as nephelometric turbidity units (NTU) shall not be greater than 10 percent over baseline conditions in areas where natural turbidity is greater than 50 NTU. All Project discharge plans shall identify an acceptable location or locations at which to measure background turbidity. The JPA shall monitor receiving water and discharge turbidity at least one time every 8 hours on days when discharges from excavations or any other dewatering processes may occur.

e. Nutrients - the receiving waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
f. There shall be no violation of any water quality standard for receiving waters adopted by the Regional Water Board or the State Water Resources Control Board.

Background locations for turbidity will be collected on up to five occasions at the planned project discharge location area prior to the start of construction activities. The sample(s) must be representative of ambient conditions prior to construction. The background turbidity will be used as the basis of comparison for turbidly discharges described under (b) above.

The discharge location is provided in the Diversion Plan's Monitoring Plan, Attachment G (SCVWD 2016). Water detained behind the upstream cofferdam will be pumped and piped past the work area and be discharged below the downstream cofferdam.

4.3 Soil and Waste Management

The excavation trench is expected to range from approximately eight feet to 25 feet deep such that it will extend to the base of Bay Mud soils, and be approximately 1,000 feet long. After the new piping and appurtenances are installed, the trench will be backfilled with a structural backfill in accordance with the engineering plans and geotechnical report (Attachment C). As described in the engineering plans, the project does not allow stockpiled soil in the public right-of-way unless approved by the City Engineer. The stockpiled soil will be characterized for offsite disposal or reuse in accordance with local, state and federal regulations. Designated areas for temporary stockpiled soil are parking lot of Baylands Athletic Center, an unused portion of Palo Alto Golf Course. Stockpile management would include inspection and cover, as appropriate. Stockpile minimization is preferred, with direct off-haul, if possible, during excavation.

If the presence of contaminated soil is observed, all activities will be stopped until the exact nature of the contamination is determined. Once the hazards associated with the contaminant(s) are determined, an action plan will be developed. At a minimum, the plan will include health and safety considerations, including appropriate personnel protection equipment (PPE), methods for removal and disposal. Contaminated soil will be segregated from clean soil/cuttings and profiled for appropriate disposal.

Sections of the existing asbestos cement piping will be filled with cement slurry, capped on both sides with 12-inches of concrete and abandoned in place. Other portions of the existing asbestos cement pipe need to be removed due to proximate location near San Francisquito Creek and the new levee. This piping will be removed and disposed as a non-hazardous special waste in accordance with San Mateo and Santa Clara County regulations. The California Environmental Protection Agency (CalEPA) considers non-friable bulk asbestos containing waste to be nonhazardous regardless of its asbestos content, so it is not subject to regulation under Title 22, Division 4.5, of the California Code of Regulations (DTSC 2006).

4.4 Stormwater Management and Spill Prevention to Protect San Francisquito Creek and Sensitive Habitats

The contractor will be obtaining coverage under the Construction General Permit (Water Board Order No. DWQ-2009-0009, as amended by Order Nos. 2010-0014-DWQ and 2012-006-DWQ). In accordance with permit requirements for Risk Level 2 sites, the contractor will comply with associated Best Management Practices as described in the Diversion Plan (SCVWD 2016) and engineering plans (Attachment C). These practices include stormwater management, erosion and sediment control, spill prevention and control procedures.

4.5 Documentation

Documentation will consist of as-built diagrams. In particular, the installed piping locations will be surveyed in order to assess final depth of pipe within the creek, as well as easement purposes.

5 References

California Department of Toxic Substances Control (DTSC), 2006. Fact Sheet *Managing Asbestos Waste*, December.

Ferguson, Jayde 2015. *Environmental Benefits of Micro-Tunneling* DM Civil Contractors, Perth, Western Australia March 30. http://www.mining.com/web/4-environmental-benefits-microtunneling-know/ URL accessed April 5, 2016.

Primary Services Corporation/Vadnais Trenchless, on behalf of Pacific Gas and Electric (PG&E), undated. *MicroTunnel Contingency Plans for San Francisquito Creek, PG&E R-349 L-101*

Ohio Environmental Protection Agency 2013 (Ohio EPA). Fact Sheet, Division of Surface Water, *Horizontal Directional Drilling for Utility Line Installation Disposal of Horizontal Directional Drilling Wastes and Protection of Water Resources* December. http://epa.ohio.gov/Portals/0/general%20pdfs/HorizontalDirectionalDrillingforUtilityLineInstallation.pdf URL accessed April 5, 2016.

Santa Clara Valley Water District (SCVWD) 2016. *Diversion Plan, Dewatering/Fish Relocation Plan for San Francisquito Creek,* April 12.

Regional Water Quality Control Board, San Francisco Bay Region (Water Board) 2015. *Conditional Water Quality Certification for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, Cities of Palo Alto and East Palo Alto, Santa Clara and San Mateo Counties* CIWQS Place No. 757384 (SG)7, April 7.

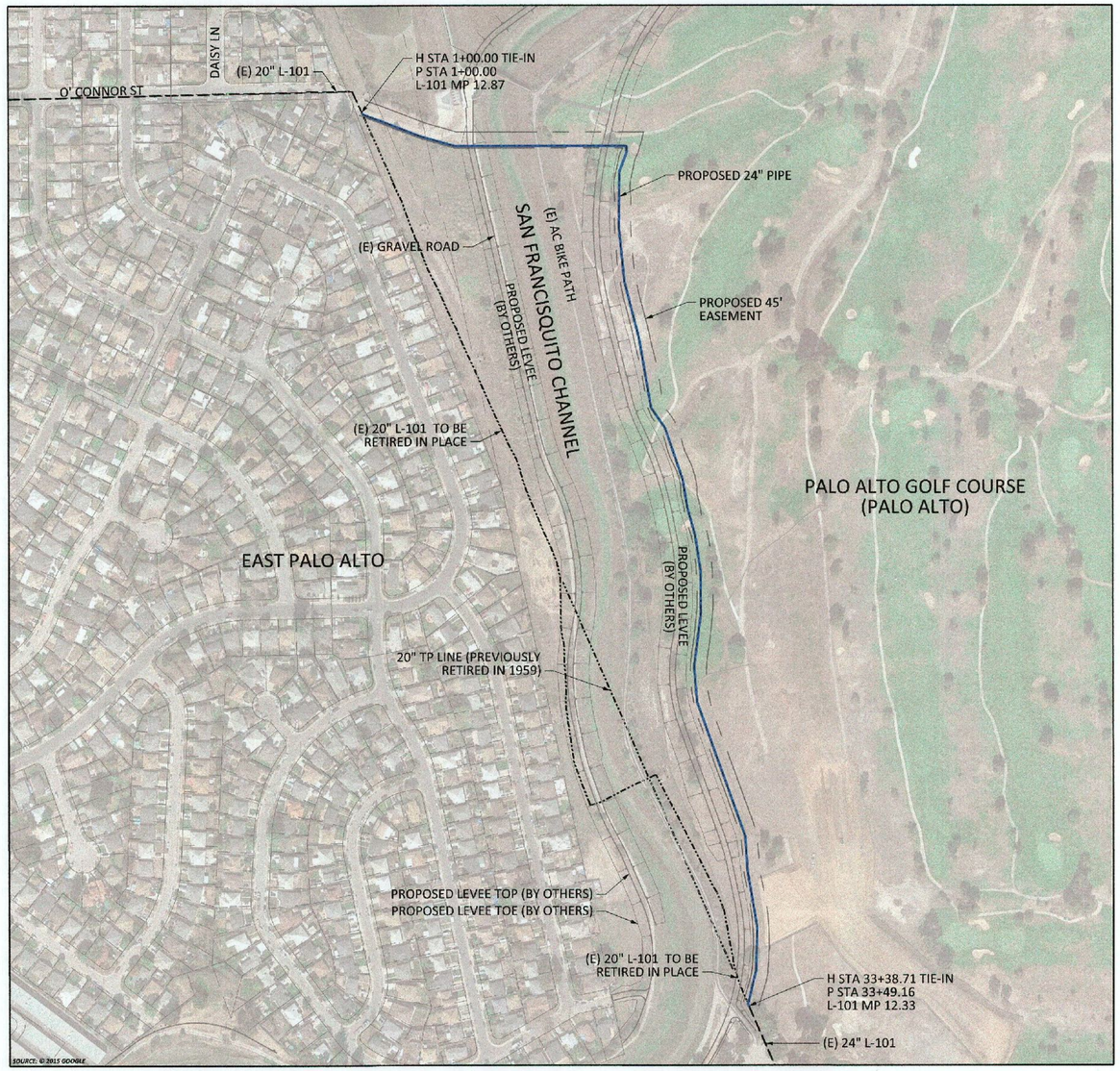
Attachment A

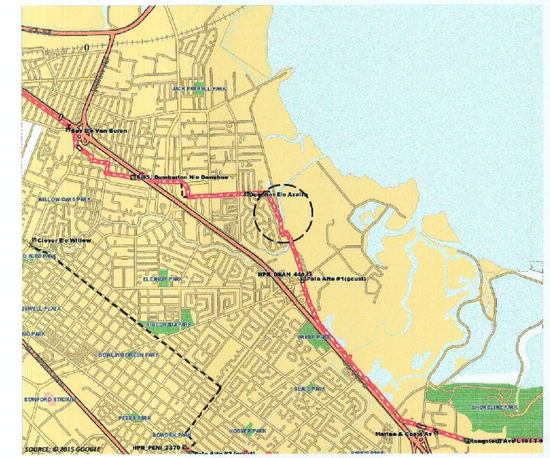
Engineering Specifications

PG&E Gas Pipeline Relocation

CP AREA # L101-PEN
WALL MAP 3280
PLAT I6, I7, J7
SANTA CLARA COUNTY
SAN MATEO COUNTY

L-101, MP 12.33 - 12.87
Relocate 3,350 Feet of 24" Pipe
San Francisquito Creek - Palo Alto, East Palo Alto





VICINITY SKETCH
NOT TO SCALE
PALO ALTO & EAST PALO ALTO, CA

SCHEDULE OF SHEETS

SHEET 1 -- TITLE & INDEX
SHEET 2 -- CONSTRUCTION NOTES
SHEET 3 -- LEGEND & STAMPS
SHEET 4-7 -- PLAN & PROFILE
SHEET 8-10 -- DETAILS
SHEET 11 -- BILL OF MATERIALS
SHEET 12 -- DEACTIVATION SHEET

NOTE:
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811 Know what's below. Call before you dig.

ZERO IN ON SAFETY

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/2/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHR1 JDQ4

REVISIONS

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9SK
	DWN D9SK
	CHKD CDB6
	OK
JDQ4	DATE 11-17-15
OHR1	SCALES AS SHOWN

PIPELINE - TITLE & INDEX
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SAFETY PLEDGE
I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO. 1 OF 12 SHEETS	
31189651	0

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SUMMARY OF PROPOSED WORK:

1. INSTALL APPROX. 3,218 FEET OF 24" STEEL PIPE.
2. INSTALL APPROX. 131 FEET OF 20" STEEL PIPE.
3. TRENCH AND BACKFILL.
4. MICRO-TUNNEL AT THE SAN FRANCISQUITO CREEK CROSSING.
5. HYDROSTATICALLY TEST NEW MAIN LINE.
6. RETIRE APPROX. 2,950 FEET OF 20" STEEL PIPE.
7. INSTALL (3) PIPELINE MARKERS.
8. INSTALL (2) CTS STATIONS.

SEQUENCE OF OPERATIONS:

1. INSTALL APPROX. 3,220 FT OF 24" PIPE.
2. MICROTUNNEL APPROX. 320 FT UNDER SAN FRANCISQUITO CREEK.
3. INSTALL APPROX. 131 FT OF 20" PIPE.
4. HYDROSTATICALLY TEST NEW 24" AND 20" PIPE.
5. ISOLATE USING APPROVED CLEARANCE.
6. TIE-IN NEW 24" AND 20" PIPE TO EXISTING L-101.

CONSTRUCTION NOTES:

GENERAL REQUIREMENTS:

1. UNDERGROUND SERVICE ALERT :
   CALL 811 (1-800-227-2600) A MINIMUM OF 2 BUSINESS DAYS (NOT INCLUDING INITIAL DAY OF CONTACT) IN ADVANCE FOR THE MARKING OF UNDERGROUND UTILITIES, INCLUDING ALL NON-UTILITIES BEFORE YOU DIG, GRADE, OR EXCAVATE.

2. UTILITY NOTES:
   A. DIMENSIONS SHOWN ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION FROM SEVERAL SOURCES, AND SHALL BE VERIFIED IN THE FIELD BY CONSTRUCTION PERSONNEL PRIOR TO FABRICATION.
   B. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES, PROPERTY LINES, AND OTHER SUBSTRUCTURES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE, UNLESS OTHERWISE NOTED. CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR MAKING ALL DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AND OTHER SUBSTRUCTURES AS NECESSARY TO AVOID DAMAGE OR ENCROACHMENTS.
   C. PROSPECTING IS REQUIRED AHEAD OF WORK. ALL OFFSETS OR ROPING WILL NEED TO BE APPROVED BY THE PG&E PROJECT ENGINEER (PED), AND REDLINED DETAILS SHOWN ON PROFILE AND CONSTRUCTION DETAIL SHEETS OF EACH ADDITIONAL SUBSTRUCTURE.
   D. ALL EXCAVATIONS WITHIN EXISTING STATIONS SHALL BE HAND DUG OR EXCAVATED USING SOFT DIG METHODS (e.g. VACUUM EXCAVATIONS OR SIMILAR).

3. ELBOWS AND FIELD BENDS:
   A. ALL BENDS ARE SMOOTH FIELD BENDS, EXCEPT WHERE ELBOWS ARE SHOWN. FIELD BENDS SHALL BE MADE IN ACCORDANCE WITH A-36, SECTION 4D. FIELD BENDS MAY BE USED IN LIEU OF ELBOWS WHEN PREAPPROVED BY THE PG&E PROJECT ENGINEER (PED).
   B. IN ORDER TO AVOID EXCESSIVE STRAIN ON THE PIPELINE, THERE SHALL BE A MINIMUM SEPARATION OF 5 FEET BETWEEN A ROPED SECTION OF PIPELINE AND ANY ELBOWS OR FIELD BENDS.
   C. ALL ANGLES SHOWN IN THE PLAN AND PROFILE ARE APPROXIMATE AND SHALL BE CUT TO SUIT FIELD CONDITIONS.

4. SEPARATION FROM OTHER STRUCTURES:
   A. CROSSING UNDERGROUND FACILITIES: PG&E PIPELINE MUST BE INSTALLED WITH AT LEAST 24 INCHES OF CLEARANCE FROM ANY OTHER SUBSTRUCTURE/UTILITY NOT ASSOCIATED WITH THE PIPELINE UNLESS NOTED ON THE DRAWINGS.
   B. PARALLELING UNDERGROUND FACILITIES: THIS PIPELINE MUST BE INSTALLED WITH AT LEAST 5 FEET OF CLEARANCE FROM ANY OTHER UNDERGROUND STRUCTURE/UTILITY NOT ASSOCIATED WITH THE PIPELINE UNLESS NOTED ON THE DRAWINGS.

5. RESTORATION AND CLEAN UP:
   A. RESTORATION OF PUBLIC STREETS, SIDEWALKS, CURBS, ETC. ABOVE PIPE BEDDING SHALL BE IN ACCORDANCE WITH THE LATEST CITY, COUNTY, OR AGENCY STANDARDS.
   B. WHERE EVER THERE ARE ROW CROPS, THE TOPSOIL SHALL BE REMOVED TO A DEPTH OF 12" AND STORED ON SITE. UPON COMPLETION OF CONSTRUCTION, THE TOPSOIL SHALL BE RESTORED. TAKE CARE TO PREVENT MIXING OF TOPSOIL AND SUBSOIL.

6. EXISTING GIRTH WELDS, AT TIE-IN LOCATIONS, SHALL BE IDENTIFIED AND REMOVED IF PRACTICAL.

7. WELDING REQUIREMENTS:
   A. ALL ARC WELDING IS TO BE PERFORMED IN ACCORDANCE WITH THE GAS WELDING CONTROL MANUAL TD-4160M. ALL CANS OR SPOOLS SHALL BE A MINIMUM LENGTH OF ONE PIPE DIAMETER, WHENEVER POSSIBLE.
   B. INSTALL TEST STATIONS WITH THERMITE WELD CONNECTION IN ACCORDANCE WITH GAS T & D CORROSION CONTROL MANUAL O-10, O-10.1 AND O-10.2.

8. WELDING:
   WHEN INTERNAL MISALIGNMENT EXCEEDS 0.094", BACKWELD ANY GIRTH WELD WHERE THERE IS ACCESS TO THE INSIDE OF THE WELD. WHERE THERE IS NO ACCESS TO THE INSIDE OF THE WELD, MACHINE BORING OR GRINDING IS REQUIRED. BACKWELDING, GRINDING, OR BORING MUST BE DONE IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROCEDURE IN THE GAS WELDING CONTROL MANUAL TD-4160M.

9. STRENGTH TEST REQUIREMENTS
   A. STRENGTH TESTING SHALL MEET PRESSURE AND DURATION REQUIREMENTS OF GAS STANDARD A-34 AND SHALL BE CONDUCTED IN ACCORDANCE WITH UTILITY PROCEDURE TD-4137S.
   B. ALL WELDS THAT HAVE NOT BEEN STRENGTH TESTED AND ALL FITTINGS SHALL BE SOAP TESTED AT 100 PSI AND AT OPERATING PRESSURE BEFORE COATING CAN OCCUR.

10. PAINTING AND COATING REQUIREMENTS:
    A. ALL EXPOSED PIPE AND FITTINGS ARE TO BE PAINTED IN ACCORDANCE WITH GAS STANDARD E-30. ALL COATING ON BURIED PIPE AND FITTINGS ARE TO BE APPLIED IN ACCORDANCE WITH GAS STANDARD E-35.
    B. FOR COATING SELECTIONS ON BURIED PIPE, SEE DIRECT BURIAL COATING SELECTIONS TABLE.

11. DOCUMENTATION OF INSPECTION OF EXISTING PIPELINE:
    WHENEVER EXISTING BURIED GAS FACILITIES ARE EXCAVATED DURING ENGINEERING OR DURING CONSTRUCTION, AN A-FORM (TD-4110P-03-F01) SHALL BE COMPLETED FOR THE GENERAL INSPECTION. THIS ALSO APPLIES TO GAS FACILITIES BEING DEACTIVATED. THE COMPLETED A-FORM SHALL BE SUBMITTED WITH THE AS-BUILT PACKAGE.

12. TIE-IN AND CLEARANCE PROCEDURE TO BE PREPARED AND PERFORMED IN ACCORDANCE WITH THE FOLLOWING WORK PROCEDURES:
    A. WP 4100-01, HOT AND COLD WORK METHODS FOR NATURAL GAS TRANSMISSION PIPELINE SHUTDOWN AND TIE-IN.
    B. WP 4100-10, GAS CLEARANCE PROCEDURES FOR FACILITIES OPERATING OVER 60 PSIG.

13. COATING REMOVAL:
    A. PERFORM THE FOLLOWING STEPS, IN ACCORDANCE WITH TD-4711P-01, BEFORE REMOVING ASPHALTIC PIPE WRAP ON PIPELINES INSTALLED PRIOR TO 1972 (BASED ON PG&E ANALYSIS, PIPE INSTALLED IN 1972 OR LATER DOES NOT HAVE PIPE WRAP THAT CONTAINS ASBESTOS):
       1. REFER TO THE "EXISTING PIPE SPECS (PRE-1972)" STAMP TO DETERMINE IF A SAMPLE HAS BEEN COLLECTED OR IF A SAMPLE IS REQUIRED:
          a. "YES" REPRESENTS HISTORICAL RESULTS ARE AVAILABLE SHOWING THAT PIPE WRAP CONTAINS ASBESTOS. NO SAMPLE IS REQUIRED.
          b. "NO" REPRESENTS HISTORICAL RESULTS ARE AVAILABLE AND THE PIPE WRAP DOES NOT CONTAIN ASBESTOS (CONTENT WAS NON DETECT). NO SAMPLE IS REQUIRED.
          c. "UNKNOWN" REPRESENTS NO HISTORICAL RESULTS ARE AVAILABLE. A SAMPLE IS REQUIRED IF THE PIPE INSTALLATION DATE IS PRIOR TO 1972.
       2. WHEN A PIPE WRAP SAMPLE IS REQUIRED TO BE ANALYZED FOR ASBESTOS:
          a. COLLECT SAMPLE PER TD-4711P-01 AND COMPLETE CHAIN OF CUSTODY FORM TD-4711P-01-F01.
          b. FILE PINK COPY OF THE CHAIN OF CUSTODY FORM AND FINAL LABORATORY RESULTS WITH THE AS-BUILTS.
    3. WHEN REMOVING PIPE WRAP THAT CONTAINS ASBESTOS, OR FOR EMERGENCY WORK, FOLLOW TD-4711P-01 "PIPE WRAP REMOVAL, HANDLING AND DISPOSAL".

CATHODIC PROTECTION NOTES:

1. THE PERSON FILLING OUT THE A-FORM (TD-4110P-03-F01) IS RESPONSIBLE FOR BOTH THE INTERNAL CORROSION AND EXTERNAL CORROSION INSPECTION OF THE PIPELINE.

2. UPON COMPLETION OF BORINGS, CONTACT THE CORROSION SUPERVISOR FOR THE LOCAL AREA/DIVISION TO PERFORM CURRENT DRAIN TESTS ON THE PIPELINE SEGMENT THAT WAS INSTALLED IN THE BORE. THE CURRENT DRAIN TEST MUST BE PERFORMED PRIOR TO WELDING PIPE ON EITHER SIDE OF THE BORE.

3. FOR THE INSTALLATION OF THE OMNIMETRIX RECTIFIER REMOTE MONITOR, CONTACT THE CORROSION SUPERVISOR FOR THE LOCAL AREA/DIVISION.

4. BONDING CABLES TO BE INSTALLED ACROSS PIPELINE CUT-OUTS AT ALL LOCATIONS THE PIPELINE IS SEVERED PRIOR TO REMOVAL. CHAIN CLAMPS, MAGNETIC CLAMPS, OR OTHER CONSTRUCTION MANAGEMENT APPROVED CLAMPS AND #6 (MIN) STRANDED CABLE SHALL BE UTILIZED. CLAMPS TO REMAIN IN PLACE UNTIL PIPELINE IS TIED IN.

RETIREMENT PROCEDURE FOR EXISTING PIPE:

1. GT&D UTILITY WORK PROCEDURE TD 9500P-16, "DEACTIVATION AND/OR RETIREMENT OF UNDERGROUND GAS FACILITIES," SHALL BE FOLLOWED.

2. THE EXISTING PIPE SECTIONS SHALL HAVE FREE LIQUIDS REMOVED AND BE 100% PURGED PER GAS DESIGN STANDARD A-38, "PROCEDURES FOR PURGING GAS FACILITIES."

3. THE PIPE SHALL BE SECTIONALIZED AT INTERVALS AS SPECIFIED IN THE RETIREMENT PLAN. THE LOCATIONS CALLED OUT ARE APPROXIMATE AND ARE SUBJECT TO FIELD VERIFICATION TO IDENTIFY THE MOST OPTIMUM LOCATION IN THAT VICINITY. ACCURATE SURVEY DATA MAY NOT BE AVAILABLE FOR THESE LOCATIONS SO USE CAUTION DURING EXCAVATION AND WHEN IDENTIFYING THE PIPELINE TO BE RETIRED. OTHER ACTIVE PIPELINES MAY BE IN THE AREA.

4. AT EACH SUCH LOCATION NOTED ABOVE, A PIECE OF PIPE AT LEAST 24" LONG SHALL BE REMOVED. INSTALL A 1" HIGH PRESSURE SAVE-A-VALVE (H-17491, M022287) TO CHECK FOR PRODUCT AND PRESSURE PRIOR TO CUTTING INTO THE PIPELINE. THE OPEN ENDS OF THE RETIRED PIPE SHALL BE SEALED BY THE MOST APPROPRIATE METHOD OUTLINED IN GT&D UTILITY WORK PROCEDURE TD-9500P-16. BACKFILL MUST BE THOROUGHLY COMPACTED IN PLACE OF THE REMOVED SECTION OF PIPE.

DESIGN CHANGE PROCEDURE

MAINTENANCE AND CONSTRUCTION PERSONNEL MUST OBTAIN APPROVAL FROM THE PROJECT ENGINEER (PED) BEFORE MAKING ANY DESIGN CHANGE TO GAS FACILITIES PER WP-4900.

JOB SPECIFIC NOTES

ALL FIELD CHANGES REQUIRE APPROVAL BY PROJECT ENGINEER (PED). SEE CONTACT INFORMATION.

CONTACT INFORMATION:

PROJECT MANAGER	----	JEFF HAHN	925-244-3253
PROJECT ENGINEER (PED)	----	JOSE QUINTERO	925 244-3208
RESPONSIBLE ENGINEER (RE)	----	OSCAR ROSALES	925-328-5968
PIPELINE ENGINEER (PLE)	----	ELPINIKE PAPPOUS	925-328-6169
ESTIMATOR / DESIGNER	----	DEAN SCHMITZ	925-244-3493
FIELD ENGINEER	----	GIAN CERVONE	707-775-8608
CONSTRUCTION MANAGER	----	CHRIS WILLAMS	209-272-2811
LAND PLANNER	----	MALLORY CLAY	925-951-3568
ENVIRONMENTAL	----	TIM ANDREWS	415-693-8212
ENVIRONMENTAL - WATER	----	STEPHEN QUALE	510-316-3644
CORROSION ENGINEER	----	JONATHON RIGOTTI	925-328-5876
TRANSMISSION PLANNER	----	STEWART LEE	925-788-0675
I&R (CLEARANCES)	----	VERN LOPES	650-766-3851

REFERENCE DRAWINGS:

OPERATING MAP	----	384522 REV 81 (SHT 2 OF 3) MILPITAS TERMINAL TO LOMITA PARK METER STATION LINES 101, 109, 132, & 147
PLAT SHEETS	----	3280 (I6, I7, J7)
AS BUILT	----	GM #144674
DRAWING	----	381100 (75-76)

REGISTERED PROFESSIONAL ENGINEER OSCAR H. ROSALES M18299 MECHANICAL STATE OF CALIFORNIA

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ZERO IN ON SAFETY

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/2/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHRZ JDQY

REVISIONS

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9SK
	DWN D9SK
	CHKD CDB6
	OK
JDQY	DATE 11-17-15
OHRZ	SCALES AS SHOWN

PIPELINE - CONSTRUCTION NOTES
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO.	2 OF 12 SHEETS

31189651 0

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DIRECT BURIAL COATING SELECTIONS
LISTED IN ORDER OF PREFERENCE

MAIN LINE COATING	FBE
MINOR REPAIRS	3M SCOTCHKOTE 323, PROTAL 7200, FBE
TIE-IN WELDS	3M SCOTCHKOTE 323, PROTAL 7200, FBE
GIRTH WELDS	3M SCOTCHKOTE 323, PROTAL 7200, FBE
BUTT WELDED FITTINGS	3M SCOTCHKOTE 323, PROTAL 7200, FBE
VALVE ASSEMBLIES	3M SCOTCHKOTE 323, PROTAL 7200, DEVGRIP 238
SHORT SEGMENTS OF PIPE	3M SCOTCHKOTE 323, PROTAL 7200, FBE
AIR-TO-SOIL TRANSITIONS	PROTAL 7200 / PSX 700
PRESSURE CONTROL FITTINGS	BODY: PROTAL 7200 FLANGE: WAX TAPE
TIE-INS/COATING TRANSITIONS	PROTAL 7200, WAX TAPE, POLYKEN TAPE

BORED COATING SELECTIONS
LISTED IN ORDER OF PREFERENCE

MAIN LINE COATING	ARC APPLIED OVER FBE
MINOR REPAIRS	PROTAL 7200, POWERCRETE J, 3M SCOTCHKOTE 323
TIE-IN WELDS	ARC OVER FBE, PROTAL 7200, POWERCRETE J

NOTES:
1) CONTACT THE PIPELINE ENGINEER (PLE) TO REQUEST A VARIANCE FROM THE ABOVE COATING SELECTIONS.
2) ALL COATINGS ARE TO BE APPLIED IN ACCORDANCE WITH GS&S E-30 AND E-35.

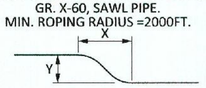
INTERNAL CORROSION (IC) DESIGN & CONSTRUCTION REVIEW		
IC THREAT (PER RMP-16)	YES	NO
	X	
IC REVIEW COMPLETED BY (CORROSION ENGINEER OR DESIGNATE)	LAN ID	DATE
CORROSION ENGINEERING HAS REVIEWED THIS DESIGN AND INCORPORATED ANY NECESSARY IC DESIGN AND CONSTRUCTION CONSIDERATIONS. DOCUMENTATION OF THE REVIEW AND ACTIONS TAKEN ARE IN THE JOB PACKAGE AND INCORPORATED IN THIS DESIGN.	J3RL	07-13-15
EDRS ROUTING NUMBER:	2015-59975	

INSTALLATION TESTED OR INSPECTED AND NOTED ON DRAWING.
ALL CORROSION LEVELS SATISFACTORY PER PG&E GAS UTILITY STANDARD TD-4181S.

QUALIFIED EMPLOYEE DATE

CORROSION MECHANIC'S SIGNATURE IS REQUIRED WHEN A CPA BOUNDARY IS WITHIN THE SCOPE OF THE PROJECT.

ROPING TABLE
MINIMUM DISTANCE REQUIRED TO ROPE AN OFFSET OF 24" O.D.x 0.375 WT. API-5L, GR. X-60, SAWL PIPE.
MIN. ROPING RADIUS =2000FT.



Y	X	Y	X
3.0	117	5.5	159
1.0	83	6.0	166
1.5	83	6.5	173
2.0	96	7.0	179
2.5	107	7.5	186
3.0	117	8.0	192
3.5	127	8.5	198
4.0	136	9.0	203
4.5	144	9.5	209
5.0	152	10.0	214

LEGEND:

- GT — GAS TRANSMISSION LINE
- GD — GAS DISTRIBUTION LINE
- GS — GAS SERVICE LINE
- GT — GAS TRANSMISSION LINE (RETIRED)
- GD — GAS DISTRIBUTION LINE (RETIRED)
- GS — GAS SERVICE LINE (RETIRED)
- ET — ELECTRIC TRANSMISSION LINE
- ED — ELECTRIC DISTRIBUTION LINE
- ES — ELECTRIC SERVICE LINE
- T — TELEPHONE LINE
- FO — FIBER OPTIC LINE
- TV — CABLE TV LINE
- SD — STORM DRAIN LINE
- SS — SEWER LINE
- W — WATER LINE
- ER — EDGE OF ROAD
- FC — FACE OF CURB
- UNPAVED ROAD
- RAILROAD
- TEMPORARY EASEMENT
- PROPERTY BOUNDARY
- FENCE
- WALL
- BARRIER
- TEMPORARY BARRIER (TYPE K)
- GUARD RAIL
- DASHED PAVEMENT MARKINGS
- TOE OF SLOPE
- TOP OF SLOPE
- GAS LINE MARKER (ALL)
- GAS LINE MARKER (PADDLE DUAL)
- GAS LINE MARKER (PADDLE SINGLE)
- GAS LINE MARKER (POST)
- GAS LINE INDICATOR (DISC)
- INSULATION JOINT
- PRESSURE CONTROL FITTING
- GAS BOX
- GAS HIGH PRESSURE REGULATOR
- GAS METER
- GAS DISTRIBUTION REGULATOR
- PG&E GAS MANHOLE
- GAS VAULT
- GAS VENT
- PG&E ELECTRIC MANHOLE
- ELECTRIC VAULT
- UTILITY POLE (ELECTRIC)
- UTILITY POLE (OTHER)
- JOINT POLE
- EXISTING ELECTRIC TOWER
- WATER METER
- WATER VALVE
- STORM DRAIN
- SEWER MANHOLE
- FOREIGN MANHOLE
- CABLE TV BOX
- TELECOMM BOX
- TELECOMM MANHOLE
- TELECOMM VAULT
- STREET LIGHT BOX
- TREE
- ANODE
- DEEPWELL ANODE
- COMPUTER AUTOMATED TEST STATION
- COUPON TEST STATION
- ELECTROLYSIS TEST STATION
- POLE-MOUNTED RECTIFIER
- POTHOLE
- CITY/COUNTY MONUMENT
- MONUMENT, SEE DESCRIPTION
- SURVEY CONTROL POINT
- CENTERLINE
- ACCESS ROAD
- LAYDOWN / STAGING / CONSTRUCTION IMPACT AREA
- EXCAVATION / BELL HOLE
- SAFETY ZONE LIMITS
- ENVIRONMENTALLY SENSITIVE AREAS

DETAIL LEGEND:

- PROPOSED GAS TRANSMISSION LINE
- EXISTING GAS TRANSMISSION LINE
- GAS TRANSMISSION LINE (TO BE DEACTIVATED)
- GAS TRANSMISSION LINE (TO BE RETIRED)
- GAS TRANSMISSION LINE (TO BE REMOVED)
- PIPE END CUT (SIDE)
- PIPE END CUT
- GAS VALVE
- FLOW — FLOW ARROW
- TIE-IN WELD
- S — MATERIAL OF RECORD ASSET

Acronym	Definition	Acronym	Definition	Acronym	Definition	Acronym	Definition
(E)	Existing	DP	Design Pressure	LN	Linear Weldable	SD	Storm Drain
(P)	Proposed	DPV	Damage Prevention Volume	LNW	Linear Non-Weldable	SHT	Sheet
API	American Petroleum Institute	DR	Distribution Regulator	LONG	Longitude	SL	Sewer Lateral
APN	Assessor's Parcel Number	DREG	District Regulator	M	Monitor	SMLS	Seamless
ARC	Abrasion Resistant Coating	DSAW	Double Submerged Arc-Welded	MAOP	Maximum Allowable Operating Pressure	SMYS	Specified Minimum Yield Strength
ASME	American Society of Mechanical Engineers	DWA	Deep Well Anode	MAX	Maximum	SPEC	Specification
ASTM	American Society for Testing Materials	ELE	Electric	MH	Manhole	SS	Sanitary Sewer
ATM	Atmosphere	ELEV	Elevation	MIN	Minimum	SSAW	Single Submerged Arc-Welded
B	Bare Steel	EM	Electronic Marker	MLV	Main Line Valve	STA	Station
BBCL	Bell Bell Chill Ring	EMS	Engineering Material Specification	MOP	Maximum Operating Pressure	STD	Standard
BC	Back of Curb	ER	Edge of Road	MP	Mile Point	STL	Steel
BD	Blowdown	ERW	Electric Resistance Welded	MW	Working Monitor	STPR	Strength Test Pressure Report
BLDG	Building	ETS	Electrolysis Test Station	NDE	Non-Destructive Examination	T	Tied (Connected to System)
BOM	Bill of Materials	F	Filter	NOP	Normal Operating Pressure	TD	Technical Document
BTU	British Thermal Units	FBE	Fusion Bonded Epoxy	NPC	Non-Protected/Native Coupon	TT	Top Tap
BW	Back of Walk	FC	Face of Curb	NTS	Not to Scale	TCE	Temporary Construction Easement
BYP	Bypass	FDP	Future Design Pressure	OC	On Center	TCP	Traffic Control Plan
CATS	Computer Automated Test Station	FL	Fence Line	OD	Outside Pipe Diameter	TDW	T. D. Williamson
CCV	Corrosion Control Volume	FLG	Flange	OH	Overhead	TSP	Transmission System Planning
CI	Cast Iron	G	Natural Gas	P	Pipeline	TYP	Typical
CL	Centerline	GM	Natural Gas Main	P/L	Property Line	UG	Underground
CNG	Compressed Natural Gas	GR	Grade	PC	Protected/Polarized Coupon	UON	Unless Otherwise Noted
CONTR	Contractor	GS	Natural Gas Service	PCF	Pressure Control Fitting	USA	Underground Service Alert
CP	Cathodic Protection	GS&S	Gas Standards and Specifications	PL	Plastic	UT	Ultra-Sonic Test
CROP	Conditional Reduction of Pressure	GW	Natural Gas Well	PLC	Programmable Logic Controllers	V	Valve
CTR	Center	H	Horizontal	PSI	Pounds per Square Inch	VIF	Verify in Field
CTS	Coupon Test Station	HDD	Horizontal Directional Drill	RAD	Radius	VOL	Volume
CU	Copper	HFW	High Frequency Weld	RE	Reference	W	Water
DE	Dead End	HPR	High Pressure Regulator	REG	Regulator	WT	Wall Thickness
DCUST	Distribution Customer	ILI	In-Line Inspection	ROW	Right of Way	W/	With
DEG	Degree	JT	Joint Trench	S	Screwed	W/O	Without
DET	Detail	L	Line Number	SAWH	Submerged Arc-Welded Helical	WOW	Without Locating Wire
DF	Design Factor	L/R	Left/Right	SAWL	Submerged Arc-Welded Longitudinal	WP	Work Procedure
DFM	Distribution Feeder Main	LAT	Latitude	SCADA	Supervisory Control and Data Acquisition	WS	Water Service
DIST	Distribution	LNG	Liquid Natural Gas				

REGISTERED PROFESSIONAL ENGINEER OSCAR H. ROSALES M18299 MECHANICAL STATE OF CALIFORNIA

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	10/22/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHRI JDG4

REVISIONS

APPROVED BY	
PSRS	40993
SUPV	K1F7
DSGN	D9Sk
DWN	D9Sk
CHKD	CDB6
OK	
DATE	11-17-15
SCALES	AS SHOWN

JDG4 OHRI

PIPELINE - LEGEND & STAMPS
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO.	3 OF 12 SHEETS
31189651	0

31189651-S003-LG.dgn 17-NOV-2015 17:17PM

RIGHT OF WAY

TRACT NUMBER
OWNERSHIP/AGENCY

PROPERTY SKETCH NO.
PERMIT DWG. NO.

VACANT LAND (NEC)
CENSUS TRACT 06119004001
CITY OF EAST PALO ALTO
SAN MATEO COUNTY
APN 063-580-050

TRANSPORT FACILITY
CENSUS TRACT 06119004001
CITY OF EAST PALO ALTO
SAN MATEO COUNTY
APN 063-580-040

MARSHLAND
CENSUS TRACT 06119004001
CITY OF EAST PALO ALTO
SAN MATEO COUNTY
APN 063-580-100

PALO ALTO MUNICIPAL GOLF COURSE
CENSUS TRACT 06085021815
CITY OF PALO ALTO REAL ESTATE DIVISION
SANTA CLARA COUNTY
APN 008-06-001

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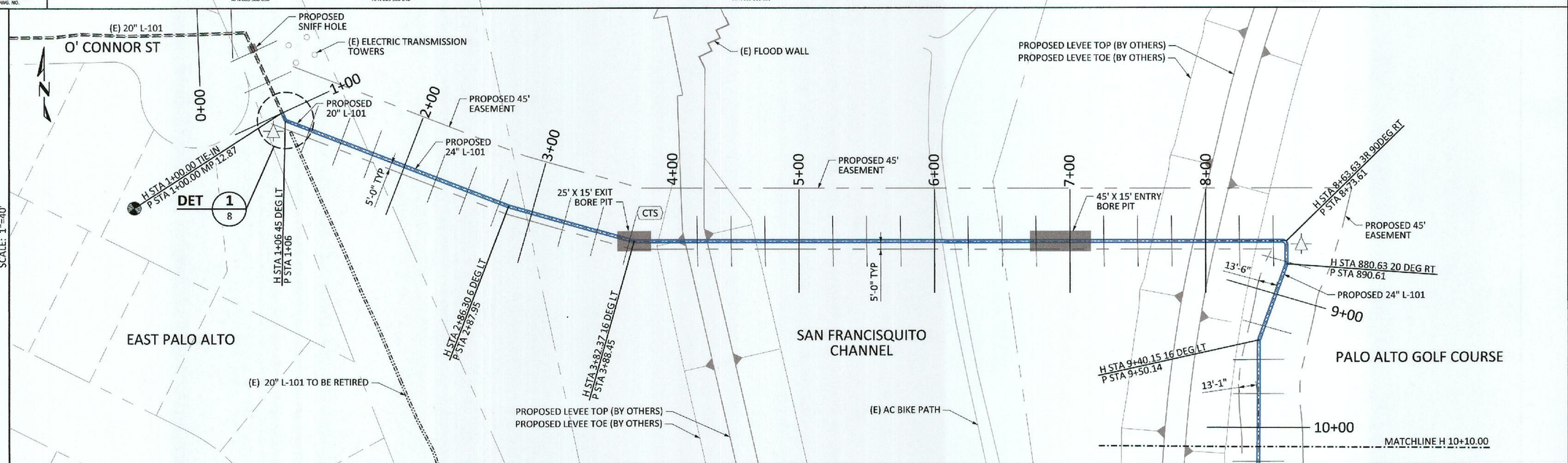
SURVEY PLAN

SCALE: 1"=40'

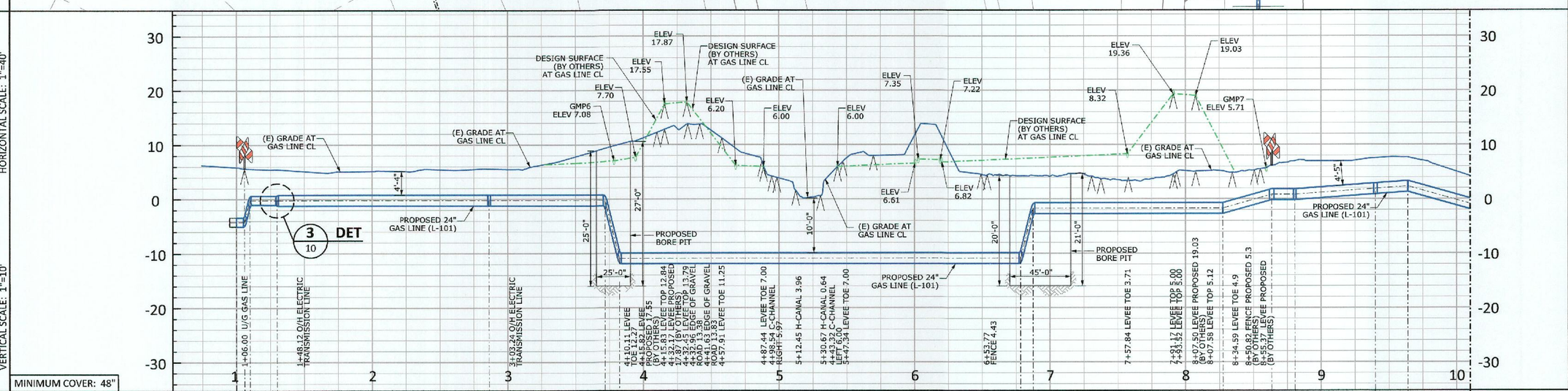


SURVEY PROFILE

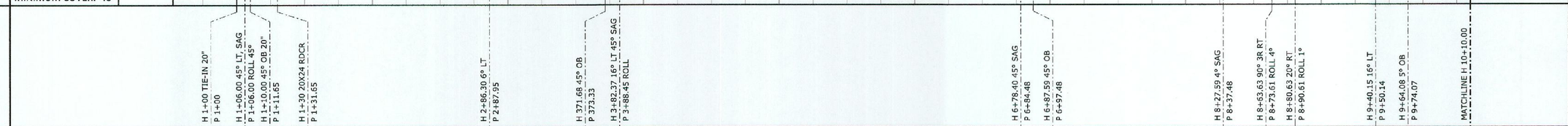
HORIZONTAL SCALE: 1"=40'

VERTICAL SCALE: 1"=10'

MINIMUM COVER: 48"



PIPELINE STATIONING



DESIGN CRITERIA

BOM#	CLASS LOCATION	DESIGN FACTOR	FDP (PSIG)	FDP (% SMYS)	MAOP (PSIG)	MAOP (% SMYS)	MIN TEST PRESSURE (PSIG)	MIN TEST PRESSURE (% SMYS)	MAX TEST PRESSURE (PSIG)	MAX TEST PRESSURE (% SMYS)	PSIG @ 90% SMYS	TEST MEDIUM	PIPE SPEC.	O.D. (IN.)	W.T. (IN.)	WELD INSPECTION* NDT	100%	"X"%
1	3	0.50	720	28.80	720	28.80	1080	43.20	1280	51.20	2250	WATER	API 5L X-60 SAWL	24.0	0.500		X	
2	3	0.50	720	38.40	720	38.40	1080	57.60	1280	68.27	1688	WATER	API 5L X-60 SAWL	24.0	0.375		X	
3	3	0.50	720	29.53	720	29.53	1080	44.30	1280	52.51	2194	WATER	API 5L X-65 HFW	20.0	0.375		X	

*VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)

TD-4160P-60

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/15/15	ISSUED FOR CONSTRUCTION	31189651	D95K	CDB6	K1F7	DHR1 JD24

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D95k
	DWN D95k
	CHKD CDB6
	OK
JD24	DATE 11-17-15
DHR1	SCALES AS SHOWN

PIPELINE - PLAN & PROFILE
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL SEE SHEET 11
REF DWG LIST SEE SHEET 2
SUPSDS
SUPSD BY
SHEET NO. 4 OF 12 SHEETS

31189651 | 0

SAFETY PLEDGE
I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

GAS TRANSMISSION ESTIMATING & DESIGN

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

31189651-S004-PLP.dgn
18-NOV-2015 10:50AM

RIGHT OF WAY
TRACT NUMBER
OWNERSHIP/AGENCY
PROPERTY SKETCH NO.
PERMIT DWG. NO.

PALO ALTO MUNICIPAL GOLF COURSE
CENSUS TRACT #5040013025
CITY OF PALO ALTO REAL ESTATE DIVISION
SANTA CLARA COUNTY
APN 008-06-001

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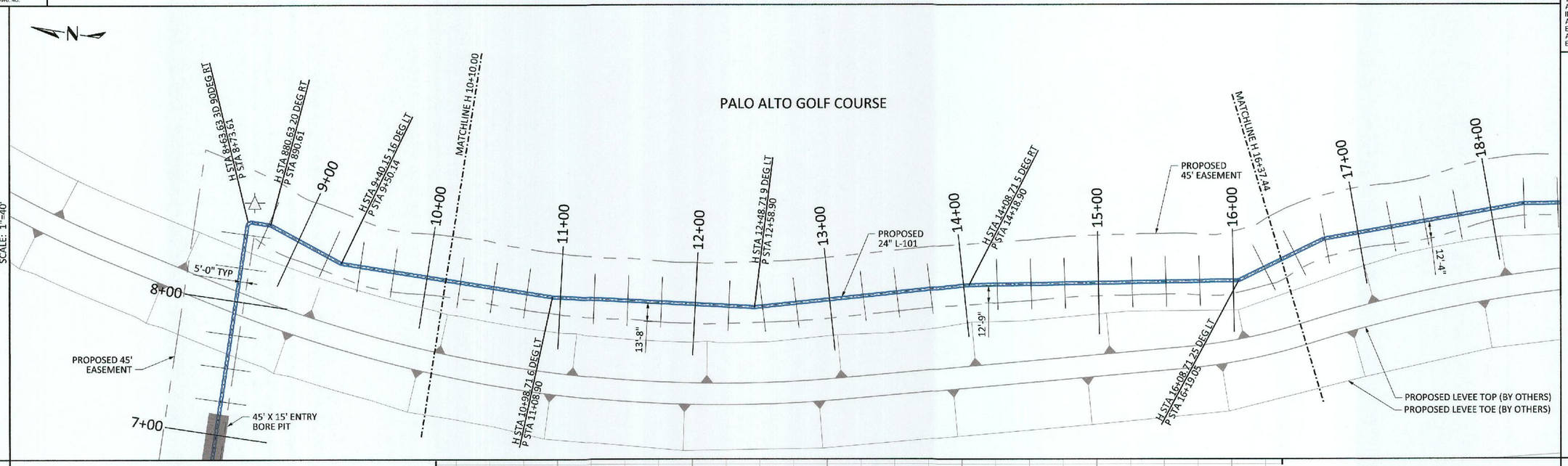
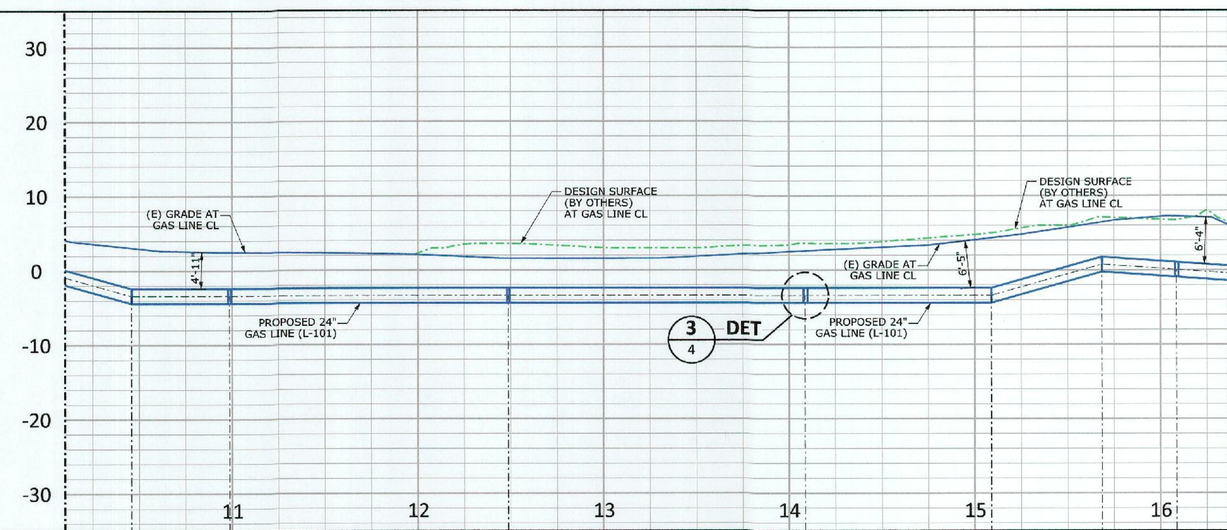
SURVEY PLAN
SCALE: 1"=40'



SURVEY PROFILE
HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=10'



MINIMUM COVER: 48"

PIPELINE STATIONING

	MATCHLINE H 10+10.00		H 10+45.91 4° SAG P 10+56.10		H 10+98.71 6° LT P 11+08.90				H 12+48.71 9° LT P 12+58.90				H 14+08.71 5° RT P 14+18.90			H 15+08.96 4° SAG P 15+19.15		H 15+68.53 5° OB P 15+78.86		H 16+08.71 25° LT P 16+19.05		MATCHLINE H 16+37.44
BOM#		1	7	1	7		1		7		1		7		2	7	2	7	2	7	2		

DESIGN CRITERIA

BOM#	CLASS LOCATION	DESIGN FACTOR	FDP (PSIG)	FDP (% SMYS)	MAOP (PSIG)	MAOP (% SMYS)	MIN TEST PRESSURE (PSIG)	MIN TEST PRESSURE (% SMYS)	MAX TEST PRESSURE (PSIG)	MAX TEST PRESSURE (% SMYS)	PSIG @ 90% SMYS	TEST MEDIUM	PIPE SPEC.	O.D. (IN.)	W.T. (IN.)	WELD INSPECTION? NDT	100%	"X"%
1	3	0.50	720	28.80	720	28.80	1080	43.20	1280	51.20	2250	WATER	API 5L X-60 SAWL	24.0	0.500		X	
2	3	0.50	720	38.40	720	38.40	1080	57.60	1280	68.27	1688	WATER	API 5L X-60 SAWL	24.0	0.375		X	

*VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)

TD-4160P-60

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/3/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OTHR JDG4

REVISIONS

APPROVED BY	
PSRS	40993
SUPV	K1F7
DSGN	D9Sk
DWN	D9Sk
CHKD	CDB6
OK	
DATE	11-17-15
SCALES	AS SHOWN

JDG4
OTHR

PIPELINE - PLAN & PROFILE
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL SEE SHEET 11
REF DWG LIST SEE SHEET 2
SUPSDS
SUPSD BY
SHEET NO. 5 OF 12 SHEETS

31189651 0

SAFETY PLEDGE
I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

GAS TRANSMISSION ESTIMATING & DESIGN

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

31189651-S005-PLP.dgn
18-NOV-2015 10:49AM

RIGHT OF WAY
TRACT NUMBER
OWNERSHIP/AGENCY
PROPERTY SKETCH NO.
PERMIT DWG. NO.

PALO ALTO MUNICIPAL GOLF COURSE
CENSUS TRACT #5040011.02
CITY OF PALO ALTO REAL ESTATE DIVISION
SANTA CLARA COUNTY
APN 008-06-001

NOTE:
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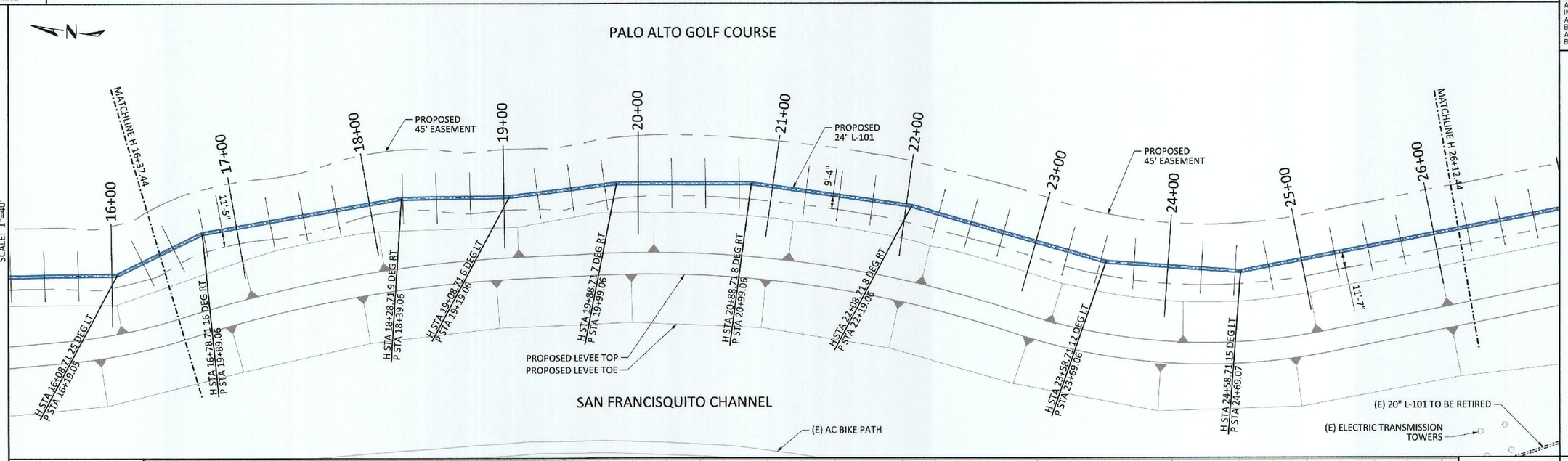
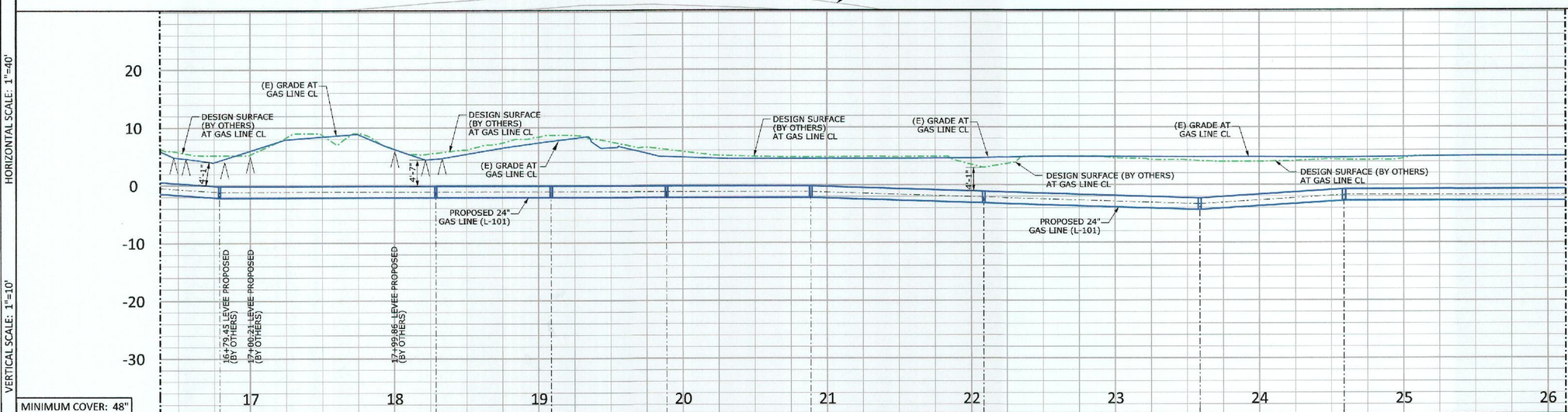
SURVEY PLAN
SCALE: 1"=40'



SURVEY PROFILE
HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=10'



MINIMUM COVER: 48"

PIPELINE STATIONING

	MATCHLINE H 16+37.44		H 16+78.71 16° RT SAG P 16+89.06 ROLL 1°				H 18+28.71 9° RT P 18+39.06			H 19+08.71 6° LT P 19+19.06			H 19+88.71 7° RT P 19+99.06			H 20+88.71 8° RT OB P 20+99.06 ROLL 0.5°			H 22+08.71 8° RT P 22+19.06			H 23+58.71 12° LT SAG P 23+69.06 ROLL 1°			H 24+58.71 15° LT SAG P 24+69.07 ROLL 1°			MATCHLINE H 26+12.44
BOM#		2	7		2		7		2	7		2	7		2	7		2	7		2	7		2	7		2		

DESIGN CRITERIA

BOM#	CLASS LOCATION	DESIGN FACTOR	FDP (PSIG)	FDP (% SMYS)	MAOP (PSIG)	MAOP (% SMYS)	MIN TEST PRESSURE (PSIG)	MIN TEST PRESSURE (% SMYS)	MAX TEST PRESSURE (PSIG)	MAX TEST PRESSURE (% SMYS)	PSIG @ 90% SMYS	TEST MEDIUM	PIPE SPEC.	O.D. (IN.)	W.T. (IN.)	WELD INSPECTION* NDT	100%	"X"%
2	3	0.50	720	38.40	720	38.40	1080	57.60	1280	68.27	1688	WATER	API 5L X-60 SAWL	24.0	0.375		X	

*VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)

TD-4160P-60

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/9/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHRI JDO4

REVISIONS

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9Sk
	DWN D9Sk
	CHKD CDB6
	OK
JDO4	DATE 11-17-15
OHRI	SCALES AS SHOWN

PIPELINE - PLAN & PROFILE
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL SEE SHEET 11
REF DWG LIST SEE SHEET 2
SUPSDS
SUPSD BY
SHEET NO. 6 OF 12 SHEETS

31189651 0

SAFETY PLEDGE
I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

GAS TRANSMISSION ESTIMATING & DESIGN

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

31189651-S006-PLP.dgn
16-NOV-2015 10:50AM

RIGHT OF WAY
TRACT NUMBER
OWNERSHIP/AGENCY
PROPERTY SKETCH NO.
PERMIT DWG. NO.

PALO ALTO MUNICIPAL GOLF COURSE
CENSUS TRACT #5046011025
CITY OF PALO ALTO REAL ESTATE DIVISION
SANTA CLARA COUNTY
APN 008-06-001

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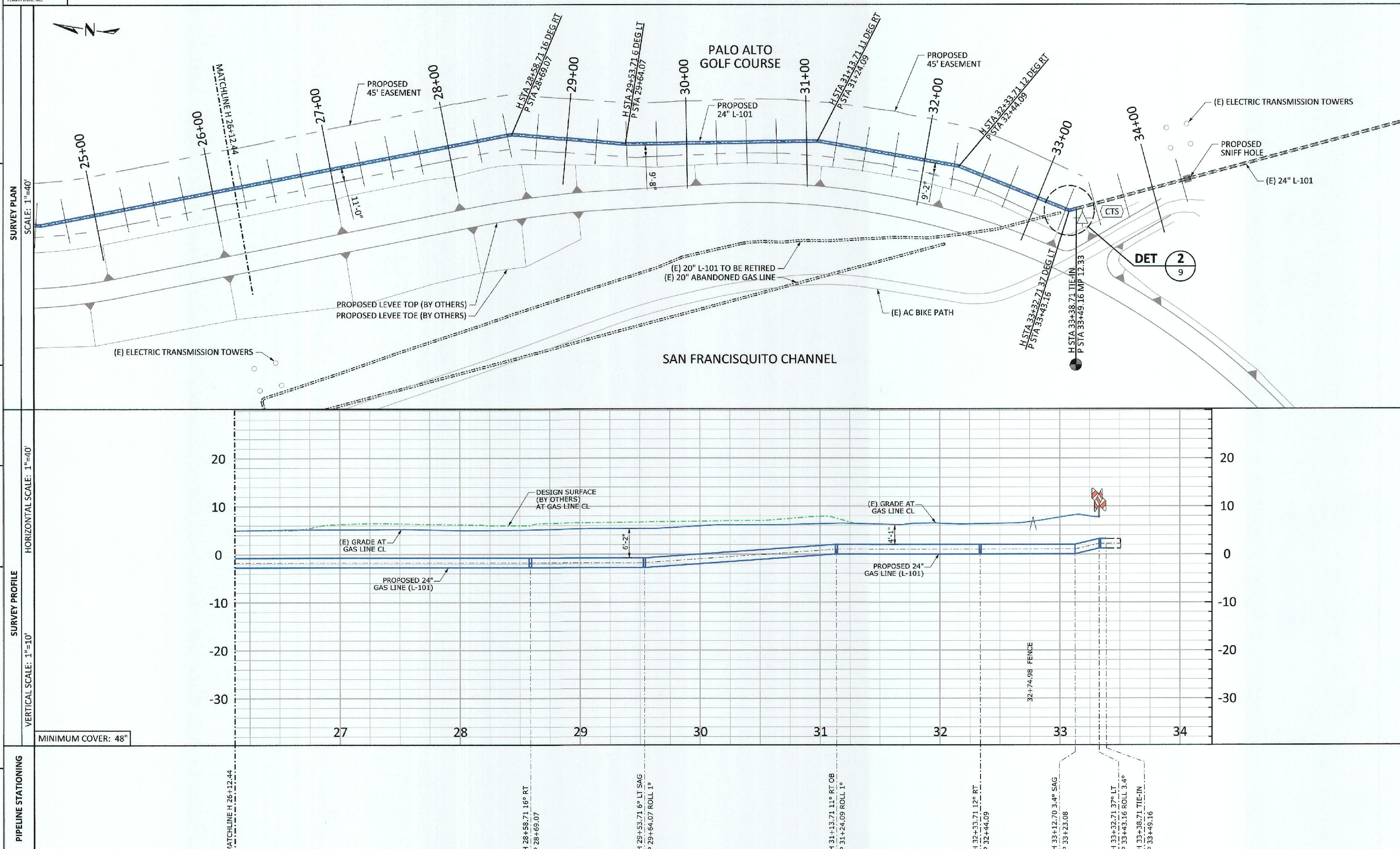


BOM# | 2 | 7 | 2 | 7 | 2 | 7 | 2 | 7 | 2 | 7 | 2 | 7 | 2 | 7 | 2

SAFETY PLEDGE
I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

GAS TRANSMISSION ESTIMATING & DESIGN

REGISTERED PROFESSIONAL ENGINEER OSCAR H. ROSALES M18299 MECHANICAL STATE OF CALIFORNIA

DESIGN CRITERIA

BOM#	CLASS LOCATION	DESIGN FACTOR	FDP (PSIG)	FDP (% SMYS)	MAOP (PSIG)	MAOP (% SMYS)	MIN TEST PRESSURE (PSIG)	MIN TEST PRESSURE (% SMYS)	MAX TEST PRESSURE (PSIG)	MAX TEST PRESSURE (% SMYS)	PSIG @ 90% SMYS	TEST MEDIUM	PIPE SPEC.	O.D. (IN.)	W.T. (IN.)	WELD INSPECTION* NDT	100%	"X"%
2	3	0.50	720	38.40	720	38.40	1080	57.60	1280	68.27	1688	WATER	API 5L X-60 SAWL	24.0	0.375		X	

*VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)

TD-4160P-60

REVISIONS

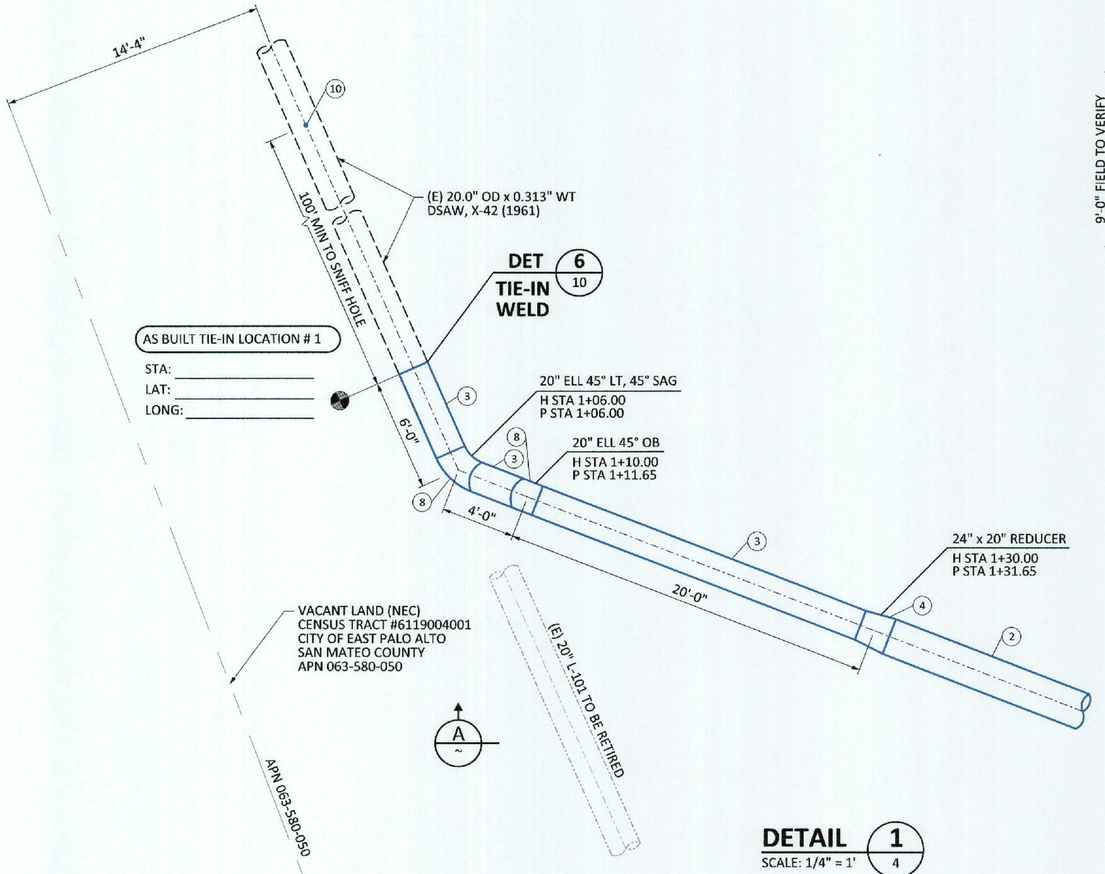
NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/2/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHR1 JDQY

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9Sk
	DWN D9Sk
	CHKD CDB6
	OK
JDQY	DATE 11-17-15
OHR1	SCALES AS SHOWN

PIPELINE - PLAN & PROFILE
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

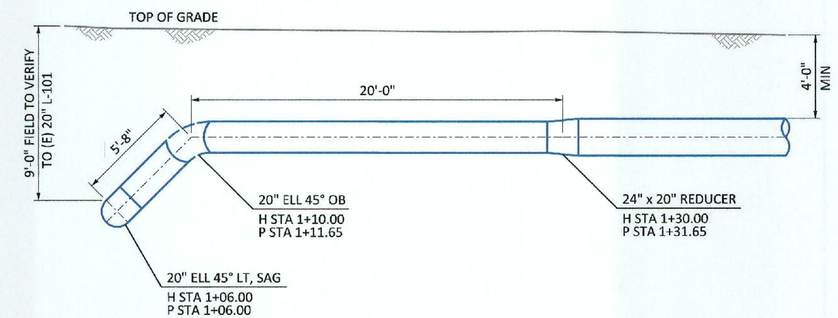
BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO.	7 OF 12 SHEETS

31189651 | 0



DETAIL 1/4

SCALE: 1/4" = 1'



ELEVATION A

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

EXIST PIPE SPECS	
HEADER SIZE: 20.0"	WALL THICKNESS: 0.313"
PIPE SPECS: DSAW, X-42	
PRESENT MAOP: 365 PSIG	
% SMYS @ MAOP: 27.70%	
INSTALL JN: 149403	YEAR: 1961

MAXIMUM ALLOWABLE PRESSURE DURING WELDING (G.S.&S. D-22)

EVALUATE THE FOLLOWING OPERATING PRESSURE LIMITATIONS TO DETERMINE THE MAXIMUM OPERATING PRESSURE PERMITTED DURING WELDING

A) (365 PSIG) WHEN WELDING ON BODY OF THE PIPE. UNLESS,

B) (262 PSIG) WHEN WELDING WITHIN 3" OF THE LONGITUDINAL SEAM (EXCEPT DSAW PIPE),THE CIRCUMFERENTIAL, AND ANY BRANCH WELD, OR WITHIN 3" OF ANY DEFECT (GOUGES, CORROSION, LAMINATIONS, ETC.) IN THE PIPE WHICH EXCEEDS 1/3 OF THE NOMINAL WALL THICKNESS IN DEPTH AND/OR 1/4 OF THE NOMINAL PIPE DIAMETER IN LENGTH.

JOB # 30823996
BOM ITEM # 2

DESIGN CRITERIA

CLASS LOCATION 3
DESIGN FACTOR 0.50
FDP 720 PSIG 38.40 % SMYS
MAOP 720 PSIG 38.40 % SMYS
STRENGTH TEST PRESSURE
MIN. 1080 PSIG 57.60 % SMYS
MAX. 1280 PSIG 68.27 % SMYS
1688 PSIG=90% SMYS
TEST MEDIUM WATER
PIPE SPEC. API 5L X-60 SAWL
O.D. 24.0" W.T. 0.375"

WELD INSPECTION (WELDING MANUAL TD-4160M) *

[X] NON-DESTRUCTIVE TESTING:
MIN % OF THE PROJECT DAILY WORK
[X] 100% * VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)
[ ] ___ %

JOB # 30823996
BOM ITEM # 3

DESIGN CRITERIA

CLASS LOCATION 3
DESIGN FACTOR 0.50
FDP 720 PSIG 29.53 % SMYS
MAOP 720 PSIG 29.53 % SMYS
STRENGTH TEST PRESSURE
MIN. 1080 PSIG 44.30 % SMYS
MAX. 1280 PSIG 52.51 % SMYS
2025 PSIG=90% SMYS
TEST MEDIUM WATER
PIPE SPEC. API 5L X-65 HFW
O.D. 20.0" W.T. 0.375"

WELD INSPECTION (WELDING MANUAL TD-4160M) *

[X] NON-DESTRUCTIVE TESTING:
MIN % OF THE PROJECT DAILY WORK
[X] 100% * VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)
[ ] ___ %

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

WELDING INSPECTED PER PG&E WELDING MANUAL TD-4160M

VISUAL [ ]
RADIOGRAPHIC [ ]
MAGNETIC PARTICLE [ ]
INSPECTOR
DATE

NOTE:
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ZERO IN ON SAFETY

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/2/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CD86	K1F7	DHR1 JDQ4

REVISIONS

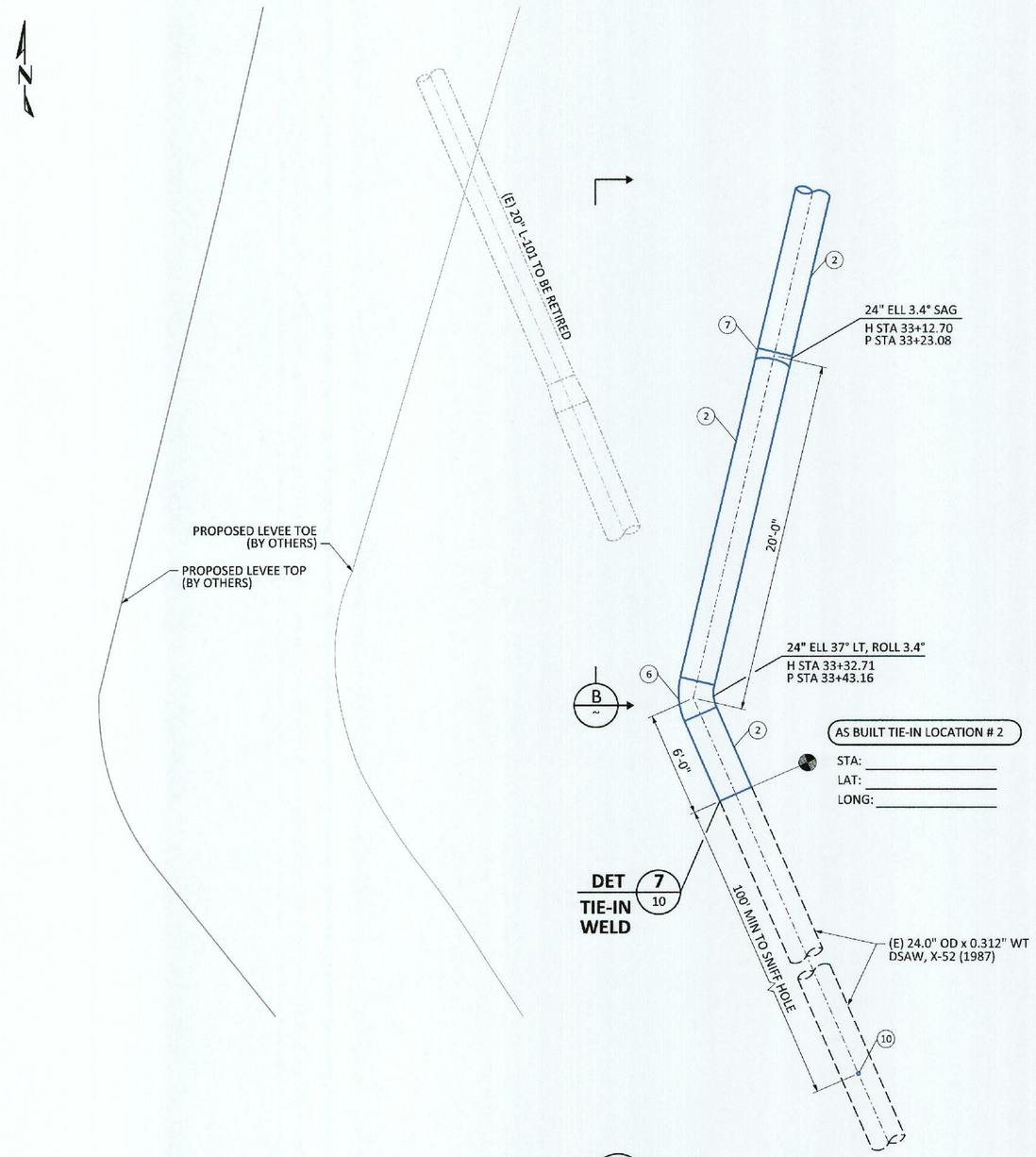
APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9SK
	DWN D9SK
	CHKD CD86
	OK
JDQ4	DATE 11-17-15
DHR1	SCALES AS SHOWN

PIPELINE - DETAILS
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

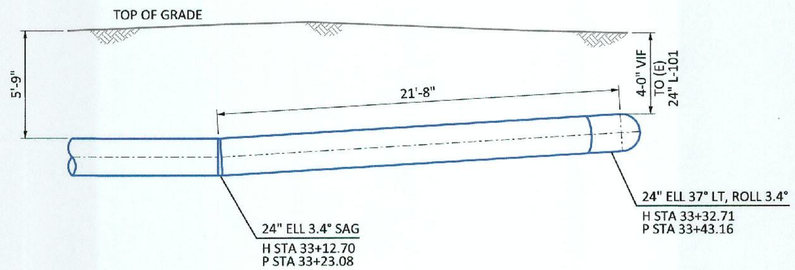
BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO. 8 OF 12	SHEETS

31189651 0

31189651-S008-DET.dgn 17-NOV-2015 17:18PM



DETAIL 2/7
SCALE: 1/4" = 1'



ELEVATION B/~
SCALE: 1/4" = 1'-0"

EXIST PIPE SPECS	
HEADER SIZE: 24.0"	WALL THICKNESS: .312"
PIPE SPECS: DSAW, X-52	
PRESENT MAOP: 365 PSIG	
% SMYS @ MAOP: 26.99%	
INSTALL IN: 144674	YEAR: 1987

MAXIMUM ALLOWABLE PRESSURE DURING WELDING (G.S.&S. D-22)

EVALUATE THE FOLLOWING OPERATING PRESSURE LIMITATIONS TO DETERMINE THE MAXIMUM OPERATING PRESSURE PERMITTED DURING WELDING

A) (365 PSIG) WHEN WELDING ON BODY OF THE PIPE. UNLESS,

B) (270 PSIG) WHEN WELDING WITHIN 3" OF THE LONGITUDINAL SEAM (EXCEPT DSAW PIPE),THE CIRCUMFERENTIAL, AND ANY BRANCH WELD, OR WITHIN 3" OF ANY DEFECT (GOUGES, CORROSION, LAMINATIONS, ETC.) IN THE PIPE WHICH EXCEEDS 1/3 OF THE NOMINAL WALL THICKNESS IN DEPTH AND/OR 1/4 OF THE NOMINAL PIPE DIAMETER IN LENGTH.

JOB # 30823996
BOM ITEM # 2

DESIGN CRITERIA

CLASS LOCATION	3		
DESIGN FACTOR	0.50		
FDP	720 PSIG	38.40	% SMYS
MAOP	720 PSIG	38.40	% SMYS
STRENGTH TEST PRESSURE			
MIN.	1080 PSIG	57.60	% SMYS
MAX.	1280 PSIG	68.27	% SMYS
	1688 PSIG=90% SMYS		
TEST MEDIUM	WATER		
PIPE SPEC.	API 5L X-60 SAWL		
O.D.	24.0"	W.T.	0.375"

WELD INSPECTION
(WELDING MANUAL TD-4160M) *

[X] NON-DESTRUCTIVE TESTING:
MIN % OF THE PROJECT DAILY WORK
[X] 100%
[ ] ___%

* VISUALLY INSPECT ALL WELDS. (THIS REQUIREMENT APPLIES EVEN IF NON-DESTRUCTIVE TESTING IS REQUIRED)

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

WELDING INSPECTED PER PG&E
WELDING MANUAL TD-4160M

VISUAL ☐
RADIOGRAPHIC ☐
MAGNETIC PARTICLE ☐
INSPECTOR
DATE

NOTE:
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ZERO IN ON SAFETY

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	11/17/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	DHR1 JDG4

REVISIONS

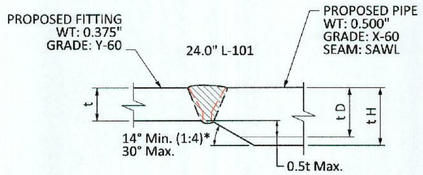
APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9SK
	DWN D9SK
	CHKD CDB6
	OK
JDG4 DHR1	DATE 11-17-15
	SCALES AS SHOWN

PIPELINE - DETAILS
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

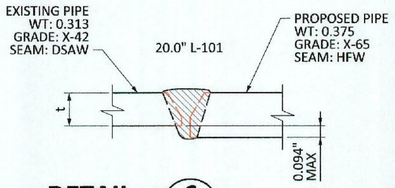
BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO. 9 OF 12	SHEETS

31189651 | 0

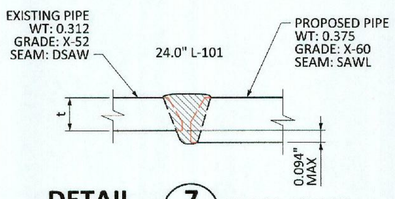
31189651-S009-DET.dgn 18-NOV-2015 07:56AM



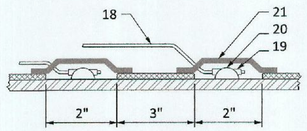
DETAIL 3/4 WELD (TD-4160P-20) FIGURE 3
SCALE: NO SCALE



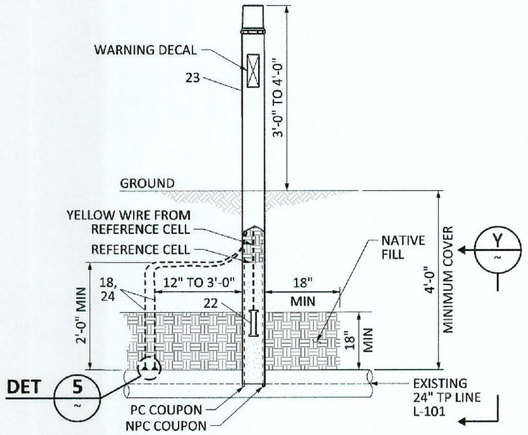
DETAIL 6/8 WELD (TD-4160P-20) FIGURE 1
SCALE: NO SCALE



DETAIL 7/9 WELD (TD-4160P-20) FIGURE 1
SCALE: NO SCALE



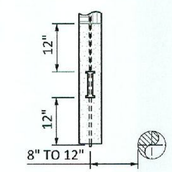
DETAIL 5/~ ATTACHING THE WIRES TO THE GAS MAIN (CCV O-10) FIGURE 1
SCALE: NTS



NOTE: INSTALL COUPONS PARALLEL TO PIPE A DISTANCE OF 8" TO 12". COUPONS MUST BE INSTALLED IN NATIVE SOIL WITHIN 18" OF ELECTRODE. TAMP NATIVE AND ADD IMPORT TO ACHIEVE A MINIMUM 95% COMPACTION.

DETAIL 4/~ COUPON TEST STATION ABOVE GROUND CCV O-10.2
SCALE: NTS

NOTE:
INSTALL REFERENCE ELECTRODE WITHIN 12"FROM THE BOTTOM OF THE TUBE. FILL TUBING WITH CASING MUD TO AT LEAST 12" ABOVE REFERENCE ELECTRODE. THE REMAINDER OF THE TUBE CAN BE FILLED WITH NATIVE SOIL.



SECTION Y/~
SCALE: NTS

CATHODIC PROTECTION LOCATION TABLE					
LOCATION	CP TYPE	OTHER INFO	LINE/DFM	SHEET	*S/N (RECORD IN FIELD)*
H 3+80.00	CTS		L-101	4	
H 33+40.00	CTS		L-101	7	

ATTENTION FOREMAN
24 HOURS PRIOR TO STARTING JOB
CONSULT AREA CORROSION MECHANIC
AT 8-441-6576 FOR LOCATING WIRE
INSTALLATION AND CATHODIC
PROTECTION REQUIREMENTS

REGISTERED PROFESSIONAL ENGINEER
OSCAR H. ROSALES
M18299
MECHANICAL
STATE OF CALIFORNIA

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811 Know what's below. Call before you dig.

ZERO IN ON SAFETY

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/2/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHR1 JDO4

REVISIONS

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9Sk
	DWN D9Sk
	CHKD CDB6
	DK
JDO4	DATE 11-17-15
OHR1	SCALES AS SHOWN

PIPELINE - DETAILS
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL SEE SHEET 11
REF DWG LIST SEE SHEET 2
SUPSDS
SUPSD BY
SHEET NO. 10 OF 12 SHEETS
31189651 0

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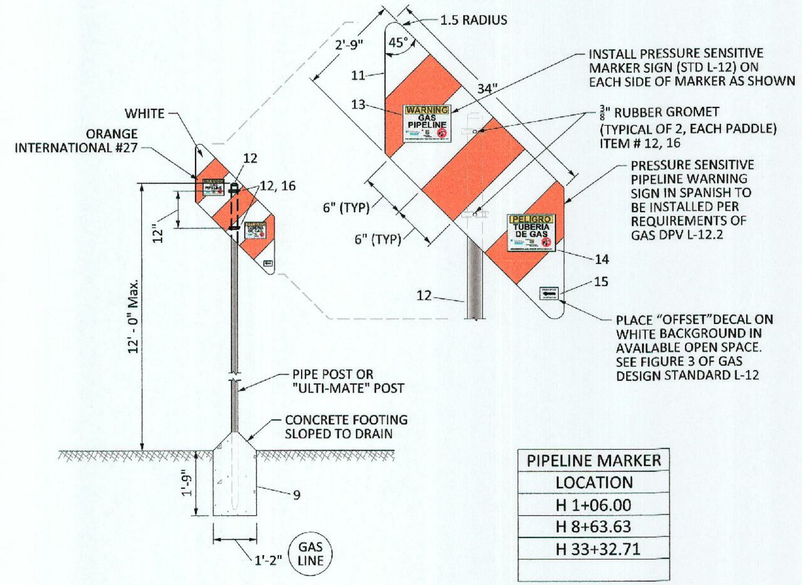

PIPELINE MARKER LOCATION
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H 8+63.63
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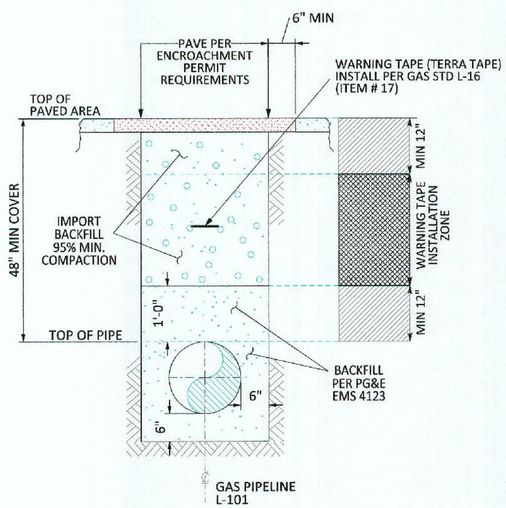
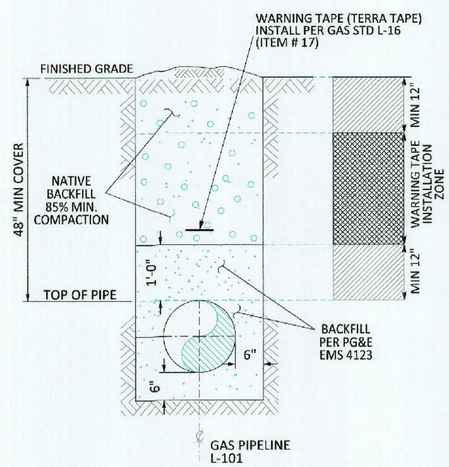
TYPICAL PIPELINE PADDLE MARKER
SCALE: NO SCALE INSTALL PER DPV L-11.1



TYPICAL "T" TRENCH PAVED AREA
SCALE: NO SCALE IMPORT BACKFILL



TYPICAL TRENCH NON-PAVED AREA
SCALE: NO SCALE NATIVE BACKFILL

PG&E CODE	ITEM NO.	QNTY.	ORDER NO. 30823996 DESCRIPTION	CATALOG OR REFERENCE	OTHER DATA
M010863	1	320'	PIPE, 24", STEEL, 24.0" OD x 0.500" WT, API 5L X-60 SAWL (DSAW), FBE+ARC	GAS STD A-15	--
M010790	2	3,220'	PIPE, 24", STEEL, 24.0" OD x 0.375" WT, API 5L X-60 SAWL (DSAW), FBE	GAS STD A-15	--
M011083	3	131'	PIPE, 20", STEEL, 20.0" OD x 0.375" WT, API 5L X-65 HFW, FBE	GAS STD A-15	--
M022168	4	1	REDUCER , 24" X 20", STEEL 24.0" OD x 0.375" WT X 20.0" OD x 0.375" WT, API 5L, Y-60	GAS STD B-20.2	--
M022261	5	1	ELBOW, 24", STEEL, 90 DEG, 24.0" OD x 0.500" WT, Y-60, 3R	GAS STD B-20.2	--
M022430	6	1	ELBOW, 24", STEEL, 90 DEG, 24.0" OD x 0.375" WT, Y-60, LR	GAS STD B-20.2	--
M022999	7	30	ELBOW, 24", STEEL, 45 DEG, 24.0" OD x 0.375" WT, Y-60, LR	GAS STD B-20.2	--
M020349	8	2	ELBOW, 20", STEEL, 45 DEG, 20.0" OD x 0.375" WT, Y-60, LR	GAS STD B-20.2	--
--	9	AS REQ'D	CONCRETE	--	--
M022289	10	4	NIPPLE, SAV-A-VALVE, 2", STEEL, TYPE H-17491, 1,200 PSI GWP 1,440 PSI MAX (COMPLETE WITH STEEL CAP)	GAS STD C-14	--
M379959	11	6	COATED ALUMINUM PADDLE MARKER (FIGURE 1)	DPV L-11.1	--
M018566	12	3	PIPE, MARKER, 2" X 12' GALVANIZED STEEL, SCHEDULE 40, ASTM 120, CLAMP-ON U-BOLT ASSEMBLY, INCLUDING: • (2) GALVANIZED 1/4" U-BOLT FOR 2.375" OD PIPE WITH NUTS • (2) 1/8" U-BRACKET • (2) RUBBER WASHER PRESS-ON 20 GAUGE PIPE CAP TO FIT 2" STANDARD PIPE	DPV L-11.1	--
M379962	13	6	PIPELINE WARNING SIGN DECAL, FIGURE 1	DPV L-12	--
M379961	14	6	SPANISH-LANGUAGE WARNING SIGN DECAL, FIGURE 2	DPV L-12	--
M379960	15	6	OFFSET ARROW DECAL, FIGURE 3	DPV L-12	--
M018704	16	6	CLAMP-ON U-BRACKET ASSEMBLY, INCLUDING GALVANIZED 1/4" U-BOLT FOR 2.375" OD PIPE WITH NUTS, 1/8" U-BRACKET, AND 5/16" X 1" BOLT WITH FIBER WASHER	DPV L-11.1	--
M379947	17	1 ROLL	GAS PIPELINE UNDERGROUND WARNING TAPE (TERRA TAPE)	DPV L-16	--
M294991	18	AS REQ'D	WIRE, #10 HMWPE WITH 47 MIL THICKNESS 600 VOLTS, SOLID COPPER, BLACK INSULATION	TD 4181, O-10	--
M303755	19	2	SLEEVE, COPPER, THERMOWELD A200 OR EQUIVALENT	TD 4181, O-10	--
M159260	20	2	CARTRIDGE, CADWELD CA-15, OR THERMOWELD 15P, 15-GRAM, 20 PER BOX	TD 4181, O-10	--
M562324	21	2	HANDY CAP, ROYSTON, 4" x 4" PATCH	GAS STD E-27	--
M241269	22	2	ELECTRODE REFERENCE GMC STAPERM CUCUS04, GMC ELECTRICAL # CU-2-FW, W/ POINTED CERAMIC TIP AND 15' OF #14 RHH-RHW YELLOW WIRE. (EACH UNIT SHOULD BE PACKED WITH SPECIAL NON-ORGANIC CASING MUD)	CCV O-10.2	--
M560691	23	2	COUPON TEST STATION	CCV O-10.2	--
M294107	24	AS REQ'D	WIRE, #10 HMWPE WITH 47 MIL THICKNESS 600 VOLTS, SOLID COPPER, WHITE INSULATION	TD 4181, O-10	--

REGISTERED PROFESSIONAL ENGINEER OSCAR H. ROSALES M18299 MECHANICAL STATE OF CALIFORNIA

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ZERO IN ON SAFETY

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/3/15	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHR1 JDG1

REVISIONS

APPROVED BY	
	PSRS 40993
	SUPV K1F7
	DSGN D9SK
	DWN D9SK
	CHKD CDB6
	OK
JDG1	DATE 11-17-15
OHR1	SCALES AS SHOWN

PIPELINE - BILL OF MATERIALS
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL	SEE SHEET 11
REF DWG LIST	SEE SHEET 2
SUPSDS	
SUPSD BY	
SHEET NO. 11 OF 12 SHEETS	

31189651 | 0

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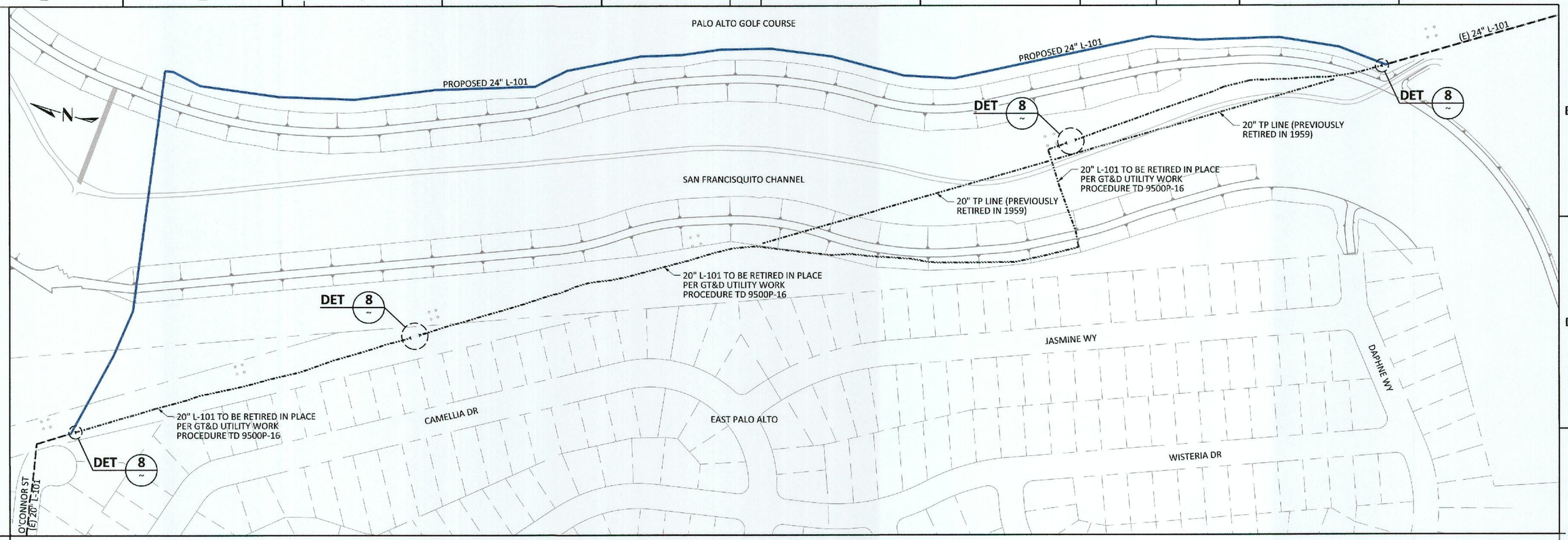


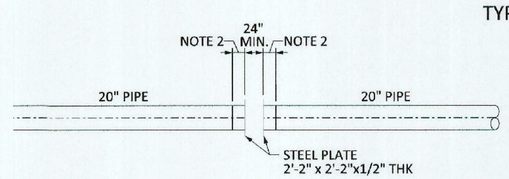
PLAN

SCALE: 1" = 100'

DEACTIVATION PROCEDURE FOR EXISTING PIPE:

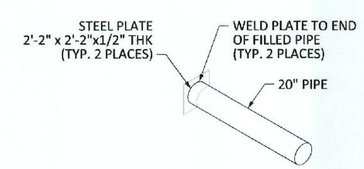
1. GT&D UTILITY WORK PROCEDURE TD 9500P-16 SHALL BE FOLLOWED.
2. THE EXISTING PIPE SECTIONS SHALL HAVE FREE LIQUIDS REMOVED AND BE 100% PURGED AS PER STANDARD A-38.
3. AT THE INTERVALS OF APPROXIMATELY 1000' OR A MAXIMUM OF 4000', THE MAIN SHALL BE SECTIONALIZED. THE LOCATIONS CALLED OUT ARE APPROXIMATE AND ARE SUBJECT TO FIELD VERIFICATION TO IDENTIFY THE MOST OPTIMUM LOCATION. ACCURATE SURVEY DATA MAY NOT BE AVAILABLE FOR THESE LOCATIONS SO USE CAUTION DURING EXCAVATION AND WHEN IDENTIFYING THE PIPELINE TO BE RETIRED.
4. AT EACH SUCH LOCATION NOTED ABOVE, A PIECE OF PIPE AT LEAST 24" LONG SHALL BE REMOVED. INSTALL A SAVE-A-VALVE TO CHECK FOR PRODUCT AND PRESSURE PRIOR TO CUTTING INTO THE PIPELINE. THE OPEN ENDS OF THE RETIRED MAIN SHALL BE SEALED BY THE MOST APPROPRIATE METHOD OUTLINED IN GT&D UTILITY WORK PROCEDURE TD 9500P-16. BACKFILL MUST BE THOROUGHLY COMPACTED IN PLACE OF THE REMOVED SECTION OF PIPE.
5. VALVES MAY BE REMOVED AND SALVAGED IF THE COST OF REMOVAL IS JUSTIFIED.

TYPICAL DEACTIVATION DETAIL



8 ~ PLAN VIEW
SCALE: NOT TO SCALE

NOTES:
1. REMOVE A MINIMUM OF 24" OF PIPE.
2. PER PG&E WORK PROCEDURE TD 9500P-16.



ISOMETRIC VIEW
SCALE: NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER OSCAR H. ROSALES M18299 MECHANICAL STATE OF CALIFORNIA

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NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
0	12/2/16	ISSUED FOR CONSTRUCTION	31189651	D9SK	CDB6	K1F7	OHR 3044

REVISIONS

APPROVED BY	
PSRS	40993
SUPV	K1F7
DSGN	D9Sk
DWN	D9Sk
CHKD	CDB6
OK	
DATE	11-17-15
SCALES	AS SHOWN

PIPELINE - DEACTIVATION SHEET
L-101 MP 12.33 - 12.87
RELOCATE 3,350 FEET OF 24" PIPE
PALO ALTO, SANTA CLARA
EAST PALO ALTO, SAN MATEO
GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
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SHEET NO.	12 OF 12 SHEETS

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Primoris Services Corporation
Vadnais Trenchless

MICROTUNNEL CONTINGENCY PLANS

***Machine Unable To Advance*:**

- **Possible Obstructions –** Our machines are designed to chew up items that are fairly large in size. The largest possible sized object that will fit in the cutting wheel is approximately 30% of the diameter of the machine. However, if an obstruction was encountered larger than 30% of the diameter of the machine and was unable to be broken up and swallowed by the microtunnel machine, we would slightly pull the face back and allow the material to be slowly chipped at until fully ingested. Finally, if the machine were indeed unable to break-up and ingest such an object, pulling back or retrieving the machine (911 shaft) would be our only alternative. Should an obstruction require a pull-back, or a 911 shaft, further discussions will be required by all stakeholders and plans will be developed and submitted for approval at that time. In the event that an obstruction was hit beneath San Francisquito Creek that we were not able to pass, pulling back the MTBM into the jacking shaft would be our only option. We would utilize the attachment points on the rear of the MTBM and run pull-back rods back through the pipeline into the jacking shaft. The pull-back rods would then be attached to the jacking frame (or specifically designed hydraulic cylinder), and an attempt to pull the machine back would be made. The void created by removing the MTBM and steel casing would be filled with a thickened bentonite mixture.

- **Insufficient Jacking –** We have little reason to believe that this scenario will occur. Previous tunnels in similar ground conditions have shown relatively low jacking loads. For this project we will have an allowable jacking force of approximately 300 tons. In the event that jacking pressures start to rise at a level greater than we were anticipating, we will add a soil support polymer to the lubrication. If that doesn't stabilize the jacking pressures, we can provide additional lubrication at injection ports throughout the tunnel alignment.

- **Machine Malfunction –** Immediately, upon any evidence of machine malfunction, the jacking operation will cease. The technician and crew will troubleshoot the problem, seek assistance from a factory representative if necessary, and perform the required repairs. When all functions of the machine test-out successfully, the jacking operation will continue.

- **Soil Unable to Support the MTBM** – Based on the information provided in the geotechnical report, it's unlikely that we will run into this problem on this project. However, if this problem does arise, jet grouting or other means of ground improvement to allow the machine to be supported by the soil would be required.

- **MTBM "Freezes" –** If after implementing the contingency plans listed above, we were still unable to advance the machine, we would have to pull the MTBM back into the jacking shaft.

***Settlement & Subsidence*:**

- **Surveyed Surface Deformations –** If heave is encountered, tunnel advancement will be slowed or slurry pressure and earth pressure decreased. Typically, heave occurs during a change in material (i.e. from stiff clay to loose sand). If settlement occurs, tunnel advancement would be increased or slurry pressure and earth pressure increased. The slurry could also be thickened to add additional support at the face of the tunnel.

- **Excess Excavated Volume –** When excavated volumes exceed calculated volumes the tunnel progress will be increased. A slow advancement rate and high slurry pressure typically cause over-excavation. Thickening of the slurry can help to counter such an occurrence.

- **Sudden Face Pressure Decrease –** If we observe a sudden decrease in face pressure while tunneling we would immediately activate the slurry bypass mode and check the surface for signs of a frac-out. If slurry was being lost at the surface we would definitely see a drop in face pressure. If no signs of a frac-out are visible we would check the separation plant for a change in the material being excavated to look for sign of unstable material. A change in material conditions from rock to sand could cause a sudden face pressure decrease. If the drop in face pressure was due to a change in the type of material we are excavating we thicken up the slurry by adding bentonite. We would also increase the advancement rate and decrease the slurry pressure to balance the pressures at the tunnel face.

***Slurry Separation Problems*:**

- **Excavated Material not Separated at Separation Plant –** If the separation plant is not providing adequate separation of the excavated material from the slurry we would check the following; proper screens on the primary and secondary shakers, hydrocyclones functioning properly, centrifuge functioning properly, proper flocculant injection rate.

- **Excavated Material Settles Out in Slurry Lines –** If the excavated material settles out in the slurry lines, the lines will be disconnected and cleaned or flushed out. This will typically occur at the booster pump raising the slurry out of the shaft. If the problem persists, bentonite will be added to the slurry to keep the excavated material suspended in the slurry.

- **Accumulation of Material in Separation Plant Tanks –** If we observe an accumulation of material in the separation plant tanks we would trouble shoot the paddle mixers in the tank to make sure they are functioning properly. If the mixers are working we would make changes to the screens, or flocculant injection rate to make sure we are removing as much material from the slurry as possible. If required, we would have a vacuum truck remove the material from the tanks.

***Slurry Losses*:**

- Slurry losses from the tank will be minimized. Slurry water that escapes will be contained within the separation plant containment berm and returned to the separation plant. In the unlikely event of an inadvertent slurry return during tunneling, we will follow our Spill Response Plan (attached).

***Groundwater Inflows to Shaft*:**

- The entrance seals will prevent much of any groundwater inflows. Any water and/or fines that do enter the shaft will be removed via a submersible sump pump that stays at the bottom of the shaft. If flows are excessive, chemical grouting will be performed through ports around the entrance ring to cut-off the inflow.

***Steering Difficulties*:**

- Steering and alignment of both line and grade are closely watched and corrected at all times by the tunnel technician. Any corrections to line or grade will be done at a return rate of not more than 1-inch per 10 feet. Advancement rates will be slowed if it is found that steering is difficult.

***Laser Distortion*:**

- **Due to Heat & Humidity -** If we observe laser distortion due to temperature or moisture levels in the shaft or tunnel we would troubleshoot our ventilation system to make sure it is functioning properly. We would also check to make sure that the laser is kept out of the direct sunlight. Temperature and moisture levels would be checked between the laser and the target to check for variations. If variations are found additional ventilation equipment may be required. If the laser is still moving while adequate ventilation and protection of the laser is provided we would have the operator closely monitor the movement and use the average reading as the center. If the movement is severe enough that we are not confident that we know the exact location of the MTBM at all times we would have to use a qualified surveyor to provide our exact location every morning.

- **Due to Physical Disturbance -** If we observe laser distortion due to a physical disturbance we would have to perform a laser check to be sure the laser is set to the design line.

***Damaged Pipe*:**

- Pipe to be found out of compliance prior to installation would be brought to the owner/engineer's attention. A decision would be made as to the acceptability of the product prior to us handling it. A similar discussion would take place if damage occurred during installation. If the pipe were damaged after installation, another conference would be held to discuss repair procedures and feasibility of repair. If it is determined that the pipe cannot be fixed in place it would have to be cycled out through the reception shaft, or the MTBM and pipe would have to be pulled back into the jacking shaft.

***Thrust Block Deformation*:**

- The design of the jacking shaft and thrust block should provide sufficient bearing to handle the anticipated jacking loads, and due to the low anticipated maximum jacking loads, there should not be a problem with thrust block deformation. In the event that we are experiencing thrust block deformation it is usually possible to observe it visually. If required, thrust block deformation can be verified using a fixed point located in the shaft, and taking measurements to see if it has moved. If thrust block deformation is observed the soil behind the thrust block would have to be stabilized.

***Possible Shaft Flooding*:**

- If floods were predicted, all power cables and the laser would be removed from the shaft and stored in a safe, dry location at the surface. The rear of the microtunnel machine will be bulk-headed off to prevent water damage to the electronics inside the MTBM. When floodwaters subside, the shaft as well as all installed pipe will be dewatered, the bulkhead will be removed, all electrical connections will be re-established and the tunneling process will continue.

***Loss of Control Signal*:**

- If, for any reason, the control signal is lost during the advancement of a drive, the forward progress will be immediately stopped. An investigation into the cause for the loss of signal will commence and repairs will be made to restore the signal. The drive will then re-commence. Under no circumstances will the tunnel drive continue to advance without a solid control signal in the operations center.

***Excessive Pipe Separation at Joints or Pipe String Movement*:**

- If, for any reason, we encounter excessive pipe separation or pipe string movement when the jacks are retracted we will have to carefully restrain the pipe using a chain and a come-a-long to apply pressure to the pipe until the next section of pipe has been installed.

***Presence of Contaminated Ground*:**

- If the presence of contaminated ground is observed we stop all activities and determine the exact nature of the contamination. Once all crewmembers are made aware of the hazards associated with the contaminant(s), we would make sure all crewmembers that are required to be near the contaminated soil are equipped with gas detection equipment, and the proper PPE. We would also make sure that all work areas are properly ventilated to prevent the accumulation of harmful gasses. Atmospheric testing would be administered prior to and during any hot work activities that could potentially provide a source of ignition.

SPILL RESPONSE PLAN

For the pipeline installation required on this project, a slurry microtunnel boring machine (MTBM) will be utilized. A slurry MTBM utilizes fluid (occasionally containing bentonite) that is mixed with the soils as the cutterhead excavates the soils away from the tunnel face. The slurry provides two important functions: (1) Pressure Balance – the slurry provides a positive hydraulic pressure to the face of the tunnel that balances the in-situ soil and groundwater pressures; and (2) Spoil Transportation – the slurry allows the excavated soils to remain in a fluid-state to facilitate pumping away from the head back to a separation plant. The function of Pressure Balance is one of the many tremendous benefits of microtunneling as it eliminates the need for dewatering, which is extremely beneficial in environmentally sensitive areas.

A potential disadvantage to this method is that slurry pressure applied to the tunnel face could (if excessive pressures are applied) release slurry to a waterway/roadway by fracturing the soil. Realistically, slurry releases can occur anywhere along the microtunnel alignment; however, most releases occur where the vertical cover above the MTBM is at its least.

With our highly experienced crew, well-trained in all aspects of microtunneling, we greatly decrease the potential for inadvertent return of slurry. Nevertheless, unforeseen conditions and circumstances can lead to situations where inadvertent returns and/or surface spills may occur. To this end, VTS has developed a plan to control inadvertent slurry releases during microtunneling. The specific objectives of this plan are:

- Minimize the potential for slurry releases.
- Monitor all activities to detect slurry releases in a timely manner.
- Protect all environmentally sensitive areas.
- Ensure an organized, quick response to any releases.
- Contain any releases to the smallest possible area.
- Ensure that any required notifications and reports are completed.

The following pages provide specifics for VTS' Spill Response Plan.

1. Microtunneling "Rules"

A) All tunnel sites will have an on-site monitor of the tunneling operations.
B) The monitor will be equipped with a radio/cell phone to remain in contact with all equipment operators on the site.
C) At no time shall tunnel cuttings, mud, and/or materials or water contaminated with bentonite or other substances be allowed to enter the stream/water body/roadway or be placed where they may be washed into a stream/water body/roadway.
D) In the unlikely event of spills or inadvertent returns, the monitor shall immediately notify the Owner, the Engineer and the Project Manager and request that the problem be addressed. All work shall stop, and will not resume until the cleanup is completed.

E) Any inadvertent return that may occur will be immediately contained, cleaned up and all recovered material will be disposed of off-site.

2. **On-Site Response Equipment:** At a minimum, the following equipment will be available at, or near, the tunnel site:
   A) At least 50 heavy weight sealable sand bags (to be filled with gravel).
   B) Two large rolls of heavy weight plastic sheeting.
   C) Several 5-gallon hard plastic pails.
   D) Three heavy-duty push brooms.
   E) Three flat-blade shovels.
   F) T-posts and enough silt fence to encapsulate the work area.
   G) Absorbent pads.
   H) Vacuum Trailer.

3. **Best Management Practices (BMPs) for Microtunnel Operations:** The following sets of BMPs have been established by VTS to prevent tunneling operations from releasing tunnel fluids to the environment. The on-site monitor shall inspect and request repairs or replacement of the materials used to meet these BMPs throughout the tunnel process.
   A) A containment unit, fiber roll, straw wattle or silt fence will be installed between the Separation Plant and any water body/roadway. This protection is meant to prevent seepage occurring outside of the work area from reaching any water body/roadway. Excess supplies of containment materials, as listed above as Response Equipment, (i.e. silt fence, shovels, etc.) will be available for use as needed. A vacuum trailer of sufficient size, at least 2000 gallons, will be available onsite in the unlikely event that a spill or inadvertent return occurs.

   B) In the event that an inadvertent return does occur, the response sequence will be to:
      i) Immediately stop all microtunneling operations and make the proper notifications.
      ii) The face pressure at the head of the MTBM will be reduced to avoid further discharges of slurry.
      iii) Determine the source or cause of the inadvertent return and coordinate with the microtunneling machine operator to eliminate or minimize further discharges, as feasible.
      iv) Completely contain the inadvertent return.
      v) Clean up the inadvertent return. If required, the vacuum trailer should immediately begin recovering the tunneling fluid.
      vi) Divert all tunneling fluids from entering any water body/roadway.
      vii) The cause of the inadvertent return will be corrected.
      viii) Microtunneling will resume in accordance with this contingency plan and the personnel will continue to closely monitor the water body/roadway.

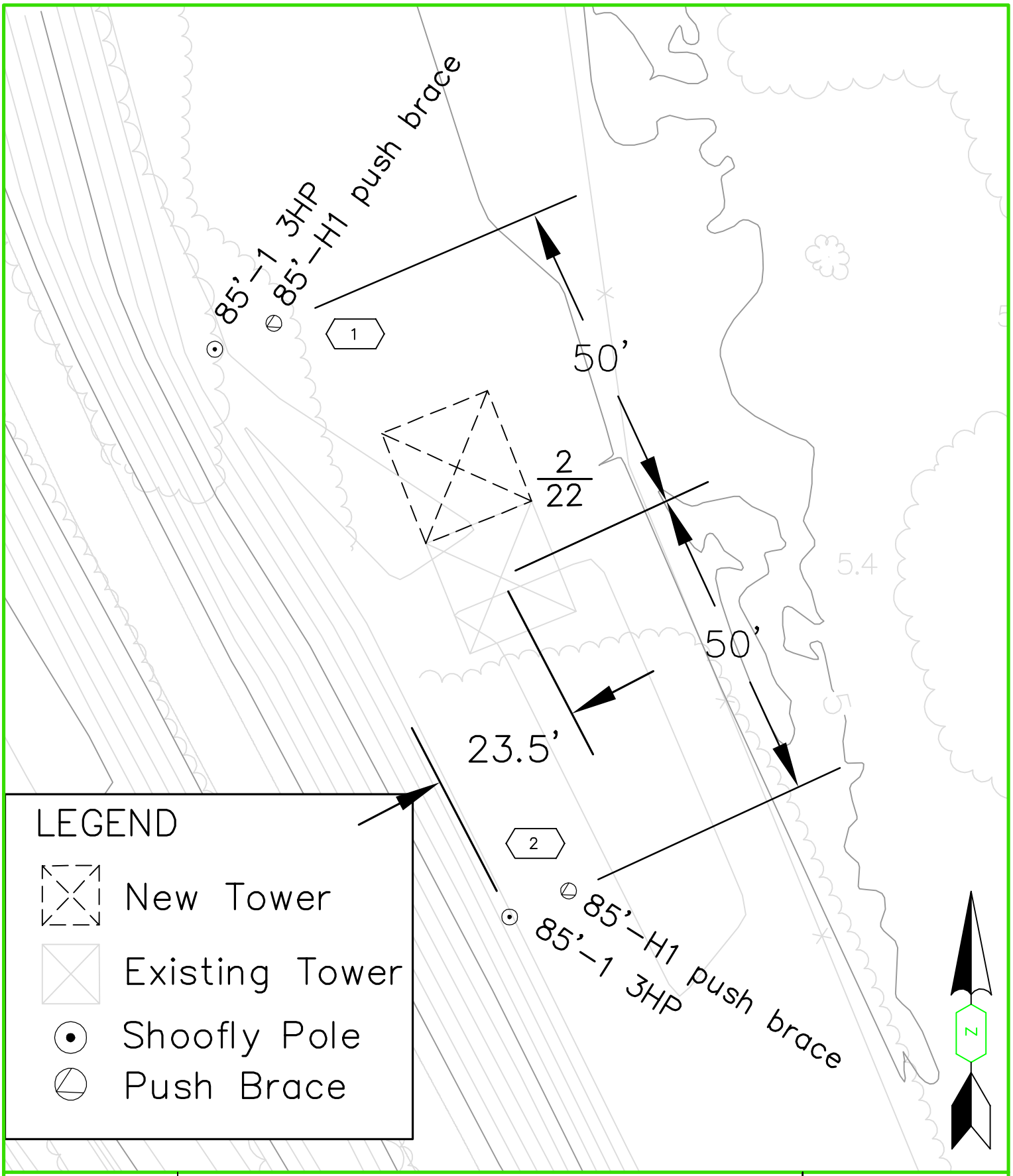
4. **Clean-up of Inadvertent Returns:** Any cleaning activity will be done with the approval of the Owner/Engineer/Contractor. When the inadvertent return clean-up activities have been completed, the collected material shall be properly disposed of off-site. The clean-up effort shall include removal of all materials, rubbish and construction debris.

5. **Upon Completion of Microtunneling Operations:**
   A) The launching and receiving shafts will be backfilled and returned to natural grade after completion of the tie-ins by the Prime Contractor.
   B) All tunneling fluids will be removed from the construction area and properly disposed of at an accepting off-site location.
   C) All protective measures (containment units, silt fence, plastic sheeting, etc.) will be removed unless otherwise recommended by the Owner/Engineer. In the event that the protective measures are left in place after microtunneling operations have ceased, provisions shall be made by the Owner/Engineer for their removal.

Attachment B

Engineering Specifications

PG&E Electrical Tower Heightening & Relocation



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ADE: snhb		SD:	
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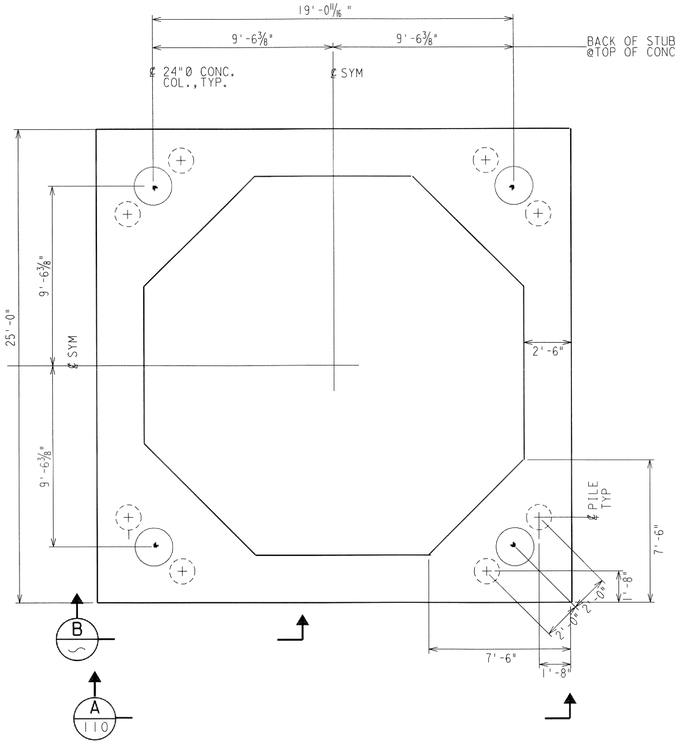
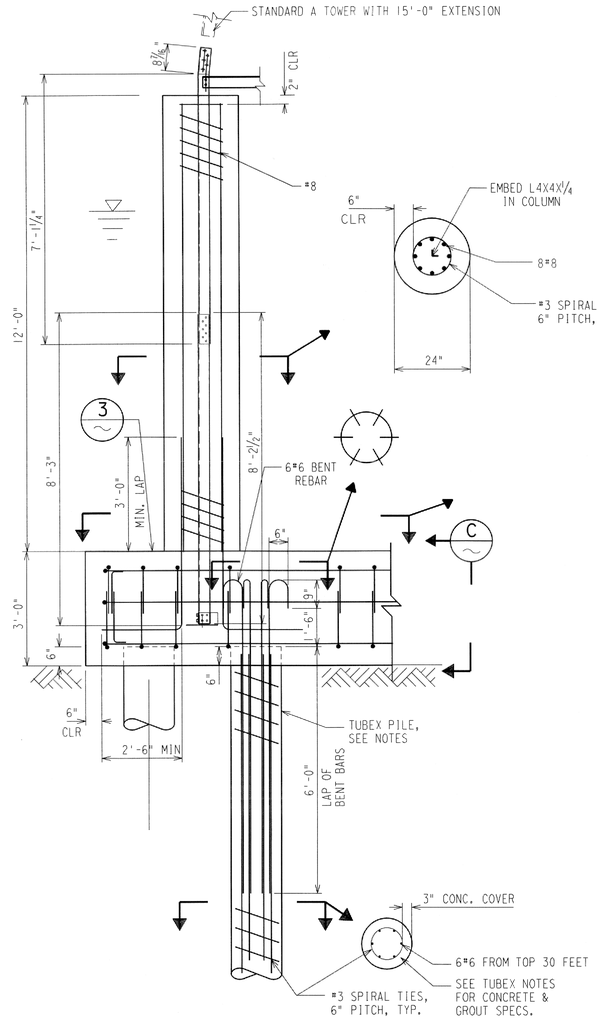
REP:		OTHER:	
PLNR:		SHT: 1 of 2	SHEETS
SCALE: 1"=20' / DATE:	PACIFIC GAS AND ELECTRIC COMPANY	PM: 30823989	REV.



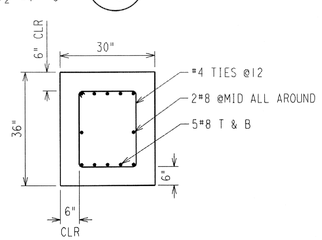
PLAN

1/4" = 1'-0"



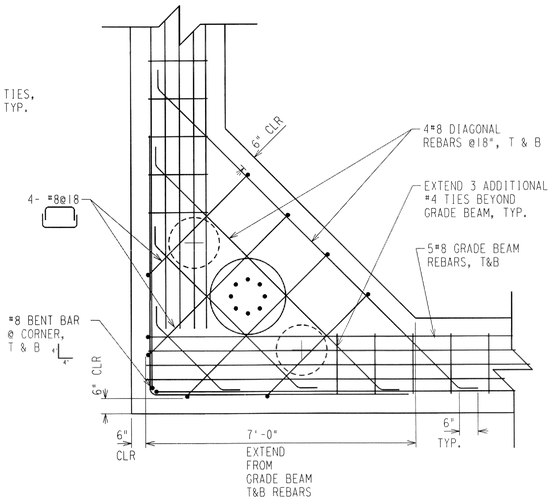
SECTION B

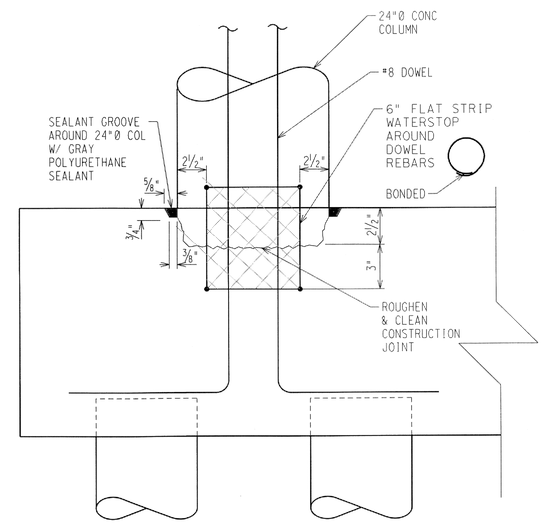
1/2" = 1'-0"



SECTION C

1/2" = 1'-0"

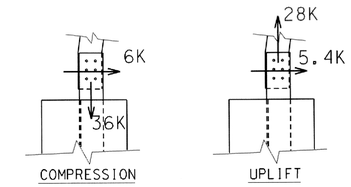




DETAIL 3

1" = 1'-0"

MAXIMUM LOADS @ EACH TOWER LEG



ULTIMATE LOADING DIAGRAM

CONCRETE NOTES

1. CONCRETE WORK SHALL BE IN ACCORDANCE WITH CURRENT ACI-318 CODE AND UNIFORM BUILDING CODE.
2. REINFORCED CONCRETE:
   CONCRETE: f'c = 5,000 PSI
   STEEL: ASTM A615 DEFORMED BARS, GRADE 60
3. UNLESS OTHERWISE NOTED, THE MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 6".
4. CHAMFER ALL EXPOSED EDGES 1".
5. FOR OTHER FOUNDATION NOTES, SEE CDS #056014.
6. CONCRETE CONTRACTOR SHALL SUBMIT THE CONCRETE MIX SPECIFICATIONS TO ENGINEER FOR APPROVAL.

STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL ELEMENTS THAT EXPOSED TO WEATHER SHALL BE HOP DIP GALVANIZED.
2. ALL STRUCTURAL ANGLES AND PLATES SHALL BE ASTM A36 STEEL.
3. ALL BOLTS SHALL BE ASTM A394 TYPE 1 OR 2 UNLESS OTHERWISE NOTED, BOLT SIZE SHALL BE 1/2"Ø, BOLT HOLES SHALL BE 11/12 "Ø.
4. STUB ANGLES AND SHOES TO BE FABRICATED AND INSTALLED PER DWG # 3005110.

TUBEX PILES

1. SEE TUBEX SPECIFICATIONS FOR INSTALLATIONS AND GROUTING SPECS OF 16-INCH DIAMETER CASING PILE. TUBEX CASING WALL THICKNESS, T = 0.312 INCH
2. USE 40-FOOT LONG TUBEX PILES FILLED WITH REINFORCED CONCRETE. MIN f'c =3,000 PSI
3. ALLOWABLE TUBEX PILE CAPACITIES:
   COMPRESSION: 50 KIPS
   TENSION: 30 KIPS

ALTERNATIVE PILES

1. ALLOWABLE PILE CAPACITIES PER EACH TOWER LEG:
   COMPRESSION: 100 KIPS
   TENSION: 60 KIPS
2. LOW VIBRATION
3. LOW NOISE LEVELS
4. NO SPOILS

REFERENCES

	DWG NO.
TYPE A TOWER	40923
TYPE A TOWER STUB DETAILS & SETTING PLAN	3005110

REGISTERED PROFESSIONAL ENGINEER TONY K. LAU No. C68313 CERT. EXPIRES 7/15 CIVIL STATE OF CALIFORNIA

BUSINESS LINE: SUBSTATION & TRANSMISSION
FACILITY TYPE: TLINE DISCIPLINE: CIVIL
FACILITY COMPONENT:
UNIT: 230KV FERC/CPUC (LINE NO.)
STATUS: ACTIVE PROJECT:
FACILITY NAME: RAVENSWOOD-PALO ALTO
DRAWING TYPE: FOUNDATION

REV	DATE	DESCRIPTION	JOB NO	DSG/DWN	CHKD	SUPV	APVD
1	4/9/13	APPROVED FOR CONSTRUCTION	30823989	SN			

REVISION 1	
DSG	SANG NAM
DWN	SANG NAM
CHKD	
SUPV	
APVD	
APVD	
DATE	4/9/13

CIVIL

RAVENSWOOD-PALO ALTO #1 & 2
SUBMERGED PILE FOOTING
TYPE A TOWER NO.2/22

DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO 1 OF 2 SHEETS	
DRAWING NUMBER	3005109 REV 1

3005109.DGN 1-27-2013 SKN

F4350

219497

Old No.	Structure No. Final	Structure No. Const.	Station	Angle	Stringing Horiz. Span-Ft.	Stringing Slope Span-Ft.	Stringing Ruling Span-Ft.	Stringing Dwg.	Structure Type	Structure Dwg.	Extensions A	B	C	D	Dwg	Foundations Type	Stub	Elev.		Dwg	Insulators Cir. 1	Cir. 2	P&E Code No.	Remarks (Figures in ( ) denote height above ground)
																								Conductor is 715 MCM AA Dwg 015014
E																								
	1/10		A 88+55.5	31°54½' L					Ravenswood - Palo Alto Nos. 1 & 2 115 KV Tower Line, SDS # 217985															
	11		Eq. A 94+15.7 5+60.41	36°9' L	560.2		560	19468	▼▼2D-DE	406710	32.5	32.5	32.5	32.5	406796	+9.3	+9.3	+9.3	+9.3	@324697 Pile fdn.	D-1018 ▨	D-1018 ▨	31-4036	
24/154			Eq. A 95+50 A 170+80.6	9°36' R					BHH ⊗		*					BH	BH							* No ext. information available
153	12		14+58.11	0°29' L	897.70		708	①	▼A-DE×	TC1						AH	A							× CONVERT TO DEADEND DWG. 051014
152	2/13		22+34.86		776.75				BHH	TC2						BH	BH							
151	14		29+81.46		746.60				▼ 2A		15'	15'	15'	15'	406734	A-1	A (EXIST A TWR FOUNDATION)							NEW 2A TWR WITH 15' EXT. PLACED ON EXISTING A TWR FOUNDATION
D 150	15		35+30.42		548.96				A-Mod.							A-1	Spec.							Beech St.
149	16		39+70.40		439.99				A-Mod.	WC1						A-1	Spec				SF-918 ▨	SF-918 ▨	31-4076	
148	17		44+08.42	18°17' L	438.02		695		2C-DE Mod *		X-arm ;4818 ⊠	0	0	0	0		Special				D-1018 ○	D-1018 ○		* Modified per Dwg. 4822 ⊠ O'Connor St.
147	18		48+10.44		402.01				A-Mod.	WC2						AH	Spec.							
144	19		52+10.61		400.17				A-Mod.	WC2						A-1	Spec.							
145	20		56+10.52		399.91				A-Mod.	WC2						A-1	Spec				SF-918 ▨	SF-918 ▨	31-4076	
144	21		61+51.54		541.03				▼A	TC1						AH	A							
C 143	22		68+60.44		709				▼A		15	15	15	15	200868					3005109	DWG No. 056414 SFAA-10	SFAA-10	[9]31-4075 [1]31-4057	
FOLD 142	23		76+69.84	7°02' R	810				BHH	TC2						B1	BH							
22/141	24		EQN. 84+88.19 248+37		818.15				BH	TC3	12.5	12.5	12.5	12.5	39924	B1	BH	9.3						Embarcadero Rd.
22/140	3/25		256+41		804		700	041842	M-Mod.	○	10	10	10	10	44570	M1	M	7.5			SF-918 ▨	SF-918 ▨	31-4076	

⊠ Construction Dept. Dwg. No.
▨ New
○ Existing

⊗ Remove existing BHH Twr. # 24/154 under GM # 179953, 1972.
⦶ STRING TO MAKE INSULATORS ON ADJACENT TOWERS PLUMB.
▽ -INSTALLED FIBEROPTIC PER DWG. 6021441.
▼ -MODIFIED STRUCTURE PER DWG. 6021441.

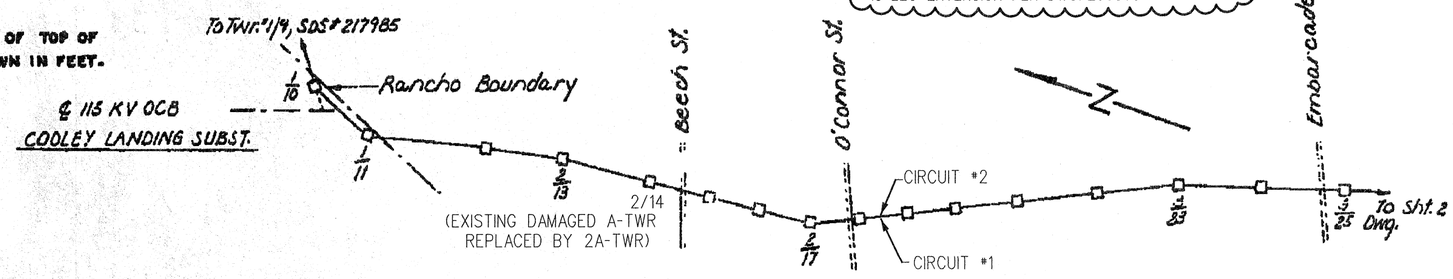
● EXCEPT FOR PILE TYPE FOUNDATIONS, WHERE FIGURES SHOWN REPRESENT ELEVATION OF TOP OF CONCRETE - BASED ON U.S.G.S. DATUM - MEAN SEA LEVEL = 0. DIMENSIONS SHOWN IN FEET.

NOTES:

1. USE SLOPE SPAN WHEN NOTED TO DETERMINE SAG
2. GRADE OF CONSTR. ____ (UNLESS OTHERWISE NOTED)
3. KEY SKETCH DWG. NO. _____
4. FOR SYMBOLS SEE DWG. NO. 048020
5. Phasing shown on Dwg. #324228

TC1 INSTALL 10FT. TOP CAGE EXTENSION FOR A-TOWER PER DWG. 397517.
TC2 INSTALL 10FT. TOP CAGE EXTENSION FOR BHH TOWER PER DWG. 3004633.
TC3 INSTALL 10FT. TOP CAGE EXTENSION FOR BH TOWER PER DWG. 392007.
WC1 INSTALL 10FT. WAIST CAGE EXTENSION FOR A-MOD TOWER PER DWG. 355984
WC2 INSTALL 15FT. WAIST CAGE EXTENSION FOR A-MOD TOWER PER DWG. 3005111.

2014 CONSTRUCTION ORDER NO.:30823989
UPDATED PER AS BUILTS OF WORK PERFORMED FROM REVISION 6. CLOUDS SHOWN ARE FOR REMAINING WORK TO BE DONE.
-REPLACE INSULATORS AND HARDWARE ON TOWER 2/22
-TOWER MODIFICATIONS:
TOWER 2/22-MOVE TOWER AND CONSTRUCT NEW FOUNDATION PER DWG. 3005109 25' TO THE NORTH TOWARDS TOWER 2/21. REPLACE EXISTING 7' LEG EXTENSION WITH 15' LEG EXTENSION PER DWG. 200868



DWG. NUMBER'S UNLESS OTHERWISE NOTED

TYPE	A	A-MOD.	BHH	BH	M-MOD.	2A
STRUCTURE	40923	305719	38390	34450	305719	405799
EXTENSION	603124					406734
15'-20'	200868					
FOUNDATION	39288	39288		39289	44820	* 39288
	3005109					
SPEC. X-ARM						

* TWR 2/14 ON A TYPE TWR FOUNDATION

No.	Date	Description	GM	By	Ch.	Appd.
8	2-5-14	MODIFY TOWER 2/22 FOR SF CREEK WIDENING & UPDATE	30823989	HCH	AA	MAG
—	——	FOR AS BUILTS FROM REVISION 6	——	——	——	——
7	3-27-13	MODIFY TOWERS 21, 22, & 23 FOR SF CREEK WIDENING	30823989	BSL	GMM	RKK
6	12-20-12	INSTALL VERTICAL & CAGE EXTENSIONS	30607160	NZL	MAG	RKK
5	1-20-11	REPLACED DAMAGED TWR 2/14 A TYPE TWR	30759178	ER	MAG	RKK
—	——	WITH NEW 2A TWR.	——	——	——	——
4	9-29-03	INSTALLED FIBEROPTIC ON STRUCTURES	8020197	ER	RSD	MB
3	4-25-73	ADD STRINGING DWG. TWR. 1/10 AND 1/11	177953	RSA	RKG	WJP

TABLE OF CHANGES

RAVENSWOOD-PALO ALTO #1 NEW LINE #10275
RAVENSWOOD-PALO ALTO #2 NEW LINE #10276

SAN JOSE DIVISION

APPROVED BY: GM 177953; SUPV. BY S.J. PONJA; DSGN. R.S.Du ALA; DR. P.S.Du ALA; CH. J.T.J.; O.K. J.T.J.; DATE 5-8-72; SCALES NONE

STRUCTURE DATA SHEET
RAVENSWOOD-PALO ALTO NOS. 1&2
115KV TOWER LINE

DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

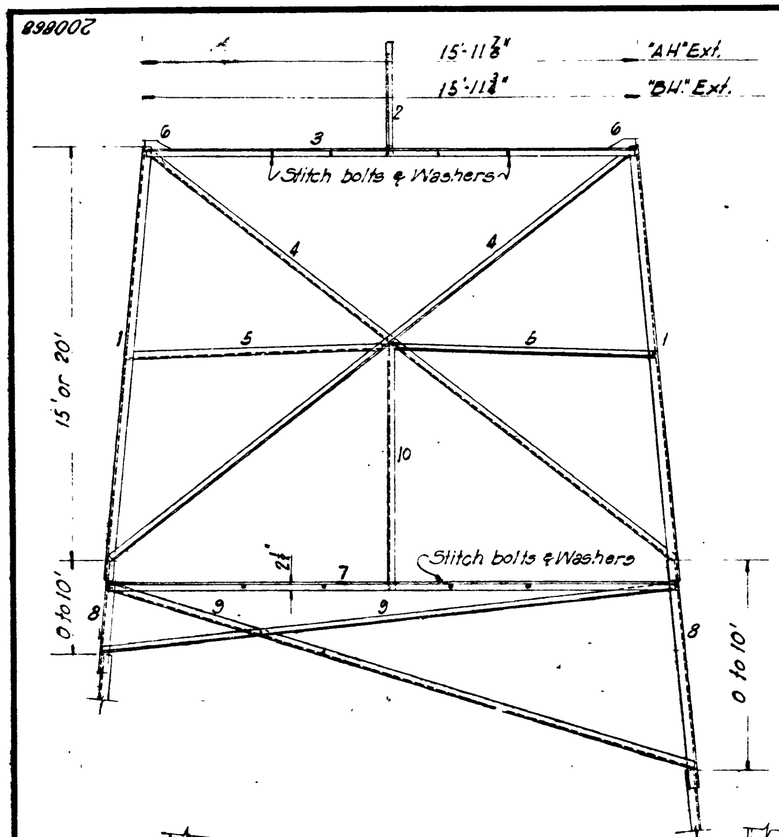
GENERAL SPECS. 044752
SUPERSEDES 29896 IN PART
SUPERSEDED BY
SHEET NO. 1 OF 2 SHEETS
DRAWING NUMBER 219497 CHANGE 8

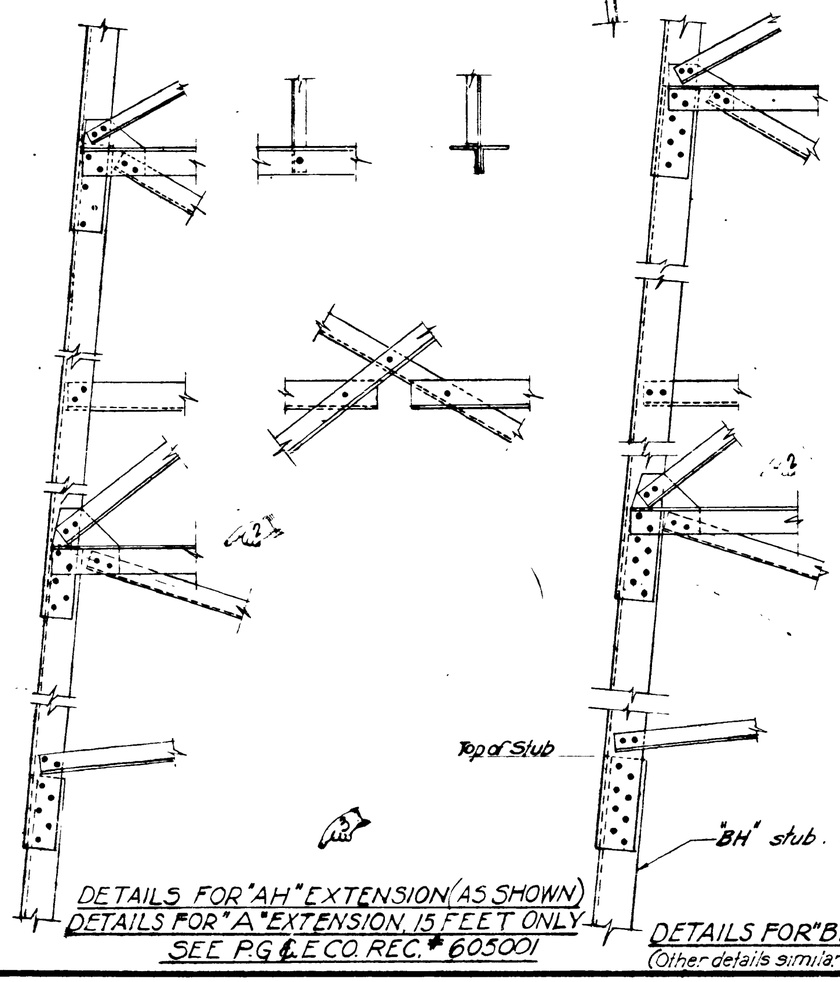
PLAN MAPS: 28224, 28225
PROFILES: 3001256, 3001257, 3008221

N1806

OLD LINE NO. 102
Date: 06-21-12
I:\Exar\Proj\RavensPaloAlto\DSD & PPD

200868





DETAILS FOR "AH" EXTENSION (AS SHOWN)
DETAILS FOR "A" EXTENSION, 15 FEET ONLY
SEE P.G.&E.CO. REC. # 605001

DETAILS FOR "BH" EXTENSION
(Other details similar to "AH" Extension)

15' or 20' ALL AROUND EXTENSION

MEMBER	"AH" 15'	"AH" 20'	"BH" 15'	"BH" 20'
1	4" x 4" x 1/4" L	4" x 4" x 5/16" L	4" x 4" x 3/8" L	4" x 4" x 7/16" L
2	2 1/2" x 2 1/2" x 1/4" L	2 1/2" x 2 1/2" x 1/4" L	2 1/2" x 2 1/2" x 1/4" L	2 1/2" x 2 1/2" x 1/4" L
3	2 1/2" x 2 1/2" x 1/8" TT	2 1/2" x 2 1/2" x 1/8" TT	2 1/2" x 2 1/2" x 1/8" TT	2 1/2" x 2 1/2" x 1/8" TT
4	2" x 2" x 1/8" L	2" x 2" x 1/8" L	2" x 2" x 1/8" L	2" x 2" x 1/8" L
5	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L
6	1/8" Plate	1/8" Plate	1/8" Plate	1/8" Plate

0 to 10' SIDE HILL EXT. "AH" TOWER

MEMBER	2'-6"	5'-0"	7'-6"	10'-0"
7	3" x 2 1/2" x 3/16" TT	3" x 2 1/2" x 3/16" TT	3" x 2 1/2" x 3/16" TT	3" x 2 1/2" x 3/16" TT
8 (15' Ext.)	4" x 4" x 1/4" L	4" x 4" x 1/4" L	4" x 4" x 1/4" L	4" x 4" x 1/4" L
8 (20' Ext.)	4" x 4" x 7/16" L	4" x 4" x 7/16" L	4" x 4" x 7/16" L	4" x 4" x 7/16" L
9	2" x 2" x 1/8" L	2" x 2" x 1/8" L	2" x 2" x 1/8" L	2" x 2" x 1/8" L
10	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L

0 to 10' SIDE HILL EXT. "BH" TOWER

MEMBER	2'-6	5'-0	7'-6"	10'-0"
7	3" x 2 1/2" x 3/16" TT	3" x 2 1/2" x 3/16" TT	3" x 2 1/2" x 3/16" TT	3" x 2 1/2" x 3/16" TT
8 (15' Ext.)	4" x 4" x 3/8" L	4" x 4" x 3/8" L	4" x 4" x 3/8" L	4" x 4" x 7/16" L
8 (20' Ext.)	4" x 4" x 7/16" L	4" x 4" x 7/16" L	4" x 4" x 7/16" L	4" x 4" x 7/16" L
9	2" x 2" x 1/8" L	2" x 2" x 1/8" L	2" x 2" x 1/8" L	2" x 2" x 1/8" L
10	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L	2 1/2" x 2 1/2" x 1/8" L

NOTES

All members galvanized.
Holes 17/32" Bolts 1/2" ϕ galvanized.
Elastic Limit of steel 45,000 #/□" min
Bolt all intersections
For extensions between 20' and 25', excluding 20' level extension, use sidehill extension under 15 level extension.

REFERENCES

Shop Details - Records # 605001 (Rev #1)
Shop Details - Record # 605025

REGISTERED CIVIL ENGINEER
A. B. MARKWART
NO. 453
STATE OF CALIFORNIA

NO	DATE	DESCRIPTION	APPRD
4	7-26-48	Added note	GUR
3	8-9-40	Changed Title & Tower "A" added	[illegible]
2	7-8-38	Connection details changed	[illegible]
1	7-1-38	Angle size changed	[illegible]

TABLE OF CHANGES
USE ONLY PRINTS SHOWING LATEST CHANGES

APPROVED BY

15 OR 20 FT. EXTENSIONS WITH 0 TO 10 FT. SIDE HILL EXTENSIONS FOR TYPES "A", "AH" & "BH" TOWERS
(First used on Natividad - Soledad 110 K.V. Transmission Line)

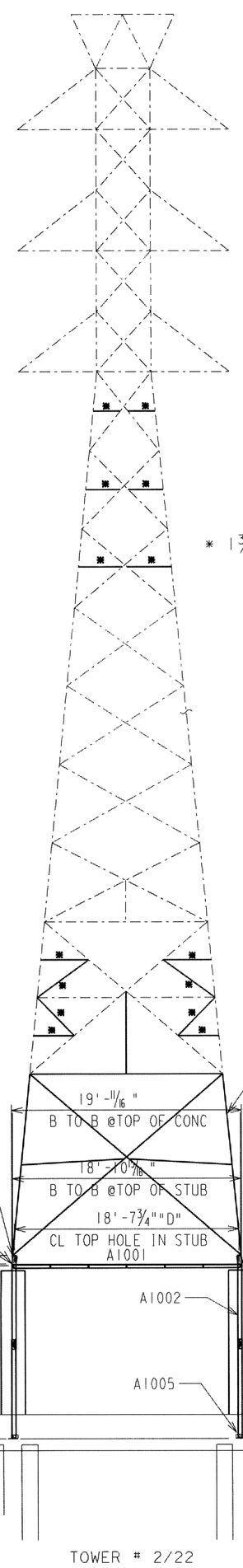
DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC CO.
SAN FRANCISCO, CALIFORNIA

BY C. W. Appleford
DR. D. J. Fraser
CH. F. E. M.
O.K. [illegible]
DATE 5-5-38
SCALES None

AUTHORIZATION
DWG. LIST
BILL OF MATERIAL

SUPERSEDES
SUPERSEDED BY
SHEET NO
SHEETS
DRAWING NUMBER 200868
CHANGE 4

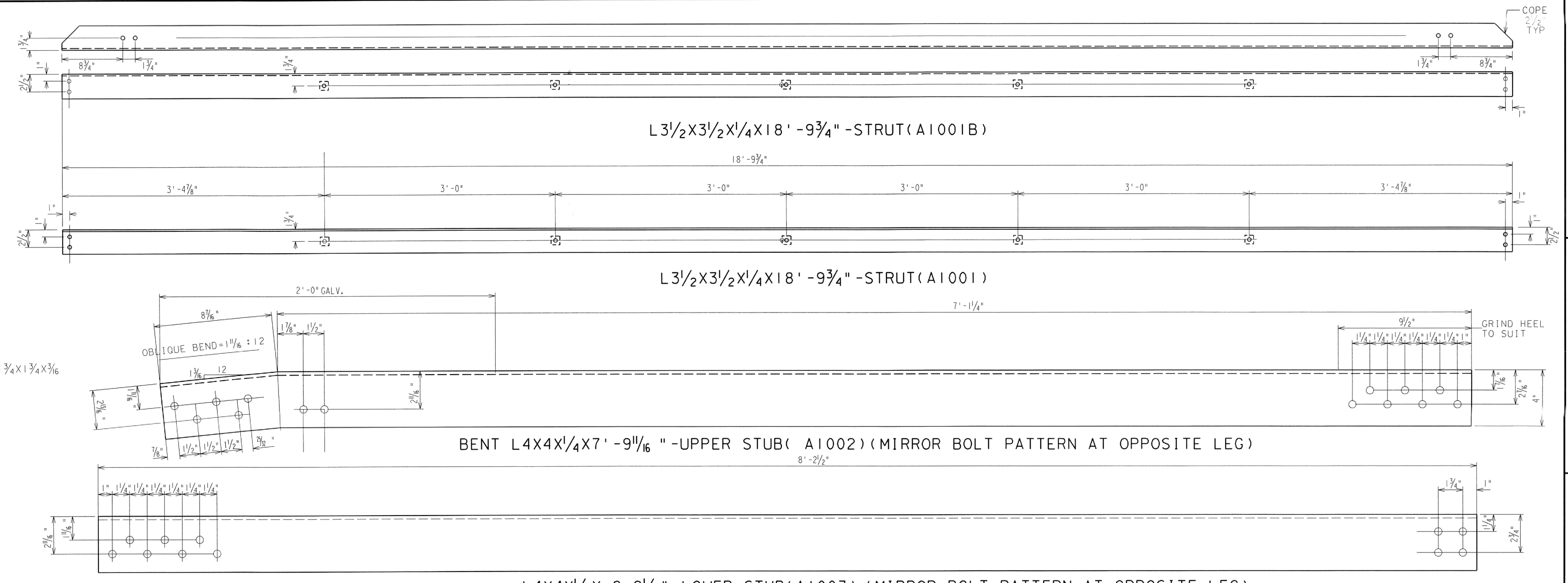
35 M/M NEG 4
SCAN 4 IC

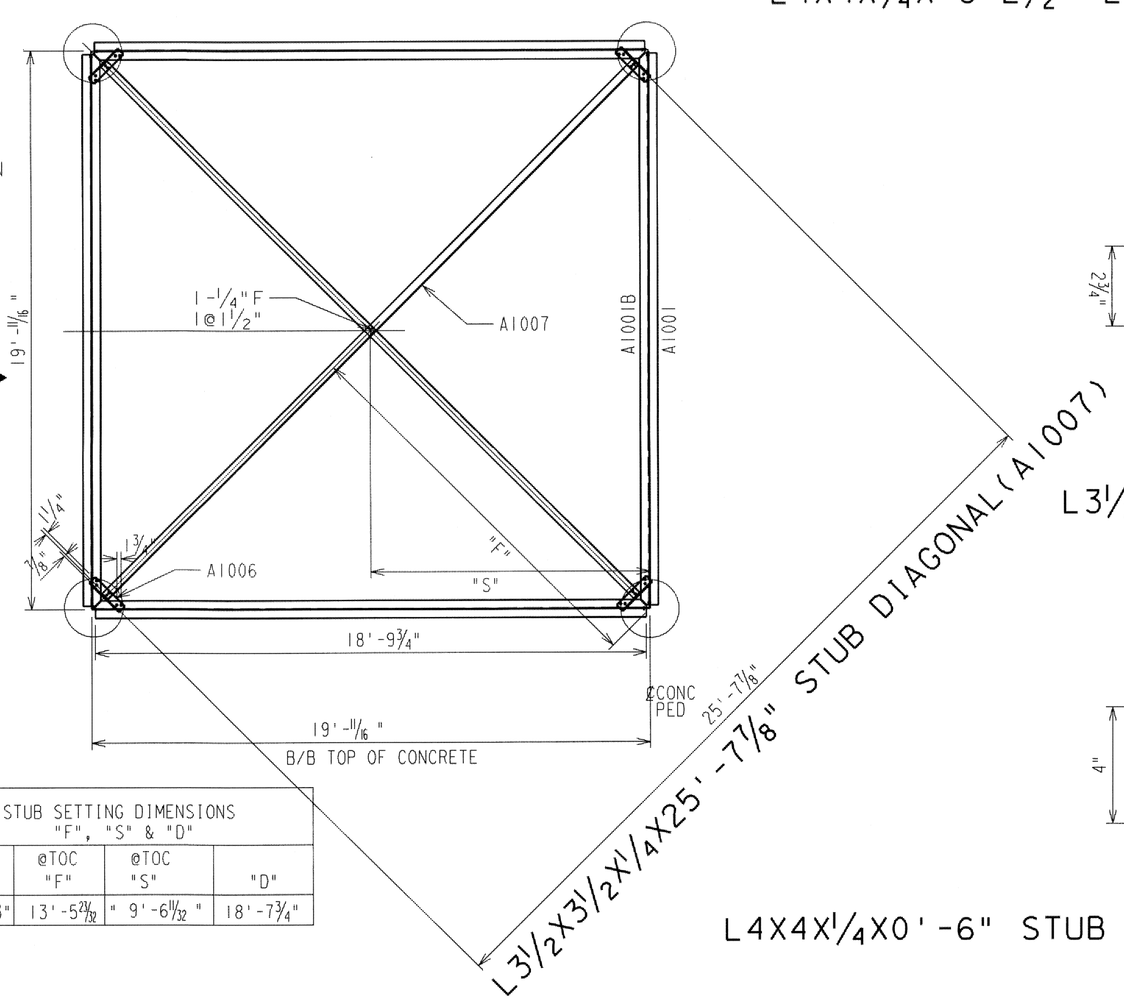


TOWER # 2/22

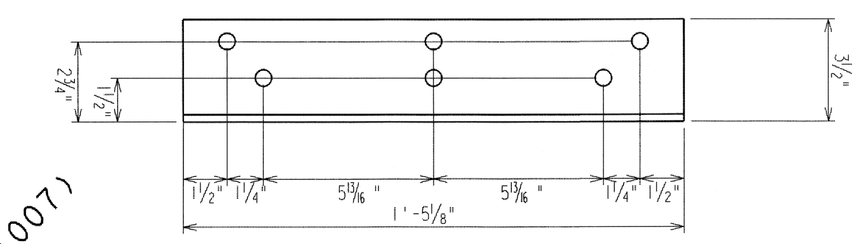
SECTION A 110 / 109

1/8" = 1'-0"

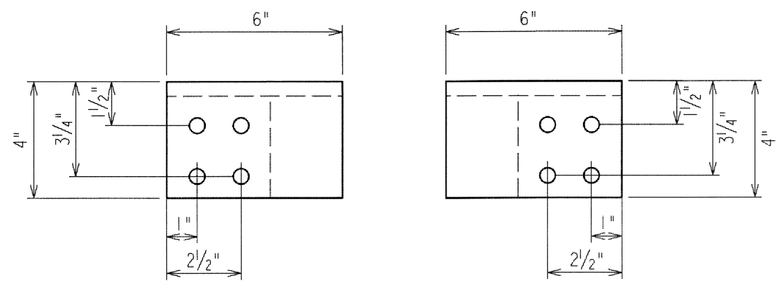




STUB SETTING DIMENSIONS "F", "S" & "D"			
HT. OF STUB	@TOC "F"	@TOC "S"	"D"
15'-3"	13'-5 29/32"	9'-6 11/32"	18'-7¾"



L3½X3½X¼X1'-5⅛" STUB TIE(A1006)



L4X4X¼X0'-6" STUB SHOE (A1004) (A1005)

BILL OF MATERIAL						
PCS	DECRIPTION	LENGTH FT.	LENGTH INS.	MARK	DWG.	GALV. WT.
MODIFICATION FOR ONE STRUCTURE						
4	L3½X3½X¼	18	9 11/16	A1001	3005110	452.9
4	L3½X3½X¼	18	9 11/16	A1001B	3005110	452.9
4	L4X4X¼	7	9 11/16	A1002	3005110	206
4	L4X4X¼	8	2½	A1003	3005110	163.2
4	L4X4X¼	0	6	A1004	3005110	12
4	L4X4X¼	0	6	A1005	3005110	12
4	L3½X3½X¼	1	5⅛	A1006	3005110	34.3
2	L3½X3½X¼	25	7⅞	A1007	3005110	308.9
				WT. OF L'S =		1,449#
21	FILLER PL 1½X1½X¼ W/ 9/16" Ø HOLE					3.47
37	BOLTS ½"Ø		1¾			7.9
152	BOLTS ½"Ø		1½			30.2
			WT. OF BOLTS & PL =			42#
			TOTAL WT. =			1,491#

NOTE:

1. SEE DWG 3005109 FOR GENERAL NOTES.

REFERENCES:

DWG NO.

1. 15FT LEG EXTENSION FOR TYPE "A" TOWER —— 200868
2. SUBMERGED PILE FOOTING, SHEET 1 —— 3005109

REGISTERED PROFESSIONAL ENGINEER TONY K. LAU No. C68313 CEAT. EXPIRES 9/1/13 CIVIL STATE OF CALIFORNIA

BUSINESS LINE: SUBSTATION & TRANSMISSION
FACILITY TYPE: TLINE DISCIPLINE: CIVIL
FACILITY COMPONENT:
UNIT: 230KV FERC/CPUC (LINE NO.)
STATUS: ACTIVE PROJECT:
FACILITY NAME: RAVENSWOOD-PALO ALTO
DRAWING TYPE: FOUNDATION

REV	DATE	DESCRIPTION	JOB NO	DSG/DWN	CHKD	SUPV	APVD
1	4/16/13	APPROVED FOR CONSTRUCTION	30823989	SN	VR		

REVISION 1	
DSG	SANG NAM
DWN	SANG NAM
CHKD	V. Ro
SUPV	
APVD	
APVD	
DATE	6/21/13

CIVIL

RAVENSWOOD-PALO ALTO #1 & 2
SUBMERGED PILE FOOTING
TYPE A TOWER NO. 2/22

DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO 2 OF 2 SHEETS

DRAWING NUMBER 3005110 REV 1

30051110.DGN 1-26-2013 SKN

F4350

Attachment C

Engineering Specifications

East Palo Alto Sanitary Sewer Siphon and Line Relocation

EAST PALO ALTO SANITARY DISTRICT

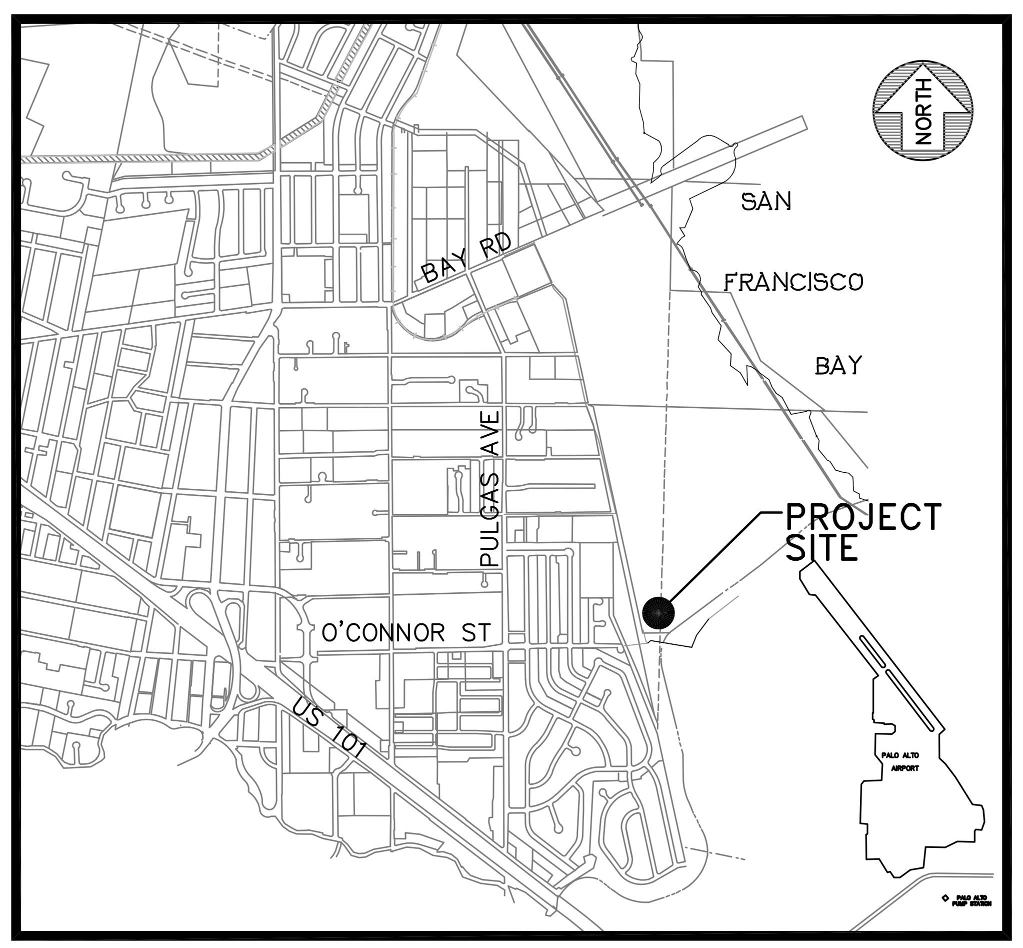
SAN FRANCISQUISTO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

UNAUTHORIZED CHANGES & USES: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

Construction contractor agrees that in accordance with generally accepted construction practices, construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property; that this requirement shall be made to apply continuously and not be limited to normal working hours, and construction contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting liability arising from the sole negligence of design professional.

BOARD OF DIRECTORS

GLENDA SAVAGE	PRESIDENT
BETSY YAÑEZ	VICE PRESIDENT
JOAN SYKES–MIESSI	SECRETARY
GORO MITCHELL	DIRECTOR
DENNIS SCHERZER	DIRECTOR
KENNETH C JONES	GENERAL MANAGER



VICINITY LOCATION
NTS

INDEX OF DRAWINGS

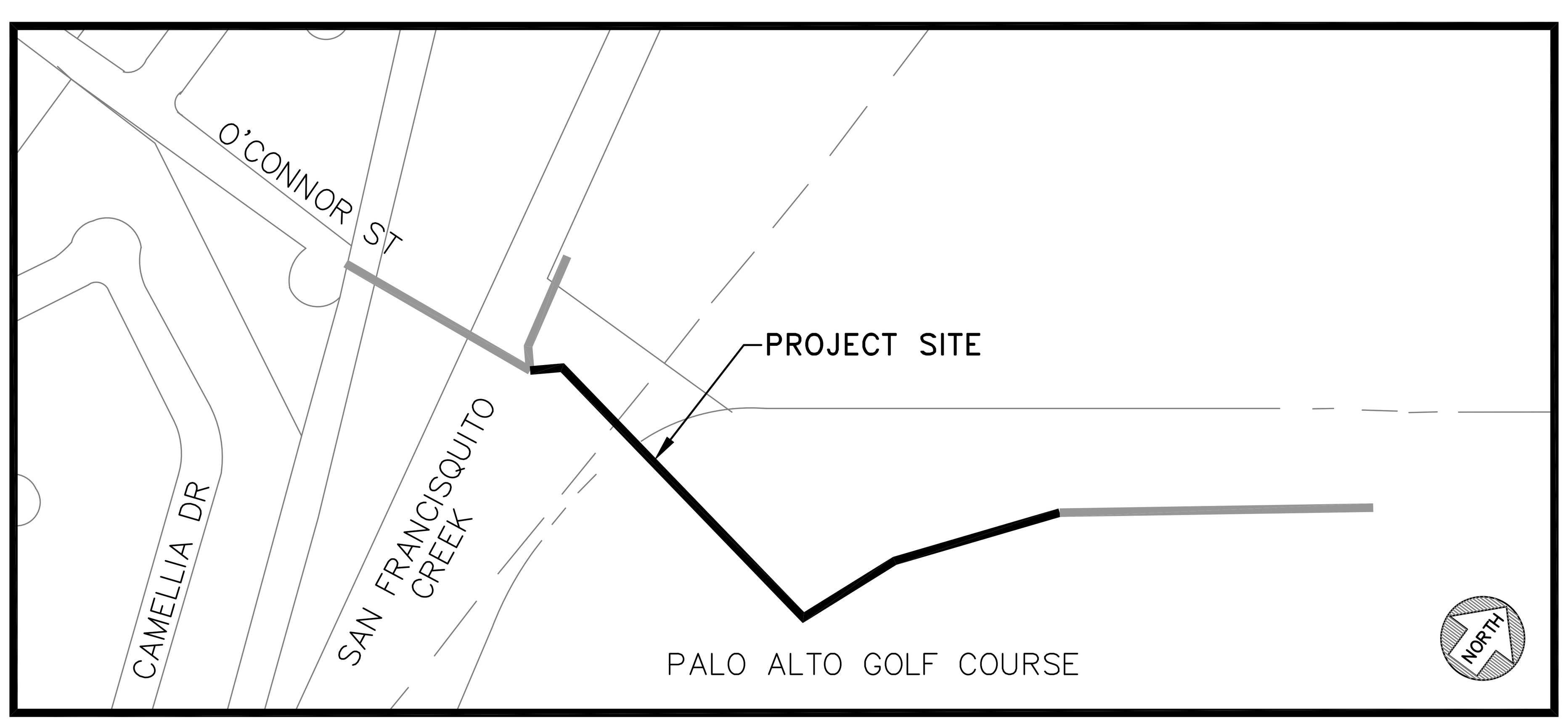
SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
2	OVERALL LAYOUT
3	SANITARY SEWER PLAN AND PROFILE STA: 0+00 – 3+75
4	SANITARY SEWER PLAN AND PROFILE STA: 3+75 – 6+50
4A	[ADD ALTERNATIVE 1 VERSION]
5	SANITARY SEWER PLAN AND PROFILE STA: 6+50 – 11+00
5A	[ADD ALTERNATIVE 1 VERSION]
6	DETAIL SHEET
7	CONSTRUCTION BMPs

LEGEND

- SANITARY SEWER TO BE INSTALLED
- NEW SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER TO BE REMOVED OR ABANDONED PER PLAN
- LIMITS OF NEW BERM (BY OTHERS)
- EXISTING STORM DRAIN
- EXISTING ELECTRICAL LINE
- EXISTING WATER LINE
- EXISTING CONTOURS
- EXISTING CATCH BASIN

ABBREVIATIONS

ACP	ASBESTOS CEMENT PIPE
APPROX	APPROXIMATE
BMPs	BEST MANAGEMENT PRACTICES
DIA, ø	DIAMETER
DR	DIAMETER RATIO
EX, (E)	EXISTING
HDPE	HIGH–DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
ID	INNER DIAMETER
INV	INVERT
LF	LINEAR FEET
NTS	NOT TO SCALE
OD	OUTER DIAMETER
S	SLOPE
SD	STORM DRAIN
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEANOUT
SSMH	SANITARY SEWER MANHOLE
STA	STATION
TYP	TYPICAL
VERT	VERTICAL



SAN FRANCISQUITO CREEK SIPHON PROJECT SITE

GENERAL NOTES:

1. THE FOLLOWING NOTES ARE ESTABLISHED MERELY TO GUIDE THE CONTRACTOR AS TO THE GENERAL ITEMS OF WORK INVOLVED AND ARE NOT INTENDED TO COVER COMPLETE SCOPE OF WORK. THE CONTRACTOR SHALL COMPLETE ALL WORK AS PER CONSTRUCTION PLANS AND SPECIFICATIONS.

2. CONTRACTOR AGREES THAT THEY SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

3. ALL SANITARY SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE PLANS, THE SPECIAL TECHNICAL PROVISIONS AND THE STANDARD SPECIFICATIONS OF THE EAST PALO ALTO SANITARY DISTRICT. ALL WORK NOT SPECIFICALLY COVERED IN THE STANDARD SPECIFICATIONS OF EAST PALO ALTO SANITARY DISTRICT AND THE SPECIAL TECHNICAL PROVISIONS FOR THESE IMPROVEMENTS SHALL BE DONE IN ACCORDANCE WITH THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, LATEST EDITION.

4. THE WORK SHOWN ON THESE PLANS SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS AND THE REQUIREMENTS OF THE ENCROACHMENT PERMITS.

5. THE LOCATIONS AND TYPES OF EXISTING UTILITIES SHOWN ON THE IMPROVEMENT PLANS ARE BASED ON INFORMATION FURNISHED BY SERVICING AGENCIES AND IS TO BE SUPPLEMENTED BY ACTUAL FIELD INVESTIGATION AND VERIFICATIONS BY CONTRACTOR. ATTENTION IS DIRECTED TO VERIFICATIONS OF DEPTHS AND EXACT LOCATIONS OF EXISTING SERVICES WHETHER SHOWN ON THE PLAN OR NOT AND THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PRESERVE AND AVOID DAMAGES TO EXISTING UTILITIES ENCOUNTERED. NOTE: EXISTING UTILITY SERVICES TO HOUSES ARE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL NOTIFY P G & E, AT&T, CALIFORNIA WATER AND UNDERGROUND SERVICE ALERT (USA) AT (800) 642–2444, PRIOR TO ANY FIELD INVESTIGATION.

6. BEDDING MATERIAL SHALL BE AN IMPORTED GRANULAR MATERIAL FREE FROM VEGETABLE MATTER AND OTHER ORGANIC SUBSTANCES AND SHALL BE OF SUCH NATURE THAT IT CAN BE COMPACTED READILY UNDER WATERING, ROLLING AND TAMPING TO FORM A FIRM AND STABLE BASE. BEDDING MATERIAL SHALL CONFORM TO THE GRADATION REQUIREMENTS SHOWN ON THE DETAIL DRAWING.

7. RELATIVE COMPACTION AND IN–PLACE DENSITY SHALL BE DETERMINED AS DEFINED BY THE TEST METHOD OF ASTM D1557.

8. EXISTING FLOWS FROM INDIVIDUAL LATERALS MUST BE MAINTAINED BY CONTRACTOR AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY PROPERTY OWNERS OF ANY INTERRUPTION OF SEWER SERVICES PRIOR TO ANY WORK ON EXISTING SEWER PIPES. SEWAGE FLOWS SHALL BE MAINTAINED BY PUMPING.

9. ALL EXISTING IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO LANDSCAPING, DRIVEWAYS, CURB, GUTTER, SIDEWALK, CULVERTS, DRAINS, STRIPING (PAINTED OR THERMOPLASTIC) AND MONUMENTS, SHALL BE RESTORED TO THE CONDITION IN WHICH THEY WERE OR BETTER BEFORE THE EXCAVATION WAS MADE. PAYMENT FOR RESTORATION OF EXISTING IMPROVEMENTS TO THEIR ORIGINAL CONDITION WILL NOT BE MADE AND SHALL BE CONSIDERED AS INCLUDED IN THE VARIOUS CONTRACT ITEMS OF WORK INVOLVED.

10. THE CONTRACTOR SHALL CONDUCT HIS OPERATION AS TO OFFER THE LEAST POSSIBLE OBSTRUCTION AND INCONVENIENCE TO THE PUBLIC. THROUGHOUT THE PERFORMANCE OF THE WORK, OR IN CONNECTION TO THIS CONTRACT, THE CONTRACTOR SHALL CONSTRUCT AND ADEQUATELY MAINTAIN SUITABLE AND SAFE CROSSINGS OVER TRENCHES, DRIVEWAY ACCESS AND SUCH DETOURS AS ARE NECESSARY TO CARE FOR PUBLIC PEDESTRIAN TRAFFIC. CITY OWNED ROADWAYS SHALL BE MADE SAFE AND PASSABLE AT THE END OF EACH WORK DAY UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. NO TRENCH SHALL BE LEFT IN AN UNSAFE CONDITION WHEN WORK IS NOT OCCURRING. THE CONTRACTOR SHALL BE REQUIRED TO CLOSE OR PLATE OVER THE TRENCH AT THE TRENCH AT THE END OF EACH WORK DAY OR WHEN WORK IS NOT SCHEDULED.

11. CONTRACTOR SHALL CONFORM TO ALL APPLICABLE OSHA RULES, REGULATIONS, AND ORDERS ESTABLISHED BY FEDERAL AND STATE AGENCIES BEFORE ENTERING SANITARY SEWER MANHOLES.

12. IF THE CONTRACTOR PLANS TO USE MACHINERY WITH TRACKS, PLYWOOD SHALL BE PLACED IN FRONT AND/OR BACK OF THE MACHINE (DEPENDING ON THE TRAVEL DIRECTION), SO THAT SURFACE DESTRUCTION IS AVOIDED. ANY SURFACE DESTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE DISTRICT, TO THE SATISFACTION OF THE LOCAL JURISDICTION.

13. CONTRACTOR SHALL PROVIDE PUMPS OR OTHER MEANS TO PREVENT SEWER WASTES BACKUP DUE TO THEIR WORK ON THE EXISTING SEWERS. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP AND DAMAGES CAUSED BY HIS NEGLIGENCE, AND SHALL PAY ANY FINES DUE TO HIS NEGLIGENCE.

14. PRIOR TO THE START OF SEWER CONSTRUCTION, THE CONTRACTOR SHALL PERFORM BYPASSING OPERATIONS. CONSTRUCTION CAN NOT BEGIN UNTIL BYPASSING OPERATIONS ARE APPROVED BY THE DISTRICT.

15. THE CONTRACTOR SHALL AT ALL TIMES HAVE AT THE JOB SITE SUFFICIENT PUMPING MACHINERY READY FOR IMMEDIATE USE. THE TRENCHES AND EXCAVATIONS SHALL BE KEPT ENTIRELY FREE OF WATER WHILE CONCRETE IS BEING POURED OR PIPE IS BEING LAID AND UNTIL CONCRETE OR MORTAR HAS SET HARD. WATER SHALL BE DISPOSED OF IN SUCH A MANNER AS WILL NOT CAUSE INJURY TO PUBLIC OR PRIVATE PROPERTY, NOR BE A MENACE TO PUBLIC HEALTH.

16. ALL PROPERTY LINES SHOWN ARE APPROXIMATED FROM ASSESSORS PARCEL MAPS OR FROM RECORD INFORMATION, AND THEIR LOCATION MAY NOT BE EXACT. THE PROPERTY LINES SHALL BE USED AS REFERENCE TO LOCATE SERVICE LATERAL CONNECTION TO EACH PROPERTY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE THE EXACT LOCATION OF EACH PROPERTY LATERAL FOR CONNECTION.

17. CONTRACTOR SHALL PROVIDE 72–HOUR WRITTEN NOTIFICATION TO RESIDENTS PRIOR TO INITIATING CONSTRUCTION. IF PARKING IS RESTRICTED DURING CONSTRUCTION, CONTRACTOR SHALL PROVIDE SIGNAGE WHERE THE PROPOSED RESTRICTION IS TO OCCUR AT A MINIMUM OF 48–HOUR IN ADVANCE.

18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL PERMITS REQUIRED BY THE CITY INCLUDING AN ENCROACHMENT PERMIT WHICH IS REQUIRED PRIOR TO THE START OF CONSTRUCTION. PRIOR TO ISSUANCE OF AN ENCROACHMENT PERMIT, THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A TRAFFIC MANAGEMENT PLAN. AT MINIMUM THE PLAN SHALL INCLUDE PROPOSED DETOURING, ROAD AND LANE CLOSURES (IF NECESSARY), SIGNAGE AND BARRIERS TO BE USED AND TRUCK ROUTES TO BE FOLLOWED.

19. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO WEEKDAYS FROM 8AM TO 5PM WITHIN THE PUBLIC RIGHT OF WAY UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. NO WORK SHALL OCCUR ON WEEKENDS.

20. NO STOCKPILE OF MATERIAL IS ALLOWED WITHIN THE PUBLIC RIGHT OF WAY UNLESS APPROVED BY THE CITY ENGINEER.

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		BY	DATE	DESCRIPTION OF REVISIONS	APP'D
DATE:	03/09/16		04/11/13	50% PLANS	
SCALE:	AS NOTED		03/15/16	90% PLANS	
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CHECKED:	RJL				
PROJ. ENGR:	RJL				

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EPASD
EAST PALO ALTO SANITARY DISTRICT

REGISTERED PROFESSIONAL ENGINEER RICHARD J. LAURETA C-0[?]783 CIVIL STATE OF CALIFORNIA
PRELIMINARY

TITLE SHEET

SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 1 OF 7 SHEETS

JOB NO. 002015

PALO ALTO GOLF COURSE

SHEET 3

SHEET 4
SHEET 4A

SHEET 5
SHEET 5A

SAN FRANCISQUITO CREEK

FRIENDSHIP BRIDGE

SEE INSET BELOW FOR DEWATERING TANKS LOCATION

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00

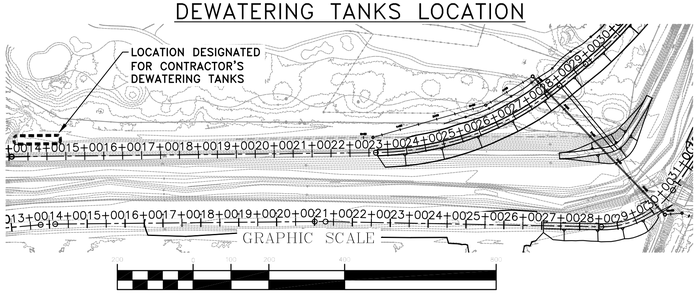
20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00

NORTH

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

DEWATERING TANKS LOCATION



(IN FEET)
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	BY	DATE	DESCRIPTION OF REVISIONS	APP'D

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EPASD
EAST PALO ALTO SANITARY DISTRICT

REGISTERED PROFESSIONAL ENGINEER RICHARD J. LAUREATA C 34395 CIVIL STATE OF CALIFORNIA
PRELIMINARY

OVERALL LAYOUT

SAN FRANCISQUITO CREEK SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 2 OF 7 SHEETS

JOB NO. 002015

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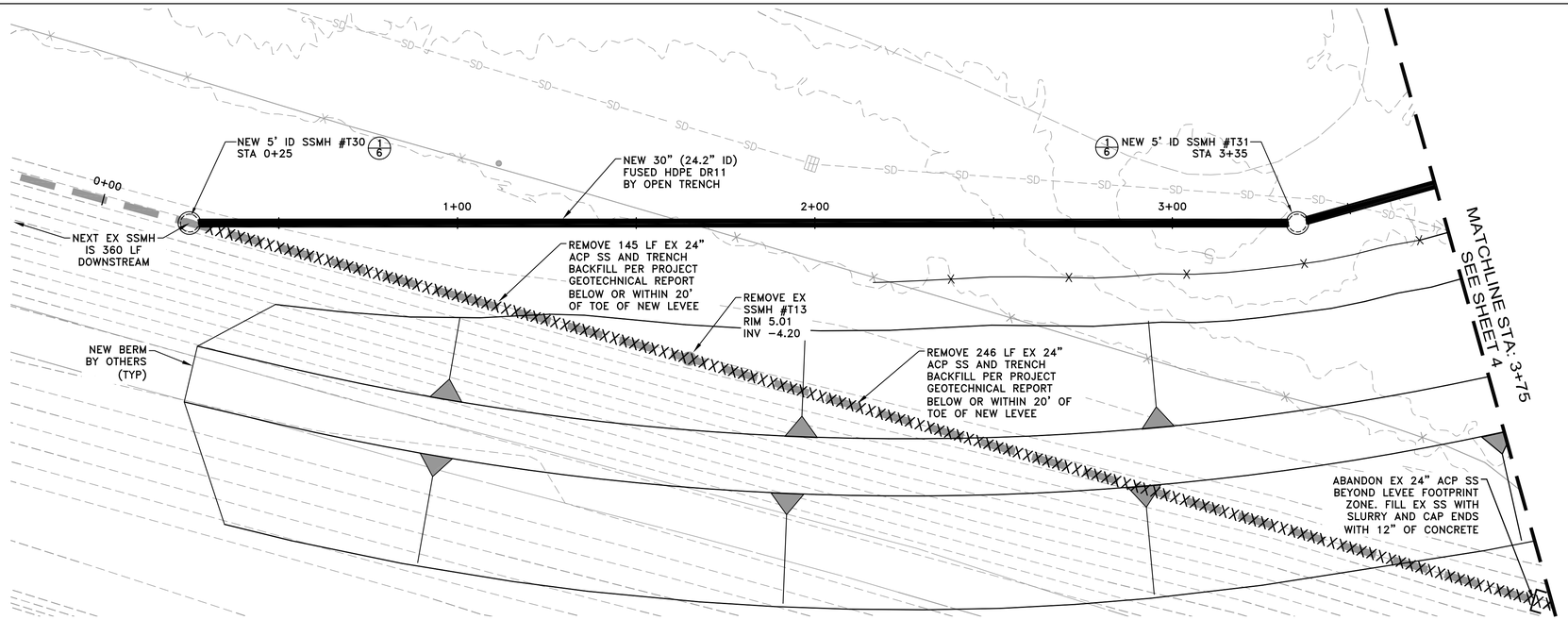

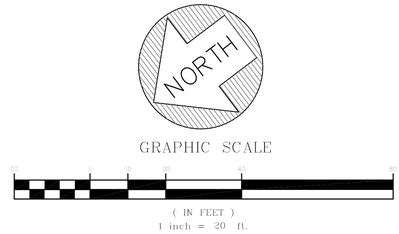

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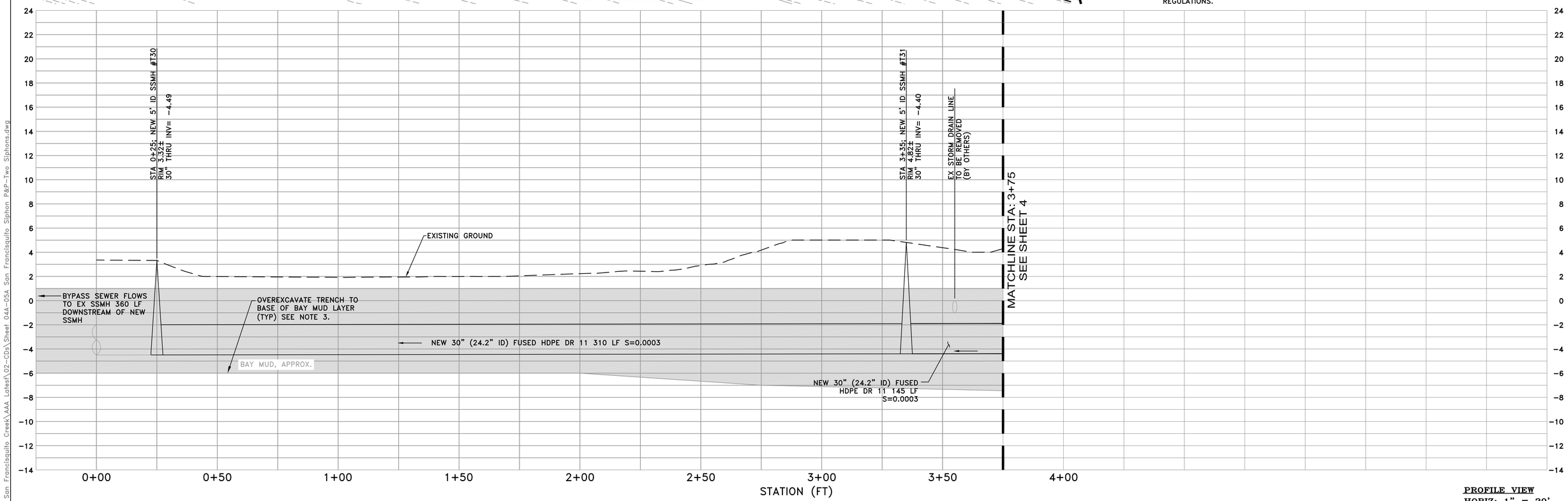

PROFILE VIEW
HORIZ: 1" = 20'
VERT: 1" = 4'

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SCALE:	AS NOTED		03/15/16	90% PLANS
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		BY	DATE	DESCRIPTION OF REVISIONS

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EAST PALO ALTO
SANITARY DISTRICT

REGISTERED PROFESSIONAL ENGINEER
RICHARD J. LAURETA
C 34193
CIVIL
STATE OF CALIFORNIA
PRELIMINARY

SANITARY SEWER PLAN AND PROFILE
STA: 0+00 - 3+75

SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 3 OF 7 SHEETS

JOB NO. 002015

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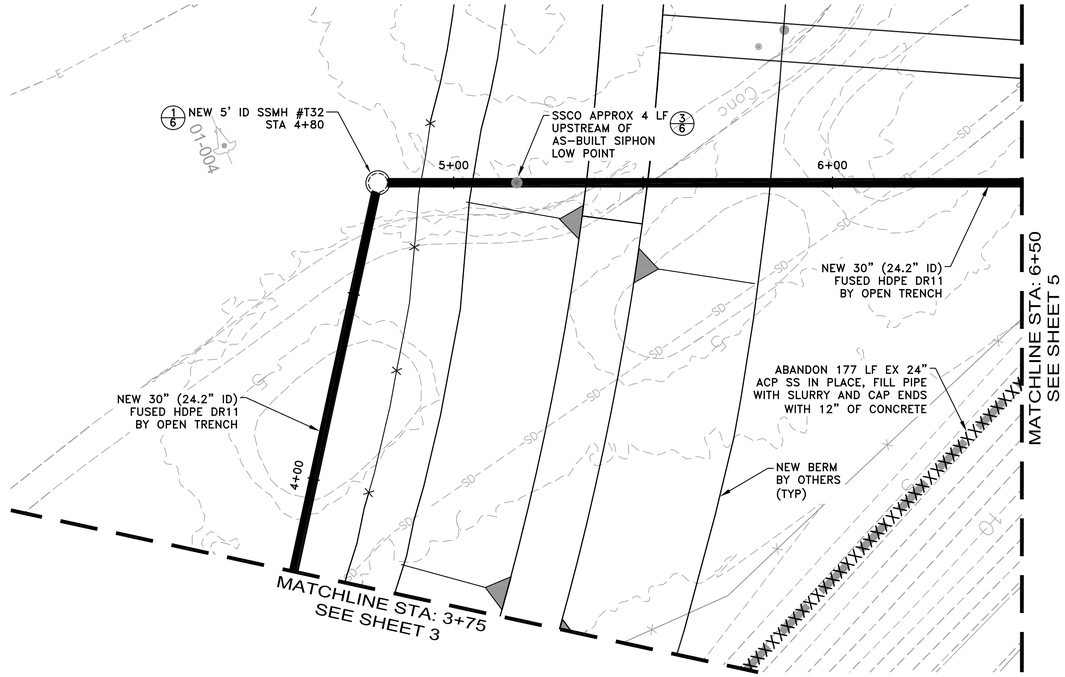

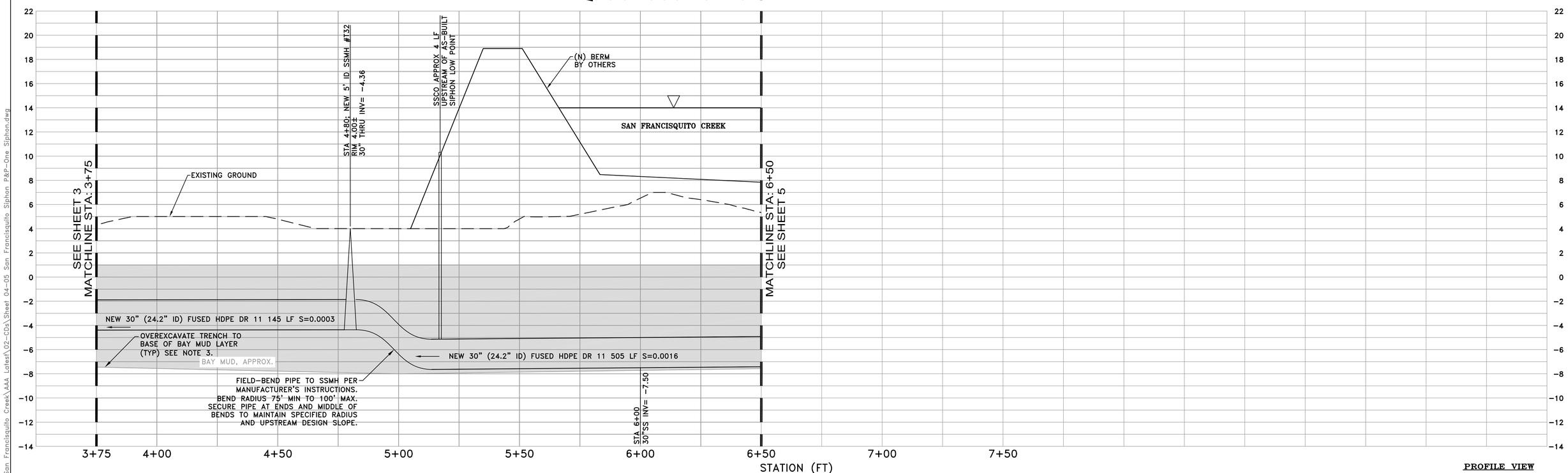

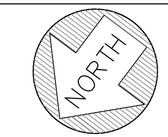

GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

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PROFILE VIEW
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VERT: 1" = 4'

DATE: 03/09/16		04/11/13	50% PLANS	
SCALE: AS NOTED		03/15/16	90% PLANS	
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EPASD
EAST PALO ALTO SANITARY DISTRICT

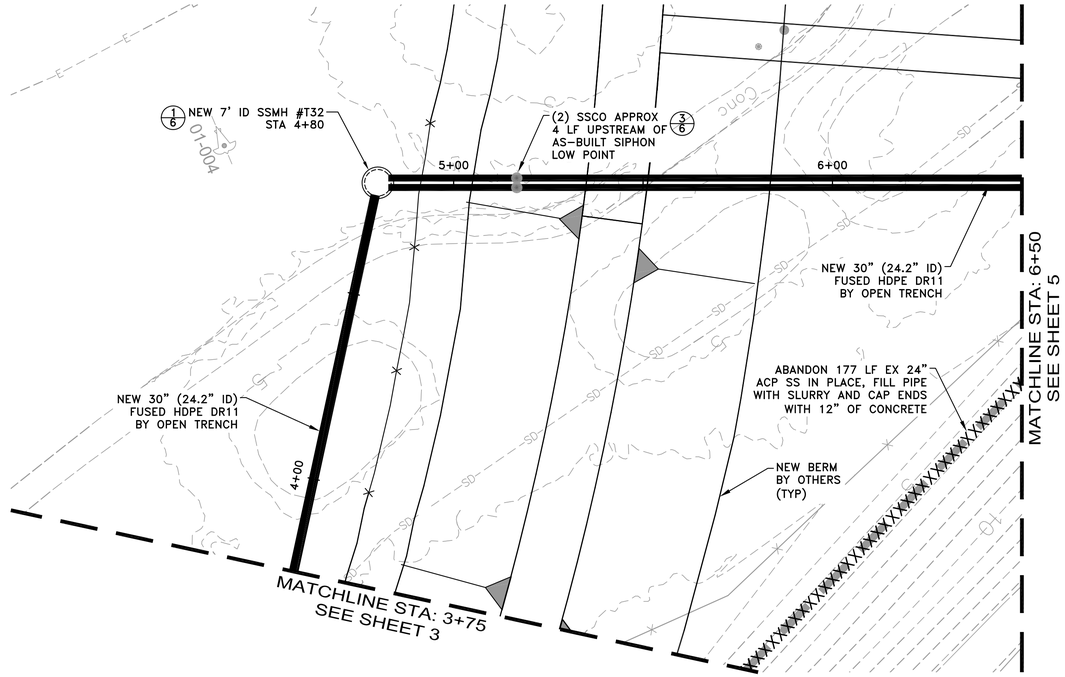
REGISTERED PROFESSIONAL ENGINEER RICHARD J. LAURETA C 34395 CIVIL STATE OF CALIFORNIA
PRELIMINARY

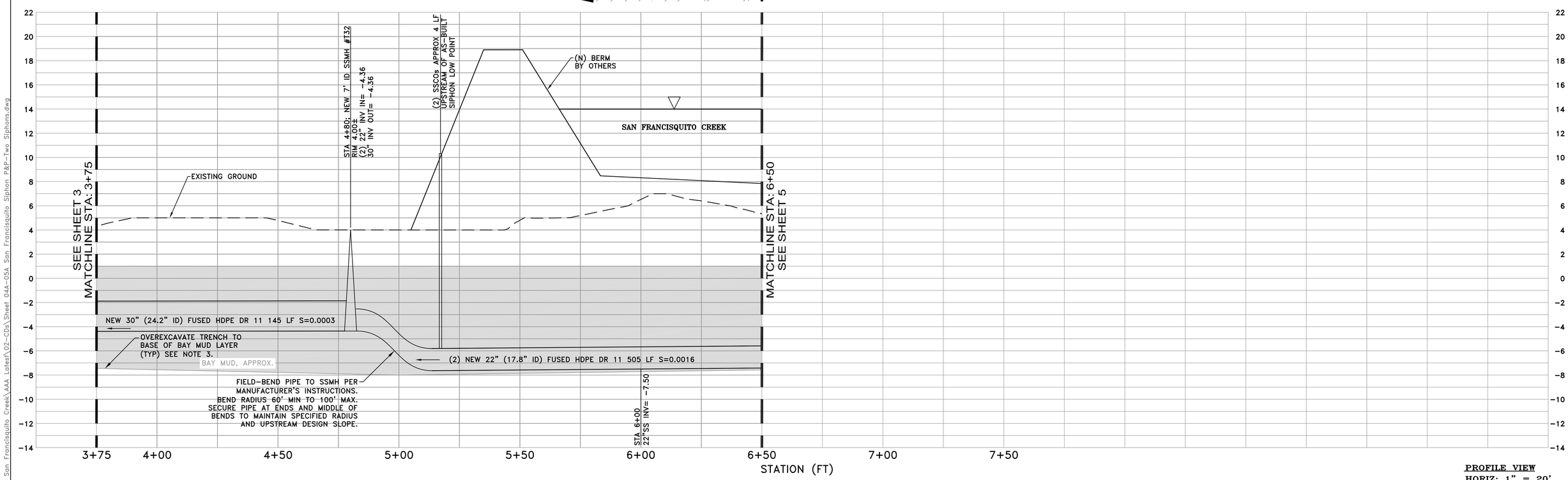
SANITARY SEWER PLAN AND PROFILE
STA: 3+75 - 6+50

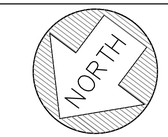
SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 4 OF 7 SHEETS
JOB NO. 002015

Z:\Projects\002 EPASD\2015 San Francisquito Creek\AAA Latest\02-CDs\Sheet 04-05 San Francisquito Siphon P&P-One Siphon.dwg







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VERT: 1" = 4'

DATE: 03/09/16		04/11/13	50% PLANS	
SCALE: AS NOTED		03/15/16	90% PLANS	
DESIGNED: HCL/JRK				
DRAWN: HCL/JRK				
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EPASD
EAST PALO ALTO SANITARY DISTRICT

REGISTERED PROFESSIONAL ENGINEER RICHARD J. LIMIN C 43795 CIVIL STATE OF CALIFORNIA

SANITARY SEWER PLAN AND PROFILE
STA: 3+75 - 6+50
[ADD ALTERNATIVE 1 VERSION]
SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 4A OF 7 SHEETS
JOB NO. 002015

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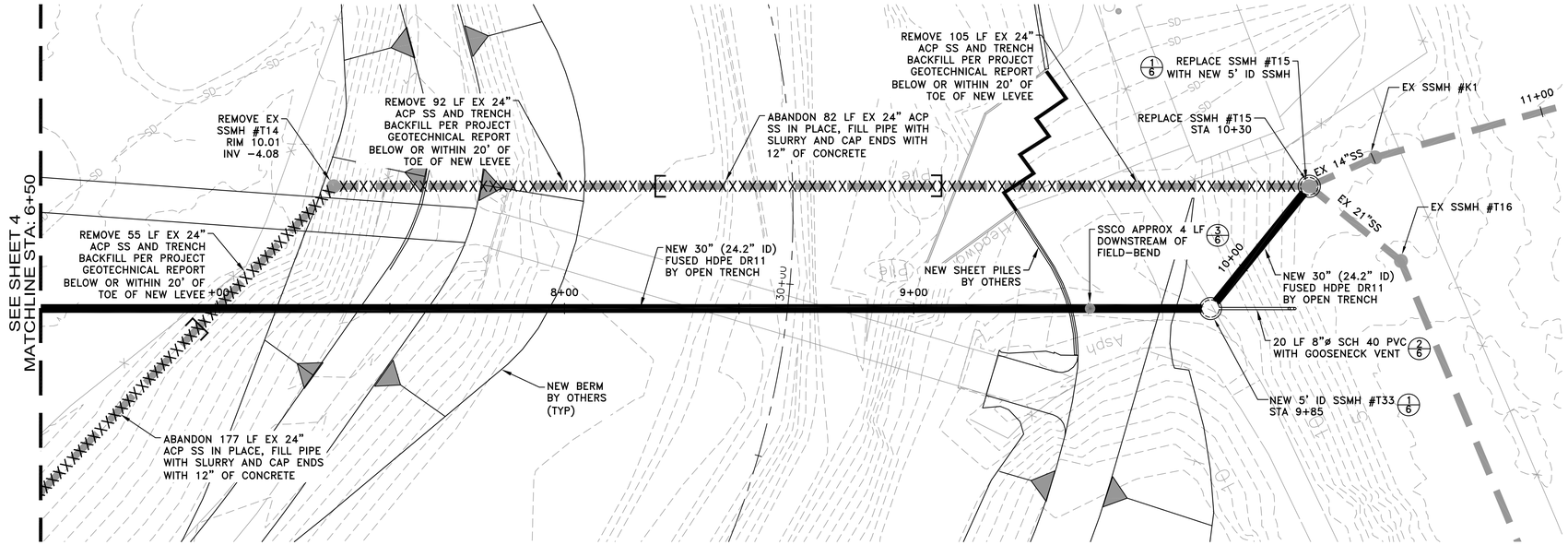

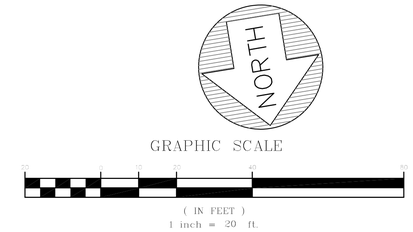

NOTES:

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2) CONTRACTOR SHALL REPLACE, RESTORE AND/OR RECONSTRUCT ANY PUBLIC ROADWAYS, CURB & GUTTER, SIDEWALK AND OTHER CITY PROPERTIES THAT MAY HAVE BEEN DAMAGED DUE TO CONSTRUCTION RELATED ACTIVITIES. ALL REPAIRS AND IMPROVEMENTS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE LOCAL CODES.

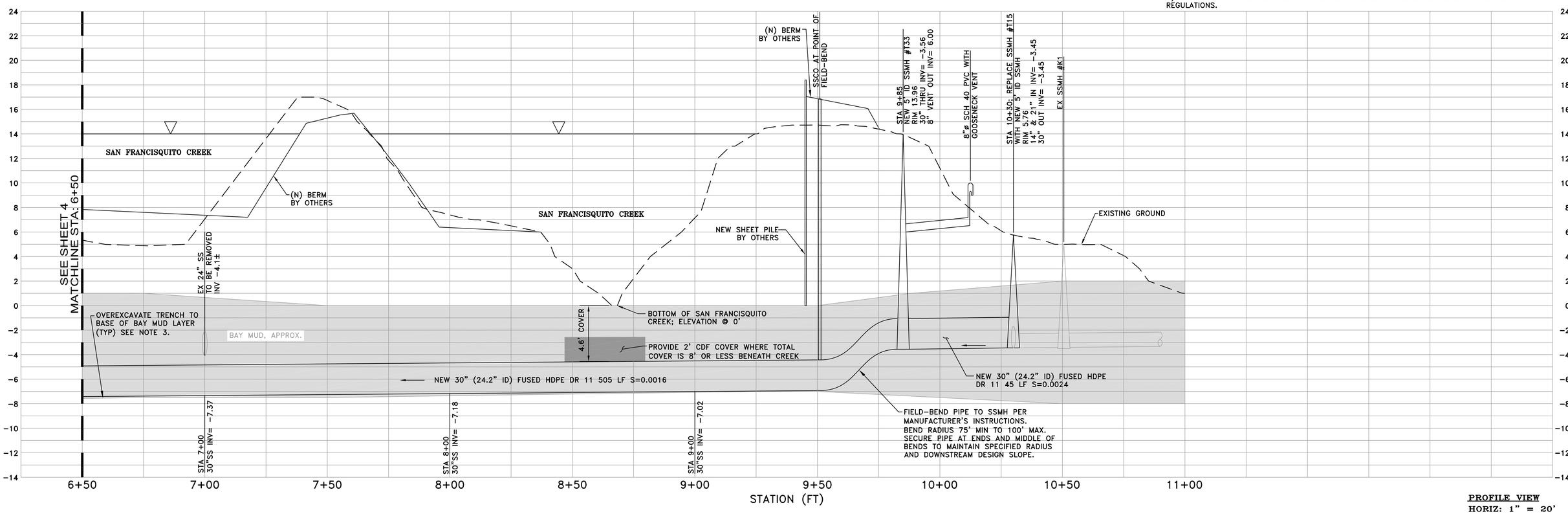
3) CONTRACTOR SHALL OVEREXCAVATE UTILITY TRENCH TO REMOVE BAY MUD SOILS PER THE PROJECT GEOTECHNICAL REPORT OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER IN THE FIELD. CONTRACTOR SHALL ASSUME THAT OVEREXCAVATION DOWN TO ELEVATION −8 WILL BE NECESSARY FOR THE LENGTH OF THE PROJECT.

4) CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING, TESTING, AND TREATMENT OF RETAINED WATER TO MEET WATER QUALITY EFFLUENT LIMITATIONS DURING CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE WATER DIVERSION PLAN PREPARED BY THE SANTA CLARA VALLEY WATER DISTRICT (SCVWD). THE LOCATION DESIGNATED FOR CONTRACTOR'S DEWATERING TANKS IS SHOWN ON THE WATER DIVERSION PLAN AND IS LOCATED ON THE SOUTH SIDE OF THE CHANNEL APPROXIMATELY 850' DOWNSTREAM OF THE MOST DOWNSTREAM NEW SSMH.

5) GROUNDWATER WAS ENCOUNTERED BETWEEN APPROXIMATE ELEVATION −2 AND 2 DURING GEOTECHNICAL EXPLORATION. PER THE GEOTECHNICAL REPORT IT IS ANTICIPATED THAT GROUNDWATER LEVELS WILL VARY, INFLUENCED BY TIDAL FLUCTUATIONS AND RIVERINE FLOW EVENTS.

6) CONTRACTOR SHALL DEMONSTRATE BYPASSING OF WASTEWATER FLOWS PRIOR TO PIPE INSTALLATION.

7) CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING ASBESTOS CEMENT PIPE PER LAWS AND REGULATIONS.



PROFILE VIEW
HORIZ: 1" = 20'
VERT: 1" = 4'

DATE: 03/09/16		04/11/13	50% PLANS	
SCALE: AS NOTED		03/15/16	90% PLANS	
DESIGNED: HCL/JRK				
DRAWN: HCL/JRK				
CHECKED: RJL				
PROJ. ENGR: RJL				
	BY	DATE	DESCRIPTION OF REVISIONS	APP'D

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EAST PALO ALTO SANITARY DISTRICT

REGISTERED PROFESSIONAL ENGINEER RICHARD J. LAURETA C 34395 CIVIL STATE OF CALIFORNIA
PRELIMINARY

SANITARY SEWER PLAN AND PROFILE
STA: 6+50 - 11+00

SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 5 OF 7 SHEETS
JOB NO. 002015

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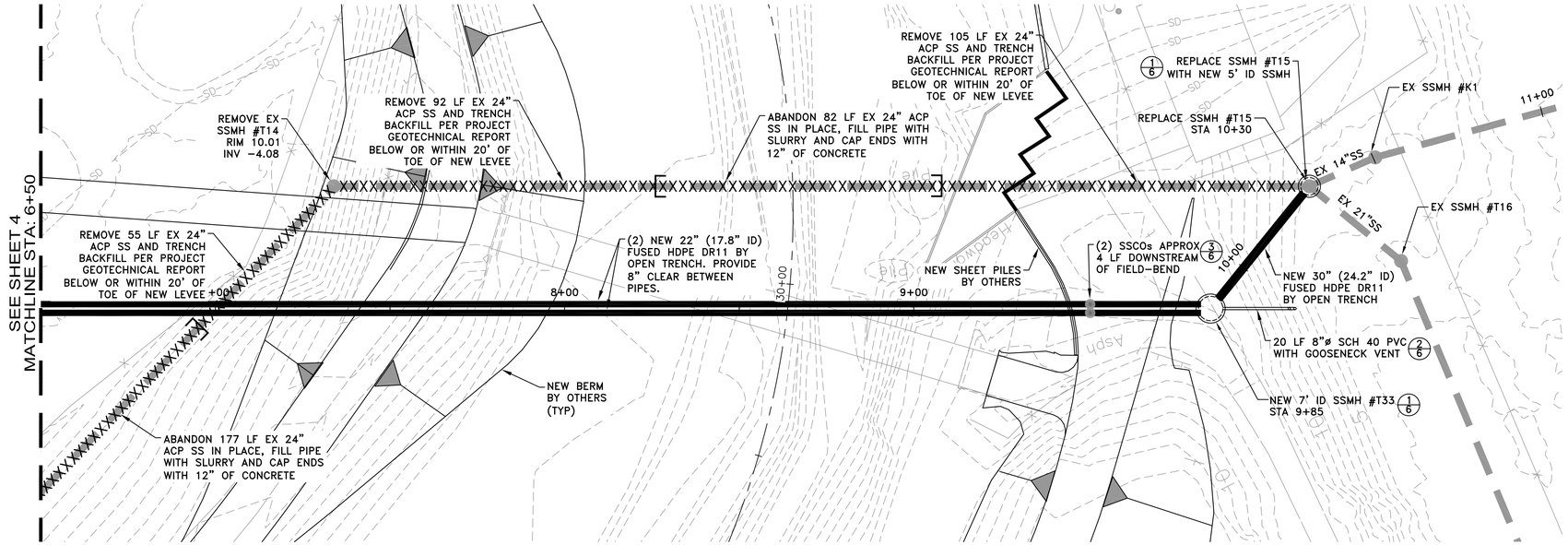

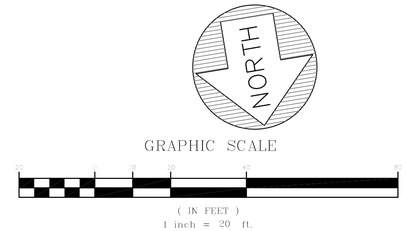

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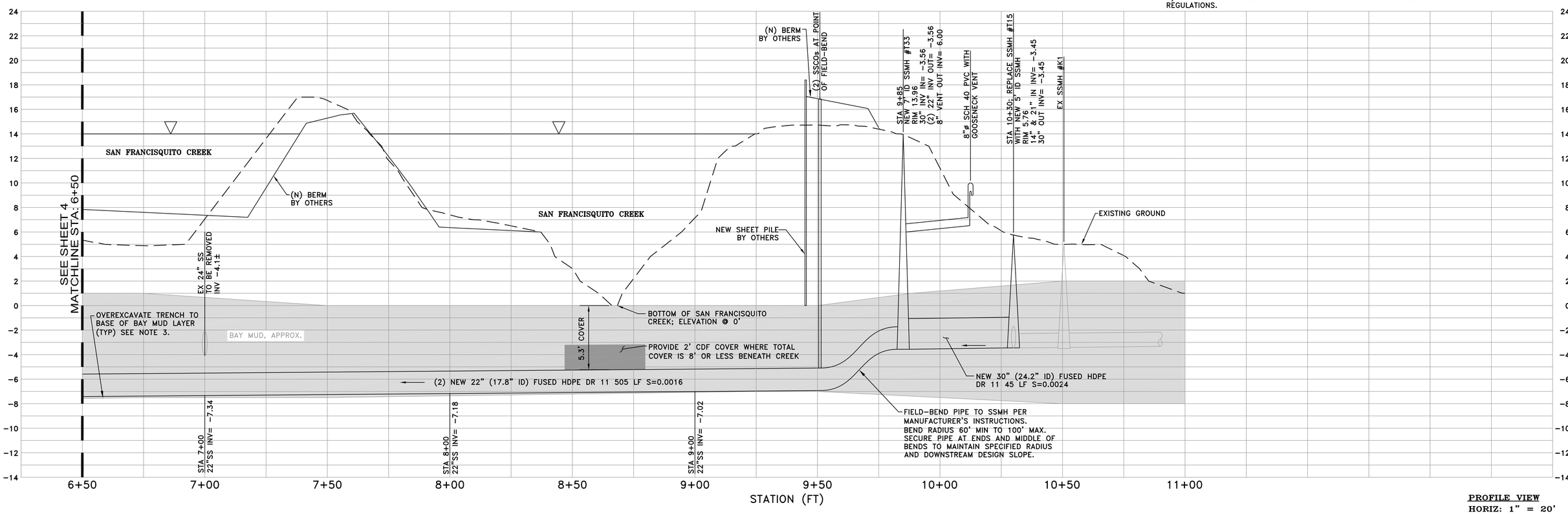

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PRELIMINARY

SANITARY SEWER PLAN AND PROFILE
STA: 6+50 - 11+00
[ADD ALTERNATIVE 1 VERSION]
SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 5A OF 7 SHEETS
JOB NO. 002015

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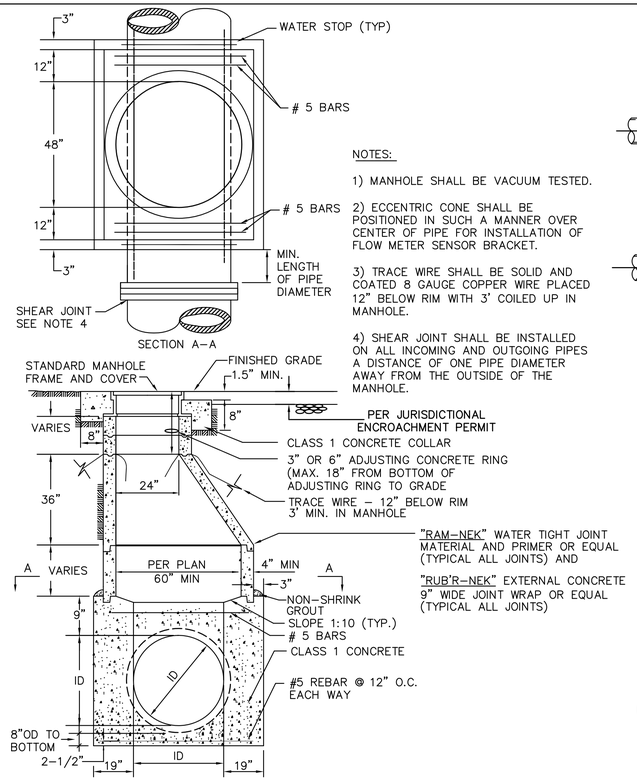


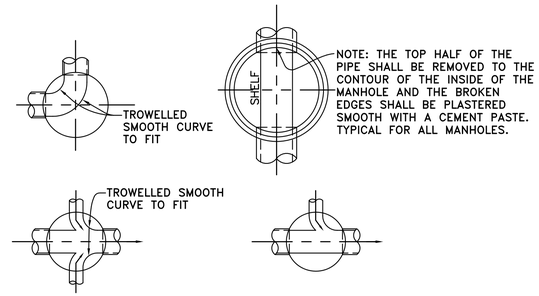
NOTES:

1) MANHOLE SHALL BE VACUUM TESTED.

2) ECCENTRIC CONE SHALL BE POSITIONED IN SUCH A MANNER OVER CENTER OF PIPE FOR INSTALLATION OF FLOW METER SENSOR BRACKET.

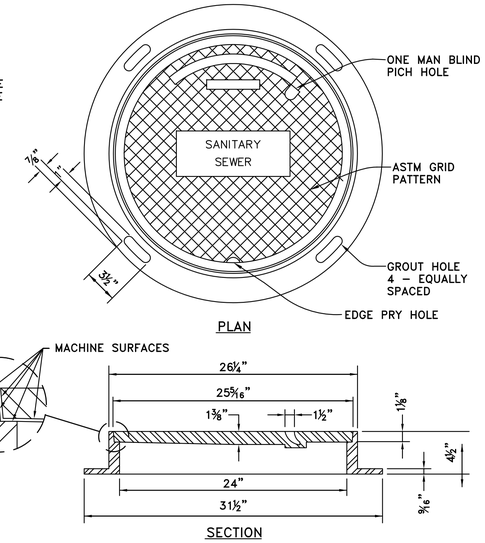
3) TRACE WIRE SHALL BE SOLID AND COATED 8 GAUGE COPPER WIRE PLACED 12" BELOW RIM WITH 3' COILED UP IN MANHOLE.

4) SHEAR JOINT SHALL BE INSTALLED ON ALL INCOMING AND OUTGOING PIPES A DISTANCE OF ONE PIPE DIAMETER AWAY FROM THE OUTSIDE OF THE MANHOLE.



TYPICAL CHANNEL CONFIGURATION PLANS

1 STANDARD MANHOLE
NOT TO SCALE

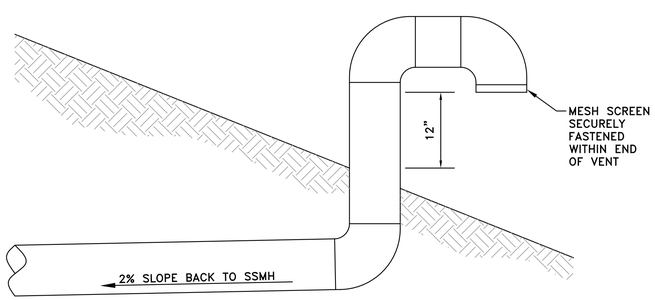


NOTES:

1. CAST IRON FRAME AND COVER SHALL BE D&L SUPPLY A–1024M, PHOENIX IRONWORKS P–1090 OR EQUAL.

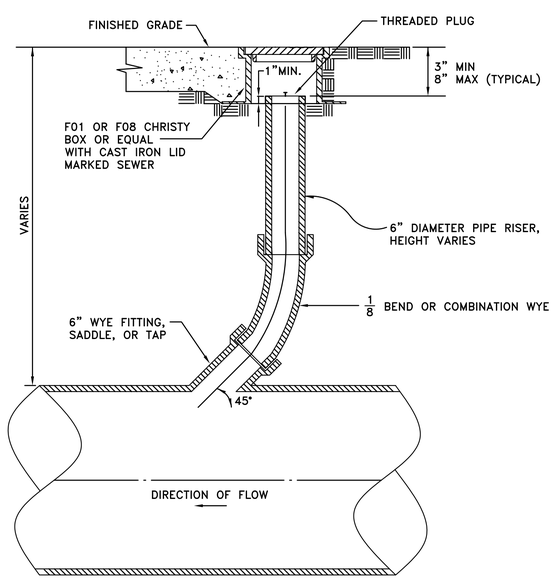
2. FRAME AND COVER SHALL MEET OR EXCEED THE REQUIREMENTS OF ASSHTO H–20 LOADING.

MANHOLE FRAME AND COVER

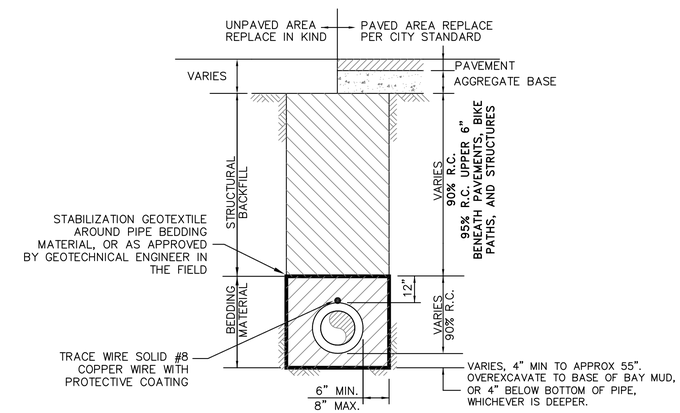


NOTES:
1. VENT PIPE SHALL BE 8" SCHEDULE 40 PVC.

2 GOOSENECK VENT
NOT TO SCALE



3 SEWER CLEANOUT
NOT TO SCALE



NOTES:

1. BEDDING AND STRUCTURAL BACKFILL MATERIALS AND REQUIREMENTS SHALL BE PER THE PROJECT GEOTECHNICAL REPORT WHICH INCLUDES SEVERAL OPTIONS. CONTRACTOR SHALL REVIEW THE GEOTECHNICAL REPORT. A SUMMARY OF MATERIAL OPTIONS ARE PROVIDED BELOW FOR REFERENCE.

2. BEDDING MATERIAL:
   CLASS II AGGREGATE BASE IS NOT ACCEPTABLE BELOW OR WITHIN 20' OF THE TOE OF THE LEVEES (LEVEE FOOTPRINT ZONE). IF IT IS USED ELSEWHERE, TRENCH PLUGS SHALL BE PROVIDED PER THE GEOTECHNICAL REPORT.

   BEDDING MATERIAL THROUGHOUT THE ALIGNMENT MAY BE CLAYEY SAND (SC) OR CLAYEY GRAVEL (GC) WITH AT LEAST 20% FINES CONTENT (PASSING #200 SIEVE).

   BEDDING MATERIAL THROUGHOUT THE ALIGNMENT MAY BE CONTROLLED DENSITY FILL (CDF) WITH A 7–DAY COMPRESSIVE STRENGTH OF 100–150 psi. CONTRACTOR SHALL CONSIDER AND CONTROL PIPELINE FLOATING AND MOVEMENT WHEN PLACING CDF AND MAKE APPROPRIATE PROVISIONS FOR WEIGHTING THE PIPE AND HOLDING THE PIPE IN PLACE AT THE DESIGN ALIGNMENT, ELEVATIONS, AND SLOPES.

   ALL BEDDING MATERIAL SHALL HAVE ¾" MAX AGGREGATE SIZE AND FREE FROM ORGANIC MATTER, LUMPS OF SILT OR CLAY, OR OTHER DELETERIOUS MATTER.

3. STRUCTURAL BACKFILL:
   STRUCTURAL BACKFILL THROUGHOUT THE ALIGNMENT MAY BE CLAYEY SAND (SC) WITH AT LEAST 30% FINES CONTENT (PASSING #200 SIEVE) OR LEAN CLAY/LEAN SILT (CL/ML). EXCAVATED ONSITE MATERIAL OTHER THAN BAY MUD OR SATURATED SOILS MAY BE REUSED IF THE SOILS HAVE AN ORGANIC CONTENT OF LESS THAN 3% BY VOLUME, ARE ABLE TO MEET COMPACTION REQUIREMENTS, AND DO NOT CONTAIN ROCKS OR LUMPS LARGER THAN 6" IN GREATEST DIMENSION WITH NOT MORE THAN 15% LARGER THAN 2.5".

   STRUCTURAL BACKFILL THROUGHOUT THE ALIGNMENT MAY BE CDF AS DESCRIBED ABOVE.

4 UTILITY TRENCH
NOT TO SCALE

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DETAIL SHEET

SAN FRANCISQUITO CREEK SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 6 OF 7 SHEETS
JOB NO. 002015

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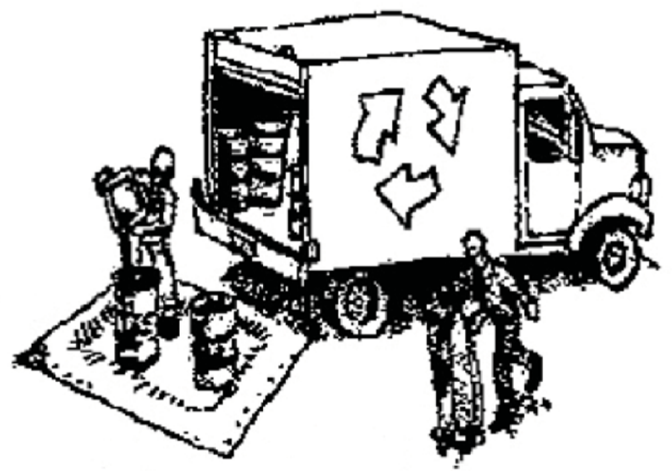
Construction Best Management Practices (BMPs)

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Construction projects are required to implement the stormwater best management practices (BMP) on this page, as they apply to your project, all year long.

Materials & Waste Management



Non-Hazardous Materials

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or if not actively being used within 14 days.
- ❑ Use (but don't overuse) reclaimed water for dust control.

Hazardous Materials

- ❑ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ❑ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ❑ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ❑ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ❑ Cover waste disposal containers securely with tarps at the end of every work day and during wet weather.
- ❑ Check waste disposal containers frequently for leaks and to make sure they are not overf lled. Never hose down a dumpster on the construction site.
- ❑ Clean or replace portable toilets, and inspect them frequently for leaks and spills.
- ❑ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.)
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning f uids as hazardous waste.

Construction Entrances and Perimeter

- ❑ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to suff ciently control erosion and sediment discharges from site and tracking off site.
- ❑ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

Equipment Management & Spill Control

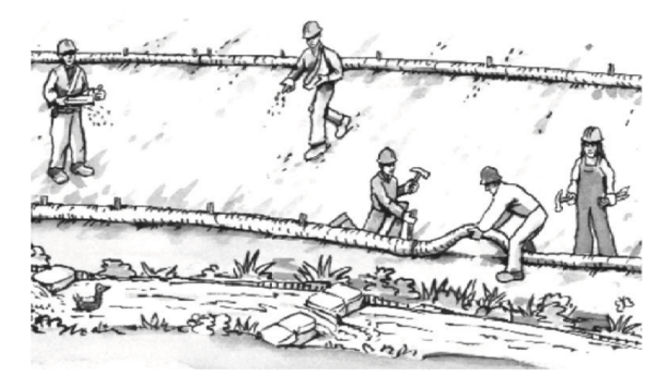
Maintenance and Parking

- ❑ Designate an area, f tted with appropriate BMPs, for vehicle and equipment parking and storage.
- ❑ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ❑ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan big enough to collect f uids. Recycle or dispose of f uids as hazardous waste.
- ❑ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ❑ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, steam cleaning equipment, etc.

Spill Prevention and Control

- ❑ Keep spill cleanup materials (rags, absorbents, etc.) available at the construction site at all times.
- ❑ Inspect vehicles and equipment frequently for and repair leaks promptly. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up spills or leaks immediately and dispose of cleanup materials properly.
- ❑ Do not hose down surfaces where f uids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags).
- ❑ Sweep up spilled dry materials immediately. Do not try to wash them away with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report signif cant spills immediately. You are required by law to report all signif cant releases of hazardous materials, including oil. To report a spill: 1) Dial 911 or your local emergency response number, 2) Call the Governor's Off ce of Emergency Services Warning Center, (800) 852-7550 (24 hours).

Earthwork & Contaminated Soils



Erosion Control

- ❑ Schedule grading and excavation work for dry weather only.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded f ber matrix) until vegetation is established.
- ❑ Seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.

Sediment Control

- ❑ Protect storm drain inlets, gutters, ditches, and drainage courses with appropriate BMPs, such as gravel bags, f ber rolls, berms, etc.
- ❑ Prevent sediment from migrating offsite by installing and maintaining sediment controls, such as f ber rolls, silt fences, or sediment basins.
- ❑ Keep excavated soil on the site where it will not collect into the street.
- ❑ Transfer excavated materials to dump trucks on the site, not in the street.
- ❑ Contaminated Soils
- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - ■ Unusual soil conditions, discoloration, or odor.
  - ■ Abandoned underground tanks.
  - ■ Abandoned wells
  - ■ Buried barrels, debris, or trash.

Paving/Asphalt Work

- ❑ Avoid paving and seal coating in wet weather, or when rain is forecast before fresh pavement will have time to cure.
- ❑ Cover storm drain inlets and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- ❑ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.
- ❑ Do not use water to wash down fresh asphalt concrete pavement.

Sawcutting & Asphalt/Concrete Removal

- ❑ Completely cover or barricade storm drain inlets when saw cutting. Use f lter fabric, catch basin inlet f lters, or gravel bags to keep slurry out of the storm drain system.
- ❑ Shovel, abosorb, or vacuum saw-cut slurry and dispose of all waste as soon as you are f nished in one location or at the end of each work day (whichever is sooner!).
- ❑ If sawcut slurry enters a catch basin, clean it up immediately.

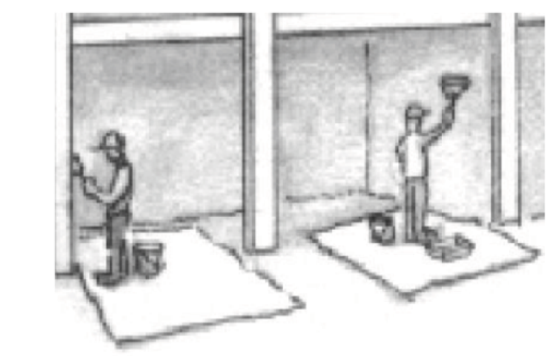
Concrete, Grout & Mortar Application

- ❑ Store concrete, grout and mortar under cover, on pallets and away from drainage areas. These materials must never reach a storm drain.
- ❑ Wash out concrete equipment/trucks offsite or in a contained area, so there is no discharge into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ Collect the wash water from washing exposed aggregate concrete and remove it for appropriate disposal offsite.

Dewatering

- ❑ Effectively manage all run-on, all runoff within the site, and all runoff that discharges from the site. Divert run-on water from offsite away from all disturbed areas or otherwise ensure compliance.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known contamination, testing is required prior to reuse or discharge of groundwater. Consult with the Engineer to determine whether testing is required and how to interpret results. Contaminated groundwater must be treated or hauled off-site for proper disposal.

Painting & Paint Removal



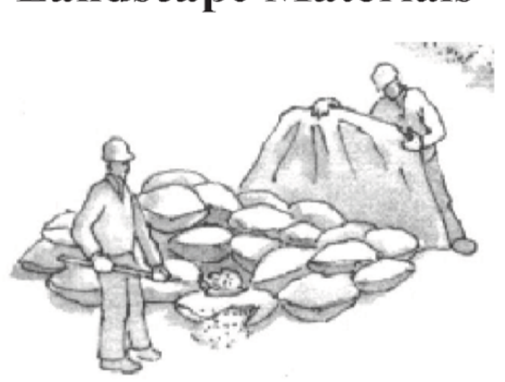
Painting cleanup

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or surface waters.
- ❑ For water-based paints, paint out brushes to the extent possible. Rinse to the sanitary sewer once you have gained permission from the local wastewater treatment authority. Never pour paint down a drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of residue and unusable thinner/solvents as hazardous waste.

Paint removal

- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead or tributyltin must be disposed of as hazardous waste.
- ❑ Paint chips and dust from non-hazardous dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash.

Landscape Materials



- ❑ Contain stockpiled landscaping materials by storing them under tarps when they are not actively being used.
- ❑ Stack erodible landscape material on pallets. Cover or store these materials when they are not actively being used or applied.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

Storm drain polluters may be liable for fines of up to $10,000 per day!

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EPASD
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PRELIMINARY

CONSTRUCTION BMPs

SAN FRANCISQUITO CREEK
SANITARY SEWER SIPHON REPLACEMENT PROJECT

SHEET 7 OF 7 SHEETS
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