GENERAL
1. The specifications are minimum requirements. The pipelines shall be designed and constructed so that Caltrain operations, maintenance, and the facilities are not interfered with, interrupted, or safety compromised.
2. Any replacement or modifications to the existing pipe (carrier or casing) shall be considered as a new installation subject to these specifications.
3. All design shall be signed and sealed by a civil engineer licensed in the State of California.
4. Pipelines shall cross tracks at right angles, if feasible. If not feasible, at minimum 45 degrees, the pipelines shall not be placed above elevations, nor under rail bridges. Nor lower than 100 feet in any portion of any rail bridge, culvert, building, or other important structure.
5. Crossing pipelines shall not be located within the limits of a turnout. The limits of a turnout is 25 feet from the switch points.
6. Longitudinal pipelines shall not be located as far as practicable from any tracks or other important structures.
7. Longitudinal pipelines shall not be located within earth embankment, or within ditches.
8. The depth of the pipelines (carrier and casing pipes) shall be such to withstand rigorous railroad operating conditions and shall allow for future installations (e.g., conduit, pipes, structures, etc.) by Caltrain.
9. The depth of the pipelines shall be the greater of the following measured vertically to the top of the casing (depths in parentheses are for flammable or hazardous substances):
   a. 5 ft below the top of ties (6 ft minimum)
   b. 4 ft below the bottom of the track (5 ft minimum)
   c. 4 ft minimum from the lowest ground level (5 ft minimum).
10. Both carrier and casing pipes shall be installed with sufficient slack so that the pipes are not in tension.
11. Hooks to indicate location of pipelines or one hook shall be installed and maintained by owner of the utilities. The utility shall be made of non-corrodible, non-conductive material and be in readily accessible location.
12. Warning tape shall be placed within 2 feet from ground surface for open cut installations.

CARRIERS PIPES
1. Carrier pipe material under and adjacent to tracks shall be capable of supporting a minimum of 3,000 pounds per square foot for cover depths of 30 feet or less. For depths greater than 30 feet, supporting agents shall be provided proportionally.
2. Carrier pipeline shall be sloped one percent (1%).
3. Uncoated carrier pipes shall have the pipe wall thickness in accordance with Table 14-3-3 (Arena, Part 1).

CASINGS
1. Pipeline requirements apply to pipelines that carry liquid or gaseous substances as follows:
   a. Oil, gas, petrol products or other flammable, highly volatile or hazardous substances under pressure.
   b. Internal water or any non-flammable, non-hazardous substance not free of pressure, may cause damage if escaping or in the vicinity of the Caltrain corridor.
2. Casings pipe shall be installed to prevent the formation of standing water under the tracks and shall slope to the one end similar to the carrier pipes (except for longitudinal pipelines).
3. Carrier pipe shall be sized such that there is at least 2 inches clearance to the widest outside diameter of carrier pipe, joints or couplings.
4. Pipe shall be sized to prevent water damage against the entrance of foreign material but allowing leakage to pass through in the event of carrier break.
5. Casings pipe and joints shall be of leak-proof construction, capable of withstanding railroad loading (as per AASHTO).
6. Casings pipe shall have a minimum yield strength of 30,000 psi when Caltrain is without protective coating, and not cathodically protected. The wall thickness shown in Table 14-3-3 (Arena, Part 1) shall be increased to the nearest standard shown in Table 14-3-3 (Arena, Part 1) except for diameters less than 12".
7. Casings shall cover entire width of the Caltrain corridor.

VENTING:
1. Carrier pipe shall be properly vented. Vent pipes shall be minimum 2 inches in diameter and shall be installed near the end of the casing.
2. Vent pipes shall be vertical shall extend not less than 6 feet above ground surface. Top of vent pipe shall be fitted with removable elbow properly scheduled on a relief valve.
3. Vents in locations subject to high water shall be extended above maximum elevation of high water and shall be supported and protected.

MANHOLE:
1. Manholes are not allowed within Caltrain corridor, except for longitudinal pipelines where manholes shall be prefabricated concrete flush with top of ground.

ABANDONED FACILITIES:
1. The owner of all crossties of longitudinal pipelines proposed for abandonment shall notify Caltrain in writing, of the intention to abandon.
2. As directed by Caltrain, abandoned pipelines shall be either removed or completely filled with cements, sand, or other methods as approved by Caltrain.
3. Abandoned pipelines shall be removed to a minimum depth of 6 feet below finished grade and completely filled with cements, sand, or other methods as approved by Caltrain.

NOTES:
1. Arena: American Railway Engineering and Maintenance-of-Way Association
2. Feed offices or electrical installations may use PVC or HORE pipe schedule 80, as a conduit.

PENINSULA CORRIDOR JOINT POWERS BOARD
STANDARD DRAWINGS
CIVIL ENGINEERING CROSSING UTILITIES PIPES
GENERAL REQUIREMENTS

SIGNATURE:

Caltrain