

DETAILED TRENCHING NOTES

1. Slope trench walls or provide supports in conformance with all local and national safety standards. Open only as much trench as can be safely maintained by available equipment. Backfill all trenches as soon as practicable, but not later than the end of each working day, unless otherwise approved.

2. Minimum Trench Widths:

PIPE DIAMETER	TRENCH WIDTH
12" OR LESS	O.D. PLUS 24" MIN
OVER 12"	O.D. PLUS 36" MIN
ANY NCCWD, PG&E, OR THE WIRED UTILITY COMPANIES	REFER TO COMPANIES STANDARDS

3. Minimum Cover: Minimum cover, from top of roadway surface to pipe or conduit crown, shall be 36 inches or as directed by the utility owning the pipe or conduit.

4. Support of Trench Walls:

- A. When sheeting, jacks, shields, boxes, or other trench supports are used, make sure that support of the pipe and its embedment is maintained throughout installation. Ensure sheeting is sufficiently tight to prevent the trench wall from washing out behind the sheeting.
- B. Unless otherwise approved, sheeting driven into or below the pipe zone shall be left in place to preclude loss of support of foundation and embedment materials. When top of sheeting is to be cut off, make such cut 1.5 feet or more above the pipe crown. Leave rangers, walers, and braces in place as required to support cutoff sheeting and the trench wall in the vicinity of the pipe zone.
- C. When using movable trench boxes and shields, do not disturb the installed pipe and its embedment. Do not use movable supports below the top of the pipe zone unless approved methods are used for maintaining the integrity of embedment material. Before moving supports, place and compact embedment to sufficient depths to protect the pipe; as supports are moved, finish placing and compacting embedment.

6. Controlling Water in the Trench:

- A. In general, do not lay or embed pipe in standing or running water. Prevent runoff and surface water from entering the trench. Pending approval, use sump pumps, well points, deep wells, geofabrics, perforated underdrains, or stone blankets of sufficient thickness to remove and control water in the trench. To preclude loss of soil support, use dewatering methods that minimize removal of fines and creation of voids in the surrounding soil.
- B. Dewater groundwater to maintain stability of in-situ and imported materials. Maintain water level below pipe bedding and foundation to provide a stable trench bottom. When excavating while depressing groundwater, make sure the groundwater is below the bottom of cut at all times to prevent trench walls from sloughing or washing out from behind sheeting. Control water in the trench before, during, and after pipe installation, and until embedment is installed and sufficient backfill has been placed to prevent flotation of the pipe.
- C. Control running water emanating from drainage of surface or groundwater to preclude undermining of the trench bottom or walls, the foundation, or the pipe embedment. Do so by providing dams, cutoffs, or the barriers periodically along the installation to preclude transport of water along the trench bottom. Backfill all trenches after the pipe is installed to prevent disturbance of pipe and embedment.

7. Compaction Methods: In general, clean, coarse-grained materials (i.e., Caltrans Class I & Class II Aggregates) such as crushed stone, gravels, and sands are more readily compacted using vibratory equipment, whereas fine materials, such as sand require kneading and impact force along with controlled water content.

- A. Hand-guided ("jumping jack") or walk-behind compactors may be used. Vibratory plate tampers may be used for sand, whereas hand tampers or air driven hand-held impact rammers shall be used for all other materials. Gas or diesel powered jumping jacks or small, walk-behind vibratory rollers impart both vibratory and kneading or impact force and hence can be used for most classes of embedment and backfill material.
- B. When approved, sand may be consolidated by water jetting, provided the material is densified in layers no more than 3 feet in depth, the jet pipe is at least 1 inch in diameter and 4 feet in length, the water supply provides a pressure of at least 40 psi, and adequate drainage of free water can be maintained. Work the jet pipe up and down, to flood the full depth of the lift being placed, and move it often to flood the entire area. Above the level of the pipe crown, use a vibra-plate to squeeze the water out of the fill, and do not place the next lift until water stops appearing at the surface.
- C. In long or exceptionally deep trenches through firm soils a compactor wheel on a backhoe or excavator may be used under the observation of a qualified inspector who will direct the lift depth and the duration of the effort.

**CITY OF
PACIFICA**

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

STANDARD

**DETAILED
TRENCH NOTES**

**AUG
2014**

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DATE

BY: