

SECTION 37 - BORING AND JACKING
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SECTION 37 - BORING AND JACKING

37-1 **GENERAL**

All sewer facilities constructed within the Sacramento Area Sewer District service area (<http://www.sacsewer.com/pdf/map-servicearea.pdf>) must be constructed in accordance with the Sacramento Area Sewer District Standards and Specifications available at

<http://www.sacsewer.com/pdf/ord/2011-SASD-Standards-and-Specifications-v1.pdf>

At locations shown or specified in the Contract, conductor pipe and associated carrier pipe must be jacked into place between the limits shown or specified, in accordance with the State Specifications, and these Specifications. All boring and jacking operations must comply with Cal OSHA Tunnel Safety Orders.

The Contractor must provide a boring and jacking plan to the Agency prior to beginning the boring and jacking operations. The boring and jacking plan must describe the equipment, method, and construction sequence for boring and jacking, and must include a proposed bore profile showing all verified utility depths with utility-required clearances and the projected bore path. Directional bore depths are to be a minimum of 42 inches below pavement grade.

The Plan must identify the location of all existing public and private utilities in the vicinity of the proposed bore and jack and address any potential conflicts with their systems. The Plan must also identify the location of nearby trees and address any conflicts with their root systems. Work associated with boring and jacking cannot begin until the Agency has reviewed the Contractor's boring and jacking plan.

Excavation of boring and receiving pits must be the minimum size necessary to complete the Work. Surface incisions on project streets must not exceed industry bore pit standards. In the event surface incision dimensions (i.e., length and width) on paved surfaces exceed industry bore pit standards (as determined by the Agency), additional pavement restoration will be required. Additional pavement restoration will include a slurry seal placed over the entire width of the roadway (or to the roadway centerline if disturbances are isolated to one half of the roadway) to encompass the area of restored pavement. Surface incisions located within 50 feet must be included in the same slurry seal area. Slurry seal must extend 4 feet beyond the outermost surface incisions.

Shoring and bracing for the boring and receiving pits must conform to the requirements in Section 19-1.06, "Shoring and Bracing", of these Specifications. Unless otherwise specified in the Special Provisions, backfill of the area excavated for the boring operation must conform to the requirements for structure excavation in Section 18-3, "Structure Excavation and Backfill", of these Specifications.

Unless otherwise specified in the Special Provisions, the Contractor may elect to either jack reinforced concrete pipe, vitrified clay microtunneling pipe, or ductile iron pipe, directly or place it in a conductor per these Specifications. If surface obstructions exist, pipelines must be placed within a conductor.

If a specific method is not stated in the Contract Documents, the method (auger bore and jack, pilot tube (guided bore), or microtunneling) must be approved by the Agency prior to implementation. Microtunneling must be used in all areas where tunneling operations occur below the groundwater table.

A directional bore profile, log of boring operations and a guidance system log must be kept on site, and up to date, during the boring operations. The profile must be included with the record drawings, as required by Section 11-3, "Record Drawings" of these Specifications.

37-2 **NOT USED**

37-3 INSTALLATION OF CONDUCTOR PIPE

The diameter of the bored hole must be not more than 0.1 foot greater than the outside diameter of the conductor pipe. Guide rails must be accurately set to line and grade to insure installation of the conductor pipe within permitted tolerances. The conductor pipe diameter must be sufficient to allow adjustment of line and grade of the carrier pipe to meet allowable tolerances and to allow sand to be placed between the conductor pipe and the carrier pipe. Conductor pipe sizes must be as shown or specified in the Contract, but in no case can the inside diameter of the conductor pipe be less than 6 inches greater than the outside diameter of the carrier pipe.

37-4 INSTALLING CARRIER PIPE INSIDE CONDUCTOR PIPE

Except for water pipe, carrier pipe having any part of a joint larger in diameter than the barrel of the pipe must be fitted with two 24-inch long polyurethane skids. The polyurethane skids must be attached to the carrier pipe as recommended by the manufacturer. The polyurethane skids must be located near the center of each carrier pipe section and must be large enough to prevent any part of a joint from bearing on the conductor pipe.

Each joint of carrier pipe for water must be strapped according to the manufacturer's recommendations to 2 pairs of 24-inch long polyurethane skids. The polyurethane skids must be located at approximately (1/5) of the pipe length from each end of each carrier pipe section.

Carrier pipe with joints not larger than the pipe barrel must be slid into place on 2 polyurethane skids that have been securely fastened to the invert of the conductor pipe or strapped to the barrel of the carrier pipe as specified above.

Carrier pipe sections must be joined outside the conductor pipe and then slid into place. The space between the carrier pipe and the conductor pipe must be completely filled with clean, dry sand. The method of placing sand must be approved by the Agency. Except for water pipe, necessary adjustments in grade must be made by adjusting the height of the skids. Adjustment in grades for water pipe must be as shown or specified in the Contract, or as directed by Agency.

37-5 VOIDS

When material tends to cave in from outside the permitted diameter of the bored hole, a shield must be used ahead of the first section of conductor pipe or the face of excavation must not extend beyond the end of pipe more than 1-1/2 feet, unless permitted by the Agency. The shield must cover the upper 2/3 of the conductor pipe and project not more than 1/2 inch beyond the conductor pipe's outer surface. Excavation must not project beyond the shield.

Voids larger than those permitted by these Specifications must be filled with sand or mortar, as directed by the Agency.

To assist in the detection of voids, a settlement monitoring grid will be established by the Agency. A minimum number of monitoring points will be quarter stations along the centerline of the pipe alignment plus wing points 25 feet on either side of the centerline points.

The Contractor must run levels over these points and record their elevations before the boring and receiving pits are constructed and each day that material is removed from the excavation. A final set of elevations must be recorded 2 weeks after the conductor pipe is filled with sand and the bulkheads are in place. A copy of the elevation records must be provided to the Agency at the end of each day. Any settlement over 1/4 inch must be corrected by the Contractor to the satisfaction of the Agency at the Contractor's expense.

37-6 TOLERANCES

The maximum deviation of conductor pipe from the line and grade shown on the Plans must be such that line and grade of the carrier pipe can be adjusted within the conductor pipe and maintain the line and grade along its full length.

Unless otherwise shown or specified in the Contract, directly jacked pipe must not deviate more than 3 inches per 100 feet from the line and grade shown on the Plans.

37-7 DRY BORING UNDER CURB, GUTTER AND SIDEWALK

Unless otherwise specified in the Special Provisions, portions of drainage lines, irrigation lines, water mains, and services that pass beneath curbs, gutters, sidewalks, and other obstructions may be installed by dry boring. The bore must begin at the edge of the street pavement, or as directed by Agency, and continue to 6 inches beyond the property line.

If the pipe material is vitrified clay, the pipe must be plain end connected with compression-type couplings. The bore must be just large enough to pass the couplings and need not be backfilled. Unless otherwise shown or specified in the Contract, the maximum length of bore is 15 feet.

37-8 WET BORING OF SMALL DIAMETER PIPELINES

When specified in the Special Provisions, pipelines that are 6 inches and smaller may be installed by wet boring. Pipe must be ductile iron pipe conforming to Section 50-25, "Ductile Iron Pipe (DIP), and Cast Iron Pipe and Ductile Iron Fittings", of these Specifications or polyvinyl chloride (PVC) pressure Class 200 pipe conforming to the requirements of AWWA Standard C900.

If the diameter of the boring hole is more than 0.1 foot greater than the outside diameter of the pipe to be installed, the void must be filled with sand or mortar, as directed by the Agency.

37-9 MEASUREMENT AND PAYMENT

Boring and jacking will be measured by the unit for each location for the size and type of pipe to be placed by boring and jacking as designated in the Contract.

The unit price paid for boring and jacking for each location for the size and type of pipe includes full compensation for furnishing all labor, materials (including conductor pipe when specified), tools, equipment, and incidentals, and for doing all the work involved in boring and jacking pipe, complete in place, including the excavation and backfill, as shown or specified in the Contract, as specified in these Specifications, and directed by the Agency.