

SECTION 602

TRENCHLESS OR OPEN CUT INSTALLATION OF STEEL CASING

602.1 DESCRIPTION:

The Contractor shall furnish all labor, material and equipment as required for the installation of steel casing by a) Trenchless operation; using horizontal earth auger boring, hand tunneling or pipe ramming, or b) Open Cut operation; using trenching, placement and backfill for the protection of underground utilities.

602.2 MATERIALS:

602.2.1 Steel Casing Fabrication:

Steel casing shall conform to ASTM A283 Grade C, ASTM A252 Gr. 2, ASTM A53, ASTM A139, (American Petroleum Institute "API" Specification) API 5L Gr B, API 5L X42 or API 5L X52. Welding shall use matching filler metal requirements as listed in AWS D1.1 Table 3.1. Shop and field joints shall be welded in accordance with AWS D1.1/D1.1M. Welding shall be performed by AWS D1.1 qualified personnel.

602.2.2 Steel Casing Wall Thickness: The minimum wall thickness for steel casings shall be in accordance with Table 602-1.

Casing Diameter (inches)	Minimum Wall Thickness (inches)
8	.322
10	.365
12, 16, 18, 20, 24, 30 and 36	.375
42, 48	.500
54, 60	.625
66, 72, 78	.750
84 and up	1.00

602.2.2.3 Steel Casing Diameter for Trenchless Installations: The steel casing for pressurized carrier pipes shall be a minimum of 12-inches larger than the largest outside dimension of the carrier line, (including pipe bells and flanges) or the size indicated on the plans, whichever is greater.

Unless otherwise directed by the Contracting Agency or by special design, the steel casing for gravity carrier pipes shall be a minimum of 18-inches larger than the largest outside dimension of the carrier line, (including pipe bells and flanges) or the size indicated on the plans, whichever is greater.

602.2.2.4 Steel Casing Diameter for Open Cut Installations: The steel casing for pressurized carrier pipes shall be a minimum of 6-inches larger than the largest outside dimension of the carrier line, (including pipe bells and flanges) or the size indicated on the plans, whichever is greater.

The steel casing for gravity carrier pipes shall be a minimum of 12-inches larger than the largest outside dimension of the carrier line, (including pipe bells and flanges) or the size indicated on the plans, whichever is greater.

602.3 TRENCHLESS OPERATION:

Before starting operations, the Contractor shall submit in accordance with Section 105.2, detailed shop drawing of the bore pit and receiving pit shoring, bulkheads, carrier pipe installation method, and welder certifications. The contractor shall submit a letter of certification for the casing listing conformity to 602.2.1 and the casing shall have the ASTM or API stenciled on the outside matching the certification letter. The contractor shall submit a procedure detailing the trenchless installation method selected from 602.1 to be used for the project, if a geotechnical report is not available in the contract documents, the contractor shall define the soil limitation for the method selected.

The bore and reception pits for the trenchless operation shall be shored to safeguard existing sub-structures and surface improvements and to protect against ground movement. Survey of the bore alignment shall be taken prior to the installation of steel casing and taken after the installation of steel casing and shall be presented to the engineer.

Steel casing larger than 36-inches grout connections shall be provided at a maximum spacing of every 20-feet located at 12 o'clock in the steel casing. Upon completion of the boring operation, the contractor shall inspect each grout hole to determine if grouting is required, any gap greater than 2-inches outside the casing will require the boring contractor to grout fill the gap. After grouting the grout holes shall be closed with a threaded plug. The grout shall be a flowable fill.

Steel casing 36-inches and smaller installed by horizontal earth auger boring, hand tunneling or pipe ramming will not require outside grouting unless caving or earth movement occurs.

Unexpected loose soil conditions that do not accommodate the method submitted by the contractor, (horizontal earth auger boring, hand tunneling or pipe ramming), shall be brought to the agency attention to determine further course of action. Contractor shall stop boring until an alternative method is mutually agreed on.

602.4 DEWATERING:

Any water encountered during the operation shall be disposed of by the Contractor in a manner that will not damage public or private property or create a nuisance or health problem. The cost of furnishing pumps, pipes and equipment for dewatering shall be considered incidental to the work and no additional payment shall be made.

602.5 CARRIER PIPE PLACEMENT:

The tolerances allowed for the alignment and grade of carrier pipe shall comply with requirements of Section 610, 615 or 618 as applicable. The Contractor shall be responsible to obtain the required line and grade for the carrier pipe, the carrier pipe shall not contact or rest on the casing.

Pressurized carrier pipes, (i.e. water, gas, force main) shall be placed using casing spacers, wood skids or steel pipes for rails. Casing spacers shall be installed 3 per joint minimum with 8-foot maximum spacing. The annular space between the casing and carrier line shall be left empty unless otherwise directed. When the annular space is to be filled, 3/8-inch pea gravel shall be used.

Gravity carrier pipes, (i.e. sewer, storm drain, irrigation) shall be placed using grade casing spacers, wood skids or steel pipes for rails. The annular space between the casing and carrier line shall be left empty unless otherwise directed. When the annular space is to be filled, 3/8-inch pea gravel shall be used.

Bulkheads consisting of brick and mortar or concrete shall be constructed on the ends of the casing; bulkheads shall be a minimum of 8-inches thick. Alternative casing end closures may be substituted for brick and mortar or concrete bulkheads if approved by the engineer.

PVC conduits for dry utilities, (i.e. communications, fiber, electric) shall be placed using non-metallic PVC casing spacers. The annular space between the casing and carrier line shall be filled as indicated in the contract documents.

After completing the carrier pipe installation, the Contractor shall remove all loose and disturbed material in the bore pits and backfill the pits in accordance with Sections 601 and 336.

602.6 MEASUREMENT AND PAYMENT:

Measurement for steel casing shall be the number of horizontal linear feet from the end of casing in the bore pit to the end of casing in the reception pit; or from the beginning of the placed casing to the end of placed casing for an open cut installation. Payment for steel casing shall be full compensation for furnishing all labor, material, tools, and equipment required for the installation of steel casing, complete in place including but not limited to placement of carrier pipe, annular space fill material (when require), bulkheads and the excavation and backfilling of pits. Payment for steel casing does not include payment for the carrier pipe, a separate payment will be made for the carrier pipe and any required testing of the carrier pipe.

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