

SUPPLY OF STEEL PIPE

19-1

Clause

Section 19

19.01 GENERAL

The General Conditions, together with the following Special Provisions, shall govern the design, manufacture and delivery of the steel pipe required for this contract.

19.02 PIPE SPECIFICATIONS

This section of these specifications is supplementary to, and shall be read together with the latest revisions of the following A.W.W.A. Specifications:

- C-201-60T - Tentative Standard for Fabricated Electrically Welded Steel Water Pipe
- C-202-49 - Standard Specifications Steel Water Pipe of sizes up to but not including 30 inch
- C-203-57 - Coal tar enamel protective coatings for Steel Water Pipe
- C-206-57 - Field Welding of Steel Water Pipe Joints
- C-207-55 - Standard Specifications for Steel Pipe Flanges
- C-208-57T - Tentative Standard for Dimensions for Steel Water Pipe Fittings.

19.03 STEEL PIPE GENERAL REQUIREMENTS

The outside diameter and wall thickness of the pipe shall be as shown on the drawings. The pipe shall be either mill pipe or new fabricated pipe.

The steel pipe joints shall be either welded or flanged as shown on the drawings.

The nominal laying length of the pipe section shall be 40 or 50 feet except where shorter lengths are required to meet horizontal or vertical deflections. If new fabricated pipe is used the steel plate shall conform to specifications for low and intermediate tensile strength carbon steel plates of structural quality, A.S.T.M. Designation A-283, Grade B or C, of latest revision. It shall also conform to the latest revision of the A.W.W.A. Specification C-201-60T.

If mill pipe is used, it shall conform to the latest revision of A.W.W.A. Specification C 202. The tenderer shall supply mill certificate and heat number for the mill pipe supplied.

19.04 VARIANCE FROM SPECIFICATIONS

Each tenderer shall, in his tender, either state that his pipe fully complies with these specifications or list the variance of his pipe from these specifications. Tenderers shall complete and sign attached form.

19.05

FLANGES AND FITTINGS

Where specified on the drawings, the pipe shall be provided with flanges on both ends, conforming to A.W.W.A. Specification C 207-55, Class D. End flanges and fittings shall conform in dimensions and drilling to standard A.S.A. B16.1 for cast iron flanges and flange fittings Class 125. Flanges shall be installed by or under the direct supervision of the pipe supplier.

The Contractor shall supply the flanged steel pipe complete with stainless steel Type 303 bolts and nuts, together with 1/8" thick, cloth inserted, rubber gaskets for the number of flanges supplied. A suitable lubricant shall also be supplied for use on the flange bolts and faces for tightening.

19.06

SHOP DRAWINGS

From the plan and profile of the proposed pipeline, the Contractor shall prepare a laying schedule for the installation of pipe and fittings, using the plan as a guide. Five copies of these detailed schedules shall be provided to the Engineer for approval prior to the manufacture of any pipe or fittings.

The bidder shall submit with his bid, detailed drawings, specifications and descriptive matter for all steel pipe and fittings.

19.07

MARKING

Special marks shall be provided for identifications, sufficient to show proper location of the pipe or special in the line by reference to layout drawings and schedules.

19.08

PIPE MANUFACTURERS' EXPERIENCE

All pipe to be supplied under this contract shall be designed and manufactured by a firm having at least five years prior experience in manufacturing this type of pipe.

19.09

INTERIOR OF STEEL PIPE

The steel pipe shall be thoroughly cleaned of all loose mill-scale, rust, dirt, oil, or other foreign matter by sand or grit blasting, as specified under Section 3.2 of A.W.W.A. Specification C-203-57. One coat of red mill primer shall be applied to all pipe to be used for sewage transport before shipment.

For pipes transporting potable water, the steel pipe shall be given a tasteless and odourless inside coating of coal tar primer, followed by a hot coat of coal tar enamel in accordance with the same A.W.W.A. specification.

19.10

EXTERIOR COATING

All steel pipe sections shall be cleaned, primed, coated with coal tar enamel and wrapped with fibrous glass mat and bonded asbestos felt wrap, in accordance with the requirements of A.W.W.A. Specification C-203-57, Standard for Coal Tar Enamel Protective Coatings for Steel Water Pipe, except as modified herein. Specifically, the exterior coating shall comply with the requirements of Section A-1.4, Coal Tar Enamel, Fibrous Glass Mat and Bonded Asbestos Felt Wrap, together with an exterior wrap of Kraft paper, as specified in Section A-2.2 of the Appendix to the above mentioned A.W.W.A. Specification. Enamel shall be modified to withstand cold temperatures. The resultant construction of this exterior protection shall be:

- (1) Coal Tar Primer
- (2) Coal Tar Enamel (3/32" plus or minus 1/32" thick)
- (3) Fibrous Glass Mat
- (4) Coal Tar Enamel (1/32" minimum)
- (5) Bonded Asbestos Felt
- (6) Kraft Paper wrap

The exterior coating shall be applied in accordance with these specifications and in accordance with the manufacturer's best practice, by experienced men in the employ of the coating manufacturer.

If necessary, the exterior coating shall be neatly cut back six inches from each end of each pipe or special to permit field welding. The ends of each length of pipe or special thus left uncoated and unwrapped shall be then coated and wrapped as specified above.

19.11

PIPE COATING EXPERIENCE

All pipe coating shall be done by a pipe coating contractor or subcontractor having had at least five years experience in coating steel pipe of this type and diameter and in this climate.

LAYING STEEL PIPE FOR RIVER CROSSINGSection 20Clause20.01 GENERAL

The Contractor shall furnish all labor, material, tools and equipment necessary to install the pipeline, fittings and appurtenances and compact the bedding and backfill at the points and to the lines, grades and elevations shown on the drawings or designated by the Engineer and as specified herein.

20.02 METHOD OF DOING THE WORK

The Corporation requires that the Contractor furnish with his tender an outline of his proposal for installing the pipe in the river. Subsequent to the award of a contract, the Contractor will be required to furnish a more detailed account of his proposed construction method and approval of this proposed method by the Corporation must be secured before construction commences. Generally, the Contractor will be permitted to follow any reasonable method of construction, provided that it results in the pipe being safely installed in the river bed with a minimum of two (2) feet of cover over the pipe at all locations.

Any plan or method of work suggested by the Engineer, or any other representative of the Corporation, to the Contractor, if adopted or followed by the Contractor in whole or in part, shall be used at the risk and responsibility of the Contractor, and the Engineer will assume no responsibility therefor.

20.03 SOUNDINGS

See Clause 2.10.

The plans show the elevation of ground and the bottom of the river as obtained from latest surveys. The Contractor's attention is drawn to the fact that the bottom of the river and the banks may not be stable at all points. Therefore, the Corporation cannot guarantee the accuracy of the profile shown.

20.04

LAYING STEEL PIPE

Proper equipment, tools and facilities satisfactory to the Engineer, shall be provided and used by the Contractor for the safe and convenient prosecution of the work. Pipe shall be handled with care at all times to avoid damage. Any damage shall be repaired or replaced to the satisfaction of the Engineer.

For welded joints the pipe shall be joined by beveled butt welds to form a single unit between the points shown on the plans. The pipe shall be carefully cut and mitred so as to reduce damage to the inside coating of the pipe to a minimum. The Contractor shall make any additional bends required to fit the pipe to the river bed contour encountered in construction. Welding shall conform to the requirements of A.W.W.A. Specification C 206-57 "Field Welding of Steel Water Pipe Joints," except that testing for water tightness shall conform to the specifications herein.

Following rewelding, the inside coating of the pipe which has been damaged shall be repaired, using tasteless and odorless coal tar primer, followed by hot coal tar enamel.

Any damage to the exterior coating and wrapping from moving, handling, welding or other operations shall be repaired to provide complete protection, to the satisfaction of the Engineer. The pipe shall be protected by applying an exterior coating as specified herein.

The entire pipe length shall be tested with a "Holiday" tester, provided by the Contractor, before lowering into the trench, and all defects found shall be satisfactorily repaired by and at the expense of the Contractor.

20.05

TRENCHING UNDER RIVER

The trenching under the river level shall be done to such depths that the pipe can be laid on a uniform grade with continuous bedding in the bottom of trench, true to line and grade as shown on the plans or as determined on the job, and approved by the Engineer. at no point shall the cover be less than two (2) feet. Bedding material shall consist of 3/4" crushed stone.

After the trench is excavated, the Contractor shall, by soundings, show whether the trench is accurately prepared and whether the depth of trench is such that there will be at least two (2) feet of cover over the pipe at all points when backfilled.

20.06

PIPE LAYING UNDER WATER

The section of the river crossing which will be under water shall be placed taking every precaution against possible damage to the tar coating and wrapping. Any damage to pipe or coating shall be repaired or replaced to the satisfaction of the Engineer. The pipe shall be fabricated by the Contractor to fit the contour of the trench, modified by any change in shape which subsequently may be found to be desirable and approved by the Engineer. Note, however, that no pipe shall be handled when the temperature is lower than  $-5^{\circ}$  F.

Any lines to be operated under pressure, such as feeder mains or forcemains require anchor blocks. These blocks shall be placed around the pipe, as shown on the plans, and securely fastened in place before lowering pipe into the trench. Otherwise, no anchor blocks shall be required. However, the Contractor shall fill the pipe with water before lowering it into the trench.

After the pipe is placed in the trench, it shall be checked by the Contractor to show that it is properly located within the trench and is properly bedded throughout its length. If necessary the pipe shall be shifted so that it will occupy its intended position, both as to line and to grade. An accurate record shall be made of the final location of the pipe.

20.07

TESTING PIPE LAID UNDER WATER

Before backfilling the trench around the pipe, the Contractor shall test the entire lengths of steel pipe for water tightness by installing bulkheads at each end and providing a tap by means of which water pressure can be applied to the pipe. For feeder mains, a test pressure of 150 psi shall be applied for a period of at least 4 hours. For sewage forcemains, a test pressure of 75 psi shall be applied for one hour. The line shall be bottletight. If the line is not tight, the Contractor shall take whatever steps are necessary to furnish a watertight crossing. Air shall not be used for testing.

20.08

BACKFILLING TRENCH UNDER WATER

The trench shall be backfilled to an elevation level with the original bottom using sand and gravel for filling material. Maximum stone size shall be 3".

Extreme care shall be used in placing the backfill so as not to disturb the alignment or grade of the pipe at any location. The fill shall be brought up simultaneously and evenly on both sides of the pipe and over the top, before filling to the edge of the trench so as not to create any side pressure which might tend to crowd the pipe either laterally or vertically.

Soundings shall be made during backfilling, to see that no movement of the pipe takes place, and that the trench is completely backfilled.

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MISCELLANEOUS CONSTRUCTION ITEMS

25-1

Clause

Section 25

25.01 GENERAL

The Contractor shall furnish all labour, tools and equipment necessary and shall perform all miscellaneous construction as required by the drawings and as specified herein.

25.02 STEEL PIPE

Further to the conditions of Section 19, SUPPLY OF STEEL PIPE, electrically welded steel water pipe, of 3/8" wall thickness, coated and wrapped as therein, is required for this contract for both sizes involved.

25.03 INSTALLATION OF STEEL PIPE

Further to the general conditions of Section 20, the following shall govern the installation of steel pipe for this contract. The river crossing shall be connected to the siphon chambers with all necessary reducers, flanged according to the requirements of Clause 19.05, FLANGES AND FITTINGS, herein.

Contrary to the trenching and pipe cover requirements of Section 20, LAYING STEEL PIPE FOR RIVER CROSSINGS, there are no cover requirements for the river portion of the crossing as shown, and no trenching requirements except where continuous bedding cannot be maintained on the river bed, as determined by the Engineer. The general conditions of Clause 20.08, BACKFILLING TRENCH UNDER WATER are not required in this contract, however the bedding and backfill requirements of 20.10 TRENCHING ON LAND shall still apply for the river banks. Further to the testing requirements of Clause 20.07, a test pressure of 45 psi shall be applied to the siphon crossing for one hour, after installation of the crossing.