

SECTION 1305

PIPELINE STRUCTURES

1305-1 GENERAL

1305-1.1 Description. - This work shall consist of furnishing all necessary material, equipment, and labor for the construction of manholes, drainage inlets, flushing inlets and other sewer drainage appurtenances, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer. The type of structures will be as designated on the plans.

1305-1.2 Existing Facilities. - Existing sewer drainage facilities shall be adjusted to grade, remodeled or abandoned as shown on the plans and in accordance with the provisions of Section 15, "Existing Facilities" of these City Standard Specifications.

New frames, grates and covers shall be set on new structures.

1305-2 MATERIALS. - Materials shall conform to the requirements of Section 1207, "Pipe and Structures."

1305-3 INSTALLATION

1305-3.1 Manholes. - Manholes shall be sound, watertight structures constructed at the locations shown on the plans, in accordance to the standard plan details and these specifications.

All manholes shall be waterproofed by applying a coat of sodium silicate, or other approved waterproofing agent, to the interior surfaces. The waterproofing agent shall contain a dark green pigment, and shall be not soluble in water and shall be easily recognizable.

1305-3.1.1 Foundation. - After excavation is completed and approved, a cast-in-place foundation or base block shall be constructed. The excavation for the foundation shall be level and of sufficient width and depth to accommodate the foundation dimensions herein specified.

The foundation specified shall be of such width that the outside edges shall be a minimum of 3 inches beyond the outside wall of the manhole wall at all points and be of such depth that it is a minimum of four inches under the outside bottom of the lowest pipe in the foundation and a minimum of three inches over the outside top of the highest pipe in the foundation.

The concrete for the foundation shall be placed continuous and deposited in such a manner that segregation of material does not occur. Once deposited, the concrete shall be consolidated mechanically so as to secure a dense watertight mass.

Before final set of the concrete, a keyway shall be made in the top of the foundation block by use of a metal form ring. The keyway in the foundation block will only be required for precast manholes.

Whenever possible, the foundation shall be formed around the pipe running continuously through the manhole.

When the pipe cannot be run continuously through the manhole base foundation invert channels shall be shaped and troweled smooth, with transitions,

of line and grade, from one pipe to another. The channels shall conform to and be of such width equal to the inside diameter of the pipes.

The top of the foundation, from inside face of manhole, shall be shaped to slope toward the channels at the rate of one inch per foot minimum.

1305-3.1.2 Precast Concrete. - Precast concrete manholes shall consist of cylindrical barrel sections, concentric tapered cones, and grade ring sections.

The various shaft sections shall fit together readily and all jointing and connections shall be cemented with mortar or joined with rubber gaskets or mastic joint fillers. All mortar joints shall be troweled smooth on the inside face and shall be watertight.

The rubber ring gaskets shall be installed so as to form a flexible watertight seal. The mastic joint filler shall be applied in accordance with the manufacturer's recommendations so as to form a watertight seal.

The shaft sections and cone shall be combined in such a manner that a maximum height of the throat or neck is no more than 18 inches to finished grade. The measurement shall include the manhole frame casting.

1305-3.1.3 Brick Construction. - All brick masonry shall be double thickness. The brick shall be clean and thoroughly dampened immediately before laying. All brick shall be laid in freshly made mortar and each brick shall be laid with a "push joint." In no case will sluicing or grouting of a joint be allowed nor will a joint be made by working in the mortar after the brick has been laid. Every fifth course of brick shall be a header course.

The joints between the courses, horizontal and vertical shall not be less than 1/4-inch nor more than 1/2-inch wide and shall be uniform throughout the work. The inside and outside surfaces shall be smoothly plastered with cement mortar at least 1/2-inch in thickness.

Upon completion of the brick work all surfaces shall be thoroughly cleaned and all excess mortar removed from foundation and interior of manhole.

1305-3.1.4 Drop Connections. - Drop connections to manholes shall be constructed, at the locations shown on the plans, in accordance to the standard details and these specifications.

The lower pipe shall be constructed into the foundation in accordance with the provisions of Section 1305-3.1.1 "Foundation." The upper pipe shall be installed after the manhole shaft is in place. The pipe shall be flush with the inner wall of the manhole and the opening between pipe and wall shall be mortared watertight.

The lower pipe, including the long radius bend shall be encased in concrete. The remaining void including 10 foot reach of the upper pipe shall be backfilled with imported backfill material and compacted to 95 percent relative compaction.

1305-3.1.5 Setting Manhole Frames Casting.- The manhole frame castings shall be permanently set when so authorized by the Engineer. The frame casting shall be centered on the manhole neck and set on a layer of mortar. The mortar shall be neatly struck. In flexible pavement areas a concrete collar shall be formed and poured around the manhole neck from the top of the casting to the top of the cone section so as to securely anchor the frame to the manhole neck. The collar shall be of uniform width at least 4 inches wider than the flange of the casting. The concrete mixture for the collar, shall contain lamp black coloring.

The amount of lamp black to be added to the mixture will be specified by the Engineer.

In areas to be paved with asphalt concrete the manhole frame casting and collar shall not be installed until the final paving lift is placed. A steel protection plate of adequate strength, close filled and well secured, shall be kept over the manhole opening until frame casting and collar is installed. Pipeline protection plates shall be installed on top of the foundation channel ledges, to protect the pipeline channels from falling debris and shall not be removed until the frame and cover is installed.

1305-3.2 Flushing Inlets. - Flushing inlets shall be constructed at the locations shown on the plans in accordance to the standard plan details and these specifications.

The riser shaft and fittings of the flushing inlet shall be 8 inches in diameter and shall be of the same material as, and joined in the same manner as, the sewer main to which it connects.

The riser shaft shall be a straight piece of pipe joined to the main by means of a 90 degree long radius bend attached directly to the main for terminus of the sewer main.

The 90 degree bend shall be encased in concrete.

In areas to be paved, the riser shaft shall not extend into the structural section of the pavement until after such pavement section is completed. The top and opening of the riser section, below the structural section, shall be protected and temporarily sealed until such time as the riser can be completed and the frame and cover permanently installed.

The finished riser shaft shall be cut smoothly and at right angle and shall extend to within 2 inches of the casting cover.

1305-3.2.1 Frame and Cover. - The riser frame and cover shall be permanently set when so authorized by the Engineer. The frame shall be centered on the riser pipe shaft so that the pipe does not touch the frame. When the frame has been set to final grade, a circular concrete collar shall be formed and poured around the frame, not touching the pipe, and bearing on firm ground. The collar shall be at least 12 inches in depth, measured from top of frame, and shall be 8 inches in circular width.

1305-3.3 Drainage Inlets. - Drainage inlets or catch basins shall be of the type specified and constructed or installed at the locations shown on the plans in accordance to the standard plan details and these specifications.

1305-3.3.1 Cast-In-Place. - Cast-in-place drainage inlets shall be constructed on a compacted subgrade with the natural earth bank serving as the outside form. All other forming and placing of concrete shall conform to the provisions of Section 51 "Concrete Structures." The interior bottom shall be shaped accurately so as to be smooth, uniform, and cause minimum resistance to flowing water. The bottom, from inside walls, shall be sloped toward the outlet.

Hooded curb inlets shall be constructed in 2 phases, The sides and bottom of the inlet shall be poured monolithically with the height of the sides below the grade of the bottom of the curb and gutter. The castings shall be set along with the forming of the curb and gutter, and poured along with or after installation of the curb and gutter.

Flat grate inlets shall be constructed in a single phase.

1305-3.3.2 Precast. - Precast inlet structures shall be set on a previously placed or constructed concrete slab foundation. The foundation shall be 6 inches thick and 3 inches wider than outside dimensions of the precast structure.

Provisions shall be made for connections for pipe laterals to be installed in the structure. All joints between vertical sections and openings around pipes shall be grouted with cement mortar.

The top of the inlet shall be accurately set to line and grade as shown on the plans.

1305-4 MEASUREMENT. - Quantities of the various type of manholes, flushing inlets and drainage inlets will be determined as units from actual count of the item complete and in place, including castings.

1305-5 PAYMENT. - Items of work, measured as specified in Section 1305-4 "Measurement" will be paid for at the contract unit price each by type for manholes, drop manholes, flushing inlets and drainage inlets.

The above prices and payments shall be full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in constructing the manholes and inlets, complete in place, including connections to pipes and other structures, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.