

SECTION 671 MANHOLES

671.1 DESCRIPTION

This work consists of the construction or reconstruction of manholes.

671.2 MATERIALS

- A. **Concrete:** Concrete shall conform to Class M6 (I28), Section 462.
- B. **Brick:** Clay or shale brick shall comply with the requirements for building bricks as provided in ASTM C 62. The brick shall be grade SW.
- C. **Concrete Block:** Concrete block masonry shall conform to ASTM C 139. The dimensions of the block may be any standard size which will produce the required dimensions in the completed structure.
- D. **Precast Units:** Precast manhole units shall conform to AASHTO M 199.
- E. **Castings:** Frames and covers shall consist of approved gray iron castings meeting AASHTO M 105, Class 30 (207).
- F. **Mortar:** Mortar shall consist of one part Portland Cement and two parts mortar sand conforming to Sections 750 and 810 respectively.

671.3 CONSTRUCTION REQUIREMENTS

Concrete for cast in place manholes shall be proportioned, mixed, hauled, and placed in accordance with Section 460.

When the foundation for a manhole is in new embankment, the embankment shall be constructed at least one foot (300 mm) above the footing before the foundation is prepared. The foundation shall be compacted to the same degree as specified for the adjacent embankment.

Castings shall be set in full mortar beds or secured as specified. Castings shall be set to the correct elevation so subsequent adjustment will not be necessary.

Inlet and outlet pipe connections shall be the same size and kind and shall meet the same requirements as the pipe they connect. Pipe sections shall be flush on the inside of the structure wall and project outside for proper connection with the next pipe section. Masonry shall fit neatly and tightly around the pipe.

Upon completion and curing of the unit, the sheeting, bracing, forms, and falsework shall be removed and the excavation backfilled. Backfill shall be placed in layers not exceeding six inches (150 mm) thick and compacted to the same degree as specified for adjacent embankment.

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Installations shall be finished and left in a satisfactory condition. The following specific provisions shall apply to the various types of construction.

- A. Cast in Place Concrete:** The foundation for manholes shall be thoroughly moistened immediately prior to placing concrete.

Steel reinforcement shall be placed in accordance with Section 480.

Concrete shall be protected and cured in accordance with Section 460. The minimum curing time shall be 72 hours. The finished surface of the concrete shall present a neat and smooth appearance.

- B. Brick:** Brick shall be saturated with water before laying. Bricks shall be laid in level courses with staggered vertical joints. Joints shall be completely filled with mortar. Joints on the inside of the manhole shall not be more than ½ inch (13 mm) wide.

Joints on the inside of the manhole shall be struck. The outside shall be plastered with mortar to a smooth surface.

In circular type manholes, the bricks shall be laid flat and radially, with the ends exposed on the structure. When the thickness of the wall is greater than the length of a brick, the outside bricks may be laid circumferentially, using full header construction in at least each sixth course.

In rectangular type manholes, the bricks shall be laid in regular courses of stretchers, using full header construction in at least each sixth course. Bats or spalls shall not be used except for shaping around openings or finishing out a course, in which case full bricks shall be placed in the corners and the bats in the interior of the course.

- C. Concrete Block:** The requirements for brick construction shall apply when applicable.
- D. Precast Sectional Reinforced Concrete Units:** The bottom precast section shall be set in a full mortar bed, and the joints between sections and around pipes shall be filled with mortar or an approved plastic cementing compound.
- E. Adjusting Manholes:** When the manhole rim and cover is to be lowered sufficiently to require reconstruction of the arch or raised more than one foot (300 mm), or when reconstruction of existing manhole is specified without change in grade, the manhole shall be reconstructed to the extent necessary to provide the adjustment specified.

When the rim and manhole is to be lowered to an extent which does not require reconstruction of the arch or when the rim and cover are to be raised one foot (300 mm) or less, the adjustment shall be made by removing the top as necessary and setting the rim at the proper elevation on a building up of brick or concrete.

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671.4 METHOD OF MEASUREMENT

- A. **Brick, Concrete Block, or Precast Manholes:** Manholes of brick, concrete block, or precast sectional reinforced concrete units will be measured as a unit for each manhole constructed.
- B. **Cast in Place Concrete Manholes:** Concrete and reinforcing steel for cast in place concrete manholes, will be measured as provided in Sections 462 and 480 respectively.

Manhole rims and covers will be measured as an assembly unit with all castings in any one manhole being considered as one assembly.

- C. **Reconstructing or Adjusting Manholes:** Reconstructing or adjusting manholes will be measured as a unit for each manhole reconstructed or adjusted.

671.5 BASIS OF PAYMENT

- A. **Brick, Concrete Block, or Precast Manholes:** Manholes of brick, concrete block, or precast sectional reinforced concrete units will be paid for at the contract unit price per manhole of each design furnished and accepted, inclusive of materials, labor, equipment, excavation, and incidentals necessary.
- B. **Cast in Place Concrete Manholes:** Concrete and reinforcing steel for cast in place concrete manholes will be paid for in accordance with Sections 462 and 480 respectively. The cost of excavation shall be incidental to the cost of concrete.

Manhole rims and covers, will be paid for at the contract unit price per assembly.

- C. **Reconstructing or Adjusting Manholes:** Reconstructing or adjusting manholes, will be paid for at the contract unit price per each reconstruction or adjustment of manhole. Payment will be full compensation for furnishing materials, labor, and equipment necessary.