

SECTION 604 - MANHOLES, INLETS AND CATCH BASINS

604.01 Description. This work includes constructing manholes, inlets, catch basins, and standard valve boxes according to the contract. *|

604.02 Materials. Concrete for structures shall be of the class specified. *| Concrete shall conform Section 601 - Structural Concrete. If concrete in *| structures is to come in direct contact with sewage or sewage gases, the Contractor shall modify the proportioning of concrete according to Section *| 625 - Sewer System.

Brick for water valve manhole shall be concrete brick. Brick for water *| valve manhole shall conform to Subsection 704.02 - Concrete Brick. |

Other materials shall conform to the following: |

Asphalt Filler	702.07
Trench Backfill Material	703.21
Asphalt (Filler) Type C Asphalt	705.06(C)
Clay or Shale Brick	704.01
Mortar for Manholes	705.08
Reinforcing Steel	709.01
Precast Concrete Units	712.06
Frames, Grates, Covers and Ladder Rungs	712.07
Pipe Collar for Valve Box	712.22

When the location of manufacturing plants allows, the Engineer may *| inspect the plants periodically for compliance with specified manufacturing *| methods. The Engineer may get samples of materials for laboratory testing for *| compliance with material quality requirements. This may be the basis for *| acceptance of manufacturing lots regarding quality. *|

The condition of materials will be subject to inspection for acceptance *| before or during incorporation of materials into the work. *|

604.03 Construction Requirements.

(A) General. Concrete construction shall conform to Section 503 - *| Concrete Structures. |

Reinforcing steel work shall conform to Section 602 - Reinforcing *| Steel. |

A certified welder shall do shop and field welding according to *
Section 501 - Steel Structures.

The Contractor shall dip or soak the brick in water before the *
Contractor lays the bricks. Joints shall be full mortar joints. Joints *
shall not be more than half (1/2) inch wide. The joints in the brick work
on the inside portion of the brick manhole shall be neatly struck.

The Contractor may furnish and install storm drain manholes, inlets *
and catch basins as precast units or combined precast and cast-in-place *
units. The units completed in place shall conform to cast-in-place *
construction specified in the contract. If the Contractor uses precast *
units or combination of precast and cast-in-place units, the Contractor *
shall submit shop drawings to the Engineer for acceptance before *
construction.

(B) Manholes, Inlets, and Catch Basins. The Contractor shall construct *
the concrete base as detailed in the contract. The Contractor shall *
allow the concrete to set for at least twenty-four (24) hours before the *
Contractor constructs additional material on this base. The Contractor *
shall not remove the forms for the concrete portion of the manhole for at *
least twenty-four (24) hours after the Contractor places the concrete. *
The Contractor shall finish the concrete while the concrete is still *
fresh.

(1) Sewer Manholes. The Contractor may make the sanitary sewer *
manholes entirely of bricks from the concrete base upwards if: *

(a) the invert to the top of the frame is ten (10) feet deep *
or less, *

(b) the invert is not below the ground water table, and *

(c) the Contractor locates the manhole in a dry area. *

Manhole walls below the ten (10) foot depth shall be of *
concrete.

The Contractor shall construct precast concrete sewer manhole *
sections according to the details shown in the contract and the ASTM *
C 478.

The Contractor shall place the reinforcing steel for precast *
sections according to ASTM C 478.

The Contractor shall construct cast-in-place sewer manhole *
walls according to the details shown in the contract. *

The Contractor shall place reinforcing steel for cast-in-place *
manhole walls according to the details shown in the contract. *

An expert cement finisher shall shape and finish the sanitary sewer manhole inverts using accepted mortar. *|
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The Contractor shall plaster the outer portion of the sewer manhole bricks with a one (1) inch thickness of accepted mortar. *|
*| The Contractor shall plaster the interior brick work to present a smooth surface. *|

(2) Water Valve Manholes. If portion of the brick manholes is below the four (4) foot elevation, USGS datum, or ground water table, the Contractor shall waterproof the depth of the manhole below such elevation. The Contractor shall apply an interior and exterior coat of accepted mortar. The mortar coat shall have a thickness of not less than five-eighths (5/8) inch on each face. *|
*| The Contractor shall extend the waterproof: *|

(a) from the four (4) foot elevation or ground water table down to the bottom of the floor slab on the outside portion of the manhole and *|
*|

(b) from the four (4) foot elevation or ground water table to top of the floor slab on the inside portion of the manhole. *|
*|

The Contractor shall leave a space of at least two (2) inches between the brick and the upper half of the barrel of the pipe. The Contractor shall fill that space with a specified asphalt filler. *|
*| The Contractor shall install reinforced concrete lintels, made from Class B Concrete, in Type A Manholes shown in the contract. *|

Upon completion, the Contractor shall clean the manhole thoroughly of debris and paint the frame and cover with one (1) coat of accepted asphaltum paint. *|
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(3) Storm Drain Manholes, Inlets and Catch Basins. The Contractor requires rungs at twelve (12) inches on centers when the height of the structure is greater than four (4) feet six (6) inches from the invert to the top of the structure. *|
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If the height of the structure is four (4) feet six (6) inches or less, the Contractor shall install one (1) rung sixteen (16) inches from the bottom or as ordered by the Engineer. The Contractor shall install additional rungs when ordered by the Engineer. *|
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The Contractor shall construct precast concrete storm drain manhole sections according to the contract and ASTM C 478. *|
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The Contractor shall place reinforcing steel for precast sections according to ASTM C 478. *|
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(C) **Setting Frames.** The Contractor shall place the frames that the Contractor will set in concrete in the exact position required. The Contractor shall tamp the concrete carefully around the frame.

The Contractor shall set the frame that the Contractor will place on mortar beds in full mortar beds. The Contractor shall bring the mortar up around the bottom of the frame.

(D) **Excavation and Backfill.** The Contractor shall excavate and backfill according to Section 206 - Excavation and Backfill for Conduits and Structures.

(E) **Reconstructing Manholes.** If specified in the contract, the Contractor shall reconstruct the existing manholes to the required elevations according to the contract and as ordered. The Contractor shall adjust the manhole or foundation below the frame to the required grade using the same type of material used in its original construction. The Contractor shall remove carefully, clean, and paint the existing frame and cover with accepted asphaltum paint before reinstallation.

(F) **Valve Boxes.** The Contractor shall install valve boxes for water valves complete in place according to the contract.

The Contractor shall set and center the eight (8) inch pipe collar plumb over the valve stem. The ends of the pipe collar shall have smooth, machined edges. The Contractor shall backfill with trench backfill material around the gate valve and pipe collar by hand to eight (8) inches below the surface of the ground.

Upon completion of installation, the Contractor shall clean and paint the valve box frames and covers with one (1) coat of accepted asphaltum paint.

If the contract requires reconstructing existing valve box to the required elevation, the Contractor shall remove carefully, clean and paint the cast iron frame and cover. The Contractor shall cut the existing pipe collar or install a new pipe collar. The Contractor shall reinstall the frame and cover and pour the four (4) inch thick concrete pad.

604.04 Method of Measurement. Except storm drain manholes, the Engineer will measure the various types of manholes, inlets, and catch basin, as follows:

(1) The Engineer will measure concrete, other than concrete in precast sections, cast-in-place wall sections, and bases according to Section 503 - Concrete Structures.

(2) The Engineer will measure brick, precast concrete, precast reinforced concrete walls, including the cone or tapered sections and cast-in-place walls vertically by the linear foot from the top of the concrete base to the bottom of the frame or ring casting. *

(3) The Engineer will measure manhole bases per each. *

(4) Exception of reinforcing steel in precast reinforced concrete walls and tapered sections, the Engineer will measure reinforcing steel according to Section 602 - Reinforcing Steel. *

(5) The Engineer will measure frame and cover or grate furnished, installed, adjusted, or salvaged by the unit per each complete in place. *

(6) The Engineer will measure excavation, other than excavation for the demolishing, adjusting, or reconstruction of structures, according to Section 206 - Excavation and Backfill for Conduits and Structures. *

(7) The Engineer will measure valve boxes by the unit per each complete in place. *

(8) The Engineer will not measure rungs for payment. *

(9) The Engineer will measure the various types of storm drain manholes, inlets and catch basins per each according to the various depths specified. *

The depth measurement for new structures shall be the vertical measurement from the invert elevation to the top of the deck slab, grating or manhole cover. *

For reconstructed structures, the depth measurement shall be the vertical measurement from the beginning of reconstruction shown in the contract to the top of the deck slab, grating or manhole cover. *

604.05 Basis of Payment. Except storm drain manholes, the Engineer will pay for the accepted quantities of materials for the various types of manholes, inlets, and catch basin as follows: *

(1) The Engineer will pay for concrete, other than concrete in precast sections, cast-in-place wall sections, and bases according to Section 503 -Concrete Structures. *

(2) The Engineer will pay for the accepted quantities of brick, precast concrete, precast reinforced concrete walls, including the cone or tapered sections and cast-in-place walls vertically at the contract unit price per linear foot. *

(3) The Engineer will pay for the accepted quantities of manhole bases at the contract unit price per each complete in place. *

(4) Except reinforcing steel in precast reinforced concrete walls and tapered sections, the Engineer will pay for reinforcing steel according to Section 602 - Reinforcing Steel. *

(5) The Engineer will pay for the accepted quantities of frame and cover or grate furnished, installed, adjusted, or salvaged at the contract unit price per complete in place. *

(6) The Engineer will pay for the accepted quantities of excavation, other than excavation for the demolishing, adjusting, or reconstruction of structures, according to Section 206 - Excavation and Backfill for Conduits and Structures. *

The Engineer will consider the cost of excavation for the reconstruction, adjusting or demolishing of the various types of structures specified in this Section incidental to the various contract items. *

(7) The Engineer will not pay for the rungs. The Engineer will consider the rungs incidental to the various contract items. *

(8) If the contract does not specify "Adjusting Manhole", the Engineer will consider them incidental to the various contract items. *

If the contract specifies "Adjusting Manhole", the Engineer will pay for the accepted quantities of the various manholes adjusted at the contract unit price per each. *

The price shall be full compensation for furnishing and placing materials and for labors, equipment, tools and incidentals necessary to complete the work. *

(9) The Engineer will pay for the accepted quantities of valve boxes at the contract unit price per each complete in place including excavation and backfill. *

The Engineer will pay for the accepted quantities of reconstructing valve boxes at the contract unit price per each complete in place including excavation and backfill. *

(10) The Engineer will pay for the accepted quantities of the various types of storm drain manholes, inlets and catch basins at the respective contract unit price per each. *

The contract unit price paid shall be full compensation for furnishing and installing frames and grates, frames and covers, and rungs; adjusting or demolishing; excavating and backfilling; placing concrete; furnishing and installing reinforcing steel and brick; furnishing materials, equipment, tools, labors and other incidentals necessary to complete the work. *

The Engineer will make payment under:

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Pay Item	Pay Unit
Brick Wall for _____ Manhole	Linear Foot
Existing Manhole to be Completely Demolished	Linear Foot
(_____) Standard Valve Box	Each
Pre-Cast Concrete Wall for _____	Linear Foot
Cast-in-Place Concrete Wall for _____	Linear Foot
Base for _____ Manhole	Each
(_____) Cast Iron Frame and Cover (_____)	Each
Type _____ Cast Iron Frame and Grate	Each
Type _____ Steel Frame and Grate	Each
Type _____ Trash Rack	Each
Type _____ Manholes, _____ feet to _____ feet	Each
Type _____ Inlet, _____ feet to _____ feet	Each
Type _____ Catch Basins, _____ feet to _____ feet	Each
Adjusting _____ Manhole	Each