Amend **Section 604 - Manholes, Inlets and Catch Basins** to read as follows:

"SECTION 604 - MANHOLES, INLETS AND CATCH BASINS

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

604.02 Materials. Concrete for structures shall be of the class specified. Concrete shall conform to 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
Structural Backfill Material	703.20
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
Cullet Materials for Utility Structures	717.03
Cullet Materials for Drainage Systems	717.04

When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The Engineer may get material samples to verify compliance with

the contract. 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 the shop and field welding according to Section 501 - Steel Structures.

Dip or soak the brick in water before laying the bricks. Joints shall be full mortar joints. Joints shall not be more than 0.5-inch wide. 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. 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. Construct the concrete base according to the contract. Allow the concrete to set for at least 24 hours before constructing additional material on this base. Do not remove the forms for at least 24 hours after placing the concrete. 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 10 feet deep or less,

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

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

Make the manhole walls below the 10-foot depth of concrete.

Construct precast concrete sewer manhole sections according to the contract and ASTM C 478.

Place the reinforcing steel for precast sections according to ASTM C 478.

Construct cast-in-place sewer manhole walls according to the contract.

Place the reinforcing steel for cast-in-place manhole walls according to the contract.

An expert cement finisher shall shape and finish the sanitary sewer manhole inverts using accepted mortar.

Plaster the outer portion of the sewer manhole bricks with a one inch thickness of accepted mortar. Plaster the interior brick work to present a smooth surface.

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

(a) down to the bottom of the floor slab on the outside portion of the manhole and

(b) to the top of the floor slab on the inside portion of the manhole.

Leave a space of at least two inches between the brick and the upper half of the barrel of the pipe. Fill that space with a specified asphalt filler. Install reinforced concrete lintels, made from Class B Concrete, in the Type A Manholes shown in the contract.

Upon completion, clean the manhole thoroughly of debris and paint the frame and cover with one coat of accepted asphaltum paint.

(3) **Storm Drain Manholes, Inlets, and Catch Basins.** The contract requires rungs at 12 inches on centers when the height of the structure is greater than 4.5 feet. Measure the height of the structure from the invert to the top of the structure.

Install one rung 16 inches from the bottom or as specified by the Engineer if the height of the structure is 4.5 feet or less. Install additional rungs when specified by the Engineer.

Construct precast concrete storm drain manhole sections according to the contract and ASTM C 478.

Place reinforcing steel for precast sections according to ASTM C 478.

(C) Setting Frames. Place the frames in the concrete according to the contract. Carefully tamp the concrete around the frame.

Set the frame in full mortar beds. Bring the mortar up around the bottom of the frame.

(D) Excavation and Backfill. Excavate and backfill according to Section 206 - Excavation and Backfill for Conduits and Structures.

(E) Reconstructing Manholes. Reconstruct the existing manholes to the required elevations according to the contract and as ordered by the Engineer. Adjust the manhole frame to the required grade using the same type of material used in its original construction. Carefully remove, clean, and paint the existing frame and cover with accepted asphaltum paint before reinstallation.

(F) Constructing and/or Adjusting Valve Boxes. Construct or adjust the valve boxes to the required elevations according to the contract and as ordered by the Engineer.

Set and center the 8-inch pipe collar plumb over the valve stem. Ends of the pipe collar shall have smooth, machined edges. Backfill around the gate valve and pipe collar with trench backfill by hand. Backfill 8 inches below the surface of the ground.

Upon completion of installation, clean and paint the valve box frames and covers with one coat of accepted asphaltum paint.

Adjust the existing valve boxes to the required grade using the same type of material used in its original construction. Carefully remove, clean, and paint the existing cast iron frame and cover with accepted asphaltum paint Cut the existing pipe collar or install a new pipe collar. Reinstall the frame and cover and pour the four inch thick concrete.

604.04 Method of Measurement. The Engineer will measure manholes, inlets, and catch basins per each.

The Engineer will measure valve boxes per each complete in place.

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. The Engineer will pay for the accepted manholes, inlets, catch basins, and valve boxes at the contract unit price per each complete in place.

The price includes 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, brick, precast concrete, precast reinforced concrete walls, including the cone or tapered sections and cast-in-place walls vertically ; furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Type ____ Manhole, ____ feet to ____ feet	Each
____ Inlet, ____ feet to ____ feet	Each
Adjusting _____ Frame and Cover	Each"

END OF SECTION