

SECTION 02502 – STORM SEWER MANHOLES, INLETS, AND CATCH BASINS

PART 1 – GENERAL

1.1 DESCRIPTION.

- A. The WORK under this Section includes providing all labor, materials, tools and equipment necessary for furnishing and installing manholes, inlets, and catch basins as shown on the Drawings and the Standard Details.

1.2 SUBMITTALS

- A. Storm Sewer Manholes and Catch Basins
- B. Frames and Grates: Catalogue cuts and material certifications.

PART 2 – PRODUCTS

2.1 JOINT MORTAR

- A. Joint mortar shall be non-shrink-type, and shall consist of one part Portland cement and two parts approved sand with water as necessary to obtain the required consistency. Mortar shall be used within 30 minutes after its preparation. If mortar is submerged and cannot be kept dry until cured, a substitute approved by the ENGINEER shall be used.

2.2 FRAMES, GRATES, COVERS, AND LADDER RUNGS

- A. Frames, grates, covers and ladder rungs shall conform to the plan dimensions and to the following Specification requirements for the designated materials:
 - 1. All frames, grates, and covers shall be ductile iron, conforming to ASTM A 48, Class 30, and shall be designed for heavy duty traffic.
 - 2. Carbon-steel castings shall conform to the requirements of AASHTO M 103. Grade shall be optional unless otherwise designated.
 - 3. All manhole covers shall have the words “STORM DRAIN” cast into the top in letters approximately three inches high.
 - 4. Structural steel shall conform to the requirements of AASHTO M 183.
 - 5. Manhole steps shall be constructed of polypropylene conforming to ASTM D 4101 and shall meet current state and federal safety standards.
 - 6. Galvanizing, where specified for these units, shall conform to the requirements of AASHTO M 111.
 - 7. Malleable iron castings shall conform to the requirements of ASTM A 47. Grade shall be optional unless otherwise designated.

2.3 REINFORCING STEEL

- A. Reinforcing steel shall conform to the following applicable requirements:

Deformed Billet-Steel Bars	AASHTO M 31 (ASTM A 615, grade 60)
Welded Steel Wire Fabric	AASHTO M 55 (ASTM A 185)

SECTION 02502 – STORM SEWER MANHOLES, INLETS, AND CATCH BASINS

Cold-Drawn Steel Wire AASHTO M 32 (ASTM A 82)

Fabricated Steel Bar or Rod Mats AASHTO M 54 (ASTM A 184)

2.4 CORRUGATED METAL UNITS

- A. Corrugated metal units shall conform to plan dimensions. Steel units shall conform to AASHTO M 36 and aluminum units shall conform to AASHTO M 196. Polymer precoating shall conform to AASHTO M 245 for the type specified.
- B. Branch stubs shall be corrugated pipe sections extending 12 inches from the inlet unit to match the connecting pipe size shown on the Drawings.

2.5 PRECAST CONCRETE UNITS

- A. Precast concrete units shall conform to the requirements of AASHTO M 199, except that the absorption test will not be required.
- B. Cracks in units will be cause for rejection. Honeycombed or patched areas in excess of 30 cumulative square inches will be cause for rejection.
- C. Concrete shall conform to Section 03302 – Concrete Structures.
- D. Manhole steps shall meet current state and federal safety standards.

2.6 CORRUGATED POLYETHYLENE PIPE UNITS

- A. The pipe used for these units shall conform to the requirements of Section 02501 – Storm Sewer Pipe, Article 2.6.
- B. The bottom plate shall be factory sealed to the barrel section, per pipe manufacturer's recommendations.
- C. Branch stubs shall be corrugated polyethylene pipe sections extending 12 inches from the inlet unit to match the connecting pipe size shown on the Drawings and shall be factory connected to the barrel section.

2.7 CONFLICT MANHOLE UNITS

- A. Conflict manholes shall consist of a precast concrete unit conforming to the requirements of Article 2.5 of this Section, with an insulated sanitary sewer pipe section installed in the manhole crossways to the storm drainage flow.
 - 1. The conflict manhole shall conform to the requirements of CBJ Standard Detail 303 - Storm Drain Manhole Types I & II.
 - 2. The frame and cover shall conform to CBJ Standard Detail 306 – Storm Drain Manhole Cover & Frame.
 - 3. The insulated pipe shall consist of an inner (carrier) pipe and outer (protective) pipe, both of which shall be PVC pipe meeting the requirements of Section 02401 – Sanitary Sewer Pipe, Article 2.2. The outer pipe shall be seven inches

SECTION 02502 – STORM SEWER MANHOLES, INLETS, AND CATCH BASINS

larger in nominal diameter than the inner pipe, or as shown on the Drawings, with the annular space between the two pipes filled with closed cell urethane foam. Ends of the insulation shall be covered and sealed with either a manufactured closure supplied by the manufacturer or with a manufactured cap with a hole neatly cut for the carrier pipe. The cap shall be sealed all around the carrier pipe with an approved sealant made for use with the type of pipe furnished, and shall be solvent welded to the outer pipe.

4. The insulated pipe shall have a minimum length of 12 feet and shall extend a minimum of 36 inches beyond the edge of the manhole.

PART 3 – EXECUTION

3.1 CONSTRUCTION

- A. Concrete construction shall conform to the requirements of Section 03302 – Concrete Structures.
- B. Welding shall be done in accordance with the best modern practice and the applicable requirements of AWS D1.1 except as modified by AASHTO “Standard Specifications for Welding of Structural Steel Highway Bridges.”
- C. Metal frames shall be set in full mortar bed.
- D. Manholes and catch basins shall be constructed in accordance with the Drawings and Standard Details. There shall be a minimum 16 inch catch constructed in the invert of the manholes or catch basins, unless otherwise specified. After the mortar is set, holding the pipe in place, the pipe is to be cut off evenly so that neither more than two inches, nor less than one inch, of the pipe protrudes into the manhole or catch basin.
- E. When a pipe enters the manhole through a wall of a precast unit, the CONTRACTOR shall perform the cutting of the concrete and steel reinforcement in a manner that will not loosen the reinforcement in the wall. The steel reinforcement shall be cut flush with the wall face. All joints and openings cut in the walls shall be grouted.
- F. Where indicated on the Drawings, a stub shall be provided for future connections to the manhole. The stub shall be sized and positioned as indicated. The end of the stub shall be stopped with a wooden plug, concrete biscuit, or other adequate methods to prevent water, earth, or other substances from entering pipe.
- G. In case of poured-in-place manhole construction, if the CONTRACTOR elects to accomplish the manhole construction utilizing more than one continuous concrete pour, a keyed construction joint shall be used. These manholes shall have poured-in-place bases.
- H. Adjustment of Existing Frame Grates to Grade shall consist of raising or lowering the frame or ring casting one foot or less and providing the necessary adjusting rings, and mortar required to adjust the frame and grate to finish grade, as per CBJ Standard Detail 205 – Manhole Heights.
- I. Replacing Frame and Covers shall consist of removal and disposal of the existing frame, cover and adjustment bricks, blocks and mortar and replacing with a new frame and

SECTION 02502 – STORM SEWER MANHOLES, INLETS, AND CATCH BASINS

cover per the Drawings and CBJ Standard Details. The new frame and cover shall be adjusted to finish grade per CBJ Standard Detail 205 – Manhole Heights.

- J. Reconstructing Manholes shall consist of one or more of the following:
1. The WORK necessary to bring the manhole frame and cover to grade when the cone and/or barrel section(s) must be removed for lowering.
 2. The WORK necessary to raise the manhole frame and cover more than one foot.
 3. The WORK necessary to reconstruct a portion of the manhole as specified with no change in line or grade.
 4. The WORK necessary to tap one or more additional pipes into an existing manhole.
- K. The manholes shall be reconstructed to the required elevation and to conform essentially to the details on the Drawings. This WORK shall conform to the requirements above specified for new construction except that material may be reused if of satisfactory quality and if approved by the ENGINEER.
- L. Existing storm flow shall not be impeded during construction.
- M. On resurfacing contracts, the metal frames and gratings shall be, unless otherwise permitted or directed, adjusted to grade prior to placing the surface course.
- N. Excavation, bedding and backfilling shall conform to the requirements of Section 02203 – Trenching.
- O. Manhole pipe connections shall be made as shown on the Drawings and as required by the manufacturer's recommendations. A snug, watertight seal shall be provided for each pipe connection.
- P. All manholes shall be bedded in accordance with CBJ Standard Detail 303 – Storm Drain Manhole Types I & II.

END OF SECTION