SECTION 33 39 00 – MANHOLES AND CATCHBASINS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Provide manholes as shown on the drawings. This section includes:

- Precast Manholes
- Masonry Inverts
- Frames and Covers
- Precast Catchbasin and Concrete Masonry Catch Basins

B. Earthwork: Section 31 20 00

C. Sewers and Drains: Section 33 30 00

D. Concrete: Section 03 30 00

1.02 QUALITY ASSURANCE:

A. General: Provide complete manhole and catchbasin structures capable of supporting AASHTO H2O loading.

B. Precast Manhole and Catchbasin Components: ASTM C478

1.03 SUBMITTALS:

A. Shop Drawings: Submit for precast manholes. Show components to be used, elevations of top, base and pipe inverts, location of pipe penetrations, steps, etc.

B. Product Data: Manufacturers' product data and installation instructions for frames, grates, precast items, manhole sleeves, and joint sealants for precast sections.

PART 2 - PRODUCTS

2.01 MANHOLES:

A. Base Sections: Precast monolithic construction to a joint 16" minimum above crown of highest incoming pipe.

B. Top Sections: Precast eccentric cone. Use flat cover only if shown on drawings.

C. Pipe to Manhole Connections: Pipe sizes 8" or larger: Flexible manhole sleeves equal to CP series manufactured by Interpace Corp. size to fit diameter and type of pipe without use of gaskets.

D. Pipe to Catchbasin Connections: For pipe sizes 6" or larger, use flexible manhole sleeves equal to CP series manufactured by Interpace Corp., sized to fit diameter and type of pipe without use of gaskets.

8” PVC pipe, use CP-6
12” PVC pipe, use CP-10

Pipe sized less than 8”: schedule 40 galvanized steel pipe sleeve with segmented rubber seal equal to “Link-Seal” by Thunderline Corp.

E. Joints Between Precast Sections: Watertight, shiplap type; seal with two rings of 1" diameter butyl rubber sealant.

F. Dampproofing: Bituminous coating on exterior of precast sections and parged brick.

2.02 CATCH BASINS:

A. Base Sections: Precast

B. Barrel Sections: Precast or combination of precast and concrete masonry units barrel block.

C. Top Sections: Precast eccentric cone or flat cover if required by grade.

D. Joints between precast sections: Shiplap type sealed with one ring of 1” diameter or square butyl rubber sealant.

E. Dampproofing: Bituminous coating on exterior of precast barrel block sections.

2.03 MASONRY MATERIALS:

A. Sewer Brick: ASTM C32, Grade SS, hard brick.

B. Concrete Masonry Units: ASTM C139.

C. Mortar: Type M, ASTM C270. Use Type II Portland cement, Type S lime.

1 part Portland cement, ¼ part hydrated lime. 3 to 3 ¾ parts sand.

2.04 FRAMES, GRATES, AND COVERS:

A. General:

1. Coatings for All Frames, Grates, and Covers: Two coats coal tar pitch varnish applied after sandblasting to provide a smooth, tough, non-brittle, non-scaling finish. Repair damage to coatings to the satisfaction of the Engineer.

2. Cast Iron: ASTM A48 Class 30.

B. Manhole Frames and Covers:

1. General: Minimum 22" dia. opening, minimum weight 350 pounds, labeled with "SEWER" in 3" high raised letters on cover.

2. Standard Frames and Covers: Equal to:

LC258-2 frame and L25C5 cover by E.L. Lebaron Foundry, Model R1760 frame and Type C cover with self-sealing application by Neenah Foundry, or Equivalent

3. Catchbasin Frames and Grates: Equal to:

Model R2504-D frame and type C grate by Neenah Foundry, Model M72 x 7G by Etheridge Foundry.

2.05 MISCELLANEOUS:

A. Dampproofing: Provide bituminous coating equal to Dehydrate No. 4 Dampproof by W.R. Grace or Bitumastic Super Service Black by Koppers Co. for field application.

PART 3 - EXECUTION

3.01 INSTALLATION OF MANHOLES:

A. Placement: Place bases on compacted bedding material so catchbasin structure is plumb and pipe inverts are at proper elevations. Place barrel and top sections in the appropriate height combinations. Plug all lifting holes inside and out with non-shrink mortar.

B. Joints: Follow manufacturer's instructions for sealing joints between precast sections. Point joints with non-shrinking mortar.

C. Frames and Covers: Set to final grade as shown on the drawings or set flush with pavement grade in paved areas. Provide adequate temporary covers to prevent accidental entry until final placement of frame and grate is made.

D. Inverts: Construct smooth channels using sewer brick with semi-circular bottoms that match inside surface of pipes to be connected. Where changes in direction of flow are made, fit pipes flush to inside surfaces of manholes and form channel with as large a radius as possible.

Slope bench 1/8 inch per foot from channel up to manhole wall.

E. Dampproofing: Repair damage to dampproofing and apply dampproofing to masonry as shown on drawings.

3.02 INSTALLATION OF CATCHBASINS:

A. Placement: Place bases on compacted bedding material so that structure is plumb and pipe inverts are at proper elevations.

B. Plug: lifting holes inside and out, fill spaces between pipes and catch basin walls with mortar and/or masonry and trowel smooth.

C. Concrete Masonry Construction: Construct walls in horizontal courses with vertical joints broken. Lay units in mortar, fill all joints completely with mortar. Parge inside and out with ½" parge coat of mortar.

D. Frames and Grates: Set to grade as shown on the Drawings.

E. Dampproofing: Repair damage to dampproofing and apply dampproofing to masonry as shown on the drawings.

3.03 MANHOLE TESTING:

A. General: Use vacuum test or exfiltration test for all sanitary sewer manholes. Perform tests before constructing invert or backfilling. No allowance will be made for absorption during the 8-hour exfiltration test period. No allowance will be made for leakage at test plugs.

B. Retests: Retest unacceptable manholes following repairs until acceptable leakage rate is attained.

C. Vacuum Test:

1. Plug pipes into and out of MH and seal MH opening.

2. Draw a vacuum of 10 inches of Hg and hold for duration specified below:

MH diameter (ft)	Duration (seconds)
4	60
5	75
6	90

3. Acceptable Vacuum Drop: Not more than 1 inch of Hq over the specified timeframe.

D. Exfiltration Test:

1. Plug pipes into and out of manhole and secure plugs.

2. Lower groundwater table (GWT) to below manhole. Maintain GWT at this level throughout test. Provide means of determining GWT level at any time throughout test.

3. Fill manhole with water to top of cone.

4. Allow a period of time for absorption (determined by Contractor).

5. Refill to top of cone.

6. Determine volume of leakage in an 8-hour minimum test period and calculate rate.

7. Acceptable Leakage Rate: Not more than 1 gallon per vertical foot per 24 hours.

3.04 REPAIRS:

A. Determine causes of all leaks and repair them. Perform the necessary earthwork if manhole has been backfilled.

B. Perform repairs using methods and material approved by the Engineer. Remove and replace or reconstruct manhole if necessary. Remove and replace defective sections if required by Engineer.

* END OF SECTION 33 39 00 *