SECTION 02640

MANHOLES AND COVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modular precast concrete manhole section with tongue-and-groove joints with masonry transition to lid frame, covers, anchorage, and accessories.

B. Modular precast catch basins with frames and grates

C. Modular precast concrete manhole sections with tongue-and-groove joints with masonry transition to lid frame, covers, anchorage, and accessories.

1.02 RELATED SECTIONS

A. Section 02250 - Dewatering.

B. Section 02315 - Excavation.

C. Section 02317 - Trenching.

D. Section 02535 - Sanitary Sewer Piping.

E. Section 02635 - Storm Drainage Piping.

1.03 REFERENCES

A. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2005.

B. ASTM A 48/A 48M - Standard Specification for Gray Iron Castings; 2003.

C. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.

D. ASTM C 55 - Standard Specification for Concrete Brick; 2003.

E. ASTM C 62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale); 2005.

F. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections; 2006a.

G. ASTM C 923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals; 2002.

H. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.

1.04 SUBMITTALS

A. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of penetrations.

B. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C 478 (ASTM C 478M), with resilient connectors complying with ASTM C 923 (ASTM C 923M).
   1. Use concrete that will attain a 28-day compressive strength of not less than 4,000 psi.
   2. Reinforcing: H-20 loading
   3. Horizontal Joints:
      a. Tongue and Groove formed of concrete to receive a flexible plastic gasket.
      b. Joints to be watertight
      c. Cast to allow installation to be vertical and in true alignment
   4. Provide two tapered lifting holes 180 degrees apart in each section for handling and placing.
   5. Base Section: Cast holes for pipes to provide invert elevations as required by Drawings.
   6. Pipe to Structure Joints:
      a. Flexible sleeves, rubber quality, ASTM C-443 and C361 cast into base
      b. If premanufactured adaptor cannot be installed, use rubber concrete adaptor designed to provide a watertight seal between pipe and structure.

B. Mortar and Grout: ASTM C270, using the proportion specification
   1. Masonry below grade and in contact with earth: Type S

C. Concrete Masonry Units: ANSI/ASTM C139.

D. Manhole Brick: ANSI/ASTM C32, Grade MS

E. Sewer Brick: ANSI/ASTM C32, Grade SS

F. Masonry Mortar: ANSI/ASTM C270, Type M.

G. Frames and Covers: Grey cast iron, ANSI/ASTM A 48, Class 30 B.
   1. Furnish covers with cast-in legend on roadway face as indicated. Also refer to plans.
   2. Minimum clear opening of frame shall be 24 inches.

H. Manhole Steps: Polypropylene steps meeting the requirements of ASTM C-478 and AASHTO M-199. Polypropylene conforms to ASTM D-4101. Grade 60, 1/2 inch diameter reinforcing bar meeting the requirements of ASTM A-615.

I. Catch Basin Frames and Gratings: Grey cast iron, ANSI/ASTM A 48, Class 30 B. Also refer to plans.

J. Other Precast Structures:
   1. Use concrete that will attain a 28-day compressive strength of not less than 4,000 psi.
   2. Manufactured in accordance with ASTM C-478
   3. Reinforcing: H-20 loading
   4. Horizontal Joints:
      a. Tongue and groove formed of concrete to receive a flexible plastic gasket.
      b. Joints to be watertight.
      c. Cast to allow installation to be vertical and in true alignment.
   5. Pipe to structure joints;
      a. Flexible sleeves, rubber quality, ASTM C-433 and C-361 cast into place.
      b. If pre-manufactured adaptor cannot be installed, use rubber-concrete adaptor designed to provide a watertight seal between pipe and structure.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location, and ready for roughing into Work.

C. Verify excavation for manholes, catch basins and other structures is correct.

3.02 PRECAST CONCRETE STRUCTURES

A. Precast Concrete structures: Place precast concrete sections as shown on drawings, Where structures occur in pavement, set tops of frames and covers flush with finish surface. Elsewhere, set tops 3 inches above finish surface, unless otherwise indicated.
   1. use epoxy bonding compound where manhole steps are mortared into structure walls.
   2. Provide rubber joint gasket complying with ASTM C443
   3. Place base section level on 12 inch layer of crushed stone.
   4. Fix inlet and outlet stubs into sleeves with stainless steel pipe clamp.
   5. Place barrel sections, cones or tops of the appropriate combination of heights to meet grades required by Drawings or existing conditions.
   6. Seal horizontal joints as recommended by manufacturer.
   7. Apply lubricant to inside tongue and rubber gaskets immediately prior to joining sections.
   8. Fill lifting holes with non-shrink mortar.
   9. Place frame and grate on top or otherwise prevent accidental entry by unauthorized persons until ready for adjustment to grade.
   10. Repair damaged coating of frames and covers with coat-tar-pitch varnish.

3.03 MASONRY WORK

A. Laying Brick:
   1. Use clean bricks
   2. Lay brick by methods consistent with the trade acceptable to Owner
   3. Lay in full bed of mortar and joint without subsequent grouting, flushing, or filling, for thorough bond.
   4. Bring casting rim to grade with brick and coat outside with mortar; minimum thickness 3/8 inch with troweled waterproof surface.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with the requirements of the servicing utility.

B. Provide copies of test report to Owner and servicing utility, documenting results and compliance with requirements in advance of requesting a certificate of occupancy.

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

END OF SECTION 02640