

## **1.0 GENERAL**

### **1.1 REFERENCES**

- .1 Provide precast concrete manholes in accordance with the following standards (latest revision) except where specified otherwise.
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM C478M Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric).
  - .2 ASTM A48 Standard Specification for Gray Iron Castings.
- .3 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A3000 Cementitious Materials Compendium.

### **1.2 SUBMITTALS**

- .1 Provide the following submittals.
- .2 Shop drawings of precast concrete manhole components, including [access hatches, frames and covers] at least 20 days prior to fabrication. Indicate on the shop drawings material specifications, dimensions and elevations, and pipe openings.
- .3 Certified copies of results of tests specified in ASTM C478M prior to delivering any precast concrete manhole components to the Site.

### **1.3 DELIVERY, STORAGE, AND HANDLING**

- .1 Inspect each shipment of material and timely replace any damaged material.
- .2 Unload, handle, and store materials in accordance with the manufacturer's written instructions.
- .3 Store sealant in a warm and dark location until immediately before use.

## **2.0 PRODUCTS**

### **2.1 MATERIALS**

- .1 Provide materials in accordance with the following.
- .2 Manholes:
  - .1 Precast reinforced concrete manhole sections, monolithic bases, and top slabs in accordance with ASTM C478M with matching female and male joints between precast concrete manhole components.
  - .2 Safety lift rings in precast manhole sections and monolithic bases.

Tender No. [ ]

- .3 Concrete for manholes: Minimum compressive strength of 30 MPa at 28 days using Type 50 Sulphate Resistant Portland Cement in accordance with CAN/CSA-A3000, with an air content between 5% and 8%.
- .3 Butyl rubber sealant for joining manhole components: Conseal CS 302 as manufactured by Concrete Sealants Inc. or Kent Seal No. 2 as manufactured by Hamilton Kent Ltd.
- .4 Rungs: Aluminum MSU Model 350 climbing rungs complete with Model 3102 safety T-handle handles as manufactured by MSU Mississauga Ltd.
- .5 Hatches: [Aluminum MSU Type M access hatches as manufactured by MSU Mississauga Ltd.] Sizes as specified in the Contract Documents.
- .6 Frames and Covers: Cast iron in accordance with ASTM A48, Class 30B. Provide Model [ ] as manufactured by [ ] or similar style as manufactured by [Norwood Foundry, Titan Foundry, or Neenah Foundry].
- .7 Flexible connectors: Kor–N–Seal pipe to manhole connectors as manufactured by NPS Inc.
- .8 Cement grout: To consist of 1 part Type 50 Sulphate Resistant Portland Cement to 2 parts sand with sufficient water to produce a stiff paste.

## **2.2 SHOP FABRICATION**

- .1 Form or core openings in the manhole sections to accommodate pipe penetrations and flexible connectors. Keep the diameter of each opening to the minimum required to accommodate the pipe penetration or flexible connector. Exercise care during the coring operation to prevent damage to the manhole section.

## **3.0 EXECUTION**

### **3.1 EXCAVATION AND PREPARATION OF THE FOUNDATION**

- .1 Excavate the manhole foundation to the specified elevations as specified in the Contract Documents.
- .2 Provide care of water to permit the work to be carried out in the dry.
- .3 The Minister will identify unsuitable bearing soils when encountered at the earth foundation level. Perform [excavation, as classified by the Minister,] [Authorized Structure Over-Excavation] to remove unsuitable bearing soils and replace with [fill materials] [Authorized Fill Placement] as directed by the Minister.
- .4 Compact the base of the excavation to provide a firm foundation of uniform density beneath the manhole.

### **3.2        INSTALLATION**

- .1    Install precast concrete manholes at the locations, of the sizes, and to the lines, grades, slopes, and elevations specified in the Contract Documents. The tolerance from specified lines, grades, slopes, and elevations is +/-15 mm, and the maximum variation from plumb is 1H:300V.
- .2    Install the sealant between manhole components in strict accordance with the manufacturer's written instructions to provide a watertight joint.
- .3    Install the flexible connectors in strict accordance with the manufacturer's written instructions to provide a watertight joint.
- .4    Completely fill the gaps between the manhole sections and pipes with cement grout to provide a watertight joint. Continuously moist cure and protect the grout for a minimum of 7 consecutive days at a minimum temperature of 10°C.
- .5    Do not commence backfilling operations until the Minister has inspected the manhole installation. Rectify defects, including any identified by the Minister.
- .6    Provide the specified backfill evenly around manholes to avoid displacing the manhole components.
- .7    Within 1000 mm of the manhole, remove stones larger than 80 mm in diameter from the fill material. Place fill in lifts not exceeding 100 mm in thickness. Compact each lift using pneumatic or mechanical hand tamping equipment.
- .8    Compact each lift of fill at the moisture content and to the density specified in Section 02331 – Fill Placement.
- .9    Prevent displacement of the manholes through floatation.
- .10    Maintain the interior of the manholes free of foreign material.

**END OF SECTION**