

## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section 03 41 00 - Precast Structural Concrete
- .2 Section 31 23 33.01 - Excavating Trenching and Backfilling
- .3 Section 31 05 16 - Aggregate for Earthworks

### 1.02 MEASUREMENT PROCEDURES

- .1 Measure excavation and backfill in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling. Excavation to be included in unit price of catch basin installation.
- .2 Catch Basin backfilling to be included in unit price of catch basin installation.
- .3 Measure catch basins in units for lump sum unit pricing for complete installation.
- .4 Adjusting tops of existing maintenance holes or catch basins to be included in lump sum of work.
- .5 Gratings to be included in unit price of catch basin installation.
- .6 Any other additional materials to be included in unit price of catch basin installation.

### 1.03 REFERENCE STANDARDS

- .1 ASTM International
  - .1 ASTM A 48/A 48M-03(2012), Standard Specification for Grey Iron Castings.
  - .2 ASTM A 123/A 123M-2012, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .3 ASTM C 117-13, Standard Test Method for Materials Finer than 75-mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .4 ASTM C 136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .5 ASTM C 139-11, Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
  - .6 ASTM C 478M-13, Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric).
  - .7 ASTM D 698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

- .4 CSA Group
  - .1 CSA A23.1/A23.2-19, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA-A165 Series-04(R2009), CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
  - .3 CAN/CSA-A3000-18, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .4 CSA G30.18-09 R2019, Carbon Steel Bars for Concrete Reinforcement.

#### **1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for catch basin structures and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Newfoundland, Canada.

#### **1.05 QUALITY ASSURANCE**

- .1 Certifications:
  - .1 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect and catch basin structures from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Precast concrete:
  - .1 In accordance with Section 03 41 00 - Precast Structural Concrete.
  - .2 CAN/CSA-A3001, Type GU.
  - .3 Concrete mix design to produce 35 MPa minimum compressive strength at 28 days and containing 20 mm maximum size coarse aggregate, with water/cement ratio to CSA A23.1, F-2 exposure and 75 mm slump at time and point of deposit.
    - .1 Air entrainment to CSA A23.1, class F-2 exposure.
- .2 Precast catch basin sections: to ASTM C 478M.
- .3 Joints: made watertight using rubber rings, bituminous compound, epoxy resin cement or cement mortar. The rubber compound used shall consist of synthetic nitrile butadiene rubber polymer and shall conform with the sealing and oil resistance requirements for Oil-Resistant Gaskets.
- .4 Mortar:
  - .1 Aggregate: 10 mm maximum.
  - .2 CAN/CSA-A3002.
- .5 Ladder rungs: to CSA G30.18, No.25M billet steel deformed bars, hot dipped galvanized to ASTM A 123/A 123M.
  - .1 Rungs to be safety pattern (drop step type).
- .6 Adjusting rings: to ASTM C 478M.
- .7 Concrete Brick: to CAN/CSA-A165 Series.
- .8 Galvanized iron sheet: approximately 2 mm thick.
- .9 Frames, gratings, covers to dimensions as indicated and following requirements:
  - .1 Metal gratings and covers to bear evenly on frames.
    - .1 Frame with grating or cover to constitute one unit.
    - .2 Assemble and mark unit components before shipment.
  - .2 Gray iron castings: to ASTM A 48/A 48M, strength class 30B.
  - .3 Castings: coated with two applications of asphalt varnish.
- .10 Granular bedding and backfill: in accordance with Section 31 05 16 - Aggregate for Earthworks.

## 3 EXECUTION

### 3.01 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for maintenance holes and catch basin structures installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of DR.

- .2 Inform DR of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from DR.

### 3.02 EXCAVATION AND BACKFILL

- .1 Excavate and backfill in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling and as indicated.
- .2 Obtain approval of DR before installing catch basins.

### 3.03 CONCRETE WORK

- .1 Do concrete work in accordance with Section 03 41 00 - Precast Structural Concrete.
- .2 Position metal inserts in accordance with dimensions and details as indicated.

### 3.04 INSTALLATION

- .1 Construct units in accordance with details indicated, plumb and true to alignment and grade.
- .2 Complete units as pipe laying progresses.
- .3 Dewater excavation to approval of DR and remove soft and foreign material before placing concrete base.
- .4 Set precast concrete base on 150 mm minimum of granular pipe bedding compacted to 100% standard maximum density to ASTM D 698.
- .6 Precast units:
  - .2 Make each successive joint watertight with DR approved rubber ring gaskets (nitrile rubber that is hydrocarbon resistant), bituminous compound, cement mortar, epoxy resin cement, or combination of these materials.
  - .3 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
  - .4 Plug lifting holes with concrete plugs set in cement mortar or mastic compound.
- .7 For sewers:
  - .1 Place stub outlets and bulkheads at elevations and in positions indicated.
- .8 Compact backfill to 100% standard maximum density to ASTM D 698.
- .10 Installing units in existing systems:
  - .1 Where new unit is installed in existing run of pipe, ensure full support of existing pipe during installation, and install new unit as specified.
  - .2 Make joints watertight between new unit and existing pipe.
  - .3 Where deemed expedient to maintain service around existing pipes and

when systems constructed under this project are ready for operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.

- .11 Set frame and cover to required elevation on precast grade rings.
- .12 Place frame and cover on top section to elevation as indicated.
  - .1 If adjustment required use concrete ring.
- .13 Clean units of debris and foreign materials.
  - .1 Remove fins and sharp projections.
  - .2 Prevent debris from entering system.
- .14 Install safety platforms in maintenance holes having depth of 5 m or greater, as indicated.

### 3.05 ADJUSTING TOPS OF EXISTING UNITS

- .1 Remove existing gratings, frames and store for re-use at locations designated by DR.
- .2 Sectional units:
  - .1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
  - .2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section.
    - .1 When amount of raise is less than 600 mm use standard maintenance moduloc or grade rings.
- .3 Monolithic units:
  - .1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation with mortared brick course for 150 mm or less alteration.
  - .2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
  - .3 When monolithic units with tapered upper section are lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
  - .4 Install additional maintenance hole ladder rungs in adjusted portion of units as required.
  - .5 Re-use existing gratings, frames.
  - .6 Re-set gratings and frames to required elevation on not more than 4 courses of brick.
    - .1 Make brick joints and join brick to frame with cement mortar, parge and trowel smooth.
    - .2 Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

### 3.06 SEALING OVER EXISTING UNITS

- .1 Cut galvanized iron sheet to extend 50 mm beyond opening of existing maintenance hole or catch basin grating.
  - .1 Center iron sheet over existing grating and spot or stitch weld to

grating.

- .2 Fill with cast-in-place concrete approved by DR.

### **3.07 FIELD QUALITY CONTROL**

- .1 Not used.

### **3.08 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**