

## **PPART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 33 41 00 - Storm Utility Drainage Piping.

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM).
  - .1 ASTM A48/A48M-00, Standard Specification for Gray Iron Castings.
  - .2 ASTM C117-04, Standard Test Method for Materials Finer than 75- $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing.
  - .3 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM C139-05, Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
  - .5 ASTM C478M-06, Standard Specification for Precast Reinforced Concrete Manhole Sections Metric.
  - .6 ASTM D698-00a, 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>)).
- .2 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.
- .3 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CAN/CSA-A3000-03(R2005), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
    - .2 CSA-A3002-03, Masonry and Mortar Cement.
  - .3 CAN/CSA-A165 Series-04, CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
  - .4 CAN/CSA-G30.18-M92(R2002), Billet Steel Bars for Concrete Reinforcement.
  - .5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).

## **PART 1 - GENERAL (CONT'D)**

### **1.3 SUBMITTALS**

- .1 Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

### **1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **1.6 MEASUREMENT FOR PAYMENT**

- .1 Catch Basin: Supply and installation of deep sump non-inspection catch basin, including 600 mm x 600 mm heavy duty prefabricated catch basin frame and grate, as detailed on the drawings, will be measured by the unit installed in place.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Cast-in-place concrete:
  - .1 In accordance with Section 03 30 00 - Cast-in-Place Concrete.
  - .2 Cement: to 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 CAN/CSA-A23.1, C1 exposure and 50 mm to 100 mm slump at time and point of deposit.
    - .1 Air entrainment to CAN/CSA-A23.1, class C1 exposure.
  - .4 Concrete reinforcement: in accordance with Section 03 20 00 - Concrete Reinforcing.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.1 MATERIALS**  
**(CONT'D)**

- .2 Precast catch basin sections: to ASTM C139 and ASTM C478M.
- .3 Joints: made watertight using rubber ring gaskets.
- .4 Mortar:
  - .1 Aggregate: to CSA A82-56.
  - .2 Masonry Cement: to CAN/CSA-A3002.
- .5 Ladder rungs: to CAN/CSA-G30.18, No.25M billet steel deformed bars, hot dipped galvanized to CAN/CSA-G164.
  - .1 Rungs to be safety pattern (drop step type).
- .6 Adjusting rings: to ASTM C478M.
- .7 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 A48/A48M, strength class 30.
  - .3 Castings: coated with two applications of asphalt varnish, sand blasted or cleaned and ground to eliminate surface imperfections.
  - .4 Catch basin frames and covers: minimum 204 kg per set.
- .8 Granular bedding and backfill: in accordance with Section 31 05 17 - Aggregate Materials and following requirements:
  - .1 Crushed stone, gravel, sand.
  - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.
  - .3 Table:

Sieve Designation	% Passing	
	Stone/Gravel	Gravel/Sand
25 mm	100	-
12.5 mm	65-90	100
4.75 mm	35-55	50-100
2.00 mm	25	30-90
0.425 mm	10-25	10-50
0.075 mm	0-8	0-10

## **PART 2 - PRODUCTS** **(CONT'D)**

### **2.1 MATERIALS** **(CONT'D)**

- .9 Non-shrink grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 30 MPa.

## **PART 3 - EXECUTION**

### **3.1 EXCAVATION AND BACKFILL**

- .1 Excavate and backfill in accordance with Section 31 23 10 - Excavating Trenching and Backfilling and as indicated.
  - .1 Obtain approval of Departmental Representative before installing catch basins.

### **3.2 CONCRETE WORK**

- .1 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .2 Place concrete reinforcement in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 Position metal inserts in accordance with dimensions and details as indicated.

### **3.3 INSTALLATION**

- .1 Construct units in accordance with details indicated, plumb and true to alignment and grade.
- .2 Complete units as pipe laying progresses.
  - .1 Maximum of three (3) units behind point of pipe laying will be allowed.
- .3 Dewater excavation to approval of Departmental Representative and remove soft and foreign material before placing concrete base.
- .4 Cast bottom slabs directly on undisturbed ground.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.3 INSTALLATION**  
**(CONT'D)**

- .5 Precast units:
  - .1 Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base.
  - .2 Make each successive joint watertight with approved rubber ring gaskets.
  - .3 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
  - .4 Plug lifting holes with non-shrink grout.
- .6 Compact granular backfill to 95% corrected maximum dry density.
- .7 Place frame and cover on top section to elevation as indicated.
  - .1 If adjustment required use concrete ring.
  - .2 Place non-shrink grout all around frame to secure in place.
- .8 Clean units of debris and foreign materials.
  - .1 Remove fins and sharp projections.
  - .2 Prevent debris from entering system.

**3.4 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.