

1. **GENERAL**

1.1. **General Requirements**

1. Read and be governed by conditions of the *Contract Documents*, including sections of Division 01.
2. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. **Related Work**

- |                                          |    |    |    |                  |
|------------------------------------------|----|----|----|------------------|
| 1. Site Grading                          |    |    |    | Section 31 23 13 |
| 2. Excavating, Trenching and Backfilling |    |    |    | Section 31 23 10 |
| 3. Storm Sewers                          |    |    |    | Section 33 44 00 |
| 4. Aggregates: General Section           | 31 | 05 | 17 |                  |

1.3. **References**

1. ASTM A48/A48M-03 (2016), Specification for Gray Iron Castings.
2. ASTM C139-18 (1989), Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
3. ASTM C478M-90, Specification for Precast Reinforced Concrete Manhole Sections
4. CSA A3000, Portland Cement.
5. CSA A3000, Masonry Cement.
6. CAN/CSA-A23.1-M90, Concrete Materials and Methods for Concrete Construction.
7. CSA A82.56-M1976, Aggregate for Masonry Mortar.
8. CAN3-A165 Series-M85, CSA Standards on Concrete Masonry Units.
9. CAN/CSA-G30.18-M92, Billet Steel Bars for Concrete Reinforcement.
10. CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
11. Ontario Provincial Standard Specification 407.

2. **PRODUCTS**

2.1. **Materials**

1. Precast manhole units: to ASTM C478M, circular or oval. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation. Monolithic bases to be approved by Consultant and set on concrete slabs cast in place.
  1. 1200 mm diameter manhole as per OPSD 701.010.
2. Precast catch basins: to ASTM C478M.
  1. Catch basins as per OPSD 705.010
3. Joints: to be made watertight using rubber rings or cement mortar.
4. Mortar:
  1. Aggregate: to CSA A82.56.

2. Cement: to CAN/CSA-A8.
5. Ladder rungs: to CAN/CSA-G30.18, No. 25M billet steel deformed bars, hot dipped galvanized to CAN/CSA G164 Rungs to be safety pattern (drop step type).
6. Adjusting rings: to ASTM C478M.
7. Concrete Brick: to CAN3-A165 Series.
8. Frames, gratings, covers to dimensions as indicated and following requirements:
  1. Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
  2. Gray iron castings: to ASTM A48, strength class 30B.
  3. Castings: coated with two applications of asphalt varnish.
  4. Storm manhole frames and covers: heavy duty municipal type for road service. Cover cast without perforations and complete with two 25 mm square lifting holes, as per OPSD 400.010, unless otherwise specified.
  5. Catchbasin frame and cover: as per OPSD 400.010.
  6. Manhole frame and cover as per OPSD 401.010.
9. Granular bedding and backfill: Granular B Type I: to OPSD 1010 and Section 02701 – Aggregates: General and to Section 02315 – Excavating, Trenching and Backfilling.
10. Unshrinkable fill: to Section 02315 – Excavating, Trenching and Backfilling.
3. **EXECUTION**
- 3.1. **Excavation and Backfill**
  1. Excavate and backfill in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
  2. Obtain approval of Consultant before installing manholes or catch basins.
- 3.2. **Installation**
  1. Construct units in accordance with details indicated, plumb and true to alignment and grade.
  2. Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.
  3. Dewater excavation free of standing water or as directed by Consultant and remove soft and foreign material before placing concrete base.
  4. Set precast concrete base on 150 mm minimum of granular bedding compacted to 100% Corrected Maximum Dry Density.
  5. Precast units.
    1. Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight with rubber ring gaskets, cement mortar, or combination thereof.
    2. Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
    3. Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
  6. For sewers:

1. Place stub outlets and bulkheads at elevations and in positions indicated.
2. Bench to provide a smooth U-shaped channel in manholes.
7. Compact granular backfill to 98% Corrected Maximum Dry Density.
8. Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.
9. Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

3.3. **Leakage Test**

1. Visual inspection of leakage will be carried out. If any leakage is observed, correct leakage as directed by Consultant at no additional cost.

**END OF SECTION**