

**Part 1 General**

**1.1 REFERENCES**

- .1 Canadian Standards Association (CSA)
  - .1 CSA A23.1-09/A23.2-09 – Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA-A23.3-04(R2010) – Design of Concrete Structures.
  - .3 CSA-G30.18--09, Carbon Steel Bars for Concrete Reinforcement.

**1.2 SHOP DRAWINGS**

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

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility as approved by the Departmental Representative.
- .5 Divert unused concrete materials from landfill to local facility as approved by the Departmental Representative.
- .6 Fold up metal banding, flatten and place in designated area for recycling.

**1.4 EXISTING CONDITIONS**

- .1 Subsurface investigation report bound into specification following Section 31 80 10 – Subsurface Investigation Report.
- .2 Notify the Departmental Representative in writing if subsurface conditions at site differ from those indicated and await further instructions from the Departmental Representative.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Concrete mixes and materials: in accordance with Section 03 05 10- Cast-in-Place Concrete.
- .2 Reinforcing steel: to CAN/CSA-G30.18 and in accordance with Section 03 05 10- Cast-in-Place Concrete.

## **2.2 SOURCE QUALITY CONTROL**

- .1 Concrete tests: to CSA-A23.2.

## **Part 3 Execution**

### **3.1 FIELD RECORDS**

- .1 Provide the Departmental Representative with copies of records.

### **3.2 INSTALLATION**

- .1 Contractor to coordinate locations of piles with ALL utilities and site confirm all dimensions prior to pile install.
- .2 Bore holes to diameters as indicated until required bearing stratum as determined by the Departmental Representative is reached.
- .3 On reaching required depth excavate bell to details as indicated.
- .4 Plus or minus deviations from the shaft length shown on the drawings, if required by soil conditions encountered, will be paid for at the unit prices bid on in the unit price form. For pricing purposes, plus or minus deviations of 0.5 m or less will be considered the same as zero deviation.
- .5 Check each bored shaft for toxic and explosive gases and provide appropriate protective measures for personnel working in shaft.
- .6 Dispose of excavated materials as directed by the Departmental Representative.
- .7 The Departmental Representative to inspect pile excavation prior to placing of concrete. Remove loose material, foreign matter and water as directed by the Departmental Representative. Place concrete within two hours of completing cleaning of the pile base.
- .8 Install steel reinforcement in accordance with Section 03 05 10- Cast-in-Place Concrete.
- .9 Fill pile excavations with concrete to elevations as indicated. Place concrete in one continuous pour in accordance with Section 03 05 10- Cast-in-Place Concrete.
- .10 Where required, use steel protective casing approved by the Departmental Representative. Ensure penetration of casing to required depths either by self-mass or driving. Have protective steel casing on site at time of drilling.
- .11 Vibration may be carried out before removing casing.
- .12 Withdraw steel protective casing immediately upon completion of concreting. Top up concrete displaced by casing withdrawal. Ensure top of pile is fully compacted/vibrated and adequately finished.

### **3.3 DEFECTIVE PILES**

- .1 Cased concrete shaft piles shall be rejected where:
  - .1 Soil has entered casing.
  - .2 Water has entered casing.
  - .3 Casing is damaged, out of tolerance or alignment.
- .2 Defective piles to be cut off at elevation specified by the Departmental Representative.

### **3.4 TOLERANCES**

- .1 Locate centerline of piles within the following tolerances:
  - .1 Maximum Variation of Location:
    - .1 For pile diameters of 600 mm or less: 25 mm
    - .2 For pile diameters greater than 600 mm: 1/24<sup>th</sup> of shaft diameter.
  - .2 Shafts Out of Plumb: maximum of 1.5% of length or 12.5% of shaft diameter, whichever is less.
- .2 Concrete Cut-off Elevation: plus 25 mm to minus 75 mm
- .3 If tolerances are exceeded and result in excessive eccentricity, propose corrective construction to compensate. Submit proposal for review and approval by Departmental Representative prior to proceeding.

**END OF SECTION**