

**PART 1. GENERAL**

**1.1 REFERENCES**

- .1 CSA-A23.1 (latest edition): Concrete Materials and Methods of Concrete Construction.
- .2 CSA-A23.2 (latest edition): Methods of Test for Concrete.
- .3 CSA A283 (latest edition): Qualification Code for Concrete Testing Laboratories.
- .4 CSA G30.5-M1983: Welded Steel Wire Fabric for Concrete Reinforcement.
- .5 CAN/CSA-G30.18-M92: Billet-Steel Bars for Concrete Reinforcement.
- .6 Reinforcing Steel: Reinforcing Steel Manual of Standard Practice, Institute of Canada (RSIC), Third Edition, 1996.

**1.2 RELATED SECTIONS**

- .1 Section 01 10 10 - General Instructions

**1.3 STANDARDS ON SITE**

- .1 Keep a copy of CAN/CSA-A23.1 (latest edition) at the work site, and make available for reference.

**1.4 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit reinforcement shop drawings clearly showing plan, layout, sizes, dimensions, installation details, bar lists, chair sizes and other relevant details and information.

## **1.5 QUALIFICATIONS**

- .1 Concrete shall be supplied by an approved and qualified concrete supplier.

## **PART 2. PRODUCTS**

### **2.1 MATERIALS**

- .1 Reinforcing steel:
  - .1 billet steel, to CAN/CSA-G30.18 (latest edition), Grade 60 deformed bars.
  - .2 size as shown on drawings.
- .2 Reinforcing steel and welded wire fabric supports:
  - .1 Footings and slabs-on-grade:
    - .1 Class C, Type CB chairs or bolsters.
    - .2 of adequate for strength and support of reinforcing steel under construction loads.
- .3 Reinforcing polypropylene fibres:
  - .1 Acceptable products: PSI Fibrestrand 150 by Euclid
- .4 Non-shrink grout:
  - .1 Acceptable products: SikaGrout 212 HP

### **2.2 REINFORCING STEEL FABRICATION**

- .1 Fabricate and detail reinforcement in accordance with Reinforcing Steel Institute of Canada Manual of Standard Practice.
- .2 Do bending and splicing in accordance with CAN/CSA-A23.1 (latest edition).

### **2.3 MIX DESIGNS**

- .1 Proportion concrete in accordance with CAN/CSA-A23.1 (latest edition), Alternative 1 to give the following properties.
- .2 Have mix design prepared by concrete supplier, or CSA Certified Materials Testing Laboratory, to meet the criteria for the specified mix.

.3 Mix design:

	<u>All Concrete</u>
<b>Class</b>	F-1
<b>Nominal Maximum Size Aggregate</b>	3/4" (19 mm)
<b>Slump</b>	50mm to 100mm
<b>Air Content</b>	5% to 7%
<b>Minimum Compressive Strength at 28 days</b>	32 MPa
<b>Other Admixtures</b>	None

- .4 Materials, proportions and source of supply of ready-mixed concrete shall be subject to review by the Departmental Representative.
- .5 Provide 3.0 kg/m<sup>3</sup> of polypropylene micro-fibre in concrete mix for oil pipe encasement. Mix in accordance with manufacturer's specifications.

### PART 3. EXECUTION

#### 3.1 PLACING REINFORCEMENT

- .1 Accurately space and support reinforcement in accordance with CAN/CSA-A23.1-M (latest edition).
- .2 Minimum clear cover for reinforcement shall be in accordance with CAN/CSA-A23.1 (latest edition) and as detailed.
- .3 Place reinforcing steel supports in continuous rows at 30-inches centre-to-centre.
- .4 Coordinate placement of reinforcement with Mechanical trade.
- .5 Placement of reinforcement shall proceed in such a way to prevent damage to rink piping. All damage shall be reported to mechanical trade for immediate repair.
- .6 Upon completion of reinforcement installation and prior to concrete pour, the Consultant to inspect installation. Give 72 hour written

notice of date for review to the Consultant and Departmental Representative. Make corrections as required to satisfaction of the Consultant.

### **3.2 PLACING**

- .1 Handling, depositing, consolidation and vibration shall conform to CAN/CSA-A23.1 (latest edition).
- .2 Appropriate measures shall be taken to ensure rink piping reinforcement and other embedded items are not damaged or displaced by workers, equipment, or other loads which may be present during the concreting operation.
- .3 Give 72 hours written notice of date for concrete placement to the Consultant and Departmental Representative.

### **3.3 CURING AND PROTECTION**

- .1 Curing and protection shall conform to CAN/CSA-A23.1 (latest edition).

### **3.4 CONCRETE FINISHINES**

- .1 All exposed surfaces to have steel trowel finish.
- .2 Hand steel trowel surfaces not accessible for power trowelling.

### **3.5 TESTING**

- .1 A Testing Company shall be employed by the Contractor at his expense to advise on quality control regarding all aspects of protection, mixing, transporting, placing, and finishing of the cast-in-place concrete.
- .2 Review and testing of concrete and concrete materials shall be carried out by a testing laboratory certified in accordance with CSA A283 (latest edition).
- .3 Provide access to the work for review and selection of samples, and provide materials required for test specimens.
- .4 Materials for concrete shall be tested, if required, and approved before concrete placing begins.

- .5 Cast a minimum of one (1) set of three (3) standard cylinders for each 100 cubic-yards of concrete placed.
- .6 One cylinder shall be tested at age seven (7) days; remaining two (2) at age 28 days.
- .7 Report test results will be issued to the Contractor and Consultant.
- .8 Slump and air content tests will be taken at intervals as frequent as considered necessary, and if required, make immediate adjustments to correct them.
- .9 Cement:
  - .1 to CAN/CSA-A5-M (latest edition), Type 10.
- .10 Fine and coarse aggregates:
  - .1 to CAN/CSA-A23.1 (latest edition).
- .11 Air entraining admixture:
  - .1 to CAN3-A266.1 (latest edition)
  - .2 Acceptable products: Darex AEA as manufactured by Grace Construction Materials.
- .12 Insulation:
  - .1 extruded polystyrene, shiplapped edges
  - .2 to CAN/CGSB-51.20-M (latest edition), Type VI
  - .3 Acceptable products: Styrofoam Highload-40.
- .12 Cement board:
  - .1 aggregated portland cement board with vinyl-coated, woven glass-fibre mesh embedded in front and back surfaces, specially formulated to resist water and steam, square cut and smooth finished edges.
- .13 Isolation board:
  - .1 Acceptable products: Sealtight Asphalt Expansion Joint Filler by W.R. Meadows.

**END OF SECTION**