Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 00 – Concrete Forming and Accessories.

.2 Section 03 20 00 – Concrete Reinforcing.

1.2 REFERENCES

.1 Abbreviations and Acronyms:

.1 Cement: hydraulic cement or blended hydraulic cement (the “b” suffix denotes blended product).

.1 Type GU or GUb - General use cement.

.2 Reference Standards:

.1 CSA International

.1 CSA A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06 R2011, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001-88).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 At least 4 weeks prior to beginning Work, provide Departmental Representative with samples of materials proposed for use as follows:

.1 Curing compound.

.2 Type of supplementary cementing material.

.3 Type of blended hydraulic cement.

.4 Admixture.

.5 Fine and coarse aggregate.

.3 Provide testing results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.4 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Departmental Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.3 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials, in accordance with section 01 74 21 – Construction/Demolition Waste Management.

1.5 Management and waste disposal

.1 Route concrete and the concrete constituents unused to a local recycling facility authorized by the Departmental Representative.

.2 Route unused additives to a site approved collection hazardous materials authorized by the Departmental Representative.

.3 It is forbidden to dump unused adjuvants in sewers, in a course of water, in a lake, on the ground or at any other place where it may present a risk to health or the environment.

Part 2 Products

2.1 FORMS

.1 Materials formwork

.1 For concrete without architectural features, use wood and wood products, formwork materials to CSA 0121, CAN/CSA-086, CSA 0437 Series - F93 (R2006) and CSA0153.

.2 For concrete with architectural features, use of formwork materials to CSA-A23.1/A23.2.

.2 Form ties

.1 For concrete not designated “Architectural”, use of removable metal or snap-off materiel ties, fixed length or control, having no device that could leave on the surfaces of concrete holes with a diameter greater than 25 mm.

.2 In the case of concrete to present architectural features, use snap ties complete with plastic cones and light gray concrete plugs.

.3 Form release: non-toxic, biodegradable, low VOC content.

.4 Falsework materials: to CSA Standard S269.1.

.5 Construction and installation

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1.

.5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.6 Align form joints and make watertight.

.7 Keep form joints to minimum.

.8 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

.9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.10 Incorporate anchors, sleeves and other embedded items required for works specified in other sections.

.11 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.12 Before pouring the concrete, clean forms according to the CSA-A23.1/A23.2.

.6 Remove formwork:

.1 Leave formwork in place for 24 hours after placing concrete.

2.2 CONCRETE REINFORCING

.1 Reinforcing steel, deformed steel wire for concrete reinforcement, chairs, bolsters, bar supports: to Section 03 20 00 – Concrete Reinforcing.

2.3 MIXE

.1 Prescriptive Method for specifying medium concrete: mix in accordance with CSA A23:

.1 Concrete type 1: wall concrete:

.1 Use cement type GU-SF.

.2 Compressive strength at 28 days age: 35 MPa minimum.

.3 Class of exposure: C-1.

.4 Water/cement report, maximum mass: 0.40.

.5 Coarse aggregate nominal size: 50-80 microns.

.6 Slump: at time and point of discharge: 150 to 200 mm.

.7 Admixture: approved by Departmental Representative and used to correct a default mixture or to facilitate the pouring.

2.4 MATERIALS/EQUIPMENT

.1 Cement: for general use, in accordance with CSA standard A3001, GU type or GUb.

.2 Water: to CSA A23.1

.3 Aggregates: to CSA A23.1/A23.2.

.4 Admixture:

.1 Air Coach: to ASTM C260 standard.

.2 Chemical admixture: to ASTM C494 standard. Departmental Representative must accept accelerator or retarder used to pouring in cold weather or hot weather.

.5 Curing: white, to CSA A23.1/A23.2.

Part 3 Execution

3.1 PREPARATION

.1 Obtain the written approval from from Departmental Representative before the pouring.

.1 Provide Departmental Representative48 hours notice before each concrete pour.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.

.4 Protect previous Work from staining.

.5 Ensure reinforcement and embedded parts are not moved during commissioning pouring of concrete.

.6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Clean and remove stains prior to application of concrete finishes.

.8 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work in accordance with CAN/CSA A23.1.

.2 Building the wall with reinforcing steel as indicated on the plan.

.3 Do not pour fresh concrete into water.

.4 Inserts:

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.

.5 Finishes:

.1 Formed concrete surfaces in accordance with CSA A23.1.

3.3 DRAINAGE HOLES

.1 Built a concrete coating around the prefab pipe under the existing drainage manhole.

.2 Level the foundation with aggregates 14-20 mm.

.3 Drill the existing manhole and seal it with a concrete mass as indicated on drawing.

.4 Install a grating at the exit pipe with galvanized reinforcing. Fix the grating with chemical anchors.

3.4 FAUTLY CONCRETE

.1 Concrete that does not comply with the requirements of the drawings and specifications or that the apparent surface is not accepted by the Departmental Representative shall be considered faulty.

.2 Repair of exposed concrete surfaces shall not be undertaken before Departmental Representative notes defaults.

.3 Defaults do not affect the structural capacity, such as not conform concrete to details and elevations indicated on the drawings, the fastening pin holes and concrete with small cavities on the surface caused by air bubbles or honeycombs:

.1 Defaults can be repaired if usual methods and durable material that provide the repaired surfaces will be identical, in the short and long term, to adjacent surfaces.

.2 Built parts where including too many defaults, must be demolished and rebuilt without cost for the Departmental Representative.

.4 Concrete defaults that affect the structural capacity, such as concrete with insufficient strength and concrete with honeycombs or imperfections that compromise its structural efficiency, will be demolished and rebuilt without cost for Departmental Representative.

.5 Apparent repair surfaces are subject to be approved by the Departmental Representative. It may require representative repair defaults to ensure uniformity and similarity for surfaces and joint concealment. If repairs are rejected for their appearance, parts of faulty concrete will be rebuilt to the Departmental Representative satisfaction.

.6 Smudges, streaks and other unsightly irregularities of exposed surface must be removed within 24 hours after stripping.

3.5 IMPLEMENTATION OF TOLERANCE

.1 Concrete tolerance to CSA A23.1; Straightedge Method.

3.6 FIELD QUALITY CONTROLE

.1 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2 and its satisfaction and the cost of these tests will be undertake by Departmental Representative.

.2 Departmental Representative will undertake the cost of testing for ministerial purposes.

.3 Departmental Representative will collect additional samples at cold weather concreting work. The treatment of these samples should be at the site in the same conditions as mixing concrete.

.4 Inspection and testing by the Consultant can neither replace nor supplement the quality control performed by the Contractor, nor does it emit its contractual responsibilities in this regard.

3.7 CLEANING

.1 Perform cleanup in accordance with Section 01 74 11 – Cleaning.

.2 Designate cleaning area for tools to limit water use and runoff.

.3 Cleaning of concrete equipment to be done in accordance with Section 01 35 43 Environmental Procedures

.4 Waste Management: separate waste materials for reuse/reuse and their recycling in accordance with Section 01 74 21 – Construction/Demolition Management and Disposal.

END OF SECTION