

SPECIFICATION

Section 03410 - Hollow Core Precast/Prestressed Concrete

1.0 General

1.1 Description

- .1 The General conditions of the Contract and Supplementary General Conditions apply to this Division, except as qualified herein and/or excluded.
- .2 Refer to the drawings and specifications.
- .3 The precast hollow core slabs shall be the "extra-long span"® as produce by Schokbeton Québec Inc., and shall be of dimensions and type as shown on the drawings.

1.2 Related Work

- .1 Cast-in-Place Concrete: **Section 03300**

[Spec Note: *The following items relating to precast/prestressed slabs, carried out by other trades, should be covered in their respective specifications.*]

- (1) Drypacking of gap between precast/prestressed slabs at all locations where load-bearing walls are parallel to length of slab.
- (2) Perimeter caulking.
- (3) Electrical holes.
- (4) Concrete topping (minimum 37 mm [1 1/2"])

1.3 Reference Standards

Spec Note: *List latest standards. Specifier to update specifications to latest edition.*

- .1 Do precast/prestressed concrete work in accordance with **CSA A23.4** and **CSA A23.3**.
- .2 Do welding in accordance with **CSA W59** for welding to steel structures and **CSA W186** for welding reinforcement.

1.4 Qualifications of Manufacturer

- .1 Fabricate precast/prestressed concrete elements certified by the Canadian Standards Association in the appropriate category(ies) according to **CSA Standards A23.4-00 / A251** "Precast Concrete - Materials and Construction". The precast concrete manufacturer shall be certified in accordance with the CSA Certification program for Structural Precast/Prestressed Concrete prior to submitting a tender and must specifically verify as part of his tender that he is currently certified in the appropriate category(ies):
 - (A) Precast Concrete Products - Architectural
 - (I) Non-Prestressed or (II) Prestressed
 - (B) Precast Concrete Products - Structural
 - (I) Non-Prestressed or (II) Prestressed
 - (C) Precast Concrete Products - Specialty
 - (I) Non-Prestressed or (II) Prestressed

Only precast concrete elements fabricated by certified manufacturers are acceptable to the Owner. Certification must be maintained for the duration of the fabrication and erection for the project. Fabricate precast concrete elements in accordance with _____(Provincial) Building Code requirements.

- .2 The precast concrete manufacturer shall have a proven record and satisfactory experience in the design, manufacture and erection of precast concrete facing units of the type specified. The company shall have adequate financing, equipment, plant and skilled personnel to detail, fabricate and erect the work of this Section as required by the Specification and Drawings. The size of the plant shall be adequate to maintain the required delivery schedule.

1.5 Design Criteria

- .1 Design precast/prestressed concrete units to **CSA A23.3** and to carry handling stresses.
- .2 Design loads in accordance with applicable codes for use and occupancy, wind, temperature, and earthquake.
- .3 Consider vibration characteristics in accordance with NBC.
- .4 Design prestressed units to meet one (1) or two (2) hour fire resistance rating [**specify**].

1.6 Source Quality Control

- .1 Upon request, provide Engineer with certified copies of quality control tests and inspection related to project as specified in **CSA Standards A23.4 - 00 / A251**.
- .2 Inspection of prestressed concrete tendons is required in accordance with **ASTM Standards A416M, A421 and A722** (As specified in A23.1 – 00 "7.4 – Prestressing Steel").
- .3 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel supplied, showing physical and chemical analysis.

1.7 Shop Drawings

Spec Note: *It is not the Precast Manufacturer's responsibility to confirm and correlate dimensions at the job site.*

- .1 Submit shop drawings in accordance with Section 01340 - Shop Drawings, Product Data.
- .2 Submit shop drawings in accordance with **CSA Standards A23.4 – 00 / A251 – 00 and CSA Standard A23.3**. Upon request, the following items shall be provided:
 - .1 Design calculations for items designed by the Manufacturer
 - .2 Estimated camber
 - .3 Finishing schedules
 - .4 Methods of handling and erection
 - .5 Openings, inserts and related reinforcement
 - .6 Each drawing submitted to bear stamp of qualified Professional Engineer registered in the Province of _____ **[specify]**.

1.8 Warranty

- .1 This Contractor hereby warrants that the precast/prestressed elements will not spall or show visible evidence of cracking, except for normal hairline shrinkage cracks, in accordance with the General Conditions warranty clause, for a one-year period.

2.0 Products

2.1 Materials

- .1 Cement, aggregates, water, admixtures: To **CSA Standards A23.4 - 00 and A23.4./ A251 – 00**.
- .2 Prestressing steel: Uncoated 7 wire cable conforming to **ASTM Standards A416M and A421**.
- .3 Reinforcing steel: To CSA G30.18.
- .4 Anchorages and couplings: To **CSA Standards A23.1 and A23.4 – 00 / A251 - 00**.
- .5 Embedded steel: To **CSA G40.21**, Type M300W
- .6 Welding materials: To **CSA W48.1**.
- .7 Bearing pads: 3mm masonite smooth one side.

- .8 Insulation: Expanded polystyrene to **CAN/CGSB-51-20**.
- .9 Air entrainment admixtures: To **ASTM Standard C260** (As specified in CSA A23.1 – 00 “6.2 – Air Entraining Admixtures”).
- .10 Chemical admixtures: To **ASTM Standard C494** .(As specified in A 23.1 – 00 “6.3 – Chemical Admixtures”).

2.2 Concrete Mixes

- .1 Use concrete mix designed to produce 41 MPa (6000 psi) compressive strength at 28 days with a maximum water/cement ratio to **CSA A23.1**, Table 7 for Class D exposure.
- .2 Air entrainment of concrete mix: To **ASTM Standard C260**.
- .3 Chemical admixtures: To **ASTM Standard C494**.
- .4 Do not use calcium chloride or products containing calcium chloride.

2.3 Grout Mix

- .1 Cement grout: One-part type 10 Portland cement 2 1/2 parts sand, sufficient water for placement and hydration.

2.4 Manufacture

- .1 Manufacture units in accordance with **CSA A23.4**.
- .2 Mark each precast unit to correspond to the identification mark on shop drawings for location on a part of unit which will not be exposed.
- .3 Provide hardware suitable for handling elements.
- .4 Provide 50mm (2") thick insulation plug at each cell end of hollow core at exterior **[optional]**.

3.0 Execution

3.1 Erection

- .1 The erection shall be performed by the manufacturer himself within the allowable tolerances indicated or specified.
- .2 Erection tolerances to be non-cumulative in accordance with **CSA A23.4**, Section 10.

- .3 Install 3mm masonite bearing pads, smooth side up when bearing on concrete or masonry supports.
- .4 Set units in a tight, level position on true level bearing surface. A clean and leveled surface shall be provided by others prior to installation. Minimum bearing 90mm (3 1/2") on masonry and 75mm (3") on structural steel.
- .5 Fasten precast/prestressed units in place as indicated on reviewed shop drawings.
- .6 Level differential elevation of horizontal joints with grout to slope not more than 1:12.
- .7 Clean field welds with a wire brush and touch up with primer.
- .8 Each respective trade will field cut holes and openings themselves for mechanical trades but only after having received the proper instruction and authorization from Schokbeton. Openings of 10" x 10" or greater are to be located on shop drawings at time of approval to be formed in the plant or cut in field. Do not cut reinforcing without prior approval of the precast hollow core slab manufacturer and the Engineer.
- .9 Following the installation of the piping, conduits and other specialized items once the installation of the slab has taken place all holes and openings will have to be filled and sealed with an expandable (non-shrink) grout
- .10 The general contractor will examine in detail all specifications, articles and conditions make himself aware of all the work involving the different trades linked to his work. He will assume and execute at his costs all work that is not explicitly described in the specification, but nevertheless is required or necessary in order to perform and complete the work in the best practice of the trade.
- .11 The general contractor will provide good, leveled and well compacted access roads and working area for the cranes and trucks.

3.2 Topping

- .1 This contractor shall provide a suitable top finish to accept direct application of finished flooring/roofing as per room finish schedule.
- .2 Where concrete topping (minimum 37mm [1 1/2"]) is to be applied by others, refer to the appropriate specifications. The top surface of the precast/prestressed slabs is to be raked (roughened) for bonding of the topping.
- .3 The placing of the concrete topping on the slabs shall not be performed whenever the temperature is below 10°C

3.3 Exposed Ceilings

- .1 Caulk exposed ceiling longitudinal joints, using standard caulking.
- .2 The underside of precast shall be finished as per **CSA A23.4** (clause 24.2.2) STANDARD FINISH. To receive a textured paint.

3.4 Clean-Up

- .1 Upon completion of the work of this section, all surplus material and debris shall be removed from the site.

3.5 Work not included

- .1 The supply and installation of steel framings, supports, bolts, inserts, support base, anchor plates, cornices for ceilings and all steel support. Provision of access to the site. All site preparation work in order to execute the work safely and to have free available access for our equipments on every floor but as well as around the perimeter of the building.
- .2 All required and necessary permits from the proper authorities in order to execute the work including but not limited to the rental of road.