

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 10 00 – Concrete forming and accessories
- .2 Section 03 20 00 – Concrete reinforcing
- .3 Section 03 37 26 – Underwater placed concrete
- .4 Section 03 41 00 – Precast structural concrete

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .2 ASTM D260-86(2001), Standard Specification for Boiled Linseed Oil.
 - .3 ASTM D1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.
- .3 CSA International
 - .1 CSA-A23.1/A23.2-2014, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .3 CAN/CSA-G30.18-R2009, Billet-Steel Bars for Concrete Reinforcement.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-installation Meetings: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart, convene pre-installation meeting one (1) week prior to beginning concrete works.
 - .1 Ensure Departmental Representative testing laboratories attend.
 - .2 Verify project requirements.

1.4 AIMED ELEMENTS

- .1 The main elements aimed by the present section are, without limiting itself to it, the following elements:
 - .1 Bases of mooring device
 - .2 Base of lamppost
 - .3 Gap between existing Berlin wall and news timbers cribwork
 - .4 Resurfacing existing concrete slab on Berlin wall (top)

- .5 Level adjustment on main south wharf

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.
 - .2 Submit drawings showing formwork and falsework design to: CSA A23.1/A23.2.
 - .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
- .3 At least four (4) weeks prior to beginning Work, inform Departmental Representative of source of fly ash.
 - .1 Do not change source of fly ash without written approval of Departmental Representative.
- .4 At least four (4) weeks prior to beginning Work, submit to Departmental Representative samples of following materials proposed for use: curing compound, joint filler, waterstops.
- .5 At least four (4) weeks prior to beginning Work, submit to Departmental Representative data sheets of following materials to be used in concrete mix:
 - .1 Supplementary cementing materials
 - .2 Blended hydraulic cement
 - .3 Admixture
 - .4 Fine and coarse aggregate
 - .5 Fly ash
- .6 Provide concrete mix formula results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
- .7 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.

1.6 QUALITY ASSURANCE

- .1 Provide to Departmental Representative, four 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
 - .1 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements.
 - .2 Sustainability Standards Certification:
 - .1 Construction Waste Management: provide copy of plan.
 - .2 Recycled Content:
 - .1 Provide listing of recycled content products used.

- .2 When Supplementary Cementing Materials (SCMs) are used, provide evidence to certify reduction in cement from Base Mix to Actual SCMs Mix, as percentage.

1.7 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 the Departmental Representative.
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
 - .3 Packaging Waste Management: remove for reuse, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Performance : to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

- .1 Cement: to CSA A3001, Type GUb – SF ou GUb-F/SF.
- .2 Water: to CSA A23.1/A23.2
- .3 Reinforcing bars: to CAN/CSA-G30.18, Grade 400W.
- .4 Pieces of hardware and sundry equipment: to CSA-A23.1/A23.2.
- .5 Concrete forming: CAN/CSA-S269.3-FM92 and CAN/CSA-A23.4.
- .6 Anchors and supports: to CAN/CSA-G40.21, type 300W, galvanized.
- .7 Galvanizing: Hot-Dip Galvanized, 610 g/m², to ASTM A-123
- .8 Air-entraining admixture : to ASTM C260.
- .9 Admixture
 - .1 Set accelerator are not authorized
 - .2 It's forbidden to use some chloride of calcium or materials which contain it.

- .3 Super plasticizing, water reducer and retarder: to ASTM C494
- .10 Shim spacer: plastic
- .11 Sealer: boiled linseed oil to ASTM D260
- .12 Welded steel wire fabric: to ASTM A185.
- .13 Premoulded joint filler:
 - .1 Bituminous impregnated fibreboard: to ASTM D1751.
- .14 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.

2.4 MIXES

- .1 Concrete 1 – (resurfacing and concrete bases)
 - .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
 - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in standard 3101, Tome VII, Concrete normal density, Concrete type V.
 - .2 Provide concrete mix to meet following plastic state requirements:
 - .1 Water / cement ratio: less than 0.45
 - .2 Water: 340-365 kg/m³ of concrete (see tome VII)
 - .3 Aggregate size: 2.5-10 mm maximum.
 - .4 Air content: 5-8%
 - .5 L bar: 230 micrometers.
 - .6 Slump at time and point of discharge: 80mm ± 30mm
 - .3 Provide concrete mix to meet following hard state requirements:
 - .1 Durability and class of exposure: C-1
 - .2 Compressive strength at 28 days age: 35 MPa minimum.
 - .3 Intended application: Pedestrians, medium/light vehicle's traffic
 - .4 Finishability: lightly brushed non-slip finish.
 - .5 Permeability in the ions chlorinates: 1500 Coulombs
 - .4 Submit a management plan of the quality to assure the quality control of the concrete according to the specified performance requirements.
 - .5 Concrete supplier's certification
 - .2 Concrete 2 – (Gap between existing Berlin wall and news timbers cribwork)
 - .1 Lean concrete 20 MPa
 - .1 The Contractor have to provide a concrete mix for lean concrete supplying for the Departmental Representative approval.

Part 3 Execution

3.1 PREPARATION

- .1 Provide Departmental Representative 24 hour notice before each concrete pour.

- .2 Coordinate every sequence of concreting with the test laboratory indicated by the Departmental Representative for testing and sampling during concreting
- .3 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .4 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.
- .5 Protect previous Work from staining.
- .6 Clean and remove stains prior to application of concrete finishes.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.
- .2 Sleeves and inserts:
 - .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.
 - .2 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.
- .3 The Contractor have to plan all the material and the equipment required for concreting during cold weather.

3.3 FINISHES

- .1 Formed surfaces exposed to view: [sack rubbed finish] in accordance with CSA A23.1/A23.2.
- .2 Resurfacing, wharf concrete slab
 - .1 Finishing operations followed by final finishing comprising mechanical floating and wood trowelling to provide lightly brushed non-slip finish.
 - .2 Provide round edges and joint spacings using standard tools.
- .3 Walkway and curbs:
 - .1 Finishing operations followed by final finishing comprising mechanical floating and wood trowelling
 - .2 Provide round edges and joint spacings using standard tools.

3.4 CONTROL JOINTS

- .1 Cut or form control joints in slabs on grade at locations indicated, to CSA A23.1/A23.2 and install specified joint sealer/filler.

3.5 EXPANSION AND ISOLATION JOINTS

- .1 Install premolded joint filler in expansion and isolation joints full depth of slab flush with finished surface to CSA A23.1/A23.2.

3.6 CURING

- .1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.

3.7 SEALING APPLICATION

- .1 After curing is complete, apply two (2) even coats of linseed oil mixture to clean dry surfaces, each at 8 m²/L. Allow first coat to dry before applying second coat.

3.8 SITE TOLERANCES

- .1 Concrete floor slab finishing tolerance to CSA A23.1/A23.2.

3.9 FIELD QUALITY CONTROL

- .1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Departmental Representative.

3.10 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Use trigger operated spray nozzles for water hoses.
- .3 Designate cleaning area for tools to limit water use and runoff.
- .4 Cleaning of concrete equipment to be done in accordance with Section 01 35 43 Environmental Procedures.
- .5 Waste Management: separate waste materials for reuse, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Divert unused concrete materials from landfill to local quarry or facility after receipt of written approval from Departmental Representative.
 - .2 Provide appropriate area on job site where concrete trucks and be safely washed.
 - .3 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

END OF SECTION