
Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM F1554-18, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength
- .2 CSA Group (CSA)
 - .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .3 CAN/CSA G30.18-09 (R2014), Billet-Steel Bars for Concrete Reinforcement.
- .3 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2018, Reinforcing Steel Manual of Standard Practice.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer s instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Newfoundland and Labrador, Canada.
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.
- .4 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 60 minutes for concrete delivered to site of Work and discharged after batching.
- .5 Provide concrete testing results for review by Department Representative and do not proceed without written approval when deviations from mix design or parameters are found.

1.3 QUALITY ASSURANCE

- .1 Provide to Departmental Representative, 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
 - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture meet specified requirements.

- .2 Quality Control Plan: provide written report to Departmental Representative verifying compliance concrete in place meets performance requirements.
- .3 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

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 Modifying maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2 is prohibited.
 - .2 Deviations submitted for review by Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.5 AMBIENT CONDITIONS

- .1 Placing concrete during rain or weather events damaging to concrete is prohibited.
- .2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.
- .3 Cold weather protection:
 - .1 Maintain protection equipment, in readiness on Site.
 - .2 Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.
 - .3 Placing concrete upon or against surface at temperature below 5°C is prohibited.
- .4 Hot weather protection:
 - .1 Protect concrete from direct sunlight when ambient temperature above 27°C.
 - .2 Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.
- .5 Protect from drying.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Alternative 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 GU.
- .2 Water: to CSA A23.1/A23.2.
- .3 Reinforcing bars:
 - .1 Billet steel, grade 400, black bars, deformed bars to CSA G30.18, unless indicated otherwise.
 - .2 All reinforcing to be detailed to meet the requirements of RISC.
- .4 Anchor Rods: to ASTM F1554, Grade 36
- .5 Other concrete materials: to CSA A23.1/A23.2.

2.4 MIXES

- .1 Alternative 1 - Performance Method for specifying concrete: to 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 in Quality Control Plan.
 - .2 Provide concrete mix to meet following hard state requirements:
 - .1 Durability and class of exposure: C-1.
 - .2 Compressive strength at 28 days:
 - .1 Fence Posts: Min. 20 MPA
 - .2 Thrust Blocks: Min. 20 MPa
 - .3 All Other Concrete: 35 MPa
 - .3 Intended application: All concrete.
 - .4 Aggregate size 20mm maximum.
 - .5 Water Cement Ratio: 0.4 Maximum
 - .6 Air content category: 1.
 - .7 Prequalification: Concrete supplier to meet the requirements of CSA A23.1

Part 3 Execution

3.1 PREPARATION

- .1 Provide Departmental Representative 24 hours notice before each concrete pour.
- .2 During concreting operations:
 - .1 Development of cold joints not allowed.

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- .2 Concrete delivery and handling to facilitate placing with minimum of rehandling, and without damage to existing structure or Work.
 - .3 Protect previous Work from staining.
 - .4 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 built-in.
- 3.3 FINISHES**
- .1 Formed surfaces exposed to view: sack rubbed finish in accordance with CSA A23.1/A23.2.
 - .2 Equipment pad surfaces: Light Broom Finish.
- 3.4 CURING**
- .1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.
- 3.5 FIELD QUALITY CONTROL**
- .1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Contractor. Accelerated test methods apply.
- 3.6 CLEANING**
- .1 Clean in accordance with Section 01 74 00 - Cleaning.
 - .2 Cleaning of concrete equipment in accordance with Section 01 35 43 – Environmental Procedures.
 - .3 Use trigger operated spray nozzles for water hoses.
 - .4 Designate cleaning area for tools to limit water use and runoff.
 - .5 Waste Management: separate waste materials for recycling and reuse.
 - .1 Divert unused concrete materials from landfill to local facility after receipt of written approval from Departmental Representative.
 - .2 Provide appropriate area on job site where concrete trucks and be safely washed.
 - .3 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by [Departmental Representative].
 - .4 Disposal of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location to pose health or environmental hazard is prohibited.

- .5 Prevent admixtures and additive materials from entering drinking water supplies or streams.
- .6 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.
- .7 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION