

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS
- .1 Section 03 30 00.01 - Cast-In-Place Concrete Short Form.
- 1.2 REFERENCE STANDARDS
- .1 American Concrete Institute (ACI)  
.1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International  
.1 ASTM A 82/A 82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.  
.2 ASTM A 185/A 185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .3 CSA International  
.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.  
.2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.  
.3 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.  
.4 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)  
.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .2 Shop Drawings:  
.1 Submit drawings stamped and signed by professional engineer registered or licensed in Newfoundland and Labrador of Canada.  
.1 Indicate placing of reinforcement and:  
.1 Bar bending details.  
.2 Lists.  
.3 Quantities of reinforcement.
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1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS  
(Cont'd)

- .2 (Cont'd)
  - .1 (Cont'd)
    - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
    - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.
  - .3 When Chromate solution is used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by Departmental Representative prior to its use.

1.4 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.

2.1 MATERIALS  
(Cont'd)

- .4 Cold-drawn annealed steel wire ties: to ASTM A 82/A 82M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A 82/A 82M.
- .6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .7 Mechanical splices: subject to approval of Departmental Representative.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative , weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

PART 3 - EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative .
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3.1 FIELD BENDING .2 When field bending is authorized, bend without  
(Cont'd)

.3 Replace bars, which develop cracks or splits.

3.2 PLACING  
REINFORCEMENT

.1 Place reinforcing steel as indicated on  
placing drawings and in accordance with  
CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Departmental  
Representative's approval of reinforcing  
material and placement.

.3 Ensure cover to reinforcement is maintained  
during concrete pour.

3.3 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus  
materials, rubbish, tools and equipment.

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS
- .1 Section 03 20 00 - Concrete Reinforcing.
- 1.2 REFERENCE STANDARDS
- .1 ASTM International
- .1 ASTM A 185/A 185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.
- .3 CSA International
- .1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .3 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.
- 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.
- 1.4 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 the Departmental Representative
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- 1.4 DELIVERY,  
STORAGE AND  
HANDLING  
(Cont'd)
- .1 (Cont'd)
  - .1 (Cont'd)
  - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

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: to CAN/CSA-G30.18, Grade 400.
  - .4 Welded steel wire fabric: to ASTM A 185.
  - .5 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.
  - .6 Other concrete materials: to CSA A23.1/A23.2.

- 2.4 MIXES
- .1 Alternative 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 PART 3 - VERIFICATION.
    - .2 Provide concrete mix to meet following plastic state requirements:
      - .1 Uniformity:.
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- 2.4 MIXES  
(Cont'd)
- .1 (Cont'd)
  - .2 (Cont'd)
    - .2 Workability: free of surface blemishes and segregation.
    - .3 Provide concrete mix to meet following hard state requirements:
      - .1 Durability and class of exposure: F-1.
      - .2 Compressive strength at 28 age: 25 MPa minimum.
      - .3 Aggregate size 20 mm maximum.
    - .4 Concrete supplier's certification.
    - .5 Provide quality management plan to ensure verification of concrete quality to specified performance.

PART 3 - EXECUTION

- 3.1 PREPARATION
- .1 Provide Departmental Representative 24 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 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.
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- 3.2 INSTALLATION/  
APPLICATION  
(Cont'd) .2 (Cont'd)  
.2 Sleeves and openings greater than 100 mm  
x 100 mm not indicated, must be reviewed by  
Departmental Representative.
- 3.3 FINISHES .1 Formed surfaces exposed to view: sack rubbed  
finish in accordance with CSA A23.1/A23.2.
- 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  
Departmental Representative . Accelerated test  
methods will apply.
- 3.6 CLEANING .1 Use trigger operated spray nozzles for water  
hoses.  
.2 Designate cleaning area for tools to limit  
water use and runoff.