

PART 1 - GENERAL

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| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 03 30 00.01 - Cast-In-Place Concrete Short Form. |
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| <u>1.2 REFERENCE STANDARDS</u> | .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. |
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| <u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u> | .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

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| 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. |
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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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- END OF SECTION

PART 1 - GENERAL

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| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 03 20 00 - Concrete Reinforcing. |
| <u>1.2 REFERENCE STANDARDS</u> | .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. |
| <u>1.3 QUALITY ASSURANCE</u> | .1 | Provide to Departmental Representative , 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete. |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u> | .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

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| <u>2.1 DESIGN CRITERIA</u> | .1 | Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS. |
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| <u>2.2 PERFORMANCE CRITERIA</u> | .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. |
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| <u>2.3 MATERIALS</u> | .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. |

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| <u>2.4 MIXES</u> | .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
<u>(Cont'd)</u> | .2 | (Cont'd)
.2 Sleeves and openings greater than 100 mm
x 100 mm not indicated, must be reviewed by
Departmental Representative. |
| <u>3.3 FINISHES</u> | .1 | Formed surfaces exposed to view: sack rubbed
finish in accordance with CSA A23.1/A23.2. |
| <u>3.4 CURING</u> | .1 | Use curing compounds compatible with applied
finish on concrete surfaces free of bonding
agents and to CSA A23.1/A23.2. |
| <u>3.5 FIELD QUALITY
CONTROL</u> | .1 | Concrete testing: to CSA A23.1/A23.2 by
testing laboratory designated and paid for by
Departmental Representative . Accelerated test
methods will apply. |
| <u>3.6 CLEANING</u> | .1 | Use trigger operated spray nozzles for water
hoses. |
| | .2 | Designate cleaning area for tools to limit
water use and runoff. |