

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 03 10 00 - Concrete Forming and Accessories.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 35 59 29 - Mooring Devices.

### **1.2 REFERENCES**

- .1 American Concrete Institute (ACI).
  - .1 ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .2 American National Standards Institute/American Concrete Institute (ANSI/ACI).
  - .1 ANSI/ACI 315-80, Details and Detailing of Concrete Reinforcement.
- .3 Canadian Standards Association (CSA).
  - .1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
  - .2 CSA-A23.3-04, Design of Concrete Structures for Buildings.
  - .3 CSA G30.3-M1983 (R1998), Cold Drawn Steel Wire for Concrete Reinforcement.
  - .4 CSA G30.5-M1983 (R1998), Welded Steel Wire Fabric for Concrete Reinforcement.
  - .5 CSA G30.14-M1983 (R1998), Deformed Steel Wire for Concrete Reinforcement.
  - .6 CSA G30.15-M1983 (R1991), Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
  - .7 CAN/CSA-G30.18-M92 (R2007), Billet-Steel Bars for Concrete Reinforcement.
  - .8 CAN/CSA-G40.21-04, Structural Quality Steels.
  - .9 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 American Society for Testing & Materials (ASTM).
  - .1 ASTM A123/A123M-09, zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

### **1.3 SHOP DRAWINGS**

- .1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SHOP DRAWINGS**  
**(CONT'D)**

- .2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, 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. Indicate sizes, spacings and locations of chairs, spacers and hangers. Submit shop drawing for each type of chair, spacer or hanger to be used. Prepare reinforcement drawings in accordance with the Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada, ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

**1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.

**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 CAN/CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-30.18.
- .4 Cold-drawn annealed steel wire ties: to CSA G30.3.
- .5 Welded steel wire fabric: to CSA G30.5. Provide in flat sheets only.
- .6 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.
- .7 Mechanical splices: subject to approval of Departmental Representative.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.2 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.
- .2 Obtain Departmental Representative's 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 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum two (2) weeks prior to commencing reinforcing work.
- .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.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars which develop cracks or splits.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.2 PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on the reviewed placing drawings and in accordance with CAN/CSA-A23.1.
- .2 Use approved type chairs to locate the reinforcing steel at the proper grade.
- .3 Tie reinforcement where spacing in each direction is:
  - .1 Less than 300 mm: tie at alternate intersections.
  - .2 300 mm or more: tie at each intersection.
- .4 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .5 Ensure cover to reinforcement is maintained during concrete pour.

**3.3 CLEANING**

- .1 Clean reinforcing before placing concrete to CAN/CSA A23.1.