

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 03 10 00 – Concrete forming and accessories.
- .2 Section 03 30 00 - Cast-In-Place Concrete.

**1.2 PRICE AND PAYMENT PROCEDURES**

- .1 Measurement and Payment
  - .1 No measurement will be made under this Section.
    - .1 Include reinforcement costs in items of concrete work in Section 03 30 00—Cast-In-Place Concrete.

**1.3 REFERENCE STANDARDS**

- .1 ASTM International
  - .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - .2 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .2 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 CSA-A23.3-04(R2010), Design of Concrete Structures.
  - .3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
  - .4 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .5 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .6 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .3 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00—Submittal Procedures.

**1.5 QUALITY ASSURANCE**

- .1 Submit in accordance with Section 01 45 00—Quality Control and as described in PART 2—SOURCE QUALITY CONTROL.

- .1 Mill Test Report: upon request, provide Consultant with certified copy of mill test report of reinforcing steel, minimum 3 weeks prior to beginning reinforcing work.
- .2 Submit in writing to Consultant proposed source of reinforcement material to be supplied.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00—Common Product Requirements.
- .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 off ground.
  - .2 Replace defective or damaged materials with new ones.

## **PART 2 PRODUCT**

### **2.1 MATERIALS**

- .1 Substitute different size bars only if permitted in writing by Consultant.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Galvanized steel reinforcements used for wall repairs: billet steel, galvanized to CAN/CSA-G164, grade 400, deformed bars to CSA-G30.18.
- .4 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating [610] g/m<sup>2</sup>.
  - .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
  - .2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
    - .1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.
  - .3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
    - .1 In this case, no restriction applies to temperature of solution.
  - .4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.
    - .1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .5 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.

- .6 Welded steel wire fabric: to ASTM A185/A185M.
  - .1 Provide in flat sheets only.
- .7 Non-metallic chairs, bolsters, bar supports and spacers to CSA-A23.1/A23.2 standard.
- .8 Mechanical splices: subject to approval from Departmental Representative.
- .9 Plain round bars: to CSA-G40.20/G40.21.

## **2.2 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada and CSA-A23.1/A23.2.
- .2 Obtain Consultant's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.

## **2.3 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 3 weeks prior to beginning reinforcing work.
- .2 Inform Consultant 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 Consultant.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars which develop cracks or splits.

### **3.2 PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on drawings in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
  - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
  - .2 When paint is dry, apply thick even film of mineral lubricating grease.
- .3 Prior to placing concrete, obtain Consultant's approval of reinforcing material and placement.
- .4 Ensure cover to reinforcement is maintained during concrete pouring.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11—Cleaning.

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion of works, remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 11—Cleaning.

**END OF SECTION**