

This specification outlines the requirements for materials and placement of concrete reinforcement.

## PART 1 REFERENCES

This specification refers to the following standards, specifications, or publications:

American Concrete Institute

SP-66 ACI Detailing Manual

ASTM International

A123/A123M      Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A143/A143M Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement

**A641/A641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire**

A775/A775M Standard Specification for Epoxy-Coated Reinforcing Steel Bars

**A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.**

CSA Group

A23.1/A23.2 Concrete Materials and Methods of Concrete Construction  
/ Test Methods and Standard Practices for Concrete

A23.3 Design of Concrete Structures

G30.18 X Carbon Steel Bars for Concrete Reinforcement

# G40.20/G40.21 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

## W186 Welding of Reinforcing Bars in Reinforced Concrete Construction

Reinforcing Steel Institute of Canada (RSIC)

RSIC, Reinforcing Steel Manual of Standard Practice

PART 2 GENERAL

2.1 ADMINISTRATIVE REQUIREMENTS

- .1 Preinstallation Meetings: In accordance with Section 01200 - Project Meetings, convene preinstallation meeting one (1) week before beginning concrete works.
  - .1 Ensure key personnel, site supervisor, the Owner, the Owner's Representative, and any required specialty contractor – finishing or forming attend.
    - .1 Verify project requirements.

2.42.2 SUBMITTALS

- .1 Submit in accordance with Section 01340 – Shop Drawings, Samples and Submissions.
- .2 Submit shop drawings stamped and signed by professional engineer registered or licensed in the Province of Newfoundland and Labrador.
  - .1 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and SP-66.
  - .2 Indicate placing of reinforcement and:
    - .1 Bar bending details.
    - .2 Lists.
    - .3 Quantities of reinforcement.
    - .4 Sizes, spacing, locations of reinforcement and mechanical splices if approved by Owner, with identifying code marks to permit correct placement without reference to structural drawings.
    - .5 Indicate sizes, spacing and locations of chairs, spacers and hangers.
  - .3 Detail lap lengths and bar development lengths to CAN/CSA A23.3, unless otherwise indicated.
  - .4 Indicate position and size of openings in slabs and walls. Coordinate with trades requiring openings.

2.3 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01600 – Material and Equipment.
- .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 accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.4 Handle, transport, store, and install epoxy coated reinforcing steel bars to prevent damage to coating. Prevent bar-to-bar abrasion and excessive sagging. Do not drop or drag bars. Store on suitable non-metallic supports. For lifting use nylon lifting slings, padded slings, separators or other means recommended by epoxy coated reinforcing steel supplier.

PART 3 PRODUCTS

3.1 MATERIALS

.1 Substitution of different size bars permitted only upon written approval of the Owner.

.2 Reinforcing steel: billet steel, deformed bars in accordance with CSA G30.18 unless indicated otherwise.

.3 Reinforcing steel: weldable low allow steel deformed bards to CSA G30.18.

.4 Cold-drawn annealed steel wire ties in accordance with ASTM A1064/A1064M.

.5 Deformed steel wire for concrete reinforcement in accordance with ASTM A1064/A1064M.

.6 Welded steel wire fabric in accordance with ASTM A1064/A1064M. Fabricated from as drawn steel wire Furnish into flat sheets, sizes as indicated in Contract Documents for wire with cross-section area of 21 mm<sup>2</sup> or greater.

.1 Finish as indicated:

.1 Galvanized: having Class A coating in accordance with ASTM A641/A641M.

.2 Epoxy Coated: Epoxy coated after welding in accordance with ASTM A 884/A 884M, Class A coated <175 µm, Type 1 intended for use in concrete or masonry, colour contrasting with rust.

.7 Epoxy Coating of non-prestressed reinforcement: to ASTM A775/A775M.

.8 Galvanizing of non-prestressed reinforcement: to ASTM A123/A123M, Coating Grade 85, 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 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 minimum 32 °C and galvanized steels immersed for minimum 20 seconds.
- .3 If galvanized steels at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5 % to 1 %.
  - .1 No restriction applies to temperature of solution.
- .4 Chromate solution sold for this purpose may replace solution described above, provided if of equivalent effectiveness.
  - .1 Provide product description as described in Submittals subsection of this Section.
- .7.9 Chairs, bolsters, bar supports, spacers in accordance with CSA A23.1/A23.2.
- .8.10 Mechanical splices subject to the approval of the Owner.
- .9.11 Tie wire: 1.5 mm diameter annealed wire.
- .10.12 Plain round bars: to CSA G40.20/G40.21

3.2 FABRICATION

- .1 Fabricate reinforcing in accordance with CSA A23.1/A23.2, SP-66, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada and to the following tolerances:
  - .1 Sheared length: plus or minus 25 mm.
  - .2 Stirrups, ties and spirals: plus or minus 12 mm.
  - .3 Other bends: plus or minus 25 mm.
  - .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar list.
- .2 Obtain the Owner's approval for locations of reinforcement splices other than shown on steel placing drawings.
- .3 Upon approval of Owner, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
  - .4.1 Ship epoxy coated bars in accordance with ASTM A 775A/A 775M.

3.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Owner with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to commencing reinforcing work.
- .2 Upon request inform Owner of proposed source of material to be supplied.

PART 4 EXECUTION

4.1 PREPARATION

- .1 Galvanizing to include chromate treatment.
  - .1 Duration of treatment 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

4.14.2 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by the Owner.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars that develop cracks or splits.

4.24.3 PLACING REINFORCEMENT

- .1 Cutting or puncturing vapour retarder is not permitted; repair damage and reseal vapour retarder before placing concrete.
- .2 Place reinforcing steel as indicated on approved shop drawings and in accordance with CSA A23.1/A23.2. Tie reinforcing where spacing in each direction is:
  - .1 Less than 300 mm: Tie at alternate intersection.
  - .2 300 mm or more: Tie at each intersection.
- .3 Use plain round bars as slip dowels in concrete. Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint. When paint is dry, apply a thick even film of mineral lubricating grease.
- .4 Prior to placing concrete, obtain the Owner's approval of reinforcing steel and placement.
- .5 Maintain cover to reinforcement during concrete pour.

.6 Protect coated portions of bars with covering during transportation and handling.

**4.4 SITE TOUCH-UP**

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

**4.5 CLEANING**

.1 Progress Cleaning: Clean in accordance with Section 01710 – Reinstatement and Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01710 – Reinstatement and Cleaning.

**PART 5 PAYMENT**

**5.1 MEASUREMENT FOR PAYMENT**

.1 No measurement will be made under this section. Include costs in items of concrete work for which reinforcement is required.

**5.2 BASIS OF PAYMENT**

.1 No separate or direct payment will be made for work specified in this specification. Costs of all work specified is deemed to be included in the lump sum and unit prices quoted in the MERX Schedule of Quantities and Prices.