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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | November 5, 2007 | Minor revisions by Legal Services. |
| 3 | November 13, 2009 | Modified ‘Related Section’ |
| 4 | March 15, 2011 | Minor changes from Legal |
| 5 | June 5, 2012 | Added References and Replacement Parts Section |
| 6 | June 29, 2012 | Reformatted to Remove White Space |
| 7 | April 24, 2015 | General formatting |
| 8 | August 17, 2015 | First draft review of updated spec. (AV) |
| 9 | September 16, 2015 | Updated, Finalized Specification – Reference eDOCS #6263147-v3 (AV) |
| 10 | April 26, 2018 | 2.1.10 Removed manufacturers and products, added performance specification  2.1.11 Removed manufacturers and products, added performance specification  3.4.1 Added inspection requirement  (BM) |
| 11 | March 31, 2020 | References updated throughout  2.1 materials revised  3.1 revised  3.4 revised (BM) |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

# GENERAL

## Related Sections

### *[Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.*

### *Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.*

### *Contractor is responsible for coordination of the Work.*

### *This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]*

### *[List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### *[List Sections specifying products installed but not supplied under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### *[List Sections specifying related requirements.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

## Measurement and Payment

*[Choose one of the following payment language provisions that best suits the individual project.*

*If this Section is not specifically referenced by an item in the Bid Form, please use the following language:*

.1 The work of this Section will not be measured separately for payment. All costs associated with the work of this Section shall be included in the Contract Price.

*OR If this Section is specifically referenced in the Bid Form, use the following language and identify the relevant item in the Bid Form:*

.1 All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

## If the work of this Section is to be measured and paid for by several different methods, please amend the standard wording given above to reflect the different methods of measurement and payment.]

## References

### Reinforcing Steel Institute of Canada, Reinforcing Steel Manual of Standard Practice.

### American Concrete Institute (ACI)

#### SP-066(04), ACI Detailing Manual-2004

### American Society for Testing and Materials (ASTM)

#### ASTM A775/A775M-19, Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

#### ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

#### ASTM A1064/A1064M-18a, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

### Canadian Standards Association (CSA)

#### CSA A23.1-14, Concrete Materials and Methods of Concrete Construction.

#### CSA A23.3-14, Design of Concrete Structures for Buildings.

#### CSA G30.18-09 (R2019), Carbon Steel Bars for Concrete Reinforcement.

#### CSA G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

#### CSA W186 M1990 (R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.

## Shop Drawings

### Submit shop drawings in accordance with Section 01300 – Submittals.

### Before submitting the shop drawings of reinforcing bar, provide shop drawings detailing all construction so that the reinforcing details can be confirmed against the pours.

### Indicate on the shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by the Consultant, with identifying code marks to permit correct placement without reference to the structural drawings. Indicate the sizes, spacings and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with the Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

### Detail lap lengths and bar development lengths in accordance with CSA A23.3-14. Provide type B tension lap splices unless otherwise indicated on the Contract Drawings.

# PRODUCTS

## Materials

### Substitute different sized bars only if permitted in writing by the Consultant.

### Reinforcing steel: billet steel, grade 400, deformed bars in accordance with G30.18-09 (R2019) *[Consultant to confirm standard reference]* unless indicated otherwise on the Contract Drawings.

### Reinforcing steel: weldable low alloy steel deformed bars in accordance with G30.18-09 (R2019) *[Consultant to confirm standard reference*].

### Cold drawn annealed steel wire ties: in accordance with ASTM A1064/A1064M-18a *[Consultant to confirm standard reference*].

### Welded steel wire fabric: in accordance with ASTM A1064/A1064M-18a. Provide in flat sheets only.

### Welded deformed steel wire fabric: in accordance with ASTM A1064/A1064M-18a. Provide in flat sheets only.

### Epoxy coating of non-pre-stressed reinforcement: in accordance with ASTM A775/A775M-19.

### Galvanizing of non-pre-stressed reinforcement: in accordance with ASTM A123/A123M-17, minimum zinc coating 610 g/m2.

### Chairs, bolsters, bar supports, spacers: in accordance with CSA A23.1-14.

### Mechanical Splices Products: in accordance with CSA G30.18-09 (R2019) *[Consultant to confirm standard reference]*.

### Dowel Bars: Structural grade steel conforming to requirements of ASTM A663, Grade 70 or better. Cut bars to length with ends square and free of burrs.

### Plain round bars: in accordance with CSA G40.20-13/G40.21-13 (R2018) *[Consultant to confirm standard reference]*.

## Fabrication

### Fabricate reinforcing steel in accordance with CSA A23.1-14, ACI SP-066(04), and the Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada unless indicated otherwise on the Contract Drawings.

### Obtain the Consultant’s approval for the locations of reinforcement splices other than those shown on the Contract Drawings.

### Upon the approval of the Consultant, weld reinforcement in accordance with CSA W186-M1990 (R2016).

### Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists as shown on the reinforced steel shop drawings.

## Quality Control

### Provide the Consultant with a certified copy of the mill test report of reinforcing steel, showing the physical and chemical analysis, a minimum of twenty-eight (28) Days prior to commencing any reinforcing work.

### Upon request, inform the Consultant of the proposed source of material to be supplied.

# EXECUTION

## Preparation

### Ensure all materials are stored in a manner that will prevent contamination or deterioration through protection from freezing, excess heat, and moisture.

### Clean reinforcing steel prior to placing so as to remove any particles that may impede the proper bond.

### Notify the Consultant when reinforcing is ready for inspection and allow sufficient time for inspection (a minimum of 48 hours) prior to placing concrete.

### Clean reinforcing bars of loose rust, mill scale, dried cement paste, mud, oil, or other coatings that will affect adhesion in accordance with CSA A23.1-14, Clause 6.1.6 *[Consultant to verify]* - Surface Conditions of Reinforcement, prior to placing concrete.

## Field Bending

### Do not field bend or field weld reinforcement except where indicated in the Contract Documents or authorized by the Consultant.

### When field bending is authorized, bend without heat, applying a slow and steady pressure.

### Replace all bars which develop any cracks or splits.

## Placing Reinforcement

### Place reinforcing steel as indicated on the Contractor’s reviewed placing drawings and in accordance with CSA A23.1-14.

### Use plain round bars as slip dowels in the concrete. Paint the portion of the dowel which is intended to move within the hardened concrete with one coat of asphalt paint. When the paint is dry, apply a thick even film of mineral lubricating grease.

### Ensure that the cover to the reinforcement is maintained during the concrete pour. Comply with the erection tolerances of CSA A23.1-14.

## Inspection

### The Consultant will inspect the reinforcing steel once it has been placed and will check for conformity with the shop drawings, bar lists, depth of cover, free from debris/deleterious materials and waterstop placement. A signed checklist for the inspection shall be prepared by the Consultant providing approval prior to any concrete pour.

### Notify the Consultant a minimum of two Working Days in advance of the date of the proposed inspection.

### The Consultant’s review does not relieve the Contractor of its responsibility for correctly placing and adequately supporting the reinforcing steel.

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

### At the discretion of the Region, an independent testing agency may be retained by the Region to visually inspect and test reinforcing steel welds as specified in Section 05050 - Welding. The Contractor shall make good any steel welds that are deemed inadequate by the independent testing agency. *[Consultant to confirm Section 05050 content to permit inspection and testing and amend to ensure Contractor is responsible for correcting all welds deemed inadequate by the independent testing agency/welding inspector]*.

## Field Touch up

### Touch up any damaged and cut ends of epoxy coated or galvanized reinforcing steel with a compatible finish in order to provide a continuous coating.

**END OF SECTION**