

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

1.2 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual 2004.
 - .1 ACI 315-99, Details and Detailing of Concrete Reinforcement.
 - .2 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.
 - .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 143/A 143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .2 ASTM A1064-16 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - .3 ASTM A 767/A 767M-05 Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
 - .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-A23.3-04, Design of Concrete Structures.
 - .3 CAN/CSA-G30.18-M92 (R2007), Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.
 - .4 CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.
 - .6 CAN/CSA-S6-06, Canadian Highway Bridge Design Code.
 - .7 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.

1.3 INCLUSIONS

- .1 Costs associated with the work described in this section must be included in the general lump sum portion of the contract under the fixed price item “Approach Road Works”. It

shall not be measured.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI Detailing Manual - 2004.
- .3 Submit shop drawings including placing of reinforcement and indicate:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .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.
 - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
- .4 Detail lap lengths and bar development lengths to CSA S6-06, unless otherwise indicated.
 - .1 Provide Type B tension lap splices unless otherwise indicated.
- .5 Quality Control: as described in paragraph 2.3 – Quality Control.
 - .1 Mill Test Report: Provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Submit in writing to Departmental Representative proposed source of reinforcement material to be supplied. Meet or exceed specified provincial standards using only materials that are approved for use in Ministry of Transportation of Ontario (MTO) or Ministère des Transports du Québec (MTQ) construction projects. Demonstrate in writing that the product meets or exceeds provincial requirements before being used.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 All reinforcement and accessories shall be kept clean of mud, oil and other deleterious materials and stored clear of ground contact.
- .2 Polyethylene sheeting, used for protection purposes shall be opaque and have a minimum thickness of 150 micrometres.
- .3 Take all necessary precautions to protect galvanized reinforcing steel from damage to galvanized coating.

Part 2 Products

2.1 MATERIALS

- .1 Cold-drawn annealed steel wire ties: to ASTM A 1064-16.
- .2 Deformed steel wire for concrete reinforcement: to ASTM A 1064-16.
- .3 Welded steel wire fabric: to ASTM A 1064-16.

- .1 Provide in flat sheets only.
- .4 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1-04.
- .5 Plain round bars: to CSA G40.20/G40.21-04.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1-04, ANSI/ACI 315-99 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .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-M1990 (R2007).
 - .1 Follow manufacturer's recommendations for its use.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 QUALITY CONTROL

- .1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Inform Departmental Representative of proposed source of material to be supplied.
- .3 Certificates of Conformance and interim inspections, as specified elsewhere in the contract documents, shall be required:
 - .1 Upon completion of reinforcing steel placement and prior to concrete placement at that location.

Part 3 Execution

3.1 FIELD CUTTING

- .1 Field cutting of reinforcing steel bars and splice bars may be carried out only by quick mechanical saws where permitted in writing by the Departmental Representative.

3.2 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 slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.3 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CAN/CSA-A23.1-04.
- .2 Ensure cover to reinforcement is maintained during concrete pour. Concrete cover as per CAN/CSA-S6-06 and as specified on the Contract Drawings.

END OF SECTION