PART 1 - GENERAL

1.1 Related Sections

.1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 Measurement Procedures

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

1.3 References

.1 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.

.2 CSA G30.3-M1983 (R1998), Cold Drawn Steel Wire for Concrete Reinforcement.

.3 CAN/CSA-G30.18-M92 (R1998), Billet-Steel Bars for Concrete Reinforcement.

.4 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 CSA W186-M1990 (R1998), Welding of Reinforcing Bars in Reinforced Concrete Construction.

PART 2 - PRODUCTS

2.1 Materials

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: billet steel, having a yield stress of 400 MPa, deformed bars to CAN/CSA-G30.18-M92 (R1998), unless indicated otherwise.

.3 Cold-drawn annealed steel wire ties: to CSA G30.3-M1983 (R1998).

.4 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1-00.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1-00 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

2.2 Fabrication (Cont'd)

.2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 Source Quality Control

.1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

PART 3 - EXECUTION

3.1 Field Bending

.1 Do not field bend or field weld reinforcement.

3.2 Placing Reinforcement

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1-00.

.2 Prior to placing concrete, obtain Departmental Representative's review of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

3.3 Splicing

.1 Where splicing of rebar is allow, the minimum splice length will be 40 times the rebar size diameter.

END

PART 1 - GENERAL

1.1 Related Sections

.1 Section 03 20 00 - Concrete Reinforcing.

.2 Section 05 50 00 - Metal Fabrications.

1.2 Measurement Procedures

.1 Reinforced Concrete Deck(Reinforcing supplied by contractor): cast-in-place reinforced concrete deck to be measured in square metres (m2) calculated from neat dimensions indicated or authorized in writing by Engineer. Measurements to be made on the surface area of the deck to the outside face of the wheelguard. Construction/control joints, galvanized steel angle to fasten timber sheathing and 50mm PVC pipes for deck drains as shown will be considered incidental to this item.

.2 Reinforced Concrete Deck(Reinforcing supplied by owner): cast-in-place reinforced concrete deck to be measured in square metres (m2) calculated from neat dimensions indicated or authorized in writing by Engineer. Measurements to be made on the surface area of the deck to the outside face of the wheelguard. Construction/control joints, galvanized steel angle to fasten timber sheathing and 50mm PVC pipes for deck drains as shown will be considered incidental to this item.

.3 Concrete Beams(Reinforcing supplied by contractor): cast-in-place reinforced concrete beams including reinforced concrete wheelguard above deck elevation to be measured in cubic metres (m^3) calculated from neat dimensions indicated or authorized in writing by Departmental Representative. The galvanized steel round section on the wheelguard as shown will be considered incidental to this item.

.4 Concrete Beams(Reinforcing supplied by owner): cast-in-place reinforced concrete beams including reinforced concrete wheelguard above deck elevation to be measured in cubic metres (m^3) calculated from neat dimensions

1.2 Measurement Procedures (Cont'd)

.4 (Cont'd)
indicated or authorized in writing by Departmental Representative. The galvanized steel round section on the wheelguard as shown will be considered incidental to this item.

.5 Formwork and falsework will not be measured but considered incidental to the work.

.6 No deductions will be made for volume of concrete displaced by reinforcing steel.

.7 Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work.

.8 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work.

.9 Supply and installation of concrete additives as recommended by the supplier will not be measured but considered incidental to work.

1.3 References

.1 Canadian Standards Association (CSA)
.1 CAN/CSA-A5-93, Portland Cement.
.2 CAN/CSA-A23.5-M86, Supplementary Cementing Materials.
.3 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.4 CSA A283-00(R2003), Qualification Code for Concrete Testing Laboratories.
.5 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
.1 CSA-A3001-03, Cementitious Materials for Use in Concrete.

1.4 Certificates

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

.2 Prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory

1.4 Certificates (Cont'd)

.2 (Cont'd)
that following materials will meet specified requirements:
.1 Portland cement.
.2 Blended hydraulic cement.
.3 Supplementary cementing materials.
.4 Admixtures.
.5 Aggregates.
.6 Water.

.3 Provide mix design and certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1-00.

.4 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1-00.

1.5 Waste Management and Disposal

.1 Designate a cleaning area for concrete trucks off site, at a company owned site for such a purpose (meeting all federal and provincial requirements)

.2 Use trigger operated spray nozzles for water hoses.

.3 Designate a cleaning area for tools to limit water use and runoff.

.4 Carefully coordinate the specified concrete work with weather conditions.

.5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies orwaterways. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal.

.6 Choose least harmful, appropriate cleaning method which will perform adequately.

PART 2 - PRODUCTS

2.1 Materials

.1 Blended hydraulic cement: Type GUb-F/SF to CAN/CSA-A3001.

.2 Supplementary cementing materials: to CAN/CSA-A3001.

.3 Water: to CAN/CSA-A23.1-00.

.4 Aggregates: to CAN/CSA-A23.1/A23.2. Coarse aggregates to be normal density.

.5 Air entraining admixture: to ASTM C 260-01.

.6 Chemical admixtures: to ASTM C 494/C 494M-99ae1. Engineer to approve accelerating or set retarding admixtures during cold and hot weather placing.

.7 Concrete retarders: to ASTM C 494/C 494M-99ae1 water based,, low VOC, solvent free. Do not allow moisture of any kind to come in contact with the retarder film.

2.2 Mixes

.1 Proportion normal density concrete in accordance with CAN/CSA-A23.1-00, Alternative 1.
.1 Cement: GUb-F/SF.
.2 Minimum compressive strength at 28 days: 35 MPa.
.3 Minimum cement content: 385 kg/m^3 of concrete.
.4 Maximum water/cement ratio: 0.4
.5 Class of exposure: C1.
.6 Nominal size of coarse aggregate: 5-20 mm.
.7 Slump at time and point of discharge: 50 to 100 mm.
.8 Air content: 5 to 8 %.

PART 3 - EXECUTION

3.1 Preparation

.1 Obtain Departmental Representative's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.

.2 Pumping of concrete is permitted only after approval of equipment and mix.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Prior to placing of concrete inform Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.6 Do not place load upon new concrete until authorized by Engineer .

3.2 Construction

.1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1-00.

3.3 Finishing

.1 Only ACI certified or other pre-approved concrete finishers are to be utilized in finishing all concrete works.

.2 Finish concrete in accordance with CAN/CSA-A23.1.

.1 Float surfaces with wood or metal floats or power finishing machines and bring surfaces to true grade or dimensions.

.2 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

.3 Broom finish deck surface with coarse bristle obtaining a coarse textured finish with a non-slip finish. All brush strokes to be in the direction perpendicular to traffic.

3.4 Site Tolerance

.1 Concrete tolerance in accordance with CAN/CSA-A23.1-00

3.5 Field Quality Control

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Departmental Representative in accordance with CAN/CSA-A23.1-00 and Section 01 45 00.

.2 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.3 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2-00.

END