

## 1 GENERAL

### 1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrication
- .2 Section 02 41 16 - Structure Demolition

### 1.2 REFERENCE STANDARDS

- .1 Ontario Traffic Manual.
- .2 ASTM International
  - .1 ASTM A123/A 123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A276-17, Standard Specification for Stainless Steel Bars and Shapes.
  - .3 ASTM B209M-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.
  - .4 ASTM B210M-12, Standard Specification for Aluminium and Aluminum-Alloy Drawn Seamless Tubes Metric.
  - .5 ASTM B211M-03, Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire Metric.
- .3 CSA International
  - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA O80 Series-08, Wood Preservation.
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA W47.2-11, Certification of Companies for Fusion Welding of Aluminum.
  - .5 CAN/CSA-Z809-08, Sustainable Forest Management.

### 1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for traffic signage, including product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

- .1 Submit drawings stamped and signed by an experienced professional engineer (P.Eng.) member of the Professional Engineer's of Ontario (PEO).

## **2 PRODUCTS**

### **2.1 DESIGN CRITERIA**

- .1 Sign supports to be capable of withstanding the combination of loads comply with paragraph 1.2 Reference Standard.

### **2.2 MATERIALS**

.1 Sign supports:

- .1 Steel posts: to CSA G40.21, 4 m long, flanged "U" shaped in cross section, measuring 65 mm wide x 30 mm deep. Metal thickness: 4.5 mm.
- .2 Base plates for mounted signs. Refer to standard applicable.
- .3 Aluminum flanges: to ASTM B211M.
- .4 Anchor and connecting bolts, 'U' clamps and miscellaneous hardware for overhead sign installations: fabricate from 304 stainless steel as specified in ASTM A276.
- .5 Fasteners: bolts, nuts, washers and other hardware for roadside signs to be cast aluminum alloy, or galvanized steel.

.2 Signboards:

- .1 Plywood: to CSA O121, 19 mm thick. Overlaid Douglas Fir, Medium Density CAN/CSA-Z809 or FSC or SFI certified, overlaid one side only with fibre or plastic sheet surfacing material.
- .2 Aluminum sheet: to ASTM B209M, precut to required dimensions.
  - .1 Thickness for signboards up to 750 mm wide: 1.6 mm minimum.
  - .2 Thickness for signboards 750-1200 mm wide: 2.1 mm minimum.
  - .3 Thickness for refurbishing existing sign panels: 1.0 mm minimum.
- .3 Aluminum extrusions: to ASTM B211M, 150 mm or 300 mm panels suitable for bolting together.
- .4 T-shape stiffeners for signboards: to ASTM B210M.
- .5 Connecting straps and brackets: to ASTM B209M.
- .6 Aluminum materials: to ASTM B209M.

- .7 Primer for plywood: to MPI #5 VOC limit of 350 g/L to SCAQMD Rule 1113.
- .8 Primer for aluminum: to MPI # 8, VOC limit of 250 g/L to GS-11.
- .9 Silk screen ink:
  - .1 Transparent or opaque colours: selected by Departmental Representative, or as indicated.
- .10 Reflective sheeting and tape: to CGSB 62-GP-11M. Adhesive, class of reflectivity and colour as indicated.
- .11 Transparent tape: flexible, smooth-surfaced, moisture resistant tape with pressure sensitive adhesive.
- .12 Clear varnish protective coat: MPI-EXT 6.4H VOC limit of 350 g/L to SCAQMD Rule 1113.
- .3 Reutilization of the signage
  - .1 If current signage is in good condition, if approved by Departmental Representative, current signage have to be reused.

## 2.3 FABRICATION

- .1 Supports:
  - .1 Connect aluminum support members by welding in accordance with CSA W47.2. Work to be performed by Canadian Welding Bureau qualified members only. Flame cutting of members not permitted.
  - .2 Welds to be of same strength as adjacent member or casting.
  - .3 Reinforce in area of electrical hand holes to equal strength of full section member.
  - .4 Remove sharp edges and burrs.
- .2 Signboards:
  - .1 Aluminum blanks:
    - .1 Degrease, etch and bonderize with chemical conversion coating.
    - .2 Clean surfaces with xylene thinner. Then Dry.
    - .3 For non-reflective signs, spray face with one coat vinyl pretreatment coating and two finish coats of required colour.
    - .4 For aluminum signboards that are to be painted before installation, spray and bake face of signboards with two coats of enamel in accordance with MPI-EXT 5.4A.

- .2 Reflective background sheeting and lettering:
  - .1 Cut and apply in accordance with manufacturer's instructions.
  - .2 Apply adhesive coated material with heat lamp vacuum applicator or by squeeze roll application method. Apply pressure sensitive material with roller or squeegee.
  - .3 Edge wrap sheeting on each extrusion prior to bolting extrusions. Match pieces of sheeting from different rolls for each signboard to ensure uniform appearance and brilliance by day and night.
  - .4 Reflective signboard faces may be prepared using silk screen transparent ink.
- .3 Non-reflective lettering and symbols: cut from vinyl film as specified in CGSB 62-GP-9M, or paint using required colour of finish paint maximum VOC of 350 or 250 g/L to SCAQMD Rule 1113 GS-11 or silk screen transparent ink.
- .4 Clean signboards completely and apply transparent tape over top edge and extending 25 mm minimum down back and front of signboard.
- .5 Protect finished signboard faces with one coat of clear varnish with maximum VOC limit of 350 g/L to SCAQMD Rule 1113.
- .6 Apply two coats of white paint with maximum VOC content of 50 g/L to GS-11 to wooden signposts. Allow initial coat to dry before applying second coat. Apply paint only when relative humidity is below 85% and ambient temperature is above 5 degrees C.
- .3 Sign identification:
  - .1 Apply sign number and date of installation with 25 mm high stencil painted black letters on lower left back face of each signboard.
  - .2 Label characteristic for the typical load limit panel sign (Wa-63A):
    - .1 White panel;
    - .2 Load limit configuration as it mention on the existing signage.

### 3 EXECUTION

#### 3.1 Apportionment

- .1 Take into consideration that 75% of the posts will be embedded into rock surface.

### 3.2 INSTALLATION

- .1 Sign support:
  - .1 Mount the supports as indicated on drawing and adapted the depth at 1.0 m below the final ground surface and at the satisfaction of the Departmental Representative
  - .2 Erect posts plumb and square to details as indicated.
- .2 Signboard:
  - .1 Fasten signboards to supporting posts and brackets as indicated.
  - .2 Fasten lane markers to signboard.
  - .3 Use strapping with crimped or bolted connections where signs fastened to utility poles.
  - .4 Use T-shape aluminum stiffeners to join portions of sign panel on site. Cover face of T-stiffener with material identical to face of sign panel.

### 3.3 CORRECTING DEFECTS

- .1 Correct defects, identified by Departmental Representative, in sign message, consistency of reflectivity, colour or illumination. Correct angle of signboard and adjust luminaire-aiming angle for optimum performance during night conditions to approval of Departmental Representative.

### 3.4 CLEANING

- .1 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 00 10 - General Instructions.
  - .1 Carefully dismantle and salvage wood, aluminum and steel materials for reuse and recycling.

### 3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by traffic signage installation and salvage operations.

END OF SECTION