1.0 GENERAL

1.1 DETAIL DRAWINGS

.1 The following detail drawings are appended hereto and form part of this section.

Number	Title
[ ]	[ ]
[ ]	[ ]

1.2 REFERENCES

.1 Provide W-Beam guardrail in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M180 — Standard Specification for Corrugated Sheet Steel Beams for Highway Guardrail.

.3 American Road and Transportation Builders Association (ARTBA)

.1 ARTBA Technical Bulletin No. 268-B.

.4 American Society for Testing and Materials (ASTM)

.1 ASTM A307 — Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 ASTM D4956 — Standard Specification for Retroreflective Sheeting for Traffic Control

.5 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181 — Ready-Mixed Organic Zinc-Rich Coating.

.6 Canadian Standards Association (CSA)

.1 CSA-O80 SERIES — Wood Preservation.

.2 CSA-G40.20 Quality Steel. — General Requirements for Rolled or Welded Structural

.3 CAN/CSA-G164 — Hot-Dip Galvanizing of Irregularly Shaped Articles.

.4 CSA-W59M Version). — Welded Steel Construction (Metal Arc Welding) (Metric

.7 National Lumber Grades Authority (NLGA)

.1 NLGA Standard Grading Rules for Canadian Lumber.

1.3 SUBMITTALS

.1 Provide the following submittals.

.2 Shop drawings of the guardrail, including material specifications, dimensions, finishes, and other details, at least 20 days prior to fabrication.

.3 Manufacturer's written instructions for unloading, handling, storing and handling guardrail and for repairing damaged galvanized coating prior to performing the work.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Inspect each shipment of material and timely replace any damaged materials.

.2 Unload, handle, and store rails according to the manufacturer's written instructions to prevent damage to the galvanized coating and the material.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide materials in accordance with the following.

.2 W-Beam guardrail and terminal elements:

.1 Match the design profiles and dimensions of the AASHTO/ARTBA hardware requirements so that similar components are fully interchangeable, regardless of the manufacturer.

.2 Manufacture in accordance with AASHTO M180 from open hearth, electric furnace or basic oxygen semi-spring steel sheet. The sheet thickness is to be in accordance with AASHTO M180 Table 2 (Class A, Type 2) with a nominal base metal thickness of 2.8 mm (2.57 mm minimum). The sheet width for the rail is to be 483 mm with a tolerance of minus 3.2 mm.

.3 Manufacture from base metal with a minimum yield point of 345 MPa, a minimum tensile strength of 483 MPa, and a minimum elongation of 12% in 50 mm of length in accordance with CSA-G40.20.

.4 Punch holes for splices and post bolts, in accordance with AASHTO M180, to match the number and centre-to-centre spacing of posts as specified in the Contract Documents.

.5 For shop fabrication of the terminal elements, perform welding in accordance with CSA-W59.

.6 Permanently stamp on each element, the manufacturer's name or trademark, metal thickness, and year of production. Locate stamp on the face opposite the traffic side.

.7 Reject any element with warpage greater than 50 mm when laid on a flat surface, or with injurious defects or excessive roughness of the zinc coating.

.3 Bolts, nuts, and washers: In accordance with ASTM A307, galvanize finish.

.4 Galvanizing: Hot-dip galvanized guardrail, bolts, and other steel components in accordance with CAN/CSA-G164.

.5 Wooden posts and blocks: Douglas Fir, Hemlock, Lodgepole Pine or better, in accordance with NLGA requirements for No. 1 Structural Posts and Timbers that is in accordance with NLGA Standard Grading Rules for Canadian Lumber. After drilling the holes, pressure treat the posts and blocks in accordance with CSA-O80 Series with a waterborne preservative of chromate copper arsenate or ammoniacal copper arsenate to 8 kg/m^3. Stamp the year of production on the side of the post near the top.

.6 Reflectors: Solid guardrail reflectors with a minimum dimension of 108 mm by 76 mm. Reflector sheeting to consist of double sided sheeting in accordance with ASTM D4956 Type IX or XI. Colour to be either fluorescent white or yellow as determined by the Minister.

3.0 EXECUTION

3.1 INSTALLATION

.1 Accurately set guardrail posts at the locations, and to the alignment, spacing, and heights specified in the Contract Documents. Maintain plumb and grade of posts within a tolerance of +/-6 mm.

.2 For posts, auger holes of sufficient diameter to allow pneumatic tamping. Remove unsuitable soils, as determined by the Minister, at the bottom of the hole and replace with granular material. Compact the base of the hole.

.3 Place the posts directly and solidly on compacted material.

.4 Place and compact backfill material in layers not exceeding 150 mm, for the full depth of the hole. Crown the compacted fill slightly to provide drainage away from the posts.

.5 Install the W-beam guardrail in accordance with the manufacturer's written instructions and as specified. Tighten bolts to a torque of 100 N-m.

.6 Make guardrail laps in the direction of traffic flow.

.7 Do not punch, cut, or weld guardrail on Site without prior authorization of the Minister.

.8 Attach reflector strips to the top of every third post.

.9 Provide a completed guardrail installation that is smooth and uniform in alignment, and continuously rigid.

3.2 REPAIR OF DAMAGED GALVANIZED COATING

.1 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.

.2 Power tool clean surfaces to be repaired to a bright metal surface. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

END OF SECTION