

## **1 GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

### **1.02 MEASUREMENT AND PAYMENT**

- .1 Measure supply and erection of roadside steel W-beam guide rail including posts, delineators and necessary hardware in metres of guide rail installed and measured from outer tips of steel W-beam guide rail, including guide rail used in anchorages and terminal sections. Length measured does not include laps.

### **1.03 REFERENCES**

- .1 American Association of State Highway and Transportation Officials (AASHTO)
  - .1 AASHTO M180-2000(2004), Standard Specification for Corrugated Sheet Steel Beams for Highway Guardrails.
- .2 ASTM International
  - .1 ASTM A 123/A 123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A 307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .3 Canada Green Building Council (CaGBC)
  - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
- .4 CSA International
  - .1 CAN/CSA 080 Series-08, Wood Preservation.
- .5 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
  - .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1.
  - .3 FSC Accredited Certified Bodies.
- .6 Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.
- .7 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

## 1.04 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 guide rail, wood, and coatings and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
- .4 Sustainable Design Submittals:
  - .1 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with EPA 832/R-92-2005 authorities having jurisdiction.
  - .2 Wood Certification: submit vendor's, manufacturer's Chain-of-Custody Certificate number for FSC certified wood.

## 1.05 QUALITY ASSURANCE

- .1 Sustainable Standards Certification:
  - .1 Certified Wood: submit listing of wood products and materials used in accordance with FSC-STD-01-001.

## 1.06 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect guide rails from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Steel W-beam guide rail as indicated and as follows:
  - .1 Steel rail and terminal sections: to AASHTO M180, class A Type 1 zinc coated.
  - .2 Bolts, nuts and washers: to ASTM A 307, hot dip galvanized to

ASTM A 123/A 123M.

- .2 Sawn timber posts and offset blocks:
  - .1 Species: Maple, Birch, Beech or Hemlock.
  - .2 Type: pressure treated in accordance with CAN/CSA-O80 Series, pressure preserved wood for highway construction table 1 and its references. Standard minimum retention of CCA preservative 6.4kg/m<sup>3</sup>.
  - .3 Grade: National Lumber Grades Authority (NLGA)
    - .1 Standard Grading Rules for Canadian Lumber 2000.
  - .4 Dimensions: 200 x 200 x 2500 mm.
  - .5 FSC certified.
  - .6 Well seasoned, straight and sound, free from rot, loose knots or other defects, dressed four sides.
- .3 Reflector strips to be scotchlite delineator 50mm x 300mm on metal backing.

### 3 EXECUTION

#### 3.01 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for guide rail installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

#### 3.02 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent].
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

#### 3.03 ERECTION

- .1 Set posts by instrument for alignment, and locations as indicated on the drawings or as directed by Departmental Representative.
- .2 Excavate post holes to depths as indicated and to diameter of 360 mm plus or minus 20 mm.
  - .1 Compact bottom to provide firm foundation.
  - .2 Set post plumb and square in hole.

- .3 Backfill around posts using excavated material and compact in uniform layers not exceeding 150 mm compacted thickness.
- .4 Leave or make depression approximately 150 mm deep around posts until painting is completed, then fill and compact to ground elevation.
- .5 Cut off tops of posts as indicated, with tops parallel to grade of pavement edge.
- .6 Worker protection: ensure workers wear gloves, dust masks, long sleeved clothing, eye protection, protective clothing when handling, drilling, sawing, cutting or sanding preservative treated wood and applying preservative materials.
- .7 Treat cut tops with 2 coats of Wolman End Cut Preservative or approved equivalent.
- .8 Erect steel W-beam components to details as indicated. Lap joints in direction of traffic.
  - .1 Tighten nuts to 100 N.m torque.
  - .1 Maximum protrusion of bolt 12 mm beyond nut.
- .9 Once the W-beam rail is properly installed, place new reflective strips immediately under the rail on every third post on curves and on each end post, and every fifth post facing traffic in the other direction.

### **3.04 TOUCH UP**

- .1 Galvanized steel-touch up:
  - .1 Clean damaged surfaces with wire brush removing loose and cracked coatings.
  - .1 Apply 2 coats of organic zinc-rich paint to damaged areas in accordance to manufacturer's instructions.

### **3.05 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.06 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by guide rail installation.

**END OF SECTION**