

SECTION 1109—GUIDE RAIL AND METAL MEDIAN BARRIER

1109.01 RAILS—As shown on the [Standard Drawings](#) and as follows:

(a) **Rail Elements.** AASHTO M 180, Class A, Type II; mark to show the approximate radius of curved rails.

(b) **Rubbing Rails.** Fabricate from steel, [ASTM A 1011/A 1011M](#), with mechanical properties conforming to AASHTO M 270/M 270M ([ASTM A 709/A 709M](#)), Grade 250 (Grade 36).

Galvanize as specified in [Section 1105.02\(s\)](#) (AASHTO M 111).

Shop form, when required, on curves having a radius of less than 45 m (150 feet), as follows:

- Notch flanges to form a curve with a series of chords of equal lengths not exceeding 450 mm (18 inches) (for radii from 0 to 6 m (0 to 20 feet)), 900 mm (3 feet) for radii from 6 m (20 feet) to 30 m (100 feet), and 1.9 m (6 1/4 feet) for radii from 30 m (100 feet) to 45 m (150 feet); cut notches to the proper angle and weld.
- Form so the midpoint of the chord is tangent to the curve.
- Mark to show the approximate radius of curvature.

1109.02 TERMINAL SECTIONS—As shown on the [Standard Drawings](#) and as follows:

(a) **Alternate Terminal Sections.** AASHTO M 180, Class A, Type II.

(b) **Terminal Section Bridge Connection.** AASHTO M 180, Class B, Type II.

(c) **Flared Terminal Section.** AASHTO M 180, Class A, Type II.

1109.03 POSTS—

(a) **Steel I-Beam Posts.** AASHTO M 270/M 270M ([ASTM A 709/A 709M](#)), Grade 250 (Grade 36) or [ASTM A 769/A 769M](#).

Galvanize as specified in [Section 1105.02\(s\)](#) (AASHTO M 111).

(b) **Steel C-Posts and Channel Posts.** Fabricate from steel, [ASTM A 570/A 570M](#), with mechanical properties conforming to AASHTO M 270/M 270M ([ASTM A 709/A 709M](#)), Grade 250 (Grade 36).

Galvanize as specified in [Section 1105.02\(s\)](#) (AASHTO M 111).

(c) **Wood Guide Rail Posts.** AASHTO M 168. As shown on the [Standard Drawings](#) and as follows:

Label each wood item with lot or batch number, plant, place, and date of manufacture.

Manufacture from timber having a minimum grade of 8.2 MPa (1,200 pounds per square inch) according to the current standard grading and dressing rules of the West Coast Lumber Inspection Bureau, the Southern Pine Inspection Bureau or other acceptable timber associations. Timber to be either rough sawn (unplanned) or surfaced four sides (s4s) to the dimensions indicated. Size in the direction parallel to the axis of bolt holes to be within a tolerance of ± 6 mm ($\pm 1/4$ inch). Use one type of surface finish for posts and offset blocks in a continuous run of guide rail.

Treat timber with a preservative according to AASHTO M 133, after end cuts are made and holes are drilled. AASHTO M 133 designates AWPA C14 and AWPA C2 as the respective specifications. In cases of conflict, AWPA C14 will govern.

Certify as specified in [Section 106.03\(b\)3](#).

(d) **Breakaway Terminal Wood Posts.** [Section 1109.03\(c\)](#)

(e) **Breakaway Terminal Foundation Wood Posts.** [Section 1109.03\(c\)](#)

1109.04 OFFSET BRACKETS—

(a) **General Requirements.** Provide offset brackets from a manufacturer listed in [Bulletin 15](#). Certify as specified in [Section 106.03\(b\)3](#).

(b) **Wood Offset Brackets.** As shown on the [Standard Drawings](#) and/or the approved Shop Drawings manufactured from timber having a minimum grade of 8.2 MPa (1,200 pounds per square inch) according to the standard grading and dressing rules of the West Coast Lumber Inspection Bureau, the Southern Pine Inspection Bureau, or other acceptable timber associations. Treat timber with a preservative according to AASHTO M 133, after cutting ends, drilling bolt holes and, if applicable, routing. Provide brackets with a ± 6 mm ($\pm 1/4$ -inch) dimension tolerance in the direction of the bolt hole.

1. **Non-Routed.** Use with wood posts.

2. **Routed.** Use with steel posts.

(c) **Plastic Offset Brackets.** As shown on the [Standard Drawings](#) and/or the approved Shop Drawings and manufactured from greater than 95% virgin and/or recycled plastic material. Provide brackets with a ± 6 mm ($\pm 1/4$ -inch) dimension tolerance in the direction of the bolt hole.

1. **Non-Routed.** Use with wood posts.

2. **Routed.** Use with steel posts.

(d) **Composite Offset Brackets.** As shown on the [Standard Drawings](#) and/or the approved Shop Drawings and manufactured from a combination of either virgin or recycled wood, plastic, rubber, or other materials. Provide brackets with a ± 6 mm ($\pm 1/4$ -inch) dimension tolerance in the direction of the bolt hole.

1. **Non-Routed.** Use with wood posts.

2. **Routed.** Use with steel posts.

1109.05 MISCELLANEOUS MATERIAL—As shown on the [Standard Drawings](#) and as follows:

(a) **Nuts, Bolts, and Washers.** [Section 1105.02\(c\)1](#).

Galvanize as specified in [Section 1105.02\(s\)](#) ([ASTM A 153](#), or [ASTM B 695](#) and [B 696](#)).

(b) **Base Plates, Post Plates, End Post Support Angles, and Hardware.** AASHTO M 270/M 270M ([ASTM A 709/A 709M](#)), Grade 250 (Grade 36).

Galvanize base plates and hardware after fabrication, as specified in [Section 1105.02\(s\)](#) (AASHTO M 111). Do not punch, drill, grind, cut, or weld after galvanizing. Repair minor abrasions of galvanized surfaces with two coats of galvanizing paint.

(c) **Rotating Bracket.** Fabricate from malleable cast iron, [ASTM A 47](#) or structural steel, AASHTO M 270/M 270M ([ASTM A 709/A 709M](#)), Grade 250 (Grade 36).

Galvanize as specified in [Section 1105.02\(s\)](#) (AASHTO M 111).

(d) **Steel Spacer Tube.** [ASTM A 53](#), Type S, Grade B, plain end, Schedule 40 steel pipe.

Galvanize as specified in [Section 1105.02\(s\)](#).

1109.06 GALVANIZING—Galvanize metal parts as specified in [Section 1105.02\(s\)](#) ([ASTM A 153](#) unless otherwise specified) and conform to the requirements of AASHTO M 180, Section 9.

1109.07

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1109.07 GALVANIZING PAINT—Bulletin 26

1109.08 WELDING MATERIAL—[Section 1105.02\(t\)](#)

1109.09 CERTIFICATION—[Section 106.03\(b\)3](#)