

SECTION 967
RAIL ELEMENTS COMPONENTS FOR GUARDRAIL

967-1 Description Steel Guardrail.

This Section covers the material and fabrication requirements for guardrail components.

967-2 Materials.

All components supplied under this Specification shall be from producers currently on the Department's Production Facility Listing. Producers seeking inclusion on the Department's Production Facility Listing must meet the requirements of Section 105.

967-2.1 Timber: Timber products must have a minimum stress grade of 1200 psi and meet the material requirements of Section 954. Timber is to be dressed on four sides (S4S) and treated in accordance with the post requirements in Section 955.

967-2.2 Steel: Steel guardrail materials ~~must~~ shall meet the requirements of AASHTO M180, (except as specified below), and for either Class shown. Type 2 zinc coating will be required component fabrication requirements in 967-3.

Where specified, components must be welded in accordance with the American Welding Society Structural Welding Code ANSI/AWS D1.1 using material conforming to E60XX. Nondestructive testing of welds is not required.

967-3 Fabrication.

967-3.1 Posts: Posts shall not vary more than 1 inch from the specified length shown in the Design Standards.

967-3.1.1 Timber Posts: Posts shall be shaped and drilled prior to wood treatment.

967-3.1.2 Steel Posts: Posts must conform to the requirements of ASTM A6 and ASTM A36. Posts must be fabricated from rolled sections with cross-sections defined in the American Institute of Steel Construction (AISC) Manual of Steel Construction. Posts must be drilled or punched prior to galvanizing in accordance with ASTM A123.

967-3.2 Special Steel Posts: Posts and plate materials must meet the requirements of ASTM A6 and ASTM A36. Posts and plates must be drilled, punched, and welded prior to galvanizing in accordance with ASTM A123.

967-3.3 Offset Blocks: Offset blocks must not vary more than 0.25 inch from the specified dimensions in the Design Standards.

967-3.3.1 Steel Offset Blocks: Blocks must meet the requirements for steel posts.

967-3.3.2 Timber Offset Blocks: Blocks must meet the requirements for timber posts.

967-3.3.3 Composite Offset Blocks: Composite offset blocks must be listed on the APL. Manufacturers seeking evaluation of their product for approval must submit an application in accordance with Section 6 and include the following:

1. Test reports from an independent laboratory showing the product meets all crash test requirements of the National Cooperative Highway Research Program, Report 350 (NCHRP- 350) or the Manual for Assessing Safety Hardware 2009 (MASH-09).

2. Test reports from an independent laboratory showing the composite material meets the following physical requirements:

<u>Composite Block</u>	<u>Test Method</u>	<u>Requirement</u>
<u>Durometer Hardness</u>	<u>ASTM D2240 Shore D</u>	<u>Minimum 50</u>
<u>Durometer Hardness after UV exposure</u>	<u>ASTM D5870</u>	<u>< 15 points change from initial after exposure per ASTM D4329, 1000 hours, cycle C, type UVB-313 lamps</u>

967-3.4 Steel Panels: W-beam, thrie-beam, thrie-beam transitions, terminal connectors, end shoes, end units, and all other compatible panels must meet the requirements of AASHTO M180 (for beams and rails), for either Class shown. Type II zinc coating will be required on all panels.
~~the coating properties, sampling, test methods, inspection, and certification related to galvanizing regardless of the method of galvanization of the rail elements shall meet the requirements of ASTM A123.~~

967-3.5 Bolts: Hex and button head bolts, including bolts, nuts, washers, and other accessories etc., must meet the material requirements of AASHTO M180, except bolts must be (and including the steel trailing end anchorage rods required to be used with aluminum guardrail) shall be galvanized in accordance with ASTM A153.
~~All supports, fastenings and other accessories, shall be galvanized in accordance with ASTM A153.~~

967-3.6 Barrier Delineators: Barrier delineators must meet the requirements of Sections 705 and 993 and be listed on the APL.

967-3.7 End Delineators: Retroreflective sheeting is to be yellow, Type IV or greater in accordance with Section 994 and listed on the APL.

967-3.8 Steel Plates: Steel plates must meet the requirements of ASTM A36. Drill holes prior to galvanizing in accordance with ASTM A123.

967-3.9 Pipe Rail: Pipe is to be Schedule 40 in accordance with ASTM A53 and, if applicable, welded prior to galvanizing.

967-3.10 Rub Rail: Rail materials must meet the requirements of 967-3.4.

967-3.11 Steel Tube Foundations: Steel tube foundations must meet the requirements of ASTM A500, Grade B. After all punching, drilling, stamping, and welding is complete, steel tube foundations are to be galvanized in accordance with ASTM A123.

Brackets and fixtures must meet the requirements of ASTM A36. Foundations must be drilled or punched prior to galvanizing in accordance with ASTM A123.

967-3.12 Approach Terminal Assemblies: Approach terminals must be listed on the APL.

Manufacturers seeking evaluation of their product for approval must submit:

1. A completed application in accordance with Section 6, including a product drawing meeting the dimensions of Design Standards, Index No. 400 and that is signed and sealed by a registered Florida P.E.

2. Independent test reports indicating that the product meets all crash test requirements of MASH-09 or NCHRP 350 as applicable

3. Documentation showing the assembly is deemed eligible by the Federal Highway Administration for federal funding on the National Highway System (NHS)

~~Acceptance of steel guardrail materials shall be based on manufacturer's certified mill analysis of test results meeting the specification limits of the ASTM or AASHTO designation as~~

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~~stated above. Certification of these test values, representing each shipment of guardrail materials, shall be provided to the Engineer for each project.~~