

### **13.4 BRIDGE RAILINGS - GENERAL**

One of the standard rail types as shown in the Bridge Design Manual Standard Drawings shall be shown on the plans, unless there is a clearly provable advantage in doing otherwise. Among those types, selection shall be made with due consideration of economy, aesthetics, Level of Service, and the preference of the District Engineer. The following table indicates the test level of ITD standard railings. Test Levels are defined in Article 13.7.2.

Bridge Railing	Test Level
Concrete Parapet	TL-4
Combination Rail	TL-3
Two Tube Curb Mount Rail	TL-4
W-Beam Railing	TL-3
Delaware Retrofit	TL-4
Iowa Retrofit	TL-4

#### **NEW CONSTRUCTION**

Concrete parapet is the preferred rail type for safety reasons. When an overlay is placed on the structure during original construction, the height of the parapet should be 2'-8" from the top of the overlay. Other rail types should be considered to meet Context Sensitive Design criteria.

Concrete parapets and median barriers shall be constructed perpendicular to the roadway cross slope for superelevation rates up to 6%. Bridges with superelevation rates greater than 6% shall be evaluated on a case-by-case basis.

For superelevation rates greater than 6%, revise the Notes on the Standard Drawing as follows:

- Concrete parapet shall be constructed so that the outside face is in a vertical plane. Height control shall be at the inside (traffic) face. End faces that fit up to precast concrete end sections shall be constructed perpendicular to the roadway grade.
- Concrete median barrier shall be constructed vertically.

Combination railings shall be used on a raised sidewalk when there is no barrier between the roadway and sidewalk.

Pedestrian/Bicycle Railing shall be used when a traffic barrier separates the roadway from the sidewalk.

W-Beam railing may be used if the site meets TL-3 criteria and the span length is less than 40'.

#### **REHABILITATION**

The following options should be considered on a deck rehab project:

##### **DO NOTHING**

When no major work is being done on the bridge and the existing rail is continuous and designed for a 10<sup>k</sup> rail load, then the existing rail is acceptable. The railing does not require a successful crash test, but the connection to the roadway railing should be modified to meet current standards.

##### **RETROFIT**

When no major work is being done on the bridge and the existing rail was not designed for a 10<sup>k</sup> rail load, the existing rail should be retrofit using the metal rail details shown on G-2-F in the Roadway Standard Plans, the Delaware Retrofit, or the Iowa rail retrofit. See Rail Standard drawings B13.7A, B13.7B, B13.7C, B13.7D, and B13.7E. No design calculations are needed to check the deck slab, but the exterior girder should be checked for the rail dead load and truck wheel load.

**UP-GRADE**

Up-grading the existing rail should be considered when the work will be cost effective; e.g., when the deck slab is replaced. One of the standard rail types shown in the Bridge Design Manual should be used. The deck slab and exterior girder shall meet the requirements of the current AASHTO code.

**Revisions:**

June 2006

The Combination Rail Test Level was changed to TL-3 to comply with Article 13.7.3.2.

Corrected the w-beam railing reference from PL-1 to TL-3.

Added the Delaware Retrofit to the Retrofit options.

Added reference for Context Sensitive Design rail options.

Added reference to new rail retrofit standard drawings B13.7A – B13.7E.