



Florida Department of Transportation

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STRUCTURES DESIGN BULLETIN 12-04

ROADWAY DESIGN BULLETIN 12-07

DATE: March 19, 2012

TO: District Directors of Production, District Design Engineers, District Structures Design Engineers

FROM: Robert Robertson, P. E., State Structures Design Engineer
David O'Hagan, P.E., State Roadway Design Engineer

COPIES: Brian Blanchard, Tom Byron, Jeffrey Ger (FHWA)

SUBJECT: Adoption of *LRFD Bridge Design Specifications*, Sixth Edition

This Structures Design Bulletin (SDB) adopts the *LRFD Bridge Design Specifications*, Sixth Edition with the exceptions listed below.

REQUIREMENTS

1. Replace *Structures Manual* Introduction Section I.6.B.5 with the following:

5. *LRFD Bridge Design Specifications*, Sixth Edition

2. Replace *Structures Design Guidelines*, Section 2.6.1.A with the following:

A. Design structures according to *LRFD* [3.6.5.1] and this section. Calculate the annual frequency for a pier to be hit by a heavy vehicle using *LRFD* C3.6.5.1. Determine the ADTT based on the design year AADT on the lower roadway. Grade separation bridges carrying Interstate or other high speed limited access roadways are considered critical for this evaluation. The Department will determine if other grade separation bridges are critical for heavy vehicle impact loading using the following items:

- Existing and projected traffic volumes on the bridge
- Structure type, in particular continuous spans or integral piers

- Route impacts on local residents and businesses
- Availability and length of detours
- Evacuation/emergency response routes
- Estimated duration/difficulty/cost of bridge damage repair or replacement
- Other safety and economic impacts due to the loss of the structure

Commentary: When a bridge is determined to be critical, which pier design strategy (shielding or designing for the equivalent static load) is selected will depend on the design and geometrics of the pier itself and the overall roadway configuration near the pier, e.g., other requirements for the use of adjacent roadside barriers, sight distance limitations, geometrics of the lower roadway.

3. Replace **Structures Design Guidelines**, Sections 2.6.3.A and B with the following:

A. Design piers located within the setback distance for the **LRFD** equivalent static force, or shield piers using **Design Standards** Index 411 or other similar Test Level 5 traffic railing if the calculated annual frequency for the pier to be hit by a heavy vehicle is greater than or equal to 0.0001 for critical bridges or 0.001 for typical (non-critical) bridges. Utilize the shear reinforcement required at the pier base to a distance of 8 feet above the adjacent ground surface.

B. Provide roadside barriers in accordance with **PPM**, Volume 1, Chapter 4 for piers located within the clear zone or horizontal clearance limits and that are not shielded using **Design Standards** Index 411 or other similar Test Level 5 traffic railing as described above.

4. Replace **Structures Design Guidelines**, Section 2.6.4.C with the following:

C. For existing piers and pile bents located within the setback distance that are not theoretically capable of resisting the **LRFD** equivalent static force and that are unshielded, shielded by guardrail or shielded by non-crash tested barrier wall:

1. When Resurfacing, Restoration, Rehabilitation (RRR) criteria applies and on freeway resurfacing projects, determine the need for roadside barriers in accordance with the **PPM**, Volume 1, Chapter 4 or Chapter 25, as applicable. New guardrail and existing guardrail conforming to the requirements of **Design Standards** Index 400 shall be used. Existing guardrail that does not conform to the requirements of **Design Standards** Index 400 must be upgraded or replaced. If there is insufficient deflection space for guardrail and new concrete barrier wall is determined to be required, and if the calculated annual frequency for the pier to be hit by a heavy vehicle is greater than or equal to 0.0001 for critical bridges or 0.001 for typical (non-critical) bridges, provide **Design Standards** Index 411 Pier Protection Barriers or other TL-5 barriers in lieu of **Design Standards** Index 410 Concrete Barrier Walls. Where required sight distances cannot be maintained using **Design Standards** Index 411 Pier Protection Barriers or other TL-5 barriers, instead provide **Design Standards** Index 410 Concrete Barrier Walls to shield piers. An exception for pier strength is required.

2. When new construction criteria applies except on freeway resurfacing projects, provide **Design Standards** Index 411, Pier Protection Barriers or other TL-5 barriers if the calculated annual frequency for the pier to be hit by a heavy vehicle is greater than or equal to 0.0001 for critical bridges or 0.001 for typical (non-critical) bridges.

5. Replace **Structures Design Guidelines**, Section 2.6.7.H with the following:

H. In addition to the above requirements, as conditions warrant or as directed by the Department, provide crash walls with a minimum height of 6 feet above the top of rail for bridge piers located more than 25 feet from the centerline of track. Consider the horizontal alignment of the track, adjacent embankment height, and assess the consequences of serious damage to the bridge in the case of a collision.

6. Add the following to the end of **Structures Design Guidelines**, Section 3.16.5:

Traffic railing mounted sound walls and combination traffic railing / sound walls must meet the requirements of **PPM** Vol. 1, Section 7.1.2.1. The criteria specified in **LRFD** 15.8.5 may be used to design test specimens for crash testing.

7. Replace **Plans Preparation Manual**, Volume 1, Section 26.9.7, Paragraph 2 with the following:

Countermeasures designed into the bridge alternatives shall meet one or more of the following objectives:

1. Design structure for blast effects;
2. Maximizing explosive standoff distance;
3. Denial of access;
4. Minimizing time-on-target;
5. Selective protection of the structural integrity of key members;
6. Structural redundancy.

IMPLEMENTATION

These requirements are effective on projects not yet executed. Projects already underway should incorporate the new requirements when deemed appropriate and where minimal revision to the existing design is necessary.

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