Bridge Factors Factual Report Attachment 55 – FDOT Structures Design Guidelines (SDG), Structures Manual Volume 1, dated January 2015

Miami, FL

HWY18MH009

(5 pages)

FLORIDA DEPARTMENT OF TRANSPORTATION

STRUCTURES DESIGN GUIDELINES

FDOT STRUCTURES MANUAL
VOLUME 1
JANUARY 2015

B. Delete the third paragraph of ***LRFD*** [4.6.3.1] and add the following:

When a refined method of analysis is used for bridge superstructures not meeting the requirements of ***LRFD*** [4.6.2.2], indicate the name, version, and date of the software used on the FDOT Load Rating Summary Tables.

C. When widening existing AASHTO and Florida Bulb-T beam bridges with Florida-I Beams, the live load distribution factors may be calculated using the ***LRFD*** [4.6.2.2] approximate method.

*Commentary: The **LRFD** approximate method produces distribution factors that are conservative when compared to refined analyses even though the beam stiffnesses and spacings vary significantly.*

2.10 REDUNDANCY AND OPERATIONAL IMPORTANCE [1.3.4 AND 1.3.5]

A. Redundancy [1.3.4]

Delete the Redundancy factors, η_R, in ***LRFD*** [1.3.4] and use $\eta_R = 1.0$ unless a revised value is established in the tables below.

Redundancy Factors, η_R for Flexural and Axial Effects	
Structure Type	**η_R Factor**
Welded Members in Two Truss/Arch Bridges	1.20
Floor beams with Spacing > 12 feet and Non-Continuous Stringers and Deck	1.20
Floor beams with Spacing > 12 feet and Non-Continuous Stringers but with Continuous Deck	1.10
Steel Piers (Caps, columns, C-Piers, Straddle Piers, etc.)	1.20
Concrete C-Piers and Straddle Bents or Piers located over roadways	1.05

Redundancy Factors, η_R for Steel Girder Bridges						
Number of Girders in Cross Section	Span Type	# of Hinges required for Mechanism	I-Girders		Box Girders	
			With Cross-Frames[1]	Without Cross-Frames	With Exterior Diaphragms	Without Exterior Diaphragms
2	Interior	3	1.20	Not Permitted	1.00	1.20
	End	2	1.20	Not Permitted	1.00	1.20
	Simple	1	1.20	Not Permitted	1.05	1.20
3 or 4	Interior	3	1.00	Not Permitted	1.00	1.00
	End	2	1.00	Not Permitted	1.00	1.05
	Simple	1	1.00	Not Permitted	1.00	1.10
5 or more	Interior	3	1.00	Not Permitted	1.00	1.00
	End	2	1.00	Not Permitted	1.00	1.00
	Simple	1	1.00	Not Permitted	1.00	1.05

1 With at least three evenly spaced intermediate cross-frames or floor beams (excluding end cross-frames) in each span.

B. Operational Importance [1.3.5]

Delete the operational importance factors, η_I, in ***LRFD*** [1.3.5] and use $\eta_I = 1.0$ unless otherwise approved by the Department. For bridges considered critical to the survival of major communities, or to the security and defense of the United States, use $\eta_I = 1.05$.

Modification for Non-Conventional Projects:
Delete ***SDG*** 2.10.B and see the RFP for requirements.

10 PEDESTRIAN BRIDGES

10.1 GENERAL

A. The criteria covers engineered steel and concrete pedestrian bridge superstructures, including proprietary trusses, and the associated substructures, ramps, stairs, etc. crossing over FDOT roadway or placed on FDOT right-of-way.

B. Minor timber or aluminum structures associated with boardwalks, docks or fishing pier projects are not covered by these policies except that the loading shall meet requirements defined herein.

C. Wooden trusses or timber beam structures shall not cross over FDOT roadway facilities.

D. Aluminum or Fiber-reinforced polymer (FRP) (i.e. plastic, carbon fiber, or fiberglass) pedestrian bridges are not allowed.

E. Comply with ADA requirements for ramps and railings. See ***SDG*** 1.1.6 (ADA on Bridges).

10.2 REFERENCED STANDARDS

Reference Standards are in accordance with Section 8.2 of the ***PPM*** (Volume 1).

10.3 DESIGNER QUALIFICATIONS

A. All design calculations and design details or any design changes must be signed and sealed by a Professional Engineer licensed in the State of Florida.

B. For FDOT projects, engineering design firms working directly for the FDOT or Contractor's EORs designing prefabricated steel truss pedestrian bridges meeting the requirements of ***PPM***, Volume 1, Article 8.7.2 shall be pre-qualified in accordance with Rule 14-75, work group 4.2.2.

C. Engineering firms designing private, permitted bridges crossing FDOT roadway facilities need not be pre-qualified in accordance with Rule 14-75, but must comply with Rule 14-75 for minimum personnel and technical experience.

10.4 DESIGN (Rev. 01/15)

A. All pedestrian bridge structures shall be designed in accordance with the following:

- AASHTO LRFD Bridge Design Specifications (AASHTO)
- AASHTO Guide Specifications for the Design of Pedestrian Bridges (Guide Spec.)
- FDOT Plans Preparation Manual (***PPM***)
- FDOT Structures Manual