



# Florida Department of Transportation

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

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SUBJECT: Load Ratings for Existing Double Leaf Bascule Span Bridges

## **REQUIREMENTS:**

For existing double leaf bascule bridge spans, including bridges that are repaired, load rate in accordance with the Load Factor Rating (LFR) method as permitted in Chapter 6 of the Florida Department of Transportation (FDOT) Structures Manual (SM). The main girders shall be load rated both with and without the benefit of the span locking device. The decision on when to use the load rating for the main girders with or without the benefit from the span locking device will be made by the District Structures Maintenance Engineer (DSME)

Bridges designed by the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) method shall be load rated by the AASHTO Load and Resistance Factor Rating (LRFR) method. Moveable bridges undergoing structural rehabilitation shall be designed and load rated using LRFD and LRFR, respectively.

## **COMMENTARY:**

Currently the SM requires that double leaf bascule span bridges be load rated in accordance with the LRFR Manual. The LRFR Manual requires the bridge to be rated without any contribution from the span locking devices. Section 6 of the LRFR Manual allows for the bridge to be rated using Load Factor Rating (LFR) for older structures and does not preclude the contribution of the span locking devices. The majority of existing double leaf bascule span bridges in Florida were designed and subsequently load rated assuming the main girders transfer shear at the span locking device. Load rating existing double leaf bascule span bridges, assuming that the main girders behave as a cantilever without any benefit

from the span locking device, will lower the load rating capacity of many Florida bridges. The current LRFR load rating criteria may result in some existing double leaf bascule span bridges being posted for weight restrictions, which would require the replacement of these bridges in accordance with current FDOT procedures.

The decision on the method to load rate Florida's existing double leaf bascule span bridges should be made by the District Structures Maintenance Engineers (DSME) in conjunction with advice from the State Bridge Evaluation Engineer. The DSME needs to take into account the bridge's structural and mechanical condition, the functionality of the movable span and condition of the span locks, and the reliability of the movable bridge's monitoring system. LFR load ratings for existing double leaf bascule span bridges need to be performed with and without the span locks engaged to allow for the full understanding of the bridge's limitations. The assumption for the condition and contribution of the span locks must be included in the load rating documentation. If the load rating assumes the span locks are engaged and the condition or operation of the span locks is compromised the load rating is invalid and the load rating without the locks engaged shall be used. If the span locks are not functional, but were assumed to contribute in the load rating, the load rating performed without benefit from the span locks will be used to determine what types of vehicles may continue to use the bridge until repairs are made.

Load ratings that rely on a contribution from the span locks need to confirm the capacity of the span locks to transfer the appropriate loads, including analysis of the span lock connections. This analysis also needs to confirm the ability of the floor beams and/or framing of the superstructure to transfer the stresses due to span lock loads to the main girders.

**IMPLEMENTATION:**

May be used immediately for all load rating of existing double leaf bascule span bridges which were not designed using LRFD.

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RVR/JAP