LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Office of Operations
Bridge Maintenance
Load Rating Unit
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Jeff Landry, Governor
Joe Donahue, Secretary

MEMORANDUM

TO: ALL BRIDGE RATERS – IN HOUSE, LOCAL OWNERS, AND CONSULTANTS

FROM: WILLIAM J. METCALF JR. P.E.
LOUISIANA LOAD RATING ENGINEER

SUBJECT: UPDATES TO SELECT LOAD RATING POLICIES.

DATE: APRIL 1ST, 2025

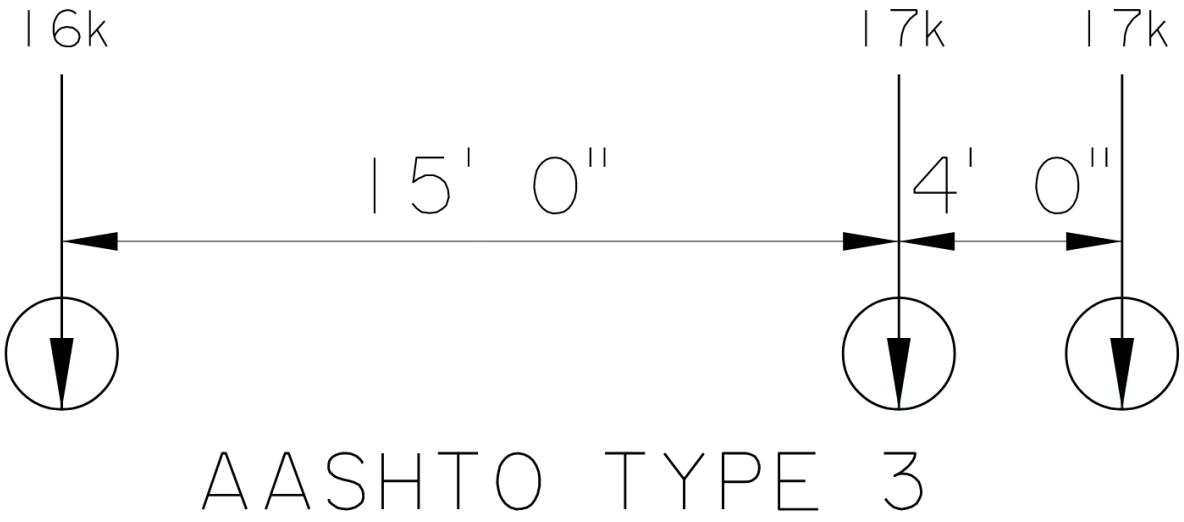
The following memorandum serves to update select policies affecting the load rating of bridges in the state of Louisiana. The policies in this memo are effective immediately. Past ratings are exempt from these policies. Ratings that are significantly close to completion upon the receipt of this document may be considered exempt on a case-by-case basis (contact our office for exemption). Policies in this memorandum shall supersede any past policy that conflicts with it.

The memorandum will address the following issues:

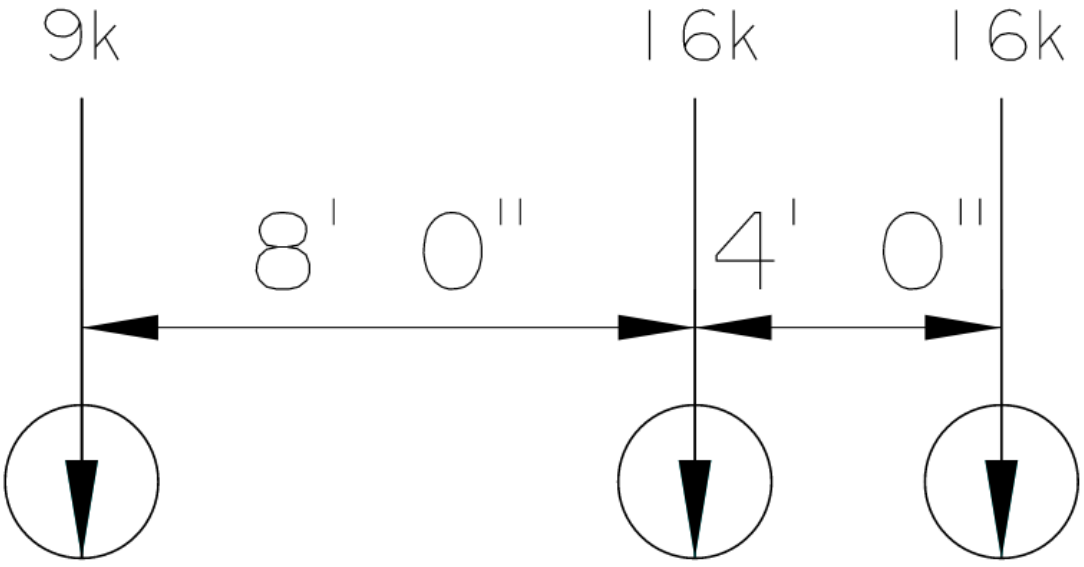
1. AASHTO Type 3 vehicle replacing Louisiana Type 3 vehicle in legal ratings.
2. Traffic factors influencing ADTT for the new SNBI Functional classes.
3. BrR settings and policy for rating pre-stressed girder bridges.
4. New Posting sign/values and updated summary sheet.

AASHTO TYPE 3 VEHICLE

Effective immediately, the AASHTO Type 3 vehicle shall replace the Louisiana Type 3 vehicle in all Load and Resistance Factor (LRFR) ratings of Louisiana bridges (see illustrations below). This change is a result of our 2024 FHWA intermediate review. The AASHTO Type 3 vehicle has a heavy steer axle resulting in a lower rating factor for some bridges. The La Type 3 vehicle is lighter and results in a lower tonnage value. There are reasonable arguments for the use of either truck. This policy change is intended to align us with what FHWA is looking for and not because it results in better or worse ratings. Type 3 almost never controls ratings so this change should have little overall effect on ratings.



AASHTO TYPE 3



LOUISIANA TYPE 3

TRAFFIC FACTORS FOR SNBI

LRFR ratings incorporate traffic data into the calculations. This is done using the ADT, directional percentage, and truck percentage. In Louisiana, directional percentage and truck percentage are assumed based on the functional class of the route where the bridge is located. The values that are used are established by the Traffic Engineering section.

In the past, bridges were inventoried based upon the National Bridge Inventory (NBI) standards. Currently all states are transitioning to using Specifications for the National Bridge Inventory (SNBI) standards. Under the SNBI standards there are significantly fewer functional classes than there were for NBI, so the table for assuming these values has been updated. Immediately below is the updated table.

Code	Functional Class	Directional %	Truck %
1	Interstate	58.74	27.76
2	Principal Arterial-Other Freeways and Expressways	58.13	20.67
3	Principal Arterial-Other	58.29	19.43
4	Minor Arterial	58.33	18.48
5	Major Collector	59.18	18.67
6	Minor Collector	58.36	16.57
7	Local	58.28	15.90

BrR SETTINGS AND RATING LOAD FACTORS FOR PRE-STRESSED GIRDER BRIDGES

The LRFR and LRFD code adopted in Louisiana circa 2012 included a live load factor for pre-stressed members being rated for the Service III limit state (henceforth Service III) of 0.8. DOTD decided instead to use live load factor of 1.0 for Service III. This applied to both rating and design.

It is our office's opinion that for design, a value of 1.0 should be used without exception. For rating, 1.0 is a better choice, but because Service III is not applicable to legal loads, which load factor is used has little practical effect on the load carrying capacity of the bridge. Changing the load factor presents a problem in the BrR software, and this software is used for 90% or more of our ratings. The load factor change is accomplished by overriding the specification and changing the load factor as shown below.

Factors - LRFR

Name: 2018 (2022 Interim) AASHTO LRFR S

Description: AASHTO Manual for Bridge Evaluation, 3rd Edition, including 2022 interims

Load factors | Legal loads | Permit loads | Concrete | Steel | Wood | Aluminum | Buried structures | Specifications

Bridge type: Prestressed Post-tension secondary effects: 1.000

Limit state	Dead load		Design load				Vehicle			
			Inventory	Operating	Legal load	Permit load	Consider			
	DC	DW	LL	LL	LL	LL	Inv	Op	Legal	Permit
STRENGTH I	1.250	1.500	1.750	1.350	Table...		☑	☑	☑	☐
STRENGTH II	1.250	1.500				Table...	☐	☐	☐	☑
SERVICE I	1.000	1.000				1.000	☐	☐	☐	☑
SERVICE III	1.000	1.000	Table 6A.4.2.2-2		1.000		☑	☐	☐	☐

Table 6A. 4.2.2-2-load factors for live load for the Service-III load combinations at the design-load inventory level

Component	LL max
Prestressed concrete components designe...	1.000
All other prestressed concrete components	1.000

Member Alternative Description

Member alternative: Type III Int.

Description | Specs | Factors | Engine | Import | Control options

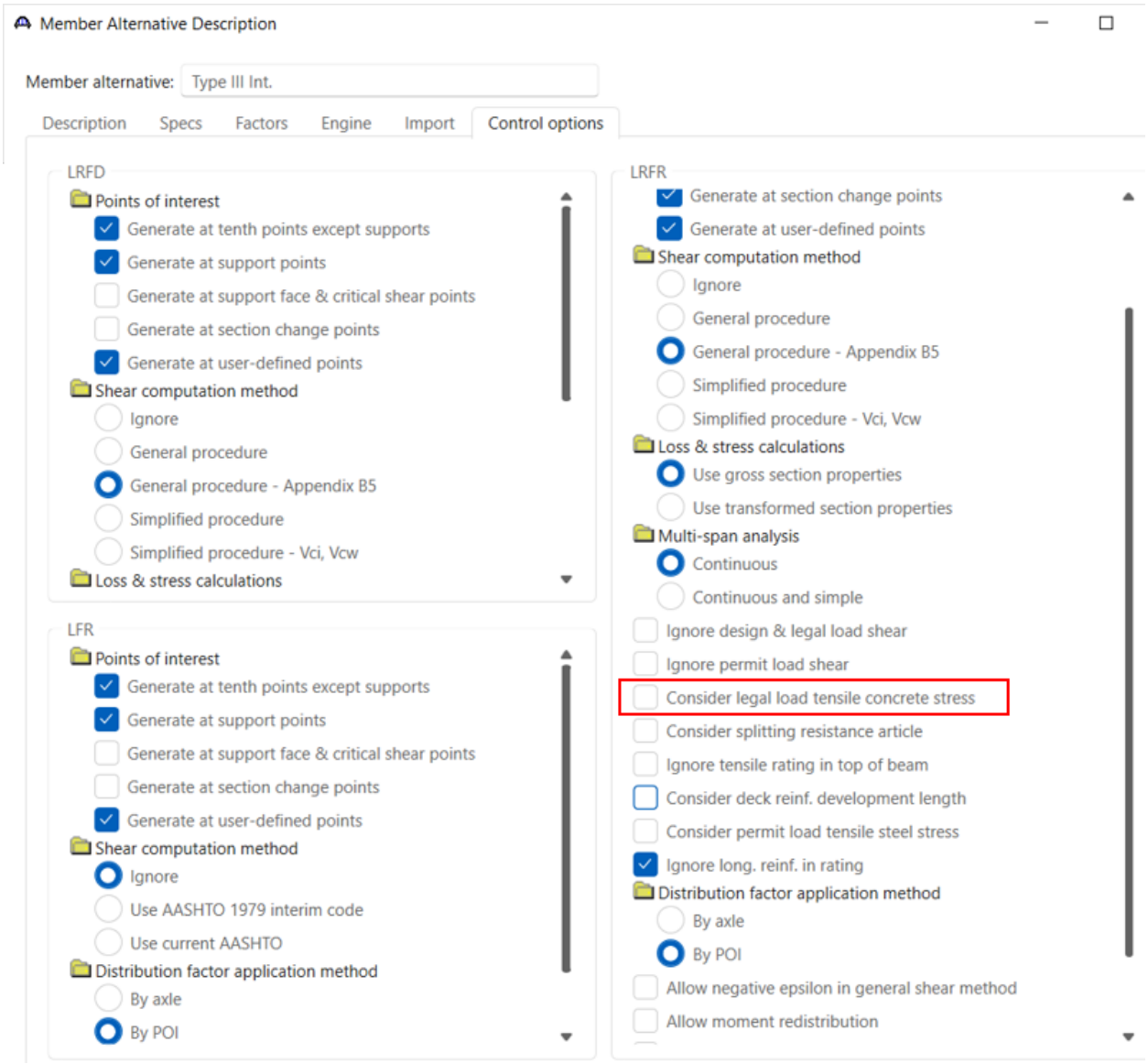
Analysis method type	Analysis module	Selection type	Spec version	Factors
ASR	AASHTO ASR	System Default	MBE 3rd 2023i, Std 17th	N/A
LFR	AASHTO LFR	System Default	MBE 3rd 2023i, Std 17th	2002 AASHTO Std. Specifications
LRFD	AASHTO LRFD	System Default	LRFD 9th	2020 AASHTO LRFD Specifications
LRFR	AASHTO LRFR	Override	MBE 3rd 2023i, LRFD 9th	2018 (2022 Interim) AASHTO LRFR Spec.

Overriding the specification creates a problem. When you override the specification, you have overridden the system default, which is tied to the bridge permanently. The code used to rate the bridge is not updated as the code is updated. Our choice is to either update the thousands of pre-

stress BrR files we have for each of the yearly code updates or to leave our bridges to be rated by old codes. Neither of these options are acceptable. Considering the above and the fact that Service III has little practical effect on the rating outcome, the negatives of overriding the specification greatly outweigh the benefits.

Effective immediately, pre-stress members shall be rated with the load factors prescribed in the code and in BrR files for these members, the system default specification shall not be overridden. When creating the BrR file in this way, the following box on the member alternative "control options" tab needs to be unchecked to ensure Service III is not analyzed for legal loads.

(See next page)


Member Alternative Description
Member alternative: Type III Int.
Description
Specs
Factors
Engine
Import
Control options
LRFD
Points of interest
Generate at tenth points except supports
Generate at support points
Generate at support face & critical shear points
Generate at section change points
Generate at user-defined points
Shear computation method
Ignore
General procedure
General procedure - Appendix B5
Simplified procedure
Simplified procedure - Vci, Vcw
Loss & stress calculations
LFR
Points of interest
Generate at tenth points except supports
Generate at support points
Generate at support face & critical shear points
Generate at section change points
Generate at user-defined points
Shear computation method
Ignore
Use AASHTO 1979 interim code
Use current AASHTO
Distribution factor application method
By axle
By POI
LRFR
Generate at section change points
Generate at user-defined points
Shear computation method
Ignore
General procedure
General procedure - Appendix B5
Simplified procedure
Simplified procedure - Vci, Vcw
Loss & stress calculations
Use gross section properties
Use transformed section properties
Multi-span analysis
Continuous
Continuous and simple
Ignore design & legal load shear
Ignore permit load shear
Consider legal load tensile concrete stress
Consider splitting resistance article
Ignore tensile rating in top of beam
Consider deck reinf. development length
Consider permit load tensile steel stress
Ignore long. reinf. in rating
Distribution factor application method
By axle
By POI
Allow negative epsilon in general shear method
Allow moment redistribution

NEW POSTING SIGN VALUES AND SUMMARY SHEET

We have changed some of our posting signs and values, and created a new summary sheet. The only official policy change is that all ratings should use the new summary sheet. The new summary sheet (excel file) will be available on our website in the coming weeks. For access before it is published, you may request a copy from Teri Hammett (teri.hammett@la.gov). We included a copy of the new summary sheet (excel file) with this document. Please note that visually it looks very similar to the existing summary sheet.

Raters do not have to be concerned with the new posting values. If they use the updated summary sheet, the right posting values will be selected automatically. The legal posting values are only changing slightly as we have consolidated some of our signs. The emergency vehicle posting signs have changed significantly. Emergency vehicles have three posting values: Gross, Single Axle, and Tandem Axle. It is now our policy to base the Single Axle posting on the EV2 rating and the Tandem Axle on the EV3 rating. The Gross will still be based on whichever emergency vehicle is critical. As a result, there are some postings with a "-" for the single posting which means no posting for single axle fire trucks.

Thank you in advance for working with us on these changes. I do not foresee any of these changes causing any issue. If you have any questions please contact the rating office or myself.

Sincerely,

William J. Metcalf Jr. P.E,
Load Rating Engineer

Wjm:WJM