

FAQ for LARS Bridge Load Rating (February 2011)

1. Can we perform a load rating of a Steel Box Girder using LARS Bridge? If yes, please provide an example. **Answer: LARS Bridge currently cannot load rate steel box girders.**
2. Can we perform a load rating of a Prestressed Box Girder (not voided box beam) using LARS Bridge? **Answer: Assuming this question is referring to post-tensioned box girders, LARS does not rate post tensioned boxes.**
3. Dead Load input in LARS is a single input. How do we incorporate DL1 and DL2 in the system? Is the self-weight included automatically for the member, or does the user need to include it manually in the input? **Answer: The dead load input on the Description menu is actually DL2, however, in the latest LRFR version there is an option for Continuous-constant stage I loading. Multiple loads (concentrated, uniform, varying) can be entered which are superimposed by the system. Self-weight (DL1) is automatically computed by LARS based on the member definition.**
4. What kind of elements are considered for different dead loads? How does it differ in LARS? What happens for Steel Deck weight for a non-composite section? **Answer: For self-weight calculations, LARS uses member definition, including slab along with the respective material properties to compute the dead load. Steel deck weight for a non-composite section would have to be added separately using the *Description _ Dead Load* command since there is no steel deck element used as part of the member definition.**
5. Under “*Bridge Analysis Type / Vehicle Description*”, when does the user check the “*Use Std. Live Loads*” box? Please clarify with an example. Also, what is the definition of “*Allow. Stress Ratio*” in this context. When do we need to fill in this information and how does it pertain to ASR/LFR/LRFR? **Answer: When the ‘Use Std. Live Loads’ box is checked, LARS will also include any trucks specified in the *Analysis _ Live Load Vehicles* command in the rating analysis. The *Analysis _ Live Load Vehicles* command allows selection of nine additional vehicles each for inventory, operating or posting rating to be used in addition to the vehicles selected on the *Bridge Analysis Type/Vehicle Description* dialog. The *Allow. Stress Ratio* option allows entry of a user specified ratio and is used for ASR rating only.**
6. Explain more regarding the “*LFD moment Re-distribution*” box, the “*Never Compact*” box, and the “*Fixity*” box and their usage in the analyses process. **Answer: The Moment Redistribution flag tells LARS to perform moment redistribution for SS and CSC members per the AASHTO Spec (LFR only). Never Compact is a flag that applies to SS and CSC members for LFR rating and forces the system to never qualify the section as compact regardless of the F_y value. The Fixity option on the Structure Configuration dialog allows the left support (abutment), right support (abutment) or both to be modeled as fixed (or moment resistant) instead of pinned.**
7. Explain more regarding the “*Stretch Truck*” box and how it pertains to New Jersey. Clarify when to check this box. **Answer: Selection this option will activate the HS20 stretch vehicle and include in the live load analysis a variance of the distance from the second to**

third axle of 14 feet to 30 feet. HL93 automatically stretches the third axle from 14 feet to 30 feet. Only the critical value is reported.

8. How can we customize the “Impact Factor” for values in between 10% and 30%?
Answer: The impact factor can be customized by manipulating the min/max value, for example if a specific impact factor is desired the min/max value can be set to the desired value.
- 9 Explain the difference between slab thickness and effective slab thickness. Answer: Slab thickness is the “actual” thickness of the slab and is used for dead load calculation. Effective slab thickness is used in the strength calculations for the member. Self-weight of the member is based on the “actual” thickness of the slab.
10. Where can the distribution factor for deflection in LFD be input in LARS? Answer: LARS does not support a distribution factor for deflection. LARS doesn’t perform deflection computations at this time.
11. Explain the limitations of LARS software in terms of materials and structure configurations. Answer: LARS currently handles the following materials: steel (including composite Concrete), hybrid steel (including composite Concrete), reinforced concrete, prestressed concrete (including composite Concrete) and timber. Structure configuration is: flexural members - (longitudinal girders and stringers) up to 20 spans; simple span floor beams: interior and end floor beams cantilevered and non-cantilevered; trusses up to 9 spans: simple span, multi-span continuous/cantilever, complex geometry (arch trusses). Trucks can have up to 30 axles. As mentioned above, LARS does not handle post-tensioned members. Additionally LARS does not handle true culvert rating at this time.
12. Describe the calculation process for the distribution factor for concrete slabs. Answer: slab and all other distribution factors currently have to be calculated by the user and entered into LARS. A facility is being developed in LARS to provide the ability to calculate distribution factors. When that facility is available the methods used to compute the distribution factors will be provided.

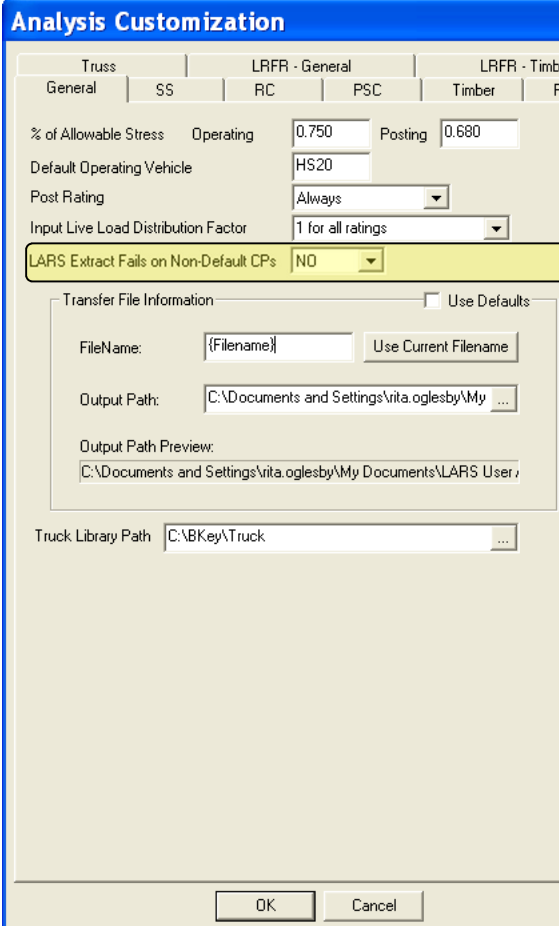
FAQ for LARS Bridge Load Rating (January 2011)

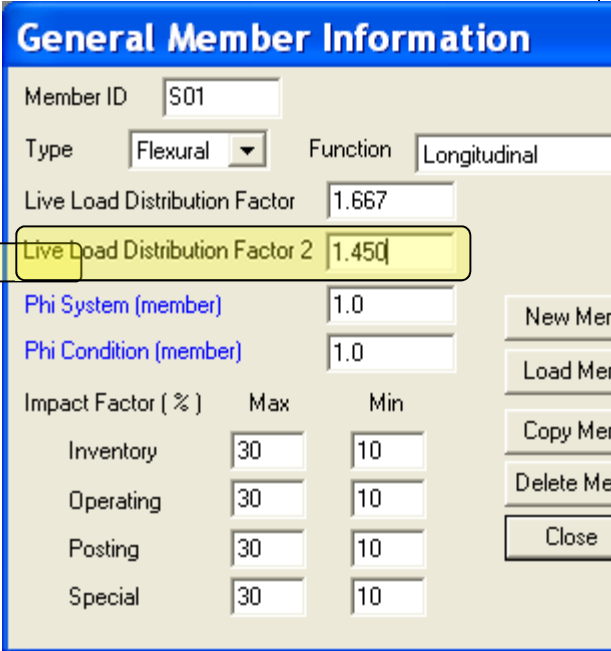
1. Clarify Max. Stiffener Spacing Units on Lateral Bracing and Stiffener input. *The maximum stiffener spacing units are assumed to be in feet if no other indication is given. For inch input, enter a double quote (") after the value entered. For example, enter 30" if the maximum stiffener spacing is 30 inches.*
2. What is the effect of corrosion factor on LRFR rating factor? *It reduces the stress limit of the pre-stressing steel – see Table 5.9.5.4.2.2-1.*
3. Explain why there is no rating value when doing LRFR & HL93 truck. Cite MBE and/or Manual for Bridge Evaluation. *Rating values are only computed for ASR and LFR rating using standard AASHTO trucks (i.e. HS20, H20, HS15, H15, etc.) The rating value is the rating factor multiplied by the numeric truck designation. There is no rating value for LRFR HL93 trucks or any non-HS20 truck. All rating values reported for LRFR will be zero.*
4. When a PS concrete section changes in depth along its length what is held (top/bottom) and what is the effect on the strand pattern. Should the strand pattern be redefined when the concrete height aspects change? *It doesn't matter whether top or bottom is held. Generally the top is held constant since driving is usually on the top of the beam. Strand pattern doesn't need to be redefined if a transition is used; LARS will place strands as defined by the User from either the top or bottom fibers of the beam.*
5. Describe how the HS20 stretch truck is handled by LARS. *Stretch is available only for ASD/LFD analysis. This option is available on the "Analysis Option" dialog. This option stretches the rear axle of a HS20 by 1 foot increments and checking the live load effect to compute the optimum "stretch" of the axle. The distance for the stretch axle is shown in the detail flexural report as "Ax. Dis."*
6. Explain the second live load distribution factor option on the General Member Information dialog. *See Attachment A below. The second live load distribution factor pertains to ASR and LRF rating only, not LRFR.*

Attachment A – LARS Live Load Distribution Factor 2

When Analysis Customization → General →
“Input Live Load Distribution Factor” is set to
“1 for all ratings”

AND Live load Distribution Factor 2 is > 0
The value of Live Load Distribution Factor 2 will
be used for shear rating.





LARS Live Load Distribution Factor 2 option cont.

When Analysis Customization → General →
“Input Live Load Distribution Factor” is set to
“1 for Inv., 1 for all others

AND Live load Distribution Factor 2 is > 0
The value of Live Load Distribution Factor 2
will be used for all rating types other than
inventory rating (i.e. operating and posting).

<p>LARS Live Load Distribution Factor 2 option cont.</p> <p>Regardless of Analysis customization option, floor beams have an additional option. (Multi-Floor Beam Only) option is primarily for use with girder floor systems when no stringers are present. Since the floor beams are spaced closely together, axles may be distributed between multiple floor beams by inputting a factor less than 1. Conversely, if a larger live load effect is desired, a value great one may be input.</p>	

General Member Information

Member ID	<input type="text" value="B03"/>		
Type	<input type="text" value="Flexural"/>	Function <input type="text" value="Floor Beam-Interior"/>	
Floor Beam Spacing	<input type="text" value="31.21"/>		
(Multi-Floor Beam Only)	<input type="text" value="0.55"/>		
Phi System (member)	<input type="text" value="1.0"/>	<input type="button" value="New Member"/> <input type="button" value="Load Member"/> <input type="button" value="Copy Member"/> <input type="button" value="Delete Member"/> <input type="button" value="Close"/>	
Phi Condition (member)	<input type="text" value="1.0"/>		
Impact Factor (%)	Max		Min
Inventory	<input type="text" value="30"/>		<input type="text" value="10"/>
Operating	<input type="text" value="30"/>	<input type="text" value="10"/>	
Posting	<input type="text" value="30"/>	<input type="text" value="10"/>	
Special	<input type="text" value="30"/>	<input type="text" value="10"/>	