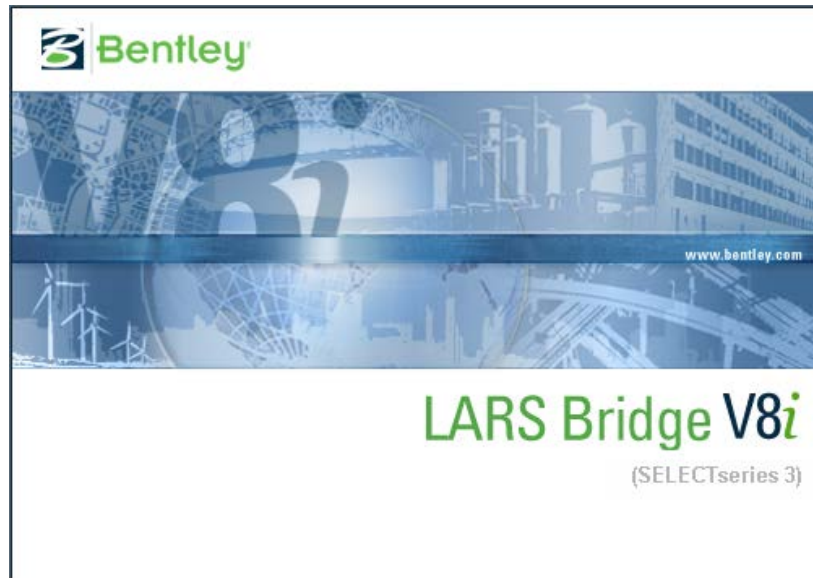


LARS Bridge Release 6.00.01.07 Release Notes



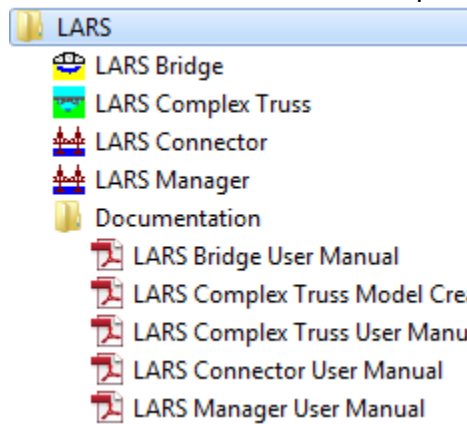
LARS Bridge V6.00.01.07 is primarily a maintenance release with no significant functional enhancements. It does represent the initial consolidated release where LARS Bridge is now a single product and all modules that were previously licensed separately are included in the single product. The modules that are now part of LARS Bridge along with the core LARS Bridge modeling and load rating engine are:

- Connector – extracts bridge models from AASHTO Bridge Rating BrR
- Manager – Manages LARS Bridge models
- RouteRunner – Perform batch processing and permit analysis using LARS Bridge models
- Complex Truss – Model and load rate truss bridges with complex geometry bridges

The following are part of LARS Bridge Release 6.00.01.07:

1. LARS Bridge single consolidated product. Contains LARS Bridge, Connector, Manager, RouteRunner and Complex Truss. LARS Bridge is still licensed on an annual subscription basis.
2. An all new installer – LARS products have migrated from using InstallShield installation tool to WiX installations. With this change, a clean install will need to be performed. The following steps are recommended:
 - a. Back-up the current “C:\BKey” folder tree to preserve any customization, data, trucks files.
 - b. Uninstall existing LARS products using **Control Panel → Programs and Features**

- c. Install LARS Bridge 6.00.01.07 by launching **LarsBridgeEnterprise.msi**. Respond to the following prompts.
 - i. Accept the license agreement
 - ii. Choose the installation option – **Typical** installs LARS Bridge only under the c:\bkey folder tree; **Custom** allows selection of the LARS application to be installed and where. The individual applications are LARS Bridge, Connector, Manager, RouteRunner and Complex Truss; **Complete** allows installation of all LARS applications under the default c:\bkey folder tree
 - iii. After the install is complete LARS will be added to the Start menu as shown below. All user documentation is also installed and available from the Start Menu. The LARS Bridge User Manual has been updated to include access to individual chapters via links in the Table of Contents,



Several updates plus an Appendix that provides links to useful information that is posted on the LARS Wiki site.

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- 3. RSS Feeds – LARS Bridge 6.00.01.07 will employ RSS feeds for news relative to LARS
- 4. For Steel members LARS now allows a minimum and maximum stiffener spacing within bracing panels on the Lateral Bracing & Stiffener Spacing Dialog. This feature was added primarily for LARS users who also use the AASHTO Bridge Rating (BrR) software. Bridges extracted from BrR using the LARS Connector previously would have only the maximum stiffener spacing in a panel. Now the LARS Connector will pick up a minimum stiffener spacing at panels adjacent to the end and intermediate supports, which should prevent artificially low shear ratings at these locations.

Lateral Bracing & Stiffener Spacing - SP001

Support Code:

Position: Max Stiff Spacing:

Min Stiff Spacing: ←

Number of Spaces: Spacing:

Element Location

Locate By:

Ref ID	Ref Point	Offset
Left End to: <input type="text" value="R1"/>	<input type="text" value="Cente"/>	<input type="text" value="0.0000"/>
Right End to: <input type="checkbox"/>		

Length (ft.):

Symmetrical

Child ID:

5. Miscellaneous maintenance fixes:
 - a. Resolve shear rating issue with reinforced concrete members
 - b. Other minor maintenance fixes
 - c. Fixed problem with floor beam impact
 - d. Fixed several LARS Connector issues
 - e. Compiler upgrades
 - f. Adjusted critical shear location logic for RC and PSC beams to consider composite section depth
6. Updated the LARS customization dialog, LRFR General tab as follows

Analysis Customization

General	SS	RC	PSC	Timber	Fr Beam
Truss	LRFR - General		LRFR - Timber		
Condition Factor	<input type="text" value="1.000"/>				
System Factor	<input type="text" value="1.000"/>				
Average Daily Traffic Total	<input 3"="" type="text" value="0.</td> <td colspan="/>				
Ydc Strength Limit State	<input type="text" value="1.250"/>				
Ydw Strength Limit State	<input type="text" value="1.500"/>				
YI Strength Limit State - Inventory	<input type="text" value="1.750"/>				
YI Strength Limit State - Operating	<input type="text" value="1.350"/>				
YII Strength I Limit State	<input type="text" value="1.800"/> ← Note 1				
YII Strength II Limit State	<input type="text" value="1.800"/> ← Note 2				
Ydc Service Limit State	<input type="text" value="1.000"/>				
Ydw Service Limit State	<input type="text" value="1.000"/>				
YII Service II Limit State - Inventory	<input type="text" value="1.300"/>				
YII Service II Limit State - Legal	<input type="text" value="1.300"/>				
YII Service III Limit State - Inventory	<input type="text" value="0.800"/>				
Ydc Fatigue Limit State	<input type="text" value="0.000"/>				
Ydw Fatigue Limit State	<input type="text" value="0.000"/>				
YII Fatigue Limit State	<input type="text" value="0.750"/>				

- a. The field that was previously labeled **YII Service I Limit State** has been changed to **YII Service II Limit State - Inventory**. See Yellow shaded cell above and in table below.
- b. The field that was previously labeled **YII Service II Limit State** has been changed to **YII Service II Limit State – Legal**. – See Green shaded cell above and in table below.
- c. The field that was previously labeled **YII Service III Limit State - Legal** has been changed to **YII Service III Limit State – Inventory**. – See Orange shaded cell above and in table below.
- d. LARS now sets the optional Service YII factors to 1.0 as follows. These cell are shaded gray in the table below
 - i. Service III YII Legal Load – Prestressed concrete
 - ii. Service I YII Permit load - Prestressed Concrete
 - iii. Service I YII Permit Load – Reinforced Concrete
 - iv. Service II YII Operating and Permit Load – Steel
- e. **Note 1:** In the LARS Customization dialog shown above, if the value is left blank the YII Legal load factor will be computed from MBE tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1. Otherwise the entered value will be used.
- f. **Note 2:** In the LARS Customization dialog shown above, if the value is left blank the YII Permit load factor will be computed from MBE table 6A.4.5.4.2a-1. Otherwise the entered value will be used.

Table 6A.4.2.2-1—Limit States and Load Factors for Load Rating

Bridge Type	Limit State*	Dead Load γ_{DC}	Dead Load γ_{DW}	Design Load		Legal Load γ_{LL}	Permit Load γ_{LL}
				Inventory γ_{LL}	Operating γ_{LL}		
Steel	Strength I	1.25	1.50	1.75	1.35	Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	—
	Strength II	1.25	1.50	—	—	—	Table 6A.4.5.4.2a-1
	Service II	1.00	1.00	1.30	1.00	1.30	1.00
	Fatigue	0.00	0.00	0.75	—	—	—
Reinforced Concrete	Strength I	1.25	1.50	1.75	1.35	Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	—
	Strength II	1.25	1.50	—	—	—	Table 6A.4.5.4.2a-1
	Service I	1.00	1.00	—	—	—	1.00
Prestressed Concrete	Strength I	1.25	1.50	1.75	1.35	Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	—
	Strength II	1.25	1.50	—	—	—	Table 6A.4.5.4.2a-1
	Service III	1.00	1.00	0.80	—	1.00	—
	Service I	1.00	1.00	—	—	—	1.00
Wood	Strength I	1.25	1.50	1.75	1.35	Tables 6A.4.4.2.3a-1 and 6A.4.4.2.3b-1	—
	Strength II	1.25	1.50	—	—	—	Table 6A.4.5.4.2a-1

7. Updated LARS to the 2013 MBE interims. Tables 6A.4.4.2.3a-1, 6A.4.4.2.3b-1 and 6A.4.5.4.2a-1 are now used within LARS. The LARS Flexural Detail report has been modified to report the correct Gamma (γ) factors.

8. Changed wording on the RC and PSC customization screens from “Ignore additional ASD/LFD checkpoints from face of support” to be “Check shear directly at supports”. There is no change in functionality or required input. This option is set to NO by default, such that shear is checked at the the d-distance location, and reported as 999 at the support.

Analysis Customization

General | SS | RC | PSC | Timber | Flr Beam | Truss | LRFR - General | LRFR - Timber

Yield Bending Stress - Reinforcing Steel

Up to Yr	Fy	Inventory	Operating	Posting
1905	26000.0	14300.0	19500.0	19500.0
1920	32000.0	17600.0	24000.0	24000.0
1944	33000.0	18150.0	24750.0	24750.0
1979	40000.0	20000.0	28000.0	28000.0
2050	60000.0	24000.0	36000.0	36000.0

Buttons: Add, Modify, Delete

Allowable Bending Stress - Reinforced Concrete

Up to Yr	f _c	Inventory	Operating	Posting
1930	3000.0	1200.0	1650.0	1650.0
2050	3500.0	1400.0	1925.0	1925.0

Buttons: Add, Modify, Delete

Yield Shear Stress - Shear Reinforcing Steel

Up to Yr	Fy	Inventory	Operating	Posting
1905	26000.0	14300.0	19500.0	19500.0
1920	32000.0	17600.0	24000.0	24000.0
1944	33000.0	18150.0	24750.0	24750.0
1979	40000.0	20000.0	28000.0	28000.0
2050	60000.0	24000.0	36000.0	36000.0

Buttons: Add, Modify, Delete

Allowable Shear Stress - Reinforced Concrete

Up to Yr	f _c	Inventory	Operating	Posting
1930	3000.0	1200.0	1650.0	1650.0
2050	3500.0	1400.0	1925.0	1925.0

Buttons: Add, Modify, Delete

Ignore shear rating when no stirrups are present: YES

Always ignore shear rating: NO

Check shear directly at supports: NO

Move critical shear locations to match concentrated loads within d regions: NO

Buttons: OK, Cancel

9. Added switches to the RC and PSC customization screens that for LFD design will control the program logic for moving critical shear location when concentrated loads are present in the d-distance regions adjacent to the supports.

Analysis Customization X

General | SS | RC | PSC | Timber | Flr Beam | Truss | LRFR - General | LRFR - Timber

Yield Bending Stress - Reinforcing Steel

Up to Yr	Fy	Inventory	Operating	Posting
1905	26000.0	14300.0	19500.0	19500.0
1920	32000.0	17600.0	24000.0	24000.0
1944	33000.0	18150.0	24750.0	24750.0
1979	40000.0	20000.0	28000.0	28000.0
2050	60000.0	24000.0	36000.0	36000.0

Add Modify Delete

Allowable Bending Stress - Reinforced Concrete

Up to Yr	f _c	Inventory	Operating	Posting
1930	3000.0	1200.0	1650.0	1650.0
2050	3500.0	1400.0	1925.0	1925.0

Add Modify Delete

Yield Shear Stress - Shear Reinforcing Steel

Up to Yr	Fy	Inventory	Operating	Posting
1905	26000.0	14300.0	19500.0	19500.0
1920	32000.0	17600.0	24000.0	24000.0
1944	33000.0	18150.0	24750.0	24750.0
1979	40000.0	20000.0	28000.0	28000.0
2050	60000.0	24000.0	36000.0	36000.0

Add Modify Delete

Allowable Shear Stress - Reinforced Concrete

Up to Yr	f _c	Inventory	Operating	Posting
1930	3000.0	1200.0	1650.0	1650.0
2050	3500.0	1400.0	1925.0	1925.0

Add Modify Delete

Ignore shear rating when no stirrups are present YES ▾

Always ignore shear rating NO ▾

Check shear directly at supports NO ▾

Move critical shear locations to match concentrated loads within d regions NO ▾

OK Cancel

10. Added switch for reinforced concrete T-Beams to consider the full cross-section (including beam flange) as effective for stiffness for the full length of the beam. The default is to consider the flange effective in the positive moment regions only.

Member Shape Description - RC - TB067

Element Type: T-Beam Variation: None

Height (in.):

T Flange Wid. (in.): Thickness:

Stem Width (in.):

Symmetrical

Locate By: Contiguous to Last L->R Child ID:

Right End to

Ref ID: Ref Point: Offset:

Length (ft.):

Consider full section effective for stiffness over entire beam length

Buttons: Add, Modify, Remove, Sectionize, Close >

LARS Limitation:

For LRFR Legal loads, LARS currently only applies the truck loads and does not apply a concurrent lane load. This limitation will be removed in a subsequent revision to the product.