



Texas Load Rating Program – LFR

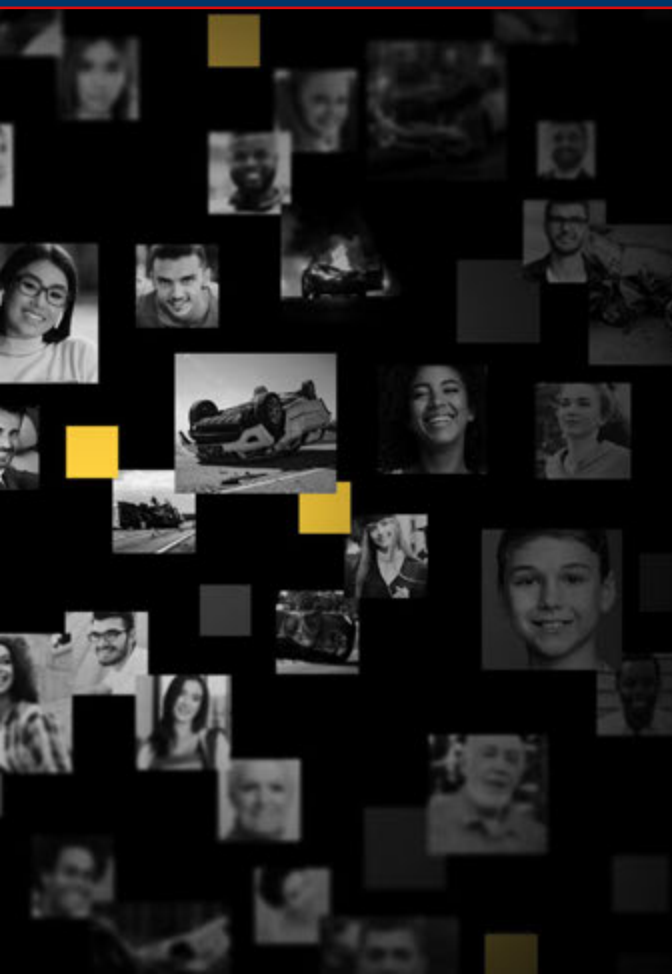
Jesus Alvarez, PE



February 13, 2025

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HELP #EndTheStreakTX

End the streak of daily deaths on Texas roadways.

TxDOT.gov
#EndTheStreakTX Toolkit



What is Load Rating?

Per AASHTO MBE:

- Bridge load rating provides a basis for determining the safe load capacity of a bridge
- Load rating requires engineering judgement in determining a rating value that is applicable to maintain the safe use of the bridge and arriving at posting and permit decisions
- The specific load ratings are used in identifying the need for load posting or bridge strengthening and in making overweight-vehicle permit decisions
- Load ratings are routinely reported

Per Title 23 CFR 650, Subpart C – National Bridge Inspection Standards

- Every bridge must have a load rating evaluation
- FHWA Metric 13 – Load rating

What is Load Rating?

Load ratings must reflect the existing conditions and be updated for:

- Changes in the condition of the structural members
- Changes to the structural configuration
- Changes to the lane configuration
- Changes to the strength of the members
- Change in dead load
- Changes to the legal live loads



What is Load Rating?

Load Rating Methods:

- Calculated
- Assigned LR Based on Design Load
- Assumed LR Based on Engineering Judgement

Bridge Inspection Manual

- Ch. 6 Load Ratings and Load Postings

Bridge Inspection Manual



Revised September 2024

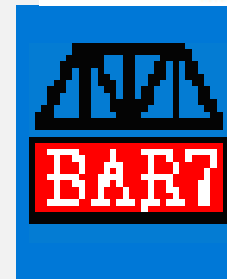
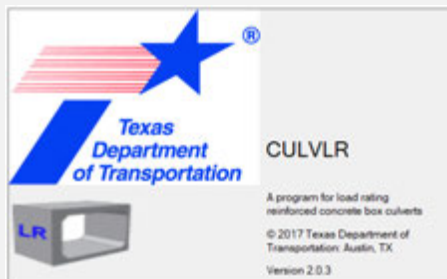
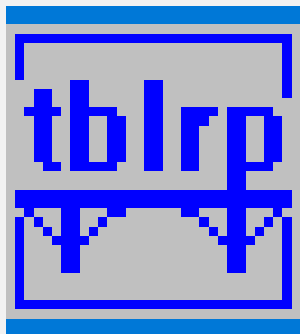
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<https://onlinemanuals.txdot.gov/TxDOTOnlineManuals/txdotmanuals/ins/ins.pdf>

What is Load Rating?

TxDOT Load Rating Tools:

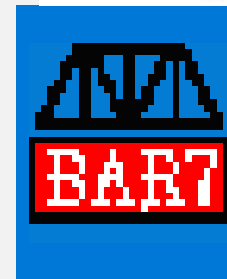
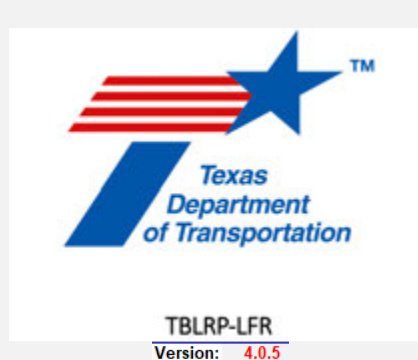
- TBLRP*
- RATE Spreadsheet
- CULVLR
- BAR7
- AASHTOWare BrR
- MDX
- Other – Hand Calcs



What is Load Rating?

TxDOT Load Rating Tools:

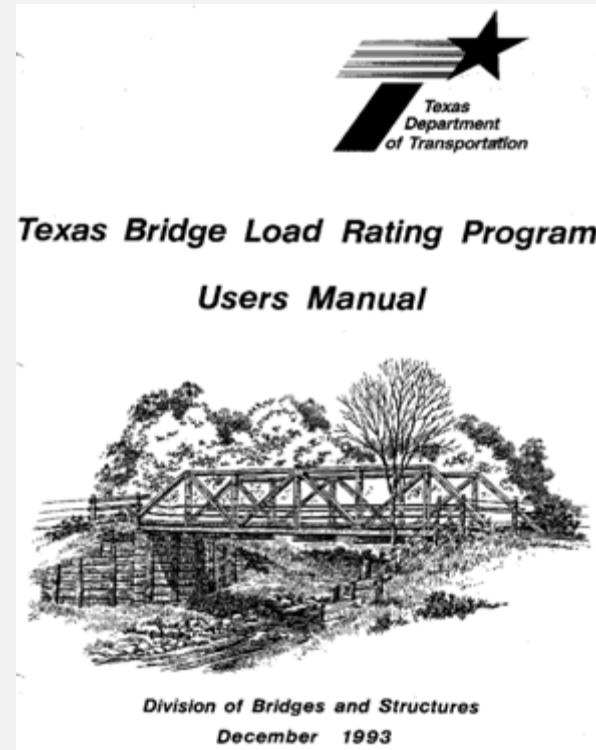
- TBLRP-LFR
- RATE Spreadsheet
- CULVLR
- BAR7
- AASHTOWare BrR
- MDX
- Other – Hand Calcs



TBLRP-LFR

TBLRP (Original)

- Based on Working Stress (WS) or Allowable Stress (AS)
- Timber and Steel Deck, Superstructure, and Substructure
- Multiple components can be rated
- Allowed carryover of dead loads from stringer analysis to substructure components



TBLRP-LFR

TBLRP (Original)

TBLRP

BRIDGE I.D. INFORMATION

County:

Route Number:

Bridge Number:

Bridge Name:

Description:

TBLRP

TEXAS BRIDGE LOAD RATING PROGRAM, V6.1

STRUCTURAL ELEMENT SELECTION

BRIDGE I.D.: AA01-64-001

A - Review Bridge ID Information
 B - Deck
 C - Timber Stringer
 D - Steel Stringer
 E - Floorbeam
 F - Steel Girder
 G - Timber Cap
 H - Steel Cap
 I - Truss
 J - Timber Pile
 K - Steel Pile

TBLRP

TEXAS BRIDGE LOAD RATING PROGRAM, V6.1

TIMBER STRINGER ANALYSIS

BRIDGE I.D.: AA01-64-001

1 - Enter/Modify Structural Data
 2 - Review Analysis Output
 3 - Save Analysis Output
 4 - Select Another Structural Element
 5 - Analyze Another Bridge
 6 - Quit
 7 - Save Input Data
 8 - Recall Input Data

DN09-074-AA01-64-001

TEXAS DEPARTMENT OF TRANSPORTATION

BRIDGE LOAD RATING PROGRAM

TIMBER DECK

V6.1

Date: 01/31/16

Initials:

074 (Falls) County

1-Single span timber stringer bridge

Span 1 Typical

Stringer Spacing, S = 24.0 IN

Stringer Deck Thickness, T = 2.50 IN

Stringer Flange Width, B = 6.7 IN

FB = 1.5 KSI

width of Deck resisting wheel load, WD = 15.0 IN

DECK SPAN, SD = S - B/2 = 24.0 - 6.7/2 = 20.7 IN

but not > S - B + T = 24.0 - 6.7 + 2.50 = 19.8 IN <== CONTROLS

INVENTORY RATING

MILL = FB * 1/8 * WD * D**2 = 1.5 * 1/8 * 15.0 * 2.50**2 = 29.64 KFT

MILL = 0.16 * (H-RATING) * S

Substituting MILL for MLL

23.44 = 0.16 * (H- 12.73)

OPERATING RATING

074 (Falls) County

1-Single span timber stringer bridge

Span 1 Single Span

2.5 IN Treated Timber Plank

1-Lane Bridge

Span length = 22.5 FT

2.0 IN Timber Runners

BENDING ANALYSIS

MILL = FB * S * 1/8 * 288 * (L/32) = 1.5 * 24.0 * 1/8 * 288 * (22.5/32) = 42.0 KFT

MILL = 1/8 * B * W**2 = 1/8 * 6.75 * 16.00**2 = 288 IN**3

MILL = 1/8 * W * L**2 = 1/8 * 0.076 * 22.5**2 = 4.8 KFT

Stringer WT = 6.75 * 16.00 * (1/244) * 0.050 = 0.018

Deck WT = 2.5 * 24.0 * (1/244) * 0.050 = 0.012

Surfacing WT = 2.0 * 24.0 * (1/244) * 0.017 = 0.017

Total Dead Load weight = 0.016 K/FT

Dead Load Pressure = 0.016 KSF

MILL = Distribution Factor * U-15 wheel load moment = (24.0/12)/4.00 * 67.5 * 0.50 * 67.5 = 33.8 KFT

INVENTORY RATING = H 15 * (42.0 - 4.8)/ 33.8 = H 18.5

MLHS/MLHSIS = 1.000 ==> HS 18.5

OPERATING RATING = H 15 * (1.36 * 42.0 - 4.8)/ 33.8 = H 23.3

==> HS 23.3

TX09-074-AA01-64-001

TEXAS DEPARTMENT OF TRANSPORTATION

BRIDGE LOAD RATING PROGRAM

TIMBER STRINGER

V6.1

Date: 01/31/16

Initials:

074 (Falls) County

1-Single span timber stringer bridge

Span 1 Single Span

2.5 IN Treated Timber Plank

1-Lane Bridge

Span length = 22.5 FT

2.0 IN Timber Runners

BENDING ANALYSIS

MILL = FB * S * 1/8 * 288 * (L/32) = 1.5 * 24.0 * 1/8 * 288 * (22.5/32) = 42.0 KFT

MILL = 1/8 * B * W**2 = 1/8 * 6.75 * 16.00**2 = 288 IN**3

MILL = 1/8 * W * L**2 = 1/8 * 0.076 * 22.5**2 = 4.8 KFT

Stringer WT = 6.75 * 16.00 * (1/244) * 0.050 = 0.018

Deck WT = 2.5 * 24.0 * (1/244) * 0.050 = 0.012

Surfacing WT = 2.0 * 24.0 * (1/244) * 0.017 = 0.017

Total Dead Load weight = 0.016 K/FT

Dead Load Pressure = 0.016 KSF

MILL = Distribution Factor * U-15 wheel load moment = (24.0/12)/4.00 * 67.5 * 0.50 * 67.5 = 33.8 KFT

INVENTORY RATING = H 15 * (42.0 - 4.8)/ 33.8 = H 18.5

MLHS/MLHSIS = 1.000 ==> HS 18.5

OPERATING RATING = H 15 * (1.36 * 42.0 - 4.8)/ 33.8 = H 23.3

==> HS 23.3

SHEAR ANALYSIS

Critical Section is 4.0 Feet From the Support

VALL = 2/3 * B * W * PV = 2/3 * 6.75 * 16.00 * 0.120 = 8.64 K

VOL = (L/2 - 4X) * W = (22.5/2 - 4.8) * 0.076 = 0.55 K

VLL = 1/2 * (0.6 + 0.7) * V = 1/2 * (0.6 + 0.50) * 10.47 = 5.76 K

DF = Distribution Factor = 0.50

V = m-15 wheel Load Shear = 0.82 * 12.0 * 0.20 * 3.0 = 10.47 K

INVENTORY RATING = H 15 * (8.64 - 0.55)/ 5.76 = H 23.1

VLLHS/VLLHSIS = 0.833 ==> HS 18.0

OPERATING RATING = H 15 * (1.36 * 8.64 - 0.55)/ 5.76 = H 25.0

==> HS 25.0

TBLRP-LFR

TBLRP-LFR (New)

- Steel member load rating based on Load Factor (LF)
- Timber member LR based on Working Stress (WS) or Allowable Stress (AS)
- Added Concrete Deck module – punching shear analysis
- Added Railroad Flatcar module
- Added drop-downs for AISC shapes (HP, S, and W)
- Retained ability for rating multiple components
- Retained carryover of dead loads from deck analysis to super and substructure

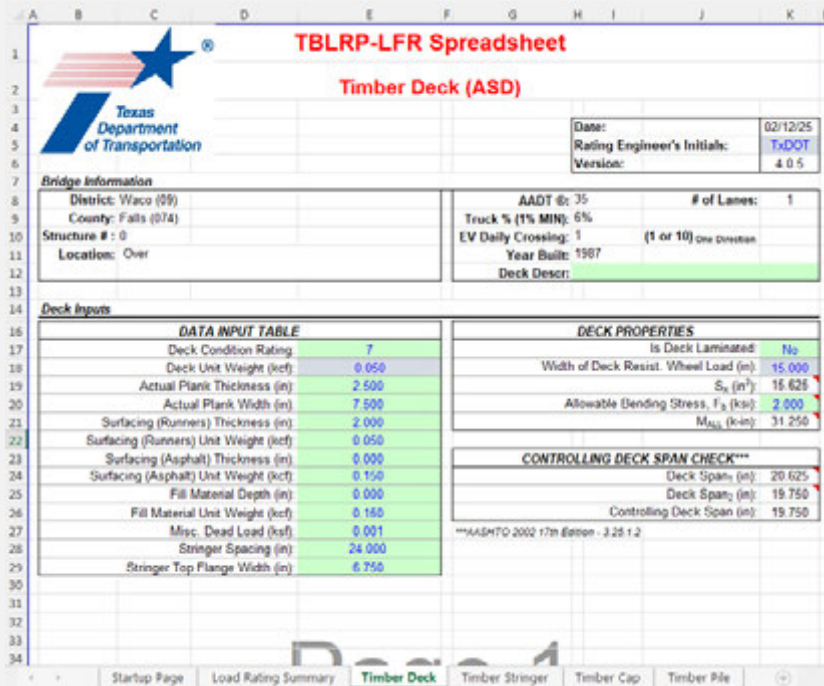
TBLRP-LFR

General Info		Load Rating Contents		Version: 4.8.5
District	Waco (09)	Load Rating Summary Sheet	Page 8	Total Pages 5
County	Falls (074)	Deck	1	
Structure #		1 Timber Deck	2	
Facility Carried		2		
Feature Intersected		3		
Location	Over	Superstructure		
Rating Engineer's Initials	TxDOT	1 Timber Stringer	3	
Year Built	1997	2		
Year Widened	N/A	3		
General Load Rating Comments:		4		
(This section will not be printed)		5		
		6		
		Substructure		
		1 Timber Cap	4	
		2 Timber Pile	5	
		3		
		4		
		5		
		6		
		7		
		8		
		Use the 'Update Sheets' to load the load rating sheets selected above. Only those selected above will be included.		
		Update Sheets		
Load Rating Info				
Number of Spans	1			
Number of Lanes	1			
AADT (One Direction)	35			
AADT Truck Percentage (1% MTR)	6%			
Emergency Vehicle (EV) Crossing Per Day	1			
DO NOT PRINT OR INCLUDE THIS PAGE IN THE LOAD RATING REPORT				
Startup Page Load Rating Summary Timber Deck Timber Stringer Timber Cap Timber Pile				

TBLRP-LFR

Color Scheme

- Green cells – input
- Gray cells – calculated cells
 - can be overwritten with an input
- White cells – locked cell that performs a calculation or imports a value from another module.



TBLRP-LFR Spreadsheet

Timber Deck (ASD)

Date: 02/12/25
Rating Engineer's Initials: TxDOT
Version: 4.0.5

Bridge Information

District: Waco (09)
County: Falls (074)
Structure #: 0
Location: Over

AADT @: 35
Truck % (1% MIN): 6%
EV Daily Crossing: 1
Year Built: 1987
of Lanes: 1
(1 or 10) One Direction

Deck Descr:

Deck Inputs

DATA INPUT TABLE		DECK PROPERTIES	
Deck Condition Rating	7	Is Deck Laminated	N ₂
Deck Unit Weight (ksf)	0.050	Width of Deck Resist. Wheel Load (in)	15,000
Actual Plank Thickness (in)	2.500	S _y (in ³)	15,625
Actual Plank Width (in)	7.500	Allowable Bending Stress, F _b (ksi)	2,900
Surfacing (Runners) Thickness (in)	2.000	M _{ALL} (k-in)	31,250
Surfacing (Runners) Unit Weight (ksf)	0.050		
Surfacing (Asphalt) Thickness (in)	0.000		
Surfacing (Asphalt) Unit Weight (ksf)	0.150		
Fill Material Depth (in)	0.000		
Fill Material Unit Weight (ksf)	0.160		
Misc. Dead Load (ksf)	0.001		
Stringer Spacing (in)	24,000		
Stringer Top Flange Width (in)	6.750		

CONTROLLING DECK SPAN CHECK***

Deck Span₁ (in): 20,625
Deck Span₂ (in): 19,750
Controlling Deck Span (in): 19,750

***AASHTO 2002 17th Edition - 3.25.1.2

Startup Page Load Rating Summary **Timber Deck** Timber Stringer Timber Cap Timber Pile

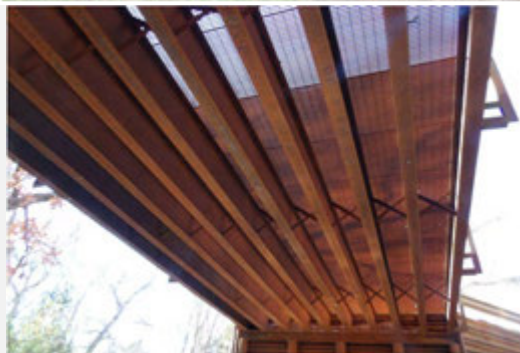
TBLRP-LFR

14

TBLRP-LFR

Load Factor Rating (LFR)

- Steel Deck
- Steel Stringer (Simple and Continuous)
- Steel Girder-Floorbeam-Stringer (Simple)
- Steel Floorbeam
- Steel Cap
- Steel Pile
- Railroad Flatcar Bridges
- Concrete Deck Punching Shear Analysis



TBLRP-LFR

Working Stress (WSR) or Allowable Stress (ASR)

Ratings

- Timber Deck
- Timber Stringer
- Timber Cap
- Timber Pile



TBLRP-LFR Example 1

Single Span Timber Stringer Bridge On Timber Pile Abutments

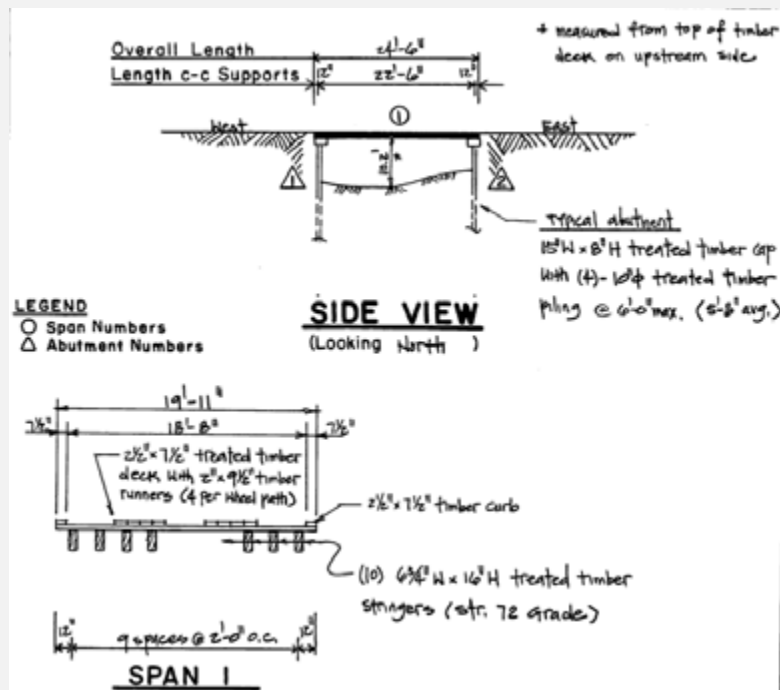


TBLRP-LFR Example 1

Single Span Timber Stringer Bridge On Timber Pile

Abutments

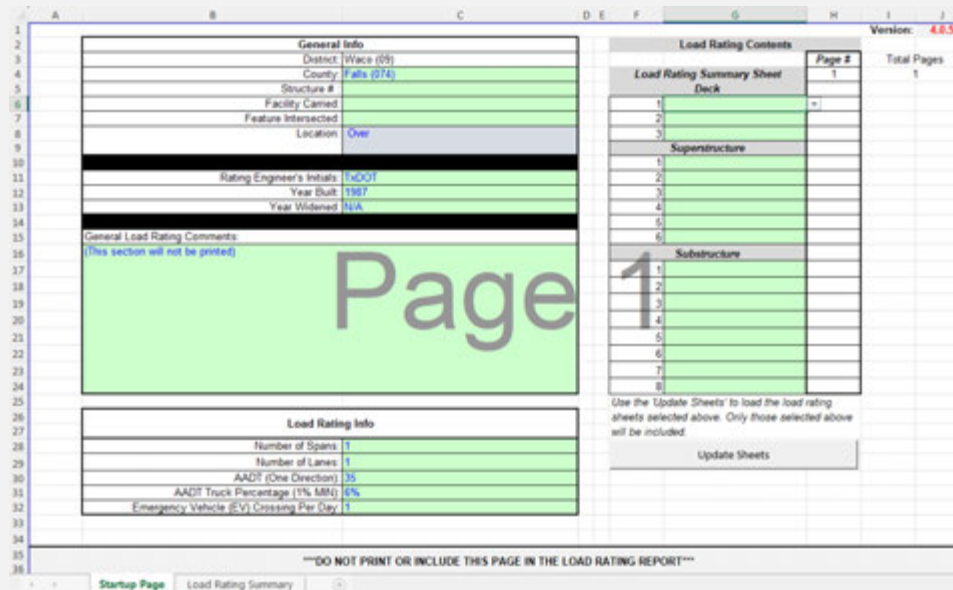
- Timber Deck
- Timber Stringers
- Timber Cap
- Timber Piles



TBLRP-LFR Example 1

Start up Page

- Enter General Information
- Select Applicable Modules
 - Timber Deck
 - Timber Stringer
 - Timber Cap
 - Timber Pile
- Click "Update Sheets"



Version: 4.8.5

General Info

District	Waco (69)
County	Falls (214)
Structure #	
Facility Carried	
Feature Intersected	
Location	Over

Rating Engineer's Initials: TACOT

Year Built: 1967

Year Widened: N/A

General Load Rating Comments:
(This section will not be printed)

Page 1

Load Rating Contents

Load Rating Summary Sheet	Page #	Total Pages
Deck	1	1
Superstructure		
Substructure		

Use the 'Update Sheets' to load the load rating sheets selected above. Only those selected above will be included.

Update Sheets

Load Rating Info

Number of Spans	1
Number of Lanes	1
AADT (One Direction)	35
AADT Truck Percentage (1% MN)	6%
Emergency Vehicle (EV) Crossing Per Day	1

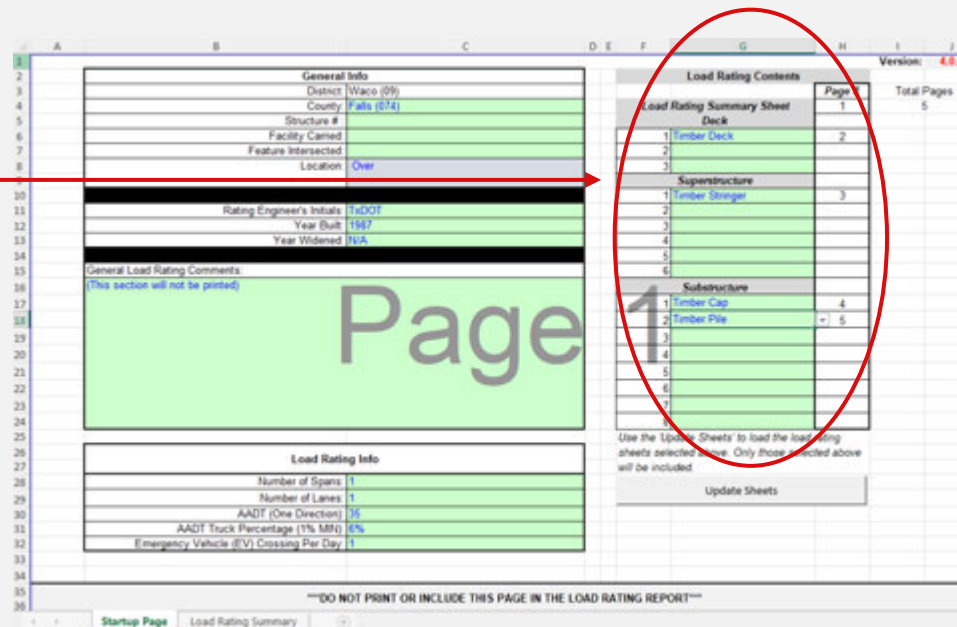
DO NOT PRINT OR INCLUDE THIS PAGE IN THE LOAD RATING REPORT

Startup Page Load Rating Summary

TBLRP-LFR Example 1

Start up Page

- Enter General Information
- Select Applicable Modules
 - Timber Deck
 - Timber Stringer
 - Timber Cap
 - Timber Pile
- Click "Update Sheets"



Version: 4.9.5

Load Rating Contents		Page	Total Pages
Load Rating Summary Sheet		1	5
Deck			
1	Timber Deck	2	
2			
3			
Superstructure			
1	Timber Stringer	3	
2			
3			
4			
5			
6			
Substructure			
1	Timber Cap	4	
2	Timber Pile	5	
3			
4			
5			
6			
7			

Use the Update Sheets button to load the load rating sheets selected below. Only those selected above will be included.

Update Sheets

General Info

District: Waco (09)

County: Falls (074)

Structure #:

Facility Name:

Feature Intersected:

Location: Over

Rating Engineer's Initials: TSCOT

Year Built: 1997

Year Widened: N/A

General Load Rating Comments:
(This section will not be printed)

Load Rating Info

Number of Spans: 1

Number of Lanes: 1

AADT (One Direction): 35

AADT Truck Percentage (1% MTR): 6%

Emergency Vehicle (EV) Crossing Per Day: 1

Page 1

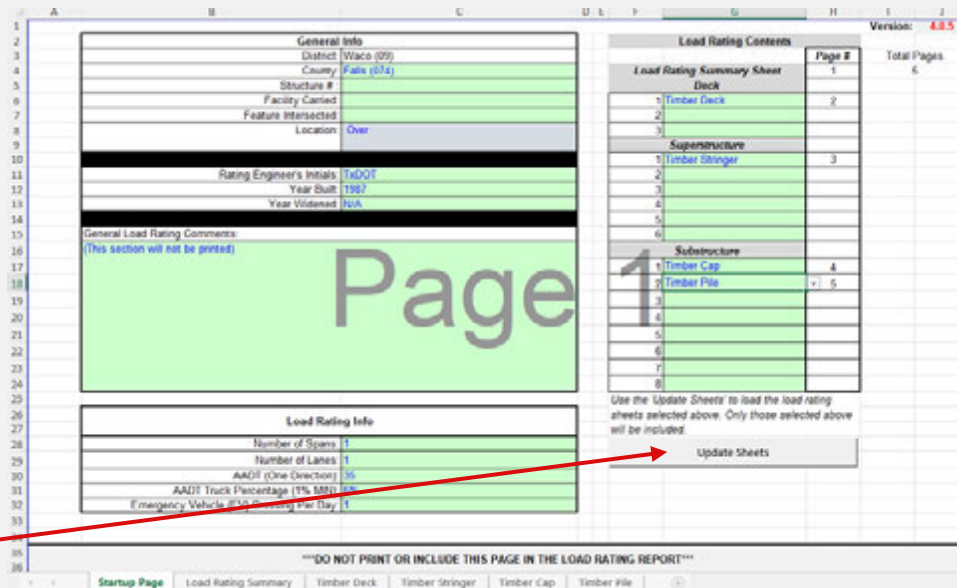
DO NOT PRINT OR INCLUDE THIS PAGE IN THE LOAD RATING REPORT

Startup Page Load Rating Summary

TBLRP-LFR Example 1

Start up Page

- Enter General Information
- Select Applicable Modules
 - Timber Deck
 - Timber Stringer
 - Timber Cap
 - Timber Pile
- Click "Update Sheets"



Version: 4.8.5

Total Pages: 6

Page 1

Load Rating Contents

Load Rating Summary Sheet	Page #
Deck	1
Timber Deck	2
Superstructure	3
Timber Stringer	3
Substructure	4
Timber Cap	4
Timber Pile	5

Use the Update Sheets to load the load rating sheets selected above. Only those selected above will be included.

Update Sheets

Load Rating Info

Number of Spans	1
Number of Lanes	1
AAOT (One Direction)	35
AAOT Truck Percentage (1% MSB)	35
Emergency Vehicle (MSB) Crossing Per Day	1

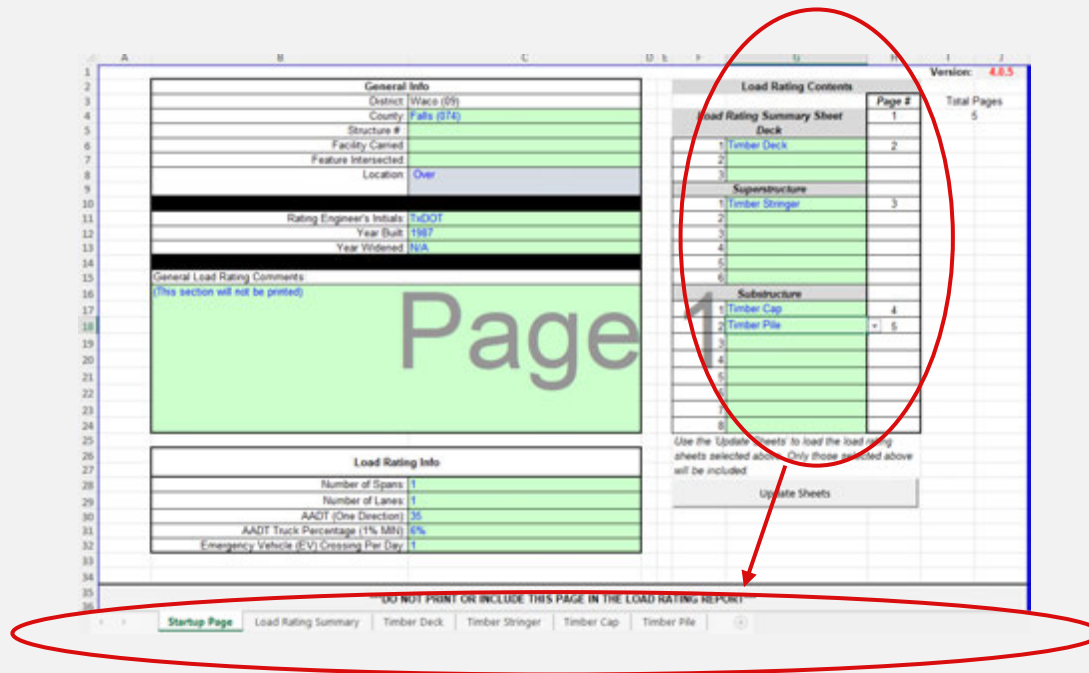
DO NOT PRINT OR INCLUDE THIS PAGE IN THE LOAD RATING REPORT

Startup Page Load Rating Summary Timber Deck Timber Stringer Timber Cap Timber Pile

TBLRP-LFR Example 1

Start up Page

- Enter General Information
- Select Applicable Modules
 - Timber Deck
 - Timber Stringer
 - Timber Cap
 - Timber Pile
- Click "Update Sheets"



Version: 4.8.3

General Info

District: Waco (09)

County: Falls (074)

Structure #:

Facility Name:

Feature Intersected:

Location: Over

Rating Engineer's Initials: TxDOT

Year Built: 1987

Year Widened: N/A

General Load Rating Comments
(This section will not be printed)

Page

Load Rating Contents

Load Rating Summary Sheet	Page #	Total Pages
1 Timber Deck	1	5
2 Timber Deck	2	
3 Timber Stringer	3	
4 Timber Stringer	4	
5 Timber Stringer	5	
6 Timber Stringer	6	
7 Timber Stringer	7	
8 Timber Stringer	8	
9 Timber Stringer	9	
10 Timber Stringer	10	
11 Timber Stringer	11	
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91 Timber Stringer	91	
92 Timber Stringer	92	
93 Timber Stringer	93	
94 Timber Stringer	94	
95 Timber Stringer	95	
96 Timber Stringer	96	
97 Timber Stringer	97	
98 Timber Stringer	98	
99 Timber Stringer	99	
100 Timber Stringer	100	

Load Rating Info

Number of Spans: 1

Number of Lanes: 1

AADT (One Direction): 35

AADT Truck Percentage (1% MN): 6%

Emergency Vehicle (EV) Crossing Per Day: 1

Update Sheets

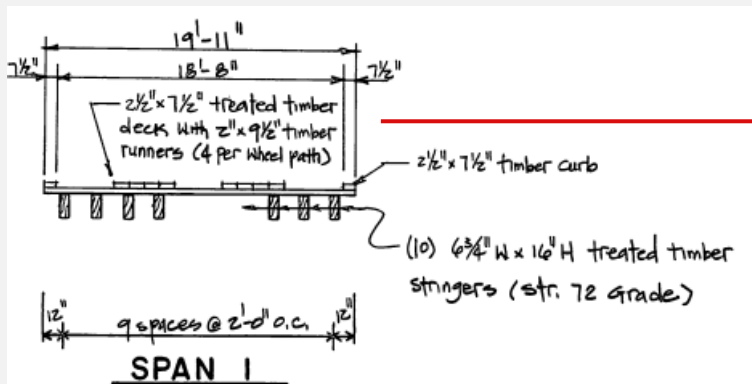
DO NOT PRINT OR INCLUDE THIS PAGE IN THE LOAD RATING REPORT

Start up Page Load Rating Summary Timber Deck Timber Stringer Timber Cap Timber Pile

TBLRP-LFR Example 1

Timber Deck

- Enter details as shown in plans/sketch



TBLRP-LFR Spreadsheet

Timber Deck (ASD)

Date: 02/12/25
Rating Engineer's Initials: TxDOT
Version: 4.0.5

Bridge Information

District: Waco (09)
County: Falls (074)
Structure #: 0
Location: Over

AADT @: 35
Truck % (1% MIN): 6%
EV Daily Crossing: 1
Year Built: 1987
Deck Descr:

of Lanes: 1
(1 or 10) One Direction

Deck Inputs

DATA INPUT TABLE		DECK PROPERTIES	
Deck Condition Rating	7	Is Deck Laminated	No
Deck Unit Weight (kcf)	0.050	Width of Deck Resist. Wheel Load (in)	15.000
Actual Plank Thickness (in)	2.500	S_x (in ²)	15.625
Actual Plank Width (in)	7.500	Allowable Bending Stress, F_b (ksi)	2.000
Surfacing (Runners) Thickness (in)	2.000	M_{ALL} (k-in)	31.250
Surfacing (Runners) Unit Weight (kcf)	0.050		
Surfacing (Asphalt) Thickness (in)	0.000		
Surfacing (Asphalt) Unit Weight (kcf)	0.150		
Fill Material Depth (in)	0.000		
Fill Material Unit Weight (kcf)	0.150		
Misc. Dead Load (ksf)	0.001		
Stringer Spacing (in)	24.000		
Stringer Top Flange Width (in)	6.750		

CONTROLLING DECK SPAN CHECK***

Deck Span₁ (in): 20.625
Deck Span₂ (in): 19.750
Controlling Deck Span (in): 19.750

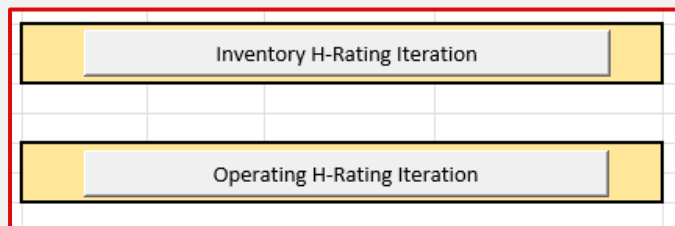
***AASHTO 2002 17th Edition - 3.25.1.2

Startup Page Load Rating Summary **Timber Deck** Timber Stringer Timber Cap Timber Pile

TBLRP-LFR Example 1

Timber Deck

- Click "H-Rating Iteration" buttons if highlighted



Page 1

Analysis				HHS - Ratings			
Dead Load Moment				Inventory			
Plank Weight (k/in)	0.001			M _{ALL} - M _{DL} (k-in)	31.100		
Wearing Surface Weight (k/in)	0.001			M _{LL} (k-in)	-		
Fill Weight (k/in)	0.000			H-Rating (Iteration)		<size H-Rating (Equation) below	
Misc. Weight (k/in)	0.000			H-Rating (Equation)	19.834	<Equation 37b	
Total Weight in Deck Plank span (k/in)	0.002			Controlling H-Rating	19.834		
(Simple / Distributed) M _{DL} (k-in)	0.148						
Inventory H-Rating Iteration				Operating			
				1.38 M _{ALL} - M _{DL} (k-in)	42.350		
				M _{LL} (k-in)	-		
				H-Rating (Iteration)		<size H-Rating (Equation) below	
				H-Rating (Equation)	36.778	<Equation 37b	
				Controlling H-Rating	36.778		
Additional Notes							
				€ HS Ratings			
				HS Inventory: HS 19.8 RF= 0.99			
				HS Operating: HS 36.8 RF= 1.84			
				WE H RATING			
				H Inventory: H 19.8 RF= 0.99			
				H Operating: H 36.8 RF= 1.84			
				AASHTO LEGAL LOADS RATING FACTORS			
				SU ₁ Operating: 1.84 TYPE 3: 1.84			
				SU ₂ Operating: 1.84 TYPE 3S2: 1.84			
				SU ₃ Operating: 1.84 TYPE 3.3: 1.84			
				SU ₄ Operating: 1.84 NRL: 1.84			
				EMERGENCY VEHICLE (EV) RATING FACTORS			
				EV ₁ Operating: 1.76 EV ₂ Operating: 1.84			

€ - Flexure Controls Rating
 v - Based on H-20 Rating
 € - Flexure Controls Rating

Startup Page Load Rating Summary **Timber Deck** Timber Stringer Timber Cap

TBLRP-LFR Example 1

Timber Deck

- Load Rating Results

Page 1

Analysis			
Dead Load Moment			
Plank Weight (k/in)	0.001		
Wearing Surface Weight (k/in)	0.001		
Fill Weight (k/in)	0.000		
Misc. Weight (k/in)	0.000		
Total Weight in Deck Plank Span (k/in)	0.002		
[Simple / Distributed] M_{DL} (k-in)	0.148		
HHS - Ratings			
Inventory			
$M_{ALL} - M_{DL}$ (k-in)	31.100		
M_{LL} (k-in)	-		
H-Rating (Iteration)			<Use H-Rating (Equation) below
H-Rating (Equation)	19.834		<Equation 37b
Controlling H-Rating	19.834		
Operating			
$1.36 \cdot M_{ALL} - M_{DL}$ (k-in)	42.350		
M_{LL} (k-in)	-		
H-Rating (Iteration)			<Use H-Rating (Equation) below
H-Rating (Equation)	36.778		<Equation 37b
Controlling H-Rating	36.778		
Additional Notes			
€ HS Ratings HS Inventory: HS 19.8 RF= 0.99 HS Operating: HS 36.8 RF= 1.84 WE H RATING H Inventory: H 19.8 RF= 0.99 H Operating: H 36.8 RF= 1.84 AASHTO LEGAL LOADS RATING FACTORS SU_2 Operating: 1.84 TYPE 3: 1.84 SU_2 Operating: 1.84 TYPE 3S2: 1.84 SU_2 Operating: 1.84 TYPE 3.3: 1.84 SU_2 Operating: 1.84 NRL: 1.84 EMERGENCY VEHICLE (EV) RATING FACTORS EV_2 Operating: 1.76 EV_2 Operating: 1.84			

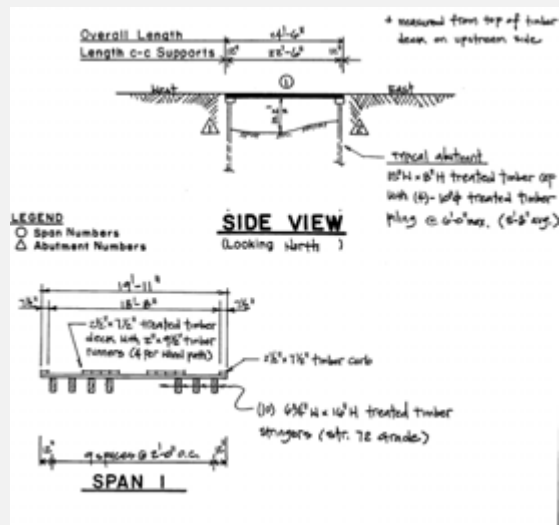
c - Flexure Controls Rating
 v - Based on H-20 Rating
 e - Flexure Controls Rating

Startup Page Load Rating Summary **Timber Deck** Timber Shoulder Timber Cap

TBLRP-LFR Example 1

Timber Stringer

- Enter details as shown in plans/sketch



TBLRP-LFR Spreadsheet
Timber Stringer (ASD)

Date: 02/12/25
 Rating Engineer's Initials: TxDOT
 Version: 4.0.5

Bridge Information

District: Waco (09)	AADT @: 35	# of Lanes: 1
County: Falls (074)	Truck % (1% MIN): 6%	
Structure #: 0	EV Daily Crossing: 1	(1 or 10) One Direction
Location: Over	Year Built: 1987	
Stringer Descr:		

Stringer Inputs

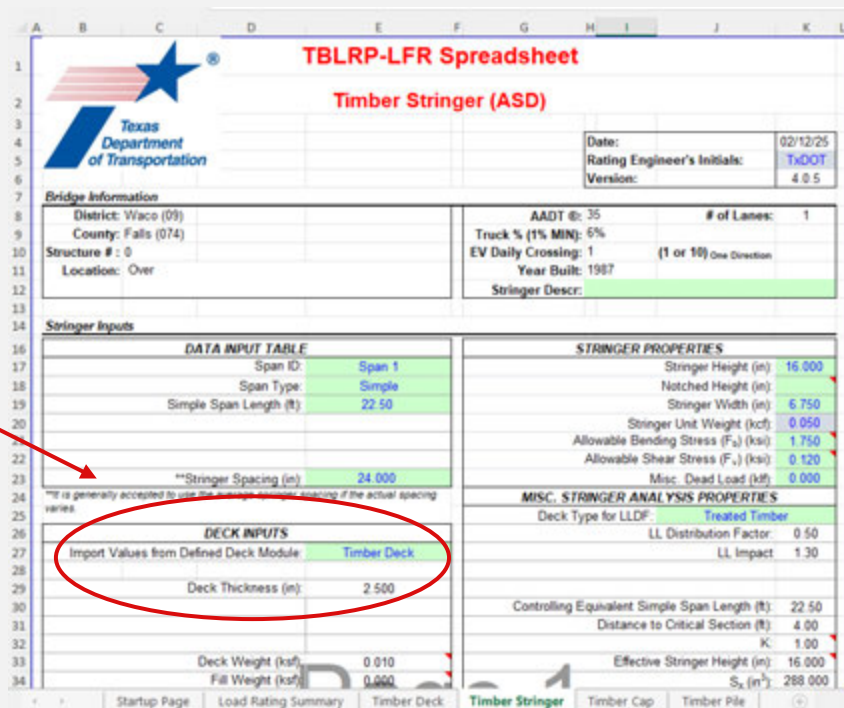
DATA INPUT TABLE		STRINGER PROPERTIES	
Span ID:	Span 1	Stringer Height (in)	16.000
Span Type:	Simple	Notched Height (in)	
Simple Span Length (ft)	22.50	Stringer Width (in)	6.750
		Stringer Unit Weight (pcf)	0.050
		Allowable Bending Stress (F _b) (ksi)	1.750
		Allowable Shear Stress (F _v) (ksi)	0.120
		Misc. Dead Load (klf)	0.000
**Stringer Spacing (in)	24.000	MISC. STRINGER ANALYSIS PROPERTIES	
*It is generally accepted to use the average stringer spacing if the actual spacing varies.		Deck Type for LLDF:	Treated Timber
DECK INPUTS		LL Distribution Factor:	0.50
Import Values from Defined Deck Module:	Timber Deck	LL Impact:	1.30
Deck Thickness (in)	2.500	Controlling Equivalent Simple Span Length (ft):	22.50
		Distance to Critical Section (ft):	4.00
Deck Weight (ksf)	0.010	K:	1.00
Fill Weight (ksf)	0.000	Effective Stringer Height (in):	16.000
		S _x (in ⁴):	288.000

Startup Page | Load Rating Summary | Timber Deck | **Timber Stringer** | Timber Cap | Timber Pile

TBLRP-LFR Example 1

Timber Stringer

- Import data previously entered in deck module



TBLRP-LFR Spreadsheet
Timber Stringer (ASD)

Date: 02/12/25
Rating Engineer's Initials: TxDOT
Version: 4.0.5

Bridge Information

District: Waco (09)	AADT @: 35	# of Lanes: 1
County: Falls (074)	Truck % (1% MIN): 6%	
Structure #: 0	EV Daily Crossing: 1	(1 or 10) One Direction
Location: Over	Year Built: 1987	
	Stringer Descr:	

Stringer Inputs

DATA INPUT TABLE	
Span ID:	Span 1
Span Type:	Simple
Simple Span Length (ft):	22.50
**Stringer Spacing (in):	24.000

**It is generally accepted to use the average stringer spacing if the actual spacing varies.

DECK INPUTS	
Import Values from Defined Deck Module:	Timber Deck
Deck Thickness (in):	2.500
Deck Weight (ksf):	0.010
Fill Weight (ksf):	0.000

STRINGER PROPERTIES

Stringer Height (in):	16.000
Notched Height (in):	
Stringer Width (in):	6.750
Stringer Unit Weight (ksf):	0.050
Allowable Bending Stress (F_b) (ksi):	1.750
Allowable Shear Stress (F_v) (ksi):	0.120
Misc. Dead Load (klf):	0.000

MISC. STRINGER ANALYSIS PROPERTIES

Deck Type for LLDF:	Treated Timber
LL Distribution Factor:	0.50
LL Impact:	1.30
Controlling Equivalent Simple Span Length (ft):	22.50
Distance to Critical Section (ft):	4.00
K:	1.00
Effective Stringer Height (in):	16.000
S_x (in ⁴):	288.000

Startup Page | Load Rating Summary | Timber Deck | **Timber Stringer** | Timber Cap | Timber Pile

TBLRP-LFR Example 1

Timber Stringer

- Load Rating Results

Page 1

Analysis

Moment Analysis

H15 Wheel Line Moment (k-ft)	67.5
HS15 Wheel Line Moment (k-ft)	67.5
M_{ALL} (k-ft)	42.0
M_{DL} (k-ft)	4.9
[H15] - M_{LL} (k-ft)	33.8
IR (H15)	16.5
IR (HS15)	16.5
OR (H15)	23.2
OR (HS15)	23.2

Shear Analysis

H15 Wheel Line Shear (k)	10.5
HS15 Wheel Line Shear (k)	12.3
V_{ALL} (k)	8.6
V_{DL} (k)	0.6
[H15] - V_{LL} (k)	5.8
IR (H15)	21.1
IR (HS15)	18.0
OR (H15)	29.2
OR (HS15)	24.9

Additional Notes

€ HS Ratings

HS Inventory:	HS 16.5	RF = 0.83
HS Operating:	HS 23.2	RF = 1.16

WE H RATING

H Inventory:	H 16.5	RF = 0.83
H Operating:	H 23.2	RF = 1.16

AASHTO LEGAL LOADS RATING FACTORS

SU ₁ Operating:	1.11	TYPE 3: 1.31
SU ₂ Operating:	1.04	TYPE 3S2: 1.42
SU ₃ Operating:	0.97	TYPE 3.3: 1.59
SU ₄ Operating:	0.97	NRL: 0.97

EMERGENCY VEHICLE (EV) RATING FACTORS

EV ₁ Operating:	1.11	EV ₁ Operating: 0.72
----------------------------	------	---------------------------------

€ - Flexure Controls Rating

x - Based on H-20 Rating

€ - Flexure Controls Rating

Startup Page Load Rating Summary Timber Deck

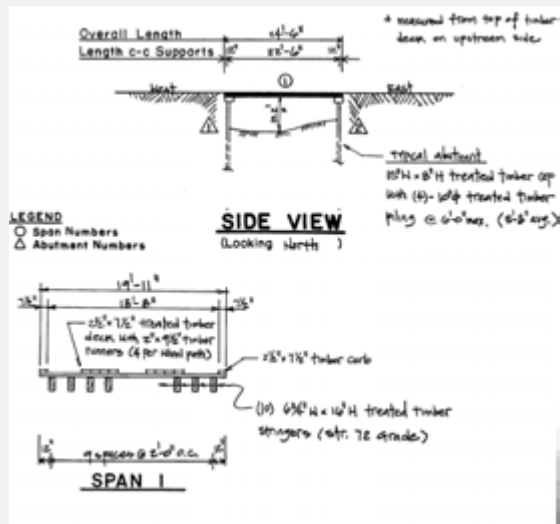
Timber Stringer

Timber Cap

TBLRP-LFR Example 1

Timber Cap

- Enter details as shown in plans/sketch



TBLRP-LFR Spreadsheet
Timber Cap (ASD)



Date: 02/12/25
Rating Engineer's Initials: T:DOT
Version: 4.0.5

Bridge Information

District: Waco (09)	AADT @: 35	# of Lanes: 1
County: Falls (074)	Truck % (1% MIN): 6%	
Structure #: 0	EV Daily Crossing: 1	(1 or 10) One Direction
Location: Over	Year Built: 1987	
Cap Descr:		

Cap Inputs

DATA INPUT TABLE		DEAD LOAD CALCS	
Bent ID Number	Abutment	Effective Deck Length for Dead Loads (ft)	11.25
Pile Spacing (ft)	6.00	Deck Type:	Timber Deck
Equivalent Length Factor	0.80	Deck+Fill+Wear Surface (ksf)	0.020
Cap Unit Weight (kcf)	0.050	Superstructure Type:	Timber Stringer
Cap Width (in)	15.000	Superstructure Member Spacing (in)	24.000
Cap Height (in)	8.000	Superstructure Member Weight (klf)	0.038
Notched Height (in)		Cap Weight (klf)	0.042
Cap Condition:	Good	Total Dead Load (klf)	0.480
Abutment or Int. Bent:	Abutment	MISC. CAP ANALYSIS PROPERTIES	
Adjacent Span Length 1 (ft)	22.50	Equiv. Simple Span Length (ft)	4.80
Adjacent Span Length 2 (ft)	0.00	K:	1.00
Superstructure Material Type:	Timber	Effective Cap Height (in)	8.000
Is Superstructure Continuous Over Cap:	No	Allowable Bending Stress, F_b (ksi)	1.400
		Allowable Shear Stress, F_v (ksi)	0.165
		S_x (in ³)	160.000
		Distance to Critical Section (ft)	1.75
		Effective Horizontal Shear Factor, K_s	0.861

Startup Page | Load Rating Summary | Timber Deck | Timber Stringer | **Timber Cap** | Timber Pile

TBLRP-LFR Example 1

Timber Cap

- Load Rating Results

Page 1

Analysis			
Moment Analysis		Shear Analysis	
Max H15 Reaction (k)	13.1	Max H15 Reaction (k)	13.1
Max HS15 Reaction (k)	16.5	Max HS15 Reaction (k)	16.5
M _{ALL} (k-ft)	18.7	V _{ALL} (k)	13.2
M _{DL} (k-ft)	1.4	V _{DL} (k)	1.1
[Max H15] - M _{LL} (k-ft)	15.8	[Max H15] - V _{LL} (k)	8.0
IR (H15)	16.4	IR (H15)	22.6
IR (HS15)	13.1	IR (HS15)	18.0
OR (H15)	22.8	OR (H15)	31.5
OR (HS15)	18.1	OR (HS15)	25.0

Additional Notes			

€ HS Ratings			
HS Inventory:	HS 13.1	RF=	0.86
HS Operating:	HS 18.1	RF=	0.91

H RATING			
H Inventory:	H 16.4	RF=	0.82
H Operating:	H 22.8	RF=	1.14

AASHTO LEGAL LOADS RATING FACTORS			
SU ₁ Operating:	1.04	TYPE 3:	1.20
SU ₂ Operating:	1.00	TYPE 3S2:	1.27
SU ₃ Operating:	1.00	TYPE 3-3:	1.47
SU ₄ Operating:	1.00	NRL:	0.98

EMERGENCY VEHICLE (EV) RATING FACTORS			
EV ₁ Operating:	0.96	EV ₂ Operating:	0.66

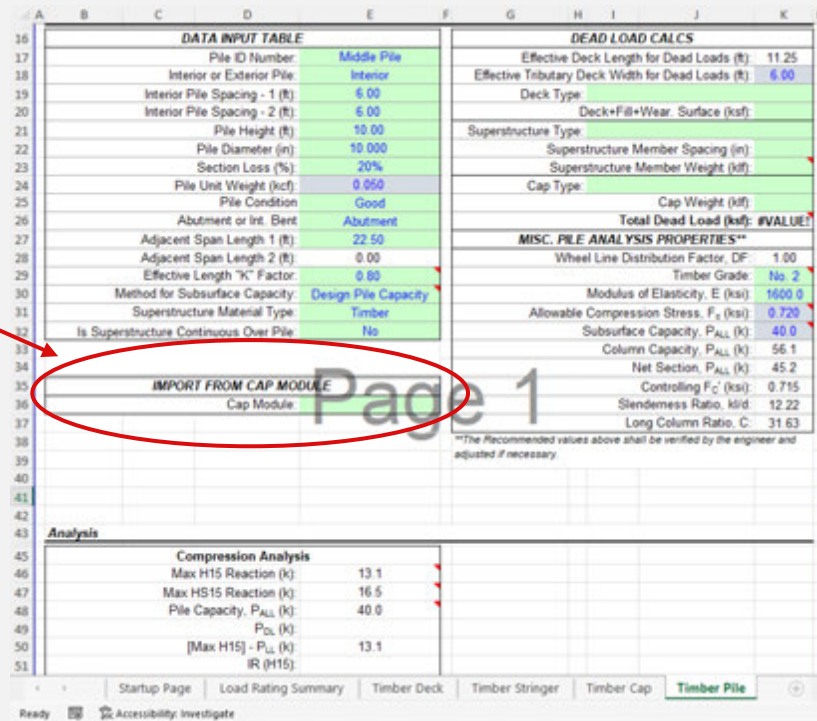
€ - Moment Controls Ratings
 v - Based on H-20 Rating
 z - Moment Controls Ratings

Startup Page | Load Rating Summary | Timber Deck | Timber Sillinger | **Timber Cap** | Timber Pole

TBLRP-LFR Example 1

Timber Pile

- Select to import data from previous cap module



The screenshot displays the TBLRP-LFR software interface for the Timber Pile module. The interface is divided into several sections: DATA INPUT TABLE, DEAD LOAD CALCS, MISC. PILE ANALYSIS PROPERTIES, and Analysis.

DATA INPUT TABLE:

Field	Value
Pile ID Number:	Middle Pile
Interior or Exterior Pile:	Interior
Interior Pile Spacing - 1 (ft):	6.00
Interior Pile Spacing - 2 (ft):	6.00
Pile Height (ft):	10.00
Pile Diameter (in):	10.000
Section Loss (%):	20%
Pile Unit Weight (kcf):	0.050
Pile Condition:	Good
Abutment or Int. Bent:	Abutment
Adjacent Span Length 1 (ft):	22.50
Adjacent Span Length 2 (ft):	0.00
Effective Length "K" Factor:	0.80
Method for Subsurface Capacity:	Design Pile Capacity
Superstructure Material Type:	Timber
Is Superstructure Continuous Over Pile:	No

DEAD LOAD CALCS:

Field	Value
Effective Deck Length for Dead Loads (ft):	11.25
Effective Tributary Deck Width for Dead Loads (ft):	6.00
Deck Type:	Deck+Fill+Wear Surface (kcf)
Superstructure Type:	Superstructure Member Spacing (in)
Superstructure Member Weight (kcf):	
Cap Type:	Cap Weight (kcf)
Total Dead Load (kcf):	#VALUE!

MISC. PILE ANALYSIS PROPERTIES:

Field	Value
Wheel Line Distribution Factor, DF:	1.00
Timber Grade:	No. 2
Modulus of Elasticity, E (ksi):	1600.0
Allowable Compression Stress, F_c (ksi):	0.720
Subsurface Capacity, P_{ALL} (k):	40.0
Column Capacity, P_{ALL} (k):	56.1
Net Section, P_{ALL} (k):	45.2
Controlling F_c (ksi):	0.715
Slenderness Ratio, kl/d :	12.22
Long Column Ratio, C:	31.63

Analysis:

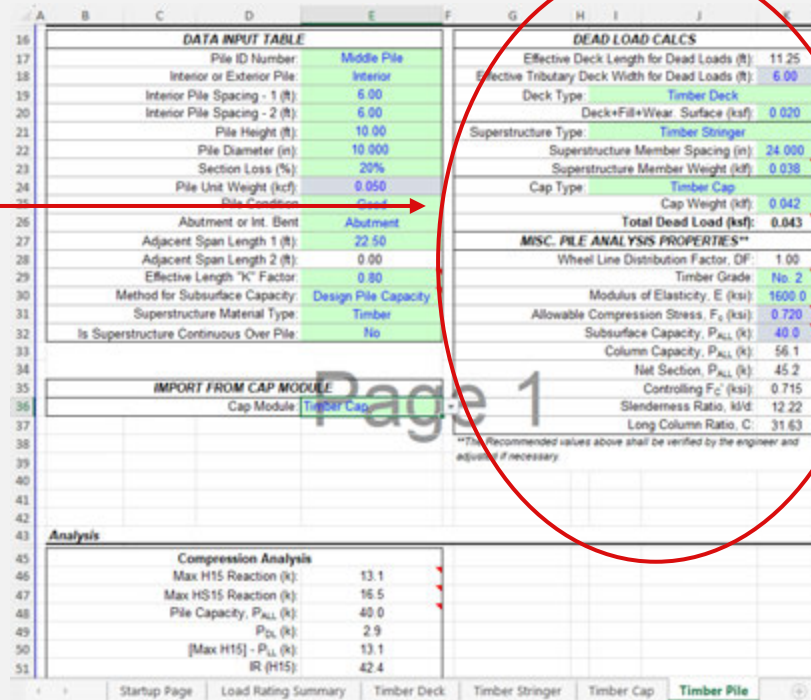
Field	Value
Max H15 Reaction (k):	13.1
Max HS15 Reaction (k):	16.5
Pile Capacity, P_{ALL} (k):	40.0
P_{DL} (k):	
[Max H15] - P_{LL} (k):	13.1
IR (H15):	

The interface also includes a navigation bar at the bottom with tabs for Startup Page, Load Rating Summary, Timber Deck, Timber Stringer, Timber Cap, and Timber Pile (selected). A red circle highlights the 'IMPORT FROM CAP MODULE' button, and a red arrow points to it from the text 'Select to import data from previous cap module'.

TBLRP-LFR Example 1

Timber Pile

- Select to import data from previous cap module



The screenshot displays the TBLRP-LFR software interface for the 'Timber Pile' module. The interface is divided into several sections:

- DATA INPUT TABLE:** Contains input fields for pile properties such as Pile ID Number (Middle Pile), Interior or Exterior Pile (Interior), Interior Pile Spacing - 1 (ft) (6.00), Interior Pile Spacing - 2 (ft) (6.00), Pile Height (ft) (10.00), Pile Diameter (in) (10.000), Section Loss (%) (20%), Pile Unit Weight (pcf) (8.050), and Pile Condition (Good).
- DEAD LOAD CALCS:** Contains calculated values for dead loads, including Effective Deck Length for Dead Loads (ft) (11.25), Selective Tributary Deck Width for Dead Loads (ft) (6.00), Deck Type (Timber Deck), Deck+Fill+Wear Surface (ksf) (0.020), Superstructure Type (Timber Stringer), Superstructure Member Spacing (in) (24.000), Superstructure Member Weight (ksf) (0.038), Cap Type (Timber Cap), Cap Weight (ksf) (0.042), and Total Dead Load (ksf) (0.043).
- MSC. PILE ANALYSIS PROPERTIES:** Contains material and analysis properties, including Wheel Line Distribution Factor, DF (1.00), Timber Grade (No. 2), Modulus of Elasticity, E (ksi) (1600.0), Allowable Compression Stress, F_c (ksi) (0.720), Subsurface Capacity, P_{ALL} (k) (40.0), Column Capacity, P_{ALL} (k) (56.1), Net Section, P_{ALL} (k) (45.2), Controlling F_c (ksi) (0.715), Slenderness Ratio, k/d (12.22), and Long Column Ratio, C (31.63).
- IMPORT FROM CAP MODULE:** A dropdown menu showing 'Cap Module' and 'Timber Cap'.
- Analysis:** A section for compression analysis results, including Max H15 Reaction (k) (13.1), Max HS15 Reaction (k) (16.5), Pile Capacity, P_{ALL} (k) (40.0), P_{DL} (k) (2.9), [Max H15] - P_{LL} (k) (13.1), and IR (H15) (42.4).

A red circle highlights the 'DEAD LOAD CALCS' and 'MSC. PILE ANALYSIS PROPERTIES' sections. A red arrow points from the 'Cap Module' dropdown in the 'IMPORT FROM CAP MODULE' section to the 'Timber Cap' option.

Load Rating Summary

Load Rating Summary

Controlling Component		Controlling Component
H Inventory:	H 16.4	Timber Cap
H Operating:	H 22.8	Timber Cap
HS Inventory:	HS 13.1	Timber Cap
HS Operating:	HS 18.1	Timber Cap
SLJ Operating:	1.04	Timber Cap
SLJ Operating:	1.00	Timber Cap
SLJ Operating:	0.97	Timber Stringer
SLJ Operating:	0.97	Timber Stringer
TYPE 3:	1.20	Timber Cap
TYPE 3S2:	1.27	Timber Cap
TYPE 3-3:	1.47	Timber Cap
NRL:	0.97	Timber Stringer
EVJ Operating:	0.96	Timber Cap
EVJ Operating:	0.66	Timber Cap

Additional Notes

TBLRP-LFR Example 2

4 Simple Span Precast Concrete Slab Panel Bridge on Steel & Timber Bents



TBLRP-LFR Example 2

4 Simple Span Precast Concrete Slab Panel Bridge on Steel & Timber Bents

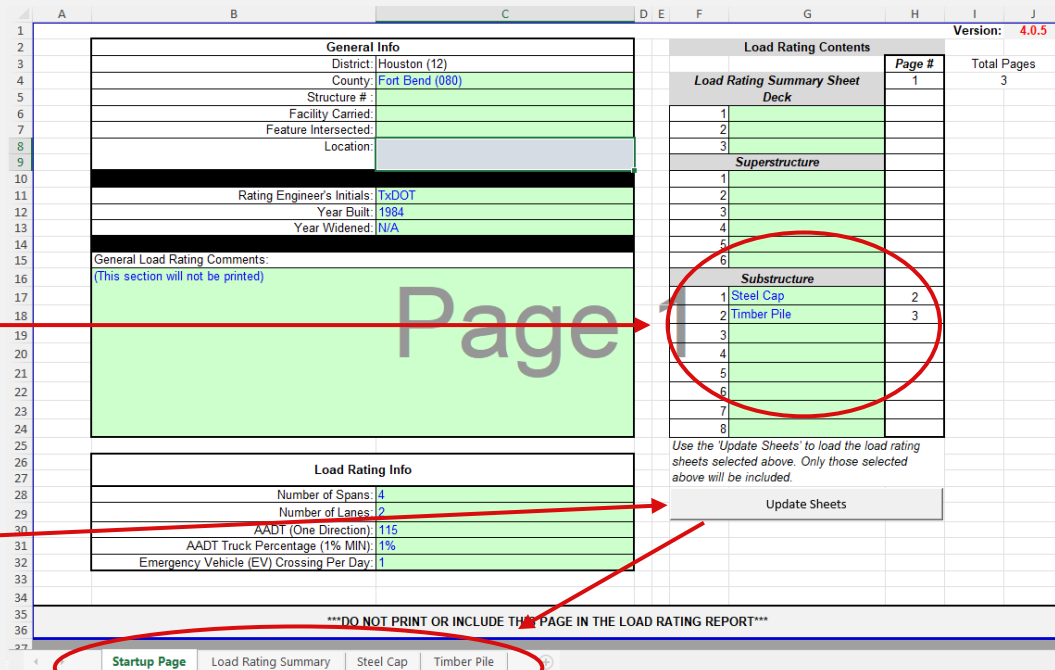
- Concrete Slab panels (Assumed rating)
- Steel Cap
- Timber Pile



TBLRP-LFR Example 2

Start up Page

- Enter General Information
- Select Applicable Modules
 - Steel Cap
 - Timber Pile
- Click "Update Sheets"



Version: 4.0.5

Total Pages: 3

Load Rating Contents		Page #
Load Rating Summary Sheet		1
Deck		
1		
2		
3		
Superstructure		
1		
2		
3		
4		
5		
6		
Substructure		
1	Steel Cap	2
2	Timber Pile	3
3		
4		
5		
6		
7		
8		

Use the 'Update Sheets' to load the load rating sheets selected above. Only those selected above will be included.

Update Sheets

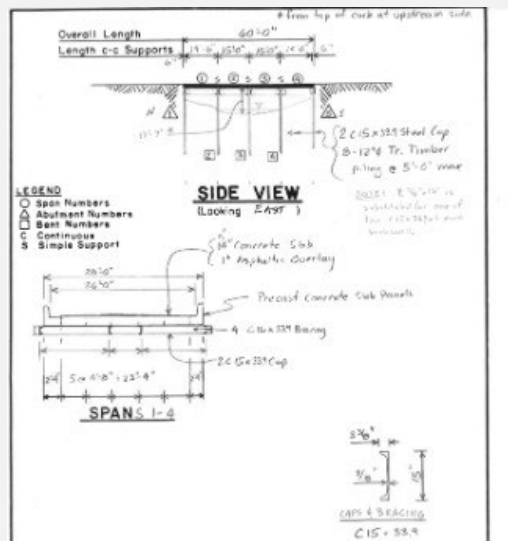
DO NOT PRINT OR INCLUDE THIS PAGE IN THE LOAD RATING REPORT

Startup Page | Load Rating Summary | Steel Cap | Timber Pile

TBLRP-LFR Example 2

Steel Cap

- Enter details as shown in plans/sketch



TBLRP-LFR Spreadsheet

Steel Cap



Date: 02/07/25
Rating Engineer's Initials: TxDOT
Version: 4.0.5

Bridge Information

District: Houston (12)
County: Fort Bend (080)
Structure #: 0
Location: 0

AADT @: 115
Truck % (1% MIN): 1%
EV Daily Crossing: 1 (1 or 10) One Direction
Year Built: 1984
Cap Descr: 2 - C15 x 33.9 channels

Cap Inputs

DATA INPUT TABLE		DECK INPUTS	
Bent ID Number	Bent 2	Deck Type	Concrete Slab
Standard Beam Designation		Deck Thickness (in)	14.000
Roller Section Depth (in)	15.000	Deck Elastic Modulus, E (ksi)	3184.0
Web Thickness (in)	0.800	Deck+Fill+Wear Surface (ksf)	0.300
Flange Width (in)	6.800	Deck Width (ft)	29.00
Top Flange Thickness (in)	0.650	SUPERSTRUCTURE INPUTS	
Bottom Flange Thickness (in)	0.650	Superstructure Type	Concrete Slab
Fillet Radius (in)	0.500		
Moment of Inertia (in ⁴)	636.567		
S (in ³)	102.411		
Fy (ksi)	36.0		
Cap Length (ft)	29.00	PILE INPUTS	
Cap Weight (klf)	0.067	Number of Piles	4
Cap Elastic Modulus (ksi)	29000.0	Distance to First Pile from Edge of Cap (ft)	0.00
Web Stiffeners Present (Y/N)	N	Pile Spacing (ft)	9.6 - 9.6 - 9.6
Abutment or Int. Bent	Int. Bent		
Adjacent Span Length 1 (ft)	15.00		
Adjacent Span Length 2 (ft)	15.00		

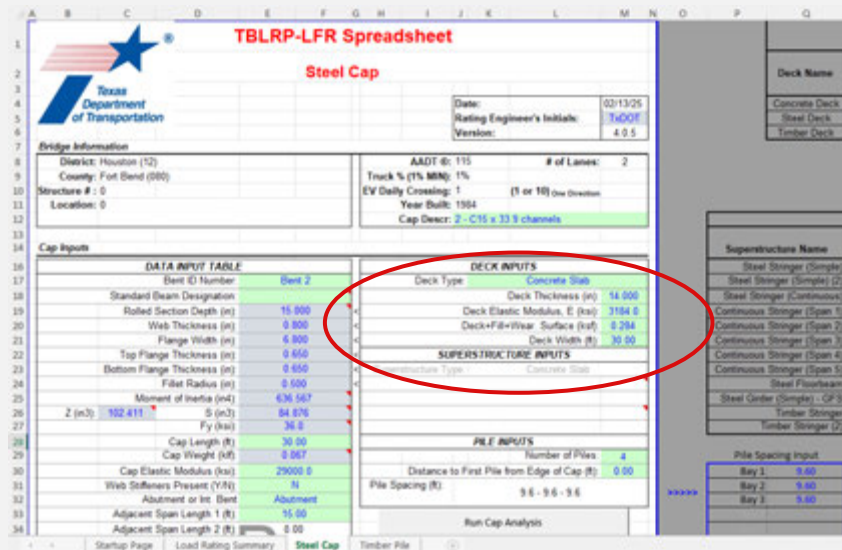
Run Cap Analysis

Startup Page Load Rating Summary **Steel Cap** Timber Pile

TBLRP-LFR Example 2

Steel Cap

- Concrete Slab selected
- Deck Dead Load Hand Calc
 - Slab beam self weight
 - Steel stringer self weight
- Pile spacing
- Click "Run Cap Analysis"



TBLRP-LFR Spreadsheet

Steel Cap

Date: 02/13/25
Rating Engineer's Initials: TAOOT
Version: 4.0.5

Bridge Information

Division: Houston (12)
County: Fort Bend (880)
Structure #: 0
Location: 0

ADT (ft): 115
Truck % (1% MIN): 1%
EV Daily Crossing: 1 (1 or 18) (see direction)
Year Built: 1984
Cap Descr: 2 - C15 x 33.9 channels

Cap Inputs

DATA INPUT TABLE		DECK INPUTS	
Bent ID Number	Bent 2	Deck Type	Concrete Slab
Standard Beam Designation		Deck Thickness (in)	14.000
Roller Section Depth (in)	15.000	Deck Elastic Modulus, E (ksi)	3184.0
Web Thickness (in)	0.800	Deck Filler Surface (ksi)	0.294
Flange Width (in)	6.800	Deck Width (ft)	30.00
Top Flange Thickness (in)	0.650		
Bottom Flange Thickness (in)	0.650	SUPERSTRUCTURE INPUTS	
Fillet Radius (in)	0.500	Structure Type	Concrete Slab
Moment of Inertia (in ⁴)	636.567		
Z (in ³)	152.411	PILE INPUTS	
S (in ³)	84.676	Number of Piles	4
Fy (ksi)	36.0	Distance to First Pile from Edge of Cap (ft)	0.00
Cap Length (ft)	30.00	Pile Spacing (ft)	9.6 - 9.6 - 9.6
Cap Weight (kft)	0.067		
Cap Elastic Modulus (ksi)	29000.0		
Web Stiffeners Present (Y/N)	N		
Abutment or Int. Bent	Abutment		
Adjacent Span Length 1 (ft)	15.00		
Adjacent Span Length 2 (ft)	0.00		

Run Cap Analysis

Startup Page | Load Rating Summary | **Steel Cap** | Timber Pile

Deck Name

Concrete Deck
Steel Deck
Timber Deck

Superstructure Name

Steel Stringer (Simple)
Steel Stringer (Simple) (2)
Steel Stringer (Continuous)
Continuous Stringer (Span 1)
Continuous Stringer (Span 2)
Continuous Stringer (Span 3)
Continuous Stringer (Span 4)
Continuous Stringer (Span 5)
Steel Floorbeam
Steel Girder (Simple) - GP 36
Timber Stringer
Timber Stringer (2)

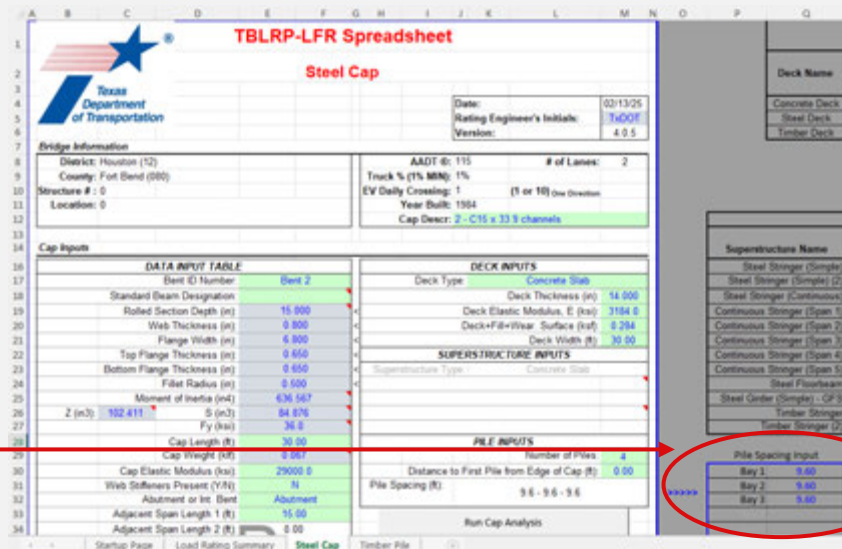
Pile Spacing Input

Bay 1: 9.60
Bay 2: 9.60
Bay 3: 9.60

TBLRP-LFR Example 2

Steel Cap

- Concrete Slab selected
- Deck Dead Load Hand Calc
 - Slab beam self weight
 - Steel stringer self weight
- Pile spacing
- Click "Run Cap Analysis"



TBLRP-LFR Spreadsheet

Steel Cap

Date: 02/13/25
Rating Engineer's Initials: TAOOT
Version: 4.0.5

Bridge Information

Division: Houston (12)
County: Fort Bend (880)
Structure #: 0
Location: 0

ADT (ft): 115
Truck % (1% MIN): 1%
EV Daily Crossing: 1 (1 or 18) one direction
Year Built: 1984
Cap Descr: 2 - C15 x 33.9 channels

Cap Inputs

DATA INPUT TABLE	
Bent ID Number	Bent 2
Standard Beam Designation	
Roller Section Depth (in)	15.000
Web Thickness (in)	0.900
Flange Width (in)	6.900
Top Flange Thickness (in)	0.650
Bottom Flange Thickness (in)	0.650
Fillet Radius (in)	0.500
Moment of Inertia (in ⁴)	636.567
Z (in ³)	152.411
S (in ²)	84.676
Fy (ksi)	36.0
Cap Length (ft)	30.00
Cap Weight (k)	0.667
Cap Elastic Modulus (ksi)	29000.0
Web Stiffeners Present (Y/N)	N
Abutment or Int. Bent	Abutment
Adjacent Span Length 1 (ft)	15.00
Adjacent Span Length 2 (ft)	0.00

DECK INPUTS

Deck Type: Concrete Slab
Deck Thickness (in): 14.000
Deck Elastic Modulus, E (ksi): 3184.0
Deck-Fill-Wear Surface (ksf): 0.294
Deck Width (ft): 30.00

SUPERSTRUCTURE INPUTS

Superstructure Type: Concrete Slab

PILE INPUTS

Number of Piles: 4
Distance to First Pile from Edge of Cap (ft): 0.00
Pile Spacing (ft): 9.6 - 9.6 - 9.6

Run Cap Analysis

Deck Name

Concrete Deck
Steel Deck
Timber Deck

Superstructure Name

Steel Stringer (Simple)
Steel Stringer (Simple) (2)
Steel Stringer (Continuous)
Continuous Stringer (Span 1)
Continuous Stringer (Span 2)
Continuous Stringer (Span 3)
Continuous Stringer (Span 4)
Continuous Stringer (Span 5)
Steel Floorbeam
Steel Girder (Simple) - GP
Timber Stringer
Timber Stringer (2)

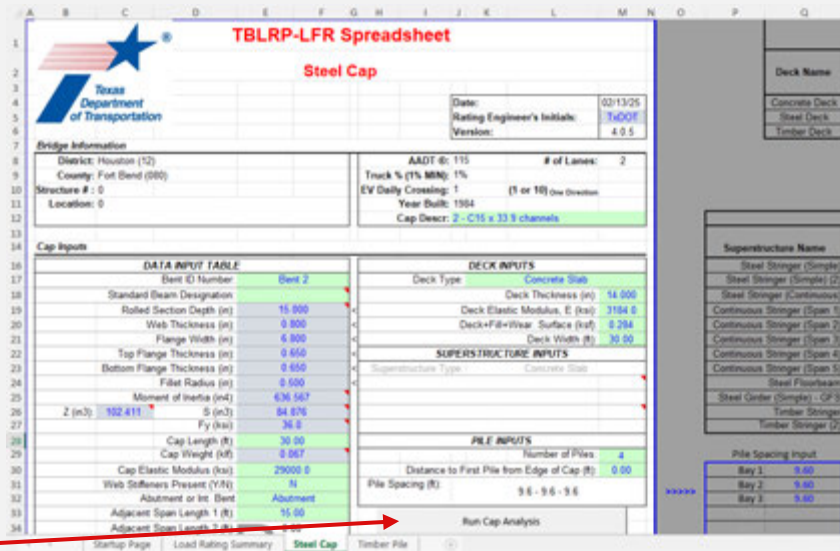
Pile Spacing Input

Bay 1	9.60
Bay 2	9.60
Bay 3	9.60

TBLRP-LFR Example 2

Steel Cap

- Concrete Slab selected
- Deck Dead Load Hand Calc
 - Slab beam self weight
 - Steel stringer self weight
- Pile spacing
- Click "Run Cap Analysis"



TBLRP-LFR Spreadsheet

Steel Cap

Date: 02/13/25
Rating Engineer's Initials: TAOOT
Version: 4.0.5

Bridge Information

Division: Houston (12)
County: Fort Bend (880)
Structure #: 0
Location: 0

ADT (ft): 115
Truck % (1% MIN): 1%
EV Daily Crossing: 1 (1 or 18) one direction
Year Built: 1984
Cap Descr: 2 - C15 x 33.9 channels

Cap Inputs

DATA INPUT TABLE	
Bent ID Number	Bent 2
Standard Beam Designation	
Roll Section Depth (in)	15.000
Web Thickness (in)	0.900
Flange Width (in)	6.900
Top Flange Thickness (in)	0.650
Bottom Flange Thickness (in)	0.650
Fillet Radius (in)	0.500
Moment of Inertia (in ⁴)	636.567
Z (in ³)	152.411
S (in ²)	5 (in ²)
Fy (ksi)	36.0
Cap Length (ft)	30.00
Cap Weight (kft)	0.067
Cap Elastic Modulus (ksi)	29000.0
Web Stiffeners Present (Y/N)	N
Abutment or Int. Bent	Abutment
Adjacent Span Length 1 (ft)	15.00
Adjacent Span Length 2 (ft)	0.00

DECK INPUTS

Deck Type: Concrete Slab
Deck Thickness (in): 14.000
Deck Elastic Modulus, E (ksi): 3184.0
Deck Fill/Wear Surface (kft): 0.294
Deck Width (ft): 30.00

SUPERSTRUCTURE INPUTS

Superstructure Type: Concrete Slab

PILE INPUTS

Number of Piles: 4
Distance to First Pile from Edge of Cap (ft): 0.00
Pile Spacing (ft): 9.6 - 9.6 - 9.6

Run Cap Analysis

Startup Page | Load Rating Summary | **Steel Cap** | Timber Pile

Deck Name

Concrete Deck
Steel Deck
Timber Deck

Superstructure Name

Steel Stringer (Simple)
Steel Stringer (Simple) (2)
Steel Stringer (Continuous)
Continuous Stringer (Span 1)
Continuous Stringer (Span 2)
Continuous Stringer (Span 3)
Continuous Stringer (Span 4)
Continuous Stringer (Span 5)
Steel Floorbeam
Steel Girder (Simple) - GP 36
Timber Stringer
Timber Stringer (2)

Pile Spacing Input

Bay 1: 9.60
Bay 2: 9.60
Bay 3: 9.60

TBLRP-LFR Example 2

Steel Cap

- Load Rating Results

Page 1

Analysis

Cap Capacity

$V_U = 228.8$ k

$M_U = 307.2$ k-ft

$M_{serv} = 203.7$ k-ft

Detailed Analysis Print: No

	Max +M Live Load w/o IM			Max -M Live Load w/o IM			Max V Dead and Live Load w/o IM		
Truck	Span	DL (k-ft)	LL (k-ft)	Span	DL (k-ft)	LL (k-ft)	Span	DL (k)	LL (k)
HS	3	34.4	32.0	2	42.3	28.4	3	28.9	24.4
SU ₄	3	34.4	32.9	1	42.3	27.0	3	28.9	23.7
SU ₃	3	34.4	35.5	1	42.3	28.9	3	28.9	25.5
SU ₂	3	34.4	38.9	1	42.3	31.4	3	28.9	27.8
SU ₁	3	34.4	40.3	1	42.3	32.5	3	28.9	28.8
EV ₂	3	34.4	31.0	2	42.3	27.9	3	28.9	23.9
EV ₁	3	34.4	49.1	1	42.3	41.0	3	28.9	35.9
T3	3	34.4	26.9	1	42.3	22.5	3	28.9	19.7
T3S2	3	34.4	26.9	1	42.3	22.3	3	28.9	19.6
T3-3	3	34.4	22.2	1	42.3	18.8	3	28.9	16.4
NRL	3	34.4	41.8	1	42.3	33.6	3	28.9	29.7

Additional Notes

HS Ratings

HS Inventory: HS 48.9 RF= 2.44

HS Operating: HS 81.6 RF= 4.06

WE H RATING

H Inventory: H 52.0 RF= 2.60

H Operating: H 86.8 RF= 4.34

AASHTO LEGAL LOADS RATING FACTORS

SU₄ Operating: 3.96 TYPE 3: 5.75

SU₃ Operating: 3.67 TYPE 3S2: 5.77

SU₂ Operating: 3.35 TYPE 3-3: 6.89

SU₁ Operating: 3.23 NRL: 3.72

EMERGENCY VEHICLE (EV) RATING FACTORS

EV₂ Operating: 4.74 EV₁ Operating: 3.15

ε - AASHTO 10.57 (Serviceability) Controls Ratings

§ - Positive Moment Analysis Controls Ratings

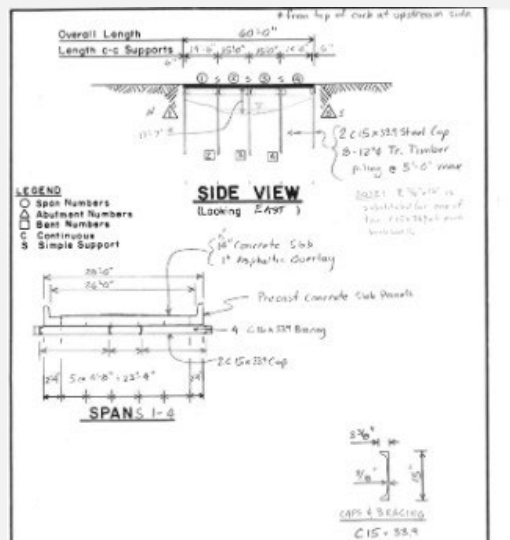
κ - Based on H-20 Rating

Startup Page Load Rating Summary Steel Cap Timber

TBLRP-LFR Example 2

Timber Pile

- Enter details as shown in plans/sketch



TBLRP-LFR Spreadsheet
Timber Pile (ASD)

Date: 02/07/25
Rating Engineer's Initials: TxDOT
Version: 4.0.5

Bridge Information

District: Houston (12)
County: Fort Bend (080)
Structure #: 0
Location: 0

AADT @: 115
Truck % (1% MIN): 1%
EV Daily Crossing: 1 (1 or 10) One Direction
Year Built: 1984
Pile Descr: 12" Timber Piles

Deck Inputs

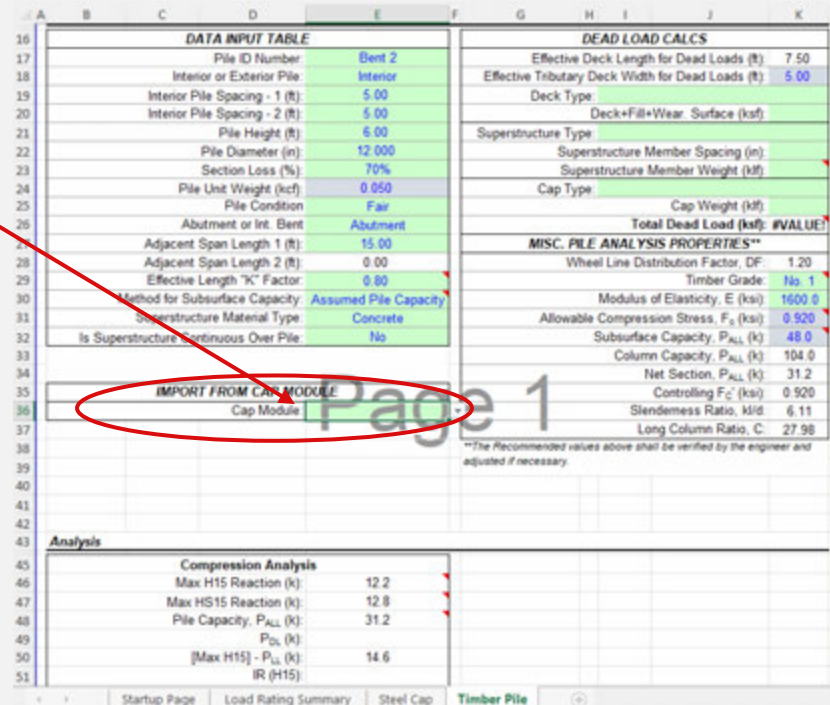
DATA INPUT TABLE		DEAD LOAD CALCS	
Pile ID Number	Bent 2	Effective Deck Length for Dead Loads (ft)	7.50
Interior or Exterior Pile	Interior	Effective Tributary Deck Width for Dead Loads (ft)	5.00
Interior Pile Spacing - 1 (ft)	5.00	Deck Type	Deck+Fill+Wear Surface (ksf)
Interior Pile Spacing - 2 (ft)	5.00	Superstructure Type	Superstructure Member Spacing (in)
Pile Height (ft)	6.00	Superstructure Member Weight (k/ft)	
Pile Diameter (in)	12.000	Cap Type	Cap Weight (k/ft)
Section Loss (%)	70%	Total Dead Load (k/ft)	#VALUE!
Pile Unit Weight (ksf)	0.050	MISC. PILE ANALYSIS PROPERTIES**	
Pile Condition	Fair	Wheel Line Distribution Factor, DF	1.20
Abutment or Int. Bent	Abutment	Timber Grade	No. 1
Adjacent Span Length 1 (ft)	15.00	Modulus of Elasticity, E (ksi)	1500.0
Adjacent Span Length 2 (ft)	0.00	Allowable Compression Stress, F _c (ksi)	0.920
Effective Length "K" Factor	0.80	Subsurface Capacity, P _{ALL} (k)	48.0
Method for Subsurface Capacity	Assumed Pile Capacity	Column Capacity, P _{ALL} (k)	104.0
Superstructure Material Type	Concrete	Net Section, P _{ALL} (k)	31.2
Is Superstructure Continuous Over Pile	No		

Startup Page Load Rating Summary Steel Cap Timber Pile

TBLRP-LFR Example 2

Timber Pile

- Select to import Steel Cap data



The screenshot displays the TBLRP-LFR software interface with the following data:

DATA INPUT TABLE		DEAD LOAD CALCS	
Pile ID Number	Bent 2	Effective Deck Length for Dead Loads (ft)	7.50
Interior or Exterior Pile	Interior	Effective Tributary Deck Width for Dead Loads (ft)	5.00
Interior Pile Spacing - 1 (ft)	5.00	Deck Type	
Interior Pile Spacing - 2 (ft)	5.00	Deck+Fill+Wear Surface (ksf)	
Pile Height (ft)	6.00	Superstructure Type	
Pile Diameter (in)	12.000	Superstructure Member Spacing (in)	
Section Loss (%)	70%	Superstructure Member Weight (klf)	
Pile Unit Weight (ksf)	0.050	Cap Type	
Pile Condition	Fair	Cap Weight (klf)	
Abutment or Int. Bent	Abutment	Total Dead Load (ksf)	#VALUE!
Adjacent Span Length 1 (ft)	15.00	MISC. PILE ANALYSIS PROPERTIES**	
Adjacent Span Length 2 (ft)	0.00	Wheel Line Distribution Factor, DF	1.20
Effective Length "K" Factor	0.80	Timber Grade	No. 1
Method for Subsurface Capacity	Assumed Pile Capacity	Modulus of Elasticity, E (ksi)	1600.0
Superstructure Material Type	Concrete	Allowable Compression Stress, F _c (ksi)	0.920
Is Superstructure Continuous Over Pile	No	Subsurface Capacity, P _{ALL} (k)	48.0
IMPORT FROM CAP MODULE		Column Capacity, P _{ALL} (k)	104.0
Cap Module		Net Section, P _{ALL} (k)	31.2
		Controlling F _c (ksi)	0.920
		Slenderness Ratio, L/d	6.11
		Long Column Ratio, C	27.96

Analysis

Compression Analysis	
Max H15 Reaction (k)	12.2
Max HS15 Reaction (k)	12.8
Pile Capacity, P _{ALL} (k)	31.2
P _{OL} (k)	
[Max H15] - P _{OL} (k)	14.6
IR (H15)	

Page 1

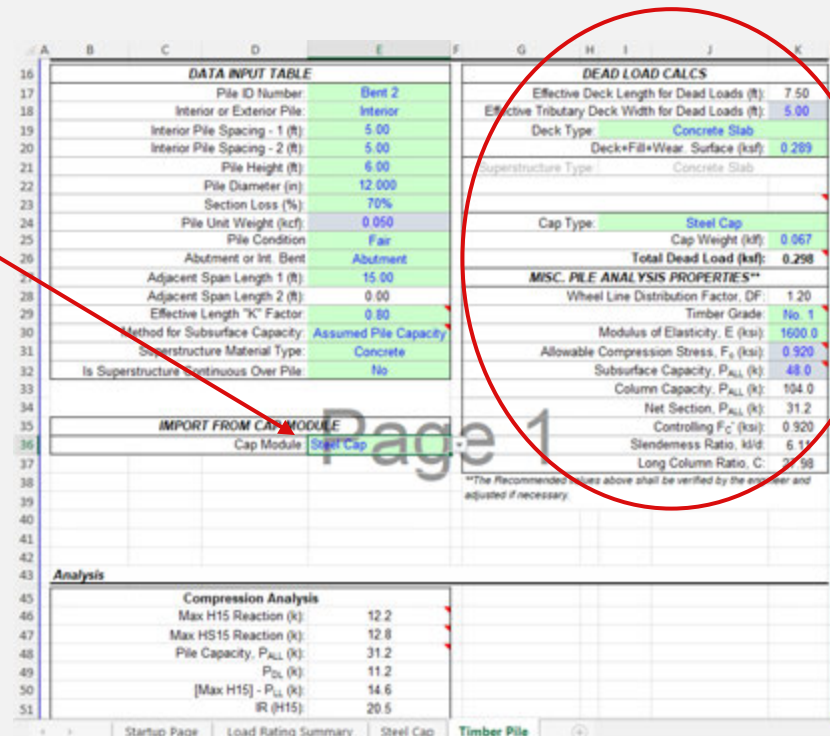
**The Recommended values above shall be verified by the engineer and adjusted if necessary.

Startup Page Load Rating Summary Steel Cap Timber Pile

TBLRP-LFR Example 2

Timber Pile

- Select to import Steel Cap data



The screenshot displays the TBLRP-LFR software interface. The 'DATA INPUT TABLE' section on the left contains various input fields for pile properties. The 'DEAD LOAD CALCS' section on the right shows calculated values. A red circle highlights the 'Cap Type' field, which is set to 'Steel Cap'. A red arrow points from the 'Select to import Steel Cap data' text to the 'Cap Type' field.

DATA INPUT TABLE		DEAD LOAD CALCS	
Pile ID Number:	Bent 2	Effective Deck Length for Dead Loads (ft):	7.50
Interior or Exterior Pile:	Interior	Effective Tributary Deck Width for Dead Loads (ft):	5.00
Interior Pile Spacing - 1 (ft):	5.00	Deck Type:	Concrete Slab
Interior Pile Spacing - 2 (ft):	5.00	Deck+Fill+Wear Surface (ksf):	0.209
Pile Height (ft):	6.00	Superstructure Type:	Concrete Slab
Pile Diameter (in):	12.000	Cap Type:	Steel Cap
Section Loss (%):	70%	Cap Weight (kft):	0.067
Pile Unit Weight (kcf):	0.050	Total Dead Load (kft):	0.298
Pile Condition:	Fair	MISC. PILE ANALYSIS PROPERTIES**	
Abutment or Int. Bent:	Abutment	Wheel Line Distribution Factor, DF:	1.20
Adjacent Span Length 1 (ft):	15.00	Timber Grade:	No. 1
Adjacent Span Length 2 (ft):	0.00	Modulus of Elasticity, E (ksi):	1600.0
Effective Length "K" Factor:	0.80	Allowable Compression Stress, F _c (ksi):	0.920
Method for Subsurface Capacity:	Assumed Pile Capacity	Subsurface Capacity, P _{ALL} (k):	48.0
Substructure Material Type:	Concrete	Column Capacity, P _{ALL} (k):	104.0
Is Superstructure Continuous Over Pile:	No	Net Section, P _{ALL} (k):	31.2
IMPORT FROM CAP MODULE		Controlling F _c (ksi):	0.920
Cap Module:	Steel Cap	Slenderness Ratio, L/d:	6.15
		Long Column Ratio, C:	0.99

Analysis

Compression Analysis	
Max H15 Reaction (k):	12.2
Max HS15 Reaction (k):	12.8
Pile Capacity, P _{ALL} (k):	31.2
P _{DL} (k):	11.2
[Max H15] - P _{DL} (k):	14.6
IR (H15):	20.5

Page 1

**The Recommended values above shall be verified by the engineer and adjusted if necessary.

Startup Page | Load Rating Summary | Steel Cap | Timber Pile

TBLRP-LFR Example 2

Timber Pile

- Load Rating Results

Page 1

IMPORT FROM CAP MODULE
Cap Module: Steel Cap

Controlling F_c (ksi): 0.920
Slenderness Ratio, K/L : 6.11
Long Column Ratio, C : 27.98

**The Recommended values above shall be verified by the engineer and adjusted if necessary.

Analysis

Compression Analysis	
Max H15 Reaction (k)	12.2
Max HS15 Reaction (k)	12.8
Pile Capacity, P_{ALL} (k)	31.2
P_{OL} (k)	11.2
$[Max H15] - P_{OL}$ (k)	14.6
IR (H15)	20.5
IR (HS15)	19.6
OR (H15)	28.5
OR (HS15)	27.2

Additional Notes

€ - Compression Controls Ratings
* - Based on H-20 Rating
€ - Compression Controls Ratings

€ HS Ratings		
HS Inventory:	HS 19.6	RF= 0.98
HS Operating:	HS 27.2	RF= 1.36

WE H RATING		
H Inventory:	H 20.5	RF= 1.03
H Operating:	H 28.5	RF= 1.43

AASHTO LEGAL LOADS RATING FACTORS		
SU_2 Operating:	1.40	TYPE 3: 1.57
SU_2 Operating:	1.33	TYPE 3S2: 1.73
SU_2 Operating:	1.33	TYPE 3.3: 1.91
SU_2 Operating:	1.33	NRL: 1.33

EMERGENCY VEHICLE (EV) RATING FACTORS		
EV ₂ Operating:	1.39	EV ₁ Operating: 0.86

Startup Page | Load Rating Summary | Steel Cap | Timber Pile

TBLRP-LFR Example 2

Load Rating Summary



TBLRP-LFR Spreadsheet
Load Rating Summary

Date: 10/27/03
Rating Engineer's Initials: TRODT
Version: 4.0.5.5

Bridge Information: District: W-000 (20) County: Falls (204) Structure #: 29-016-AAD1-6A-001 Location: CR 272 Over Tye of Willow Creek		ADOT #: 35 Truck % (1% MTR): 0% EV Daily Crossing: 1 Year Built: 1987		# of Lanes: 1 (1 of 1) See Notes	
---	--	--	--	-------------------------------------	--

Components and Load Ratings		Inventory		Operating	
Component	Description	R	RB	R	RB
Truss Deck		19.9	19.9	36.9	36.9
Truss Stringer		18.5	18.5	23.2	23.2
Truss Cap		18.4	13.1	22.9	18.1
Truss Pole		42.4	33.7	53.9	42.7

Controlling Component		Controlling Component	
R Inventory: R 14.4	Truss Cap	R Inventory: R 14.4	Truss Cap
R Operating: R 33.8	Truss Cap	R Inventory: R 14.4	Truss Cap
RB Inventory: RB 13.1	Truss Cap	R Inventory: R 14.4	Truss Cap
RB Operating: RB 18.1	Truss Cap	R Inventory: R 14.4	Truss Cap
R _{1/2} Operating: 1.84	Truss Cap	R Inventory: R 14.4	Truss Cap
R _{3/4} Operating: 1.48	Truss Cap	R Inventory: R 14.4	Truss Cap
R _{1/2} Operating: 6.97	Truss Stringer	R Inventory: R 14.4	Truss Cap
R _{3/4} Operating: 6.97	Truss Stringer	R Inventory: R 14.4	Truss Cap
TYPE 3: 1.28	Truss Cap	R Inventory: R 14.4	Truss Cap
TYPE 3B: 1.27	Truss Cap	R Inventory: R 14.4	Truss Cap
TYPE 3-5: 1.47	Truss Cap	R Inventory: R 14.4	Truss Cap
R _{1/2} : 6.97	Truss Stringer	R Inventory: R 14.4	Truss Cap
EV ₁ Operating: 8.94	Truss Cap	R Inventory: R 14.4	Truss Cap
EV ₃ Operating: 6.68	Truss Cap	R Inventory: R 14.4	Truss Cap

Additional Notes:

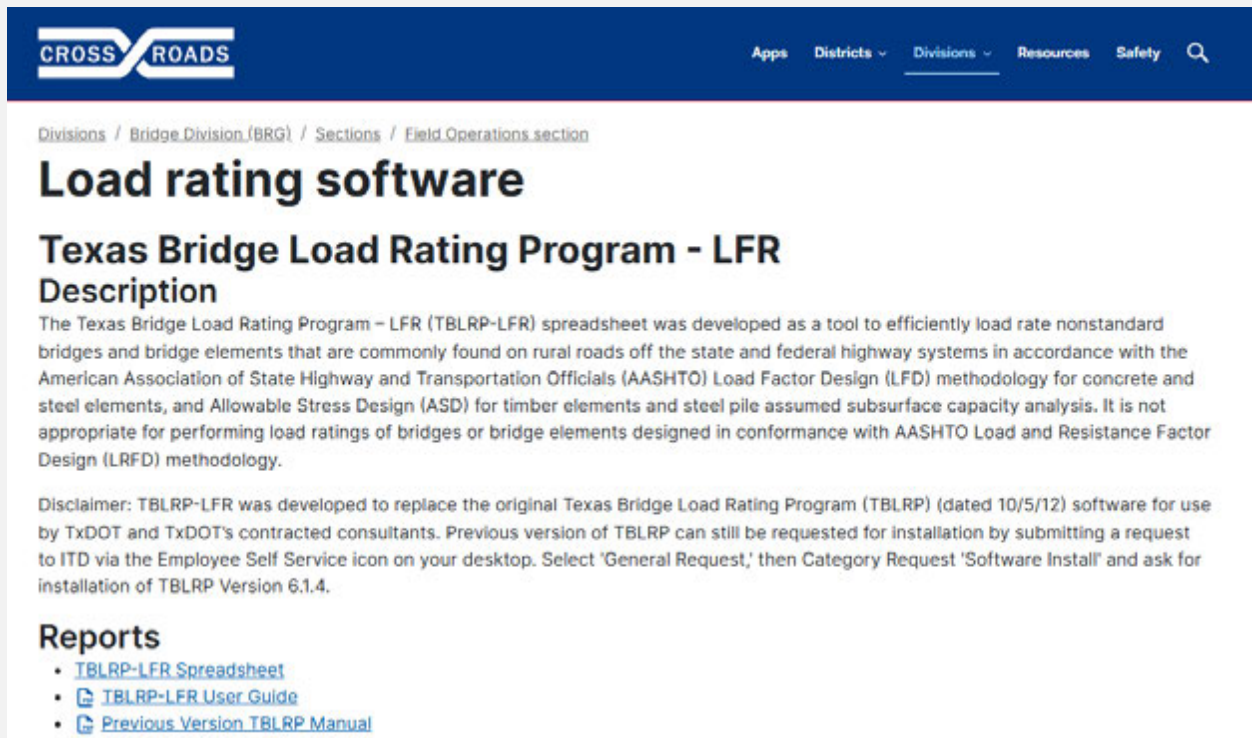
THIS INFORMATION IS CONFIDENTIAL UNDER THE TEXAS HOMELAND SECURITY ACT AND 39 USC SECTION 461. SAFETY SENSITIVE INFORMATION

Load Rating Summary

Controlling Component		Controlling Components
H Inventory:	H 20.5	Timber Pile
H Operating:	H 28.5	Timber Pile
HS Inventory:	HS 19.6	Timber Pile
HS Operating:	HS 27.2	Timber Pile
SU ₄ Operating:	1.40	Timber Pile
SU ₅ Operating:	1.33	Timber Pile
SU ₆ Operating:	1.33	Timber Pile
SU ₇ Operating:	1.33	Timber Pile
TYPE 3:	1.57	Timber Pile
TYPE 3S2:	1.73	Timber Pile
TYPE 3-3:	1.91	Timber Pile
NRL:	1.33	Timber Pile
EV ₂ Operating:	1.39	Timber Pile
EV ₃ Operating:	0.86	Timber Pile

Additional Notes

Resources (internal)



The screenshot shows the CROSSROADS website interface. The header includes the CROSSROADS logo and navigation links: Apps, Districts, Divisions, Resources, and Safety. The breadcrumb trail reads: Divisions / Bridge.Division(BRG) / Sections / Field.Operations.section. The main heading is "Load rating software". Below it is the subheading "Texas Bridge Load Rating Program - LFR" followed by "Description". The description text states: "The Texas Bridge Load Rating Program – LFR (TBLRP-LFR) spreadsheet was developed as a tool to efficiently load rate nonstandard bridges and bridge elements that are commonly found on rural roads off the state and federal highway systems in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Load Factor Design (LFD) methodology for concrete and steel elements, and Allowable Stress Design (ASD) for timber elements and steel pile assumed subsurface capacity analysis. It is not appropriate for performing load ratings of bridges or bridge elements designed in conformance with AASHTO Load and Resistance Factor Design (LRFD) methodology." A disclaimer follows: "Disclaimer: TBLRP-LFR was developed to replace the original Texas Bridge Load Rating Program (TBLRP) (dated 10/5/12) software for use by TxDOT and TxDOT's contracted consultants. Previous version of TBLRP can still be requested for installation by submitting a request to ITD via the Employee Self Service icon on your desktop. Select 'General Request,' then Category Request 'Software Install' and ask for installation of TBLRP Version 6.1.4." Under the "Reports" section, there are three links: "TBLRP-LFR Spreadsheet", "TBLRP-LFR User Guide", and "Previous Version TBLRP Manual".

CROSSROADS

Apps Districts Divisions Resources Safety

Divisions / Bridge.Division(BRG) / Sections / Field.Operations.section

Load rating software

Texas Bridge Load Rating Program - LFR

Description

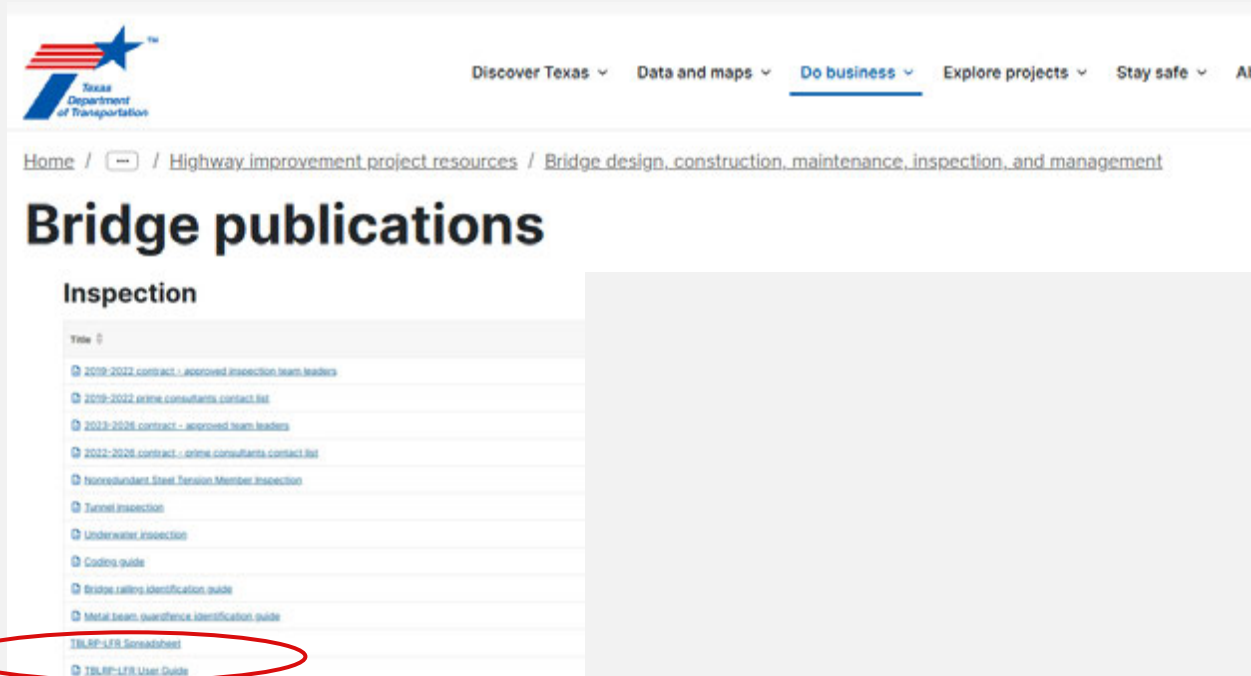
The Texas Bridge Load Rating Program – LFR (TBLRP-LFR) spreadsheet was developed as a tool to efficiently load rate nonstandard bridges and bridge elements that are commonly found on rural roads off the state and federal highway systems in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Load Factor Design (LFD) methodology for concrete and steel elements, and Allowable Stress Design (ASD) for timber elements and steel pile assumed subsurface capacity analysis. It is not appropriate for performing load ratings of bridges or bridge elements designed in conformance with AASHTO Load and Resistance Factor Design (LRFD) methodology.

Disclaimer: TBLRP-LFR was developed to replace the original Texas Bridge Load Rating Program (TBLRP) (dated 10/5/12) software for use by TxDOT and TxDOT's contracted consultants. Previous version of TBLRP can still be requested for installation by submitting a request to ITD via the Employee Self Service icon on your desktop. Select 'General Request,' then Category Request 'Software Install' and ask for installation of TBLRP Version 6.1.4.

Reports

- [TBLRP-LFR Spreadsheet](#)
- [TBLRP-LFR User Guide](#)
- [Previous Version TBLRP Manual](#)

Resources (external)

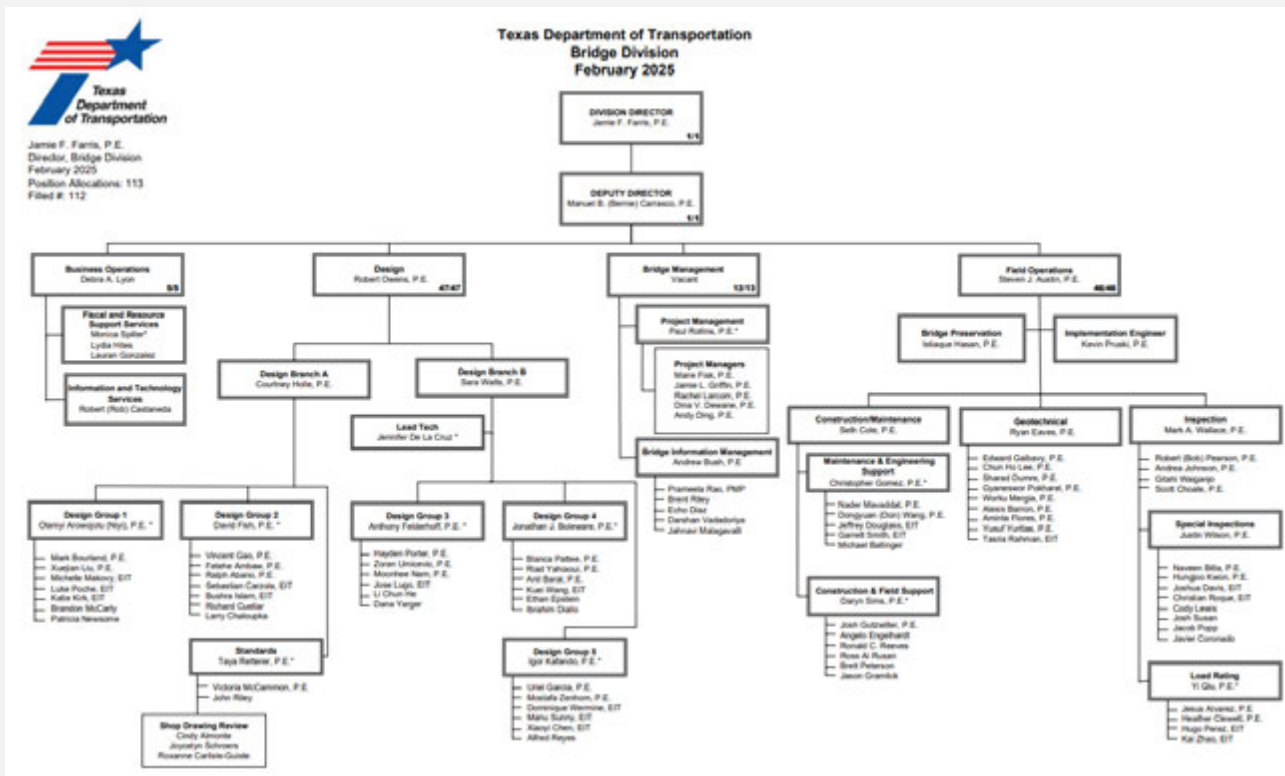


The screenshot shows the Texas Department of Transportation website. The header includes the TxDOT logo and navigation links: Discover Texas, Data and maps, Do business (highlighted), Explore projects, Stay safe, and Alerts. The breadcrumb trail reads: Home / Highway improvement project resources / Bridge design, construction, maintenance, inspection, and management. The main heading is "Bridge publications". Under the "Inspection" subheading, a list of publications is displayed. The last two items, "TBLRP-LTR Sensation" and "TBLRP-LTR User Guide", are circled in red.

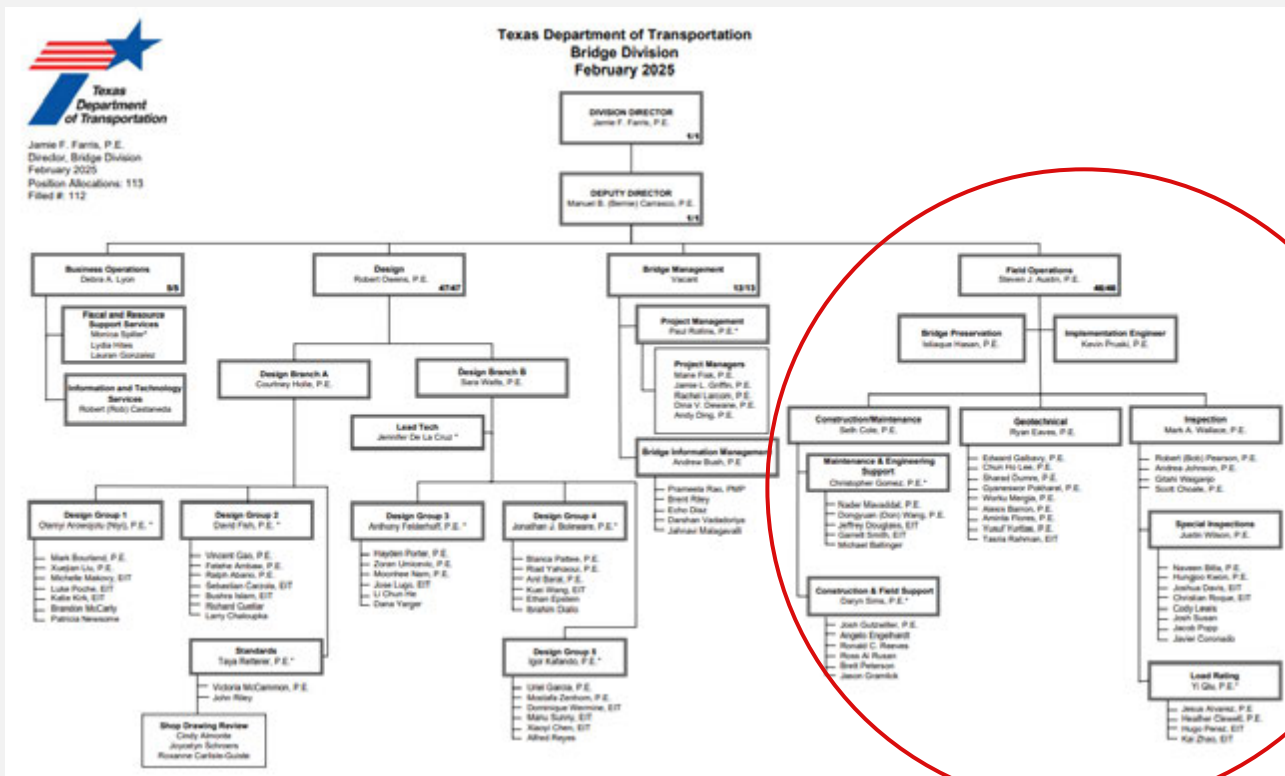
Title
2019-2022 contract - approved inspection team leaders
2019-2022 contract - online consultants contact list
2022-2026 contract - approved team leaders
2022-2026 contract - online consultants contact list
HwyRedundant Street Termination Member Inspection
Tunnel Inspection
Underwater Inspection
Coding guide
Bridge railing identification guide
Metal beam guardrail identification guide
TBLRP-LTR Sensation
TBLRP-LTR User Guide

<https://www.txdot.gov/business/resources/highway/bridge/bridge-publications.html>

Load Rating Team



Load Rating Team



Load Rating Team

Supervisor

- Mark Wallace, P.E. Mark.Wallace@txdot.gov

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- Hugo Perez, E.A. Hugo.Perez@txdot.gov
- Kai Zhao, E.A. Kai.Zhao1@txdot.gov

Q&A

