



Load Rating Requirements and Forms



3/26/2026

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What is a Load Rating?

Definition of a load rating

- It is a measure of the bridge live load capacity
 - Two common Categories defined by AASHTO Manual for Bridge Evaluation
 - Inventory Rating
 - Operating Rating



The Golden Gate Bridge Overloaded with People

Ting, E. (2019, May 25). 32 years ago, 300,000 people flattened the Golden Gate Bridge. SFGate. <https://www.sfgate.com/local-donotuse/article/Golden-Gate-bridge-walk-1987-anniversary-disaster-13896571.php#photo-17549621/>

What is an Inventory Rating?

- A live load that can safely utilize the bridge
- May be placed in multiple lanes
- Can safely use the bridge for an indefinite period without impacting the life of the structure



A Tonka Toy on a Flatbed Truck

The_Other_Guy. (2021, October 24. *Tractor Trailer carrying a toy truck* [Online Forum Post]. Reddit. https://www.reddit.com/r/funny/comments/qesmfm/tractor_trailer_carrying_a_toy_truck/

What is an Operating Rating?

- A maximum live load that can be placed on the bridge safely
- May also include the same load in multiple lanes
- Indefinite use would reduce the life of the bridge



Oversized Load on Multi-Axle Trailer

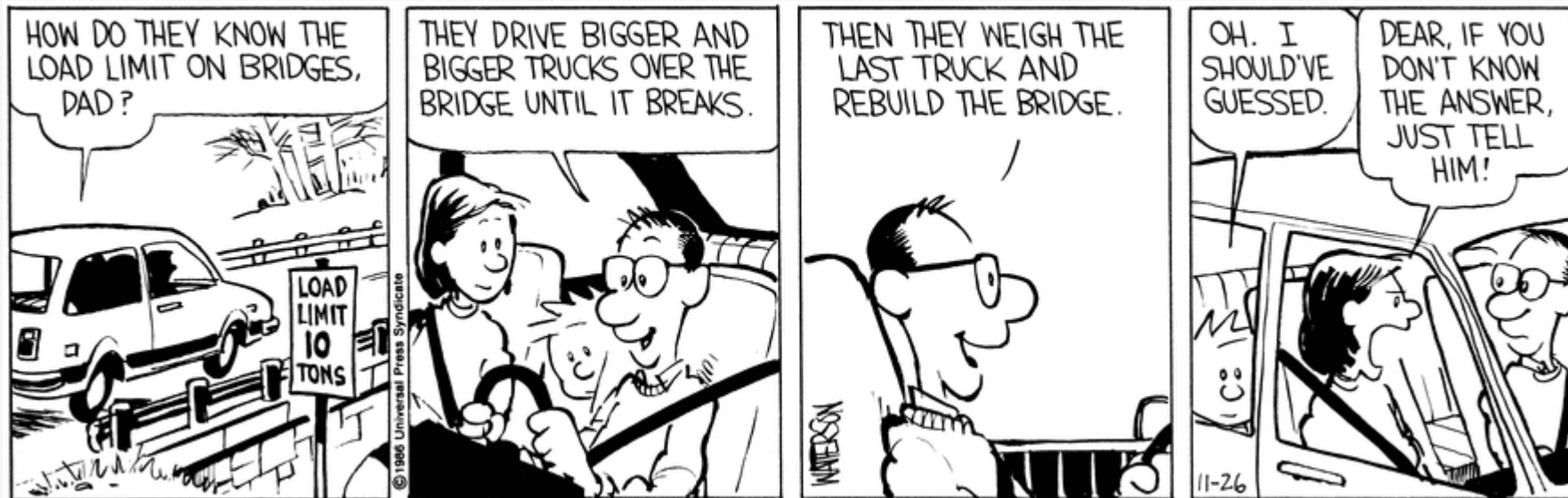
Klco, A. (2020, September 15). *Pros and Cons of Driving a Wide Load Truck*. Drive My Way.

<https://www.drivemyway.com/blog/pros-and-cons-of-driving-a-wide-load-truck/>



How do we Load Rate a Bridge?

This is not how we load rate

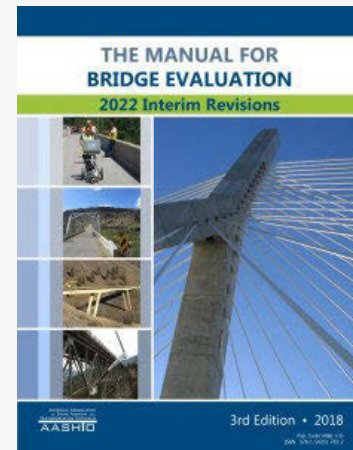


Calvin and Hobbes – “Bridge Capacity”

Watterson, B. (Artist) (1986, November 26). *Bridge Capacity*. Calvin and Hobbes Collection. Retrieved from <https://www.gocomics.com/calvinandhobbes/1986/11/26>

Requirements for how we Load Rate a bridge

- TxDOT Load Rating requirements for new bridges:
 - Bridge Design Manual – LRFD (BDM – LRFD), issued September 2024
 - Chapter 5, Section 7 outlines requirements
 - Load Rate in Accordance with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Bridge Evaluation (MBE) with current interims



MBE

Design Truck Specifications for Load Rating

- Live Load is per AASHTO LRFD Bridge Design Specifications, 9th Edition (2020)
 - Use HL-93 per Section 3.6.1.2 unless a special vehicle is specified or warranted
 - Use Fatigue Loading per Section 3.6.1.4

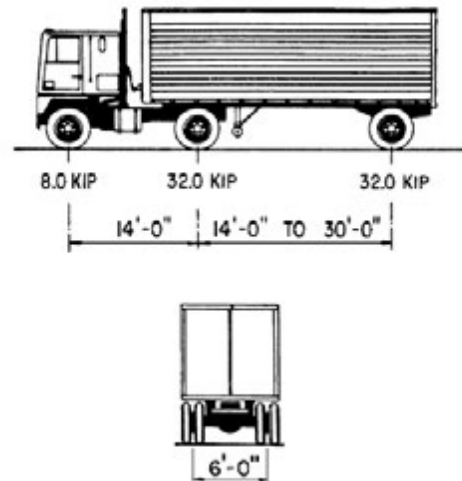


Figure 3.6.1.2.2-1—Characteristics of the Design Truck

Design Truck Diagram

What factors do we apply to the design truck?

- Use the BDM – LRFD Table 5-1 in lieu of MBE Table 6A.4.2.2-1

Table 5-1: TxDOT Limit States and Load Factors for Load Rating New Designs
(Replaces MBE Table 6A.4.2.2-1)

Bridge Type	Limit State	Dead Load (1)		Design Live Load	
				Inventory	Operating
		γ_{DC}	γ_{DW}	γ_{LL}	γ_{LL}
Prestressed Concrete	Strength I	1.25	1.50	1.75	1.35
	Service III	1.00	1.00	0.80	N/A
Structural Steel	Strength I	1.25	1.50	1.75	1.35
	Service II	1.00	1.00	1.30	1.00
	Fatigue (2)	0.00	0.00	0.80	N/A
Reinforced Concrete (3)	Strength I	1.25	1.50	1.75	1.35
Post Tensioned Concrete (4)	Strength I	1.25 max, 0.9 min	1.50 max, 0.65 min	1.75	1.35
	Service I (5)	1.00	1.00	1.00	N/A
	Service III	1.00	1.00	0.80	N/A

Table 5-1: Load Factors

What elements are required to be load rated?

Structure Type	Service Flexure	Ultimate Flexure	Ultimate Shear	Fatigue
Prestressed Beams & Girders	✓	✓	✓	
Steel Girders	✓	✓	✓	
Fracture Critical Steel Girders	✓	✓	✓	✓
Post-Tensioned Concrete Superstructure	✓	✓	✓	
Reinforced Concrete Superstructure		✓	✓	

Does it need to be load rated?

- Additional elements that may need load ratings but aren't required unless directed by TxDOT or where it may control:
 - Reinforced Concrete Bent Caps
 - Reinforced Concrete Inverted Tee Bent Caps
 - Post-Tensioned Bent Caps
 - Steel Bent Caps



Contact Bridge Division for guidance on unique structures or elements not addressed in the BDM - LRFD



Documentation of Load Rating – Form 2731 for New Bridges

Forms for Documenting Load Ratings

Existing Bridges – Form 2495

New Bridges – Form 2731



BRIDGE LOAD RATING STATEMENT

Contract & RW # _____
 STRUCTURE # _____
 FACILITY NAMED _____

FEATURE CROSSED _____
 BRIDGE DESCRIPTION _____

TEAM LEADER _____
 ENGINEER OF RECORD _____

FILE # _____

Current Condition Ratings: Current Inspection Date: _____
 Item 58 _____
 Item 59 _____
 Item 60 _____
 Item 61 _____
 Item 62 _____

Date: _____

INSTRUCTIONS: Complete the section that applies.
 Assigned Load Rating Statement
 Plans available in the bridge folder for the subject structure (CU# 9999-99-999) indicate a design load of _____ (If the principal structural elements have a condition rating below a value of "2" which indicates that the bridge elements, in their current state, continue to maintain structural capacity equivalent to the original design. Therefore, I have determined that new load rating calculations for this structure are not required. Furthermore, no other load rating calculations exist for this structure that would be in conflict with the original design load indicated.)
 I concur with the original design load indicated on the plans resulting in the following:
 SR = _____ Item 66 _____
 CR = _____ Item 64 _____

Load Rating/Comments Statement
 Existing load rating calculations exist and bridge conditions are very nearly unchanged since the last routine inspection. (Compare with the previous load rating calculations dated) _____
 SR = _____ Item 66 _____
 CR = _____ Item 64 _____

Assumed Load Rating Statement
 Rebuilding steel details and bridge piers do not exist for this concrete bridge structure. Based on the current conditions of the principal structural elements of the bridge and as per TxDOT's Bridge Inspection Manual Chap. 5, Section 3) Load Ratings, this bridge may be rated for the State Legal Load of 100-20 at the Operating Level and 100-15 at the Inventory Level if the following conditions apply:
 1) the bridge has been carrying unrestricted traffic for many years,
 2) the bridge shows no signs of significant distress,
 3) the single span (bridge)'s span-to-depth ratio of the main members does not exceed approximately 25,
 4) construction details conform to specifications at the time of the estimated construction, and
 5) appearance of the bridge indicates that construction was performed by a competent builder.
 SR = _____ Item 66 _____
 CR = _____ Item 64 _____

DO NOT DISCLOSE INFORMATION CONFIDENTIAL UNDER THE TEXAS HOMELAND SECURITY ACT AND 22 USC SECTION 6053 SAFETY SENSITIVE INFORMATION

Continide



New Bridge Load Rating Summary for Design Load

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual (BDM) for additional information.

NS Number _____ District _____ County _____

Facility Name: _____

Feature Intersected: _____

Design Load Method (Used to Determine SR and CR): _____

Standard Bridge? Yes or No (R) Defaulted to Assigned Rating? Yes or No (CR)

Load Rating Method: _____

Load Rating Software (if applicable): _____ Elements Load Rated: _____

Geometry and bridge type info:

Load State	Behavior	Rating Summary (R)		Operating	
		Rating Factor	Location	Rating Factor	Location
Strength (1)	Flexure				
	Shear				
Service (2)	Flexure			NA	NA
	Shear				
Service (3)	Flexure			NA	NA
	Shear				
Rating (3)	Flexure			NA	NA
	Shear				
Strength (4)	Flexure				
	Shear				
Service (5)	Flexure			NA	NA
	Shear				
Countdown Rating Factor (SR)					

Comments: _____

Rated By: (Name, sign and seal) _____

Checked By: _____ Entry Firm: _____ Date: _____

Notes: (SR) the design load is less than LR, indicate the bridge.
 (CR) SR Loading Error N/A for ratings not applicable for the structure type in question.
 (1) Unrestrained and unrestrained structure only.
 (2) Steel structure only.
 (3) Function critical steel structure only.
 (4) Generally, distribution elements are not rated.
 (5) Non-restricted/semi-rigid only.
 (6) See rating table on the next page for details.
 (7) Bridge designed based on TxDOT standard details for superstructure.
 (8) Use only one condition at a time, the first shown, and the controlling Rating Factor, Date, and Bridge Type must be included on all TxDOT Bridge Standards on load rating at this time. Indicate "NA" if no load rating is indicated, and enter an assigned floor board value (10-200 and 1.5 SR).

DO NOT DISCLOSE INFORMATION CONFIDENTIAL UNDER THE TEXAS HOMELAND SECURITY ACT AND 22 USC SECTION 6053 SAFETY SENSITIVE INFORMATION

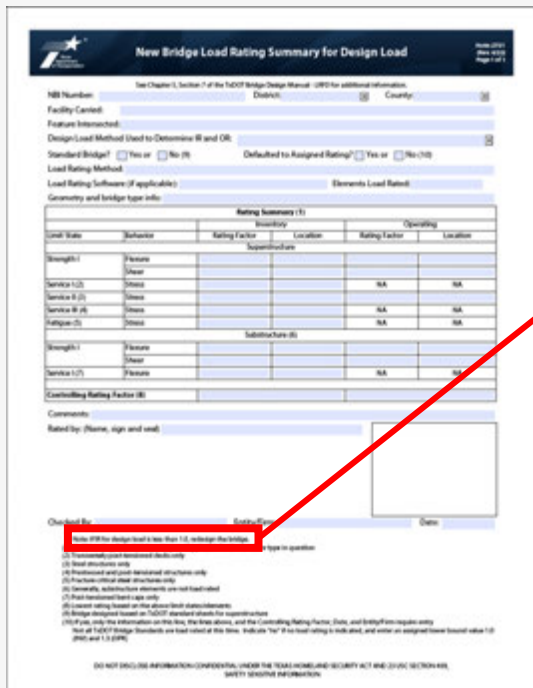
[Click this text to access Form 2731 on the TxDOT Bridge Publications website](#)

Figure 1 - Form 2495

Figure 2 - Form 2731

An Important Note Regarding Form 2731

The bridge shall be redesigned if the Inventory Rating (IR) is less than one.



New Bridge Load Rating Summary for Design Load

Form 2731
Rev. 03/11
Page 1 of 1

See Chapter 7 of the TxDOT Bridge Design Manual (BDM) for additional information.

NBI Number: District: County:

Facility Center:

Feature Information:

Design Load Method Used to Determine IR and CR:

Standard Bridge? Yes or No (R) Defaulted to Assigned Rating? Yes or No (R)

Load Rating Method:

Load Rating Software: (if applicable) Elements Load Rating:

Geometry and bridge type info:

Rating Summary (1)					
Local State	Behavior	Rating Factor	Location	Rating Factor	Location
Superstructure (A)					
Strength (1)	Flexure				
	Shear				
Service (1,2)	Other		NA	NA	
Service (3)	Other		NA	NA	
Service (4)	Other		NA	NA	
Fatigue (5)	Other		NA	NA	
Substructure (B)					
Strength (1)	Flexure				
	Shear				
Service (1,2)	Flexure		NA	NA	

Controlling Rating Factor (R):

Comments:

Rated By: (Name, sign and seal)

Checked By: Date:

Note: If IR for design load is less than 1.0, redesign the bridge.

1) If IR for design load is less than 1.0, redesign the bridge.

2) Transverse load measured directly only

3) Road structure only

4) Front-end and load-restricted structure only

5) Friction critical steel structure only

6) Generally, substructure elements are not load-rated

7) Post-tensioned bridge only

8) Control rating based on the above listed statements

9) Bridge designed based on TxDOT standard details for superstructure

10) If only the information on this line, the line above, and the Controlling Rating Factor, Date, and bridge type appear only

11) All TxDOT Bridge Standards are listed at the time. Indicate "N" if no load rating is indicated, and enter an assigned lower bound value (0, 0.85, and 1.0) (BDM and 1.0 (BDM))

DO NOT INCLUDE INFORMATION CONCERNING THE DESIGN AND SECURITY ACT AND CIVIL RIGHTS ACT, UNLESS SPECIFICALLY REQUESTED.

Note: If IR for design load is less than 1.0, redesign the bridge.




Figure 2 - Form 2731

Load Rating – Form 2731 – Lines 1 through 3



Form 2731



New Bridge Load Rating Summary for Design Load

Form 2731
(Rev. 6/22)
Page 1 of 1

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual - LRFD for additional information.

NBI Number: 14-011-0-AA01-06-502
 District: Austin
 County: Bastrop

Facility Carried: Old McDade Road

Feature Intersected: Big Sandy Creek

Design Load Method Used to Determine IR and OR: LRFR as outlined in Chapter 6, Part A of the MBE

Standard Bridge? Yes or No (9)
 Defaulted to Assigned Rating? Yes or No (10)

Load Rating Method: HL-93

Load Rating Software (if applicable): Bridgelinek PGSuper Version 7.0.2.0
 Elements Load Rated: Superstructure

Geometry and bridge type info: 3 Span Pre-Stressed Concrete I-Girder Bridge (Tx40) Unit (NW-SE) - Spans: 40' - 95' - 40'

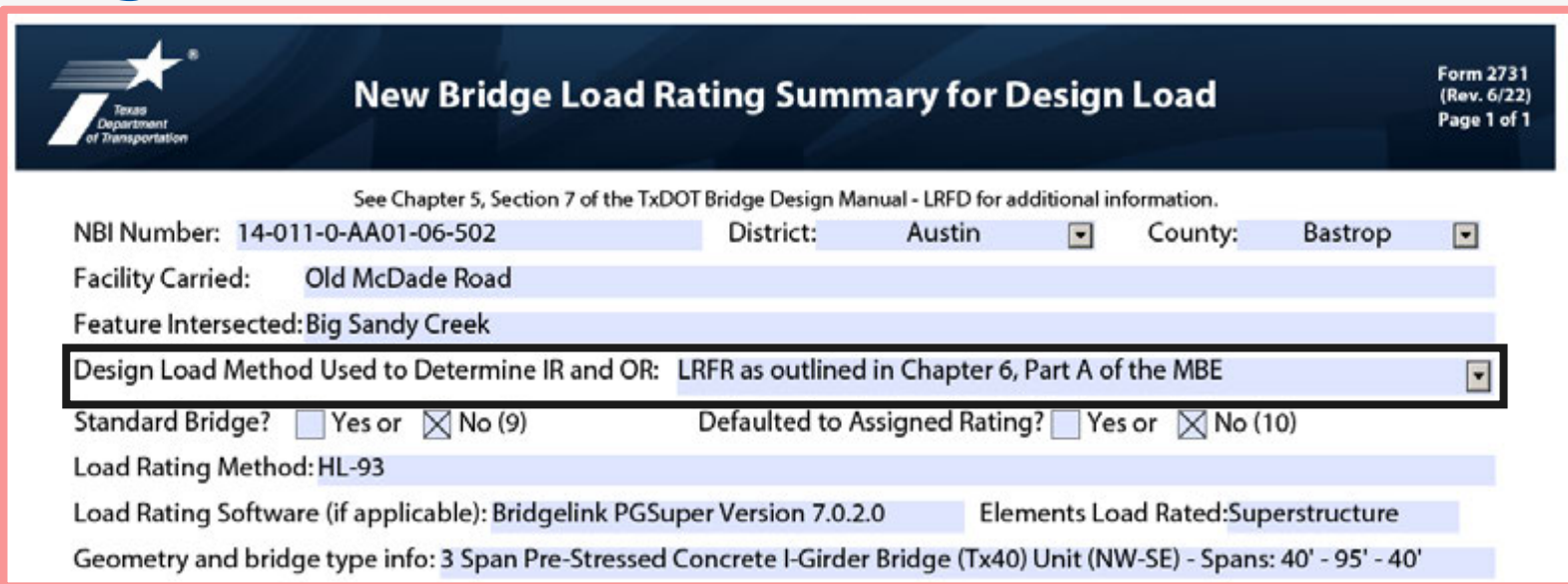
The top of form is the identifying information for the bridge, including the name, district, county and facility carried and feature intersected.

Load Rating – Form 2731 – Line 4



A small thumbnail image of the Form 2731 document, showing the title and some data fields.

Form 2731



New Bridge Load Rating Summary for Design Load

Form 2731 (Rev. 6/22) Page 1 of 1

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual - LRFD for additional information.

NBI Number: 14-011-0-AA01-06-502 District: Austin County: Bastrop

Facility Carried: Old McDade Road

Feature Intersected: Big Sandy Creek

Design Load Method Used to Determine IR and OR: LRFR as outlined in Chapter 6, Part A of the MBE

Standard Bridge? Yes or No (9) Defaulted to Assigned Rating? Yes or No (10)

Load Rating Method: HL-93

Load Rating Software (if applicable): Bridgelinek PGSuper Version 7.0.2.0 Elements Load Rated: Superstructure

Geometry and bridge type info: 3 Span Pre-Stressed Concrete I-Girder Bridge (Tx40) Unit (NW-SE) - Spans: 40' - 95' - 40'


- On line four, indicate the design load method:
 - Only one option is allowed for new bridges – Load and Resistance Factor Rating (LRFR).
 - Load Factor and Allowable Stress ratings are not allowed.

Load Rating – Form 2731 – Line 5



A small thumbnail image of the Form 2731 document, showing the title and a table of data.

Form 2731



New Bridge Load Rating Summary for Design Load

Form 2731
(Rev. 6/22)
Page 1 of 1

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual - LRFD for additional information.

NBI Number: 14-011-0-AA01-06-502 District: Austin County: Bastrop

Facility Carried: Old McDade Road

Feature Intersected: Big Sandy Creek

Design Load Method Used to Determine IR and OR: LRFR as outlined in Chapter 6, Part A of the MBE

Standard Bridge? Yes or No (9) Defaulted to Assigned Rating? Yes or No (10)

Load Rating Method:

Load Rating Software (if applicable): Elements Load Rated:

Geometry and bridge type info:


If this is a Standard Bridge, check Yes for both questions on line 5 and leave the next three lines blank.

Load Rating – Form 2731 – Line 5 Continued



A small thumbnail image of the Form 2731 document, showing the title and a table of data.

Form 2731



New Bridge Load Rating Summary for Design Load

Form 2731
(Rev. 6/22)
Page 1 of 1

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual - LRFD for additional information.

NBI Number: District: County:

Facility Carried:

Feature Intersected:

Design Load Method Used to Determine IR and OR:

Standard Bridge? Yes or No (9) Defaulted to Assigned Rating? Yes or No (10)

Load Rating Method:

Load Rating Software (if applicable): Elements Load Rated:

Geometry and bridge type info:

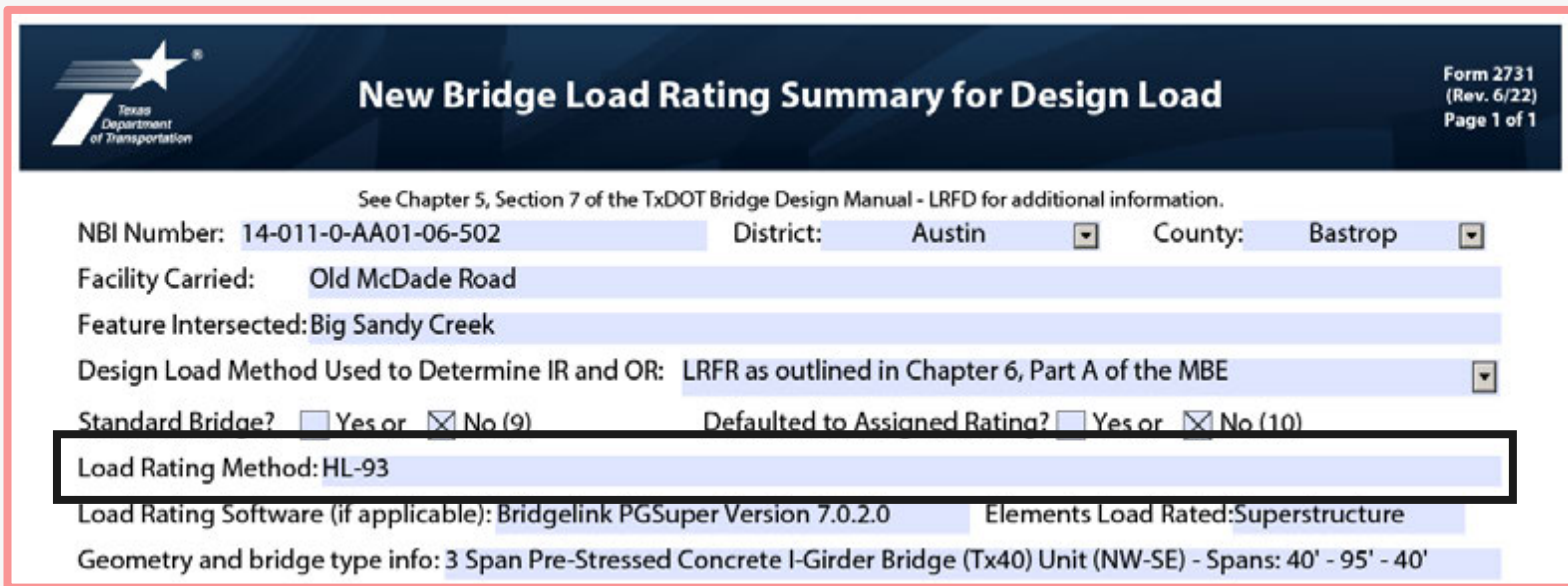
If not a Standard Bridge, check No for both questions on line 5 and proceed to lines 6 through 8.

Load Rating – Form 2731 – Line 6



A small thumbnail image of the Form 2731 document, showing the title and a table of data.

Form 2731



A screenshot of the Form 2731 document, titled "New Bridge Load Rating Summary for Design Load". The form includes the following information:

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual - LRFD for additional information.

NBI Number: 14-011-0-AA01-06-502 District: Austin County: Bastrop

Facility Carried: Old McDade Road

Feature Intersected: Big Sandy Creek

Design Load Method Used to Determine IR and OR: LRFR as outlined in Chapter 6, Part A of the MBE

Standard Bridge? Yes or No (9) Defaulted to Assigned Rating? Yes or No (10)

Load Rating Method: HL-93

Load Rating Software (if applicable): Bridgeline PGSuper Version 7.0.2.0 Elements Load Rated: Superstructure

Geometry and bridge type info: 3 Span Pre-Stressed Concrete I-Girder Bridge (Tx40) Unit (NW-SE) - Spans: 40' - 95' - 40'

Form 2731 (Rev. 6/22) Page 1 of 1


- On line 6, indicate the load rating method:
 - Typically, the only required load is the HL-93.
 - If Legal Loads (EV/SHV) or Permit Vehicle is required, include which vehicles on this line.

Load Rating – Form 2731 – Line 7 & 8



A small thumbnail image of the Form 2731 document, showing the title and some data fields.

Form 2731



New Bridge Load Rating Summary for Design Load

Form 2731
(Rev. 6/22)
Page 1 of 1

See Chapter 5, Section 7 of the TxDOT Bridge Design Manual - LRFD for additional information.

NBI Number: District: County:

Facility Carried:

Feature Intersected:

Design Load Method Used to Determine IR and OR:

Standard Bridge? Yes or No (9) Defaulted to Assigned Rating? Yes or No (10)

Load Rating Method:

Load Rating Software (if applicable): Elements Load Rated:

Geometry and bridge type info:

- On line 7, list the software used to load rate and the version number:
 - List all elements load rated.
- One line 8, describe the bridge geometry and type.

Load Rating – Form 2731 – Rating Summary Part 1

Controlling Factor for Limit State and Behavior, as applicable

Describe Corresponding Location on bridge for Each Factor

Rating Summary (1)					
		Inventory		Operating	
Limit State	Behavior	Rating Factor	Location	Rating Factor	Location
Superstructure					
Strength I	Flexure	1.48	S1&3, G1&4, 0.5L	1.91	S1&3, G1&4, 0.5L
	Shear	1.59	S2, G2&3, SZB	2.18	S2, G2&3, SZB
Service I (2)	Stress	N/A	N/A	NA	NA
Service II (3)	Stress	N/A	N/A	N/A	N/A
Service III (4)	Stress	1.01	S2, G2&3, 0.5L	NA	NA
Fatigue (5)	Stress	N/A	N/A	NA	NA
Substructure (6)					
Strength I	Flexure	N/A	N/A	N/A	N/A
	Shear	N/A	N/A	N/A	N/A
Service I (7)	Flexure	N/A	N/A	NA	NA
Controlling Rating Factor (8)		1.01		1.91	

Form 2731

Required for all structures



Load Rating – Form 2731 – Rating Summary Part 2

Service I Only applies to decks that are transversely post-tensioned



Form 2731

Rating Summary (1)					
		Inventory		Operating	
Limit State	Behavior	Rating Factor	Location	Rating Factor	Location
Superstructure					
Strength I	Flexure	1.48	S1&3, G1&4, 0.5L	1.91	S1&3, G1&4, 0.5L
	Shear	1.59	S2, G2&3, SZB	2.18	S2, G2&3, SZB
Service I (2)	Stress	N/A	N/A	NA	NA
Service II (3)	Stress	N/A	N/A	N/A	N/A
Service III (4)	Stress	1.01	S2, G2&3, 0.5L	NA	NA
Fatigue (5)	Stress	N/A	N/A	NA	NA
Substructure (6)					
Strength I	Flexure	N/A	N/A	N/A	N/A
	Shear	N/A	N/A	N/A	N/A
Service I (7)	Flexure	N/A	N/A	NA	NA
Controlling Rating Factor (8)		1.01		1.91	

Service II applies to steel structures only

Load Rating – Form 2731 – Rating Summary Part 3

Service III applies to any prestressed or post-tensioned structure types



Form 2731

Rating Summary (1)					
		Inventory		Operating	
Limit State	Behavior	Rating Factor	Location	Rating Factor	Location
Superstructure					
Strength I	Flexure	1.48	S1&3, G1&4, 0.5L	1.91	S1&3, G1&4, 0.5L
	Shear	1.59	S2, G2&3, SZB	2.18	S2, G2&3, SZB
Service I (2)	Stress	N/A	N/A	NA	NA
Service II (3)	Stress	N/A	N/A	N/A	N/A
Service III (4)	Stress	1.01	S2, G2&3, 0.5L	NA	NA
Fatigue (5)	Stress	N/A	N/A	NA	NA
Substructure (6)					
Strength I	Flexure	N/A	N/A	N/A	N/A
	Shear	N/A	N/A	N/A	N/A
Service I (7)	Flexure	N/A	N/A	NA	NA
Controlling Rating Factor (8)		1.01		1.91	

Fatigue is only for Fracture Critical Steel Structures

Load Rating – Form 2731 – Rating Summary Part 4

Generally, substructure is not required to be load rated but should be input here as required



Form 2731

Rating Summary (1)					
		Inventory		Operating	
Limit State	Behavior	Rating Factor	Location	Rating Factor	Location
Superstructure					
Strength I	Flexure	1.48	S1&3, G1&4, 0.5L	1.91	S1&3, G1&4, 0.5L
	Shear	1.59	S2, G2&3, SZB	2.18	S2, G2&3, SZB
Service I (2)	Stress	N/A	N/A	NA	NA
Service II (3)	Stress	N/A	N/A	N/A	N/A
Service III (4)	Stress	1.01	S2, G2&3, 0.5L	NA	NA
Fatigue (5)	Stress	N/A	N/A	NA	NA
Substructure (6)					
Strength I	Flexure	N/A	N/A	N/A	N/A
	Shear	N/A	N/A	N/A	N/A
Service I (7)	Flexure	N/A	N/A	NA	NA
Controlling Rating Factor (8)		1.01		1.91	

Service I only applies to post-tensioned bent caps

Load Rating – Form 2731 – Rating Summary Part 5

Lowest Operating Rating Listed in Above Columns



Form 2731

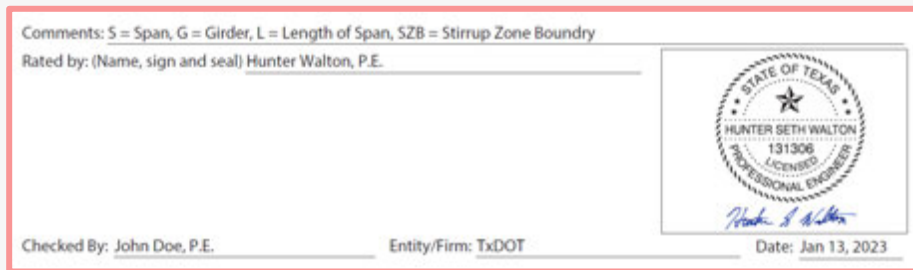
Rating Summary (1)					
		Inventory		Operating	
Limit State	Behavior	Rating Factor	Location	Rating Factor	Location
Superstructure					
Strength I	Flexure	1.48	S1&3, G1&4, 0.5L	1.91	S1&3, G1&4, 0.5L
	Shear	1.59	S2, G2&3, SZB	2.18	S2, G2&3, SZB
Service I (2)	Stress	N/A	N/A	NA	NA
Service II (3)	Stress	N/A	N/A	N/A	N/A
Service III (4)	Stress	1.01	S2, G2&3, 0.5L	NA	NA
Fatigue (5)	Stress	N/A	N/A	NA	NA
Substructure (6)					
Strength I	Flexure	N/A	N/A	N/A	N/A
	Shear	N/A	N/A	N/A	N/A
Service I (7)	Flexure	N/A	N/A	NA	NA
Controlling Rating Factor (8)		1.01		1.91	

Lowest Inventory Rating Listed in Above Columns

Load Rating – Form 2731 - Signature



Form 2731

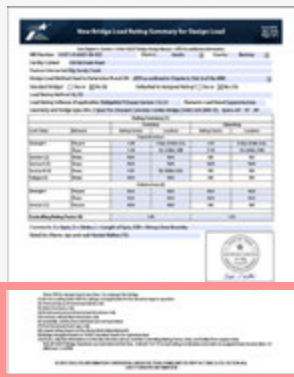


Comments: S = Span, G = Girder, L = Length of Span, SZB = Stirrup Zone Boundary
Rated by: (Name, sign and seal) Hunter Walton, P.E.

Checked By: John Doe, P.E. Entity/Firm: TxDOT Date: Jan 13, 2023

- Form 2731 must be signed and sealed by an Engineer licensed in the State of Texas
- Provide useful comments to clarify any comments provided in the Rating Summary Table
- Note the Engineer who checked the load rating

Load Rating – Form 2731 – Document Notes



Form 2731

- Note: If IR for design load is less than 1.0, redesign the bridge.
- (1) HL-93 Loading: Enter N/A for ratings not applicable for the structure type in question
 - (2) Transversely post-tensioned decks only
 - (3) Steel structures only
 - (4) Prestressed and post-tensioned structures only
 - (5) Fracture critical steel structures only
 - (6) Generally, substructure elements are not load rated
 - (7) Post-tensioned bent caps only
 - (8) Lowest rating based on the above limit states/elements
 - (9) Bridge designed based on TxDOT standard sheets for superstructure
 - (10) If yes, only the information on this line, the lines above, and the Controlling Rating Factor, Date, and Entity/Firm require entry
Not all TxDOT Bridge Standards are load rated at this time. Indicate "no" if no load rating is indicated, and enter an assigned lower bound value 1.0 (INV) and 1.3 (OPR)

DO NOT DISCLOSE INFORMATION CONFIDENTIAL UNDER THE TEXAS HOMELAND SECURITY ACT AND 23 USC SECTION 409,
SAFETY SENSITIVE INFORMATION

The bottom of form includes notes corresponding to previous inputs on the sheet to convey intended use, as identified by numbers in parenthesis

Explain it!

Where to keep Load Rating – Form 2731?

- Form 2731 and supporting calculations must be included calculations in the Bridge Design Notes





Documentation of Load Rating on Plans

How to document Load Rating on Plans

- Include the final controlling inventory and operating load ratings on the bridge layout, formatted as follows

HL-93 Loading: Superstructure Inv/Opr Ratings= X.XX/Y.YY

Substructure Inv/Opr Ratings= X.XX/Y.YY OR "Substructure Not Rated"

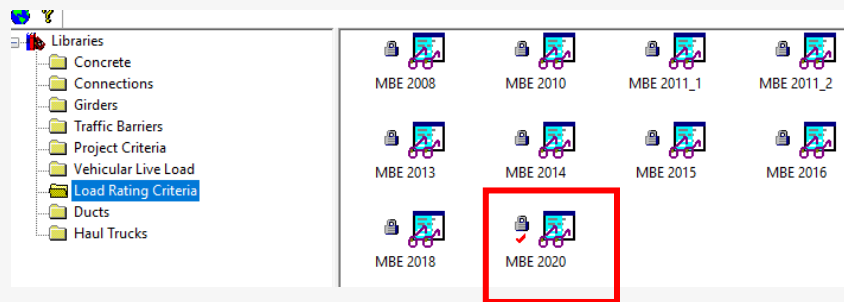
- Include controlling load ratings for all girder designs for inventory and operating on relevant plan sheets



Performing Load Ratings on Concrete Superstructures using PGSuper

How to perform Load Ratings Using PG Super

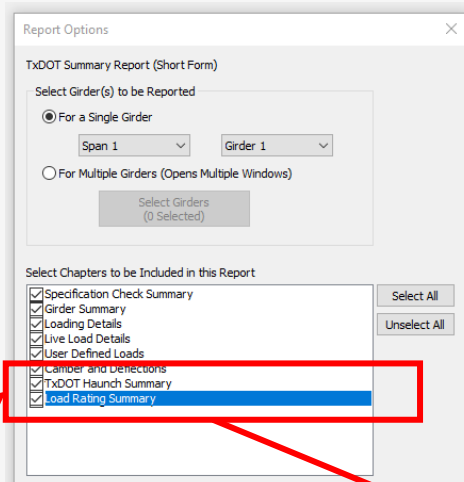
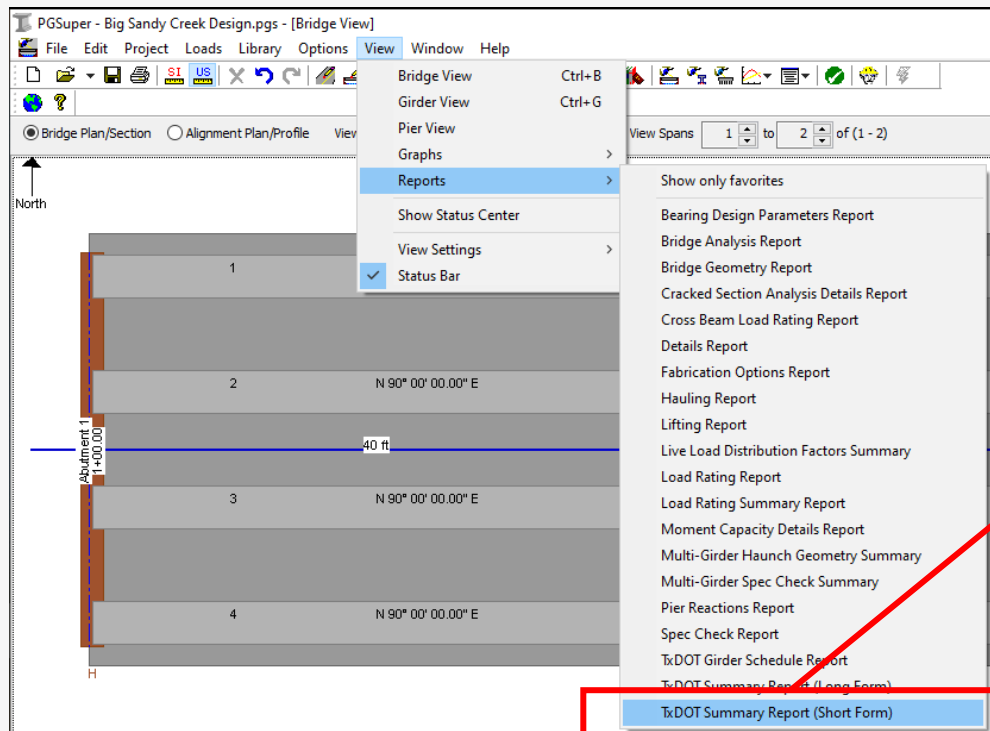
- Bridgeline's PG Super (Version 8.0.7.1) can provide load ratings for all standard TxDOT girder sections
 - TxDOT has coordinated load rating inputs and requirements for this purpose



- The load ratings be reviewed in a multitude of ways after girders have been designed and grouped

Viewing load ratings in PGSuper

View -> Reports -> TxDOT Summary Report (Short Form)



Load Rating Summary

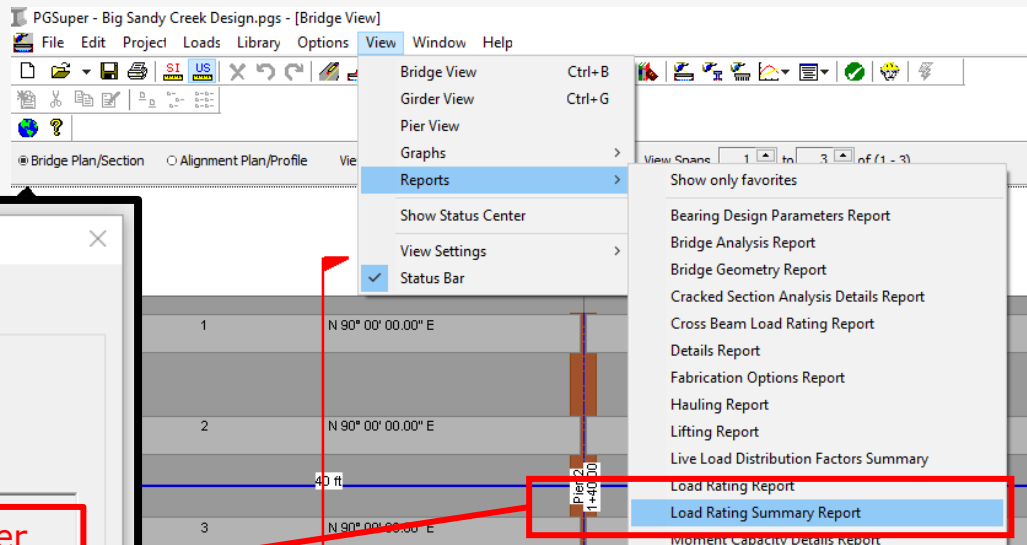
Controlling Factors per Girder

Limit State	Type	Inventory				Operating			
		RF	γ_{LL}	Location from Left Support		RF	γ_{LL}	Location from Left Support	
Strength I	Flexure	1.48	1.750	Span 1 Girder 1, (0.5L _s) 19.000 ft		1.91	1.350	Span 1 Girder 1, (0.5L _s) 19.000 ft	
	Shear	3.20	1.750	Span 1 Girder 1, (CS) 4.123 ft		4.15	1.350	Span 1 Girder 1, (CS) 4.123 ft	
Service III	Stress	2.38	0.800	Span 1 Girder 1, (0.5L _s) 19.000 ft					

Generating a Load Rating Report in PGSuper

View -> Reports -> Load Rating Summary Report

- This will provide the controlling rating by selection and at tenth points



Report Options

Load Rating Summary Report

Select Girder(s)

By Girderline

Girder 1

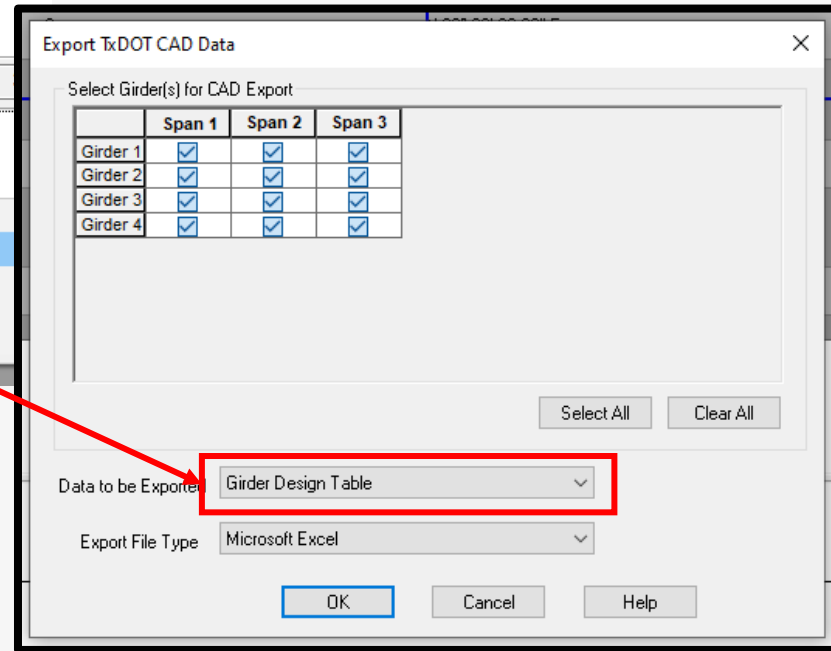
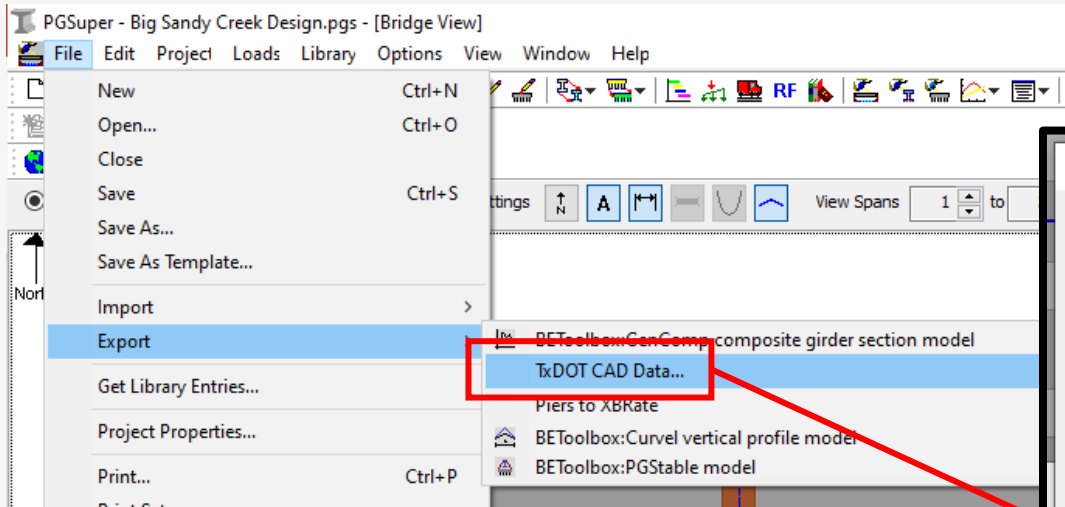
By Individual Selected Girder(s)

	Span 1	Span 2	Span 3
Girder 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Girder 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Girder 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Girder 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You can select by girder line or by individual girders

Exporting the Design Table & Load Ratings

Generating CADD Tables for Plans



PGSuper makes it simple to export your girder designs and load rating for use in generating girder design tables

- Save as an excel file ready to import

Girder Design Excel Data Table for Plan Set

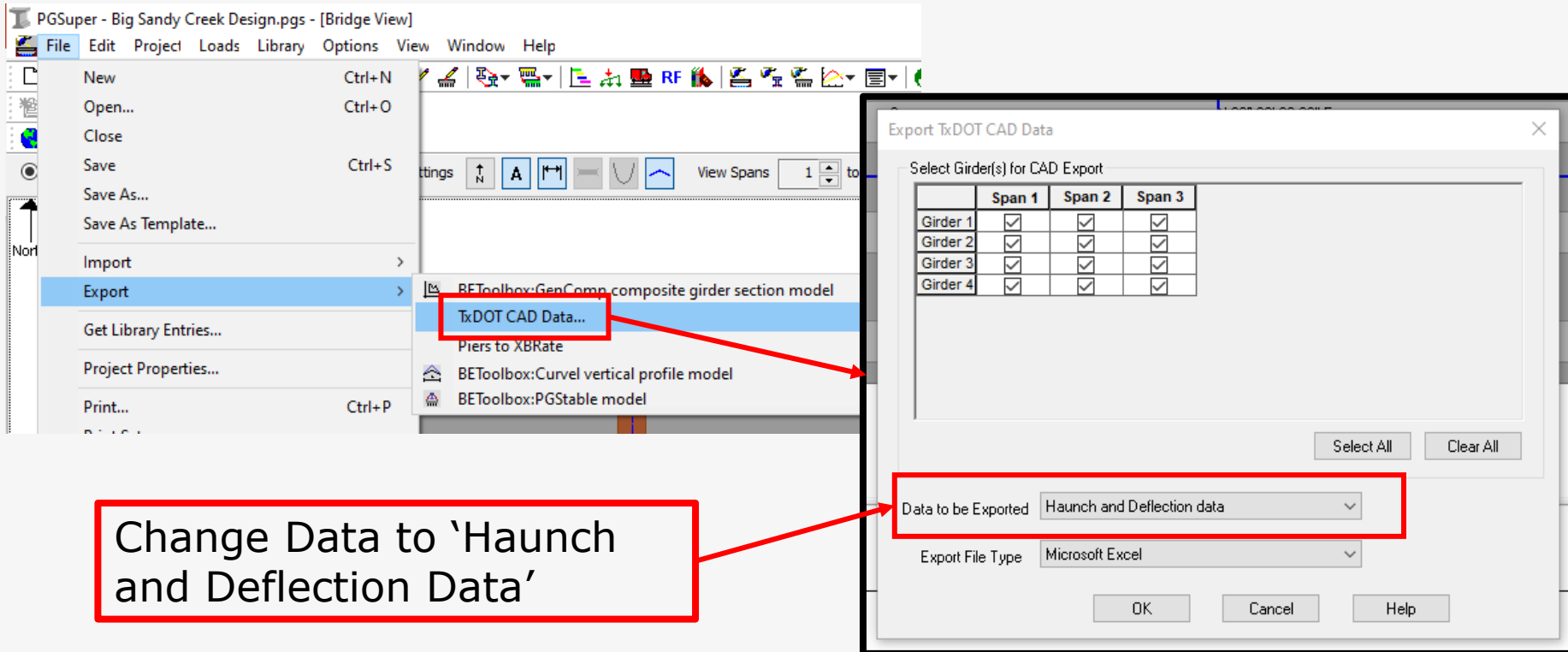
Generating CADD Tables for Plans

StructureName	DESIGNED GIRDERS										DEPRESSED STRAND PATTERN		CONCRETE		OPTIONAL DESIGN					LOAD RATING		
	Span #	Girder #	Girder Ty	PRESTRESSING STRANDS						#	To End	f'ci	f'c	Comp Stress	Tensile Stress	Ult Moment	LL Distribution Factor		Strength I		Service III	
				Non-Std	Total #	Size	Strength	"e" CL	"e" END								Moment	Shear	Inv	Opr	Inv	
					in	ksi	in	in														
	1	1	Tx40		8	0.6	270	15.60	15.60			4,000	5,000	0.688	-0.908	1758	0.787	0.814	1.48	1.91	2.38	
	1	2	Tx40		10	0.6	270	15.60	15.60			4,000	5,000	0.704	-0.932	1790	0.787	0.814	1.92	2.49	2.89	
	1	3	Tx40		10	0.6	270	15.60	15.60			4,000	5,000	0.704	-0.932	1790	0.787	0.814	1.92	2.49	2.89	
	1	4	Tx40		8	0.6	270	15.60	15.60			4,000	5,000	0.688	-0.908	1758	0.787	0.814	1.48	1.91	2.38	
	2	1	Tx40		34	0.6	270	14.07	8.78	6	36.5	5,400	6,100	3.682	-4.120	5060	0.619	0.814	1.58	2.06	1.06	
	2	2	Tx40		34	0.6	270	14.07	10.19	6	28.5	5,800	6,700	3.839	-4.284	5203	0.619	0.814	1.58	2.05	1.01	
	2	3	Tx40		34	0.6	270	14.07	10.19	6	28.5	5,800	6,700	3.839	-4.284	5203	0.619	0.814	1.58	2.05	1.01	
	2	4	Tx40		34	0.6	270	14.07	8.78	6	36.5	5,400	6,100	3.682	-4.120	5060	0.619	0.814	1.58	2.06	1.06	
	3	1	Tx40		8	0.6	270	15.60	15.60			4,000	5,000	0.688	-0.908	1758	0.787	0.814	1.48	1.91	2.38	
	3	2	Tx40		10	0.6	270	15.60	15.60			4,000	5,000	0.704	-0.932	1790	0.787	0.814	1.92	2.49	2.89	
	3	3	Tx40		10	0.6	270	15.60	15.60			4,000	5,000	0.704	-0.932	1790	0.787	0.814	1.92	2.49	2.89	
	3	4	Tx40		8	0.6	270	15.60	15.60			4,000	5,000	0.688	-0.908	1758	0.787	0.814	1.48	1.91	2.38	

Excel Report now includes controlling load factors for each girder

Exporting the Haunch & Deflection Table

Generating CADD Tables for Plans – Additional Feature



The screenshot shows the PGSuper software interface. The File menu is open, and the 'Export' option is selected. The 'Export TxDOT CAD Data...' option is highlighted in the submenu. A red box highlights this option, and a red arrow points to the 'Export TxDOT CAD Data' dialog box.

The 'Export TxDOT CAD Data' dialog box is open, showing the 'Select Girder(s) for CAD Export' table. The table has columns for Span 1, Span 2, and Span 3, and rows for Girder 1, Girder 2, Girder 3, and Girder 4. All checkboxes are checked.

The 'Data to be Exported' dropdown menu is set to 'Haunch and Deflection data'. A red box highlights this dropdown, and a red arrow points to it from a text box below.

Change Data to 'Haunch and Deflection Data'

	Span 1	Span 2	Span 3
Girder 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Girder 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Girder 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Girder 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Data to be Exported: Haunch and Deflection data

Export File Type: Microsoft Excel

Buttons: Select All, Clear All, OK, Cancel, Help

Excel Data Table for Plan Set

Generating CADD Tables for Plans – Additional Feature

TABLE OF SECTION DEPTHS										
Span No.	Beam No.	"X" at ζ of Brg	"Y" at ζ of Brg	"Z" at ζ of Span	Span No.	Beam No.	"A" Ft	"B" Ft		
1	1	10 1/2"	4'-2 1/2"	10 1/4"	1	1	-0.003	-0.004		
1	2	10 1/2"	4'-2 1/2"	10 1/8"	1	2	-0.003	-0.005		
1	3	10 1/2"	4'-2 1/2"	10 1/8"	1	3	-0.003	-0.005		
1	4	10 1/2"	4'-2 1/2"	10 1/4"	1	4	-0.003	-0.004		
2	1	10 1/2"	4'-2 1/2"	8 1/4"	2	1	-0.109	-0.155		
2	2	10 1/2"	4'-2 1/2"	8 3/8"	2	2	-0.124	-0.177		
2	3	10 1/2"	4'-2 1/2"	8 3/8"	2	3	-0.124	-0.177		
2	4	10 1/2"	4'-2 1/2"	8 1/4"	2	4	-0.109	-0.155		
3	1	10 1/2"	4'-2 1/2"	10 1/4"	3	1	-0.003	-0.004		
3	2	10 1/2"	4'-2 1/2"	10 1/8"	3	2	-0.003	-0.005		
3	3	10 1/2"	4'-2 1/2"	10 1/8"	3	3	-0.003	-0.005		
3	4	10 1/2"	4'-2 1/2"	10 1/4"	3	4	-0.003	-0.004		

Generates an Excel Report with Table of Section Depths and Dead Load Deflection



Performing Load Ratings for other Structure Types

Load ratings other Structure Types

- Other Programs can generate Load Ratings for various structure types
 - Example: MDX can be used for steel girders
- Use of these programs is at the discretion of the Engineer performing the Rating



Bus Ignoring Weight Limit

ViralHog. (2018, October 16). *Bus Ignores Weight Limit on Bridge* [Video]. YouTube. <https://www.youtube.com/watch?v=eHxvj7C0OT8>