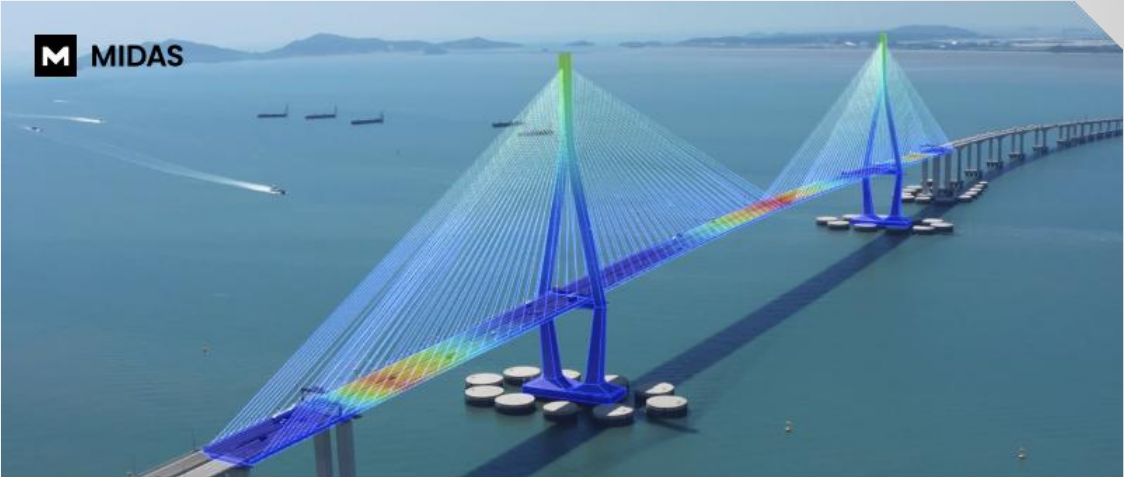


Release Note

Release Date : July 2025

Product Ver. : CIVIL NX 2025 (v2.1)



M MIDAS

CVL MIDAS CIVIL NX

© 1989-2025 MIDASIT. All rights reserved.

INTEGRATED SOLUTION SYSTEM FOR BRIDGE AND CIVIL ENGINEERING

MIDAS CIVIL NX is a state of the art software, which defines a new paradigm for bridge engineering and civil structures. It provides a distinctively easy user interface through its innovative graphic modules. MIDAS CIVIL NX provides an optimal design solution, which analyzes and designs all types of bridge structures in a 3D environment, accounting for construction stages and time-dependent properties.

DESIGN OF CIVIL STRUCTURES

Integrated Solution System for Bridge and Civil Engineering

Enhancements

Enhancements in CIVIL NX 2025 (v2.1)

1. *Addition of Material Database for Structural Steel Reinforcement as per NR/GN/CIV/025*
2. *Addition of Section Properties for U-girder Bridge as per NR/GN/CIV/025*
3. *Addition of Moving Load for UK Network Rail Bridge Assessment as per NR/GN/CIV/025*
4. *UK Network Rail Bridge Assessment as per NR/GN/CIV/025*
5. *Automated design support for asymmetric (Type 2) composite steel bridges(Eurocode, AASHTO)*
6. *RC design support for US railway bridges(Based on AREMA design code)*
7. *Update PSC section design criteria for Australia to the latest 2024 standard*
8. *Add California-specific provisions from AASHTO LRFD*
9. *Auto-generate Load combination (RC) as per TMH07 : 1981*
10. *PSC Design as per TMH07-3 : 1989*
11. *Significantly Improved Excel Design Report Generation Speed*



Enhancements

Enhancements in CIVIL NX 2025 (v2.1)

- 12. Moving patch load analysis as per Eurocode, BS & NZ traffic loads*
- 13. Addition of evaluation truck loads for existing bridges in New Zealand(Based on SP/M/022 v3.4)*
- 14. Addition of special permit trucks for load rating of existing bridges in Western Australia*
- 15. Enhancement of Australian moving load options: Add lateral offset distance option*
- 16. Enhancement of Load All Model 1 in the UK rating system to support envelope type loads*
- 17. Addition of vehicle database for 46 US states*
- 18. Addition of cross-section databases for the US and Canada*
- 19. Batch output for tendon loss table by construction stage and tendon group*
- 20. Flexible Dual Tree Menu Layout and External Docking*
- 21. Full Customization of Horizontal Toolbar Functions*
- 22. Addition of Active Fix and Zoom Fix for Stage to Status Bar*



1. Addition of Material Database for Structural Steel Reinforcement as per *NR/GN/CIV/025*

- To support bridge assessment in accordance with NR/GN/CIV/025, MIDAS CIVIL NX now includes a comprehensive set of steel and wrought iron materials used in UK railway structures from the pre-1906 era onward.
- 10 new material types added to the database, including: Wrought Iron, BS 2762:1956(A), BS 2762:1956(B), BS968:1962, BS968:1941, BS548:1934, BS15:1961, BS15:1948, BS15:1906, Pre1906. This includes definition of Yield strength values by thickness.
- This addition enables accurate structural assessments for existing UK railway bridges, including heritage structures and simplifies compliance with Network Rail’s material classification and evaluation requirements.

- **Properties > Material Properties**
- **Rating > Steel Bridge > NR/GN/CIV/025 > Modify Steel Material**

Material Data

General

Material ID1NameWrought Iron

Elasticity Data

Type of DesignSteel



Type of Material

Isotropic

Orthotropic

Steel

Modulus of Elasticity1.9000e+08kN/m²

Poisson's Ratio0.3

Thermal Coefficient1.2000e-051/[C]

Weight Density75.51kN/m³

☐ Use Mass Density

7.7kN/m³/g

Concrete

Modulus of Elasticity0.0000e+00kN/m²

Poisson's Ratio0

Thermal Coefficient0.0000e+001/[C]

Weight Density0kN/m³

☐ Use Mass Density

0kN/m³/g

Plasticity Data

Steel

StandardNR/GN/CIV/025(S)

DBWrought Iron

Concrete

Standard

Code

DB

Material Properties

Modify Steel Material

Material List

ID	Name	Es	Fu	Fy1Fy1	Fy2	
1	Wrought I...	1.9e+08	285000	190000	190000	15

Steel Material Selection

CodeNR/GN/CIV/025(S)GradeBS968:1941

Modulus of Elasticity (Es)205000000kN/m²

Poisson's Ratio (Ps)0.3

Tensile Strength (Fu)570000kN/m²

Yield Strength (Fy1)355000kN/m²

Yield Strength (Fy2)325000kN/m²

Yield Strength (Fy3)295000kN/m²

Yield Strength (Fy4)295000kN/m²

Yield Strength (Fy5)295000kN/m²

Close

Modify

Modify Steel Material

2. Addition of Section Properties for U-girder Bridge as per *NR/GN/CIV/025*

- Riveted steel plate girders can be defined, including detailed configuration of riveted angles. By accounting for rivet holes, the software automatically computes the net stiffness, which is then applied in the assessment for more accurate structural evaluation.

▪ *Properties > Section Properties*

Section Data

DB/UserSteel Girder

Section ID2NameCG

Section TypeSteel Girder I

Size

☒ Symmetric Section Auto Calculation

Distance from Reference Line

Top0m

Bottom0m

Top

Bot

B1B2

B3B4

t1

t2

H

tw

Ref.

1234

y

B10.3H0.6m

B20.3t10.014m

B30.3t20.014m

B40.3tw0.014m

Stiffener...

Riveted Angle...

OffsetCenter-Bottom

☒ Consider Shear Deformation,

Change Offset ...

☐ Consider Warping Effect(7th DOF)

Show Calculation Results...

OK

Cancel

Apply

Riveted Angle

Angle 3

Angle 1

Angle 5

Angle 7

Angle 4

Angle 2

Angle 6

Angle 8

Defined Angles

Define Angles...

NameType

aAngle

☒ Symmetric

☒ Angle 1a

☒ Angle 2a

☐ Angle 3a

☐ Angle 4a

☒ Angle 5a

☒ Angle 6a

☐ Angle 7a

☐ Angle 8a

☒ Rivet

Component	Angle	Ref.Pos (lateral)	Ref.Pos (vertical)	dR (m)	Diameter (m)
Top Left Flange	Angle 1	Left		0	0
Top Right Flange	Angle 5	Right		0	0
Web	Angle 1		Top	0	0
Web	Angle 2		Top	0	0
Bottom Left Flange	Angle 2	Left		0	0
Bottom Right Flange	Angle 6	Right		0	0

OK

Cancel

Riveted Steel Plate Girder

3. Addition of Moving Load for UK Network Rail Bridge Assessment as per *NR/GN/CIV/025*

- MIDAS CIVIL NX now supports Network Rail Standards-based moving load configurations for bridge assessment, in accordance with NR/GN/CIV/025. This enhancement ensures compliance with UK railway bridge evaluation guidelines and expands the platform's global code coverage.

- Key Features:

Vehicle Types Included:

Equivalent Uniformly Distributed Load (EUDL)

RAI (RA1 ~ RA15)

Load Wagon (Convoy Mode supported)

Wagon Type D4 (as per UIC700 standard)

Dynamic Factor Configuration:

Dynamic Amplification Factors (DAF) can be automatically calculated by defined *Determinant Length* and *group-based* selection.

This enables accurate load effect estimation under various speed rail conditions.

Track Factor Input:

Track Factor can be defined per lane in the Moving Load Case for consistent multi-track evaluation.

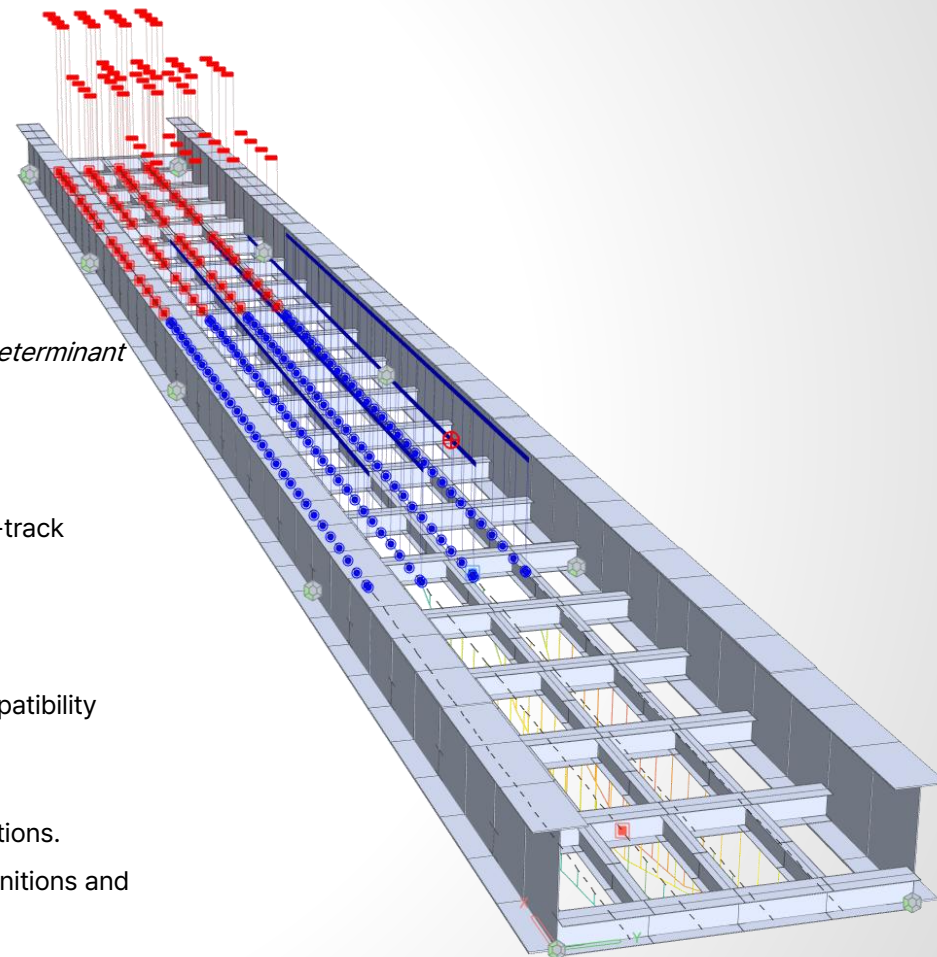
- Benefits:

EUDL (Equivalent Uniformly Distributed Load) automatically provided, enhancing compatibility with simplified evaluation methods.

Provides detailed moving load simulation tailored to UK railway infrastructure.

Allows for accurate modeling of various speed rail effects through Dynamic Factor options.

Enables bridge engineers to perform assessments using familiar UK-specific load definitions and parameters.



- A new Railway Lane type has been added to support Network Rail moving load assessments, allowing users to define track-specific configurations aligned with UK railway standards.
- The following vehicle types have been newly added: Equivalent Uniformly Distributed Load (EUDL), RA1–RA15 load types, Load Wagon with Convoy Mode, and Wagon Type D4 in accordance with the UIC700 standard.

- **Load > Moving Loads > BS**
- **Load > Moving Loads > Traffic Line/Surface Lanes**
- **Load > Moving Loads > Vehicles**
- **Load > Moving Loads > Moving Load Cases**

The screenshot displays the software interface for defining vehicle loads. It includes several dialog boxes:

- Define Standard Vehicular Load (Left):** Shows options for Standard Name (NR/GN/CIV/025), Vehicular Load Properties, Vehicular Load Name (EUDL Loading), Vehicular Load Type (Type RAI Loading), and Sub Type (EUDL). A diagram shows a standard load with width W.
- Define Standard Vehicular Load (Top Center):** Shows options for Standard Name (NR/GN/CIV/025), Vehicular Load Properties, Vehicular Load Name (RA10 Loading), Vehicular Load Type (Type RAI Loading), and Sub Type (RA10). A diagram shows a standard load with width W.
- Define Standard Vehicular Load (Middle Center):** Shows options for Standard Name (NR/GN/CIV/025), Vehicular Load Properties, Vehicular Load Name (Assessment Load Wagon), Vehicular Load Type (Wagon), and Sub Type (Assessment Load Wagon). A diagram shows a standard load with width W.
- Define Moving Load Case (Right Center):** Shows options for Load Case Name (RA 10 S), Description, Moving Load Optimization, Select Load Model, Track Factor, and Sub-Load Cases. A diagram shows a moving load case with a train and a wagon.
- Traffic Lane Properties (Far Right):** Shows options for Lane Type (Railway), Lane Width (3 m), Eccentricity (0 m), Wheel Spacing (1.6 m), Transverse Lane Optimization, and Vehicular Load Distribution (Cross Beam).

Traffic Line Lanes

- Dynamic Factor in accordance with NR/GN/CIV/025 can now be applied either by automatic calculation based on determinant length or through user-defined input, providing flexibility and compliance with UK railway standards.
- The calculated Dynamic Factor can be checked in both the table view and the detail report of the Moving Load Tracer.

Railway Dynamic Factor

Select Structure Group

- ☒ Cross Girder
- ☐ Main Girder
- ☐ Railbearer

☐ Auto Input

☒ User Input

Effects

Bending for Beam Element

Shear for Beam Element

All Other Effects

(e.g.Axial, Torsion, Stress, Displacements, Reactions, etc)

Group List	Bending	Shear	Other
Cross Girder	1.3	1.2	1.3
Main Girder, Railbearer	1.4	1.3	1.4

Add Modify Delete

OK Cancel

Moving Load Tracer

4. UK Network Rail Bridge Assessment as per *NR/GN/CIV/025*

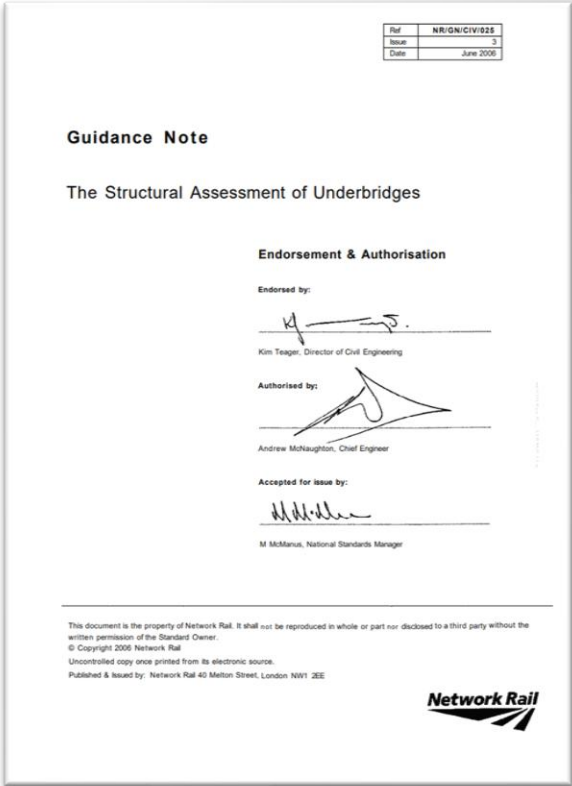
- MIDAS CIVIL NX now supports a fully automated assessment process for railway bridge structures in accordance with Network Rail standards (NR/GN/CIV/025), including the ability to generate structured Excel reports summarizing all verification results.

- **Key Features:**

- Automated Assessment Workflow
Perform Ultimate Limit State checks (Flexure, Shear, Longitudinal Shear, Intermediate and Bearing Stiffener) on main girders, cross girders, rail bearers, and stiffeners automatically after analysis.
- Code Selection Flexibility
Assessment can be carried out based on either NR/GN/CIV/025 or BS 5400 Part 3, allowing users to choose the appropriate code depending on project requirements.
- Utilisation Factor Calculation
Includes auto-calculation of Utilisation Factors based on RA rating criteria, with support for historic steel materials (e.g., Wrought Iron, Early Steel).
- Excel Report Output
A detailed Excel-format report is generated, capturing all input parameters, applied load cases (e.g., RA1-RA15, EUDL), rating factors, section capacities, and final utilisation results.
- Supports Various Design Inputs
Corrosion depth, riveted angle, effective length, and U-girder specific parameters are fully reflected in both calculation and reporting.

- **Benefits:**

- Streamlines compliance with UK Network Rail bridge assessment procedures.
- Minimizes manual input and post-processing by automating the full assessment-to-report pipeline.
- Produces clear, exportable documentation for design review, audit, and submission to authorities.



- When NR/GN/CIV/025 is selected in the Steel Bridge Rating menu, all relevant input and output menus specific to the Network Rail assessment criteria are displayed.

Excel Report

4. UK Network Rail Bridge Assessment as per *NR/GN/CIV/025*

- In Assessment Parameter, Users can modify and apply condition factors, material factors, and other parameters as needed to suit specific project conditions.
- In the assessment case, when static live load, dynamic live load, and dead load are defined, the software automatically calculates the utilisation factor based on these inputs.

Rating > Steel Bridge > *NR/GN/CIV/025*

Assessment Parameter

Resistance Formula as per

☒ NR/GN/CIV/025

☐ BS5400 Part3

Required Route Availability Number

RA1

Condition Factor(Fc)

1

Material Strength used for Assessment

☒ Characteristic Strength

☐ Worst Credible Strength

Effective Length (BS5400 Part3, 9.6.4.1.1.2)

Span Type

☒ Simply Supported Spans

☐ Continuous Beams

k2

1

k3

1

U-frame Spacing

0

m

☒ Apply Equation A4 of NR/GN/CIV/025, 9.6.4.1.1.2A

☒ User Input

Modify Design Parameters

Ultimate Limit State

☒ Flexure

☒ Shear

☒ Longitudinal Shear

☒ Intermediate and Bearing Stiffener

OK

Cancel

Assessment Parameter

Define Assessment Case

Load Combination

	Name	Limit State	Comb. Type	Description
▶	EUDL	ULS	Comb1	
	RA 10	ULS	Comb1	
*				

Copy into Assessment Load Combination

Copy into General Load Combination

Static Load Cases and Factors(Gamma_{fl})

	Static Load Cases	Factor
▶	DL(ST)	1.2000
*		

Assessment Live Load

☒ Type RAI Loading

☐ Wagon Loading

Moving Load Cases and Factors(Gamma_{fl})

☒ Static (Dynamic Factor = 1)

EUDL S(MV)

1

☒ Dynamic (Dynamic Factor= 1 + phi)

EUDL D(MV)

1

Close

Assessment Case

4. UK Network Rail Bridge Assessment as per *NR/GN/CIV/025*

- Transverse and bearing stiffeners can be defined, along with riveted angles used for their reinforcement. These inputs are considered in the automatic calculation of section properties, which are then used directly in the assessment process.
- Assessment can be performed using net section properties that account for corrosion depth, ensuring more accurate evaluation of deteriorated structures.

Rating > Steel Bridge > *NR/GN/CIV/025*

Stiffener Type

Type

☒ Located at U-frame

Defined Shape

Define Shape...

Name	Type
S	Flat
A	Angle

Transverse Stiffener

Transverse Stiffener

S

Type

☐ One stiffener☒ Two stiffener

Fy

190000

 kN/m²

Pitch

0.7

 m

Num. of U-frames in effective length

5

Cross member rotation difference

0.0036

 [rad]

Rivet Angle

Angle 1

Angle 2

Angle 3

Angle 4

☒ Angle 1

A

☒ Angle 2

A

☒ Angle 3

A

☒ Angle 4

A

OK

Cancel

Section Manager

Mode

Corrosion Depth

Grid

0.1

 m

☒ Snap

☐ Name

☒ Same Data at i & j-end

Target Section & Element

Section : 4

2 : CG

3 : MG-Middle

4 : Railbearer

5 : MG-End

Corrosion Depth

Component

Top Flange

Position

Top

Corrosion Depth

.04

 m

Add

Modify

Delete

Component	Position	Depth (m)
-----------	----------	-----------

Corrosion Depth

CG

G : 0.31430, 0.25169

SELECT

Close

Apply

Transverse and Bearing Stiffener

Corrosion Depth

12

4. UK Network Rail Bridge Assessment as per NR/GN/CIV/025

- After completing the assessment, results can be reviewed through both the table view and a generated Excel report.

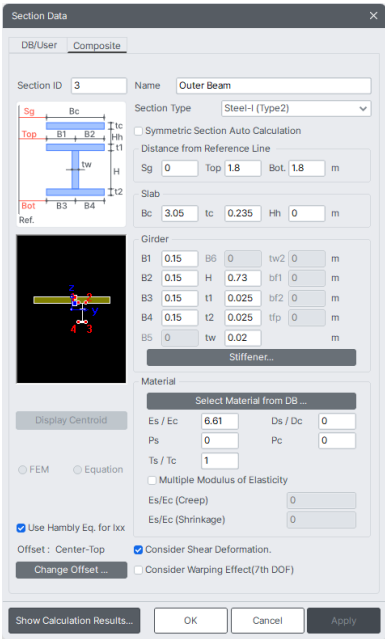
Rating > Steel Bridge > NR/GN/CIV/025

Main Girder (Bending)																						Assessed Category	
Element	Part	Rating Case	Loading (kN/m)			Capacity (kN/m)	BSU		RA		U for RA8		Assessed Category		Rating Case	Part							
			Dead	Static	Dynamic		Static	Dynamic	Static	Dynamic	Static	Dynamic	Static	Dynamic									
1	1(1)	Positive (max)	-16.949	8.558	3.496	-	-	-	-	-	-	-	-	-	A1	A1							
2	1(3)	Positive (max)	1184.805	1216.417	-	-	-	-	-	-	-	-	-	-	A1	A1							
3	1(4)	Positive (max)	1184.805	1064.275	647.859	-	-	-	-	-	-	-	-	-	A1	A1							
4	2(4)	Positive (max)	2177.280	2478.860	-	-	-	-	-	-	-	-	-	-	A1	A1							
5	1(4)	Positive (max)	2184.762	3132.987	1296.587	-	-	-	-	-	-	-	-	-	A1	A1							
6	1(5)	Positive (max)	2651.521	2955.194	-	-	-	-	-	-	-	-	-	-	A1	A1							
4	1(5)	Positive (max)	2654.792	4542.517	1577.475	-	-	-	-	-	-	-	-	-	A1	A1							
4	2(5)	Positive (max)	2935.749	3514.227	-	-	-	-	-	-	-	-	-	-	A1	A1							
5	1(6)	Positive (max)	2932.225	6111.964	2641.492	-	-	-	-	-	-	-	-	-	A1	A1							
5	2(7)	Positive (max)	2704.484	3293.999	-	-	-	-	-	-	-	-	-	-	A1	A1							
6	1(7)	Positive (max)	2704.484	5812.839	2515.940	-	-	-	-	-	-	-	-	-	A1	A1							
6	2(8)	Positive (max)	2254.418	3132.588	-	-	-	-	-	-	-	-	-	-	A1	A1							
7	1(8)	Positive (max)	2260.340	5368.961	2339.150	-	-	-	-	-	-	-	-	-	A1	A1							
7	2(9)	Negative (max)	1301.396	-31.122	-13.498	-	-	-	-	-	-	-	-	-	A1	A1							
7	2(9)	Positive (max)	1301.396	2161.713	-	-	-	-	-	-	-	-	-	-	A1	A1							
8	1(9)	Positive (max)	1307.688	3875.805	1679.516	-	-	-	-	-	-	-	-	-	A1	A1							
8	2(10)	Positive (max)	132.840	1817.881	-	-	-	-	-	-	-	-	-	-	A1	A1							
9	1(10)	Positive (max)	140.887	2261.589	980.913	-	-	-	-	-	-	-	-	-	A1	A1							
9	2(11)	Positive (max)	-1529.661	92.895	-	-	-	-	-	-	-	-	-	-	A1	A1							
10	1(11)	Positive (max)	-1529.661	163.932	71.637	-	-	-	-	-	-	-	-	-	A1	A1							
10	2(12)	Positive (max)	-3409.488	-	-	-	-	-	-	-	-	-	-	-	A1	A1							
11	1(12)	Positive (max)	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
11	2(13)	Positive (max)	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
12	1(13)	Positive (max)	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
13	1(14)	Positive (max)	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
13	2(15)	Positive (max)	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
14	1(15)	Positive (max)	1	1(1)	Bearing Stiffener	max	-	0.070	17.243	-	-	-	-	-	A1	A1	max						
15	1(16)	Positive (max)	1	1(1)	Bearing Stiffener	max	-	0.340	-	-	-	-	-	-	A1	A1	max						
16	1(17)	Positive (max)	1	1(3)	Bearing Stiffener	max	-	0.340	-	-	-	-	-	-	A1	A1	max						
16	1(17)	Positive (max)	1	1(3)	Intermediate Stiffener	max	-	0.070	17.243	-	-	-	-	-	A1	A1	max						
16	2(18)	Positive (max)	2	1(3)	Intermediate Stiffener	max	-	0.340	-	-	-	-	-	-	-	-	-						
17	1(18)	Positive (max)	2	1(4)	Bearing Stiffener	max	-	0.340	-	-	-	-	-	-	A1	A1	max						
17	2(19)	Positive (max)	2	1(4)	Intermediate Stiffener	max	-	0.340	-	-	-	-	-	-	A1	A1	max						
18	1(19)	Positive (max)	3	1(4)	Bearing Stiffener	max	-	2960.577	1587.951	-	-	-	-	-	A1	A1	max						
18	2(20)	Positive (max)	3	1(4)	Intermediate Stiffener	max	-	2960.577	1587.951	-	-	-	-	-	A1	A1	max						
19	1(20)	Positive (max)	3	1(9)	Bearing Stiffener	max	-	12437.90	-	-	-	-	-	-	A1	A1	max						
19	2(21)	Positive (max)	3	1(9)	Intermediate Stiffener	max	-	12437.90	-	-	-	-	-	-	A1	A1	max						
20	1(21)	Positive (max)	4	1(5)	Bearing Stiffener	max	-	2960.577	1587.951	-	-	-	-	-	A1	A1	max						
20	2(22)	Positive (max)	4	1(5)	Intermediate Stiffener	max	-	2960.577	1587.951	-	-	-	-	-	A1	A1	max						
21	1(21)	Positive (max)	4	1(6)	Bearing Stiffener	max	-	11495.94	5791.016	-	-	-	-	-	A1	A1	max						
21	2(22)	Positive (max)	4	1(6)	Intermediate Stiffener	max	-	11495.94	5791.016	-	-	-	-	-	A1	A1	max						
22	1(4)	Positive (max)	5	1(6)	Intermediate Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
22	2(27)	Positive (max)	5	1(7)	Bearing Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
23	1(8)	Positive (max)	5	1(7)	Intermediate Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
23	2(38)	Positive (max)	6	1(7)	Bearing Stiffener	max	-	11495.94	5791.016	-	-	-	-	-	A1	A1	max						
24	1(8)	Positive (max)	6	1(7)	Intermediate Stiffener	max	-	11495.94	5791.016	-	-	-	-	-	A1	A1	max						
25	1(8)	Positive (max)	6	1(8)	Bearing Stiffener	max	-	2420.96	19865.25	-	-	-	-	-	A1	A1	max						
25	2(9)	Positive (max)	6	1(8)	Intermediate Stiffener	max	-	2420.96	19865.25	-	-	-	-	-	A1	A1	max						
26	1(8)	Positive (max)	7	1(8)	Bearing Stiffener	max	-	2420.96	19865.25	-	-	-	-	-	A1	A1	max						
26	2(10)	Positive (max)	7	1(8)	Intermediate Stiffener	max	-	2420.96	19865.25	-	-	-	-	-	A1	A1	max						
27	1(8)	Positive (max)	7	1(9)	Intermediate Stiffener	max	-	2420.96	19865.25	-	-	-	-	-	A1	A1	max						
28	1(8)	Positive (max)	8	1(10)	Intermediate Stiffener	max	-	17308.19	-	-	-	-	-	-	A1	A1	max						
29	1(8)	Positive (max)	8	1(10)	Intermediate Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
30	1(8)	Positive (max)	9	1(11)	Bearing Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
30	2(11)	Positive (max)	9	1(11)	Intermediate Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
31	1(8)	Positive (max)	10	1(11)	Bearing Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
31	2(12)	Positive (max)	10	1(12)	Intermediate Stiffener	max	-	22025.92	-	-	-	-	-	-	A1	A1	max						
32	1(8)	Positive (max)	11	1(12)	Bearing Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
33	1(8)	Positive (max)	11	1(12)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
34	1(8)	Positive (max)	11	1(13)	Bearing Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
34	2(13)	Positive (max)	11	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
35	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
36	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
37	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
38	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
39	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
40	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
41	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
42	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
43	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
44	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
45	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
46	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
47	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
48	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
49	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
50	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
51	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
52	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
53	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
54	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
55	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
56	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
57	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
58	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
59	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
60	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
61	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
62	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
63	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
64	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
65	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
66	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
67	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
68	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
69	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
70	1(8)	Positive (max)	12	1(13)	Intermediate Stiffener	max	-	77.439	-	-	-	-	-	-	A1	A1	max						
71	1(8)																						

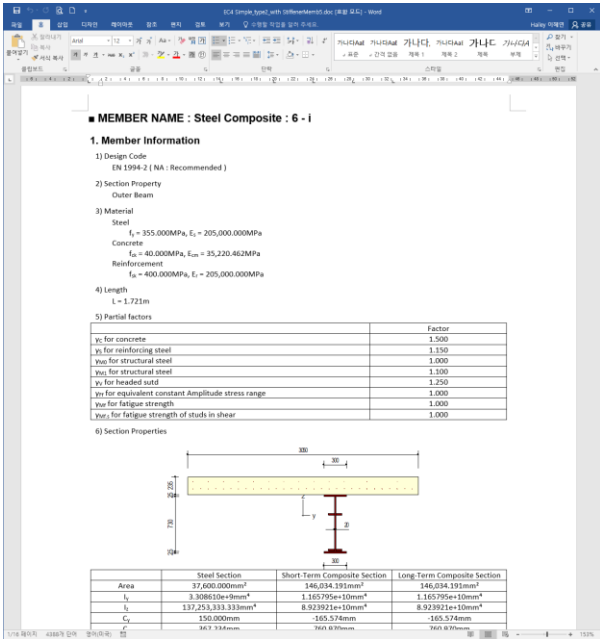
5. Automated design support for asymmetric (Type 2) composite steel bridges as per Eurocode4 & AASHTO LRFD

- In the case of exterior girders in girder bridges, the deck often needs to be modeled asymmetrically. However, previous versions did not support the design of such asymmetric sections in the automatic section design feature.
- Starting from this version, Steel Composite Design now supports asymmetric (Type 2) sections, in addition to the previously supported symmetric sections.
- The supported design codes are Eurocode 4 and AASHTO LRFD, and Type 2 section checks are available for Steel I-girders, Steel Tub girders, and Steel Box girders.

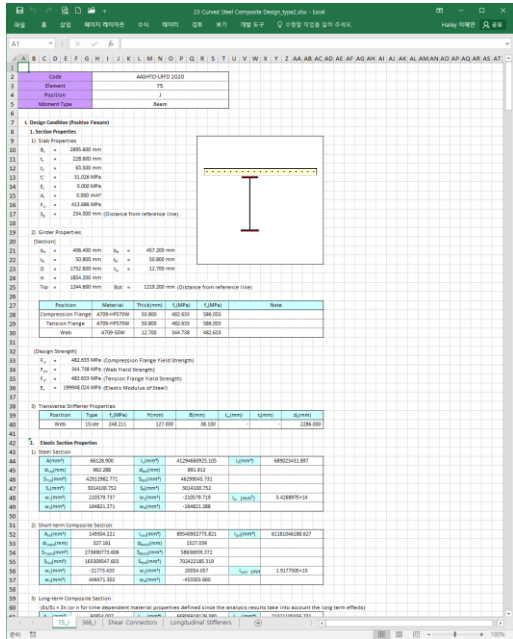
- **Properties > Section Properties**
- **Design > Composite Design > EN 1994-2 , AASHTO-LRFD20**



Composite Steel-I (Type2) Section



Steel Composite Design Report as per Eurocode4

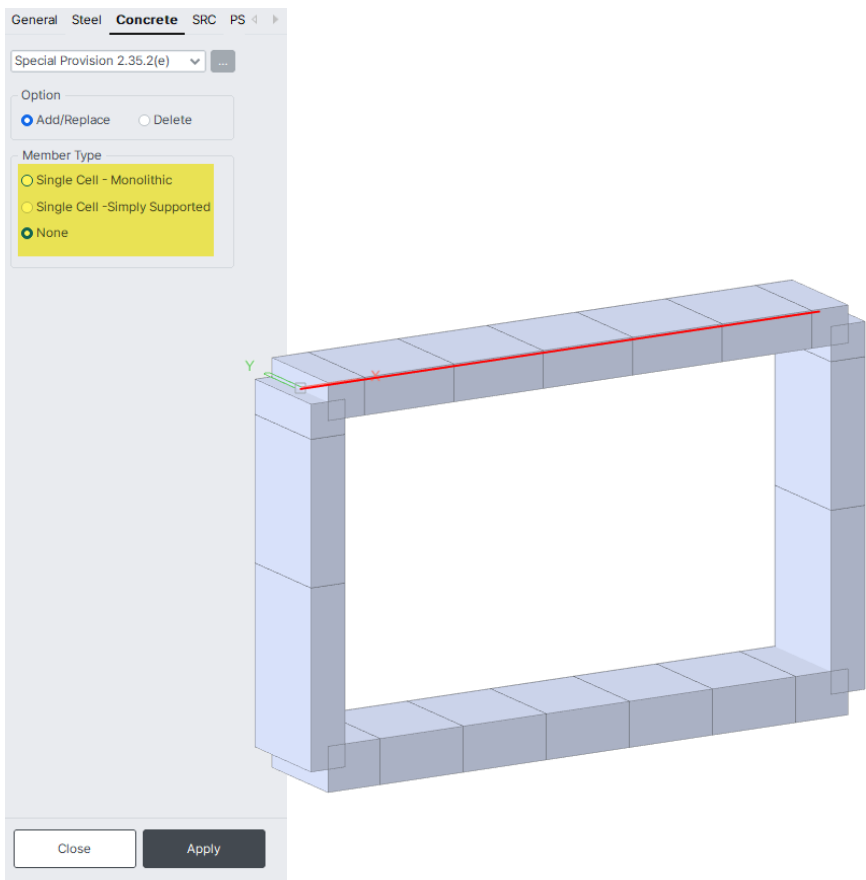


Steel Composite Design Report as per AASHTO LRFD

6. RC Design for 1D Beam & Column as per AREMA 2023

- A new option, "Special Provision 2.35.2(e)" has been added under Design Parameters to specify the type of box culvert.

Design > RC Design > Design Parameters > Special Provision 2.35.2(e)



Special Provision 2.35.2(e)

Concrete Structures and Foundations

$$v_c = 2 \left(1 + 0.0005 \frac{N_u}{A_g} \right) \sqrt{f'_c}$$
 EQ 2-47

$$v_c = 0.17 \left(1 + 0.072 \frac{N_u}{A_g} \right) \sqrt{f'_c}$$
 EQ 2-47M

The quantity $\frac{N_u}{A_g}$ shall be expressed in psi (MPa).

- d. For members subject to significant axial tension, shear reinforcement shall be designed to carry the total shear, unless a more detailed analysis is made using

$$v_c = 2 \left(1 + 0.002 \frac{N_u}{A_g} \right) \sqrt{f'_c}$$
 EQ 2-48

$$v_c = 0.17 \left(1 + 0.29 \frac{N_u}{A_g} \right) \sqrt{f'_c}$$
 EQ 2-48M

where:

N_u is negative for tension

the quantity $\frac{N_u}{A_g}$ shall be expressed in psi (MPa).

- e. Special provisions for slabs of box culverts. For slabs of box culverts under rail with 18 inches (450 mm) or more of fill (base of rail to top of culvert), shear stress v_c may be computed by:

$$v_c = 2.14 \sqrt{f'_c} + 4600 \rho \frac{V_u d}{M_u}$$
 EQ 2-49

$$v_c = 0.18 \sqrt{f'_c} + 32 \rho \frac{V_u d}{M_u}$$
 EQ 2-49M

but v_c shall not exceed $4 \sqrt{f'_c}$ (or $\frac{1}{3} \sqrt{f'_c}$ in metric). For single cell box culverts only, v_c need not be taken

less than $3 \sqrt{f'_c}$ (or $\frac{\sqrt{f'_c}}{4}$ in metric) for slabs monolithic with walls or $2.5 \sqrt{f'_c}$ (or $\frac{5}{24} \sqrt{f'_c}$ in metric)

for slabs simply supported. The quantity $\frac{V_u d}{M_u}$ shall not be taken greater than 1.0, where M_u is factored moment occurring simultaneously with V_u at section considered.

6. RC Design for 1D Beam & Column as per AREMA 2023

- Design and checking of RC frame elements to AREMA 2023 are newly introduced in midas.
- This feature can be applied to RC beam & RC column (T-girder, diaphragm, pier, pier cap & other related substructure components).
- The detailed design report provides calculations in both SI and US units, available in Word format.

■ Design > RC Design > RC Code Design > Beam/Column Design

AREMA-2023 RC-Beam Design Result Dialog

Code : AREMA-2023 Unit : kN , mm Primary Sorting Option

Sorted by ☒ Member ☐ Section

Negative Moment

Positive Moment

Shear & Torsion

MEMB	SECT	SEL	Section	fc	POS	CHK	N(-) Mu	LCB	AsTop	P(+) Mu	LCB	AsBot	vu	LCB	AsV	Tu	LCB	St	Stirrups	
Span			b _c b _f	h _c h _f	f _y															
7			Pier Cap Mid	0.04826	I	OK	2.8E+07	1-F	29121	0.00000	3	0.0000	0.00572	1-F	17.578	4376.23	2-F	101.83	9.0-#5 @100	
8	☒		1500, 2000, 0.0000	0.0000	0.41369	M	OK	2.8E+07	1-F	37933	0.00000	3	0.0000	0.00573	1-F	17.528	4376.23	2-F	102.69	9.0-#5 @100
750.00			0.0000	0.0000	0.41369	J	OK	2.8E+07	1-F	42465	0.00000	3	0.0000	0.00574	1-F	17.451	4376.23	2-F		
8	☐		Pier Cap Mid	0.04826	I	OK	2.8E+07	1-F	29021	0.00000	3	0.0000	0.00570	1-F	17.605	1040.10	1			
8	☐		1500, 2000, 0.0000	0.0000	0.41369	M	OK	2.8E+07	1-F	37800	0.00000	3	0.0000	0.00571	1-F	17.458	1040.10	1		
750.00			0.0000	0.0000	0.41369	J	OK	2.8E+07	1-F	42315	0.00000	3	0.0000	0.00572	1-F	17.381	1040.10	1		
9	☐		Pier Cap Mid	0.04826	I	OK	2.8E+07	1-M	42586	0.00000	3	0.0000	0.00576	1-F	17.520	5359.33	2			
8	☐		1500, 2000, 0.0000	0.0000	0.41369	M	OK	2.8E+07	1-M	38037	0.00000	3	0.0000	0.00575	1-F	17.520	5359.33	2		
750.00			0.0000	0.0000	0.41369	J	OK	2.8E+07	1-M	29195	0.00000	3	0.0000	0.00574	1-F	17.598	5359.33	2		
10	☐		Pier Cap Mid	0.04826	I	OK	2.8E+07	1-M	42510	0.00000	3	0.0000	0.00575	1-F	17.492	1040.95	1			
8	☐		1500, 2000, 0.0000	0.0000	0.41369	M	OK	2.8E+07	1-M	37969	0.00000	3	0.0000	0.00574	1-F	17.492	1040.95	1		
750.00			0.0000	0.0000	0.41369	J	OK	2.8E+07	1-M	29140	0.00000	3	0.0000	0.00573	1-F	17.569	1040.95	1		

☐ Connect Model View

Select All Unselect All Re-calculation

Graphic... Summary... Summary By LCB <<

Detail... C:\Users\midas\OneDrive - MIDAS\A

Option for Detail Print Position

☒ End I ☐ Mid ☐ End J

Close

Result View Option

☒ All ☐ OK ☐ NG

Copy Table

AREMA-2023 RC-Beam Checking Result Dialog

Code : AREMA-2023 Unit : kN , mm Primary Sorting Option

Sorted by ☒ Member ☐ Section

Stress Check

MEMB	SECT	SEL	Section	fc	POS	CHK	Stress Control				
Span			b _c b _f	h _c h _f	f _y		Top-s	Top-sa	Bot-s	Bot-sa	
7			Pier Cap Mid	0.04826	I	OK	205.00	206.00	0.0000	206.00	
8	☒		1500, 2000, 0.0000	0.0000	0.41369	M	OK	184.00	206.00	0.0000	206.00
750.00			0.0000	0.0000	0.41369	J	OK	205.00	206.00	0.0000	206.00
8	☐		Pier Cap Mid	0.04826	I	OK	204.00	206.00	0.0000	206.00	
8	☐		1500, 2000, 0.0000	0.0000	0.41369	M	OK	184.00	206.00	0.0000	206.00
750.00			0.0000	0.0000	0.41369	J	OK	204.00	206.00	0.0000	206.00
9	☐		Pier Cap Mid	0.04826	I	T*	292.00	206.00	0.0000	206.00	
8	☐		1500, 2000, 0.0000	0.0000	0.41369	M	OK	185.00	206.00	0.0000	206.00
750.00			0.0000	0.0000	0.41369	J	OK	144.00	206.00	0.0000	206.00
10	☐		Pier Cap Mid	0.04826	I	T*	292.00	206.00	0.0000	206.00	
8	☐		1500, 2000, 0.0000	0.0000	0.41369	M	OK	184.00	206.00	0.0000	206.00
750.00			0.0000	0.0000	0.41369	J	OK	144.00	206.00	0.0000	206.00

☐ Connect Model View

Select All Unselect All Re-calculation

Graphic... Summary... Summary By LCB <<

Detail... C:\Users\midas\OneDrive - MIDAS\A

Option for Detail Print Position

☒ End I ☐ Mid ☐ End J

Close

Result View Option

☒ All ☐ OK ☐ NG

Copy Table

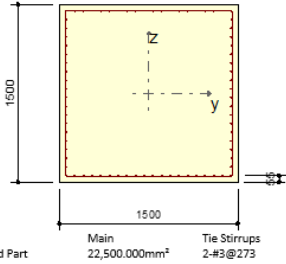
Design Result Table

MIDAS Information Technology Co.,Ltd.
MIDAS CIVIL NX 2025 (v1.1) / Design

■ MEMBER NAME : Pier (Section ID : 9, Element No.1)

1. Member Information

- 1) Design Code
AREMA-2023
- 2) Section Property
Pier (ID : 9)
- 3) Material
Concrete
 $f_c = 48.263\text{MPa}$, $E_c = 0.043w_c^{1.5}f_c^{0.5} = 35,219.834\text{MPa}$
Reinforcement
 $f_y = 413.686\text{MPa}$, $f_u = 413.686\text{MPa}$, $E_s = 199,948.024\text{MPa}$
- 4) Length
 $L = 10.000\text{m}$
- 5) Reinforcement Data



2. Axial and moment capacity (End, 1.00L)

Axial and moment	LCB	Strength Group I-FX		
		$P_u / \phi P_n$	$M_u / \phi M_{n1}$	
	$P_u / \phi P_n$	30,926.254kN / 60,413.089kN = 0.512		OK
	$M_{u1} / \phi M_{n1}$	7.118kN-m / 17.308kN-m = 0.411		OK
	$M_{u2} / \phi M_{n2}$	97.692kN-m / 237.556kN-m = 0.411		OK
	$M_u / \phi M_n$	97.950kN-m / 238.186kN-m = 0.411		OK
	$p_{min} \leq p \leq p_{max}$	$p_{min} = 0.01000 \leq p = 0.01000 \leq p_{max} = 0.08000$		OK

* Strength Group I-FX : (1.400) Dead Load, FX minimum concurrent force

Detailed Design Report

7. Update PSC section design criteria for Australia to the latest 2024 standard

- The PSC Design feature has been updated to support the latest amendment of the Australian bridge design standard: AS 5100.5:2017 Amendment 2024.
- Key Updates : Support for the 2024 Amendment is now available in the PSC Design Parameters.
Updated reinforcing steel material properties in accordance with the new amendment.
All relevant design equations and checks have been revised to comply with the updated provisions.
- This update ensures that engineers can perform PSC design fully aligned with the most current Australian bridge design standards.

Design > PSC Design > AS 5100.5:17 > Amd 2:2024

PSC Design Code

Design CodeAS 5100.5:17

Amendments :Amd 2:2024

Input Parameters

Maximum nominal aggregate size (8.2.4.2)

d_g0.016m

Crack Control

Maximum Increment of Steel Stress

160000kN/m²

Output Parameters

Ultimate limit states

☐ Transfer Check

☐ Flexural resistance

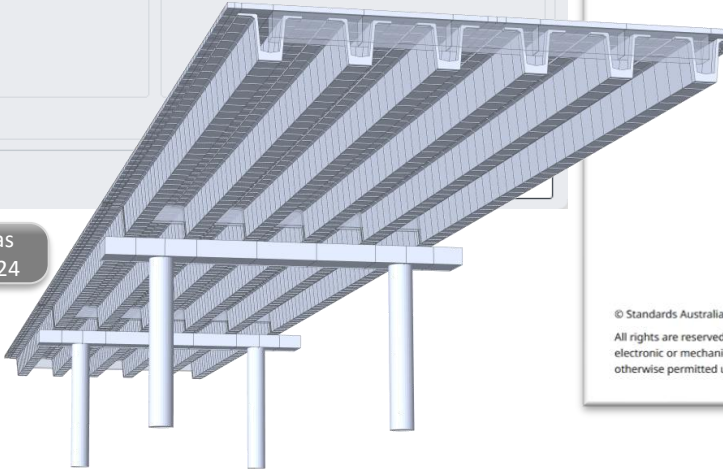
☐ Shear resistance

☐ Torsional resistance

Serviceability limit state

☐ Control of Cracking

PSC Design Parameter as per AS5100:5 Amd 2:2024



AS 5100.5:2017 Amd 2:2024

Bridge design, Part 5: Concrete

This Australian Amendment was prepared by BD-090, Br Standards Australia's Standards Development and Accreditation Committee.

Published:24 May 2024

Draft published as:DR AS 5100.5:2017 Amd 2:2024

Committee:BD-090

Committee members:ARRB (Australian Road Research Board), Australian Industry Group, Australian Steel Institute, Austroads Ltd., Bureau of Steel Manufacturers of Australia, Cement Concrete & Aggregates Concrete Institute of Australia, Concrete NZ Inc, Concrete Pipe Association of Australia, Consult Australia, Engineers Australia, Independent Chairperson (Australian Institute of Public Works Engineers), National Precast Concrete Association, New Zealand Heavy Engineering, Queensland University of Technology, Rail Industry Safety and Standards New Zealand (SNZ), Steel Construction New Zealand, Steel Reinforcement Institute of The University of Sydney, WSP New Zealand Ltd, Waka Kotahi-NZ Transport Agency

© Standards Australia Ltd 2024

All rights are reserved. No part of this work may be reproduced in any form, electronic or mechanical, including photocopying, without otherwise permitted under the Copyright Act 1968 (Cth).

1. Design Condition									
Design code	AS5100.5-17 Amd2:24	Element	Node(3)						
Section Properties									
Composite									
Gross section									
Before					After				
H (mm)	1500.0				H (mm)	1500.0			
B (mm)	2100.0				B (mm)	2100.0			
C _{top} (mm)	823.3				C _{top} (mm)	850.3			
C _{bot} (mm)	676.7				C _{bot} (mm)	648.7			
A _g (mm²)	5.937 E+06				A _g (mm²)	5.888 E+06			
I _g (mm⁴)	1.588 E+11				I _g (mm⁴)	1.569 E+11			
S _x (mm³)	1.929 E+08				S _x (mm³)	1.963 E+08			
S _y (mm³)	2.347 E+08				S _y (mm³)	2.569 E+08			
S _{xx} (mm⁴)	8.974 E+08				S _{xx} (mm⁴)	8.392 E+08			
S _{yy} (mm⁴)	9.756 E+08				S _{yy} (mm⁴)	9.166 E+08			
Transformed section									
Before					After				
H (mm)	1500.0				H (mm)	1500.0			
B (mm)	2100.0				B (mm)	2100.0			
C _{top} (mm)	823.3				C _{top} (mm)	850.3			
C _{bot} (mm)	676.7				C _{bot} (mm)	648.7			
A _g (mm²)	5.937 E+06				A _g (mm²)	5.888 E+06			
I _g (mm⁴)	1.588 E+11				I _g (mm⁴)	1.569 E+11			
S _x (mm³)	1.929 E+08				S _x (mm³)	1.963 E+08			
S _y (mm³)	2.347 E+08				S _y (mm³)	2.569 E+08			
S _{xx} (mm⁴)	8.974 E+08				S _{xx} (mm⁴)	8.392 E+08			
S _{yy} (mm⁴)	9.756 E+08				S _{yy} (mm⁴)	9.166 E+08			
Materials									
Concrete									
f _c (MPa)									
E _c (MPa)									
f _{yk} = 0.64 f _c (MPa)									
Order									
50 000									
Step									
65 000									
* α _s = 1.0 - 0.003 f _c (within the limits of 0.67 ≤ α _s ≤ 0.85)									
* γ = 1.05 - 0.007 f _c (within the limits of 0.67 ≤ γ ≤ 0.85)									
Pre-stressing steel information									
No.	Tendon name	Bond type	d _b (mm)	A _{ps} (mm²)	Strength (MPa)		E _s (MPa)		
					f _{yk}	f _{pu}			
1	S_Span1-175	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
2	S_Span1-145	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
3	S_Span1-155	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
4	S_Span1-145	Bond	1565.0	136.7	1569.1	1863.3	205000.0		
5	S_Span1-135	Bond	1615.0	136.7	1569.1	1863.3	205000.0		
6	S_Span1-145	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
7	S_Span1-155	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
8	S_Span1-145	Bond	1565.0	136.7	1569.1	1863.3	205000.0		
9	S_Span1-135	Bond	1615.0	136.7	1569.1	1863.3	205000.0		
10	S_Span1-175	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
11	S_Span1-155	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
12	S_Span1-145	Bond	1565.0	136.7	1569.1	1863.3	205000.0		
13	S_Span1-135	Bond	1615.0	136.7	1569.1	1863.3	205000.0		
14	S_Span1-175	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
15	S_Span1-162	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
16	S_Span1-152	Bond	1565.0	136.7	1569.1	1863.3	205000.0		
17	S_Span1-142	Bond	1665.0	136.7	1569.1	1863.3	205000.0		
18	S_Span1-173	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
19	S_Span1-163	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
20	S_Span1-153	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
21	S_Span1-143	Bond	1565.0	136.7	1569.1	1863.3	205000.0		
22	S_Span1-133	Bond	1615.0	136.7	1569.1	1863.3	205000.0		
23	S_Span1-170	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
24	S_Span1-160	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
25	S_Span1-150	Bond	1565.0	136.7	1569.1	1863.3	205000.0		
26	S_Span1-140	Bond	1615.0	136.7	1569.1	1863.3	205000.0		
27	S_Span1-171	Bond	1465.0	136.7	1569.1	1863.3	205000.0		
28	S_Span1-161	Bond	1515.0	136.7	1569.1	1863.3	205000.0		
29	S_Span1-151	Bond	1565.0	136.7	1569.1	1863.3	205000.0		

PSC Design Report

8. Add California-specific provisions from AASHTO LRFD

- To meet the specific requirements of California bridge projects, MIDAS CIVIL NX now supports the California Amendment to AASHTO LRFD design specifications.
- Applicable Design Modules : Steel Design, RC Design, PSC Design, Steel Composite Design
- Users can now perform code checks and design in full compliance with California Department of Transportation (Caltrans) standards, ensuring regional accuracy and approval readiness.

- **Design > Steel Design > AASHTO-LRFD17 > California Amendments**
- **Design > RC Design > AASHTO-LRFD17 > California Amendments**
- **Design > PSC Design > AASHTO-LRFD17 > California Amendments**
- **Design > Composite Design > AASHTO-LRFD17 > California Amendments**

Concrete Design Code

Design CodeAASHTO-LRFD17(US)

AmendmentsCalifornia

☐ Apply Special Provisions for Seismic Design

☐ Consider Axial-Moment Interaction for Plate Column

Moment Redistribution Factor for Beam1

OKClose

RC Design – CA Amendment

Steel Design Code

Design CodeAASHTO-LRFD17(US)

AmendmentsCalifornia

☐ All Beams/Girders are Laterally Braced

☐ Check Beam/Column Deflection

OKClose

Steel Design – CA Amendment

PSC Design Code

Design CodeAASHTO-LRFD17

AmendmentsCalifornia

Input Parameters

Tendon Type

☒ Low Relaxation Tendons

☐ Stress Relieved Tendons

☐ Prestressing Bars

Exposure Factor for Crack Width

☒ Class I (1.0)

☐ Class II (0.75)

☐ User

1

Corrosive Condition

☒ Severe

☐ Moderate/Mild

Flexural Strength

☒ Code

☐ Strain Compatibility

Construction Type

☐ Segmental

☒ Non-Segmental

Manufacturing for Post Tensioning

☒ Cast-in-place

☐ Precast

Output Parameters

At Construction Stage/Service Loads

☒ Stress by Construction Stage

☒ Stress by Service Load Combinations

☒ Stress in Prestressing Tendons

☒ Principal Stress by Construction Stage

☒ Principal Stress by Service Load Combinations (Max Shear)

☒ Principal Stress by Service Load Combination (Max Torsion)

☒ Crack Check

At Factored Loads

☒ Flexural Strength Check

☒ Shear Strength Check

☒ Combined Shear and Torsion Check

Select AllUnselect All

OKCancel

PSC Design – CA Amendment

Composite Steel Girder Design Code

CodeAASHTO-LRFD17

AMRecommended

Update by Code

Strength Resistance Factor

Resistance factor for yielding (Phi_{Ly})

0.95

Resistance factor for fracture (Phi_{Lu})

0.8

Resistance factor for axial comp. (Phi_{Lc})

0.9

Resistance factor for flexure (Phi_{Lf})

1

Resistance factor for shear (Phi_{Lv})

1

Resistance factor for shear connector (Phi_{Lsc})

0.85

Resistance factor for bearing (Phi_{Lb})

1

Girder Type for Box/Tub Section

☐ Single Box Sections

☒ Multiple Box Sections

☒ Consider St.Venant Torsion and Distortion Stresses

Option For Strength Limit State

☒ Appendix A6 for Negative Flexure Resistance in Web Compact / NonCompact Sections

☒ Mn<=1.3RhMy in Positive Flexure and Compact Sections(6.10.7.1.2-3)

☒ Post-buckling Tension-field Action for Shear Resistance(6.10.9.3.2)

☒ Long-term Section Property of Cracked Composite Section: Rebar Area/3

☒ Include Normal Stress due to Torsional Warping

Design Parameters

☒ Strength Limit State-Flexure

☒ Strength Limit State-Shear

☒ Service Limit State

☒ Constructibility

☒ Fatigue Limit State

☒ Shear Connectors, Longitudinal Stiffeners, Bearing Stiffener

OKCancel

Steel Composite Design – CA Amendment

9. Auto-generate Load combination (RC) as per TMH07 : 1981

- Load combination are generated as per Table 17 of TMH07 : 1981
- For automatically generated load combinations, the SLS combinations are classified according to TMH07-1981 for serviceability checks under PSC Design.

Results > Load Combination > Concrete Design > Auto Generation > TMH07: 1981

Type of action	Nominal actions F _k	Notation	Clause number	Limit state	γ _F = γ _k γ _ψ to be considered in combinations			Ultimate Limit State ULS = SLS Serviceability Limit State
					1	2	3	
PRINCIPAL ACTIONS	Dead loads: concrete	g _k	2.2.2	ULS	1.2	1.05	1.2	ULS = SLS Serviceability Limit State
	Dead loads: steel	g _k	2.2.2	ULS	1.1	1.0	1.0	
	Superimposed dead loads	s _{gk}	2.3.3	ULS	1.2	1.05	1.2	
	Reduced load for dead and superimposed dead load where this has a more severe effect	s _{gr}	2.3.2.2	ULS	1.0	1.0	1.0	
	Vertical earth loading on culverts	Method (i)	g _k	2.3.3.3	ULS	1.3	1.3	
					SLS	1.1	1.1	
	Earth pressure due to retained fill	Approximate theory	e _{gk}	2.4.3	ULS	1.5	1.3	
					SLS	1.1	1.1	
	As above but causing relieving effect	More accurate theory	e _{gr}	2.4.3	ULS	1.4	1.2	
					SLS	1.0	1.0	
	Water pressure of retained or excluded water	w _k	2.5.2	ULS	1.2	1.05	1.2	
	As above but causing relieving effect	w _{gr}	2.5.2	ULS	1.0	1.0	1.0	
	Vehicle traffic loading and surcharge	NA	Q _k	2.6.3.3	ULS	1.5	1.3	
		NB	Q _k	2.6.4.3	ULS	1.2	1.1	
		NC = 1/3 NA on separate carriageways	Q _k	2.6.5.3	ULS	1.2	1.1	
				SLS	1.0	1.0	1.0	
TRANSIENT AND SHORT-TERM ACTIONS	Sidewalk and cycle track loading	Q _k	2.7.1.2	ULS	1.5	1.3	1.5	ULS = SLS Serviceability Limit State
	Erection loads	Q _k	2.8.2.2	ULS	—	1.15	—	
	Centrifugal forces	F _k	3.2.4	ULS	—	1.50	—	
				SLS	—	1.0	—	
	Longitudinal braking and traction forces	F _k	3.3.6	ULS	—	1.25	—	
				SLS	—	1.0	—	
	Accidental skidding	F _{sk}	3.4.4	ULS	—	1.25	—	
				SLS	—	1.0	—	
	Impact due to vehicle collision with bridge balustrades or parapets	F _{ik}	3.5.4	ULS	—	1.25	—	
	Impact due to vehicle collision with bridge supports	F _{im}	3.7.5	ULS	—	1.25	—	
	Wind action	(a)	W	3.8.7	ULS	—	1.1	
					SLS	—	1.0	
					ULS	—	1.4	
					SLS	—	1.0	
	Flood action	(b)	W	3.8.7	ULS	—	1.1	
					SLS	—	1.0	
					ULS	—	1.0	
					SLS	—	1.0	
INDIRECT ACTIONS	Earthquake action	F _{Ek}	3.10.5	ULS	—	1.3	—	ULS = SLS Serviceability Limit State
	Creep and shrinkage	F _{cr, sh}	4.2.2	ULS	1.0	1.0	1.0	
	Parasitic prestress and prestress	F _{ps, ps}	4.3.2	ULS	1.0	1.0	1.0	
	Differential settlement	F _s	4.4.2	ULS	1.0	1.0	1.0	
	Temperature range	F _t	4.5.8	ULS	—	1.0	—	
	Temperature gradient	F _g	4.5.8	ULS	—	0.8	—	
	Frictional bearing restraint	F _{br}	4.1.1.2	ULS	—	1.3	—	
				SLS	—	1.0	—	
				ULS	—	1.3	—	
				SLS	—	1.0	—	

TABLE 17 Combinations of nominal actions F_k and partial action factors γ_F. Values for γ_F are given in Part 3.

Automatic Generation of Load Combinations

Option: Add Replace

Code Selection: Steel Concrete SRC Steel Composite

Design Code: TMH07-1981

Manipulation of Construction Stage Load Case: ST Only CS Only ST+CS

ST - Static Load Case CS - Construction Stage

Code Based: Load Factors for Permanent Loads

Dead Load: 1.25 1.05 Both

Super Imposed DL: 1.25 1.05 Both

Vertical Earth Pressure: Method-1

Non-Vertical Earth Pressure: Approximate

Earth Pressure Relieving: 0.5

Partial Safety Factor for Moving Load, Surcharge Load

Load Case: NA

Vehicle Type: NA

TMH07 Vehicle Load Factor Table

Load Co... Vehicle Type

Add Delete

Longitudinal Braking & Traction

Load Case: 1.25

Load Factor: 1.25

Load Case Factor

Add Delete

Partial Load Factor for Inaccurate Load Effect

For Ultimate Limit State: 1.10

For Service Limit State: 1.00

Consider Orthogonal Effect (100 : 30 Rule)

Set Load Cases for Orthogonal Effect...

OK Cancel

Serviceability Load Combination Type

Serviceability

Combination 1

cLCB533

cLCB534

Combination 2 and 3

cLCB535

cLCB536

cLCB537

cLCB538

cLCB539

cLCB540

cLCB541

cLCB542

cLCB543

cLCB544

cLCB545

cLCB546

cLCB547

cLCB548

OK Cancel

Auto Load Combination

SLS Load combination Type

- The design of PSC elements as per TMH07-3:1989 has been newly implemented in MIDAS.
- This feature can be applied to all the PSC girder.

- *Design > PSC Design > **TMH07-3 : 1989***

PSC Design

[Detailed Excel Report](#)

11. Significantly Improved Excel Design Report Generation Speed

- The generation speed of Excel-based design reports has been dramatically improved by adopting the LibXL library. This enhancement reduces the time required to export large and complex design calculation sheets.
- Key Improvements : Significantly faster export performance for design reports.
Improved stability when generating large files.
- This update enhances user productivity, especially for projects requiring frequent report generation and documentation submission.

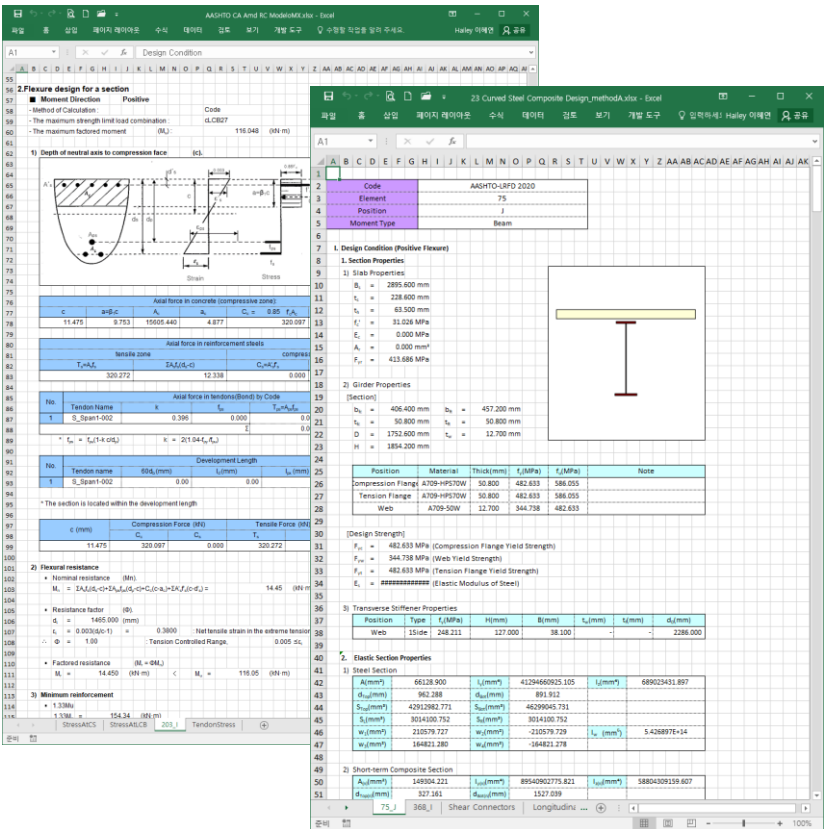
Design > Steel Design ,RC Design , PSC Design , Composite Design

Applicable to the following design codes:

PSC/PSC Composite
AASHTO-LRFD20
AS 5100.5:17
BS 5400-4:1990
CSA-S6-14
CSA-S6-19
CSA-S6S1-10
KSCE-LSD15
KDS 24 14 21 : 2021
TMH07
Eurocode2-2:05
IRC112, IRS
BD44/15 for CS455, CS457
SNiP 2.05.03-84*
SP 35.13330.2011

Steel Composite
AASHTO-LRFD20
CSA-S6-14
CSA-S6-19
SNiP 2.05.03-84*
SP 35.13330.2011
EN 1994-2
KSCE-LSD15
KDS 24 14 31 : 2018
Steel SOD
SNiP 2.05.03-84*
SP 35.13330.2011

Steel Rating
AASHTO-LRFR11
AASHTO-LRFR19
CS454/20
NR GN CIV 025
PSC Rating
AASHTO-LRFR11
AASHTO-LRFR19
CS454/20
KSCE-LSD15



Excel Report

12. Moving patch load analysis as per Eurocode, BS & NZ traffic loads

- The tire contact area of a wheel can now be applied during moving load analysis not only for AASHTO LRFD vehicles (as in previous versions), but also for all road bridge vehicles defined in Eurocode, BS and New Zealand standards.
- By applying patch (area) loads instead of concentrated wheel loads, the resulting design forces on plate elements can be significantly reduced, leading to more realistic and optimized analysis results. This enhancement improves modeling accuracy, especially for deck and slab structures where local stress distribution is critical.

▪ **Load > Moving Load (AASHTO LRFD) > Vehicles**

Define Standard Vehicular Load

Standard Name

CS 458 (BD96/11) Special Load

Vehicular Load Properties

Vehicular Load Name

SV 80

Vehicular Load Type

SV 80

P1

P2

P3

P4

P5

P6

D1

D2

A

D4

D5

* SV 80

No	P (kN)	D (m)
1	130	1.2
2	130	1.2
3	130	A
4	130	1.2
5	130	1.2
6	130	end

No	P (kN)	D (m)
----	--------	-------

A is Critical of 1.2m or 5.0m or 9.0m

☒ Dynamic Amplification Factor

☒ Auto

☐ User Input

ψ :

1

☒ Overload Factor

☒ Auto

☐ User Input

Critical Axle

1.2

All Other Axles

1.1

Distance to Front and Rear Vehicles

☒ 25m

☐ 5m

☒ Consider Contact Area

Width

0.35

m

Length

0.35

m

OK

Cancel

Apply

BS Special Vehicle

Concentrated wheel loads

Patch/area wheel loads

Define Standard Vehicular Load

Standard Name

EN 1991-2:2003 - RoadBridge

Vehicular Load Properties

Vehicular Load Name

Load Model 1

Vehicular Load Type

Load Model 1

$a_{Q1}Q_{ik}$

$a_{Q2}Q_{ik}$

$a_{q1}q_{ik}$

$a_{Q1}Q_{ik}$: Tandem System, Q_{ik}

$a_{q1}q_{ik}$: UDL System, q_{ik}

Dynamic amplification factor included

Location	Tandem System		UDL System	
	Adjustment Factor	Axle Loads (kN)	Adjustment Factor	Uniformly Dist. Loads (kN/m ²)
Lane Number1	1	300	1	9
Lane Number2	1	200	1	2.5
Lane Number3	1	100	1	2.5
Other Lanes & Remaining Area	0	0	1	2.5

ψ factor for Tandem System

0.75

ψ factor for UDL System

0.4

☒ Consider Contact Area

Width

0.4

m

Length

0.4

m

OK

Cancel

Apply

Eurocode Load Model1 Vehicle

MIDAS

22

13. Addition of evaluation truck loads for existing bridges in New Zealand(Based on SP/M/022 v3.4)

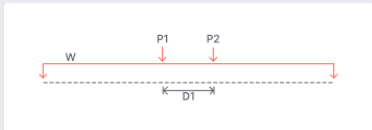
- A full set of New Zealand vehicle load models, as specified in SP/M/022 v3.4, has been added, including: HN (normal) loading, HO (overload) loading, TT530 (Fatigue), HPMV evaluation loading, General access and 50MAX reference vehicles
- This enhancement is integrated with the lane optimization feature and the patch load (tire contact area) function for improved load distribution on deck elements.
- Users can define the target element and span length, and the Dynamic Factor is automatically calculated and applied in the analysis, ensuring more accurate simulation of vehicle effects on bridge structures.

▪ Load > Moving Load > New Zealand

Define Standard Vehicular Load

Standard Name
Traffic Load

General Access Vehicle
50MAX Conforming Vehicle
High Productivity Motor Vehicle
Deck Evaluation Vehicle
Fatigue Loading Model



No	Load(kN)	Spacing(m)
1	120	5
2	120	end

W 10.5 kN/m

☐ Consider Contact Area

Width 0.5 m

Length 0.2 m

OK Cancel Apply

New Zealand Vehicles

Dynamic Load Factor

Select Structure Group
SG-P2Seg12
SG-KeySeg1
SG-KeySeg2
SG-KeySeg3
SG-FSM1
SG-FSM2
BG-S-Pier
BG-S-FsmLeft
BG-S-FsmRight
BG-EL-Pier
BG-EL-FsmLeft
BG-EL-FsmRight

Dynamic Factor Input Type
☒ Auto Input ☐ User Input

Auto Calculation

Span Length 80 m

Bending and Shear for Beam Element Auto

Reaction Auto

All Other Effects 1

(e.g.Axial, Torsion, Stress, Displacements, etc)

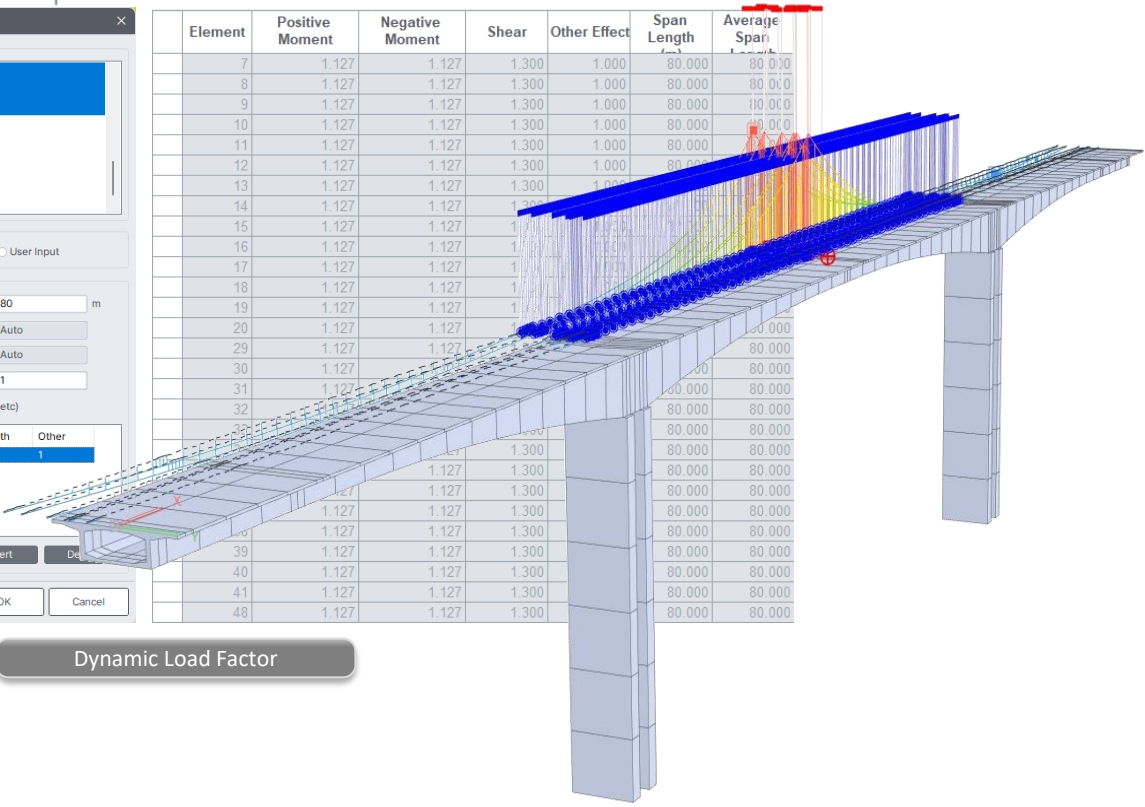
Span ID	Group List	Length	Other
1	SG-P1Seg1, SG-P1S...	80	1

Add Modify Insert Delete

OK Cancel

Dynamic Load Factor

Element	Positive Moment	Negative Moment	Shear	Other Effect	Span Length (m)	Average Span Length (m)
7	1.127	1.127	1.300	1.000	80.000	80.000
8	1.127	1.127	1.300	1.000	80.000	80.000
9	1.127	1.127	1.300	1.000	80.000	80.000
10	1.127	1.127	1.300	1.000	80.000	80.000
11	1.127	1.127	1.300	1.000	80.000	80.000
12	1.127	1.127	1.300	1.000	80.000	80.000
13	1.127	1.127	1.300	1.000	80.000	80.000
14	1.127	1.127	1.300	1.000	80.000	80.000
15	1.127	1.127	1.300	1.000	80.000	80.000
16	1.127	1.127	1.300	1.000	80.000	80.000
17	1.127	1.127	1.300	1.000	80.000	80.000
18	1.127	1.127	1.300	1.000	80.000	80.000
19	1.127	1.127	1.300	1.000	80.000	80.000
20	1.127	1.127	1.300	1.000	80.000	80.000
29	1.127	1.127	1.300	1.000	80.000	80.000
30	1.127	1.127	1.300	1.000	80.000	80.000
31	1.127	1.127	1.300	1.000	80.000	80.000
32	1.127	1.127	1.300	1.000	80.000	80.000
39	1.127	1.127	1.300	1.000	80.000	80.000
40	1.127	1.127	1.300	1.000	80.000	80.000
41	1.127	1.127	1.300	1.000	80.000	80.000
48	1.127	1.127	1.300	1.000	80.000	80.000



14. Addition of special permit trucks for load rating of existing bridges in Western Australia

- The latest version of MIDAS CIVIL NX includes a newly added vehicle database for Western Australia (WA) to support region-specific bridge assessments.
- Group 1 and Group 2 vehicles can be selected while optionally enabling Multiple Lane Factors and Accompanying Lane Factors. Group2 vehicles are fully compatible with SM1600 vehicle configurations.
- This enhancement provides improved flexibility and regulatory compliance for bridge evaluations in Western Australia.

▪ **Load > Moving Load > Australia**

Define Standard Vehicular Load

Standard Name

AS 5100.7 - Rating Vehicles

Vehicular Load Properties

Vehicular Load Name

WA-Group1-Vehicle1

Vehicular Load Type

WA-Group1-Vehicle1

Dynamic Load Allowance

0.4

P1

P2

P3

P4

P5

D1

D2

D3

D4

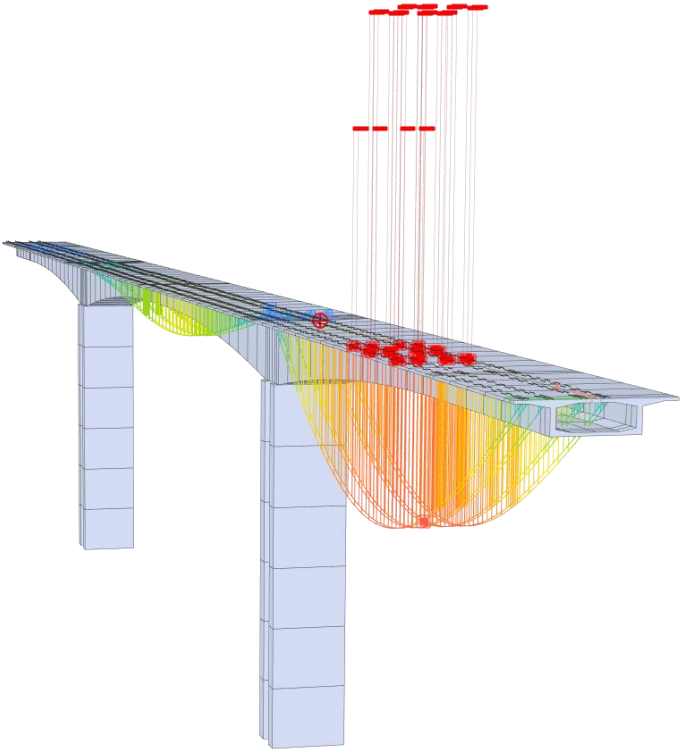
No	Load(tonf)	Spacing(m)
1	6	4.9
2	9	1.2
3	9	7.25
4	9	1.2
5	9	end

OK

Cancel

Apply

- T44 Truck Load
- L44 Lane Load
- VIC-45.5T HML B DOUBLE
- VIC-68T HML B DOUBLE
- QLD-50.5T 8G1 GML 19m B DOUBLE
- QLD-50.5T 8G2 GML 19m B DOUBLE
- QLD-62.5T 7G GML B DOUBLE
- QLD-68T 7H HML B DOUBLE
- WA-Group1-Vehicle1**
- WA-Group1-Vehicle2
- WA-Group1-Vehicle3
- WA-Group1-Vehicle4
- WA-Group2-Vehicle1 (3.01m O/A)
- WA-Group2-Vehicle1 (3.70m O/A)
- WA-Group2-Vehicle2 (3.01m O/A)
- WA-Group2-Vehicle2 (3.70m O/A)
- WA-Group2-Vehicle4
- WA-Group2-Vehicle5
- WA-Group2-Vehicle7
- WA-Group2-Vehicle8



Define Moving Load Case

Load Case Name

Lane

Description

☐ Load Case for Permit Vehicle

☒ Moving Load Optimization

☐ Select Load Model

General

Fatigue

Heavy Load Platform

Rail Traffic Load

B-Double Load

☒ WA Rating Vehicle Group1

☐ WA Rating Vehicle Group2

Multiple Lane Factor

Accompanying Lane Factor

Num of Loaded Lanes

Scale Factor

1

1

2

0.8

3 or more

0.4

Optimization

Min. Vehicle Distance

1

m

Load Case Data

Loaded Lane

Lane

Min. Number of Vehicle

0

Max. Number of Vehicle

2

Loading Effect

☐ Combined

☒ Independent

Assignment Vehicle

Selected Vehicle

VLWA-Group1-Vehi

Scale Factor

1.0

Vehicle

Scale

VLWA-Group1-Vehicle1

1

Add

Modify

Delete

OK

Cancel

Apply

Moving Load Cases

Western Australia Vehicles

24

15. Enhancement of Australian moving load options: Add lateral offset distance option

- When performing moving load analysis for Heavy Load Platform (HLP) vehicles under AS 5100.2 or WA Group 2 vehicles under AS 5100.7, it is important to evaluate the critical vehicle position considering lateral eccentricity. In previous versions, lateral eccentricity was fixed at 1.0 m during vehicle placement. With this update, users can now manually define lateral eccentricity up to 1.0 m, allowing for more accurate and flexible simulation of critical load positions.
- Benefits : Improves accuracy in rating calculations by reflecting realistic vehicle positioning.
Enables detailed control of vehicle eccentricity in accordance with project-specific requirements.
Enhances compliance with AS 5100.2 and AS 5100.7 practices.
- This feature provides more robust control for heavy vehicle evaluation, especially in rating scenarios involving wide bridges or straddling lanes.

▪ Load > Moving Load > Australia

Define Standard Vehicular Load

Standard Name

AS 5100.2 - Heavy Load Platform

Vehicular Load Properties

Vehicular Load Name

HLP320

Vehicular Load Type

HLP320

Dynamic Load Allowance

0.1

Lateral Eccentricity

1

m

P

P

D

D

P

P

D

D

P = 200 kN

D = 1.8 m

Number of Axles = 16

OK

Cancel

Apply

Heavy Load Platform

Define Standard Vehicular Load

Standard Name

AS 5100.7 - Rating Vehicles

Vehicular Load Properties

Vehicular Load Name

WA-Group2-Vehicle1 (3.01m O/A)

Vehicular Load Type

WA-Group2-Vehicle1 (3.01m O/A)

Dynamic Load Allowance

0.1

Lateral Eccentricity

1

m

P1

P2

P3

P4

P5

P6

P7

P8

D1

D2

D3

D4

D5

D6

D7

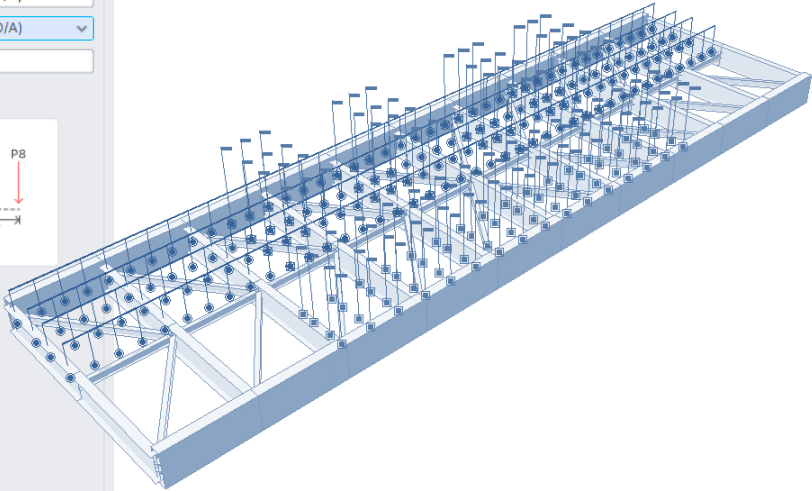
No	Load(kN)	Spacing(m)
1	58.8399	4.9
2	88.2598	1.2
3	88.2598	3
4	176.52	1.2
5	176.52	6.5
6	176.52	1.8
7	176.52	1.8
8	176.52	end

OK

Cancel

Apply

WA Rating Vehicles



16. Enhancement of Load All Model 1 in the UK rating system to support envelope type loads

- The UK rating system has been enhanced to support Vehicle Class functionality for BS moving loads, including All Model 1 as per CS454.
- Previously, reviewing All Model 1 required checking results for over 20 different vehicles individually, which was time-consuming. With the new Vehicle Class feature, users can now define a single moving load case that automatically evaluates all vehicles in the class and returns results for the most critical vehicle.
- This significantly improves efficiency by: Reducing setup and post-processing time, Automatically identifying governing cases, Enabling envelope-type load evaluations in a single step. This update streamlines the BS-based assessment process and enhances productivity, especially for complex rating projects.

▪ Load > Moving Load > BS

Define Standard Vehicular Load

Standard Name

CS 454 Assessment

Vehicular Load Properties

Vehicular Load Name

A-4AXLE

Vehicular Load Type

ALL MODEL 1

Sub Type

A-4AXLE

O1

D1

D

P1

P2

A-4AXLE

B-4AXLE

C-5AXLE

D-5AXLE_1

D-5AXLE_2

E-5AXLE_1

E-5AXLE_2

F-6AXLE_1

F-6AXLE_2

G-6AXLE_1

G-6AXLE_2

H-5AXLE_1

H-5AXLE_2

I-3AXLE

J-3AXLE

K-3AXLE_1

K-3AXLE_2

L-3AXLE_1

L-3AXLE_2

M-2AXLE

N-2AXLE

O-2AXLE

* A-4AXLE

No	P (kN)	D (m)
1	64	1.2
2	64	3.9
3	113	1.3
4	74	end

Loading Case

Single

Convoy

Road Surface

Good

Poor

Traffic Flow Category

High

Medium

Low

Consider Contact Area

Width

0.3

m

Length

0.3

m

OK

Cancel

Apply

Define Moving Load Case

Load Case Name

All Model1 Env

Description

Moving Load Optimization

Select Load Model

Standard Load (BD 37/01, BS 5400)

Special Load (BD 86/11)

CS 454 Assessment (ALL Model 1, Special Load)

CS 454 Assessment (ALL Model 2, Special Load)

NR GN CIV 025 (Network Rail)

Auto Live Load Combination

Type of Design Combination Factor

Ultimate Limit State

Serviceability Limit State

Combination of Loads

Combination 1

Combination 2 or 3

Load Case Data

Standard Load

VC:Class1

Special Load

SV 80

Assignment Lanes

Line of Lanes

Selected Lanes

Straddling Lanes

Lane 4

Lane 3

Lane 2

Lane 1

Lane 2 : Lane

Lane 3 : Lane

Lane 4 : Lane

Remaining Area

OK

Cancel

Apply

Vehicle Class Data

Vehicle Class Name

Class1

Vehicle Load

Selected Load

A-4AXLE

B-4AXLE

C-5AXLE

D-5AXLE_1

D-5AXLE_2

E-5AXLE_1

E-5AXLE_2

F-6AXLE_1

G-6AXLE_1

H-5AXLE_1

H-5AXLE_2

OK

Cancel

Apply

All Model1 Vehicles

Moving Load Case

Vehicle Class

MIDAS

26

17. Addition of vehicle database for 46 US states

- In previous versions, MIDAS CIVIL NX provided AASHTO LRFD vehicle databases for only 10 states, including California. With this update, the database has been expanded to cover all 46 U.S. states that follow the AASHTO LRFD specification.
- Key Additions: State-specific Design Trucks, Legal Trucks, and Permit Trucks are now included for each state.
- This enhancement allows users to perform more accurate and regionally compliant bridge load rating and design across a wide range of jurisdictions in the United States.

▪ Load > Moving Load > AASHTO LRFD

Define Standard Vehicular Load

Standard Name

AASHTO LRFD Load

AASHTO LRFD Load

AASHTO Standard Load

AASHTO Legal/Permit Load

IADOT Load

ILDOT Load

LADOT Load

MODOT Load

OHDOT Load

RIDOT Load

VADOT Load

WIDOT Load

INDOT Load

Fast Act EV Loads

Caltrans Standard Load (2017_draft)

Caltrans Standard Load

Turkey

Colombia

Others

Lane Support-Neg. Moment / Reaction

Application

Not assigned

a

Assigned

a,b

No

Load(kN)

Spacing(m)

W

9.3401007

kN/m

r

90

%

Dist.

15.24

m

☐ Consider Contact Area

Width

0.508

m

Length

0.254

m

☐ Add Centrifugal Force

OK

Cancel

Apply

CIVIL NX 2025 (v1.1)

Define Standard Vehicular Load

Standard Name

AASHTO LRFD Load

AASHTO LRFD Load

AASHTO Standard Load

AASHTO Legal/Permit Load

Alaska

Alabama

Arizona

Arkansas

California

Colorado

Connecticut

District of Columbia

Delaware

Florida

Georgia

Hawaii

Iowa

Idaho

Illinois

Indiana

Kansas

Kentucky

Louisiana

Massachusetts

Maryland

Maine

Michigan Normal Loading

Michigan Designed loading

Michigan Special Designed loading

Minnesota

Missouri

Mississippi

North Dakota

Nebraska

Nevada

New Jersey

New Mexico

New York

Ohio

Oklahoma

Oregon

Rhode Island

South Carolina

South Dakota

Tennessee

Texas

Utah

Virginia

Vermont

Washington

Wisconsin

West Virginia

Fast Act EV Loads

Caltrans Standard Load (2017_draft)

Caltrans Standard Load

Turkey

Colombia

Others

Define User Defined Vehicular Load

Load Type

☐ Truck/Lane

☐ Legal Load

☐ Train Load

☒ Permit Truck

Vehicular Load Properties

Vehicular Load Name

Impact Factor

0

Center of Vehicle

Center of Ref. Lane

Type of Axle

Name

a1

a2

☐ Evenly Distributed Wheel Load

☒ Symmetric Vehicle

P1

D1

P2

D2

P3

D3

P4

D4

P5

D

55.60

0.952

Type of Axle

VS

Spacing (m)

P1 (kN)

D1 (m)

P2 (kN)

D2 (m)

P3 (kN)

D3 (m)

1

a1

☐

3.35

55.60

0.95

2

a2

☐

1.22

62.28

1.07

3

a2

☐

1.22

62.28

1.07

4

a2

☐

end

62.28

1.07

5

☐

Iowa

IADOT-SPV-Type 4

User Defined

Caltrans Standard Load (2017_draft)

Caltrans Standard Load

IRC:6 Standard Load

Iowa

Alaska

Kansas

Missouri

OK

Cancel

Apply

CIVIL NX 2025 (v2.1)

Moving Load Cases

MIDAS

27

18. Addition of cross-section databases for the US and Canada

- The section database has been significantly expanded to support regional standards in the U.S. and Canada, enhancing modeling accuracy and design efficiency. These additions provide engineers with ready-to-use section profiles that comply with local specifications, streamlining design workflows for North American bridge projects.
- Canada : Added steel section database according to CISC-ICCA 2022, including : Angle, Channel, I-section, T-section, Box, Pipe, and Double Angle profiles. Added 12 PSC sections used in Ontario, including : PSC I-girders and PSC Box-girders.
- United States – Florida : Added 41 prestressed concrete (PSC) sections based on Florida Department of Transportation (FDOT) standards, covering : PSC I-Girders, PSC U-Girders, Interior & Exterior Slab Beams, PSC Pile (Square Sections)

■ Properties > Section Properties

Section Data

PSCDB/UserTaperedValueCompositeSRCSteel GirderCombined

Section ID1

I-Section

NameHP410x211

UserDB

CISC(SST12)

Sect. NameHP410x211

Built-Up Section

Get Data from Single Angle

DB NameAISC10(US)

Sect. Name

H0.406m

B10.406m

tw0.0222m

tf10.0222m

B20m

tf20m

r10m

r20m

Offset: Center-Center

Consider Shear Deformation.

Change Offset...

Consider Warping Effect(7th DOF)

Show Calculation Results...

OK

Cancel

Apply

Canada CISC Steel DB sections

Select PSC DB

CodeCanada

TypeOntario

Select DB

1:B700

2:B800

3:B900

4:B1000

5:NU900

6:NU1200

7:NU1400

8:NU1600

9:NU1800

10:NU1900

11:NU2000

12:NU2400

OK

Cancel

Canada Ontario PSC DB Sections

Select PSC DB

CodeUSA

TypeFDOT

Select DB

1:I 36 Beam

2:I 45 Beam

3:I 54 Beam

4:I 63 Beam

5:I 72 Beam

6:I 78 Beam

7:I 84 Beam

8:I 96 Beam

9:ExtL Slab Beam 4.5ft x 12in

10:ExtL Slab Beam 4.5ft x 15in

11:ExtL Slab Beam 4.5ft x 18in

12:ExtL Slab Beam 4ft x 12in

13:ExtL Slab Beam 4ft x 15in

14:ExtL Slab Beam 4ft x 18in

OK

Cancel

- Florida-I 36 Beam - Standard Details
- Florida-I 45 Beam - Standard Details
- Florida-I 54 Beam - Standard Details
- Florida-I 63 Beam - Standard Details
- Florida-I 72 Beam - Standard Details
- Florida-I 78 Beam - Standard Details
- Florida-I 84 Beam - Standard Details
- Florida-I 96 Beam - Standard Details
- AASHTO Type II Beam
- Florida-U 48 Beam - Standard Details
- Florida-U 54 Beam - Standard Details
- Florida-U 63 Beam - Standard Details
- Florida-U 72 Beam - Standard Details
- 12" Florida Slab Beam
- 15" Florida Slab Beam
- 18" Florida Slab Beam

USA Florida PSC DB Sections

19. Batch output for tendon loss table by construction stage and tendon group

- In previous versions, users could view tendon loss results for only one tendon group and one construction stage at a time.
- With this update, the result table now supports multi-selection of both tendon groups and construction stages, allowing users to review multiple results simultaneously.
- Benefits : Streamlines the process of reviewing and comparing tendon losses across various groups and stages. Significantly improves efficiency when generating reports or summarizing results, eliminating the need to check tendon data one by one. Results for all selected items are displayed together in a single integrated table.

Results > Result Tables > Tendon > Tendon Loss

Start Page MIDAS CIVIL NX Result - [Tendon Loss (Tendon Group)]									
Elem	Part	Stress (After Immediate Loss) - A (N/mm²)	Elastic Deform. Loss - B (N/mm²)	Stress/Elastic Loss/ Stress(Immediate Loss)	Creep/Shrinkage Loss (N/mm²)	Relaxation Loss (N/mm²)	Stress(After All Losses/ Stress(After Immediate Loss)	Effective Num.	
The Loss of tendon group [Tendon-Span1] at the stage of [Stage2]									
		Tendon-Span1	Stage2	Apply					
90	I	601261.7614	3461.4555	Stage3-1	0.0000	0.0000	1.0058	44.0000	
90	J	601261.7614	5870.3434	Stage3-1	0.0000	0.0000	1.0098	44.0000	
91	I	601261.7614	1441.4978	Stage3-2	0.0000	0.0000	1.0024	44.0000	
91	J	601261.7614	13877.0406	Stage4	0.0000	0.0000	1.0231	44.0000	
92	I	601261.7614	13877.0406	Stage5	0.0000	0.0000	1.0231	44.0000	
92	J	601261.7614	27214.1713		1.0453	0.0000	1.0453	44.0000	
93	I	601261.7614	27214.1713		1.0453	0.0000	1.0453	44.0000	
93	J	601261.7614	29714.8786		1.0494	0.0000	1.0494	44.0000	
94	I	601261.7614	29714.8786		1.0494	0.0000	1.0494	44.0000	
94	J	601261.7614	39148.4665		1.0651	0.0000	1.0651	44.0000	
95	I	601261.7614	39148.4665		1.0651	0.0000	1.0651	44.0000	
95	J	601261.7614	49679.9261		1.0826	0.0000	1.0826	44.0000	
96	I	601261.7614	49679.9261		1.0826	0.0000	1.0826	44.0000	
96	J	601261.7614	53502.1487		1.0890	0.0000	1.0890	44.0000	
97	I	601261.7614	53502.1487		1.0890	0.0000	1.0890	44.0000	
97	J	601261.7614	58808.5502		1.0978	0.0000	1.0978	44.0000	
98	I	601261.7614	58808.5502		1.0978	0.0000	1.0978	44.0000	
98	J	601261.7614	66534.3387		1.1107	0.0000	1.1107	44.0000	
99	I	601261.7614	66534.3387		1.1107	0.0000	1.1107	44.0000	
99	J	601261.7614	70494.8280		1.1172	0.0000	1.1172	44.0000	
100	I	601261.7614	70494.8280		1.1172	0.0000	1.1172	44.0000	
100	J	601261.7614	72857.2917		1.1212	0.0000	1.1212	44.0000	
101	I	601261.7614	72857.2917		1.1212	0.0000	1.1212	44.0000	
101	J	601261.7614	77777.4092		1.1294	0.0000	1.1294	44.0000	
102	I	601261.7614	77777.4092		1.1294	0.0000	1.1294	44.0000	
102	J	601261.7614	80703.6552		1.1342	0.0000	1.1342	44.0000	
103	I	601261.7614	80703.6552		1.1342	0.0000	1.1342	44.0000	
103	J	601261.7614	81294.6911		1.1352	0.0000	1.1352	44.0000	
104	I	601261.7614	81294.6911		1.1352	0.0000	1.1352	44.0000	
104	J	601261.7614	83409.1375		1.1387	0.0000	1.1387	44.0000	
105	I	601261.7614	83409.1375		1.1387	0.0000	1.1387	44.0000	
105	J	601261.7614	84120.0581		1.1399	0.0000	1.1399	44.0000	
106	I	601261.7614	86981.0733		1.1447	0.0000	1.1447	44.0000	
106	J	601261.7614	86956.4939		1.1446	0.0000	1.1446	44.0000	
107	I	601261.7614	86956.4939		1.1446	0.0000	1.1446	44.0000	
107	J	601261.7614	85251.8262		1.1418	0.0000	1.1418	44.0000	
108	I	601261.7614	85251.8262		1.1418	0.0000	1.1418	44.0000	
108	J	601261.7614	82144.3229		1.1366	0.0000	1.1366	44.0000	
109	I	601261.7614	82144.3229		1.1366	0.0000	1.1366	44.0000	
109	J	601261.7614	81353.9453		1.1353	0.0000	1.1353	44.0000	
110	I	601261.7614	81353.9453		1.1353	0.0000	1.1353	44.0000	
110	J	601261.7614	77633.9841		1.1291	0.0000	1.1291	44.0000	
111	I	601261.7614	77633.9841		1.1291	0.0000	1.1291	44.0000	
111	J	601261.7614	71720.8097		1.1193	0.0000	1.1193	44.0000	
112	I	601261.7614	71720.8097		1.1193	0.0000	1.1193	44.0000	
112	J	601261.7614	68960.8626		1.1147	0.0000	1.1147	44.0000	
113	I	601261.7614	68960.8626		1.1147	0.0000	1.1147	44.0000	
113	J	601261.7614	64404.7998		1.1071	0.0000	1.1071	44.0000	
114	I	601261.7614	64404.7998		1.1071	0.0000	1.1071	44.0000	

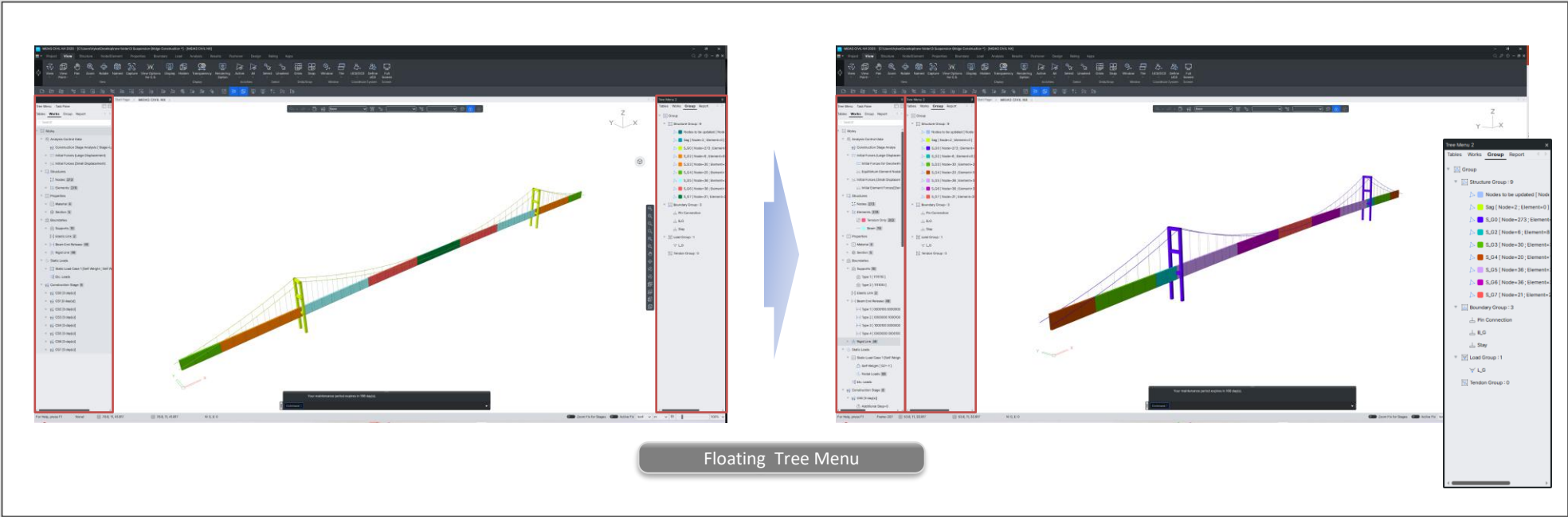
CIVIL NX 2025 (v1.1)

Start Page MIDAS CIVIL NX Result - [Tendon Loss (Tendon Group)]									
Tendon Group	Stage	Elem	Part	Stress (After Immediate Loss) - A (N/mm²)	Elastic Deform. Loss - B (N/mm²)	Stress/Elastic Loss/ Stress(Immediate Loss)	Creep/Shrinkage Loss (N/mm²)	Relaxation Loss (N/mm²)	Effective Num.
Tendon-Span1	Stage2	661.0000	I	1.0067	-43813.6287	-10682.8073	0.9582	1.0000	1.0000
Tendon-Span1	Stage2	691.0000	J	1.0077	-43523.2191	-18755.9957	0.9596	1.0000	1.0000
Tendon-Span1	Stage2	482.0000	I	1.0049	-44788.9015	-19537.9068	0.9557	1.0000	1.0000
Tendon-Span1	Stage2	482.0000	J	1.0037	-45350.8002	-19451.2183	0.9542	1.0000	1.0000
Tendon-Span1	Stage2	667.0000	I	1.0091	-42569.1626	-18868.2434	0.9615	1.0000	1.0000
Tendon-Span1	Stage2	137.0000	I	1.0087	-42781.8776	-18936.4456	0.9609	1.0000	1.0000
Tendon-Span1	Stage2	137.0000	J	1.0066	-43785.9623	-18976.2854	0.9582	1.0000	1.0000
Tendon-Span1	Stage2	143.0000	I	1.0075	-43304.7568	-18742.2595	0.9593	1.0000	1.0000
Tendon-Span1	Stage2	143.0000	J	1.0082	-42578.2314	-18867.2521	0.9616	1.0000	1.0000
Tendon-Span1	Stage2	143.0000	J	1.0089	-42519.1993	-18847.2049	0.9613	1.0000	1.0000
Tendon-Span1	Stage2	149.0000	I	1.0049	-44607.3267	-18542.3682	0.9559	1.0000	1.0000
Tendon-Span1	Stage2	149.0000	J	1.0037	-45249.5599	-18448.7618	0.9543	1.0000	1.0000
Tendon-Span1	Stage2	274.0000	I	1.0058	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	274.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	280.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	286.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	286.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	411.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	411.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	536.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	536.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	542.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	542.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	667.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	673.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	673.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	263.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	263.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	263.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	209.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	215.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	215.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	340.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	346.0000	J	1.0051	-42103.7026	-18619.5272	0.9612	1.0000	1.0000
Tendon-Span1	Stage2	471.0000	J	1.0072	-43551.0737	-18718.0384	0.9589	1.0000	1.0000
Tendon-Span1	Stage2	471.0000	J	1.0081	-43082.0674	-18786.9666	0.9601	1.0000	1.0000
Tendon-Span1	Stage2	471.0000	J	1.0079	-43619.3025	-18896.5487	0.9598	1.0000	1.0000
Tendon-Span1	Stage2	352.0000	J	1.0059	-44198.5611	-19813.2375	0.9571	1.0000	1.0000
Tendon-Span1	Stage2	477.0000	I	1.0093	-42434.7683	-18879.2253	0.9617	1.0000	1.0000
Tendon-Span1	Stage2	477.0000	J	1.0088	-42690.3720	-18841.5412	0.9611	1.0000	1.0000
Tendon-Span1	Stage2	602.0000	J	1.0077	-43123.7084	-18776.0515	0.9595	1.0000	1.0000
Tendon-Span1	Stage2	602.0000	J	1.0084	-42943.4964	-18813.0894	0.9605	1.0000	1.0000
Tendon-Span1	Stage2	608.0000	J	1.0087	-42781.8776	-18936.4456	0.9609	1.0000	1.0000
Tendon-Span1	Stage2	608.0000	J	1.0081	-42104.4933	-18776.0515	0.9601	1.0000	1.0000
Tendon-Span1	Stage2	138.0000	J	1.0075	-43305.4167	-18742.2595	0.9593	1.0000	1.0000
Tendon-Span1	Stage2	138.0000	J	1.0082	-42936.2139	-18794.7994	0.9603	1.0000	1.0000
Tendon-Span1	Stage2	144.0000	J	1.0089	-42519.1993	-18847.2145	0.9613	1.0000	1.0000
Tendon-Span1	Stage2	144.0000	J	1.0070	-43626.5599	-18700.9574	0.9586	1.0000	1.0000
Tendon-Span1	Stage2	275.0000	J	1.0079	-43157.8726	-18789.1812	0.9598	1.0000	1.0000
Tendon-Span1	Stage2	275.0000	J	1.0084	-42343.2211	-18883.8917	0.9619	1.0000	1.0000
Tendon-Span1	Stage2	275.0000	J	1.0079	-43157.8726	-18789.1812	0.9598	1.0000	1.0000
Tendon-Span1	Stage2	275.0000	J	1.0084	-42343.2211	-18883.8917	0.9619	1.0000	1.0000

CIVIL NX 2025 (v2.1)

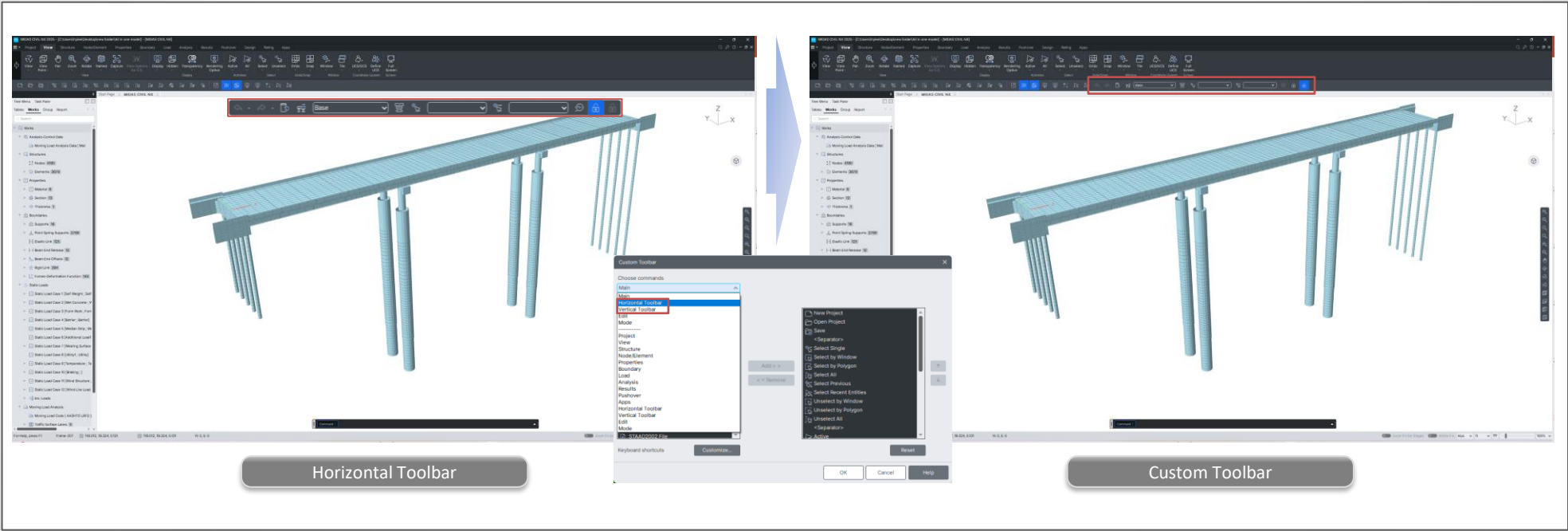
20. Flexible Dual Tree Menu Layout and External Docking

- The Dual Tree Menu functionality has been enhanced for improved usability in large and complex projects.
- Previously, the dual tree view was limited to left-right split view, with one tree on each side. In the new version, users can arrange both tree menus on either the left or right side as needed. Alternatively, the tree menu can be undocked and used as a separate floating window, ideal for dual-monitor setups.



21. Full Customization of Horizontal Toolbar Functions

- The Horizontal Toolbar, previously fixed at the top of the model view, now offers full customization and docking flexibility.
- In previous versions, key tools such as Node/Element Selection Combo Boxes and Construction Stage selection could not be added to the Custom Toolbar.
- In the new version, all functions and icons from the Horizontal Toolbar can now be added directly to the Custom Toolbar. Users can select the entire Horizontal Toolbar as a grouped item for easy integration into the Custom Toolbar, without needing to add functions individually. For users who prefer an unobstructed model view, the Horizontal Toolbar can now be completely hidden, with all necessary tools docked in the Custom Toolbar.
- Benefits : Prevents the toolbar from obstructing the model view or appearing in screen captures.
Allows for a cleaner and more personalized interface, improving usability and visibility during modeling and reporting.
Enhances productivity by enabling users to work without visual interruptions.



22. Addition of Active Fix and Zoom Fix for Stage to Status Bar

- The previously available Active Fix and Zoom Fix for Stage functions in MIDAS CIVIL NX have now been added directly to the status bar for quicker and easier access. In previous versions, key tools such as Node/Element Selection Combo Boxes and Construction Stage selection could not be added to the Custom Toolbar.
- Zoom Fix for Stage allows users to fix the view zoom and orientation in the Model View while switching between different construction stages for visual consistency.
- Active Fix keeps the activated elements fixed in the Model View, enabling users to review construction stage analysis results without resetting the view. Active Fix is available only after construction stage analysis is completed.
- Benefits : Simplifies stage-by-stage result verification without losing the current view.
Improves efficiency in checking staged results by maintaining consistent focus on key elements.

