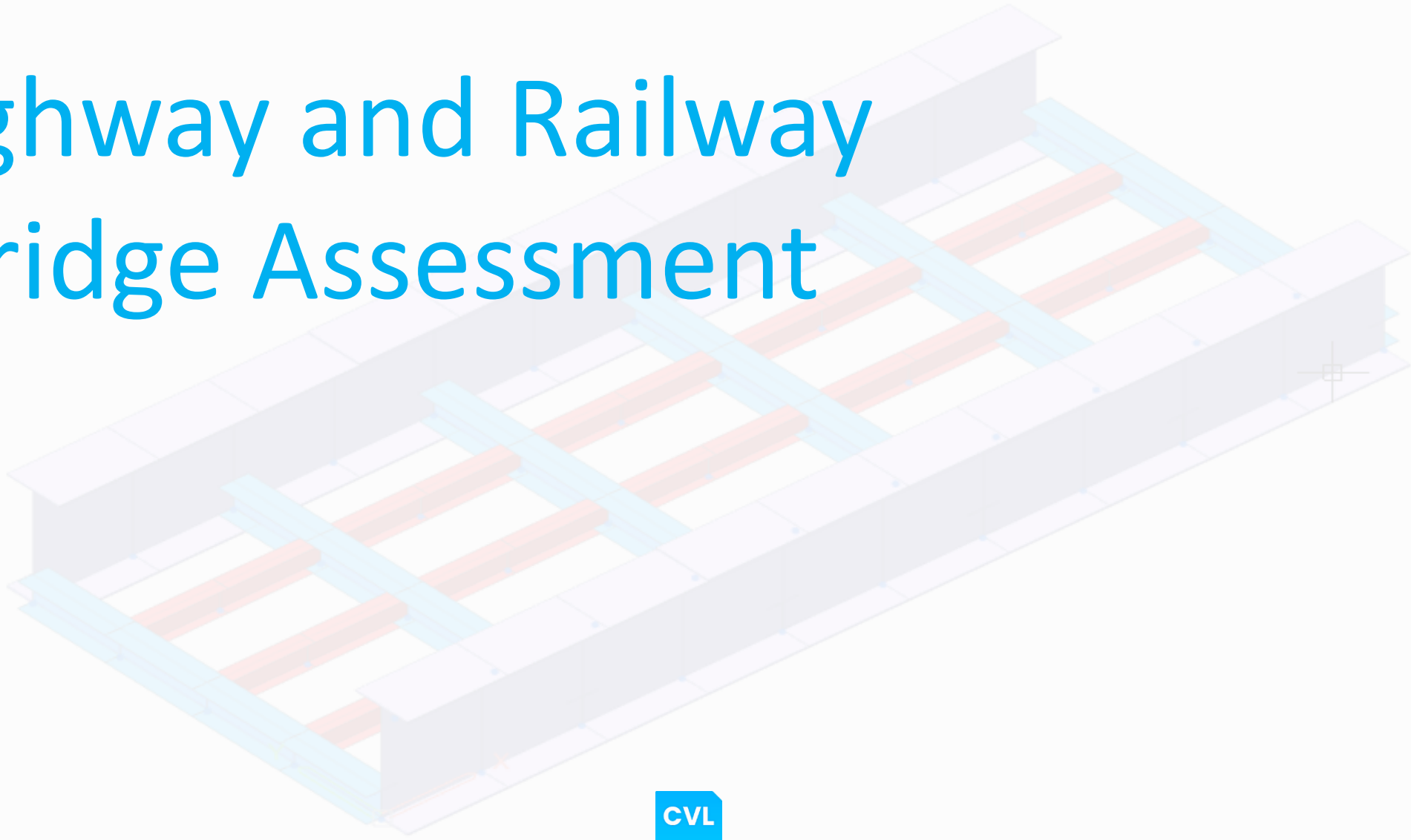


Highway and Railway Bridge Assessment



Assessment Live Load and Level of Assessment

Assessment Objective – To determine load carrying capacity in terms of live load and speed

Rail Traffic Loadings (1.5.3 – NR/GN/CIV/025)

☐ Route Availability

- In terms of BSUs of Type *RAI Loading* at permissible speed
(other speeds if Capacity < RA10)

☐ Wagons

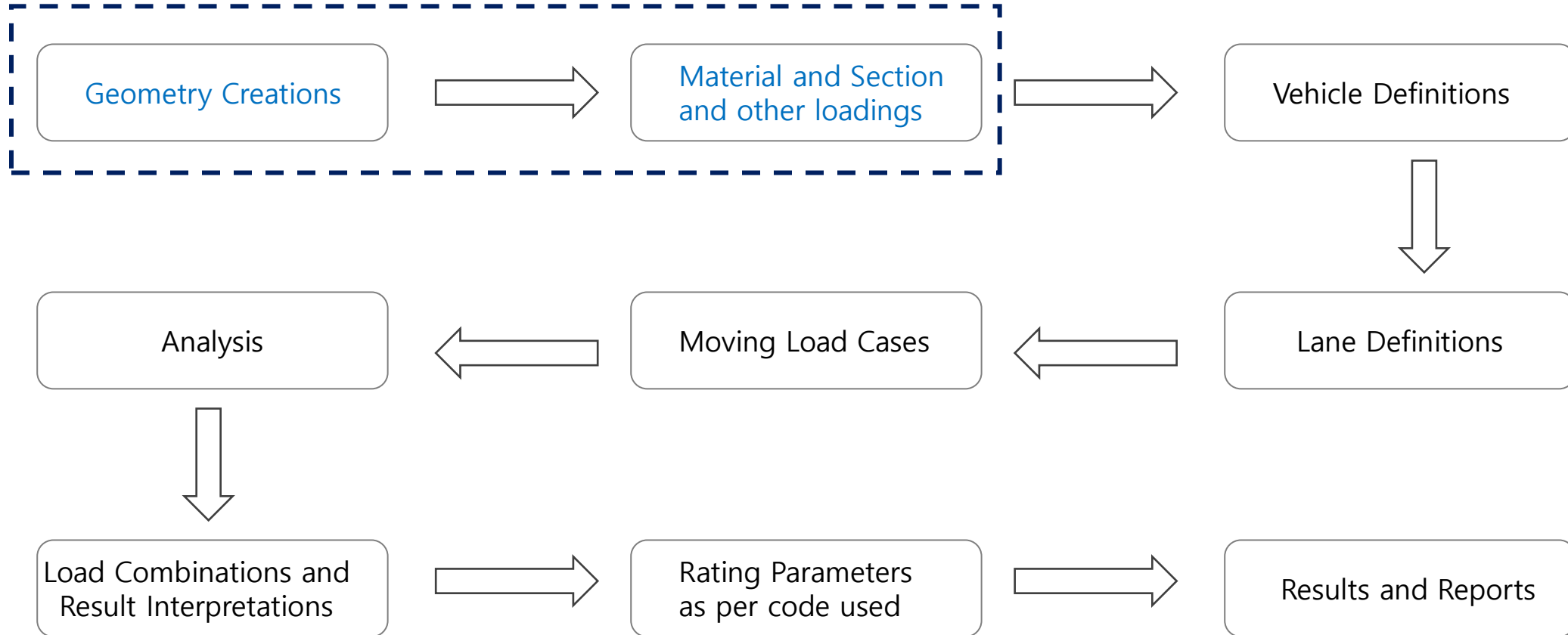
- All structures need to be assessed for carrying *D4 Wagons* in accordance with UIC 700-0

Level 1 Simplest level using assumptions known to be conservative and, where appropriate, consideration of loading by real trains.

Level 2 Use of more refined analysis and better structural idealisation. This level may also include use of data on materials strengths based on mill test certificates or recent material tests on another structure of similar form, materials and age.

Level 3 Use of a bridge specific live loading based on a statistical model of the known traffic and/or the use of tests on materials samples or the use of worst credible strengths or the use of load tests.

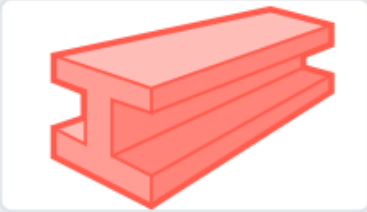
Already Defined in Base Model



Material and Section Property

Elasticity Data

Type of Design Steel



Type of Material
☒ Isotropic ☐ Orthotropic

Steel

Standard NR/GN/CIV/025(S)

DB Wrought Iron

Concrete

Standard

Code

DB

Modulus of Elasticity 1.9000e+08 kN/m²

Poisson's Ratio 0.3

Thermal Coefficient 1.2000e-05 1/[C]

Weight Density 75.51 kN/m³

☐ Use Mass Density 7.7 kN/m³/g

☐ Concrete

Modulus of Elasticity 0.0000e+00 kN/m²

Poisson's Ratio 0

Thermal Coefficient 0.0000e+00 1/[C]

Weight Density 0 kN/m³

☐ Use Mass Density 0 kN/m³/g

Different Steel and Wrought Iron Materials as per old standard codes

Section Property – I Girders

Section Data

DB/User Steel Girder

Section ID 2 Name CG

Section Type Steel Girder I

Size

☒ Symmetric Section Auto Calculation

Distance from Reference Line

Top 0 m

Bottom 0 m

B1 0.3 H 0.6 m

B2 0.3 t1 0.014 m

B3 0.3 t2 0.014 m

B4 0.3 tw 0.014 m

Stiffener...

Riveted Angle...

Riveted Angles Definition for I Girders

Riveted Angle

Defined Angles

Define Angles...

Name	Type
a	Angle

☒ Symmetric

☒ Angle 1 a

☒ Angle 2 a

☐ Angle 3 a

☐ Angle 4 a

☒ Angle 5 a

☒ Angle 6 a

☐ Angle 7 a

☐ Angle 8 a

☒ 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

Control the Rivet Positioning as per different angles

Section Stiffener

Stiffener

Name a

Type Angle

Properties

H 0.1 m

B 0.1 m

tw 0.016 m

tf 0.016 m

Add Modify Delete

Name	Type
a	Angle

OK Cancel

Define different Angle sections

Consideration of Live Load for Assessments in Civil NX

RAI Loading

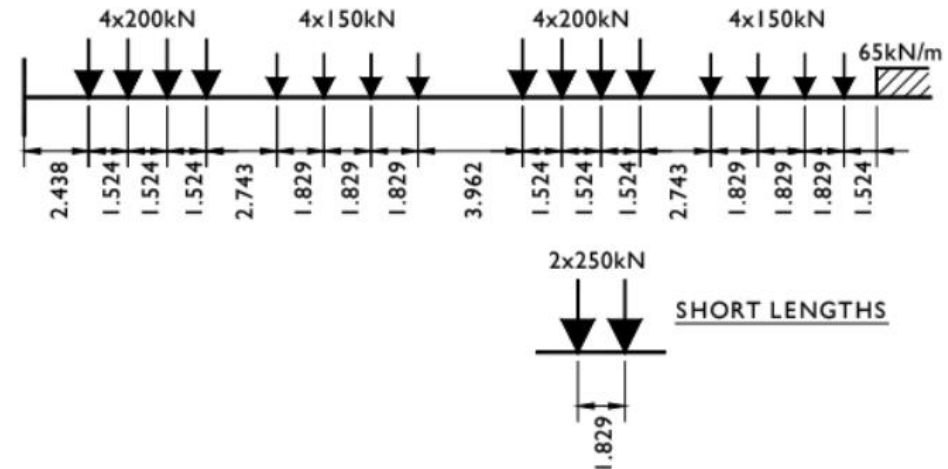
4.3.1.1 Route Availability (RA) Number

The assessment of a Bridge should be determined in terms of its Route Availability (RA) number, that is its safe rail traffic load capacity. Route Availability numbers generally range from the lowest capacity RA0 to the highest at RA15 represented by 25 British Standard Units (BSUs) of Type RAI loading as shown by Table 4.3.

RA NUMBER	RANGE OF UNITS	RANGE OF SINGLE AXLE WEIGHTS
RA0	Up to 10.99 units	Under 13.96 tonnes
RA1	11.00 to 11.99 units	13.97 to 15.23 tonnes
RA2	12.00 to 12.99 units	15.24 to 16.50 tonnes
RA3	13.00 to 13.99 units	16.51 to 17.77 tonnes
RA4	14.00 to 14.99 units	17.78 to 19.04 tonnes
RA5	15.00 to 15.99 units	19.05 to 20.31 tonnes
RA6	16.00 to 16.99 units	20.32 to 21.58 tonnes
RA7	17.00 to 17.99 units	21.59 to 22.85 tonnes
RA8	18.00 to 18.99 units	22.86 to 24.12 tonnes
RA9	19.00 to 19.99 units	24.13 to 25.39 tonnes
RA10	20.00 to 20.99 units	25.40 to 26.66 tonnes
RA11	21.00 to 21.99 units	26.67 to 27.93 tonnes
RA12	22.00 to 22.99 units	27.94 to 29.20 tonnes
RA13	23.00 to 23.99 units	29.21 to 30.47 tonnes
RA14	24.00 to 24.99 units	30.48 to 31.74 tonnes
RA15	25.00 units and over	31.75 tonnes and over

4.3.1.2 RAI Loading

The static loading used to determine the RA number is shown in Figure 4.1 for 20 units of Type RAI loading. The Short Lengths configuration should be used when it produces more onerous effects than the axle and uniformly distributed load model.



Live Load for Railway Assessments

Define Standard Vehicular Load

Standard Name: NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name: RA10 Loading

Vehicular Load Type: Type RAI Loading

Sub Type: RA10

RA Loading Type: ☒ Train ☐ Short

RA Loading Type List:

- EUDL
- RA1
- RA2
- RA3
- RA4
- RA5
- RA6
- RA7
- RA8
- RA9
- RA10**
- RA11
- RA12
- RA13
- RA14
- RA15

Train Diagram: P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16 dW1

Short Length Diagram: P1 P1 D1

* RA Loading

No	P (kN)	D (m)
1	200	1.524
2	200	1.524
3	200	1.524
4	200	2.743
5	150	1.829
6	150	1.829
7	150	1.829
8	150	3.692
9	200	1.524

* Short lengths

No	P (kN)	D (m)
1	250	1.829
2	250	end

dW1 = 65 kN/m

dD1 = 1.524 m

dD2 = 100 m

Railway Dynamic Factor: ☐ Static ☒ Dynamic

Assessment Speed: 90 mph

OK Cancel Apply

Can consider both RAI and EUDL for the moving loads

Both Train and Short Length loads can be defined (together or separate)

Assessment Speed for calculation of Dynamic Factor

Sub Type: RA10

RA Loading Type: ☒ Train ☐ Short Length ☐ More Critical

Train Diagram: P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16 dW1

Short Length Diagram: P1 P1 D1

Assessment Load Wagon

4.3.1.4 Assessment Load Wagon

The loading and axle configuration of the Assessment Load Wagon is as shown in Figure 4.2. Dynamic factors should be based on a maximum speed of the lesser of 60 mph or the permissible speed at the site.

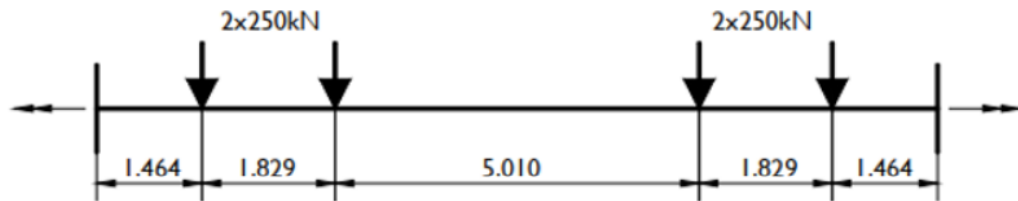


Figure 4.2
Assessment Load Wagon

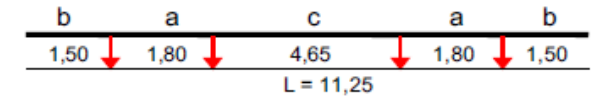
4.3.1.5 Wagon Type D4

The loading and axle configuration of Wagon Type D4 is defined in UIC700-O. Dynamic factors should be based on a maximum speed of the lesser of 60 mph or the permissible speed at the site.

D4

$P = 22,5 \text{ t}$

$p = 8,0 \text{ t/m}$



Live Load for Railway Assessments

Define Standard Vehicular Load

Standard Name
NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name
Wagon Type D4

Vehicular Load Type
Wagon

Sub Type
Wagon Type D4

* Wagon

No	P (kN)	D (m)
1	220.65	1.8
2	220.65	4.65
3	220.65	1.8
4	220.65	end

Wagon Type D4 as per UIC-700

Assessment Load Wagon as per CIV/025

Define Standard Vehicular Load

Standard Name
NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name
Assessment Load Wagon

Vehicular Load Type
Wagon

Sub Type
Assessment Load Wagon

* Wagon

No	P (kN)	D (m)
1	250	1.829
2	250	5.01
3	250	1.829
4	250	end

Dynamic Effects

4.3.2.2 Dynamic Factor for Longitudinal Members

The dynamic factor $(1 + \varphi)$ appropriate to the train speed should be applied to all members other than transverse floor members (see Clause 4.3.2.4) using the dynamic increment φ which should be taken as in Table 4.5.

	Dynamic Increment φ for Bending	Dynamic Increment φ for Shear
Normal track maintained for Permissible speed ≤ 100 mph	$(\varphi_1 + \varphi_{11})$	$\frac{2}{3} \times \varphi$ for Bending
Track maintained for Permissible speed > 100 mph – 125 mph	$1.3 \left(\varphi_1 + \frac{\varphi_{11}}{2} \right)$ (see note below table)	
Fatigue calculations only	$0.5 \left(\varphi_1 + \frac{\varphi_{11}}{2} \right)$	

4.3.2.4 Dynamic Factor for Transverse Floor Members

The dynamic factor for cross girders and other discrete transverse floor members $(1 + \varphi_T)$ appropriate to the train speed should be applied using the dynamic increment φ_T , which should be taken as in Table 4.7.

	Dynamic increment φ_T for bending	Dynamic increment φ_T for shear
Normal track maintained for permissible speed ≤ 100 mph	0.008v	$\frac{2}{3} \times \varphi_T$ for bending
Track maintained for permissible speed > 100 mph – 125mph	* 1.3 (0.008v)	
Fatigue calculations only.	0.004v	

Dynamic Effects

Railway Dynamic Factor

Select Structure Group

☐ Cross Girder
☐ Main Girder
☐ Railbearer

☒ Auto Input

Bending and Shear

Natural Frequency, ω 2 Hz

Span Length, L 25 m

Determinant Length, L_p 23 m

Permissible Speed of Track, v 100 mph

Depth of Ballast, h 0.8 m

Angle of Skew, α 90 deg
(Longitudinal Member: 65 to 90, Transverse Member: 0 to 25)

Effects

Bending and Shear for Beam Element Auto

All Other Effects 0
(e.g. Axial, Torsion, Stress, Displacements, Reactions, etc)

Separate Dynamic Factor as per structure group

☒ User Input

Effects

Bending for Beam Element 0

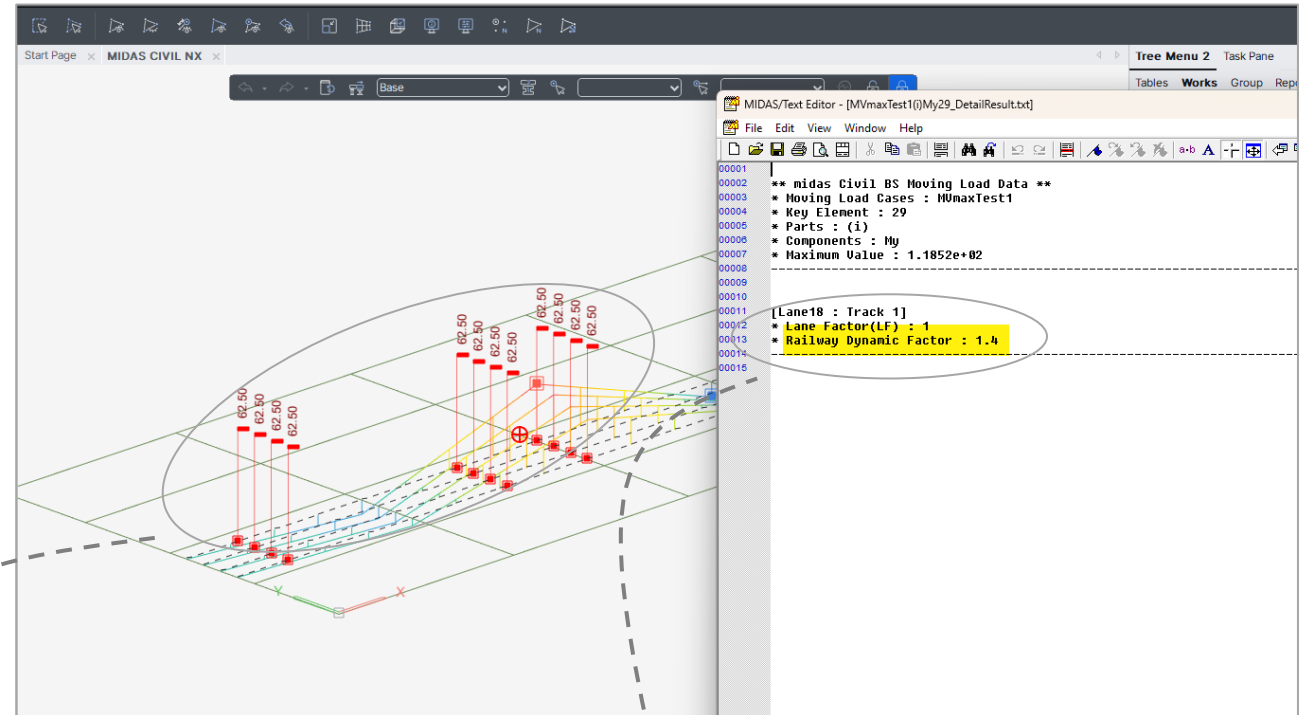
Shear for Beam Element 0

All Other Effects 0
(e.g. Axial, Torsion, Stress, Displacements, Reactions, etc)

Group List	Bending	Shear	Other

Add Modify Delete

Auto/ User Input of Dynamic Factor as per the different members



Extract Load Positions for any Max/Min Cases

Extract the Dynamic Factor for a particular load positions

Lane Definitions and Moving Load Cases

Traffic Line Lanes

Lane Name:

Traffic Lane Properties

Lane Width: m

Eccentricity: m

Wheel Spacing: m

☐ Transverse Lane Optimization

Allowable Width: m

Vehicular Load Distribution

☐ Lane Element ☒ Cross Beam

Cross Beam Group:

Skew

Start: End: [deg]

Moving Direction

☐ Forward ☐ Backward ☒ Both

Input Lane Factors for more than one lane loadings

Lane Definitions

Distribute Loads Transversally as per Cross Girders

Define Moving Load Case

Load Case Name:

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)

Track Factor

Num of Loaded Track	Scale Factor
<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2 or more"/>	<input type="text" value="1"/>

Sub-Load Cases

Loading Effect: ☒ Combined ☐ Independent

Vehicle	Scale	Lane1	Lane2	Lane3
EUDL L...	1	Track 1		

Sub-Load Case

Load Case Data

Scale Factor:

Number of Loaded Lanes:

Vehicle:

Assign Lanes

List of Lanes:

Create any combination for the loads for the Trains Loads

Steps for Definition of Vehicle

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Bases *] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary **Load** Analysis Results Pushover Design Rating Query Apps

Load Type: Moving Load Moving Load Code: BS

Traffic Line Lanes Traffic Surface Lanes Vehicles Moving Cases Concurrent Group Vehicle Classes for Infl. Surface Railway Dynamic Factor Railway Dispersal Factor

Tree Menu: Tables Works Group Report

Vehicle Name Type

EUDL	Standard
EUDL Dynamic	Standard

Buttons: Add Standard, Add User Defined, Modify, Delete, Close

Define Standard Vehicular Load

Standard Name: NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name: EUDL

Vehicular Load Type: Type RAI Loading

Sub Type: EUDL

Diagram: W, ∞

W = 85 kN/m

Railway Dynamic Factor: Static (selected) Dynamic

Assessment Speed: 90 mph

Consider Longitudinal Distribution of Point Loads: ☐

Distance between Rail Support Points: 0.75 m

Eccentricity of Lateral Displacement of Vertical Loads: 0 m

Buttons: OK, Cancel, Apply

Define Standard Vehicular Load

Standard Name: NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name: EUDL Dynamic

Vehicular Load Type: Type RAI Loading

Sub Type: EUDL

Diagram: W, ∞

W = 85 kN/m

Railway Dynamic Factor: Static Dynamic (selected)

Assessment Speed: 90 mph

Consider Longitudinal Distribution of Point Loads: ☐

Distance between Rail Support Points: 0.75 m

Eccentricity of Lateral Displacement of Vertical Loads: 0 m

Buttons: OK, Cancel, Apply

Command

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Bases *] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary **Load** Analysis Results Pushover Design Rating Query Apps

Moving Load Code BS

Load Type Moving Load Code Moving Load Analysis

Tree Menu Task Pa Tables **Works** Gro

Search

Works

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Nodes

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Properties

Material

Section 4

Boundaries

Supports 4

Beam End Release 30

Static Loads

Static Load Case 1 [DL;]

Moving Load Analysis

Moving Load Code [BS]

Traffic Line Lanes 2

Traffic Line Lane 1 [Track 1]

Traffic Line Lane 2 [Track 2]

Vehicles 4

Vehicles 1 [EUDL Dynamic; Standard]

Vehicles 2 [EUDL Static; Standard]

Vehicles 3 [RA10 Dynamic; Standard]

Vehicles 4 [RA10 Static; Standard]

Vehicles

Vehicle Name	Type
EUDL Dynamic	Standard
EUDL Static	Standard
RA10 Dynamic	Standard
RA10 Static	Standard

Add Standard

Add User Defined

Modify

Delete

Close

Define Standard Vehicular Load

Standard Name NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name RA10 Static

Vehicular Load Type Type RAI Loading

Sub Type RA10

RA Loading Type

☒ Train ☐ Short Length ☐ More Critical

Train

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16 dW1

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 dD1 dD2

Short Length

P1 P1

D1

* RA Loading

No	P (kN)	D (m)
1	200	1.524
2	200	1.524
3	200	1.524
4	200	2.743
5	150	1.829
6	150	1.829
7	150	1.829
8	150	3.692

* Short Length

No	P (kN)	D (m)
1	250	1.829
2	250	end

dW1 = 65 kN/m

dD1 = 1.524 m

dD2 = 100 m

Railway Dynamic Factor

☒ Static ☐ Dynamic

Assessment Speed 90 mph

☐ Consider Longitudinal Distribution of Point Loads

Distance between Rail Support Points 0.75 m

☐ Eccentricity of Lateral Displacement of Vertical Loads

0 m

OK Cancel Apply

Define Standard Vehicular Load

Standard Name NR/GN/CIV/025

Vehicular Load Properties

Vehicular Load Name RA10 Dynamic

Vehicular Load Type Type RAI Loading

Sub Type RA10

RA Loading Type

☒ Train ☐ Short Length ☐ More Critical

Train

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16 dW1

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 dD1 dD2

Short Length

P1 P1

D1

* RA Loading

No	P (kN)	D (m)
1	200	1.524
2	200	1.524
3	200	1.524
4	200	2.743
5	150	1.829
6	150	1.829
7	150	1.829
8	150	3.692

* Short Length

No	P (kN)	D (m)
1	250	1.829
2	250	end

dW1 = 65 kN/m

dD1 = 1.524 m

dD2 = 100 m

Railway Dynamic Factor

☐ Static ☒ Dynamic

Assessment Speed 90 mph

☐ Consider Longitudinal Distribution of Point Loads

Distance between Rail Support Points 0.75 m

☐ Eccentricity of Lateral Displacement of Vertical Loads

0 m

OK Cancel Apply

Group Report

Tables

Tables

Tables

Tables

Steps for Definition of Lane

Live Load for Railway Assessments

1 Load

2 Project

3 Node/Element

4 Boundary

5 Traffic Line Lanes

6 Traffic Line Lanes

7 Define Design Traffic Line Lane

8 Lane Type

9 Lane Width

10 Eccentricity

11 Wheel Spacing

12 Eccentricity of Vertical Loads

13 Transverse Lane Optimization

14 Vehicular Load Distribution

15 Cross Beam Group

16 Skew

17 Moving Direction

18 Selection by

19 2 Points

20 20, 2, 0

21 20, 8, 0

22 Operation

23 Add

24 Insert

25 Delete

26 OK

27 Cancel

28 Apply

29 Command

30 11to20

31 Z

32 Y

33 X

34 Base

35 Moving Load Code

36 BS

37 Traffic Line Lanes

38 Traffic Surface Lanes

39 Vehicles

40 Moving Load Cases

41 Concurrent Group

42 Vehicle Classes

43 Plate Element for Influ. Surface

44 Railway Dynamic Factor

45 Railway Dispersal Factor

46 Tree Menu

47 Task Pane

48 Works

49 Structures

50 Nodes 55

51 Elements 74

52 Properties

53 Material 1

54 Section 4

55 Boundaries

56 Supports 4

57 Beam End Release 30

58 Static Loads

59 Static Load Case 1 [DL;]

60 Moving Load Analysis

61 Moving Load Code [BS]

62 Traffic Line Lanes 1

63 Traffic Line Lane 1 [Track 1]

64 Add

65 Modify

66 Delete

67 Copy

68 Close

69 Lane Name

70 Track 1

71 Track 2

72 Define Design Traffic Line Lane

73 Lane Name

74 Track 1

75 Traffic Lane Properties

76 a: Eccentricity

77 Lane Type

78 Roadway

79 Railway

80 Lane Width

81 3

82 m

83 Eccentricity

84 2.4

85 m

86 Wheel Spacing

87 1.6

88 m

89 Eccentricity of Vertical Loads

90 to Consider Cant

91 0

92 m

93 Transverse Lane Optimization

94 Allowable Width

95 3

96 m

97 Vehicular Load Distribution

98 Lane Element

99 Cross Beam

100 Cross Beam Group

101 Cross Girder

102 Skew

103 Start

104 0

105 End

106 0

107 [deg]

108 Moving Direction

109 Forward

110 Backward

111 Both

112 Selection by

113 2 Points

114 Picking

115 Number

116 20, 2, 0

117 m

118 20, 8, 0

119 m

120 Operation

121 Add

122 Insert

123 Delete

124 No

125 Elem

126 Eccen. (m)

127 Eccen.Vert. Loads (m)

128 1

129 11

130 2.4

131 0

132 2

133 12

134 2.4

135 0

136 3

137 13

138 4

139 0

140 OK

141 Cancel

142 Apply

143 Command

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Bases *] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary Load Analysis Results Pushover Design Rating Query Apps

Moving Load Code BS

Load Type Moving Load Code

Tree Menu Task Pane

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Elements 74

Properties

Material 1

Section 4

Boundaries

Supports 4

Beam End Release 30

Static Loads

Static Load Case 1 [DL;]

Moving Load Analysis

Moving Load Code [BS]

Traffic Line Lanes 2

Traffic Line Lane 1 [Track 1]

Traffic Line Lane 2 [Track 2]

Traffic Line Lanes

Lane Name

Track 1

Track 2

Add

Modify

Delete

Copy

Close

Define Design Traffic Line Lane

Lane Name Track 2

Traffic Lane Properties

Start

End

a : Eccentricity

Lane Type

Roadway

Railway

Lane Width 3 m

Eccentricity -2.4 m

Wheel Spacing 1.6 m

Eccentricity of Vertical Loads to Consider Cant 0.0 m

Transverse Lane Optimization

Allowable Width 3 m

Vehicular Load Distribution

Lane Element

Cross Beam

Cross Beam Group

Cross Girder

Skew

Start 0 End 0 [deg]

Moving Direction

Forward

Backward

Both

Selection by

2 Points

Picking

Number

20, 0, 0 m

20, 0, 0 m

Operation

Add

Insert

Delete

No	Elem	Eccen. (m)	Eccen.Vert. Loads (m)
1	1	-2.4	0
2	2	-2.4	0
3	3	-2.4	0

OK Cancel Apply

Command

Steps for Definition of Moving Load Case

Live Load for Railway Assessments

1 Load menu

2 Moving Load Code dropdown

3 Moving Load Cases icon

4 Add button in Moving Load Cases dialog

5 Load Case Name field

6 NR GN CIV 025 (Network Rail) option

7 Sub-Load Cases section

8 Add button in Sub-Load Cases

9 Scale Factor field

10 List of Lanes

11 Assign Lanes button

12 OK button in Sub-Load Case dialog

Tree Menu 2

- Tables
 - Structure Tables
 - Result Tables
 - Design Tables
 - Query Tables

Repeat Steps 4 to 12, For EUDL Dynamic, RA10 Static & RA10 Dynamic Moving Load Case

The project will be saved by the auto-save feature.

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Bases] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary **Load** Analysis Results Pushover Design Rating Query Apps

Moving Load Code BS

Moving Load Load Type Moving Load Code

Traffic Line Lanes Traffic Surface Lanes Vehicles Moving Load Cases Concurrent Group Vehicle Classes Plate Element for Infl. Surface Railway Dynamic Factor Railway Dispersal Factor

Railway Dynamic Factor

Railway Dynamic Factor

Railway Dynamic Factor Table

Tree Menu

Task Pane

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Material 1

Section 4

Boundaries

Supports 4

Beam End Release 30

Static Loads

Static Load Case 1 [DL ;]

Moving Load Analysis

Moving Load Code [BS]

Traffic Line Lanes 2

Traffic Line Lane 1 [Track 1]

Traffic Line Lane 2 [Track 2]

Vehicles 4

Vehicles 1 [EUDL Dynamic ; Standard]

Vehicles 2 [EUDL Static ; Standard]

Vehicles 3 [RA10 Dynamic ; Standard]

Vehicles 4 [RA10 Static ; Standard]

Moving Load Cases 4

Moving Load Case 1 [EUDL Static]

Moving Load Case 2 [EUDL Dynamic]

Moving Load Case 3 [RA 10 Static]

Moving Load Case 4 [RA 10 Dynamic]

Railway Dynamic Factor

Select Structure Group

☒ SG:Cross Girder

☐ SG:Main Girder

☐ SG:Railbearer

Dynamic Factor Input Type

☐ Auto Input

☒ User Input

Effects

Bending for Beam Element 1.3

Shear for Beam Element 1.2

All Other Effects 1.3

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

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

Add Modify Delete

OK Cancel

Railway Dynamic Factor

Select Structure Group

☐ SG:Cross Girder

☒ SG:Main Girder

☒ SG:Railbearer

Dynamic Factor Input Type

☐ Auto Input

☒ User Input

Effects

Bending for Beam Element 1.4

Shear for Beam Element 1.3

All Other Effects 1.4

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

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

Add Modify Delete

OK Cancel

The project will be saved by the auto-save feature.

Command

Assessment Parameters and Reporting in CIVIL NX

Assessment Load Combinations

Define Assessment Case

Load Combination

	Name	Limit State	Comb. Type	Description
	DL	ULS	Comb1	
*				

Create different load combinations as per ULS

Static Load Cases and Factors(Gamma_{fl})

	Static Load Cases	Factor
	DL(ST)	1.0000
*		

Assessment Live Load

☒ Type RAI Loading ☐ Wagon Loading

Moving Load Cases and Factors(Gamma_{fl})

Static Live Load Test 1(MV) 1

Dynamic Live Load Test 1(MV) 1

Copy into Assessment Load Combination

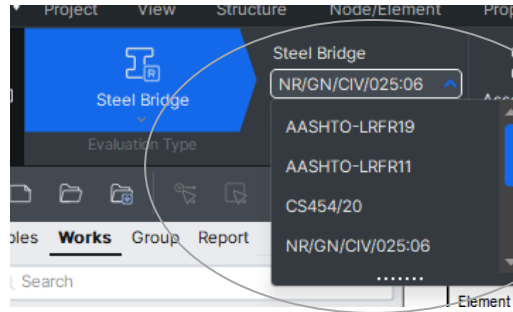
Copy into General Load Combination

Close

Provide load factors quickly according to combinations

Connect already defined Moving Load and provide gamma_{fl} accordingly

Factors for Assessment Checks



Select Assessment Code

Resistance Formula as per

☒ NR/GN/CIV/025

☐ BS5400 Part3

Required Route Availability Number: RA1

Condition Factor(F_c): 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

Manual Inputs for k2 and k3

NR/GN/CIV/025

Update by Code

Partial Safety Factors for Materials (γ_{m1})

Characteristic Strength

Wrought Iron or Steel: 1.05

Buckling of Transverse Stiffener: 1.2

Yielding of Transverse Stiffener: 1.05

Fasteners in Shear

Web/Flange Rivets: 1.2

All Other Rivets: 1.33

Worst Credible Strength

Wrought Iron or Steel: 1.05

Buckling of Transverse Stiffener: 1.2

Yielding of Transverse Stiffener: 1.05

Fasteners in Shear

Web/Flange Rivets: 1.2

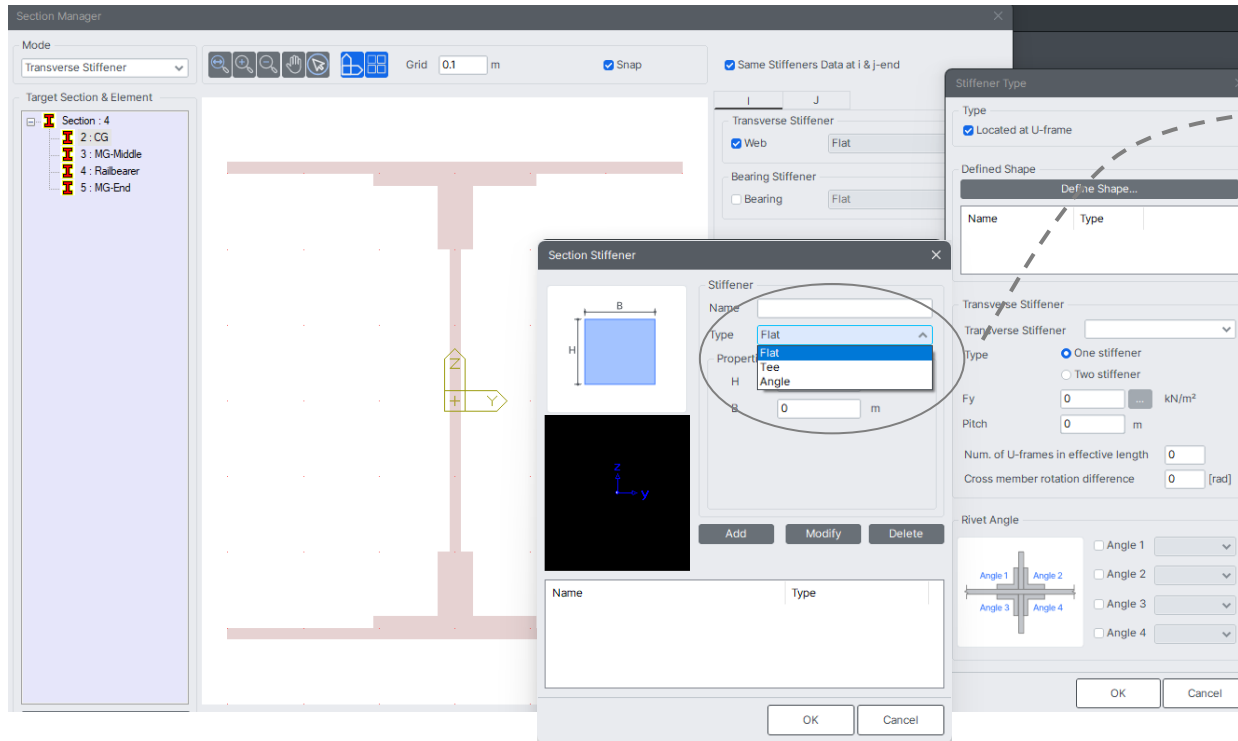
All Other Rivets: 1.33

Partial Safety Factors for Loads (γ_{f3}): 1.1

OK Cancel

Control material factors as per manual inputs too

Parameters for Assessment Checks



Can define Transverse and Bearing Stiffeners

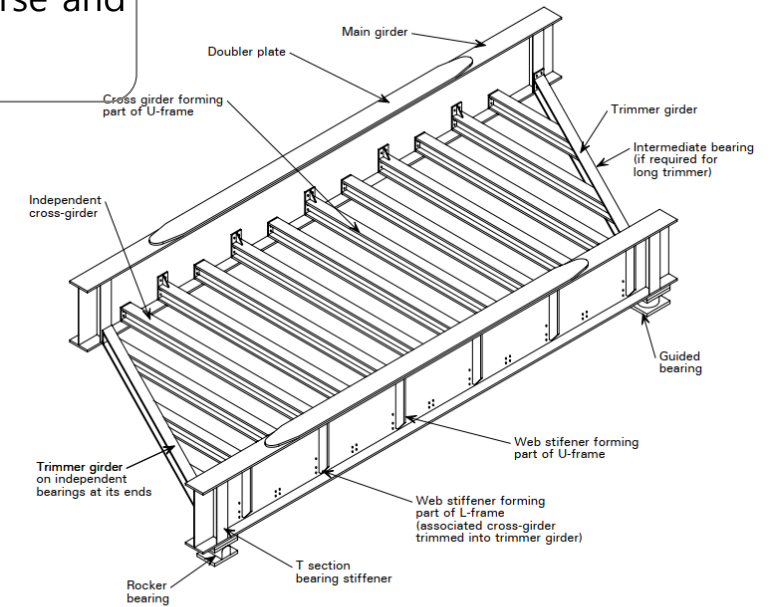
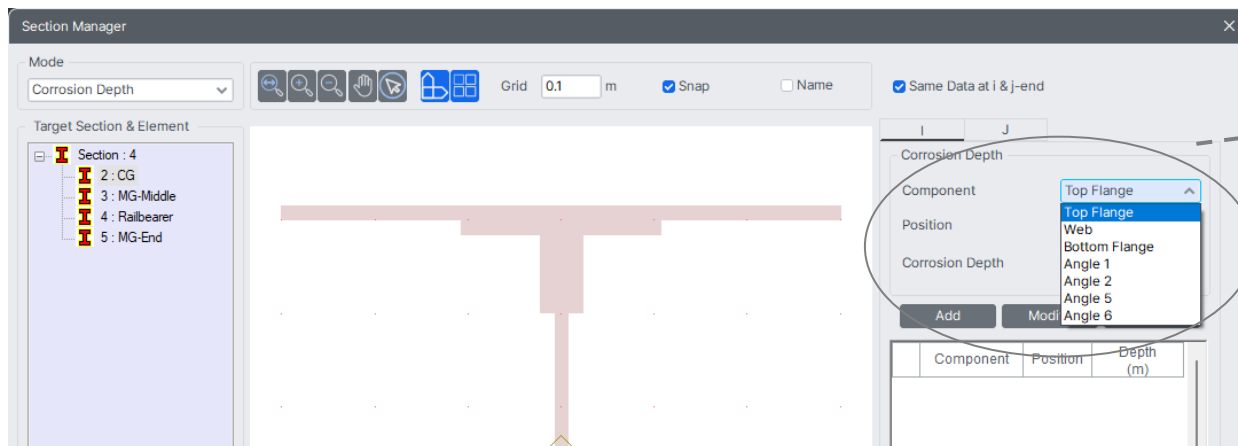


Figure 10.2 Components of half through plate girder bridge (bridge floor not shown)



Control Corrosion depth and modify section properties accordingly

Parameters for Assessment Checks

C PSC CPG Rating(PSC) **Rating(Steel)**

Effective Length of U-frame

Option
☒ Add/Replace ☐ Delete

Effective Length of U-frame

d1, d2

Cross Member is
☐ connected to the Bottom Flange
☒ User Input

d1 m
 d2 m

u
☒ Outer Beam (u=0.5)
☐ Inner Beam (u=0.33)

Member Assignments

Assign Member Type

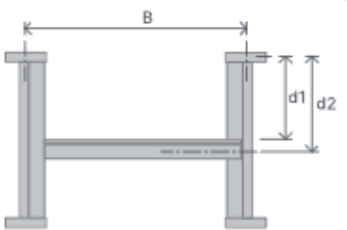
Option
☒ Add/Replace ☐ Delete

Member Type
☒ Main Girder
☐ Cross Girder
☐ Railbearer

U frame action parameters

Flexibility of Joint, f (rad/Nmm)

☒ Type (a) 0.5×10^{-10}
☐ Type (b) 0.2×10^{-10}
☐ Type (c) 0.1×10^{-10}



Rivet Parameters

Fastener-Rivets

Option
☒ Add/Replace ☐ Delete

☒ Both end parts(i & j) have the same type

I J

Longitudinal Spacing
 m

Ultimate Tensile Strength
 kN/m²

Rating Results

025:06

Assessment Code Option

Assessment Parameters

Modify Steel Material

Load Combinations

Section for Assessment

Parameter Tables

Perform Assessment

Assessment Result Tables

Assessment Result Report

Start Page x MIDAS CIVIL NX x Main Girder (Bending) x

Element	Part	Rating Case	Loading (kN-m)			Capacity (kN-m)	U for RA8				Assessed Category	
			Dead	Static	Dynamic				Static	Dynamic	Static	Dynamic
1	I [1]	DL_Fxx(Max)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Fxx(Min)	-1243.309	-1566.655	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Fyy(Max)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Fyy(Min)	-1243.309	-247.794	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Fzz(Max)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Fzz(Min)	-1243.309	-1501.452	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Mxx(Max)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Mxx(Min)	-1243.309	-1511.632	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Myy(Max)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Myy(Min)	-1243.309	-1616.948	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Mzz(Max)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	I [1]	DL_Mzz(Min)	-1243.309	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Fxx(Max)	-557.200	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Fxx(Min)	-557.200	-802.596	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Fyy(Max)	-557.200	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Fyy(Min)	-557.200	-166.103	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Fzz(Max)	-557.200	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Fzz(Min)	-557.200	-699.070	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Mxx(Max)	-557.200	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Mxx(Min)	-557.200	-670.216	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Myy(Max)	-557.200	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Myy(Min)	-557.200	-802.596	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Mzz(Max)	-557.200	-	-	-	-	-	-	-	A1	A1
1	J [3]	DL_Mzz(Min)	-557.200	-	-	-	-	-	-	-	A1	A1

Design Condition

Rating Design code	Reference formula	Element	Node(I/J)	Member Type
NR/GN/CIV/025	BS 5400	16	J	Main Girder

Section Properties

Steel girder (H Section)

Property	Value
H	2600.000 mm
tw	25.000 mm
bfl	1200.000 mm
brfl	0.000 mm
tft	60.000 mm
bfl	1200.000 mm
brfl	1200.000 mm
tfb	40.000 mm

Intermediate stiffener properties

Pair	Fillet welds (mm)	Fy (MPa)	B (mm)	t (mm)
2	0	0.000	0.000	0

Elastic Section Properties

Gross steel girder

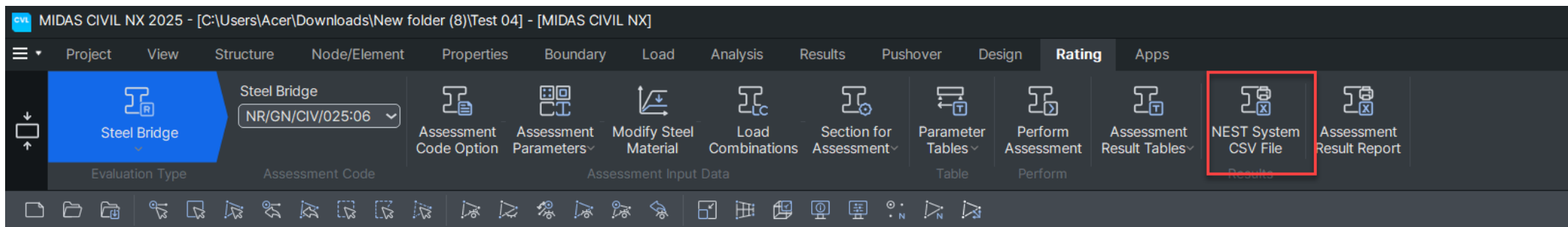
Property	Value	Property	Value
A	2.16100E+05 mm ²	Iw	2.24662E+16 mm ⁶
Iy	2.67591E+11 mm ⁴	Iz	1.79985E+10 mm ⁴
dTop	1.10316E+03 mm	dBot	1.49684E+03 mm
STop	2.42567E+08 mm ³	SBot	1.78771E+08 mm ³
SL	2.99976E+07 mm ³	SR	2.99976E+07 mm ³
w1	6.11942E+05 mm ²	w2	-6.11942E+05 mm ²
w3	9.29526E+05 mm ²	w4	9.29526E+05 mm ²

Material Properties

Normal yield stress

Assessment_29(I) Cross Girder_56 Assessment_56(I) Assessment_56(J) D16_I D16_J

Tabular and Excel Format of Results



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
		Work Order ID	Asset / Assessment Group	Parent Asset Name	Major Element Name	Major Element Physical ID	Minor Element Name	Minor Element Physical ID	Minor Element Primary Material	Element Section Reference	Element Section Location (m)	Assessed Condition	Structural Action	Description	Engineer's Line Reference Code	Track ID
1																
2	DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
3	DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
4	DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
5	DBP1	00000000	-	-	-	-	Main Girder	2	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
6	DBP1	00000000	-	-	-	-	Main Girder	2	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
7	DBP1	00000000	-	-	-	-	Main Girder	3	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
8	DBP1	00000000	-	-	-	-	Main Girder	3	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
9	DBP1	00000000	-	-	-	-	Main Girder	4	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
10	DBP1	00000000	-	-	-	-	Main Girder	4	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
11	DBP1	00000000	-	-	-	-	Main Girder	5	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
12	DBP1	00000000	-	-	-	-	Main Girder	5	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
13	DBP1	00000000	-	-	-	-	Main Girder	6	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
14	DBP1	00000000	-	-	-	-	Main Girder	6	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
15	DBP1	00000000	-	-	-	-	Main Girder	7	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
16	DBP1	00000000	-	-	-	-	Main Girder	7	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
17	DBP1	00000000	-	-	-	-	Main Girder	8	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
18	DBP1	00000000	-	-	-	-	Main Girder	8	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
19	DBP1	00000000	-	-	-	-	Main Girder	9	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
20	DBP1	00000000	-	-	-	-	Main Girder	9	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
21	DBP1	00000000	-	-	-	-	Main Girder	10	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
22	DBP1	00000000	-	-	-	-	Main Girder	10	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
23	DBP1	00000000	-	-	-	-	Main Girder	10	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
24	DBP1	00000000	-	-	-	-	Main Girder	11	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000
25	DBP1	00000000	-	-	-	-	Main Girder	11	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000

Steps for Defining Assessment Parameters and Reporting

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Base] - [MIDAS CIVIL NX]

1 Rating

2 Steel/Composite Bridge

3 Assessment Code Option

Steel/Composite Bridge
NR/GN/CIV/025:06

Assessment Code Option

Assessment Parameters

Modify Steel Material

Load Combinations Assessment

Section for Assessment

Parameter Tables

Perform Assessment

Assessment Result Tables

NEST System CSV File Results

Assessment Result Report

Tree Menu

Task Pane

Tables Works Group Report

Search

Works

Material 1

Section 4

Boundaries

Supports 4

Beam End Release 30

Static Loads

Static Load Case 1 [DL;]

Moving Load Analysis

Moving Load Code [BS]

Traffic Line Lanes 2

Traffic Line Lane 1 [Track 1]

Traffic Line Lane 2 [Track 2]

Vehicles 4

Vehicles 1 [EUDL Dynamic; Standard]

Vehicles 2 [EUDL Static; Standard]

Vehicles 3 [RA10 Dynamic; Standard]

Vehicles 4 [RA10 Static; Standard]

Moving Load Cases 4

Moving Load Case 1 [EUDL Static]

Moving Load Case 2 [EUDL Dynamic]

Moving Load Case 3 [RA 10 Static]

Moving Load Case 4 [RA 10 Dynamic]

Railway Dynamic Factor

Start Page MIDAS CIVIL NX

Base

1to55

1to74

Steel Rating Design Code

Rating Design Code NR/GN/CIV/025:06

OK

Cancel

3

4

5

Tree Menu 2

Tables Works Group Report

Tables

Structure Tables

Result Tables

Design Tables

Query Tables

*** Reading Bridge Load Rating Design Result

Command

Live Load for Railway Assessments

The screenshot displays the MIDAS CIVIL NX 2025 software interface. The main window shows the 'Rating' menu (1) and the 'Assessment Parameter' dialog (4). The 'Assessment Parameter' dialog is open, showing the 'Resistance Formula as per' section with 'NR/GN/CIV/025' selected. The 'Required Route Availability Number' is set to 'RA2', and the 'Condition Factor (Fc)' is '1'. The 'Material Strength used for Assessment' is 'Characteristic Strength'. The 'Effective Length (BS5400 Part3, 9.6.4.1.1.2)' section shows 'Span Type' as 'Simply Supported Spans', with 'k2' and 'k3' both set to '1', and 'U-frame Spacing' set to '20' m. The 'Apply Equation A4 of NR/GN/CIV/025, 9.6.4.1.1.2A' checkbox is checked. The 'User Input' checkbox is also checked. The 'Ultimate Limit State' section shows 'Flexure', 'Shear', 'Longitudinal Shear', and 'Intermediate and Bearing Stiffener' all checked. The 'Modify Design Parameters' button is visible. The 'Assessment Code Parameters' menu (3) is also shown, listing options like 'Unbraced Length (L_b)', 'Span Length', 'Transverse Stiffener', 'Web Panel Assignment', 'Effective Length of U-frame', 'Moment Distribution Factor for Slenderness', 'Fastener-Rivets', 'Assign Member Type', and 'Corrosion Depth'. The 'Modify Design Parameters' dialog (6) is open, showing 'Partial Safety Factors for Materials (gamma_m)' and 'Partial Safety Factors for Loads (gamma_{f3})'. The 'OK' button (7) is highlighted. The 'Tree Menu' on the left shows the project structure, including 'Material', 'Section', 'Boundaries', 'Supports', 'Static Loads', 'Moving Load Analysis', 'Traffic Line Lanes', 'Vehicles', and 'Moving Load Cases'. The 'Works' tab is active in the 'Tree Menu'.

Assessment Parameter Dialog (4):

- Resistance Formula as per: ☒ NR/GN/CIV/025
- Required Route Availability Number: RA2
- Condition Factor (Fc): 1
- Material Strength used for Assessment: ☒ Characteristic Strength
- Effective Length (BS5400 Part3, 9.6.4.1.1.2):
 - Span Type: ☒ Simply Supported Spans
 - k2: 1
 - k3: 1
 - U-frame Spacing: 20 m
 - ☒ Apply Equation A4 of NR/GN/CIV/025, 9.6.4.1.1.2A
- ☒ User Input
- Ultimate Limit State:
 - ☒ Flexure
 - ☒ Shear
 - ☒ Longitudinal Shear
 - ☒ Intermediate and Bearing Stiffener

Modify Design Parameters Dialog (6):

NR/GN/CIV/025 Update by Code

Partial Safety Factors for Materials (gamma_m)

	ULS
Wrought Iron or Steel	1.05
Buckling of Transverse Stiffener	1.2
Yielding of Transverse Stiffener	1.05
Fasteners in Shear	
Web/Flange Rivets	1.2
All Other Rivets	1.33

Worst Credible Strength

	ULS
Wrought Iron or Steel	1.05
Buckling of Transverse Stiffener	1.2
Yielding of Transverse Stiffener	1.05
Fasteners in Shear	
Web/Flange Rivets	1.2
All Other Rivets	1.33

Partial Safety Factors for Loads (gamma_{f3})

	ULS
	1.1

OK Cancel

*** Reading Bridge Load Rating Design Result

Command:

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Base *] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary Load Analysis Results Pushover Design **Rating** Query Apps

Steel/Composite Bridge NR/GN/CIV/025:06

Assessment Code Option Parameters Modify Steel Material Load Combinations Section for Assessment Parameter Tables Perform Assessment Assessment Result Tables NEST System CSV File Assessment Result Report

Define Assessment Case

Load Combination

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

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 Static(MV) 1

☒ Dynamic (Dynamic Factor= 1 + phi)

EUDL Dynamic(MV) 1

Copy into Assessment Load Combination

Copy into General Load Combination

Close

Define Assessment Case

Load Combination

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

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)

RA 10 Static(MV) 1

☒ Dynamic (Dynamic Factor= 1 + phi)

RA 10 Dynamic(MV) 1

Copy into Assessment Load Combination

Copy into General Load Combination

Close

Vehicles 3 [RA10 Dynamic ; Standard]

Vehicles 4 [RA10 Static ; Standard]

Moving Load Cases 4

Moving Load Case 1 [EUDL Static]

Moving Load Case 2 [EUDL Dynamic]

Moving Load Case 3 [RA 10 Static]

Moving Load Case 4 [RA 10 Dynamic]

Railway Dynamic Factor

Command

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Bse] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary Load Analysis Results Review Design Rating Query Apps

Steel/Composite Bridge NR/GN/CIV/025'06

Assessment Assessment Modify Steel Load Section for Assessment Parameter Perform Assessment Assessment NEST System Assessment

Code Option Parameters Material Combinations Tables CSV File Result Report

Tree Menu Task Pane

Concrete SRC PSC CPG Rating(PSC) Rating(Steel)

Section for Assessment Che

Option Add/Replace Delete

Position I J I & J

Select All Elements

*** Reading Bridge Load Rating Design Result

Command

Tree Menu 2

Tables Works Group Report

Works

Structures

Nodes 55

Elements 74

Properties

Material 1

Section 4

Boundaries

Supports 4

Beam End Release 30

Static Loads

Static Load Case 1 [DL;]

Moving Load Analysis

Moving Load Code [BS]

Traffic Line Lanes 2

Traffic Line Lane 1 [Track 1]

Traffic Line Lane 2 [Track 2]

Vehicles 4

Vehicles 1 [EUDL Dynamic; Standard]

Vehicles 2 [EUDL Static; Standard]

Vehicles 3 [RA10 Dynamic; Standard]

Vehicles 4 [RA10 Static; Standard]

Moving Load Cases 4

Moving Load Case 1 [EUDL Static]

Moving Load Case 2 [EUDL Dynamic]

Moving Load Case 3 [RA10 Static]

Live Load for Railway Assessments

MIDAS CIVIL NX 2025 - [E:\NR SEMINAR\Bases] - [MIDAS CIVIL NX]

Project View Structure Node/Element Properties Boundary Load Analysis Results Design Rating Query Apps

Steel/Composite Bridge NR/GN/CIV/025:06

Assessment Code

Assessment Code Option Parameters Modify Steel Material Load Combinations

Assessment Code Option Parameters Modify Steel Material Load Combinations

Section for Assessment

Parameter Tables

Perform Assessment

Assessment Result Tables

NEST System CSV File Results

Assessment Result Report

Section for Assessment Check

Section for Assessment Report

Section for Assessment Report Table

Section for Assessment Report Table

Base

16 29 56

Section for Assessment Report

Option

Add/Replace Delete

Part

I J I & J

Select Elements (16, 29 & 56)

Close Apply

*** Reading Bridge Load Rating Design Result

Command

Tree Menu

Task Pane

Concrete SRC PSC CPG Rating(PSC) Rating(Steel)

Section for Assessment Repri

Option

Add/Replace Delete

Part

I J I & J

Tree Menu 2

Tables Works Group Report

Works

Structures

Nodes 55

Elements 74

Properties

Material 1

Section 4

Boundaries

Supports 4

Beam End Release 30

Static Loads

Static Load Case 1 [DL ;]

Moving Load Analysis

Moving Load Code [BS]

Traffic Line Lanes 2

Traffic Line Lane 1 [Track 1]

Traffic Line Lane 2 [Track 2]

Vehicles 4

Vehicles 1 [EUDL Dynamic ; Standard]

Vehicles 2 [EUDL Static ; Standard]

Vehicles 3 [RA10 Dynamic ; Standard]

Vehicles 4 [RA10 Static ; Standard]

Moving Load Cases 4

Moving Load Case 1 [EUDL Static]

Moving Load Case 2 [EUDL Dynamic]

Moving Load Case 3 [RA 10 Static 1]

Live Load for Railway Assessments

The screenshot displays the MIDAS CIVIL NX software interface, specifically the 'Rating' menu and the 'Main Girder' assessment report. The interface includes a top menu bar, a left tree menu, and a main workspace displaying a detailed table of assessment results for various structural elements. A red box highlights the 'Rating' menu and the 'Main Girder' report, with numbered callouts (1-6) indicating specific steps in the process. A red arrow points from the 'Rating' menu to the 'Main Girder' report. A red box also highlights the 'Design Condition' and 'Bending Result Summary' sections of the report.

Rating Menu:

- 1. Rating
- 2. Steel/Composite Bridge
- 3. Perform Assessment
- 4. Assessment Result Tables
- 5. Main Girder, Bending Moment
- 6. Assessment Result Report

Main Girder Assessment Report (Steel-Rating):

Element	Part	Rating Case	Loading (kN-m)			RA		U		Assessed Category	
			Dead	Static	Dynamic	Static	Dynamic	Static	Dynamic		
1	I [1]	RA 10	-21.839	-34.237	-47.931	RA 15	RA 15	0.002	0.002	A1	A1
1	I [1]	RA 10	-21.839	249.733	349.626	RA 15	RA 15	0.080	0.089	A1	A1
1	J [3]	RA 10	1518.932	-20.422	-28.591	RA 15	RA 15	0.153	0.173	A1	A1
1	J [3]	RA 10	1518.932	1128.194	1579.471	RA 15	RA 15	0.152	0.172	A1	A1
2	I [3]	RA 10	1518.932	1128.194	1579.471	RA 15	RA 15	0.192	0.215	A1	A1
2	J [4]	RA 10	2850.425	2289.050	3204.669	RA 15	RA 15	0.153	0.173	A1	A1
3	I [4]	RA 10	2833.463	2268.996	3176.594	RA 15	RA 15	0.152	0.172	A1	A1
3	J [5]	RA 10	3669.203	2707.939	3791.115	RA 15	RA 15	0.192	0.215	A1	A1
4	I [5]	RA 10	3660.352	2696.468	3775.055	RA 15	RA 15	0.153	0.173	A1	A1
4	J [6]	RA 10	4280.290	3304.106	4625.748	RA 15	RA 15	0.152	0.172	A1	A1
5	I [6]	RA 10	4273.961	3298.365	4617.712	RA 15	RA 15	0.192	0.215	A1	A1
5	J [7]	RA 10	4385.124	3215.110	4501.154	RA 15	RA 15	0.153	0.173	A1	A1
6	I [7]	RA 10	4385.124	3215.110	4501.154	RA 15	RA 15	0.152	0.172	A1	A1
6	J [8]	RA 10	4273.961	3298.209	4617.493	RA 15	RA 15	0.192	0.215	A1	A1
7	I [8]	RA 10	4282.287	3305.896	4628.255	RA 15	RA 15	0.153	0.173	A1	A1
7	J [9]	RA 10	3662.349	2699.923	3779.892	RA 15	RA 15	0.152	0.172	A1	A1
8	I [9]	RA 10	3670.829	2710.753	3795.053	RA 15	RA 15	0.192	0.215	A1	A1
8	J [10]	RA 10	2835.089	2270.592	3178.829	RA 15	RA 15	0.153	0.173	A1	A1
9	I [10]	RA 10	2851.890	2290.510	3206.715	RA 15	RA 15	0.152	0.172	A1	A1
9	J [11]	RA 10	1520.397	1193.740	1671.236	RA 15	RA 15	0.192	0.215	A1	A1
10	I [11]	RA 10	1520.397	1129.654	1581.516	RA 15	RA 15	0.153	0.173	A1	A1
10	J [2]	RA 10	-20.374	-32.443	-45.420	RA 15	RA 15	0.152	0.172	A1	A1
10	J [2]	RA 10	-20.374	857.827	1200.957	RA 15	RA 15	0.192	0.215	A1	A1
11	I [12]	RA 10	-17.939	249.749	349.649	RA 15	RA 15	0.153	0.173	A1	A1
11	I [12]	RA 10	-17.939	-34.237	-47.931	RA 15	RA 15	0.152	0.172	A1	A1
11	J [13]	RA 10	1090.925	-20.422	-28.591	RA 15	RA 15	0.192	0.215	A1	A1
11	J [13]	RA 10	1090.925	1128.193	1579.471	RA 15	RA 15	0.153	0.173	A1	A1
12	I [13]	RA 10	1090.925	1128.193	1579.471	RA					

Live Load for Railway Assessments

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Project View Structure Node/Element Properties Boundary Load Analysis Results Pushover Design **Rating** Query Apps

Steel/Composite Bridge NR/GN/CIV/025:06

Assessment Code Option Parameters Modify Steel Material Load Combinations Assessment Section for Parameter Tables Perform Assessment Assessment Result Tables NEST System CSV File Results Assessment Result Report

Physical ID of Asset Work Order ID Asset / Assessment Group Parent Asset Name Major Element Name Major Element Physical ID Minor Element Name Minor Element Physical ID Minor Element Primary Material Element Section Reference Element Section Location (m) Assessed Condition Structural Action Description Engineer's Line Reference Code Track ID Loading S

DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	1	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	2	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	2	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	3	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	3	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	4	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
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DBP1	00000000	-	-	-	-	Main Girder	6	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	7	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	7	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	8	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
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DBP1	00000000	-	-	-	-	Main Girder	9	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	9	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	10	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
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DBP1	00000000	-	-	-	-	Main Girder	11	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	11	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
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DBP1	00000000	-	-	-	-	Main Girder	11	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	12	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish
DBP1	00000000	-	-	-	-	Main Girder	12	Wrought Iron	-	-	As Built	Bending Moment		DBP1	0000	Publish

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