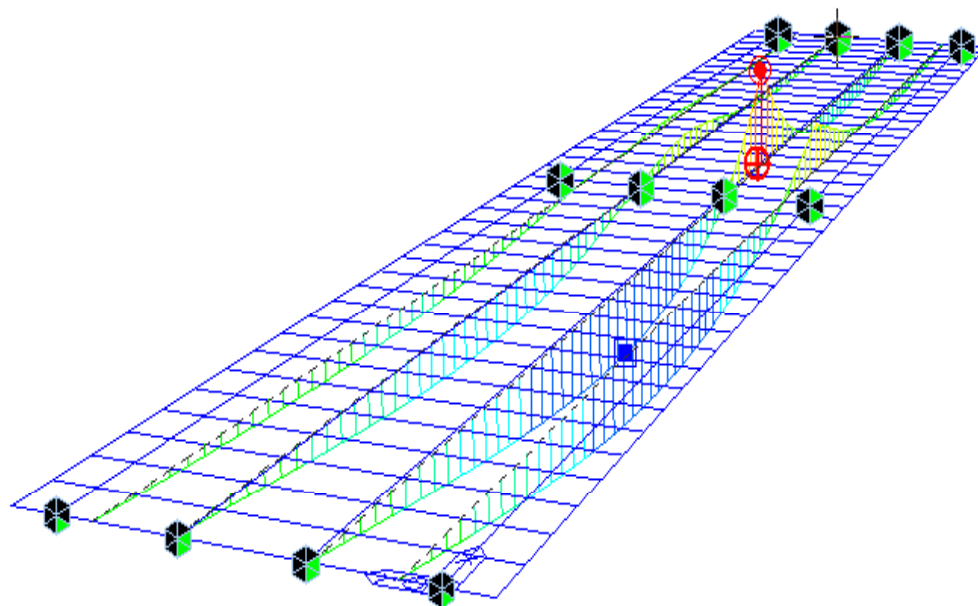


Moving load analysis

(CSA-S6-06 : 2010)



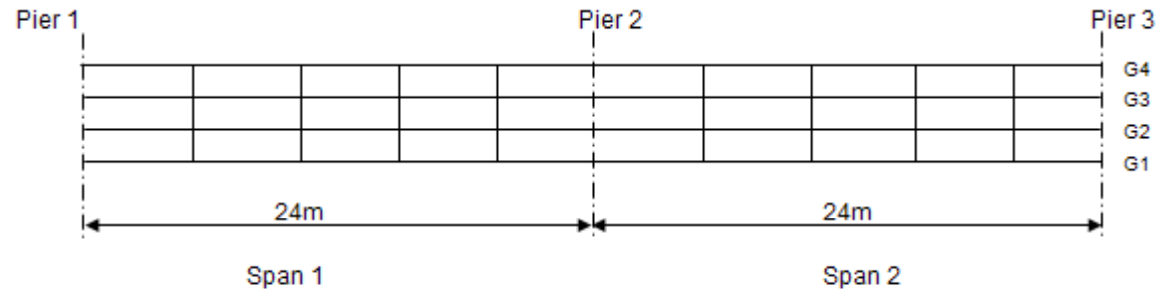
Program Version	Civil 2013 (v1.1)
Program License	Registered, Trial
Revision Date	August 31, 2012

Overview

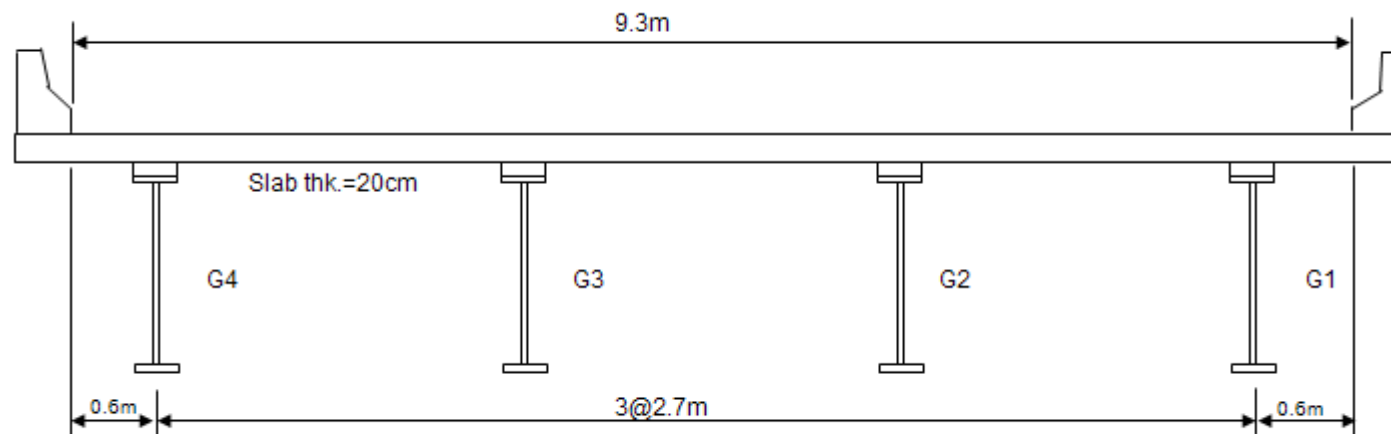
- **Bridge overview**
 - ✓ 2 span continuous composite girder bridge
 - ✓ Span length: 2@24 m
 - ✓ Carriageway width: 9.3 m
 - ✓ Unit system: kN, m
- **Lane definition**
 - ✓ As per Table 3.4 of CSA-S6-06:2010
- **Vehicle load**
 - ✓ CL-625 Truck Load
 - ✓ CL-625 Lane Load
- **Moving load analysis option**
 - ✓ Concurrent forces
- **Result evaluation**
 - ✓ Influence line
 - ✓ Moving load tracer
 - ✓ Envelope of member forces

1. Bridge overview

- **Bridge type:** Straight bridge
- **Span length:** 2@24 m
- **Carriageway width:** 9.3 m
- **Total Deck Width:** 10.2 m
- **Spacing of cross beams:** 4.8 m



a) Plan view



b) Cross section

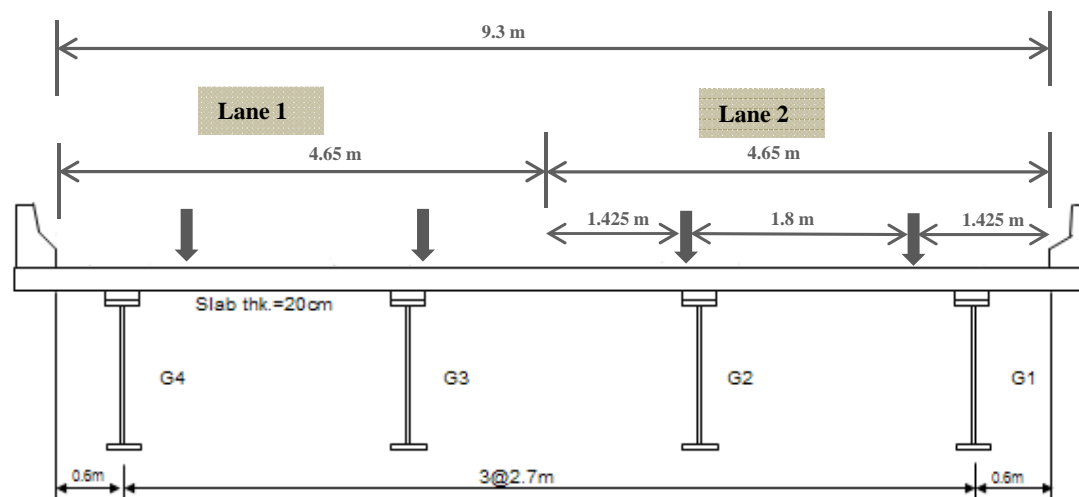
2. Number and width of notional lanes

CSA-S6-06 : 2010: Table 3.4 Number of Design Lanes

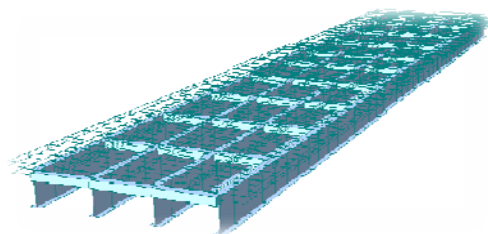
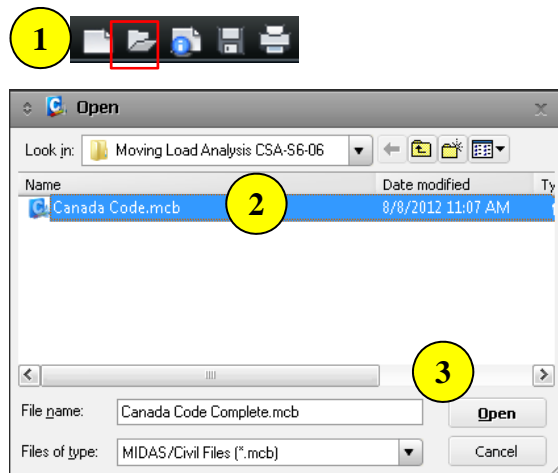
Carriageway width w	Number of lanes	Width of one lane w_e
$w = 9.3 \text{ m}$	$n = 2$	4.65 m


3. Location and numbering of the lanes of the bridge

- ✓ In midas Civil, the user directly defines the locations of lanes. For this tutorial, the lanes and axle loads are illustrated below.



Step 1. Open the model file.



1. Click .
2. Select 'Canada Moving Load .mcb'.
3. Click [Open] button.

This tutorial is intended to introduce the functions of Moving load analysis. Therefore the procedures of creating elements, assigning static loads and boundary conditions are omitted here.

Please refer to the online manual for the detailed usage.

Step2. Define moving load code



1. Load > Moving load analysis data > Moving load code...
2. Moving Load Code: **Canada**
3. Click [OK] button.

Step3-1. Define traffic line lane (Lane 1)

For detailed information of Vehicular Load Distribution, refer to the next page.

For the calculation of the eccentricity, refer page 7 of this tutorial.

Cross Beam group comprises all the transverse elements.

Traffic Line Lanes

Lane Name : Lane 1

Traffic Lane Properties

Start End
a : Eccentricity

Eccentricity : 0 m

Wheel Spacing : 1.8 m

Vehicular Load Distribution

☐ Lane Element ☒ Cross Beam

Cross Beam Group

Cross Beam

Skew

Start 0 End 0 [deg]

Moving Direction

☐ Forward ☐ Backward ☒ Both

Selection by

☒ 2 Points ☐ Picking ☐ Number

0, 0, 0 m
0, 0, 0 m

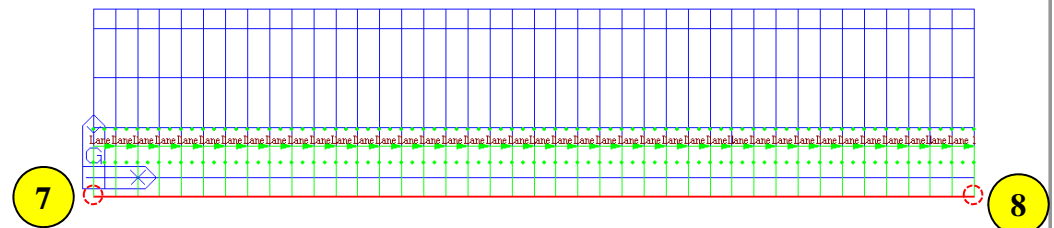
Operations

Add Insert Delete

No	Elem	Eccen. (m)
1	1	-2.775
2	2	-2.775
3	3	-2.775

Cancel Apply

1. Load > Moving load analysis data > Traffic line lanes...
2. Lane Name: **Lane 1**
3. Eccentricity : **-2.775 m**
4. Vehicular Load Distribution : **Cross Beam**
5. Cross Beam Group: **Cross Beam**
6. Selection by : **2 Points**
7. Click (0,-1.05,0).
8. Click (48,-1.05,0).
9. Click [OK] button.



Tip 1. Vehicular load distribution

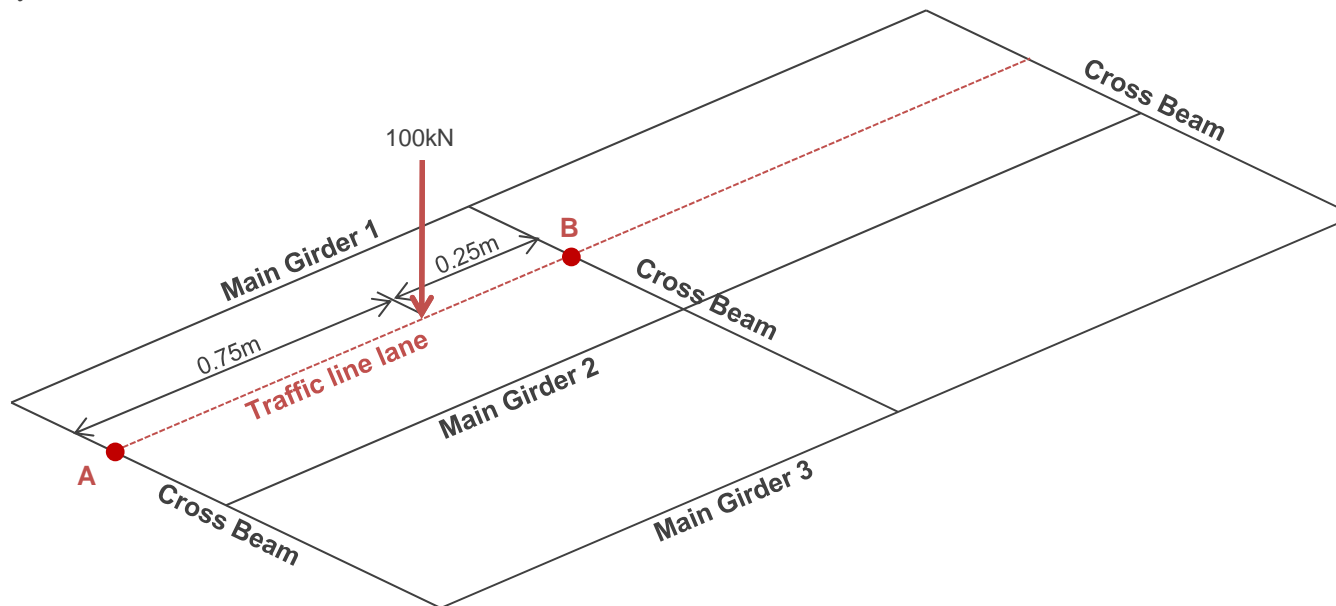
▣ **Lane element:** Apply loads to the traffic line lane elements reflecting the eccentricity.

When defining lanes by the lane element type, the vertical load components (vehicle loads) and the moments due to the eccentricity are assigned only to the line lane elements. Even though the lanes can be located on cross beam elements, if the lane element type is selected, then the distribution of the loads onto the cross beams will not be considered.

▣ **Cross beam:** Apply the traffic loads to the cross beams.

When using Cross Beam type, the eccentricity is used only for locating the lanes from the line lane elements. The vehicle loads are distributed to the girders via cross beam elements defined as a Cross Beam Group. If the user is modeling a bridge having multiple girders, the Cross Beam type is recommended for vehicular load distribution.

For example, an axle load of 100kN is located as shown below. Then, concentrated loads, 25kN and 75kN, are applied to point A and point B respectively. The cross beams themselves are loaded.



Step3-2. Define traffic line lane (Lane 2)

Traffic Line Lanes

Lane Name : Lane 2

Traffic Lane Properties

a : Eccentricity

Eccentricity : 0 m

Wheel Spacing : 1.8 m

Vehicular Load Distribution

☐ Lane Element ☒ Cross Beam

Cross Beam Group

Cross Beam

Skew

Start 0 End 0 [deg]

Moving Direction

☐ Forward ☐ Backward ☒ Both

Selection by

☒ 2 Points ☐ Picking ☐ Number

0, 0, 0 m

0, 0, 0 m

Operations

Add Insert Delete

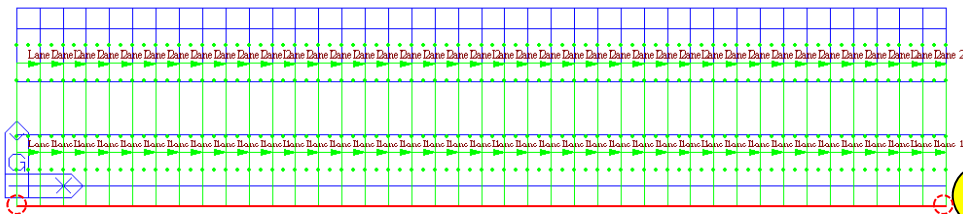
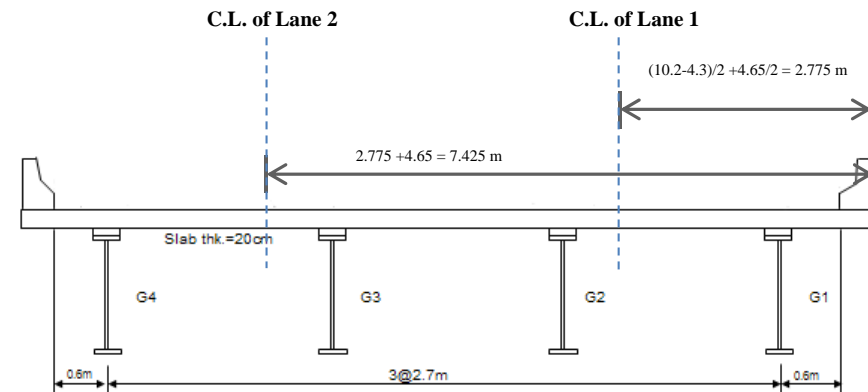
No	Elem	Eccen. (m)
1	1	-7.425
2	2	-7.425
3	3	-7.425

Cancel Apply

Enter the eccentricity of a traffic line lane relative to a traffic line lane element. Traffic line lane elements are defined as the reference frame elements from which the eccentricity is measured.

🔊 In this tutorial, the eccentricities are between the 2 Point Line (created in step 5) and the center-line of the lane .

1. Lane Name: **Lane 2**
2. Eccentricity : **-7.425 m**
3. Vehicular Load Distribution : **Cross Beam**
4. Cross Beam Group: **Cross Beam**
5. Selection by : **2 Points**
6. Click **(0,-1.05,0)**.
7. Click **(48,-1.05,0)**.
8. Click **[OK]** button.



Step6. Define vehicular load

(Case 1. CL-625 Truck)

Define Standard Vehicular Load

Standard Name: Canadian Standard Load(CAN/CSA-S6-00)

Vehicular Load Properties:

Vehicular Load Name: CL-625 Truck

Vehicular Load Type: CL-625 Truck

Diagram showing 5 point loads (P1 to P5) and 4 spacings (D1 to D4).

No	Load(kN)	Spacing(m)	W	0	kN/m
1	50	3.6			
2	125	1.2			
3	125	6.6			
4	175	6.6			
5	150	end			

Dynamic Load Allowance:

☒ Auto ☐ User Input

0.4 where only one axle of the CL-W Truck is used

0.3 where any two axle, or axles 1,2 and 3 are used

0.25 where three axles except for axles 1,2 and 3 or more than three axles are used

OK Cancel Apply

1. Load > Moving load analysis data > Vehicles...

2. Standard Name : Canadian Standard Load

3. Vehicular Load Type : CL-625 Truck

4. Click [OK] button.

For Ontario , the program also provides CL-625-ONT loadings under the vehicle load type

BCL-625 Truck and BCL-625 Lane are new additions to Civil 2013 (v1.1) as per BC Ministry of Transportation Supplement to the Canadian Highway Bridge Design Code

The user can directly change Dynamic Load Allowance via the user input option

The Static Effects Without Dynamic Load Allowance can be considered by entering 'zero' in the values fields after selecting user input

Step4. Define vehicular load

(Case 2. CL-625 Lane)

Define Standard Vehicular Load

Standard Name
Canadian Standard Load(CAN/CSA-S6-00)

Vehicular Load Properties

Vehicular Load Name : CL-625 Lane

Vehicular Load Type : CL-625 Lane

Diagram showing a truck load with five axles (P1 to P5) and a uniformly distributed load (W) over a width of 9m. The diagram also shows the spacing between axles (D1, D2, D3, D4).

No	Load(kN)	Spacing(m)
1	40	3.6
2	100	1.2
3	100	6.6
4	140	6.6
5	120	end

W 9 kN/m

Dynamic Load Allowance

☒ Auto ☐ User Input

0.4 where only one axle of the CL-W Truck is used

0.3 where any two axle, or axles 1,2 and 3 are used

0.25 where three axles except for axles 1,2 and 3 or more than three axles are used

OK Cancel Apply

1. Load > Moving load analysis data > Vehicles...

2. Standard Name : Canadian Standard Load

3. Vehicular Load Type : CL-625 Lane

4. Click [OK] button.

CL-625 Lane: The CL-W Lane Load consists of a CL-W Truck with each axle reduced to 80% of the value specified for CL-W Truck load, superimposed within a uniformly distributed load of 9 kN/m, and 3.0 m wide

The user can directly change Dynamic Load Allowance via the user input option

Step5. Define moving load case

(Case 1. FLS Combination)

Sub - Load Case

Load Case Data

Vehicle Class: VL:CL-625 Truck (4)

Scale Factor: 1

Min. Number of Loaded Lanes: 1

Max. Number of Loaded Lanes: 1

Assignment Lanes

List of Lanes: Lane 2 (5)

Selected Lanes: Lane 1

> (7)

<

OK Cancel

Define Moving Load Case

Load Case Name: CL-625-Truck (2)

Description:

☐ Load Case for Permit Vehicle

Multiple Presence Factor

Num of Loaded Lanes	Scale Factor
1	1
2	0.9
3	0.8
4	0.7
5	0.6
> 5	0.55

Sub-Load Cases

Loading Effect

☒ Combined ☐ Independent

Vehicle class	Scale	Lane1
VL:CL-625 Truck	1	Lane 1

< >

Add (3) Modify Delete

OK (8) Cancel Apply

1. Load > Moving load analysis data > Moving Load Cases...

2. Load Case Name : **CL-625 Truck**

3. Click [Add] Button.

4. Vehicle : CL -625 Truck

5. Select **Lane 1**

6. Click ->

7. Click [OK] button.

8. Click [OK] button .

For the FLS and for SLS Combination 2, the traffic load shall be one truck only, placed at the center of one travelled lane. The lane load shall not be considered.

Step7. Define moving load case

(Case 2. SLS Combination 1 / Ultimate Limit State)

Sub - Load Case

Load Case Name: **CL-625**

Vehicle Class: **VL:CL-625 Lane**

Scale Factor: **1**

Min. Number of Loaded Lanes: **1**

Max. Number of Loaded Lanes: **2**

Assignment Lanes

List of Lanes: **Lane 1, Lane 2**

Selected Lanes: **Lane 1, Lane 2**

Define Moving Load Case

Load Case Name: **CL-625**

Description:

☐ Load Case for Permit Vehicle

Multiple Presence Factor

Num of Loaded Lanes	Scale Factor
1	1
2	0.9
3	0.8
4	0.7
5	0.6
> 5	0.55

Sub - Load Cases

Loading Effect: ☒ Combined ☐ Independent

Vehicle class	Scale	Lane1
VL:CL-625 Lane	1	Lane 1
VL:CL-625 Truck	1	Lane 1

Sub - Load Case Data

Vehicle Class: **VL:CL-625 Truck**

Scale Factor: **1**

Min. Number of Loaded Lanes: **1**

Max. Number of Loaded Lanes: **2**

Assignment Lanes

List of Lanes: **Lane 1, Lane 2**

Selected Lanes: **Lane 1, Lane 2**

1. Load > Moving load analysis data > Moving Load Cases...

2. Load Case Name : **CL-625**

3. Click [Add] button.

4. Vehicle Class : **VL-CL-625 Lane**

5. Max. Number of Loaded Lanes: **2**

6. Select **Lane 1** and **Lane 2**

7. Click **->**

8. Click [OK] button.

9. Repeat steps 5 to 9 with vehicle class **VL-CL-625 Truck**

10. Click [OK] button.

For SLS Combination 1 and for ultimate limit states, the traffic load shall be the truck load increased by the dynamic load allowance or the lane load, whichever produces the maximum load effect

Step10. Moving load analysis option

Influence Line Dependent point/All Points :
Refer next slide

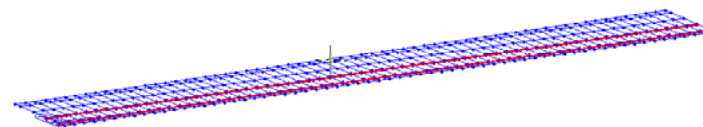
1. Analysis Tab > Moving Load
2. Frame : Normal + Concurrent Force
3. Displacements Group : Results
4. Forces/Moments Group : Results
5. Click [OK] button.

Number/Line Element : Assign the number of reference points on a line element for moving loads and drawing influence line in an influence line analysis. The accuracy of results increases with increase in the number, but the analysis time may become excessive.

Normal + Concurrent Force : If the output of concurrent forces for max and min values is required for moving load analysis, select 'Normal + Concurrent Force'.

Select the specific group for which analysis results need to be checked in order to reduce analysis time.

[Structure Group: Results]



Tip 2. Influence Line Dependent Point / All Points (Refer fig. in last slide)

Influence Line Dependent Point

This is a method which controls the vehicular loads in a moving load analysis according to the influence values.

Maximum value(+): From the locations of the applied loads only the loads that result in positive influence values are used in the computation.

Minimum value(-): From the locations of the applied loads, only the loads that result in negative(-) influence values are used in the computation.

This method is used for general vehicular loading and yields results larger than that from the All Points method because the loads are controlled according to the influence values.

All Points

This is a method which analyzes the structure for applied vehicular loads in the moving load analysis at all locations without controlling the influence values.

The method is used for train loading and yields results smaller than that from the Influence Dependent Point method because the loads are not controlled according to the influence values.

Step 11. Perform analysis

Step 12-1. Shear force diagrams

MVmin : The minimum force resulting from the vehicle load applied to the structure.

MVmax : The maximum force resulting from the vehicle load applied to the structure.

MVall : Both maximum and minimum force resulting from the vehicle load applied to the structure.

1. Click  .

1. Results > Forces > Beam Diagrams...

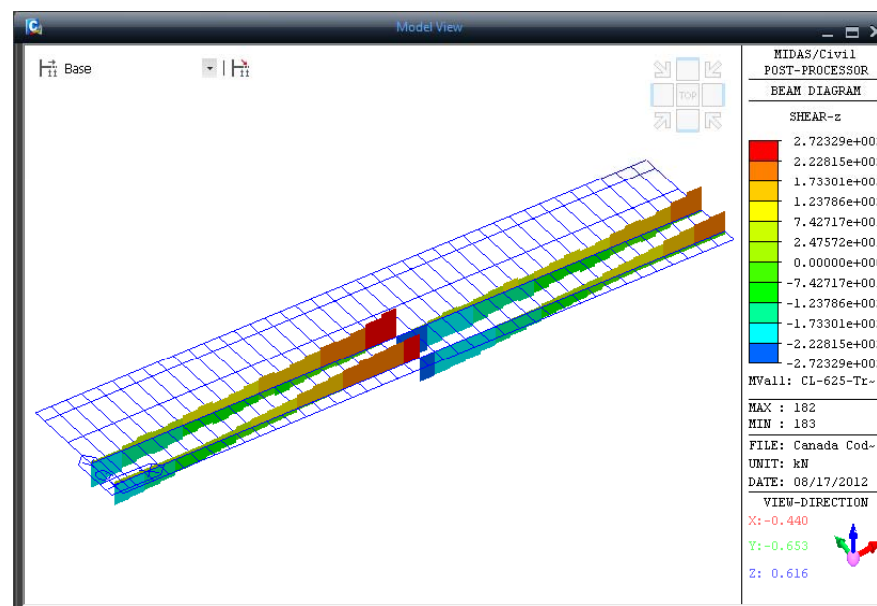
2. Load Cases/Combinations : MWall:CL-625 Truck

3. Components : Fz

4. Display Options : Solid Fill

5. Check on Legend.

6. Click [Apply] button.



Step 12-2. Shear force tables

Beam Diagrams ... **1**

Load Cases/Combinations
MVal: CL-625-Truck ...

Step ...

☒ Max/Min Diagram

Components
Part Total ...

☐ Fx ☐ Mx ☐ Fy ☐ Fz ☐ Fyz ☒ My ☐ Mz ☐ Myz

☐ Show Truss Forces
☐ Only Truss Forces

Display Options
☐ Exact ☐ No Fill ☒ 5 Points ☒ Line Fill ☐ Solid Fill

Scale: 1.000000

1. Click
2. Check on **CL-625-Truck (MV:all)**.
3. Click [OK] button.

Records Activation Dialog

Node or Element
All None Inverse Prev

Element 1to445

Select Type
Element Type ... **2**

TRUSS
BEAM
PLANE STRESS
PLATE
PLANE STRAIN
AXISYMMETRIC

Loadcase/Combination

☐ SW of Deck Slab(ST)
☐ SW of Haunch(ST)
☐ SW of Forms(ST)
☐ SDL Parapets(ST)
☐ SDL FW5(ST)
☐ MWminFLS/SLS2Fz103(ST)
☒ **MWmaxFLS/SLS2Fz103(ST)**
☒ **CL-625-Truck(MV:all)**

☐ CL-625-Truck(MV:max)
☐ CL-625-Truck(MV:min)
☐ CL-625(MV:all)
☐ CL-625(MV:max)
☐ CL-625(MV:min)
☐ FLS(CB)
☐ SLS 1(CB)

Part Number

☒ Part i
☐ Part 1/4
☐ Part 2/4
☐ Part 3/4
☒ Part j

3

OK Cancel

	Elem	Load	Part	Axial (kN)	Shear-y (kN)	Shear-z (kN)	Torsion (kN-m)	Moment-y (kN-m)	Moment-z (kN-m)
	82	CL-625-	I[42]	0.00	0.00	-187.77	-15.74	-0.00	0.00
	82	CL-625-	J[43]	0.00	0.00	-187.77	-15.74	225.33	0.00
	83	CL-625-	I[43]	0.00	0.00	-176.88	-12.63	222.32	0.00
	83	CL-625-	J[44]	0.00	0.00	-176.88	-12.63	419.98	0.00
	84	CL-625-	I[44]	0.00	0.00	-164.29	12.83	416.69	0.00
	84	CL-625-	J[45]	0.00	0.00	-164.29	12.83	584.54	0.00
	85	CL-625-	I[45]	0.00	0.00	-148.81	15.62	581.19	0.00
	85	CL-625-	J[46]	0.00	0.00	-148.81	15.62	736.92	0.00
	86	CL-625-	I[46]	0.00	0.00	-121.41	-14.87	736.92	0.00
	86	CL-625-	J[47]	0.00	0.00	-121.41	-14.87	838.41	0.00
	87	CL-625-	I[47]	0.00	0.00	-108.15	-12.00	835.64	0.00
	87	CL-625-	J[48]	0.00	0.00	-108.15	-12.00	909.85	0.00
	88	CL-625-	I[48]	0.00	0.00	-95.15	12.42	907.46	0.00
	88	CL-625-	J[49]	0.00	0.00	-95.15	12.42	954.47	0.00
	89	CL-625-	I[49]	0.00	0.00	-80.84	14.83	952.66	0.00
	89	CL-625-	J[50]	0.00	0.00	-80.84	14.83	964.84	0.00
	90	CL-625-	I[50]	0.00	0.00	67.16	-14.41	964.84	0.00
	90	CL-625-	J[51]	0.00	0.00	67.16	-14.41	925.18	0.00
	91	CL-625-	I[51]	0.00	0.00	80.93	-11.92	924.85	0.00

Step 12-3. Shear force tables (Concurrent forces)

1. Right-click on the Beam Force table.
2. Select **View by Max Value Item...**
3. Check on **Shear-z**.
4. Click [OK] button.

	Elem	Load	Part	Axial (kN)	Shear-y (kN)	Shear-z (kN)	Torsion (kN-m)	Moment-y (kN-m)	Moment-z (kN-m)
	82	MVL-CL	I[42]	0.00	0.00	-187.77	-18.22	-0.00	0.00
	82	MVL-CL	J[43]	0.00	0.00	-187.77	-18.22		
	83	MVL-CL	I[43]	0.00	0.00	-176.88	-15.43		
	83	MVL-CL	J[44]	0.00	0.00	-176.88	-15.43		
	84	MVL-CL	I[44]	0.00	0.00	-164.29	-13.77		
	84	MVL-CL	J[45]	0.00	0.00	-164.29	-13.77		
	85	MVL-CL	I[45]	0.00	0.00	-148.81	15.62		
	85	MVL-CL	J[46]	0.00	0.00	-148.81	15.62		
	86	MVL-CL	I[46]	0.00	0.00	-121.41	-16.45		
	86	MVL-CL	J[47]	0.00	0.00	-121.41	-16.45		
	87	MVL-CL	I[47]	0.00	0.00	-108.15	-13.37		
	87	MVL-CL	J[48]	0.00	0.00	-108.15	-13.37		
	88	MVL-CL	I[48]	0.00	0.00	-95.15	12.42		
	88	MVL-CL	J[49]	0.00	0.00	-95.15	12.42		
	89	MVL-CL	I[49]	0.00	0.00	-80.84	14.83		
	89	MVL-CL	J[50]	0.00	0.00	-80.84	14.83		

Result View Items

Items to Display

- ☐ Axial
- ☒ Shear-y
- ☒ Shear-z
- ☐ Torsion
- ☐ Moment-y
- ☐ Moment-z

Load Cases to Display

- ☐ SW of Girders(ST)
- ☐ SW of CFs(ST)
- ☐ SW of Deck Slab(ST)
- ☐ SW of Haunch(ST)
- ☐ SW of Forms(ST)
- ☐ SDL Parapets(ST)
- ☐ SDL FWS(ST)
- ☐ MVminFLS/SL52Fz103(ST)
- ☐ MVmaxFLS/SL52Fz103(ST)
- ☒ CL-625-Truck(MV:all)
- ☐ CL-625-Truck(MV:max)
- ☐ CL-625-Truck(MV:min)
- ☐ CL-625(MV:all)
- ☐ CL-625(MV:max)

OK Cancel

Calculate the corresponding member forces under the conditions where the maximum and minimum member forces occur at each position.

	Elem	Load	Part	Component	Axial (kN)	Shear-y (kN)	Shear-z (kN)	Torsion (kN-m)	Moment-y (kN-m)	Moment-z (kN-m)
	82	CL-625-	I[42]	Shear-z	0.00	0.00	-187.77	-11.87	-0.00	0.00
	82	CL-625-	J[43]	Shear-z	0.00	0.00	-187.77	-11.87	225.33	0.00
	83	CL-625-	I[43]	Shear-z	0.00	0.00	-176.88	-8.87	207.72	0.00
	83	CL-625-	J[44]	Shear-z	0.00	0.00	-176.88	-8.87	419.98	0.00
	84	CL-625-	I[44]	Shear-z	0.00	0.00	-164.29	-5.88	387.20	0.00
	84	CL-625-	J[45]	Shear-z	0.00	0.00	-164.29	-5.88	584.34	0.00
	85	CL-625-	I[45]	Shear-z	0.00	0.00	-148.81	-0.59	533.82	0.00
	85	CL-625-	J[46]	Shear-z	0.00	0.00	-148.81	-0.59	712.39	0.00
	86	CL-625-	I[46]	Shear-z	0.00	0.00	-121.41	-11.64	646.79	0.00
	86	CL-625-	J[47]	Shear-z	0.00	0.00	-121.41	-11.64	792.48	0.00
	87	CL-625-	I[47]	Shear-z	0.00	0.00	-108.15	-9.25	706.50	0.00
	87	CL-625-	J[48]	Shear-z	0.00	0.00	-108.15	-9.25	836.28	0.00
	88	CL-625-	I[48]	Shear-z	0.00	0.00	-95.15	-6.95	737.02	0.00
	88	CL-625-	J[49]	Shear-z	0.00	0.00	-95.15	-6.95	851.19	0.00
	89	CL-625-	I[49]	Shear-z	0.00	0.00	-80.84	-2.00	738.62	0.00
	89	CL-625-	J[50]	Shear-z	0.00	0.00	-80.84	-2.00	835.62	0.00
	90	CL-625-	I[50]	Shear-z	0.00	0.00	67.16	3.07	731.46	0.00
	90	CL-625-	J[51]	Shear-z	0.00	0.00	67.16	3.07	850.87	0.00
	91	CL-625-	I[51]	Shear-z	0.00	0.00	80.93	8.17	774.07	0.00

Step 13. Bending moment diagrams

Beam Diagrams

Load Cases/Combinations
 MVall: CL-625-Truck
 Step
☒ Max/Min Diagram

Components
 Part: Total
☐ Fx ☐ Mx
☐ Fy ☐ Fz ☐ Fyz
☒ My ☐ Mz ☐ Myz
☐ Show Truss Forces
☐ Only Truss Forces

Display Options
☐ Exact ☐ No Fill
☒ 5 Points ☐ Line Fill
 Scale: 1.000000 ☒ Solid Fill

Type of Display
☒ Contour ☐ Deform
☐ Values ☒ Legend
☐ Animate ☐ Undeformed
☐ Mirrored ☐ Quick View
☐ Current Step Force

Output Section Location
☐ I ☐ Center ☐ J
☒ Abs Max ☐ Min/Max ☐ All

Apply Close

1. Results > Forces > Beam Diagrams...

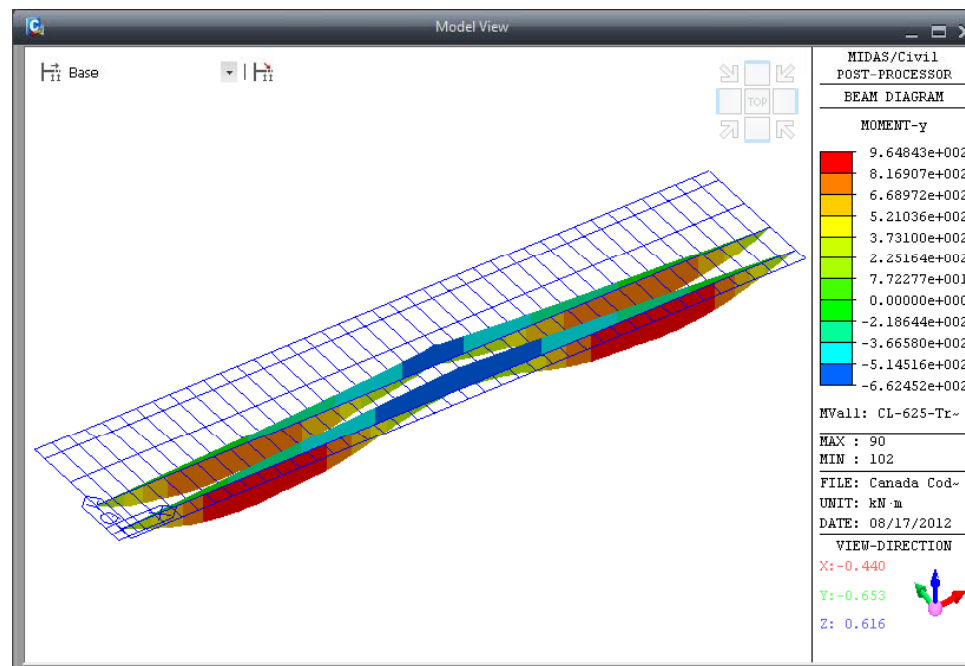
2. Load Cases/Combinations : MVall: CL-625-Truck

3. Components : My

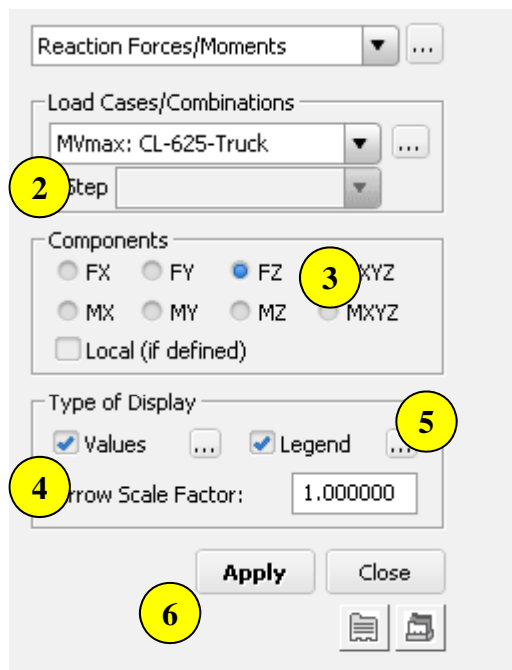
4. Display Options : Solid Fill

5. Check on Legend.

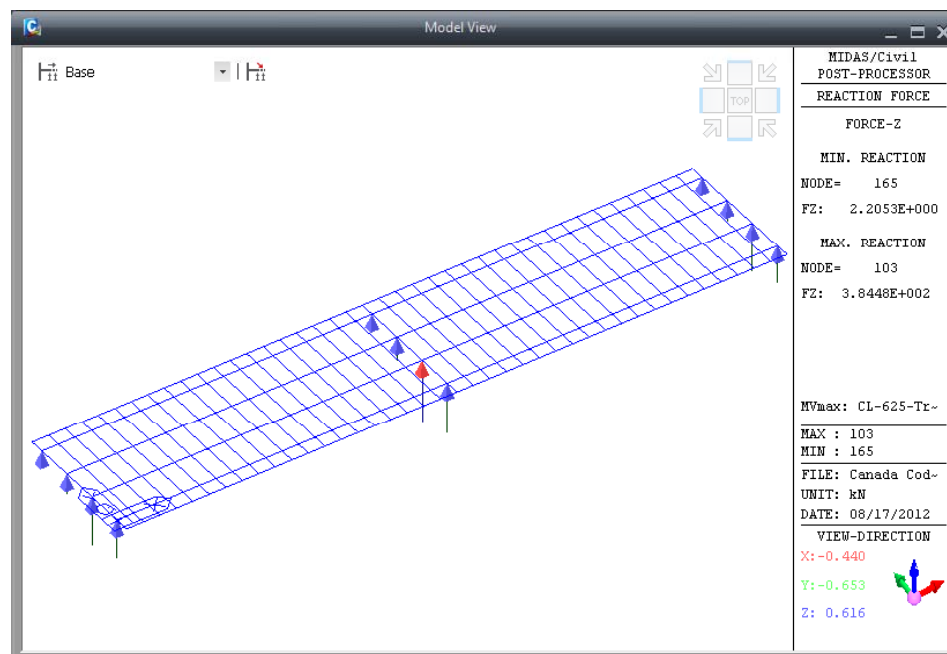
6. Click [Apply] button.



Step 14. Reactions



1. **Results > Reactions > Reaction Forces /Moments...**
2. **Load Cases/Combinations : MVmax: CL-625-Truck**
3. **Components : Fz**
4. **Check on Values.**
5. **Check on Legend.**
6. **Click [Apply] button.**



Step 15. Influence lines

Infl. Li... Infl. S... MVL T... Batch ...

Beam Forces/Moments

Line/Surface Lanes
LANE all

Key Element: 90

Scale Factor: 1.000000

Parts
☐ i ☐ 1/4 ☐ 1/2
☐ 3/4 ☒ j

Components
☐ Fx ☐ Fy ☐ Fz
☐ Mx ☒ My ☐ Mz

Type of Display
☒ Contour ☒ Legend
☐ 3D Cont ☐ Values ☐ Animate
☐ Include Impact factor

Write to File...

Apply Close

1. Results > Influence Lines > Beam Forces/Moments...

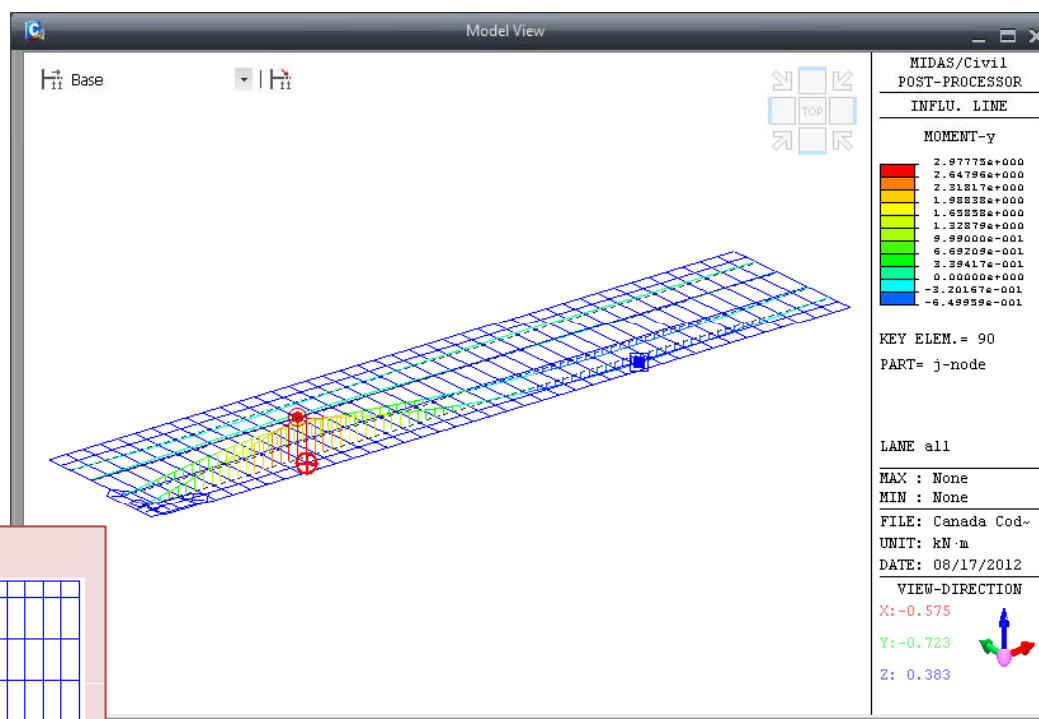
2. Key Element: 90

3. Parts: j

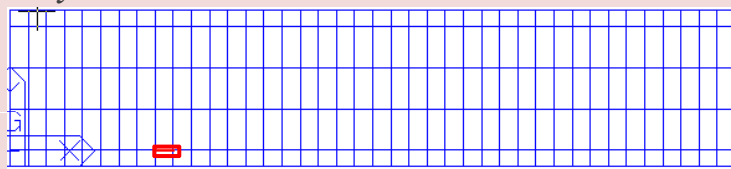
4. Components: My

5. Check on Legend

6. Click [Apply] button.



Key Element: 195

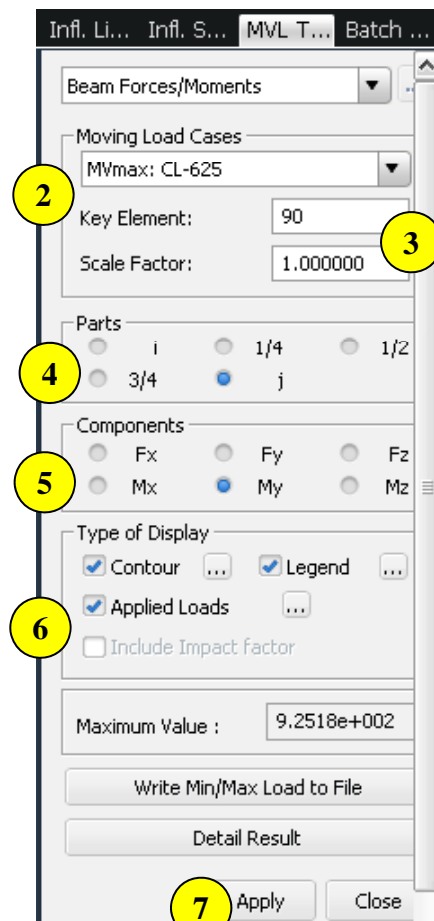


i-end j-end

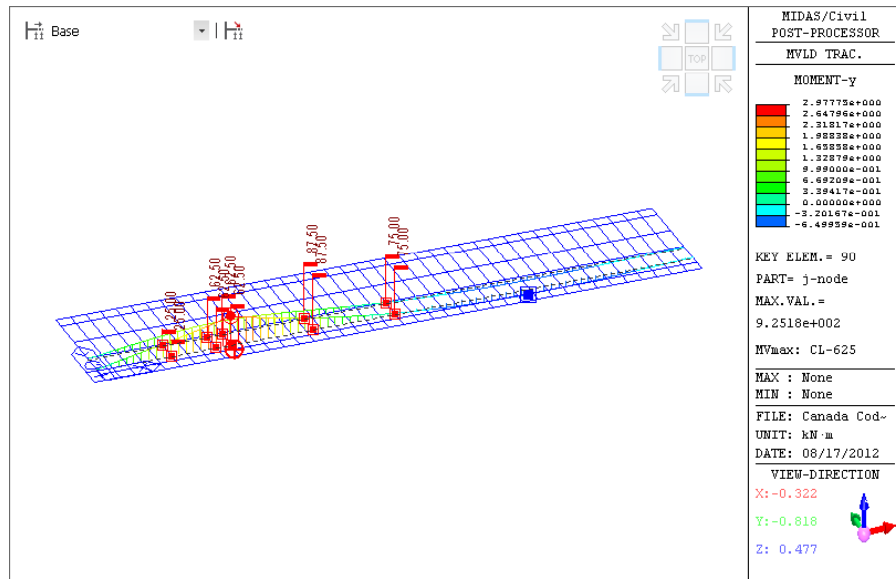
Step 16-1. Moving load tracer

Display moving load location that results in the minimum moment at the j-end of the element no. 90 due to the “CL-625” load case.

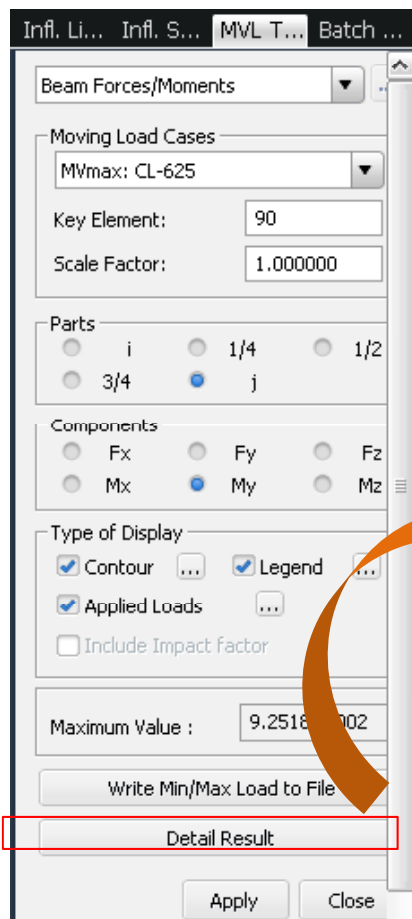
Trace and graphically display the vehicle loading condition (corresponding moving load case and location) that results in the maximum/ minimum force of a beam element. The loading condition is converted into a static loading and produced as a model file of the MCT type by clicking [Write Min/Max Load to File] button.



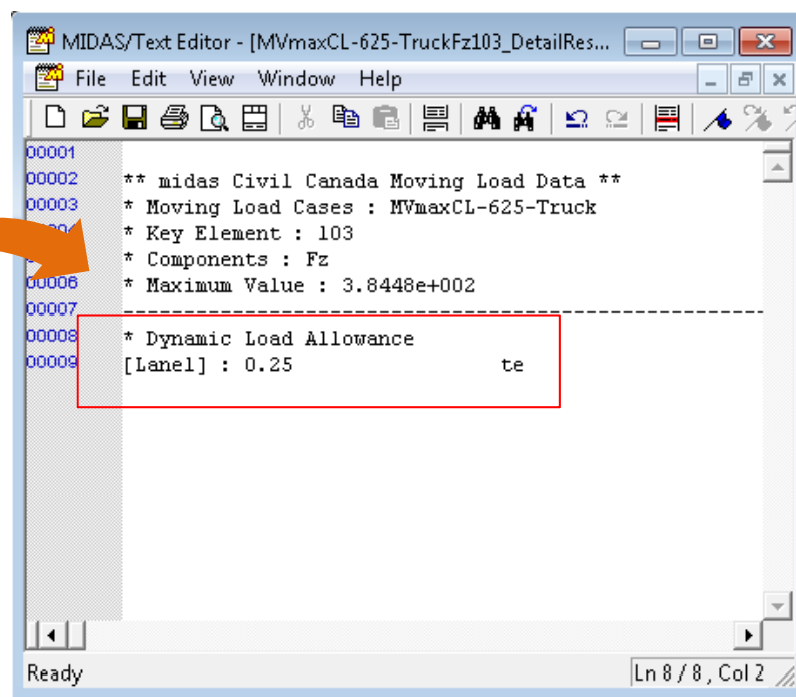
1. Results > Moving Load Tracer > Beam Forces/Moments...
2. Moving Load Cases: MVmin: CL-625
3. Key Element: 90
4. Select j end
5. Components: My
6. Check on Contour, Legend and Applied Loads.
7. Click [Apply] button.



Tip 3. Checking dynamic load allowance in post processing

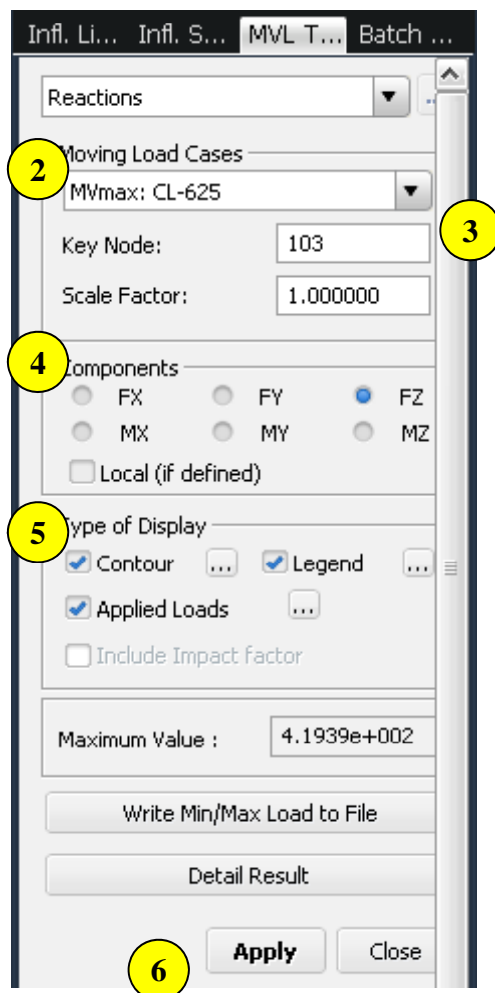


*In midas Civil , one can easily confirm the value of the dynamic load allowance used by clicking on the **Detail Result** button . This generates a text file as shown in the figure .*

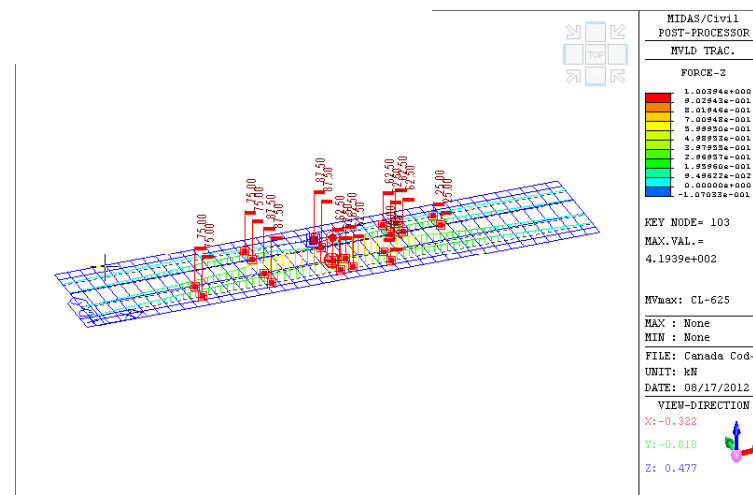
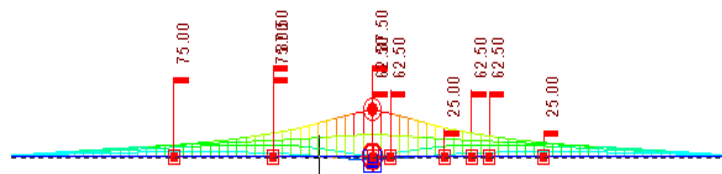


Step 16-2. Moving load tracer

Display moving load location that results in the maximum Reaction at the mid support - say at element no. 103 due to the "CL-625" load case.



1. Results > Moving Load Tracer > Reactions
2. Moving Load Cases: *Mvmax : CL-625*
3. Key Element: *103*
4. Components: *Fz*
5. Check on *Contour, Legend and Applied Loads*.
6. Click [**Apply**] button.



Step 17-1. Converting the moving load into a static load

Inf. Li... Inf. S... MVL T... Batch ...

Reactions

Moving Load Cases
MVmax: CL-625

Key Node: 103

Scale Factor: 1.000000

Components
☐ FX ☐ FY ☒ FZ
☐ MX ☐ MY ☐ MZ
☐ Local (if defined)

Type of Display
☒ Contour ☒ Legend
☒ Applied Loads
☐ Include Impact factor

Maximum Value: 4.1939e+002

Write Min/Max Load to File

Detail Result

Apply Close

1. Click [Write Min/Max Load to File] button.
2. Click [OK] button.
3. Select **File>Exit** in the **MIDAS/Text Editor**.

Moving Load Converted to ...

File Name
analysis CSA-S6-06\MVmaxCL-625Fz103.mct

OK Cancel

MIDAS/Text Editor - [MVmaxCLS_SLS2Fz103.mct]

File Edit View Window Help

00001 *VERSION
00002 5.4.0

AT, TEMPERATURE

ic Load Cases
ESC
SER.
625Fz103

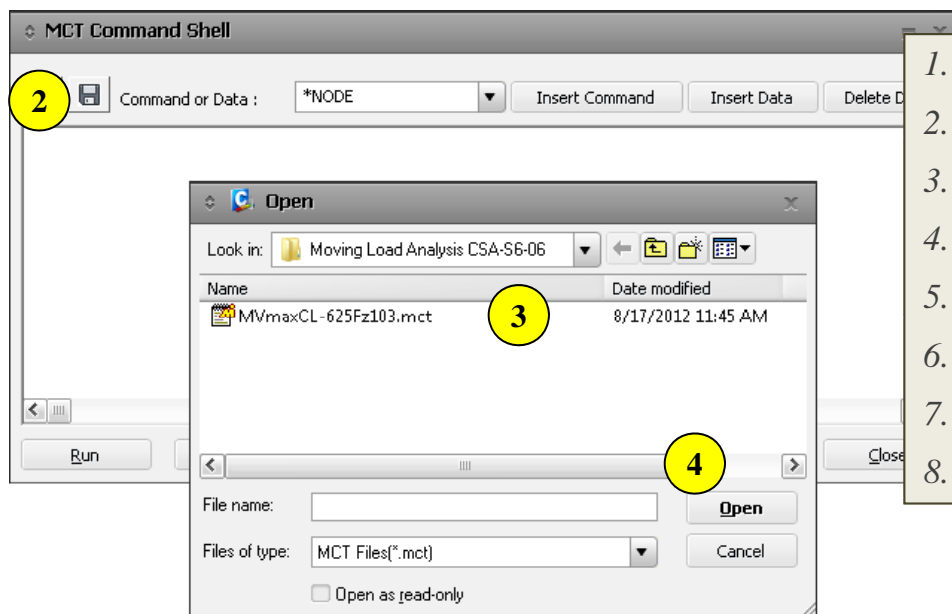
ent Beam Loads


	ELEM_LIST	CMD	TYPE	DIR	REF	D1	P1	D2	P2	D3	P3	D4	P4	GROUP
00021	131	BEAM	CONLOAD	GZ	NO	0	9720000000	-84	375	0	0000000000	0	0	0
00022	136	BEAM	CONLOAD	GZ	NO	0	9720000000	-49	2187	0	0000000000	0	0	0
00023	132	BEAM	CONLOAD	GZ	NO	0	9720000000	-49	2188	0	0000000000	0	0	0
00024	14	BEAM	CONLOAD	GZ	NO	0	9720000000	-70	3125	0	0000000000	0	0	0
00025	14	BEAM	CONLOAD	GZ	NO	0	9720000000	-70	3125	0	0000000000	0	0	0
00026	146	BEAM	CONLOAD	GZ	NO	0	9720000000	-28	125	0	0000000000	0	0	0
00027	131	BEAM	CONLOAD	GZ	NO	0	3060000000	-84	375	0	0000000000	0	0	0
00028	136	BEAM	CONLOAD	GZ	NO	0	3060000000	-49	2187	0	0000000000	0	0	0
00029	137	BEAM	CONLOAD	GZ	NO	0	3060000000	-49	2188	0	0000000000	0	0	0
00030	137	BEAM	CONLOAD	GZ	NO	0	3060000000	-49	2188	0	0000000000	0	0	0

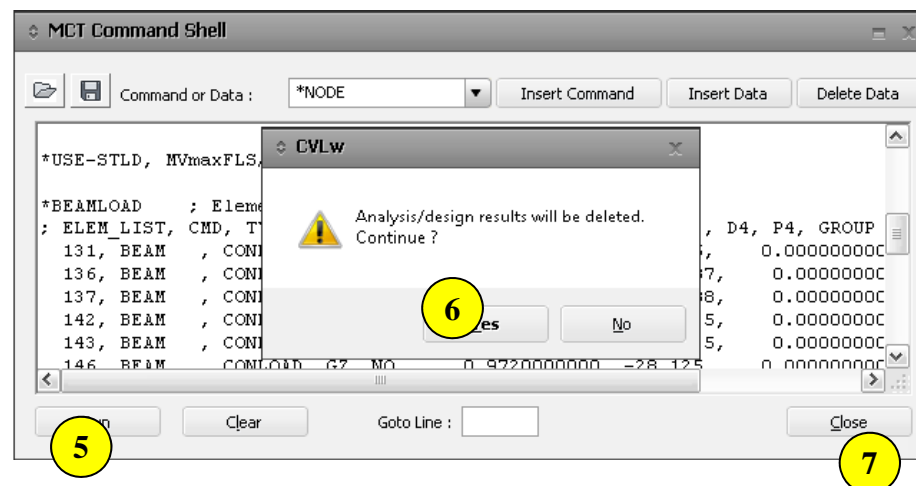
Ready Ln 0 / 48, Col 1 NUM

Where moving load analysis has been carried out, the moving load case, which produces the maximum or minimum results, is converted into a static loading and produced as the MCT type.

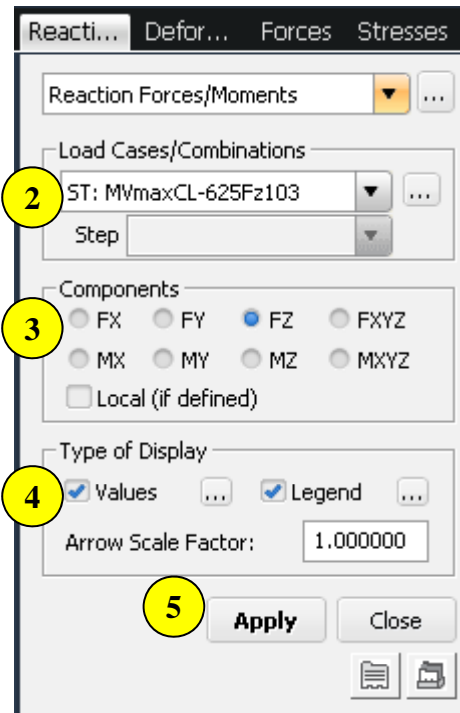
Step 17-2. Converting the moving load into a static load



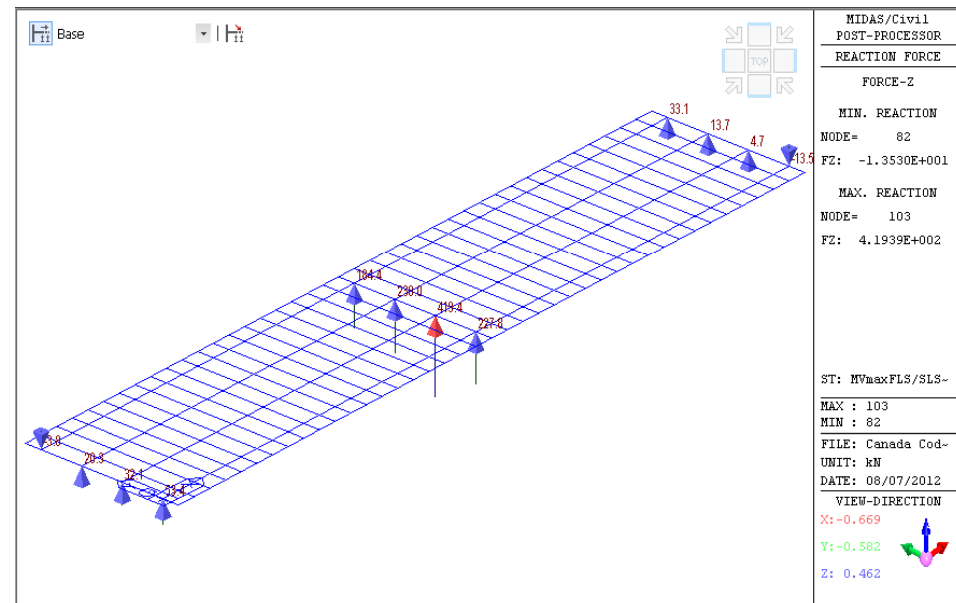
1. Tools>MCT Command Shell
2. Click .
3. Select the file name "MVmaxCL-625Fz103.mct".
4. Click [Open] button.
5. Click [Run] button.
6. Click [Yes] button.
7. Click [Close] button.
8. Click .



Step 18-1. Check beam reactions due to the converted static load



1. Results>Reactions>Reaction Forces/Moments...
2. Load Cases/Combinations: ST: MVmaxCL-625Fz103
3. Components: Fz
4. Check on Values and Legend.
5. Click [Apply] button.



Step 18-2. Check reaction table due to the static load

Reacti... Deform... Forces Stress...

Reaction Forces/Moments

Load Cases/Combinations
ST: MVmaxCL-625Fz103

Step

Components
☐ FX ☐ FY ☒ FZ ☐ FXYZ
☐ MX ☐ MY ☐ MZ ☐ MXYZ
☐ Local (if defined)

Type of Display
☒ Values ☐ Legend
 Arrow Scale Factor: 1.000000

1. Click ...
2. Check on MVmaxCL-625Fz103(ST).
3. Click [OK] button.

	Node	Load	(kN)	FY (kN)	FZ (kN)	MX (kN·m)	MY (kN·m)	MZ (kN·m)
	42	MVmaxF	0.000000	0.000000	53.351544	0.000000	0.000000	0.000000
	62	MVmaxF	0.000000	0.000000	227.778924	0.000000	0.000000	0.000000
	82	MVmaxF	0.000000	0.000000	-13.529945	0.000000	0.000000	0.000000
	83	MVmaxF	0.000000	0.000000	32.094093	0.000000	0.000000	0.000000
	103	MVmaxF	0.000000	0.000000	419.389244	0.000000	0.000000	0.000000
	123	MVmaxF	0.000000	0.000000	4.709723	0.000000	0.000000	0.000000
	124	MVmaxF	0.000000	0.000000	20.256782	0.000000	0.000000	0.000000
	144	MVmaxF	0.000000	0.000000	238.018119	0.000000	0.000000	0.000000
	164	MVmaxF	0.000000	0.000000	13.653265	0.000000	0.000000	0.000000

Records Activation Dialog

Node or Element

Node 1to246

Select Type
 Element Type
 TRUSS
 BEAM
 PLANE STRESS
 PLATE
 PLANE STRAIN
 AXISYMMETRIC

Loadcase/Combination
☐ SW of Girders(ST)
☐ SW of CFs(ST)
☐ SW of Deck Slab(ST)
☐ SW of Haunch(ST)
☐ SW of Forms(ST)
☐ SDL Parapets(ST)
☐ SDL FWS(ST)
☐ MVminFLS/SL52Fz103(ST)
☐ MVmaxFLS/SL52Fz103(ST)
☒ MVmaxCL-625Fz103(ST)
☐ CL-625-Truck(MV:all)
☐ CL-625-Truck(MV:max)
☐ CL-625-Truck(MV:min)
☐ CL-625(MV:all)
☐ CL-625(MV:max)

SUMMATION OF REACTION FORCES PRINTOUT				
	FY (kN)	FZ (kN)		
00	0.000000	1209.375300		

Reaction table due to static load case 'MVmaxCL-625Fz103' displays the concurrent reactions due to the moving load case 'CL-625' when the reaction of the node no. 103 is maximum.