
Steel Structure Design & Drawing

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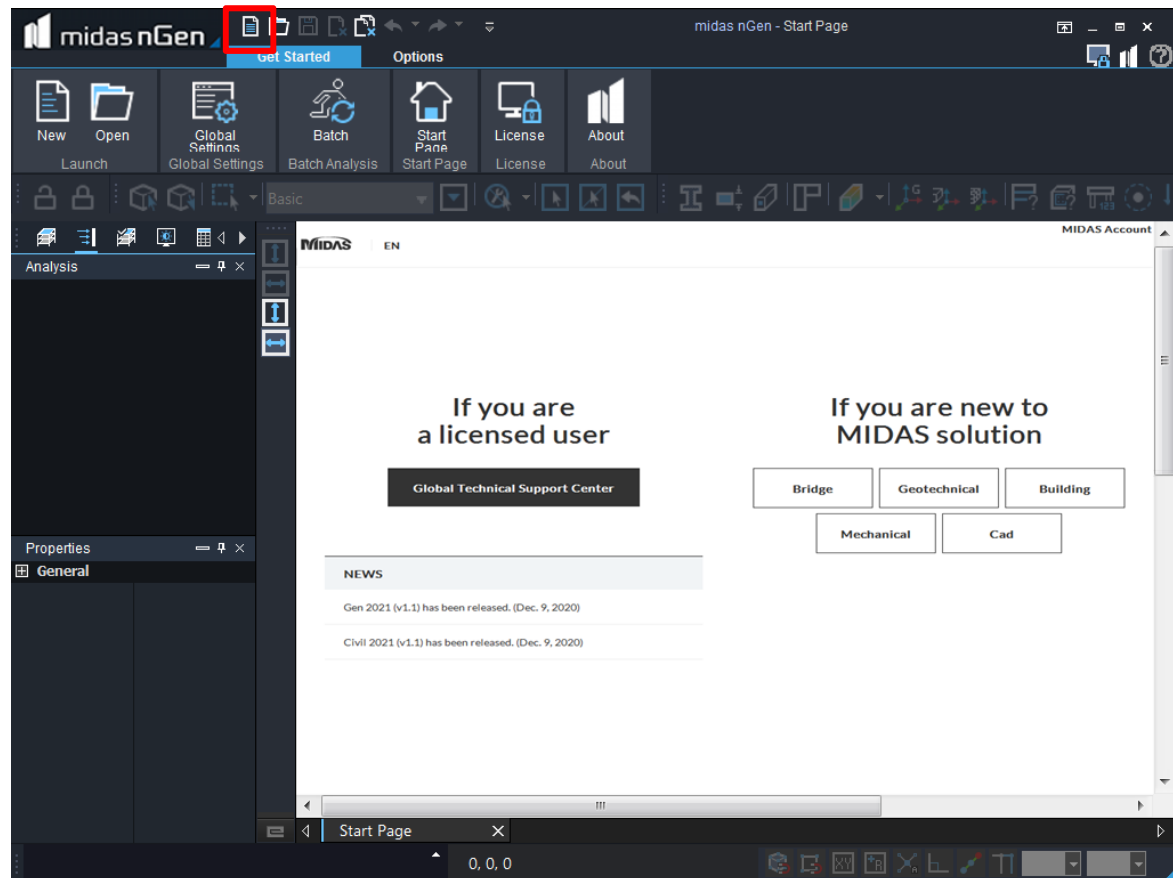
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01 Modeling

01 Getting Started

Create a New Project

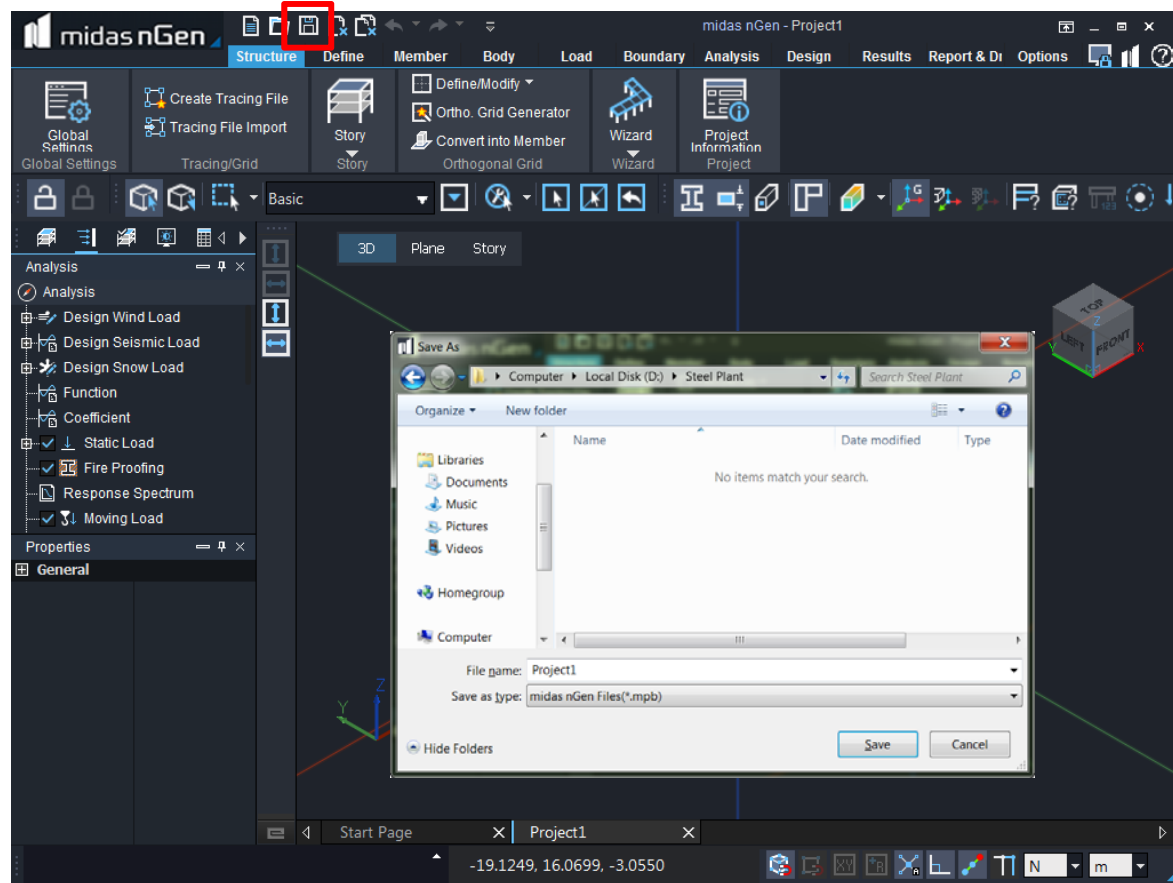
Click 
'New (Ctrl+N)'
To open a new project.



01 Getting Started

Create a New Project

Click 
'Save (Ctrl+S)'
To Save the new project.

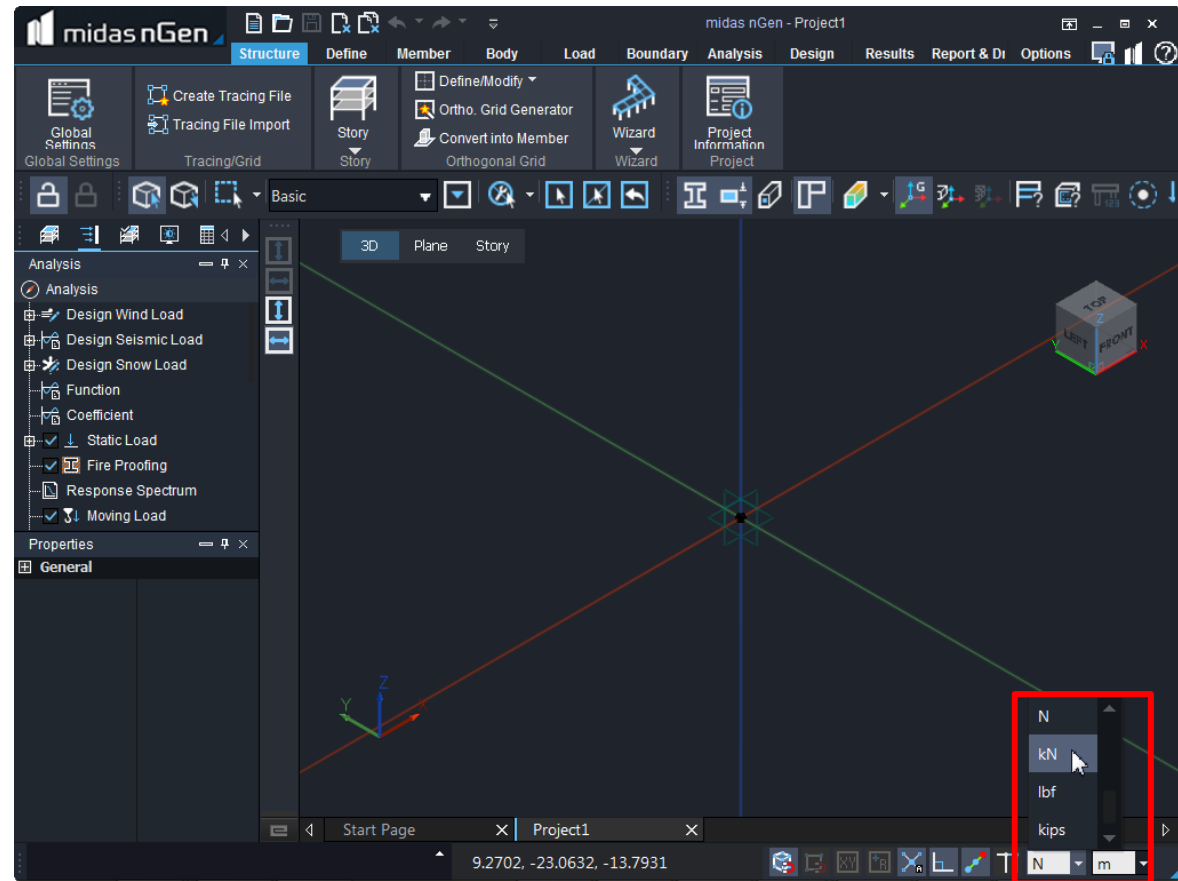


01 Getting Started

Basic Settings

Change the Unit of Measurements

→ Select [kN, m]

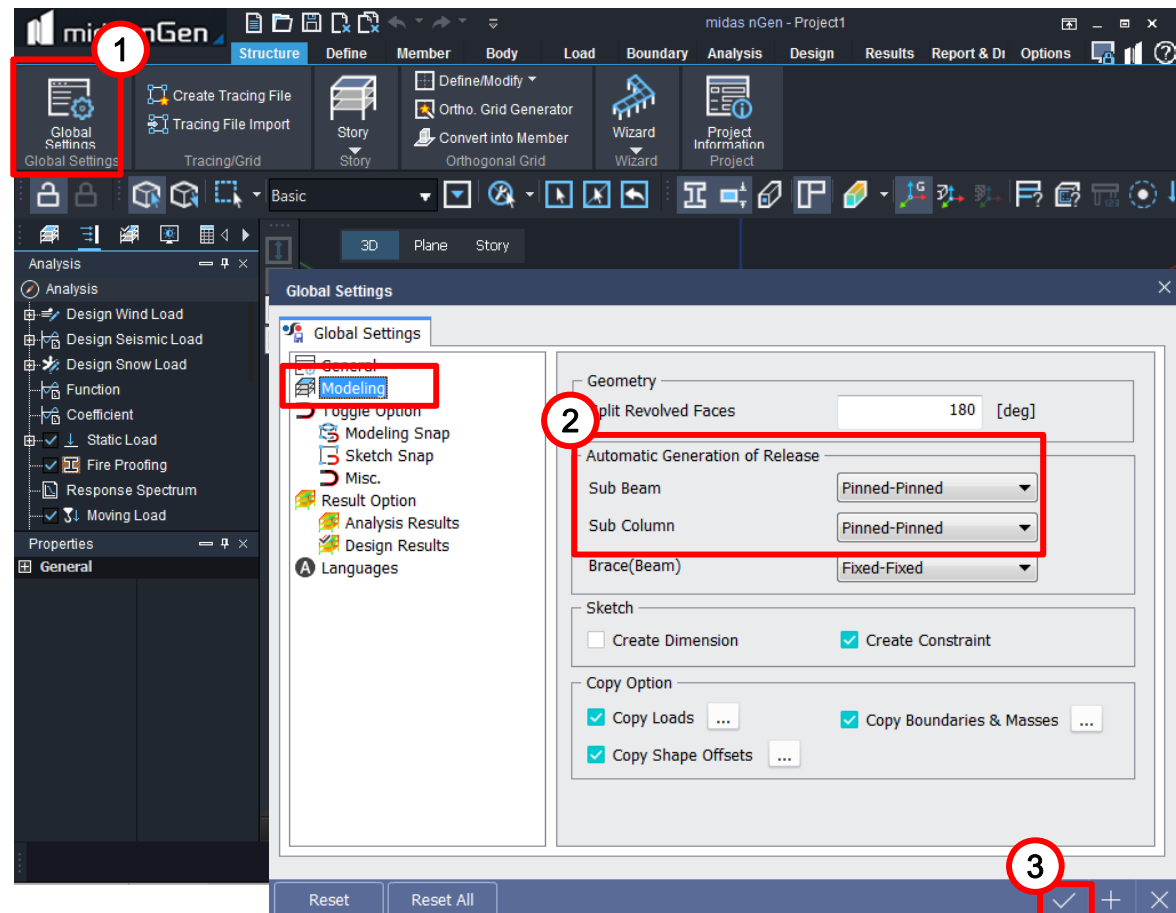


01 Getting Started

Global Settings

Define Global Settings

1. Select [Structure > Global Settings]
2. Select [Modeling > Automatic Generation of Release > Sub-beam > Pinned-Pinned]
Select [Sub-column > Pinned-Pinned].
3. Click [OK].



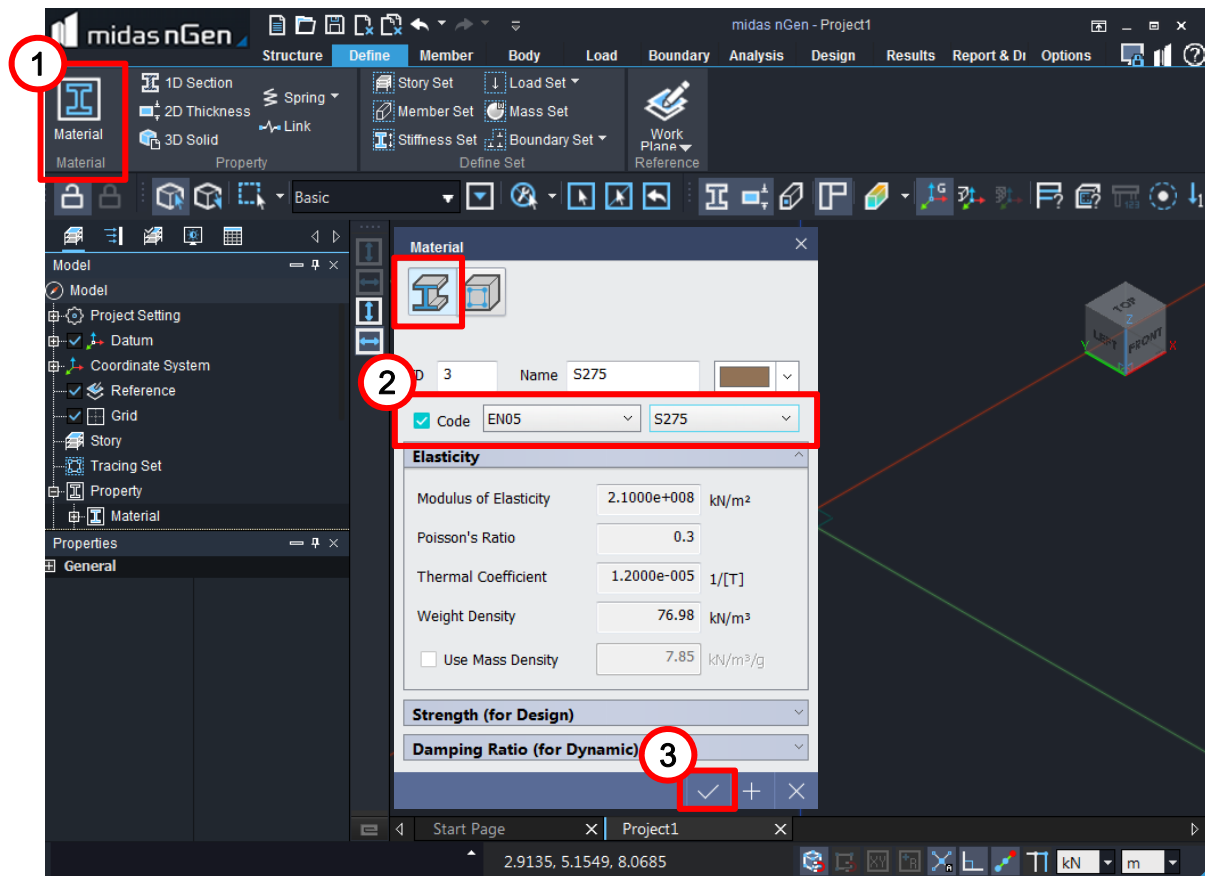
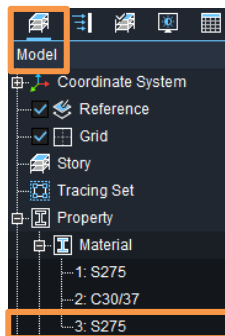
02 Define Properties

Material

Define Material

1. Select [Define > Material]
2. Select [EN05] and [S275].
3. Click [OK].

Confirm from Model Tree Menu
[Property > Material]



02 Define Properties

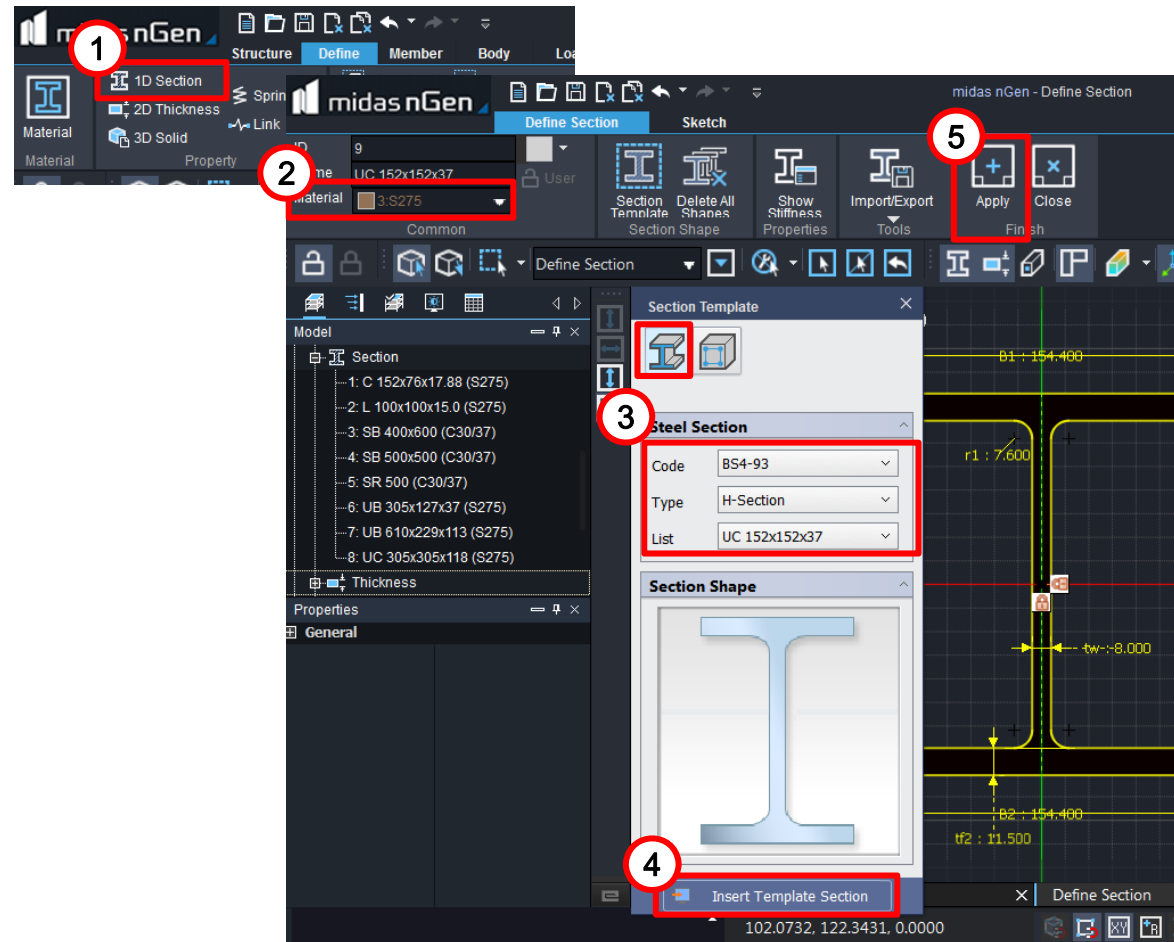
1D Section

Define Section

1. Select [Define > 1D Section].
2. Select [Material > S275].
3. Select Code: [BS4-93]
Type: [H-Section]
List: [UC 152x152x37] for column.
4. Click [Insert Template Section]
5. Click [Apply]

Similarly, define

- [UC 356x368x129] for column.
- [UB 305x165x54] for beam.
- [UB 406x178x74] for beam.



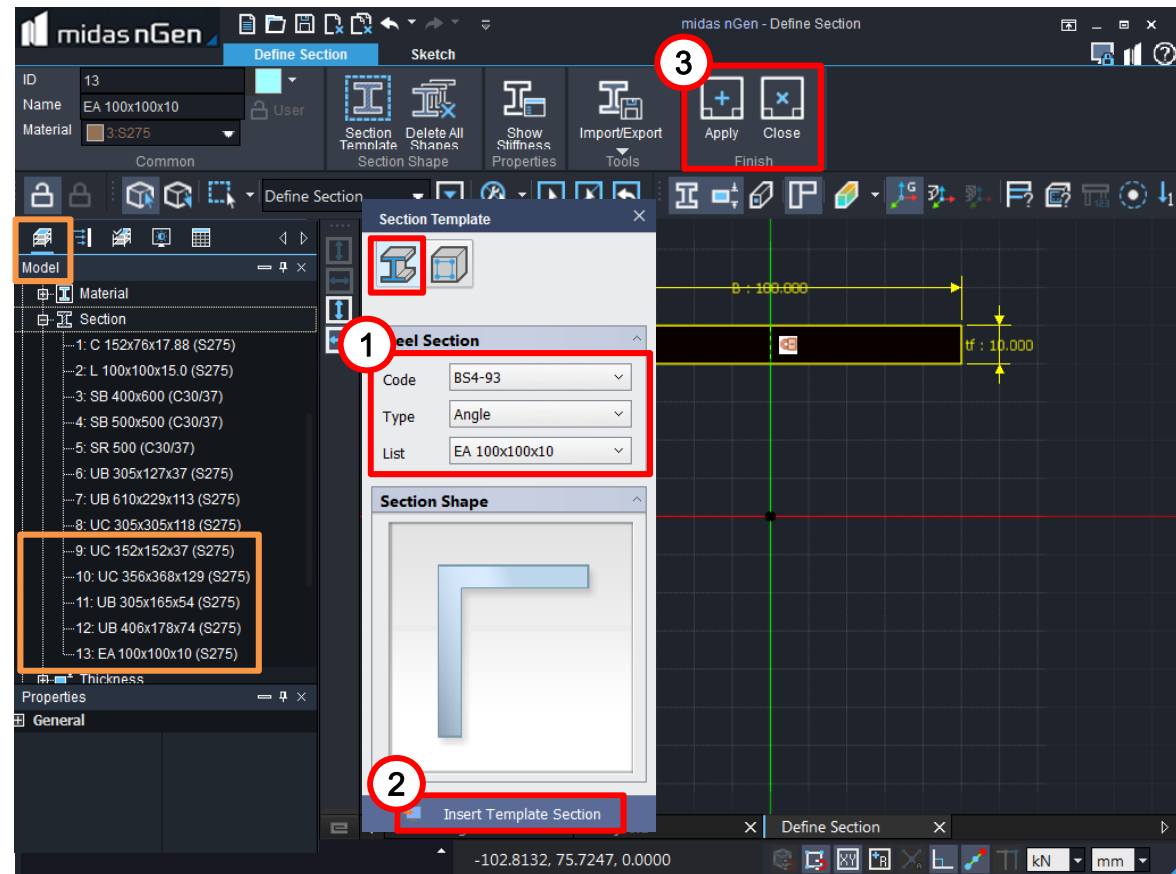
02 Define Properties

1D Section

Define Section

1. Select Code: [BS4-93]
Type: [Angle]
List: [EA 100x100x10] for brace.
2. Click [Insert Template Section]
3. Click [Apply] > Click [Close]

Confirm from Model Tree Menu
[Property > Section]



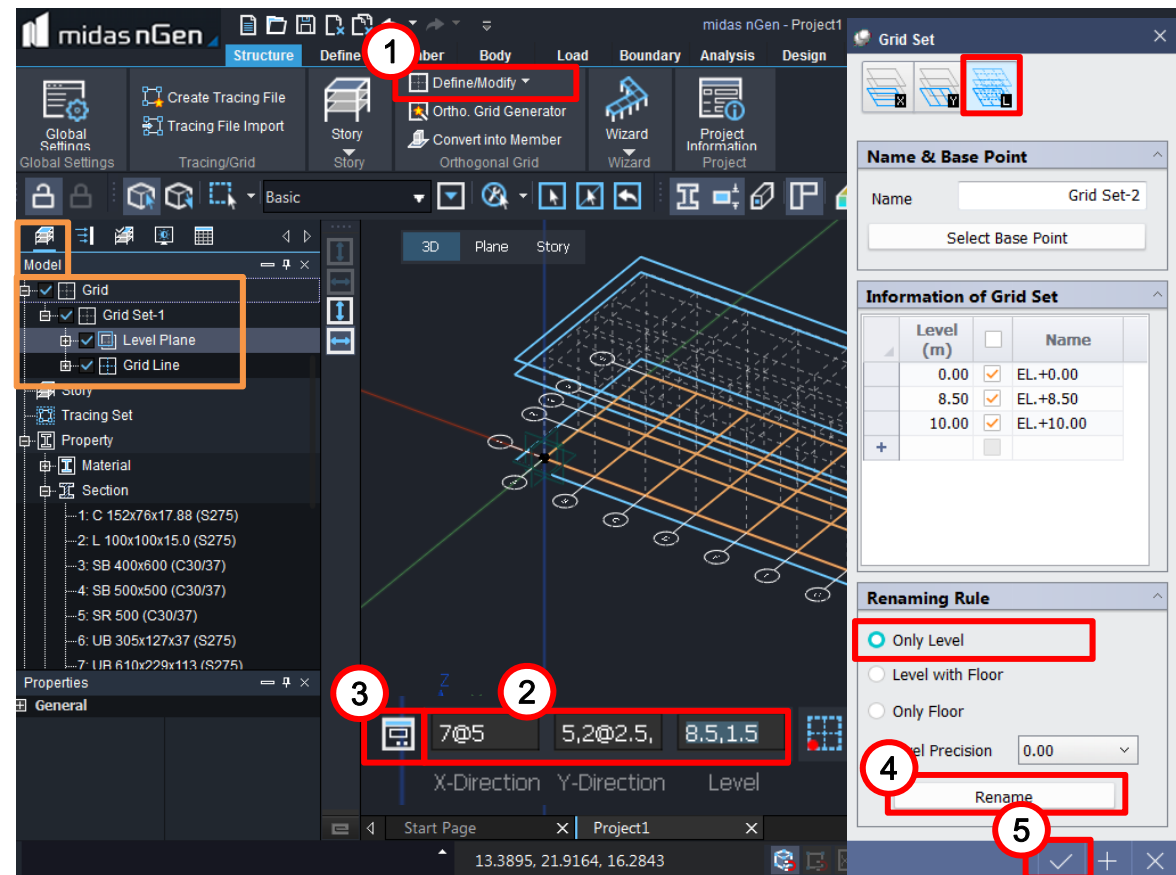
03 Grid Set

Grid Set

Create Grid Set

1. Select [Structure > Define/Modify > Define].
2. Enter [Number@Distance]
[7@5] in X-Direction, [5,2@2.5,5]
in Y-Direction, [8.5,1.5] in Level.
3. Click to open Grid Set.
4. Rename Grid Level
Select [Only Level] > Click
[Rename]
5. Click [OK].

Confirm from Model Tree Menu
[Grid > Grid Set-1]

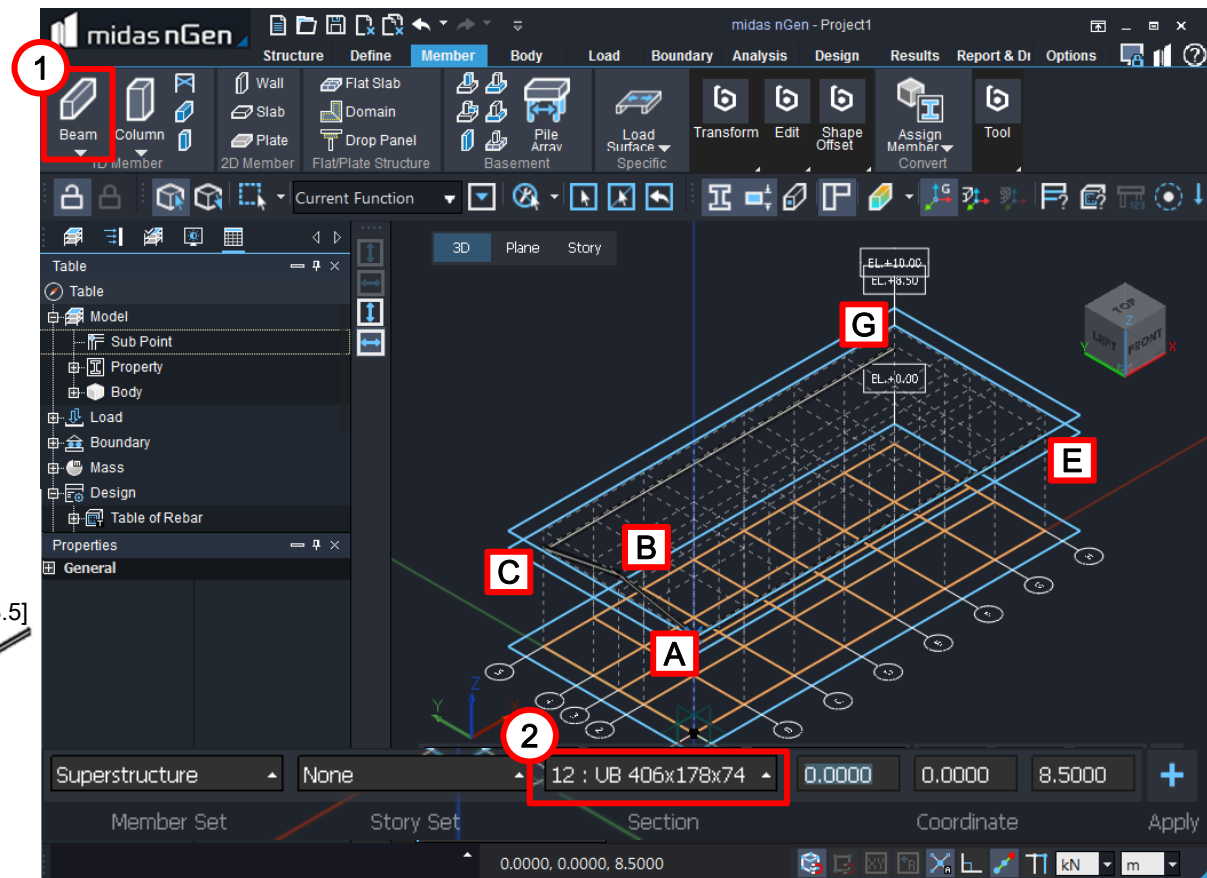
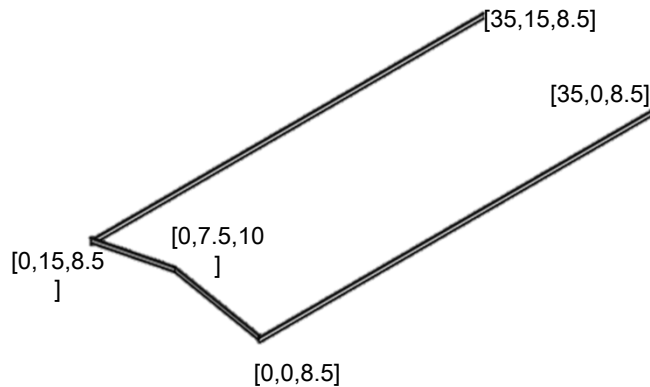


04 Beams and Columns

Create Beams and Columns

Create Beams

1. Select [Member > Beam].
2. Select [UB 406x178x74].
3. Click [A, B, C] > Right-click > Press [Space bar].
4. Click [A, E] > Right-click > Press [Space bar].
5. Click [C, G] > Right-click to finish.

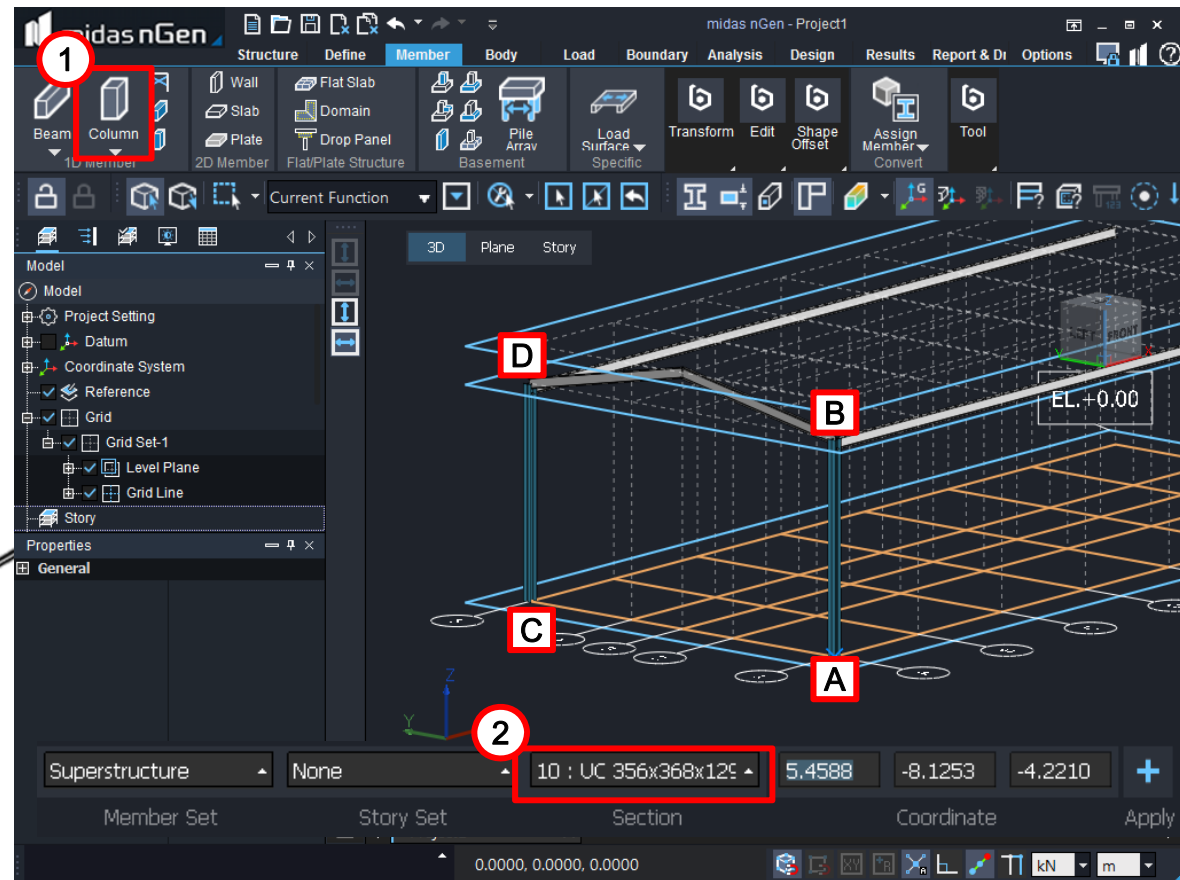
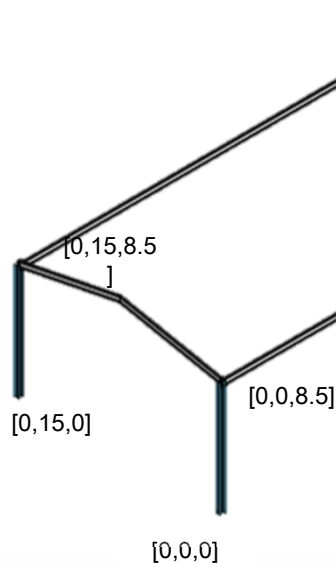


04 Beams and Columns

Create Beams and Columns

Create Columns


1. Select [Member > Column].
2. Select [UC 356x368x129].
3. Click [A, B] > Right-click > Press [Space bar].
4. Click [C,D] > Right-click to finish.

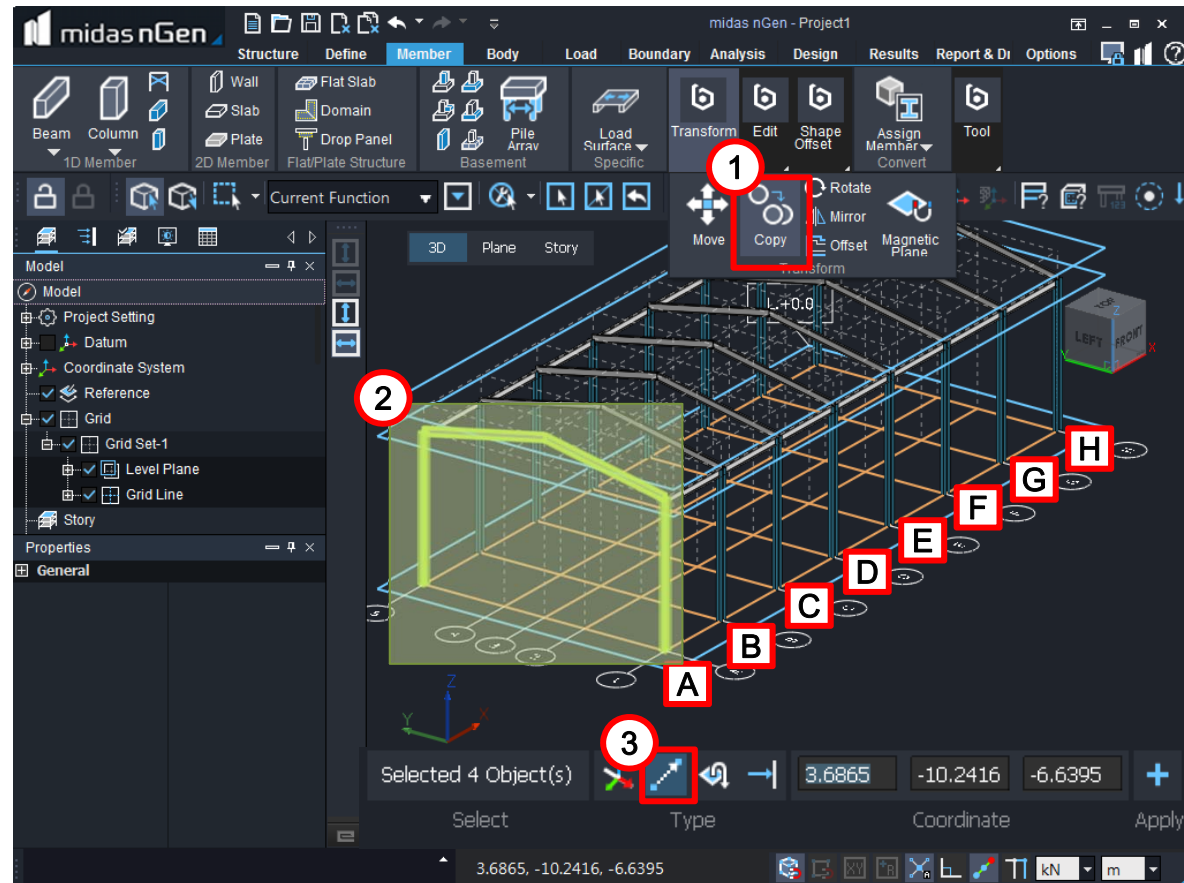


04 Beams and Columns

Copy Beams and Columns

Copy Beams and Columns

1. Select [Member > Copy].
2. Select Beams and Columns by [dragging the mouse from left to right].
3. Click  [Select 2 Points] > Click [A, B, C, D, E, F, G, H].
4. [Right-Click] > Press [Esc] to finish.

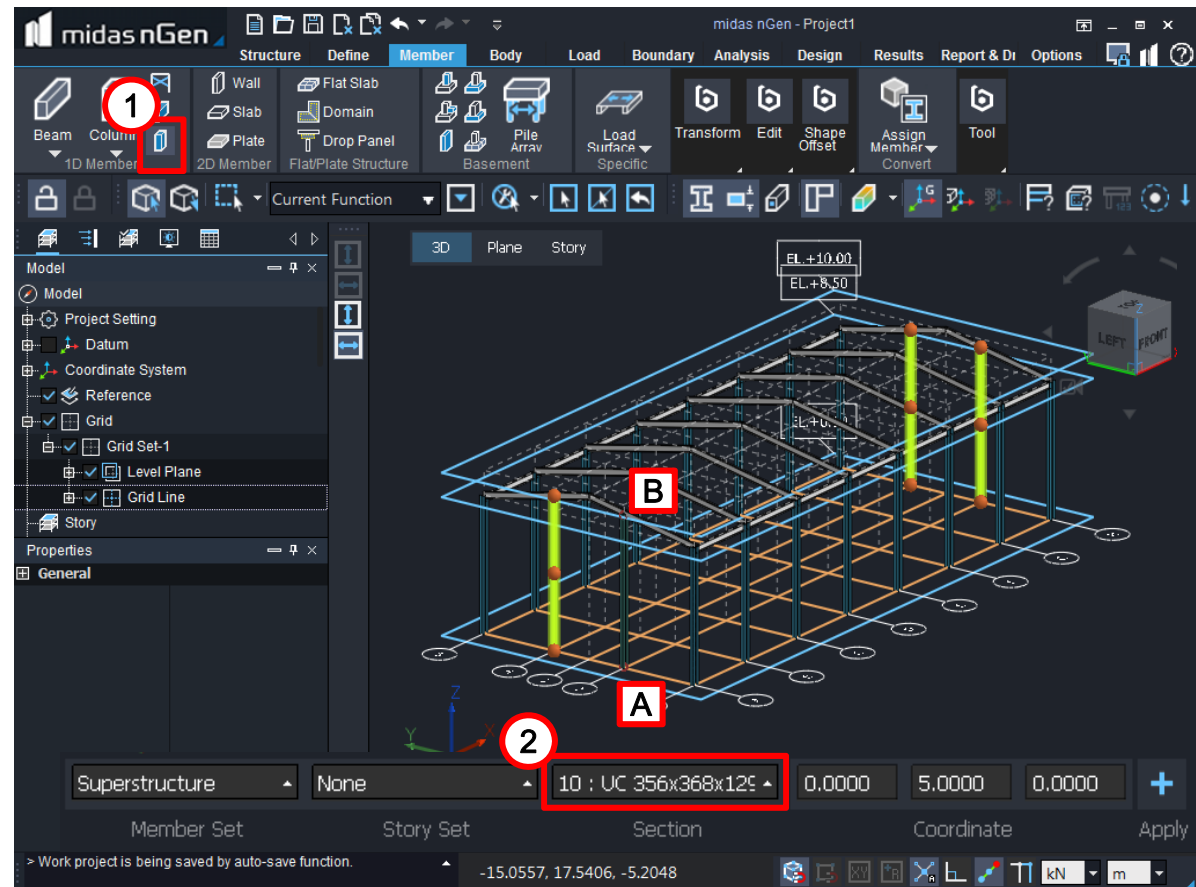
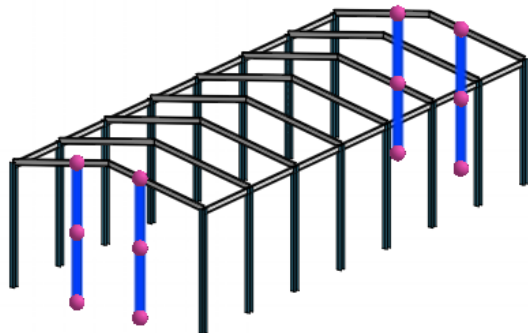


04 Beams and Columns

Create Sub Columns

Create Sub Columns


1. Select [Member > Sub Column].
2. Select [UC 356x368x129].
3. Click [A, B] > Right-click > Press [Space Bar].
4. Create 3 more Sub Columns.
5. Right-click to finish.

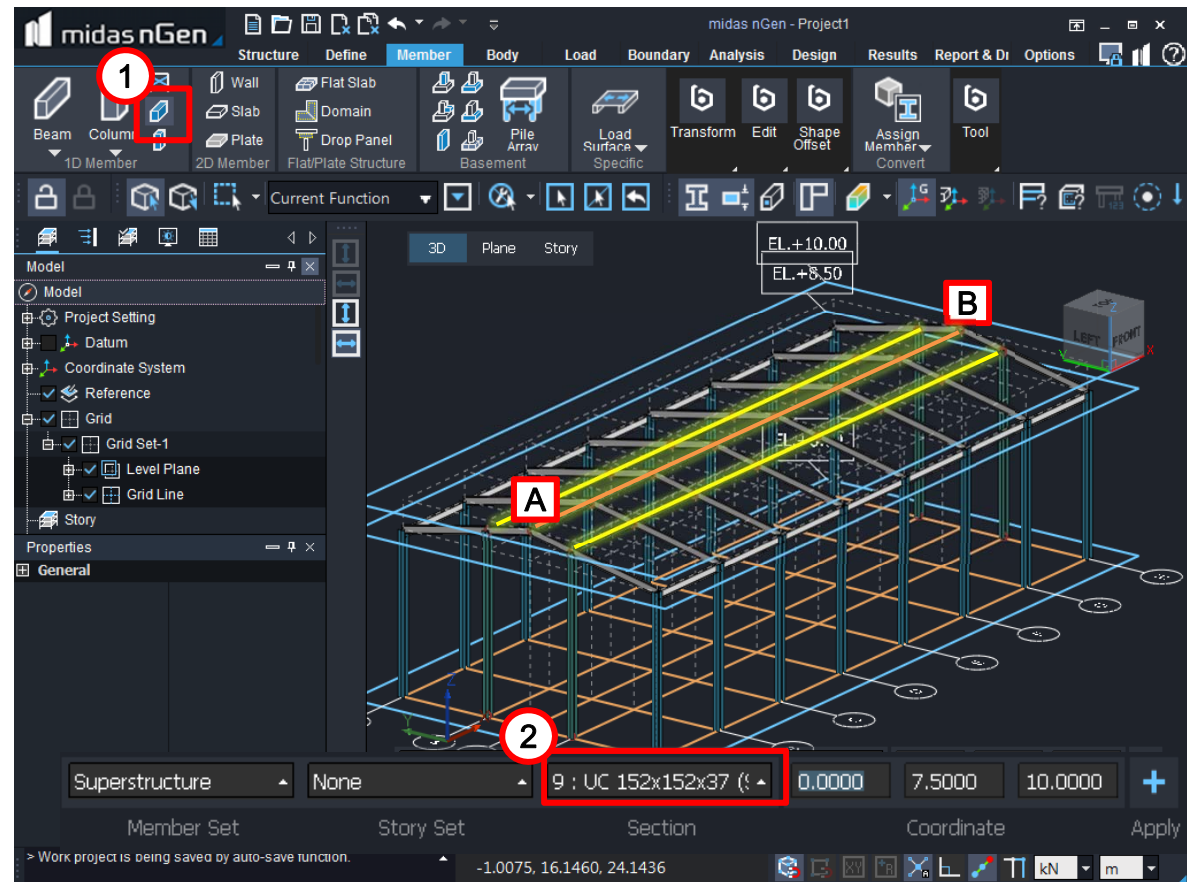
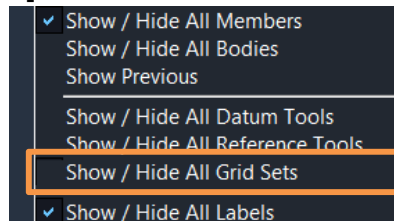


04 Beams and Columns

Create Purlins

Create Purlins


1. Make sure [Auto Intersect (F7)] is ON. 
2. Select [Member] > [Sub Beam].
3. Select [UC 152x152x37].
4. Click [A, B] > Right-click > Press [Space Bar].
5. Create 2 more Purlins connecting the sub columns.
6. Right-click to finish
[Right-click] on Work space > Click [Show/Hide All Grid Sets]

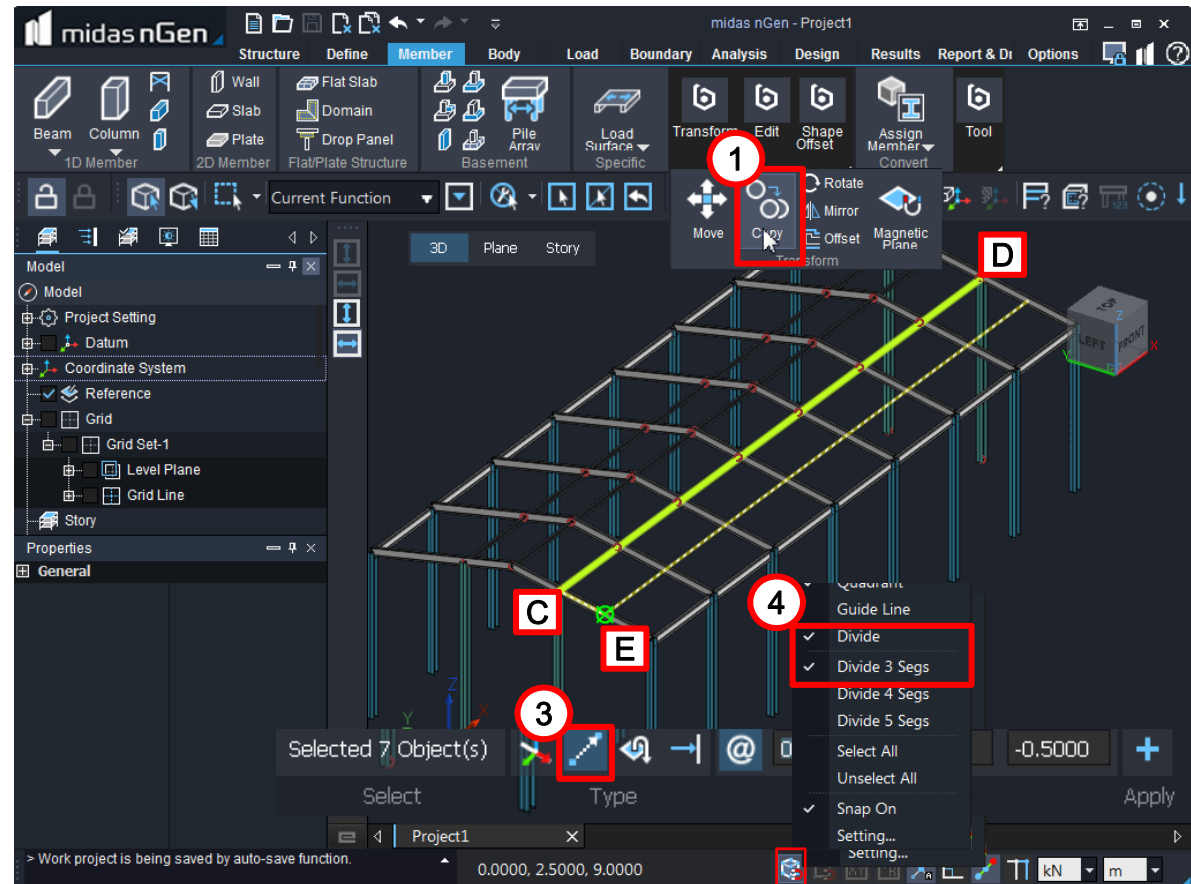


04 Beams and Columns

Create Purlins

Copy Purlins



1. Select [Member] > [Copy].
2. Select Sub Beams [CD]
3. Click  [Select 2 Points].
4. [Right-click] on Snap and Select [Divide] > [Divide 3 Segs]
5. Copy at Division snap [E].
6. [Right-Click] to stop copy.

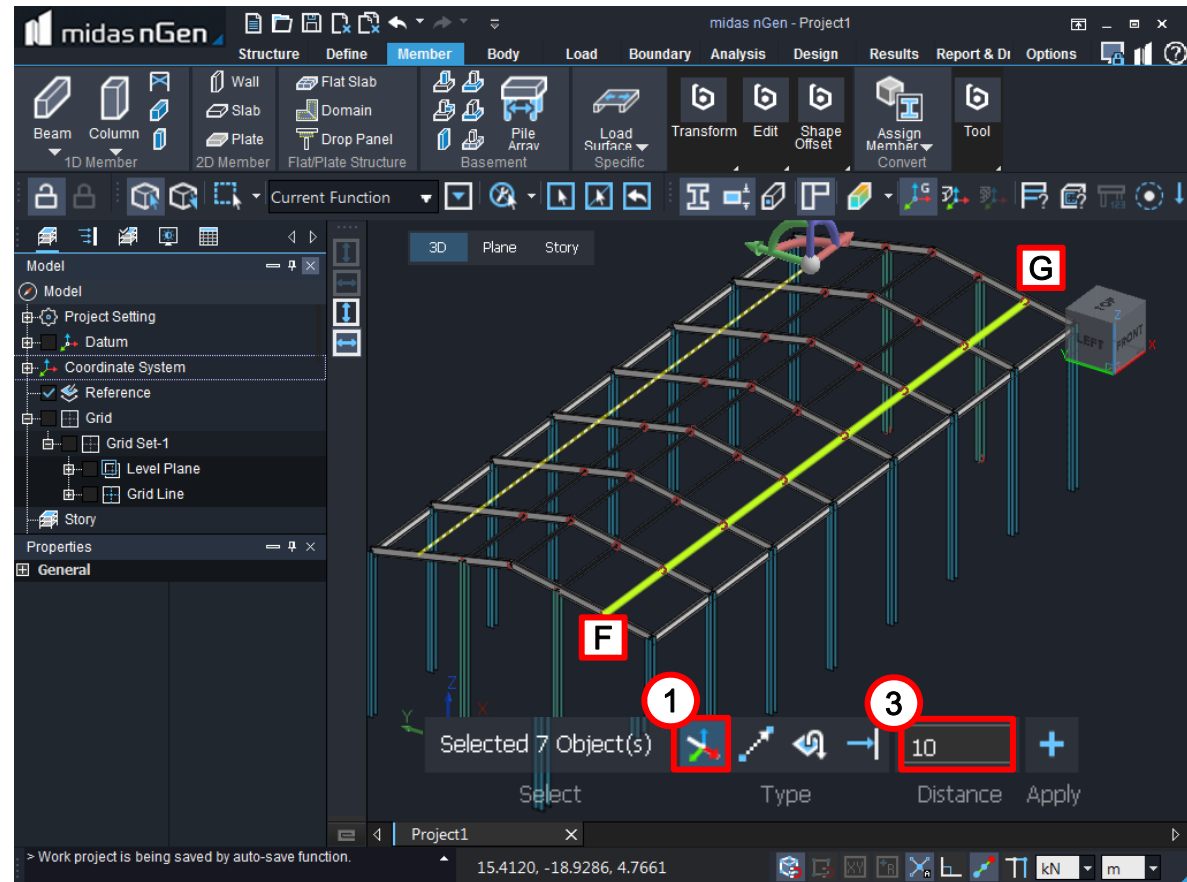
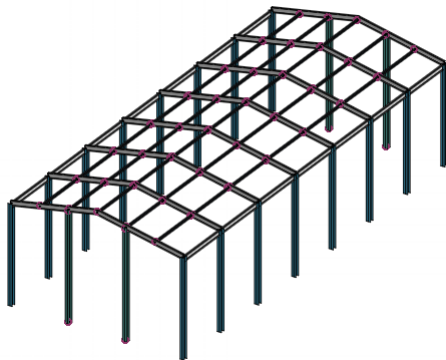


04 Beams and Columns

Create Purlins

Copy Purlins

1. Select Sub Beams [FG]
2. Click  [Select Curve/Edge]
3. Click [Y-Axis (Green)] > Enter
[10] > Press [Enter]
4. Press [Esc] to finish.
5. Check off  to finish.

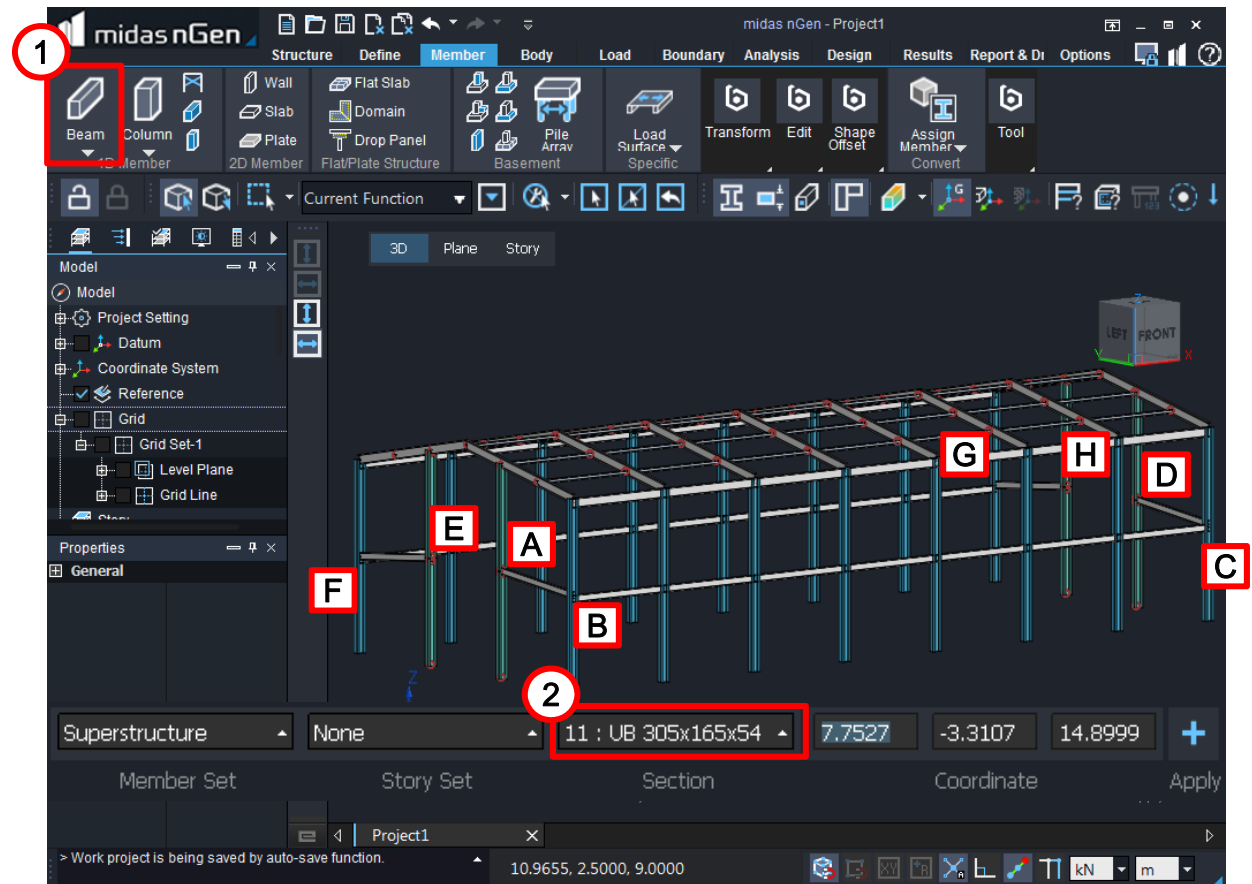


04 Beams and Columns

Create Girths

Create Girths

1. Select [Member > Beam].
2. Select [UB 305x165x54].
3. Click [A, B, C, D] with center-snap > [Right-click] > Press [Space bar]
4. Click [E, F, G, H] with center-snap > [Right-click] to finish

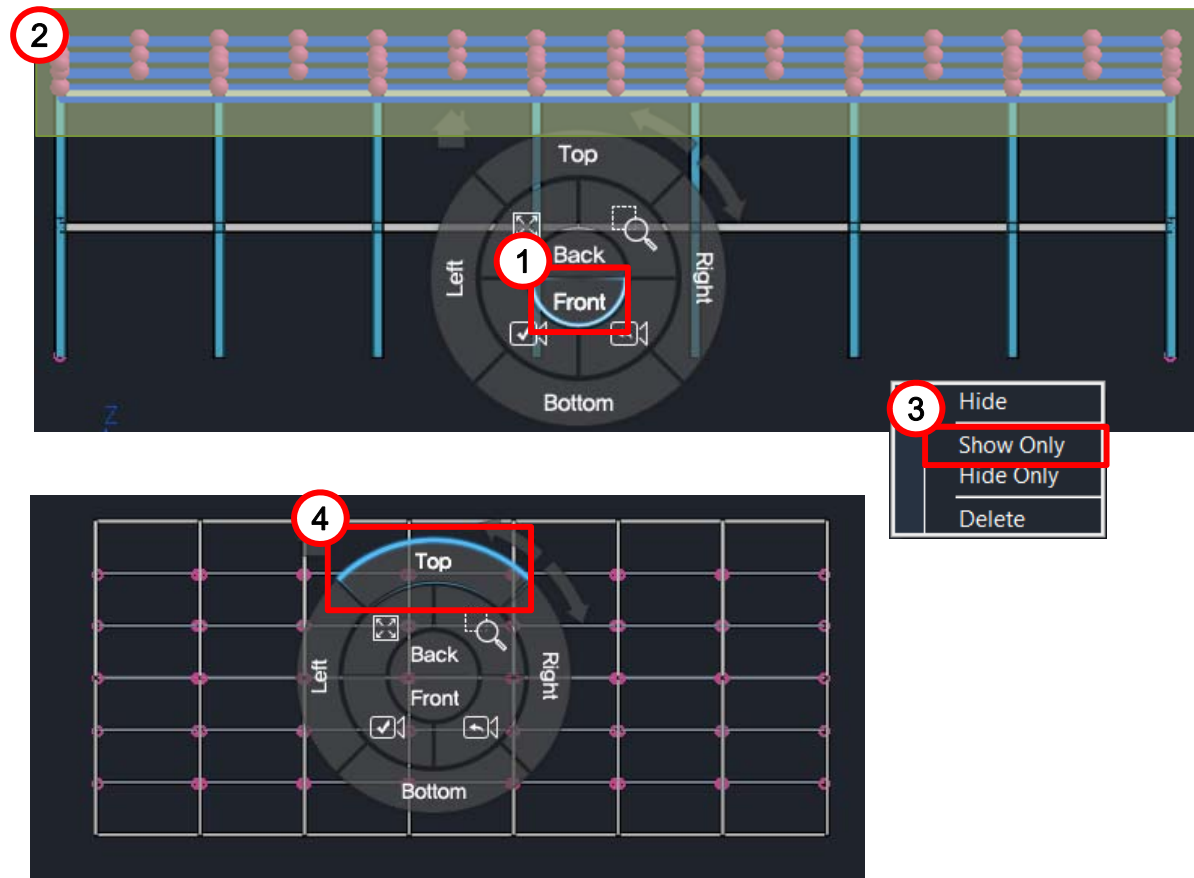


05 Braces

Create Braces

Getting Ready

1. Go to [Front] view.
2. Select Roof Members.
3. [Right-click] > [Show Only]
4. Go to [Top] view.

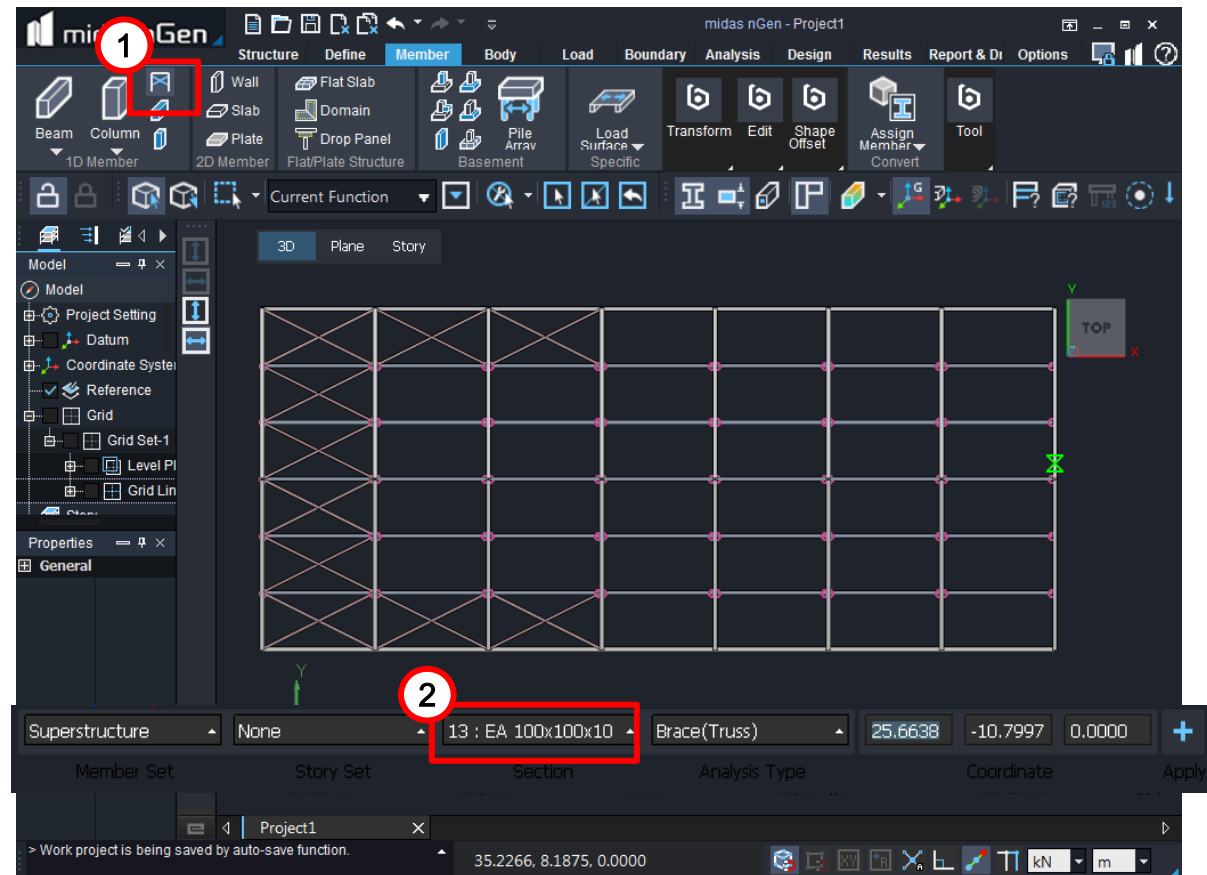


05 Braces

Create Braces

Create Braces

1. Select [Member > Brace].
2. Select [EA 100x100x10].
3. Create Braces on the roof.



05 Braces

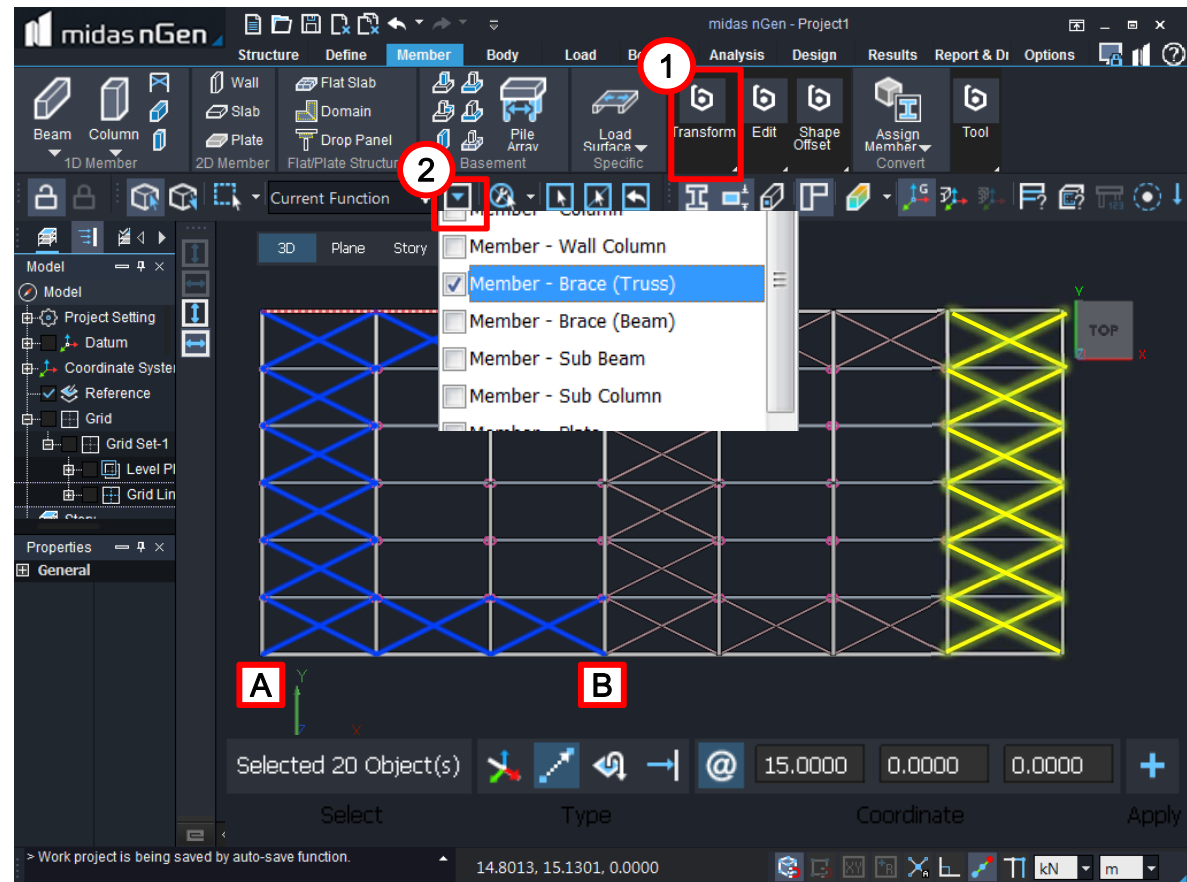
Copy Braces

Copy Braces

1. Select [Member > Copy]
2. Selection Filter > Current function > Select Member Brace (Truss) only.
3. Select all the Braces.
4. Click [Select by 2 Points] > Click [A, B].

Similarly, copy the braces to last bay on the roof.

Press [Esc] to finish.



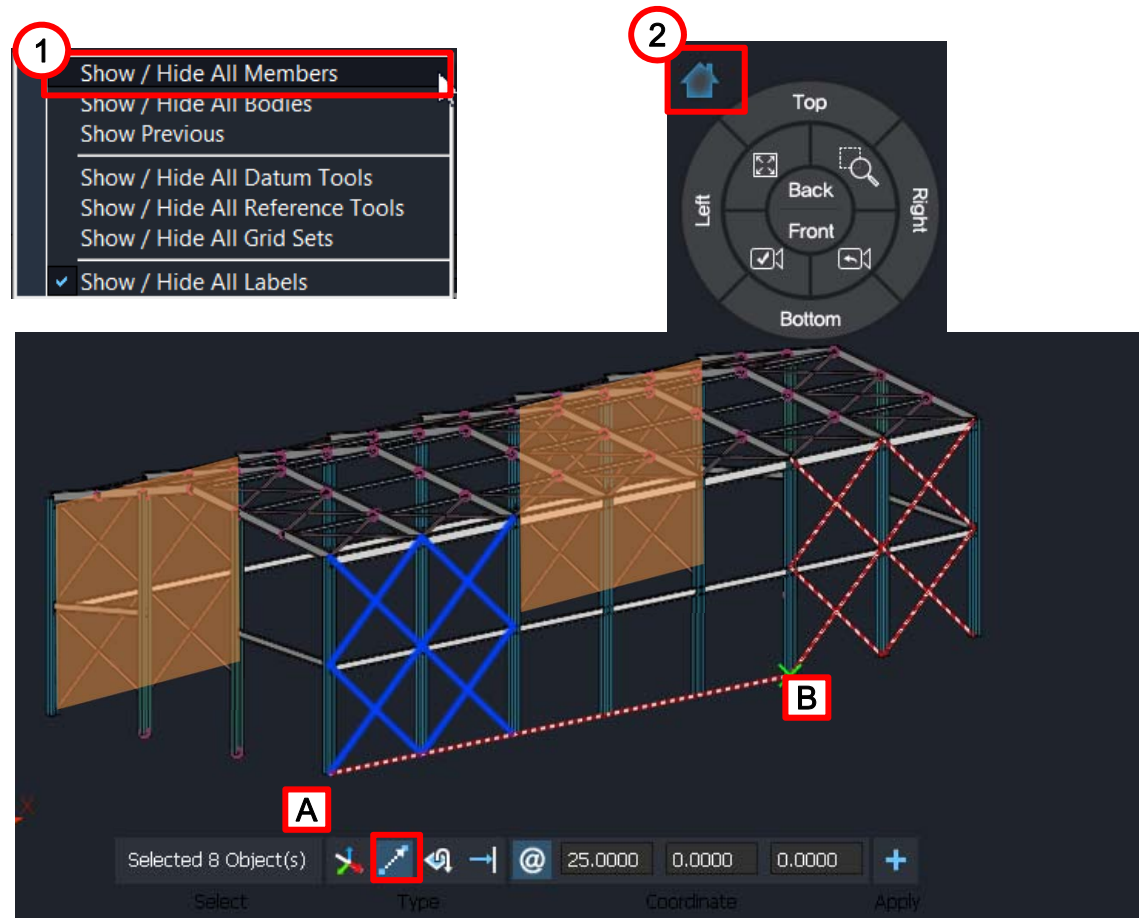
05 Braces

Create Braces

Create Braces

1. [Right-Click] > Click [Show/Hide All Members]
2. Go to [Home] view.
3. Select [Member > Brace].
4. Create Braces on the front side.
5. Select [Member > Copy].
6. Select the braces > Click [Select by 2 Points] > Click [A, B].

Similarly, create braces on the back side.

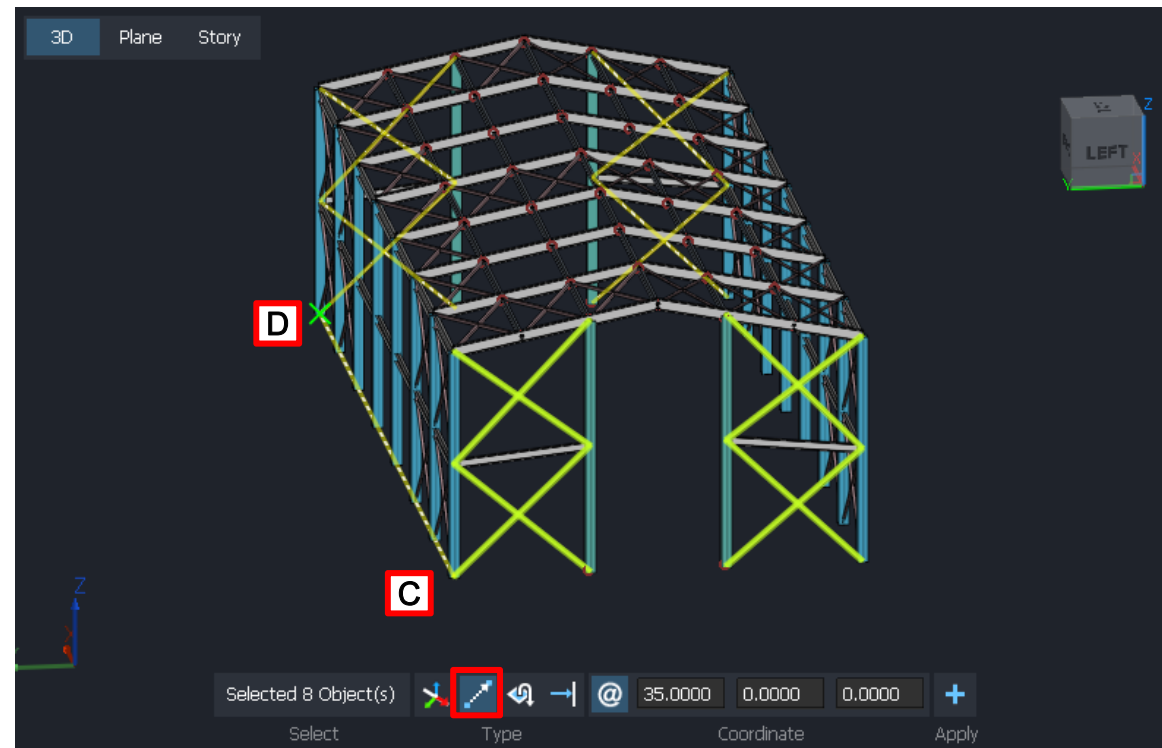
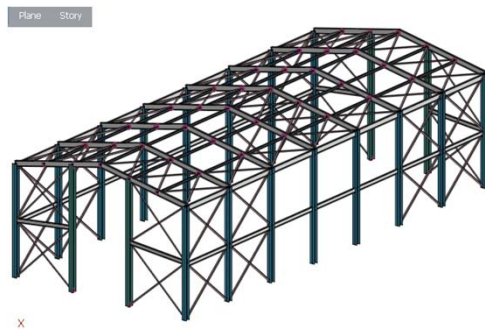


05 Braces

Create Braces

Create Braces

1. Select [Member > Brace].
2. Create Braces on the left side.
3. Select [Member > Copy].
4. Select the braces > Click [Select by 2 Points] > Click [C, D].

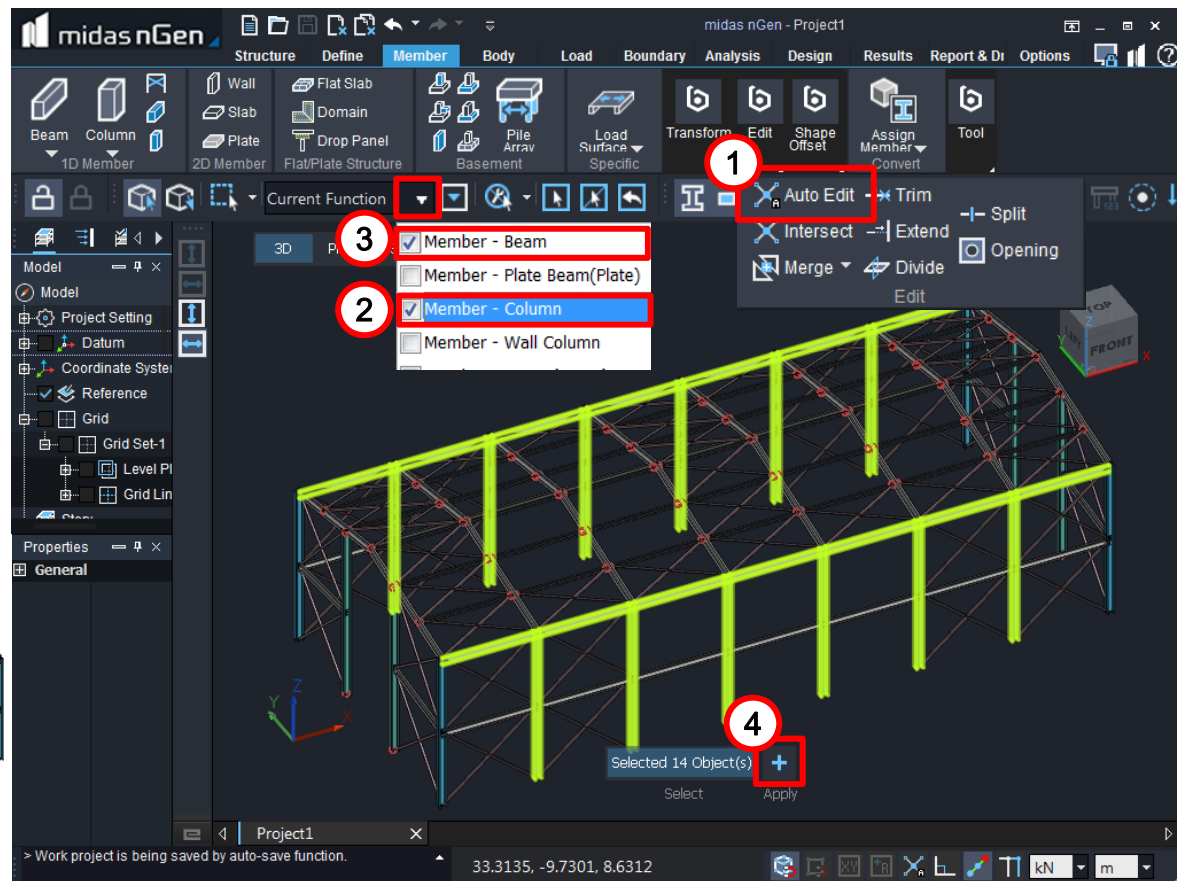
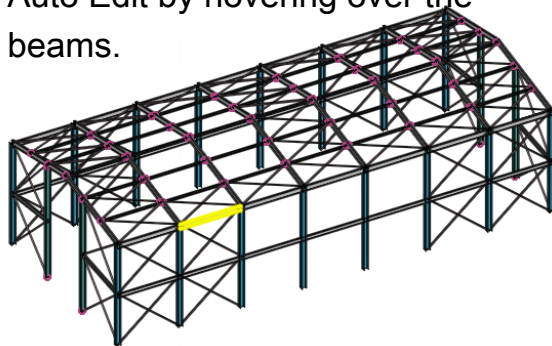


06 Auto Edit & Generate Offsets

Edit Members

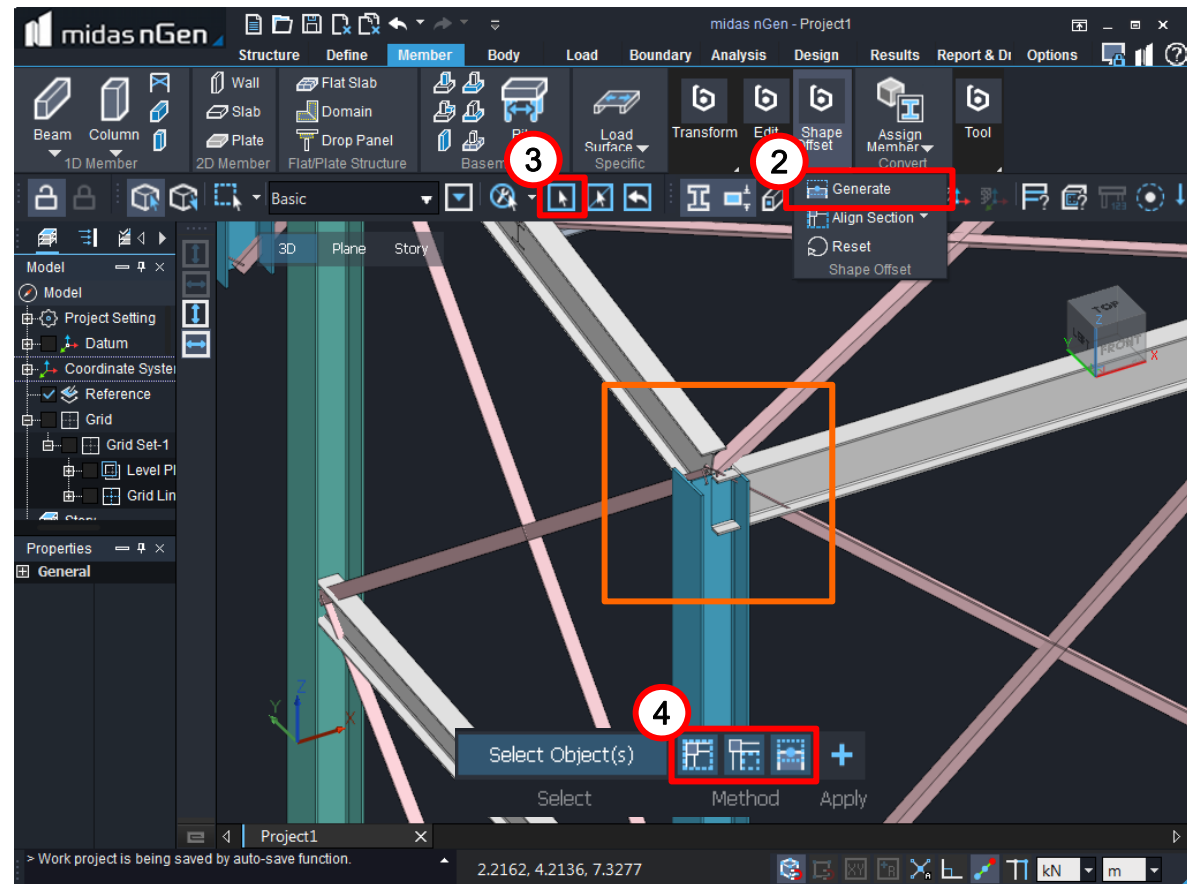
Divide or Merge Members automatically.

1. Select [Member > Auto Edit].
 2. Select columns by activating [Current function-Column] only.
 3. Select [Current function-Beam].
 4. Select beams > Click [Apply].
 5. Press [Esc] to finish.
- Confirm divided beams by using Auto Edit by hovering over the beams.



Generate Offset

-

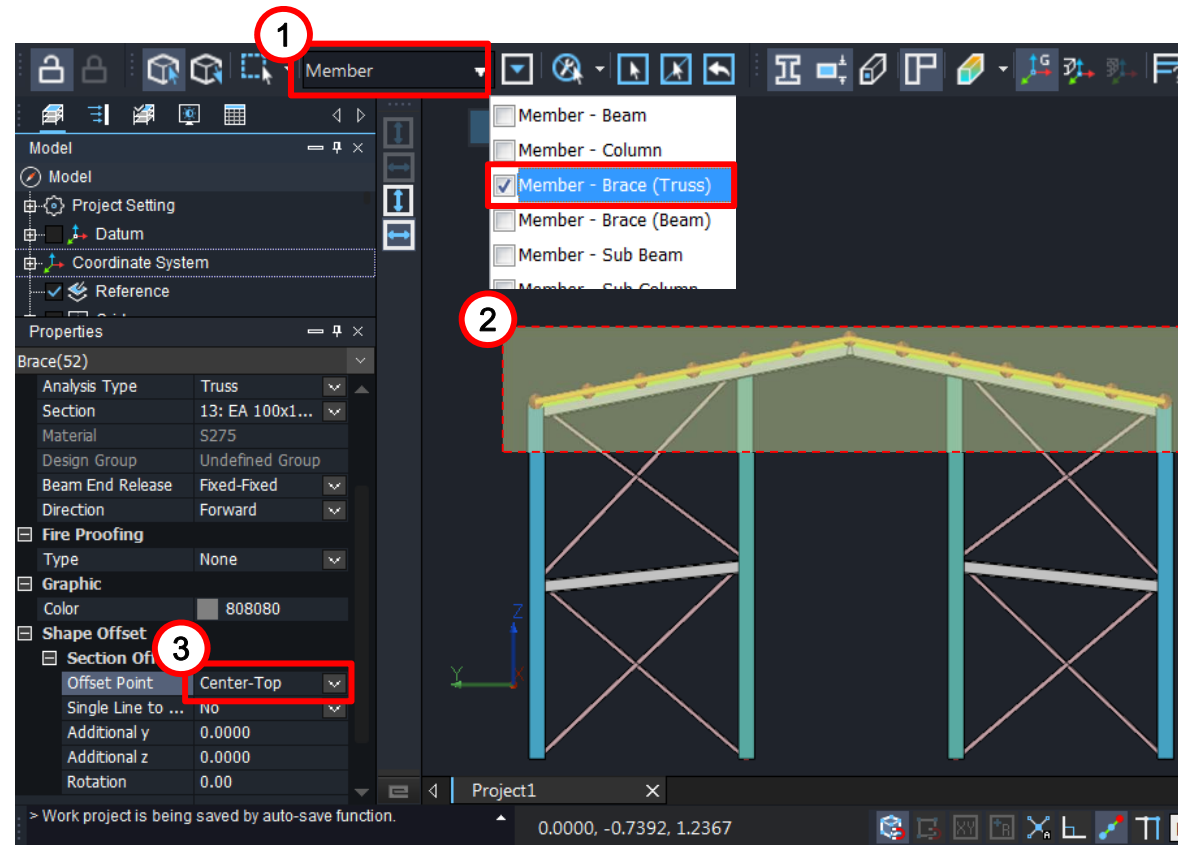
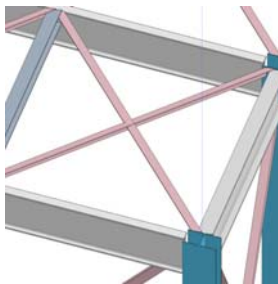


06 Auto Edit & Generate Offsets

Generate Offset

Generate Vertical Offset on the Roof.

1. Select [Member > Brace(Truss)].
2. Select Braces on the Roof.
3. Select [Work Tree > Properties > Section Offset > Offset Point > Center-Top].
4. Press [Esc] to unselect.
5. Confirm Vertical Offset generated Braces.



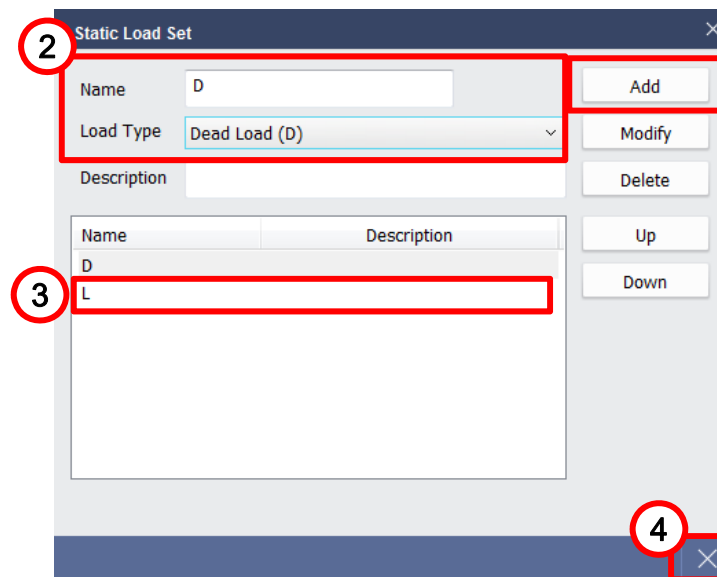
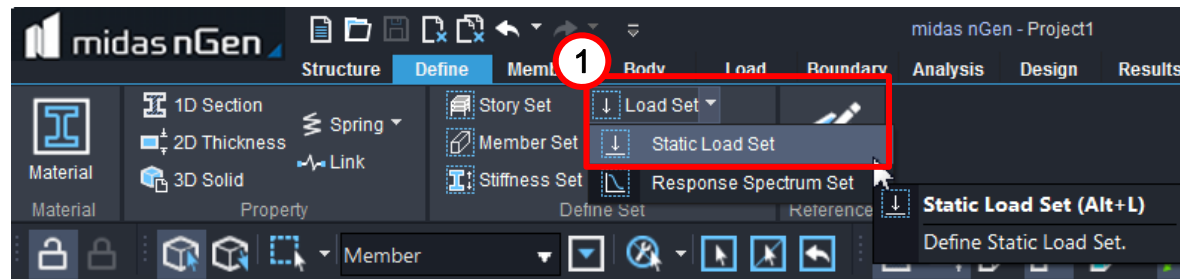
02 Load & Boundary Conditions

01 Load Set

Define Load Set

Define Load Set

1. Select [Define > Load Set > Static Load Set].
2. Enter [D] in Name > Select [Dead Load (D)] > Click [Add].
3. Enter [L] in Name > Select [Live Load (L)] > Click [Add].
4. Click [Close].



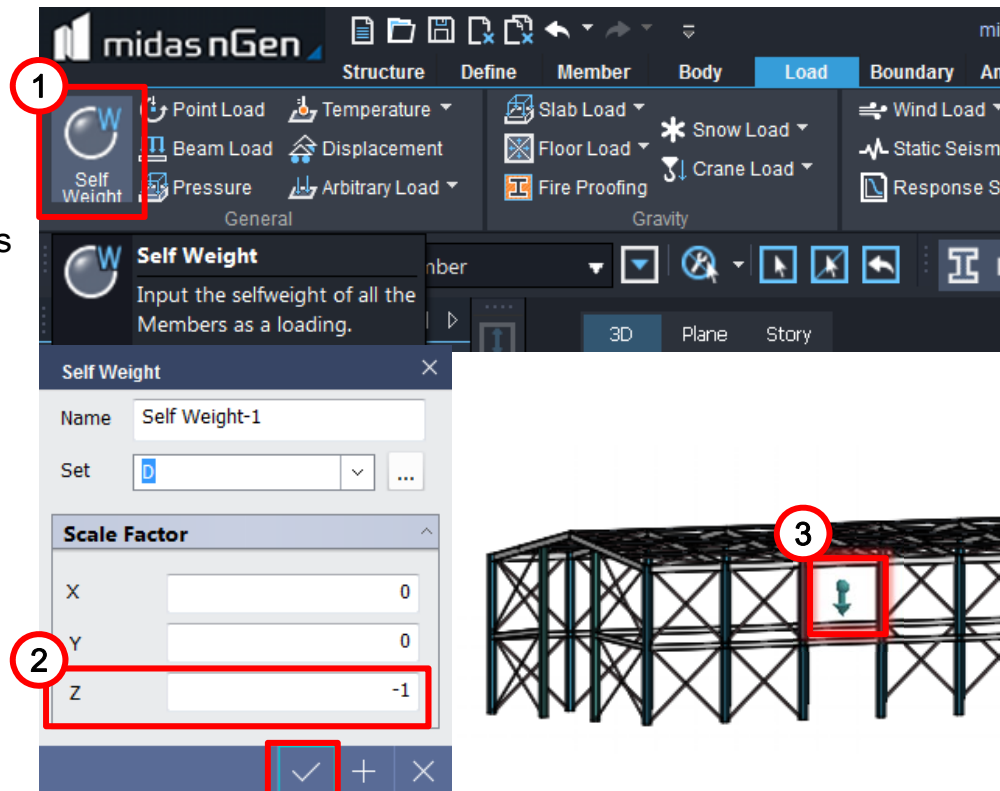
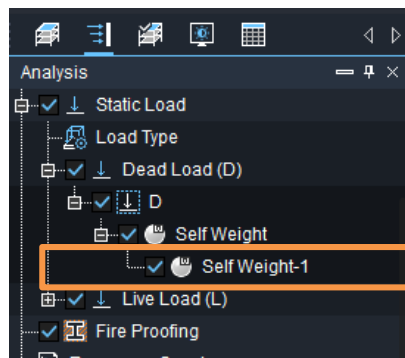
01 Load Set

Self-weight

Apply Self-weight

1. Select [Load > Self-weight].
2. Enter [-1] for Z. > Click [OK].
3. Confirm Self-weight at the mass center of the Structure.

Confirm [Work Tree > Static Load > Dead Load > Self-weight].



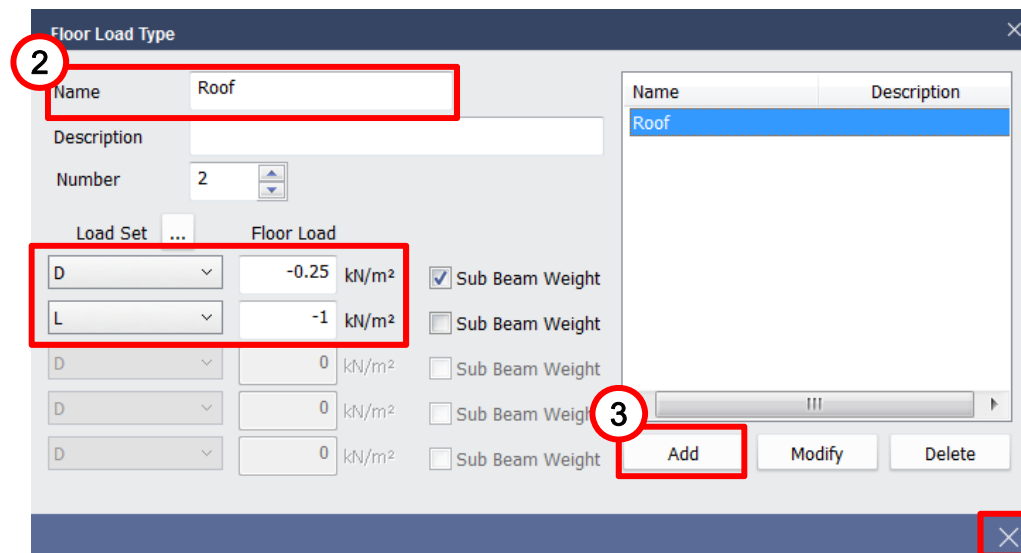
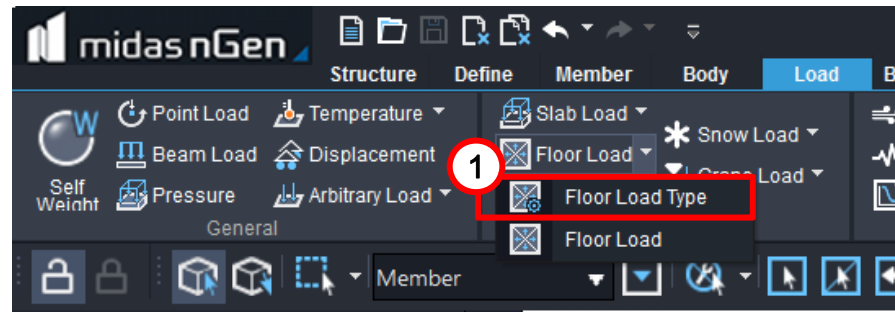
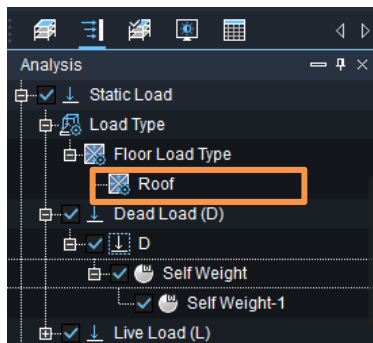
02 Floor Load

Define Floor Load Type

Define Floor Load Type

1. Select [Load > Floor Load > Floor Load Type].
2. Enter [Roof] in Name > [-0.25] for D > [-1] for L.
3. Click [Add] > Click [Close]

Confirm [Work Tree > Static Load > Floor Load Type > Roof].



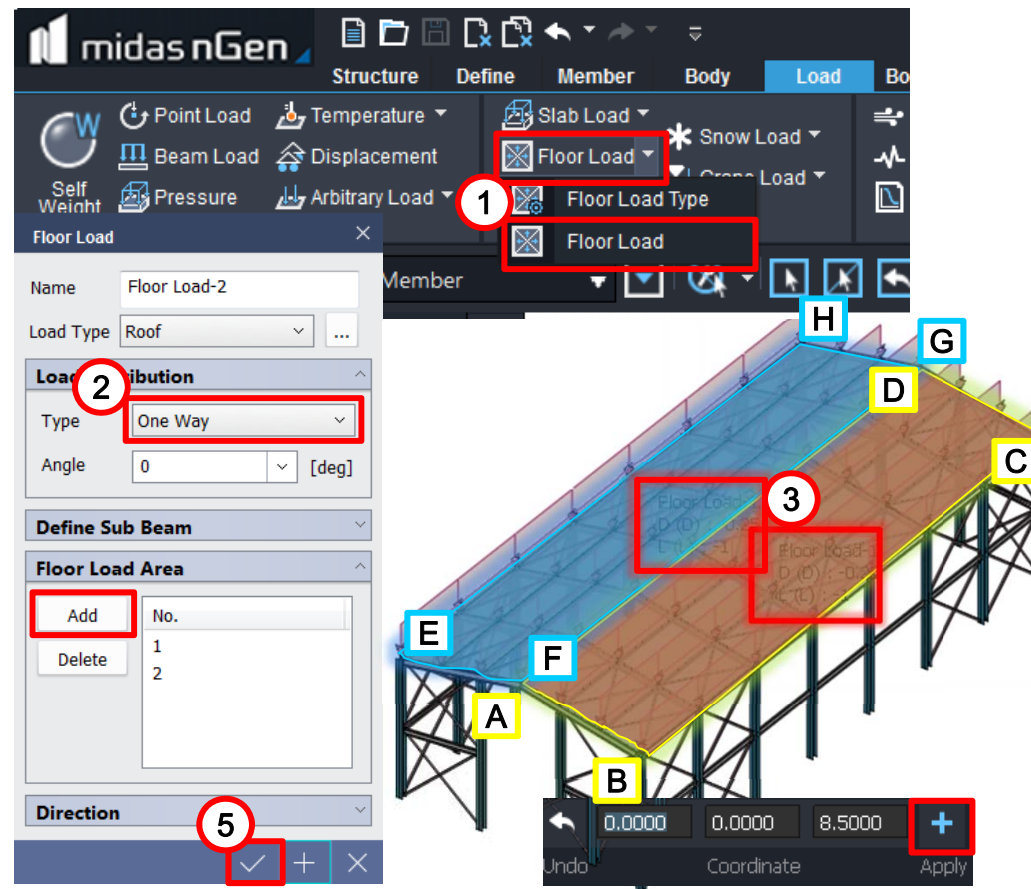
02 Floor Load

Assign Floor Load

Assign Floor Load

1. Select [Load > Floor Load > Floor Load].
2. Select [Roof] in Load Type > One-Way] in Type > Click [Add].
3. Click [A, B, C, D] > Click [Apply]
4. Click [E, F, G, H] > Click [Apply].
5. Click [OK].
6. Confirm Floor Load on the roof.



Confirm [Work Tree > Static Load > Dead Load & Live Load > Floor Load-1(Roof)].

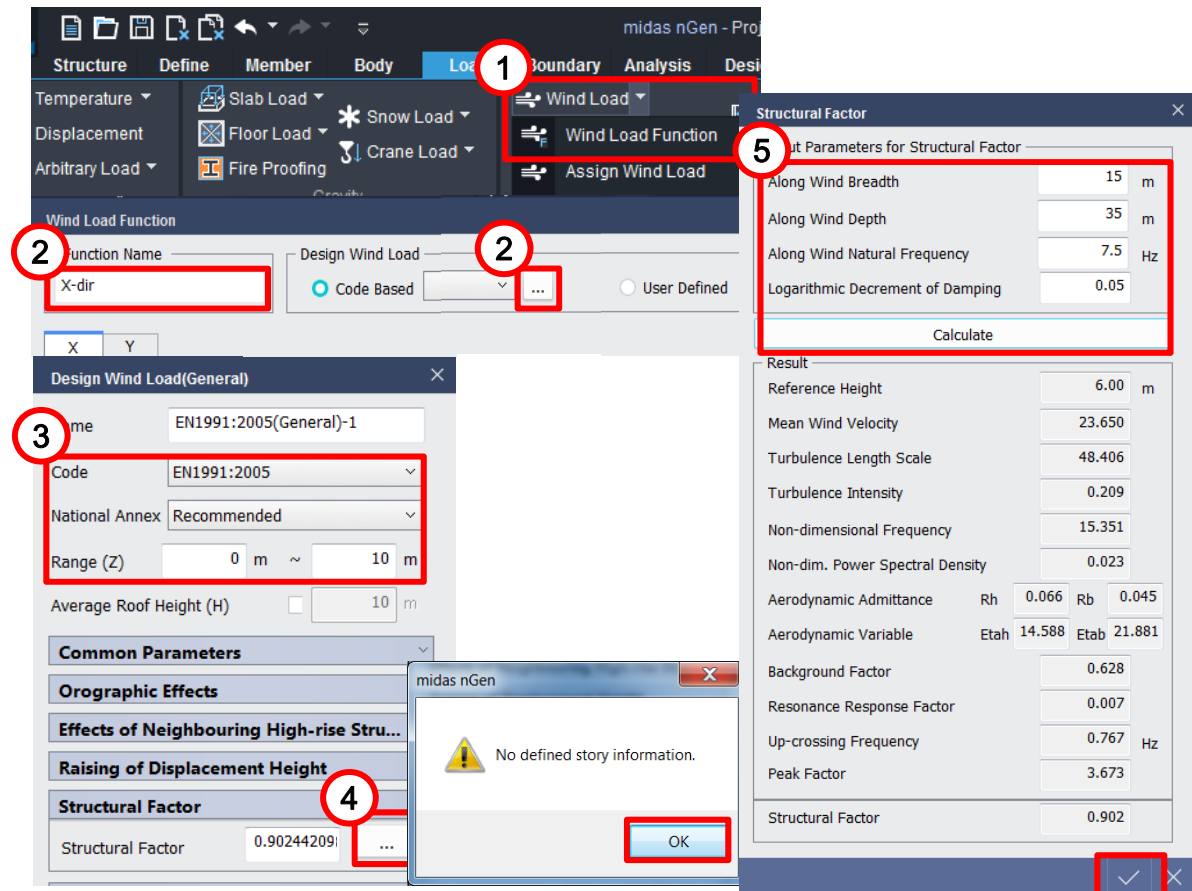


03 Wind Loads

Wind Load Function

Define Wind Load Function
(X-direction)

1. Select [Load > Wind Load > Wind Load].
2. Enter [X-dir] and Click .
Click [Add].
3. Select [EN 1991:2005] > Enter [0m~10m] in Range (Z).
4. To auto calculate Structural factor, Click  > Click [OK].
5. Enter [15], [35], [7.5] > Click [Calculate] > Click [OK].

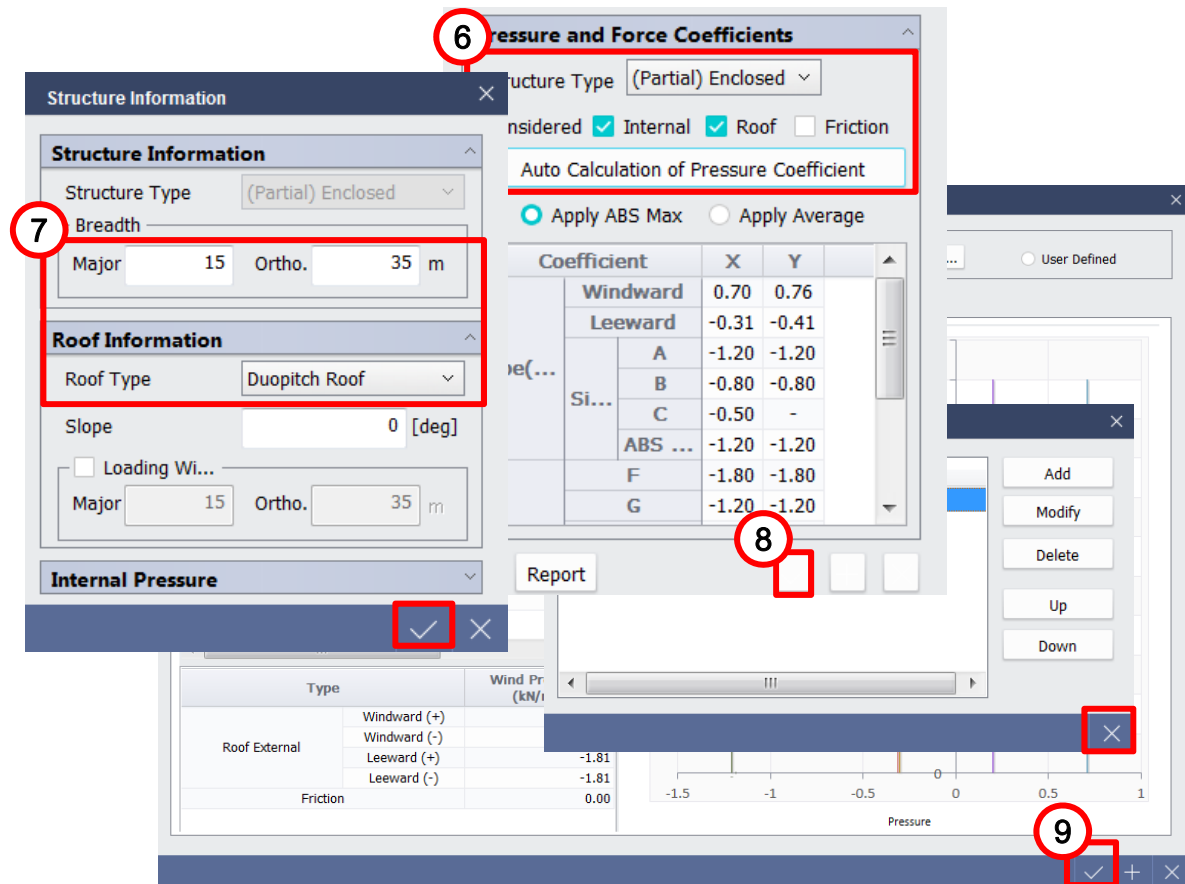


03 Wind Loads

Wind Load Function

Define Wind Load Function
(X-direction)

6. Select[(Partial) Enclosed] > Check [Internal] and [Roof] > Click [Auto Calculation of Pressure Coefficient].
7. Enter [15], [35] > Select [Duopitch Roof] > Click [OK]
8. Click [OK] > Click [Close]
9. Confirm value > Click [OK]

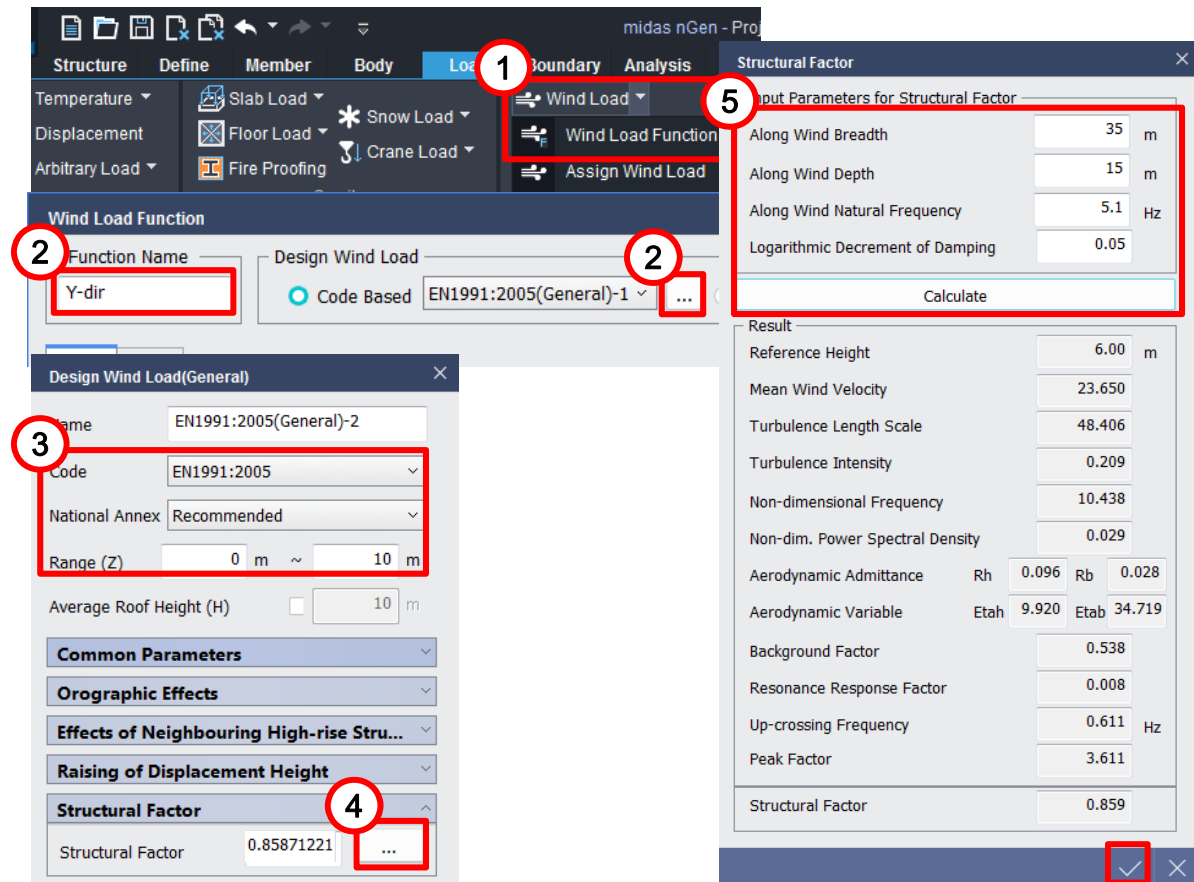


03 Wind Loads

Wind Load Function

Define Wind Load Function
(Y-direction)

1. Select [Load > Wind Load > Wind Load].
2. Enter [Y-dir] and Click
3. Click [Add] > Select [EN 1991:2005] > Enter [0m~10m] in Range (Z).
4. To auto calculate Structural factor, Click > Click OK.
5. Enter [35], [15], [5.1] > Click [Calculate] > Click [OK].

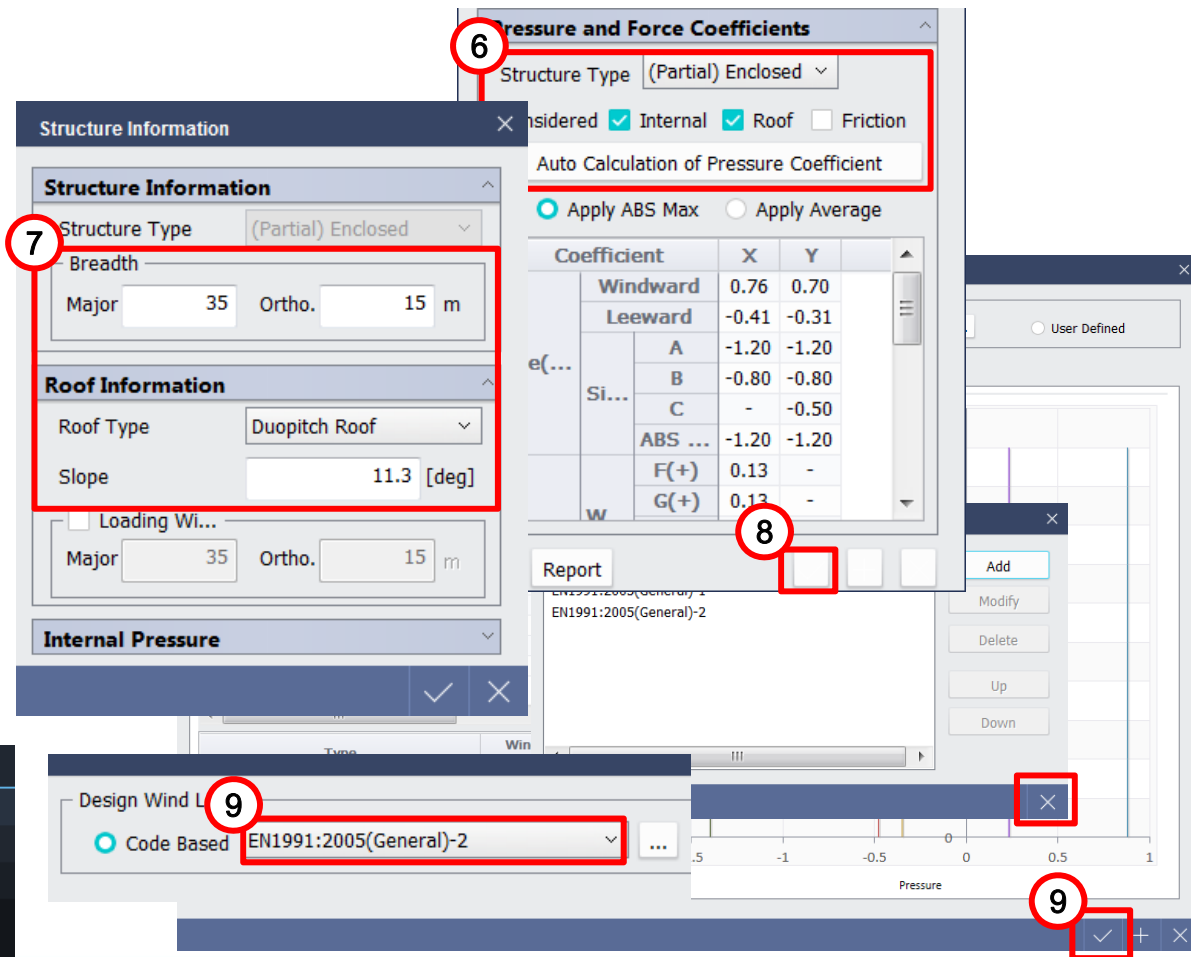
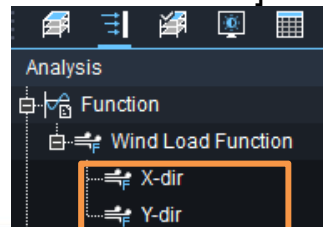


03 Wind Loads

Wind Load Function

Define Wind Load Function
(Y-direction)

6. Select[(Partial) Enclosed] > Check [Internal] and [Roof] > Click [Auto Calculation of Pressure Coefficient].
 7. Enter [35], [15] > Select [Duopitch Roof] > Enter [11.3] > Click [OK]
 8. Click [OK] > Click {Close}
 9. Select [EN1991:2005(General)-2] > Click [OK]
- Confirm [Work Tree > Function]

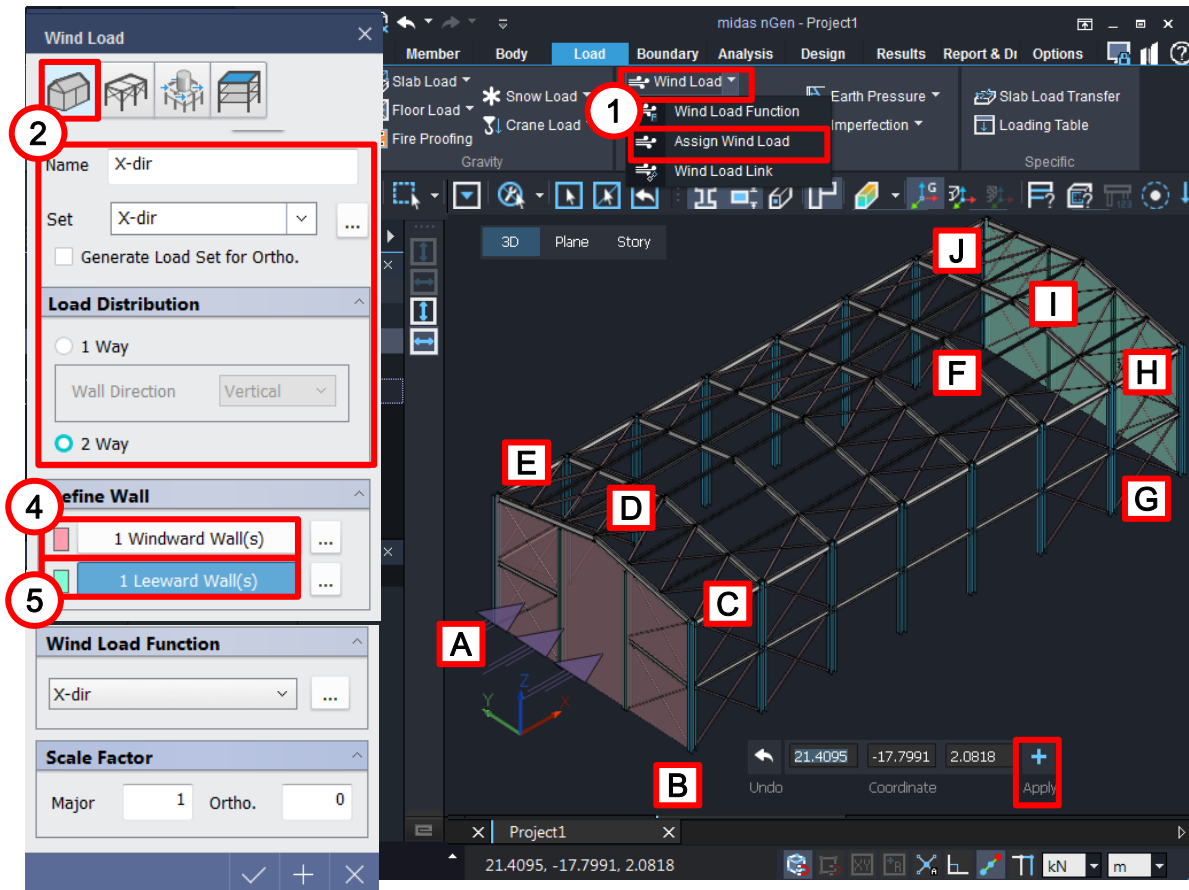


03 Wind Loads

Assign Wind Load

Apply Wind Load (X-direction)

1. Select [Load > Wind Load > Assign Wind Load]
2. Enter Set [X-dir] > Check off [Generate Ortho. Direction] > Select [2 Way]
3. Click [Define Windward Wall(s)] > Click [A, B, C, D, E] > Click [Apply]
4. Click [Define Leeward Wall(s)] > Click [F, G, H, I, J] > Click [Apply]

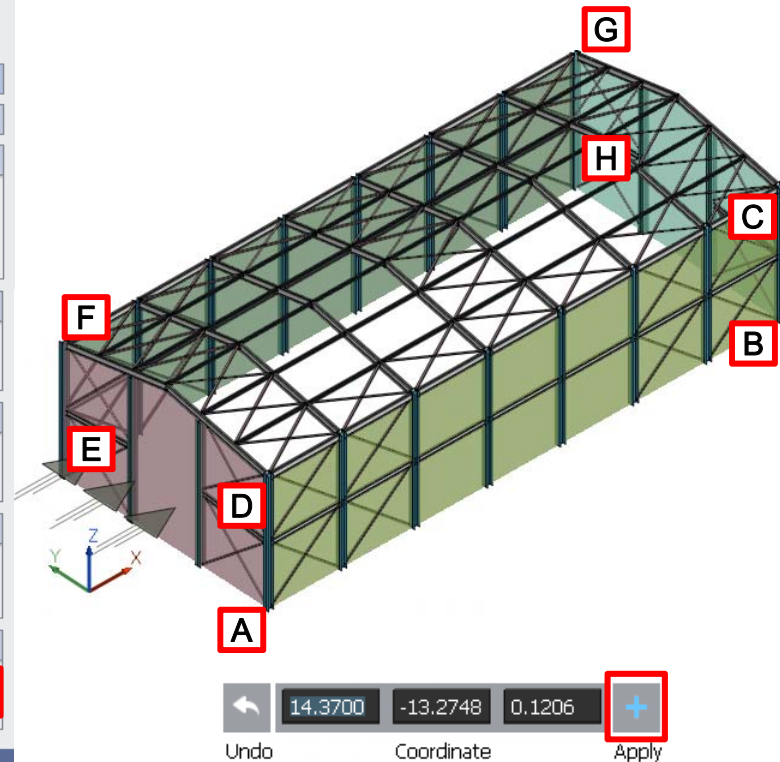


03 Wind Loads

Assign Wind Load

Apply Wind Load (X-direction)

5. Click (Ortho.) [Define Windward Wall(s)] > Click [A, B, C, D] > Click [Apply]
6. Click [Define Leeward Wall(s)] > Click [E, F, G, H] > Click [Apply]
7. Select Internal Pressure Direction [Positive]
8. Select Global X [0].
9. Select Wind Load Function > X-dir.
10. Enter Ortho. [0] > Click [Apply]



03 Wind Loads

Assign Wind Load

Apply Wind Load (Y-direction)

1. Enter Name [Y-dir]
2. Define Wall > Click [Windward Wall(s)] > Click [A, B, C, D] > Click [Apply]
3. Click [Leeward Wall(s)] > Click [E, F, G, H] > Click [Apply]
4. Define Wall Ortho. > Click [Windward Wall(s)] > Click [A, D, I, H, E] > Click [Apply]
5. Define Wall Ortho. > Click [Leeward Wall(s)] > Click [B, C, J, G, F] > Click [Apply]

Wind Load

Name Y-dir

Set Y-dir

☐ Generate Load Set for Ortho.

Load Distribution

Define Wall

1 Windward Wall(s)

1 Leeward Wall(s)

Define Wall (Ortho.)

1 Windward Wall(s)

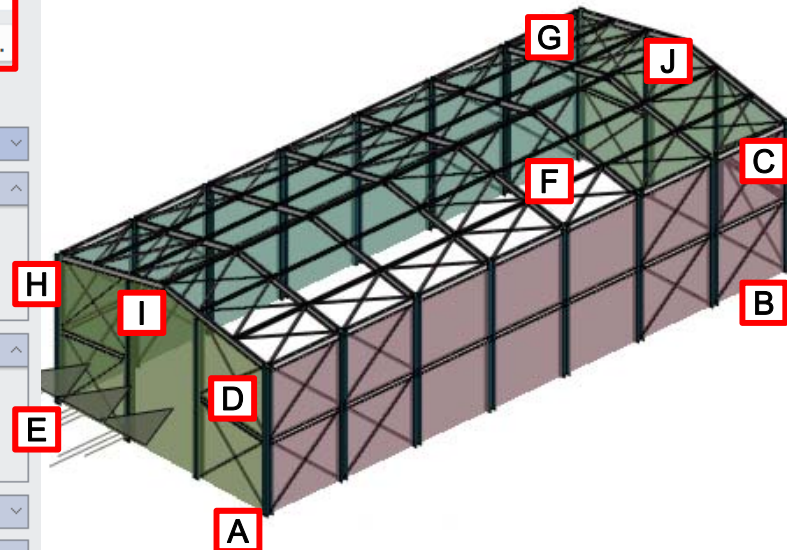
1 Leeward Wall(s)

Define Roof

Define Friction

Internal Pressure

Direction



03 Wind Loads

Assign Wind Load

Apply Wind Load (Y-direction)

6. Define Roof > Click [Windward Roof(s)] > Click [A, B, C, D] > Click [Apply]
7. Define Roof > Click [Leeward Roof(s)] > Click [C, D, E, F] > Click [Apply]
8. Select Internal Pressure [Positive]
9. Enter Direction > [90] [deg.]
10. Select [Y-dir]
11. Click [OK]

Repeat all with Negative Internal Pressure.

☐ Generate Load Set for Ortho.

Load Distribution ▾

Define Wall ▾

Define Wall (Ortho.) ▾

Define Roof ▴

1 Windward Roof(s) ...

1 Leeward Roof(s) ...

Internal Pressure ▴

Direction Positive ▾

Direction ▴

Global X ▾ 90 [deg.]

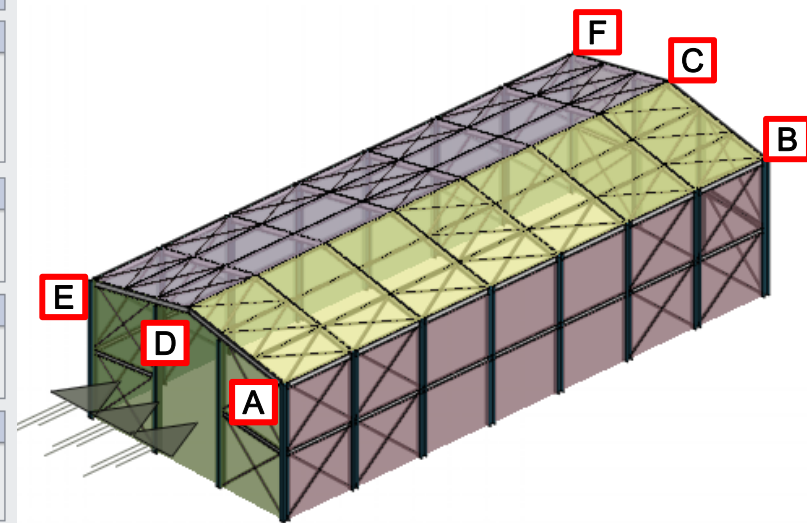
Wind Load Function ▴

Y-dir ▾ ...

Scale Factor ▴

Major 1 Ortho. 0

✓ + ×



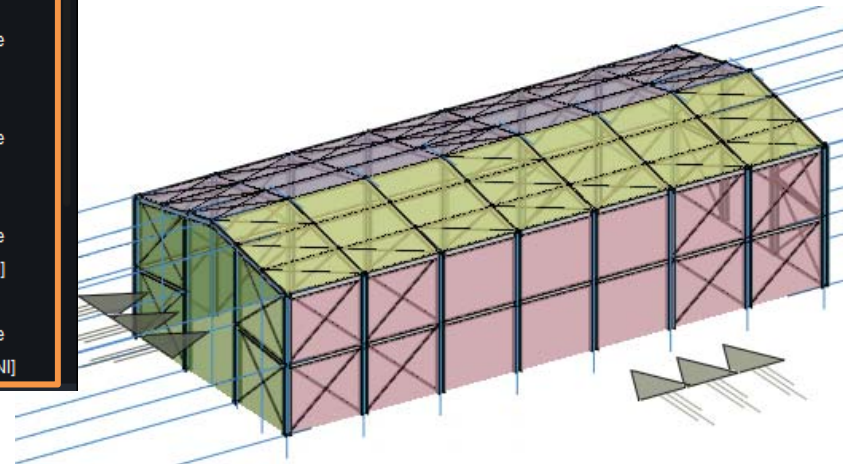
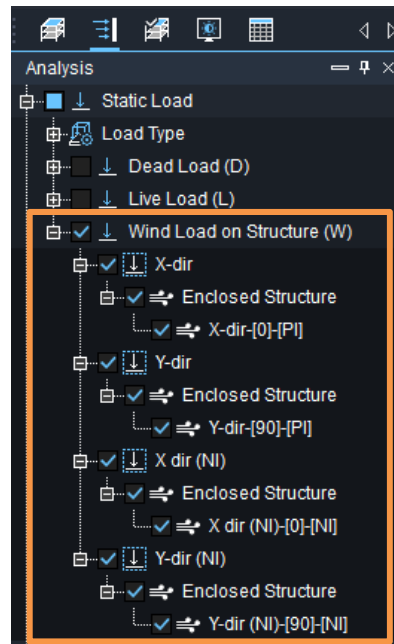
Undo 14.3700 -13.2748 0.1206 Apply

03 Wind Loads

Assign Wind Load

Apply Wind Load (Y-direction)

Confirm [Work Tree > Static Load > Wind Load on Structure (W)]

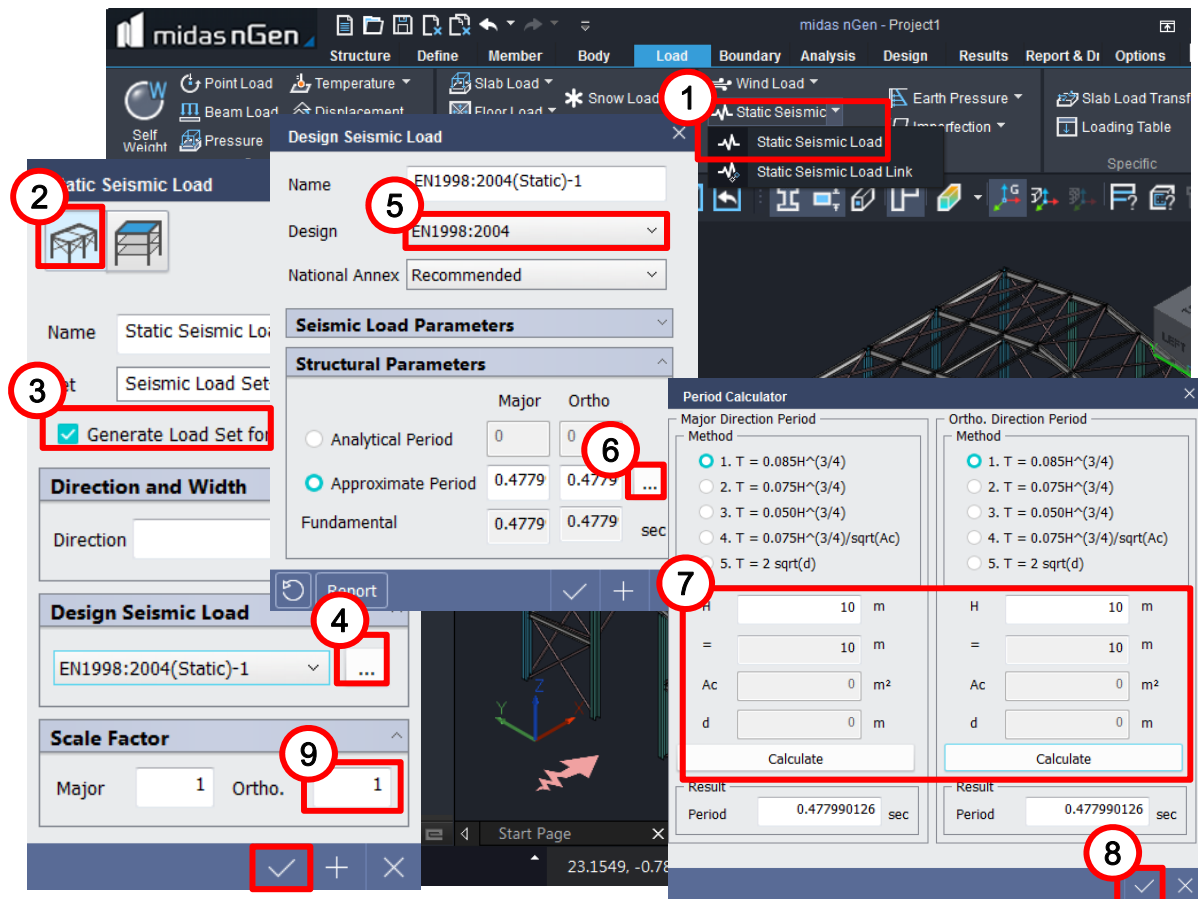


04 Seismic Loads

Seismic Loads

Apply Seismic Load

1. Select [Load > Static Seismic > Static Seismic load]
2. Select [General Structure]
3. Check on [Generate Ortho. Direction]
4. Click [...] > Click [Add]
5. Select [EN 1998:2004]
6. Click [...]
7. Enter [10] > Click [Calculate].
8. Click [OK] > Click [OK] > Click [Close].
9. Enter [1] scale factor for Ortho. > Click [OK]



04 Seismic Loads

Load to Mass

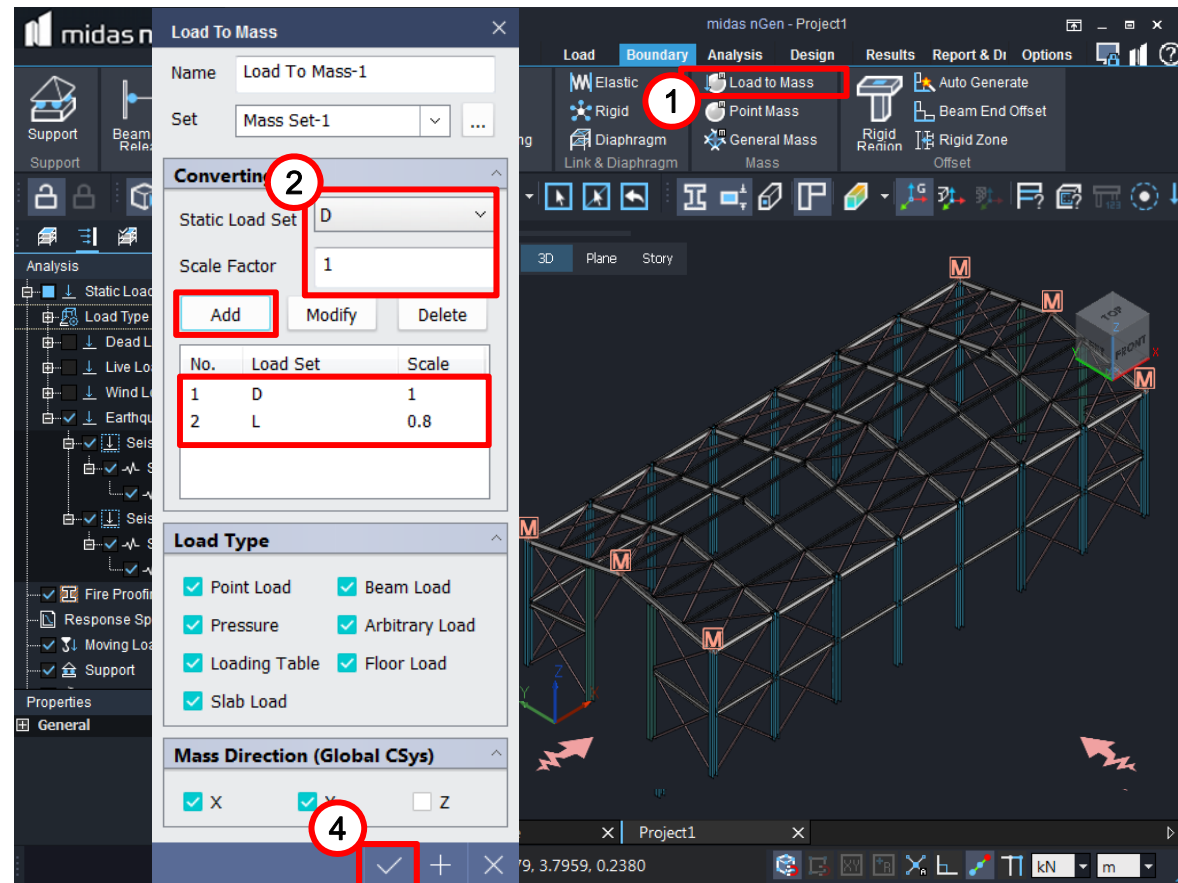
Load to Mass

1. Select [Boundary > Load to Mass].
2. Select [D] > Enter [1] > Click [Add].
3. Select [L] > Enter [0.8] > Click [Add].

Scale Factor : coefficient for variable action

$$\Psi_e = \Phi \Psi_2 = 1 \times 0.8 = 0.8$$

4. Click [OK]



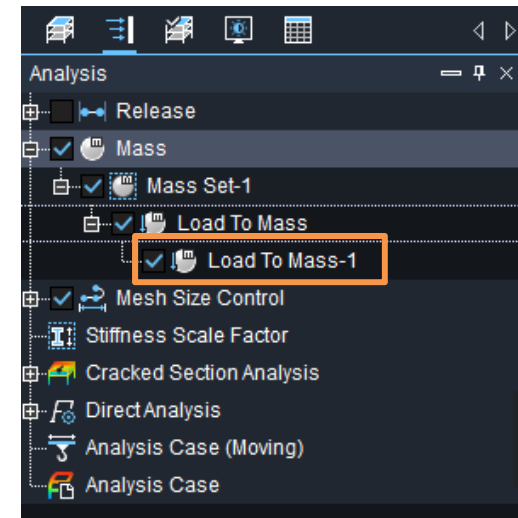
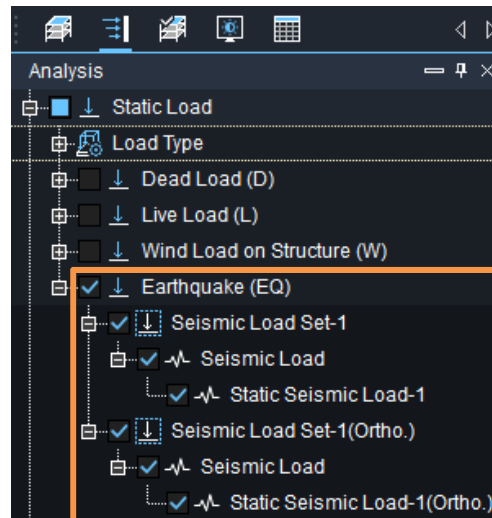
04 Seismic Loads

Seismic Loads

Seismic Loads

Confirm Analysis Tree Menu
[Static Load > Earthquake (EQ)]

Confirm Analysis Tree Menu
[Mass > Mass Set-1 > Load to
Mass].



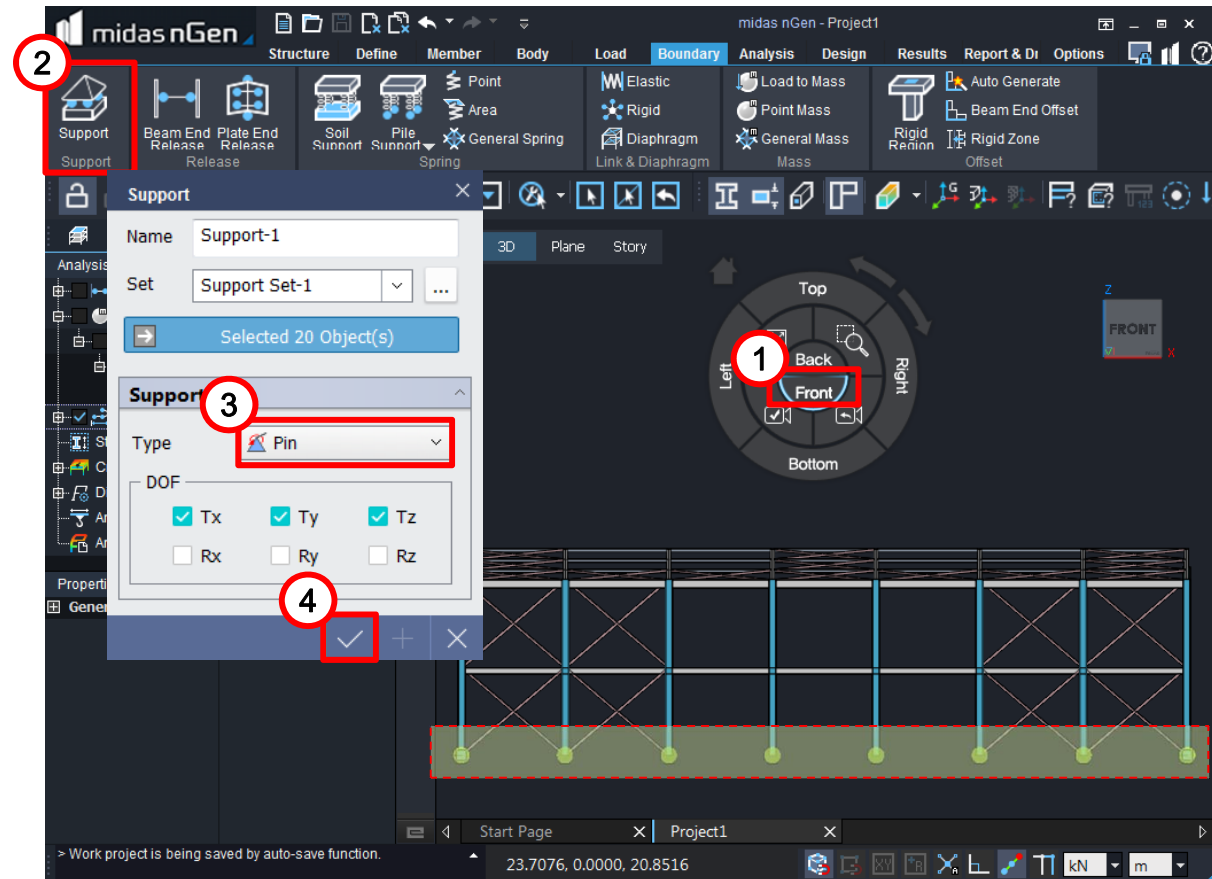
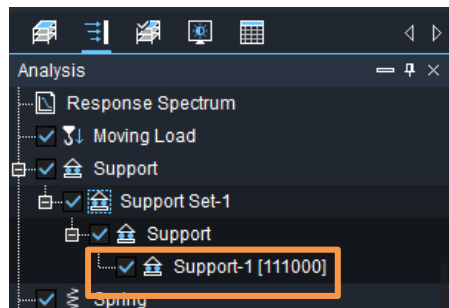
05 Boundary Conditions

Apply Supports

Apply Supports

1. Go to [Front] view
2. Select [Boundary > Support]
3. Select the [end point of columns] > Select [Pin].
4. Click [OK].

Confirm [Work Tree > Analysis > Support > Support-1].



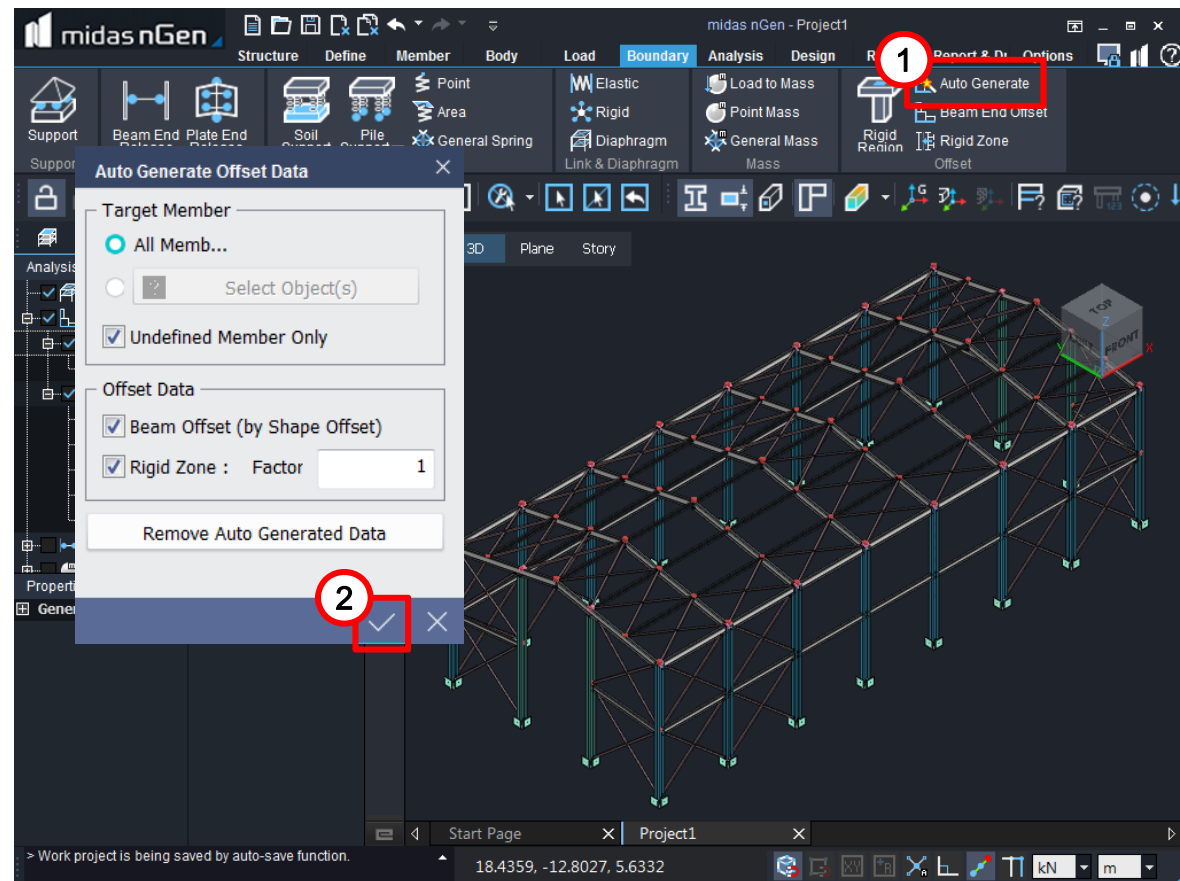
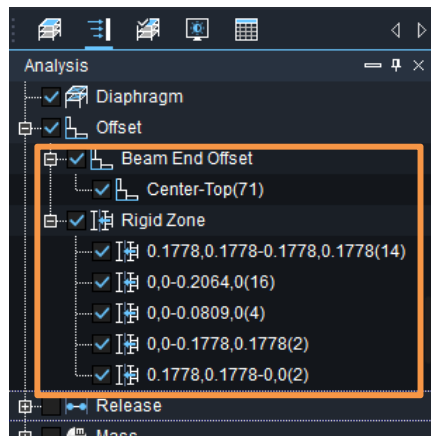
05 Boundary Conditions

Generate Offset

Apply Supports

1. Select [Boundary > Auto Generate]
2. Click [OK].

Confirm [Work Tree > Analysis > Offset].



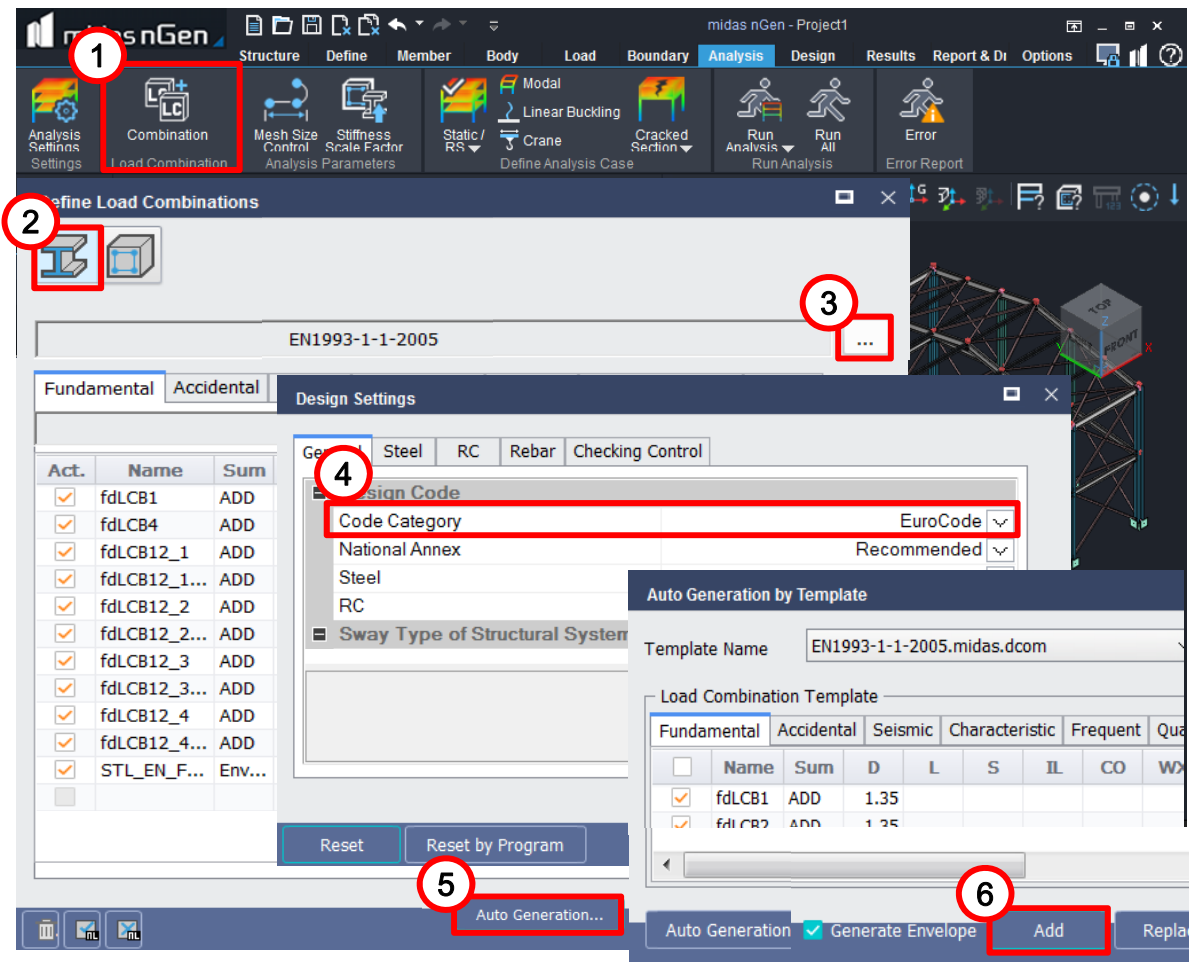
03 Analysis

01 Analysis Cases

Analysis Settings

Analysis Settings

1. Select [Analysis > Combination]
2. Select [Steel]
3. Click [...]
4. Select [Eurocode],
[Recommended] > Click [OK].
5. Click [Auto Generation]
6. Click [Add] > Click [Close]

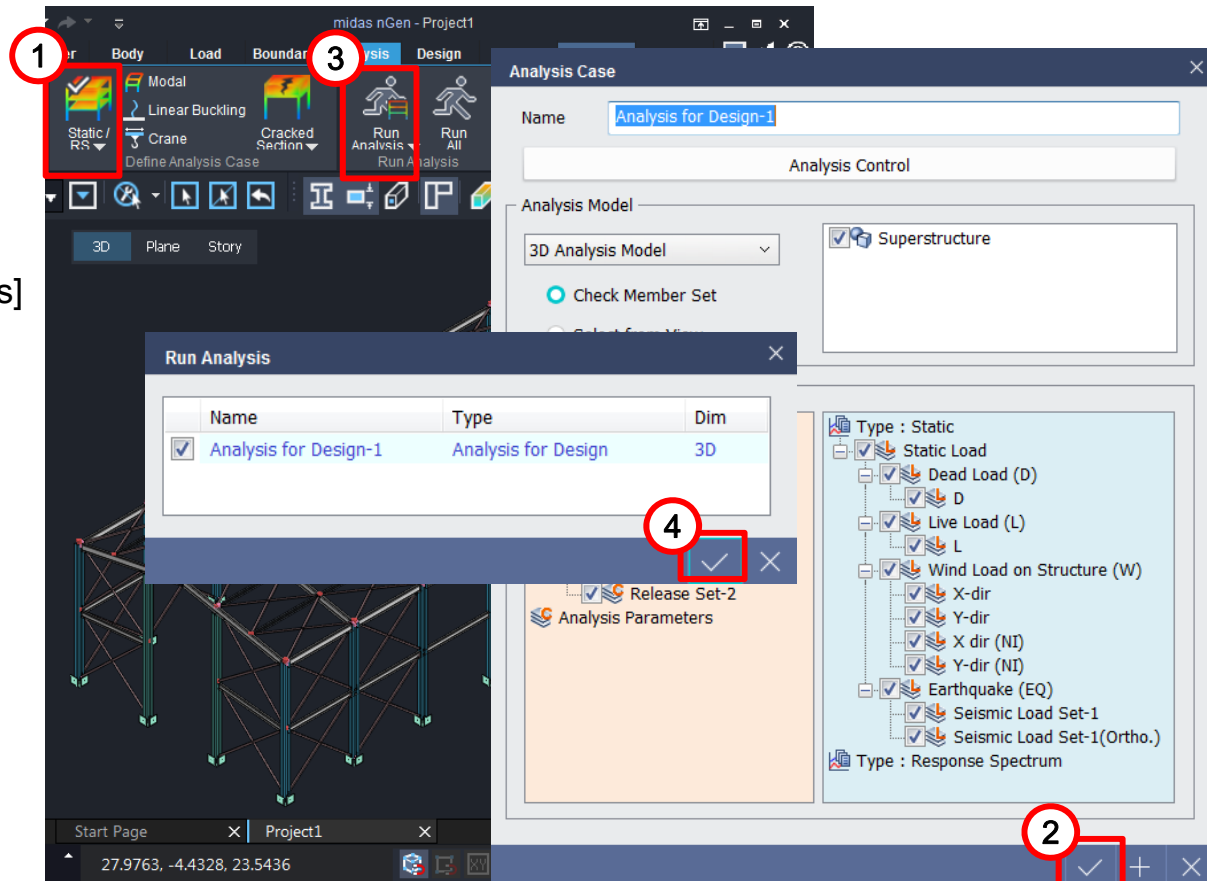


01 Analysis Cases

Perform Analysis

Define Analysis Case & Run Analysis

1. Select [Analysis > Static/RS]
2. Click [OK].
3. Select [Analysis > Run Analysis]
4. Click [OK]
5. Click [Close] to close the warnings.

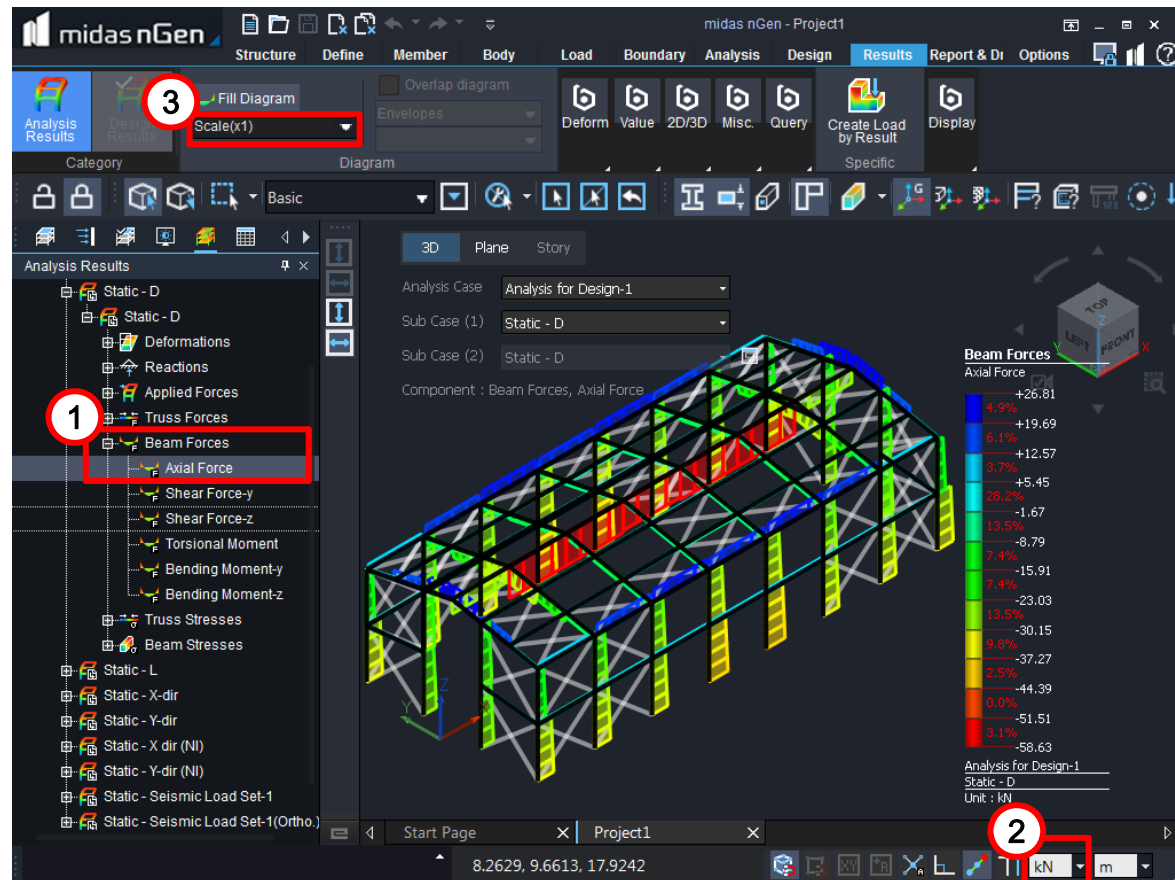


02 Analysis Result

Confirm Analysis Results

Confirm Analysis Results

1. Double-click [Analysis for Design > Static – D > Beam Forces > Axial Force]
2. Adjust the scale of [Fill Diagram].

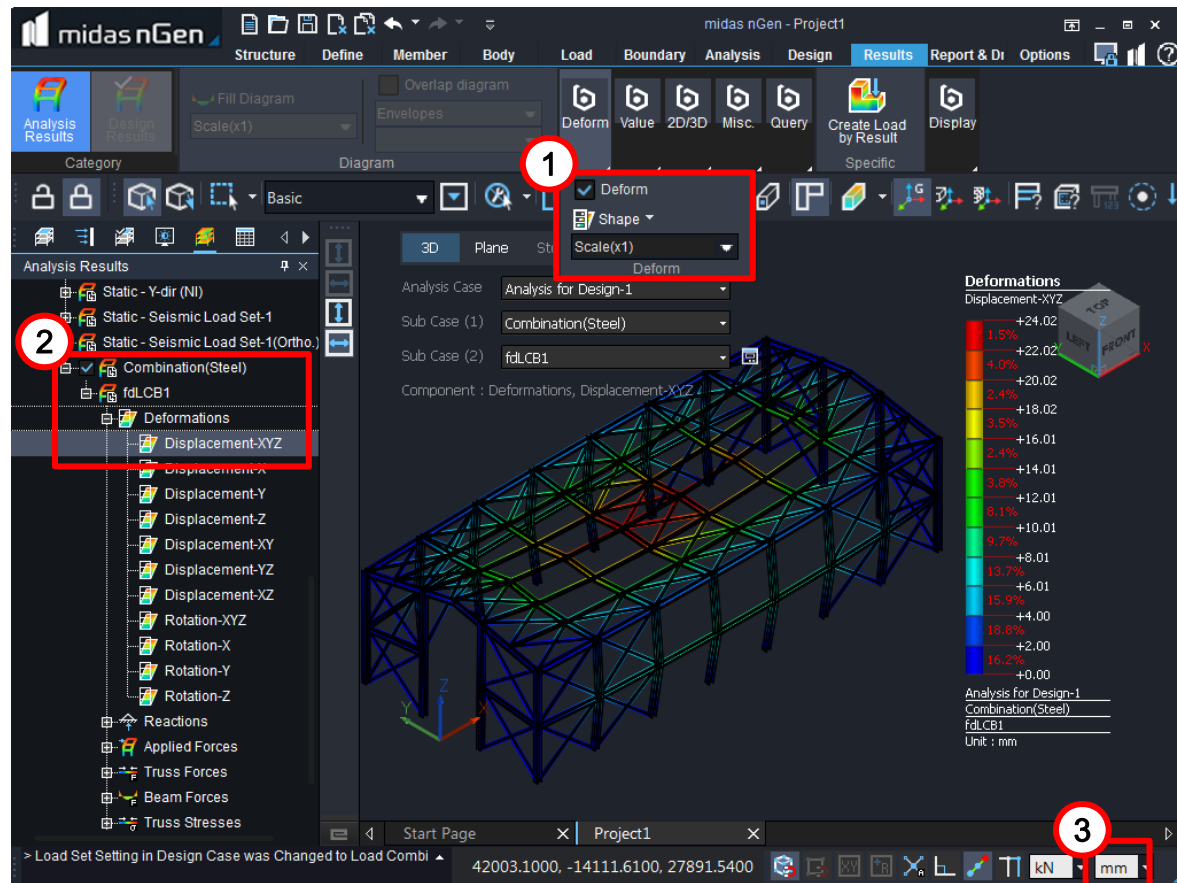


02 Analysis Result

Confirm Analysis Results

Confirm Analysis Results

1. Adjust the scale of [Deform].
2. Double-click [Analysis for Design > Combination(Steel) > fdLCB1 > Deformations > Displacement-XYZ]
3. Change the unit to [mm]



02 Analysis Result

Confirm Analysis Results

Confirm Analysis Results


1. Check to show or hide [Value] > [Abs Max] > Enter Decimal Points [2]
2. Check to show or hide [Legend].
3. Select [Initialize] to return to default.

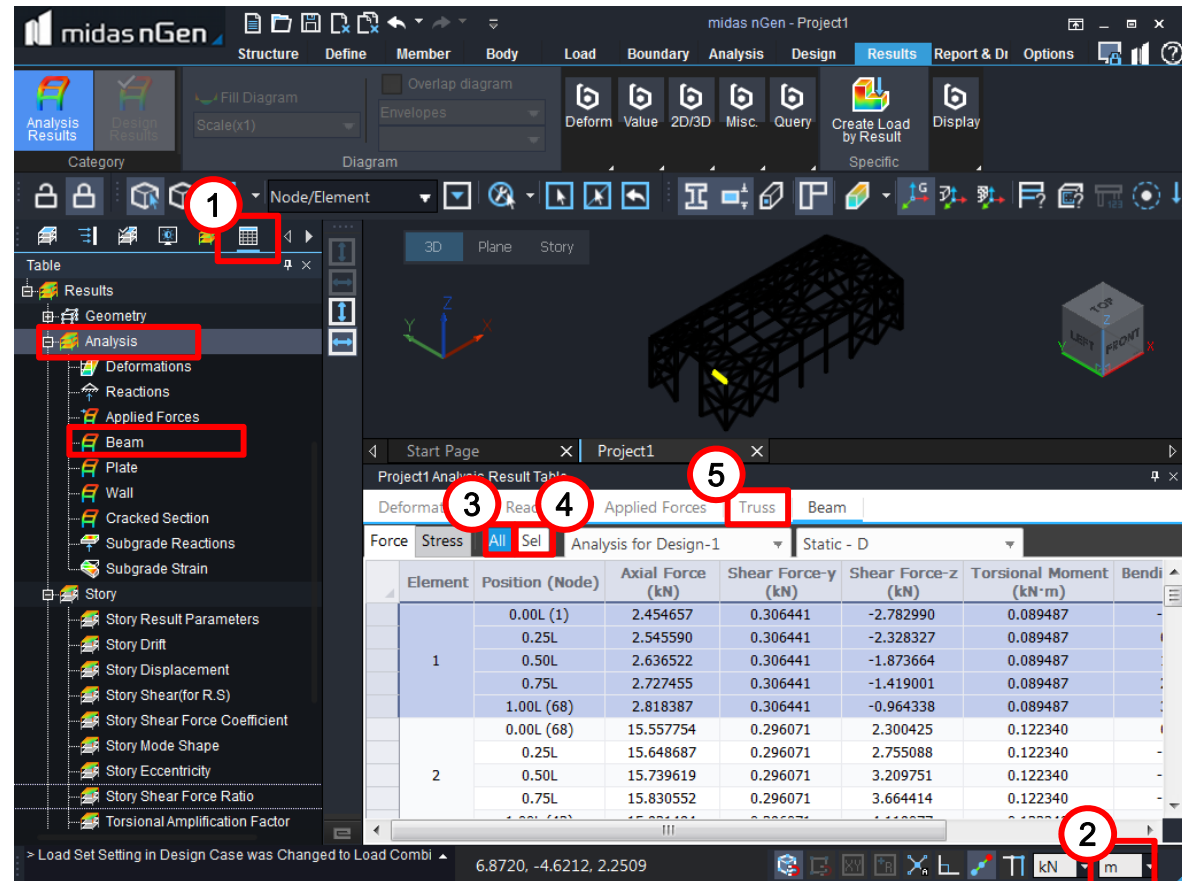


02 Analysis Result

Confirm Analysis Table

Confirm Analysis Results

1. Click  > Double-click to Select [Analysis > Beam]
2. Change Unit [m].
3. Click [All] > Check the Analysis results of every beam on the structure.
4. Click [Sel] > Select certain beams on the structure to find their analysis results.
5. Click [Truss] > Click [All] or [Sel] to view Truss analysis results.



The screenshot displays the midas nGen software interface with the following components and annotations:

- Toolbar:** Contains icons for Analysis Results, Design Results, Fill Diagram, Overlap diagram, Scale(x1), Envelopes, Deform, Value, 2D/3D, Misc., Query, Create Load by Result, and Display.
- Left Panel:** A tree view showing the project structure. The 'Analysis' folder is expanded, and the 'Beam' sub-item is selected and highlighted with a red box.
- Central View:** A 3D model of a truss structure is displayed.
- Table View:** The 'Project1 Analysis Result Table' is open. The 'Truss' tab is selected. The table has columns for Element, Position (Node), Axial Force (kN), Shear Force-y (kN), Shear Force-z (kN), Torsional Moment (kN·m), and Bendi. The table is filtered to show results for 'Static - D'. The 'All' button is highlighted with a red circle (3), and the 'Sel' button is highlighted with a red circle (4).
- Bottom Bar:** The unit is set to 'm', highlighted with a red box (2).

Element	Position (Node)	Axial Force (kN)	Shear Force-y (kN)	Shear Force-z (kN)	Torsional Moment (kN·m)	Bendi
1	0.00L (1)	2.454657	0.306441	-2.782990	0.089487	
	0.25L	2.545590	0.306441	-2.328327	0.089487	
	0.50L	2.636522	0.306441	-1.873664	0.089487	
	0.75L	2.727455	0.306441	-1.419001	0.089487	
	1.00L (68)	2.818387	0.306441	-0.964338	0.089487	
2	0.00L (68)	15.557754	0.296071	2.300425	0.122340	
	0.25L	15.648687	0.296071	2.755088	0.122340	
	0.50L	15.739619	0.296071	3.209751	0.122340	
	0.75L	15.830552	0.296071	3.664414	0.122340	

04 Design

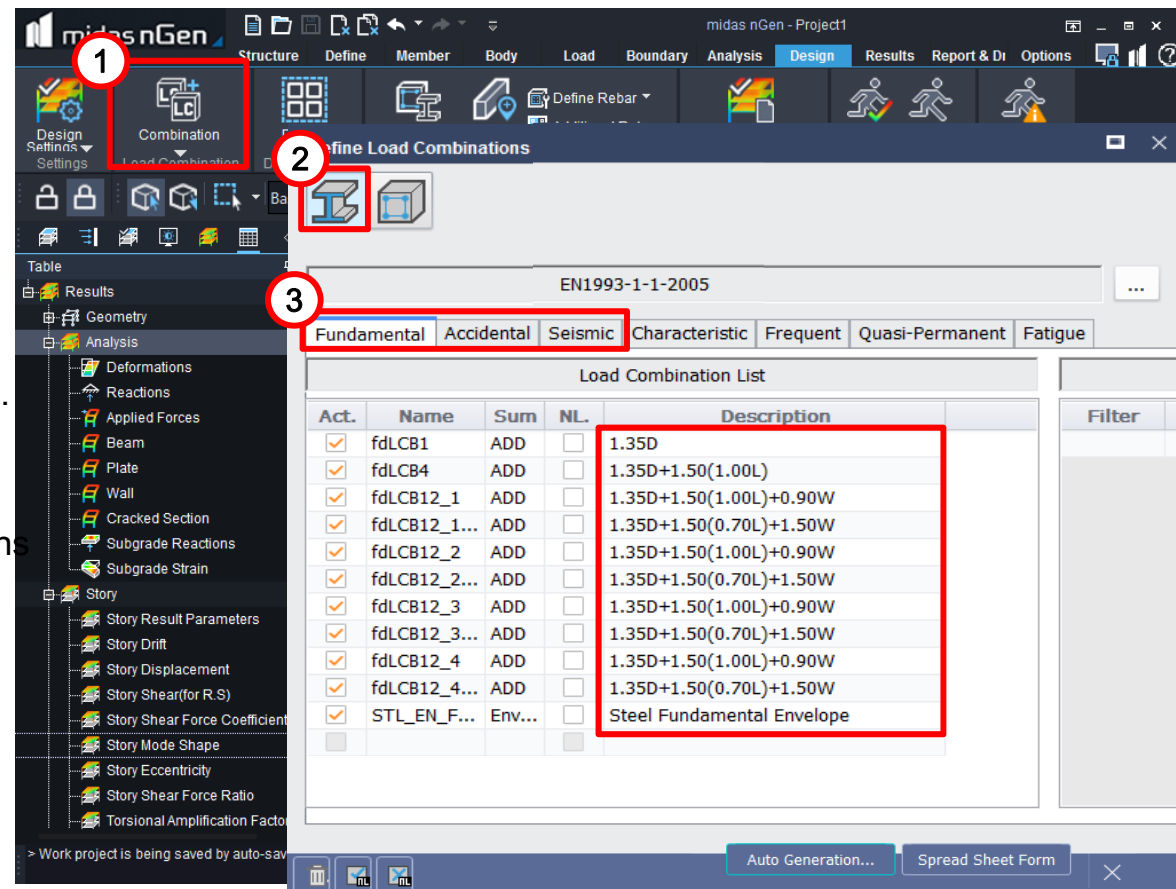
01 Load Combinations

Define Load Combinations

Check Load Combinations

1. Select [Analysis > Combination]
 2. Select [Steel]
 3. Check [ULS(Fundamental, Accidental , Seismic)]
- [Fundamental]* = persistent & Transient design situations for ULS.
- [Accidental]* = accidental design situations for ULS.
- [Seismic]* = seismic Design situation for ULS.

Check [Factors of ULS = design value of action x accompanying value of combination] in the Load Combination Data.



01 Load Combinations

Define Load Combinations

Check Load Combinations

4. Check [SLS(Characteristic,
Frequent, Quasi-permanent)].

[Characteristic] = characteristic
situations for SLS.

[Frequent] = frequent situations for
SLS.

[Quasi permanent] = Quasi
permanent situations for SLS.

5. Click [Spread Sheet Form] to work
on Excel.

Drag to Select the cells and Copy-
paste in Excel for output.

6. Click [Close].

Define Load Combinations

EN1993-1-1-2005

4

Fundamental Accidental Seismic Characteristic Frequent Quasi-Permanent Fatigue

Act.	Name	Sum	NL	Description	D	L	W	W	W	W
					D	L	X-dir	Y-dir	X-dir (NI)	Y-dir (NI)
<input checked="" type="checkbox"/>	chLCB1	ADD	<input type="checkbox"/>	1.00D	1.00					
<input checked="" type="checkbox"/>	chLCB2	ADD	<input type="checkbox"/>	1.00D+1.00(1.00L)	1.00	1.00				
<input checked="" type="checkbox"/>	chLCB6_1	ADD	<input type="checkbox"/>	1.00D+1.00(1.00L)+0.60W	1.00	1.00	0.60			
<input checked="" type="checkbox"/>	chLCB6_1_1	ADD	<input type="checkbox"/>	1.00D+1.00(0.70L)+1.00W	1.00	0.70	1.00			
<input checked="" type="checkbox"/>	chLCB6_2	ADD	<input type="checkbox"/>	1.00D+1.00(1.00L)+0.60W	1.00	1.00		0.60		
<input checked="" type="checkbox"/>	chLCB6_2_2	ADD	<input type="checkbox"/>	1.00D+1.00(0.70L)+1.00W	1.00	0.70		1.00		
<input checked="" type="checkbox"/>	chLCB6_3	ADD	<input type="checkbox"/>	1.00D+1.00(1.00L)+0.60W	1.00	1.00			0.60	
<input checked="" type="checkbox"/>	chLCB6_3_3	ADD	<input type="checkbox"/>	1.00D+1.00(0.70L)+1.00W	1.00	0.70			1.00	
<input checked="" type="checkbox"/>	chLCB6_4	ADD	<input type="checkbox"/>	1.00D+1.00(1.00L)+0.60W	1.00	1.00				0.60
<input checked="" type="checkbox"/>	chLCB6_4_4	ADD	<input type="checkbox"/>	1.00D+1.00(0.70L)+1.00W	1.00	0.70				1.00
<input checked="" type="checkbox"/>	STL_EN_CHAR	Envelope	<input type="checkbox"/>	Steel Characteristic Envelope						

5

6

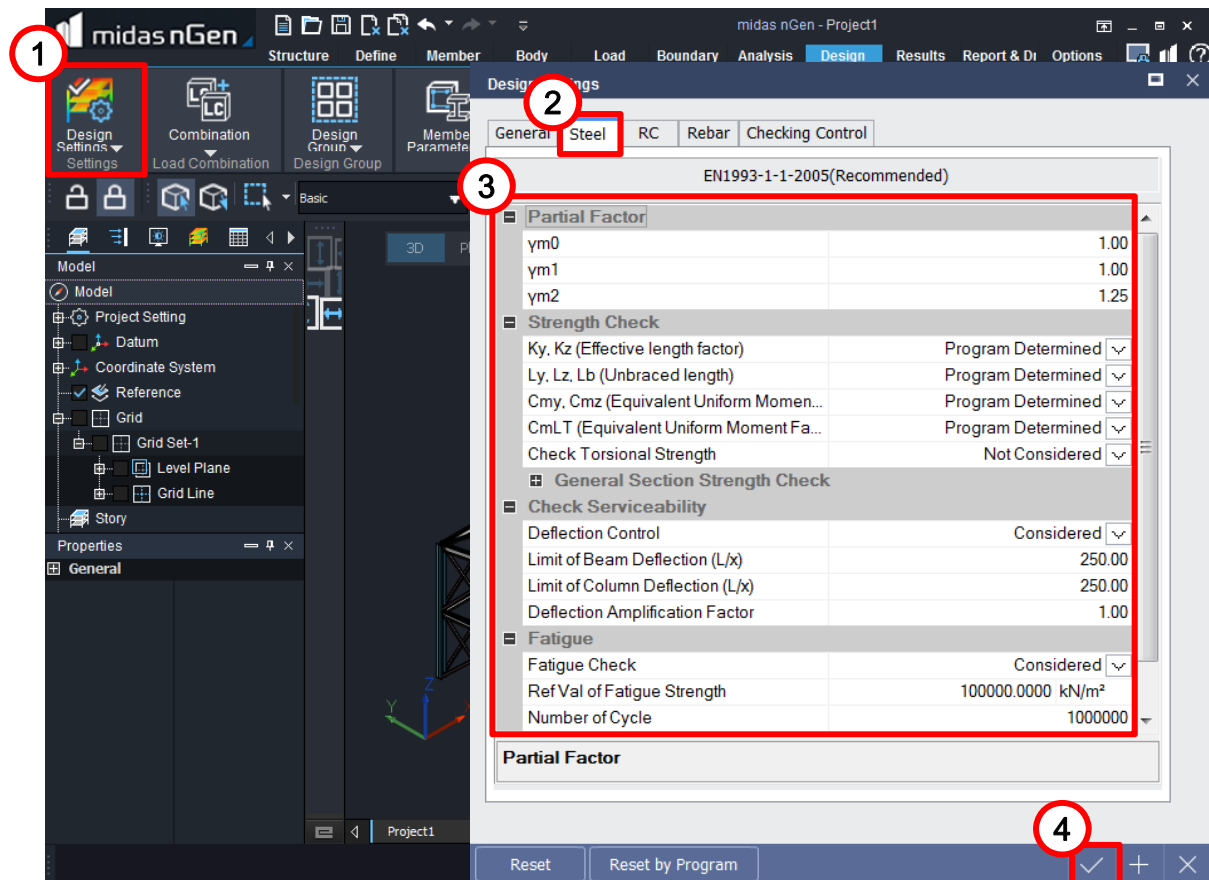
Auto Generation... Spread Sheet Form

02 Member Design Parameters

Design Settings

Design Settings


1. Select [Design > Design Settings].
2. Select [Steel].
3. Confirm [Steel Parameters: Partial Factor, Strength, Serviceability, Fatigue].
4. Click OK.

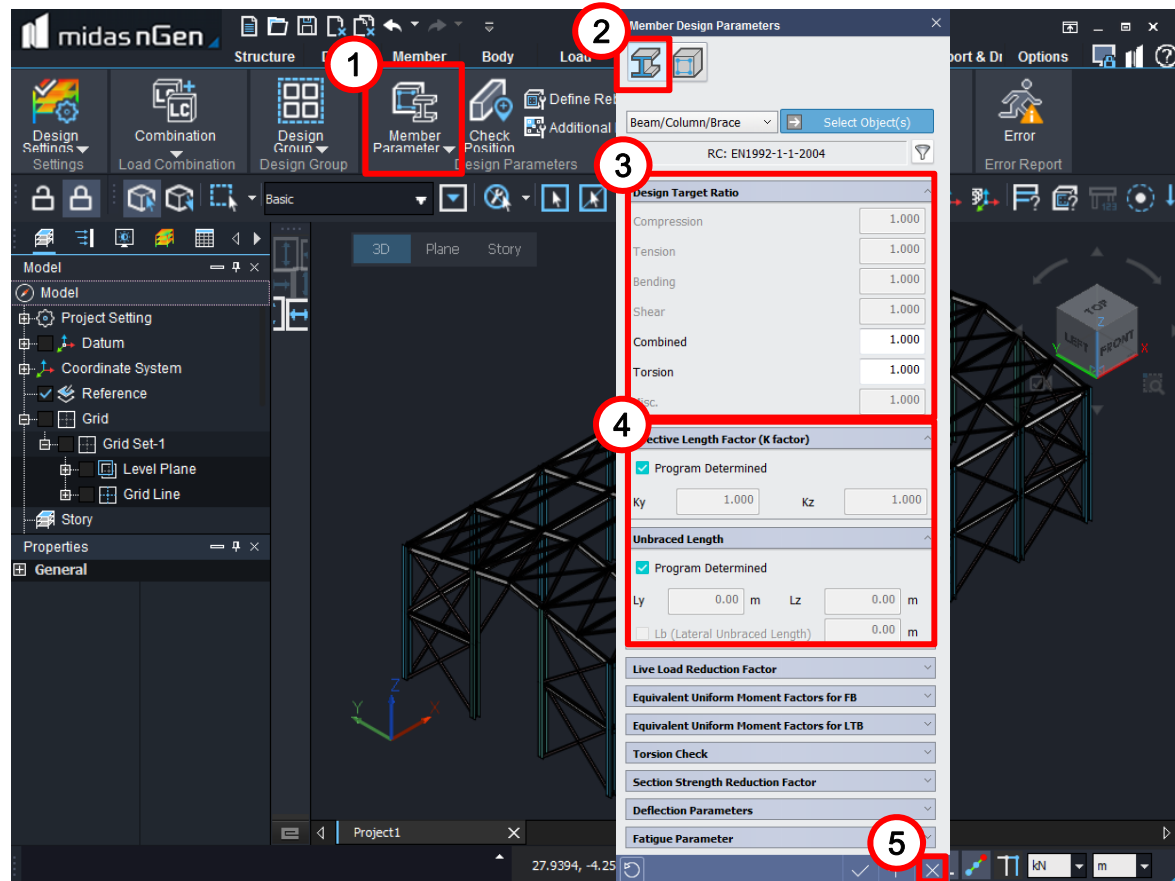


02 Member Design Parameters

Member Parameters

Define Member Parameters

1. Select [Design > Member Parameter].
2. Click .
3. Define [Target Ratio].
4. Define [Effective Length Factor & Unbraced Length].
5. Click [OK] to apply or Click [Close].

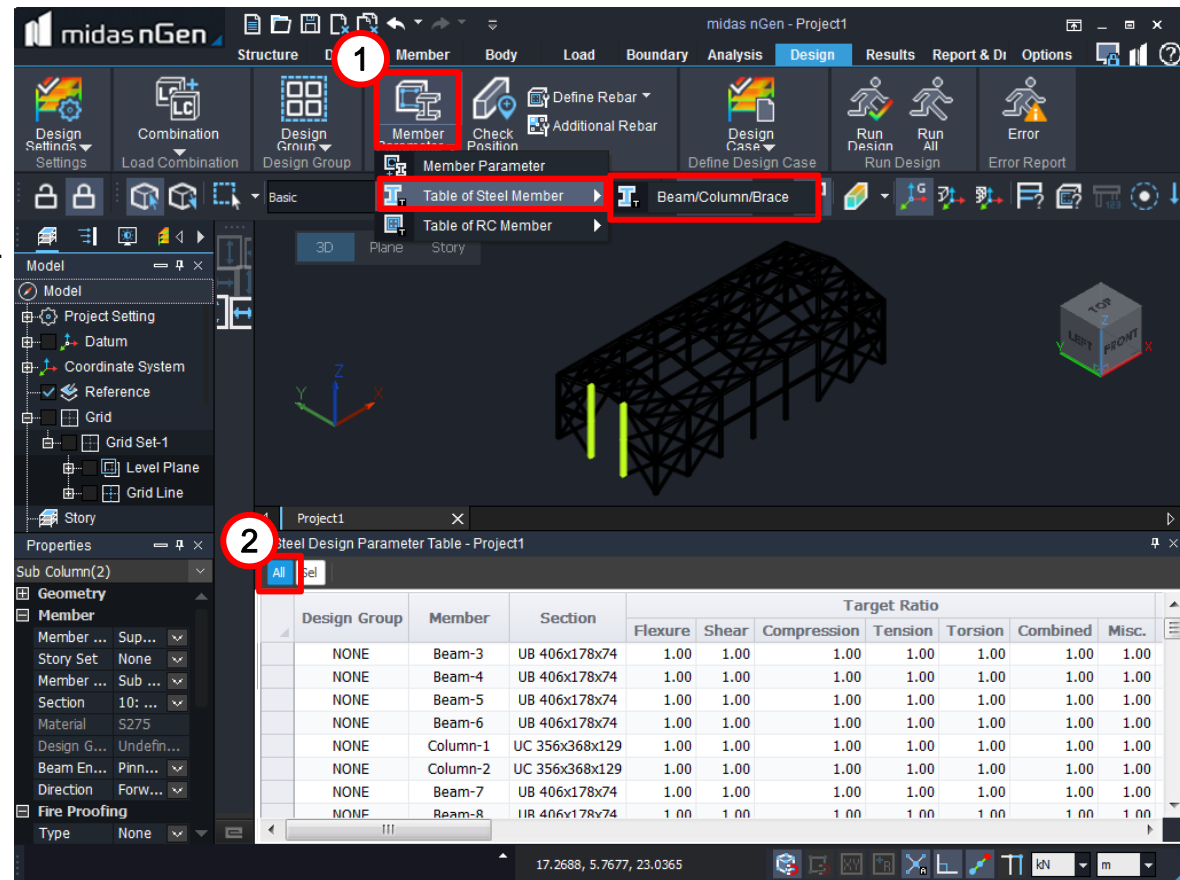


02 Member Design Parameters

Table

Table

1. Select [Design > Member Parameter > Table of Steel Member > Beam/Column/Brace].
2. Select [All] to check Member Parameters.

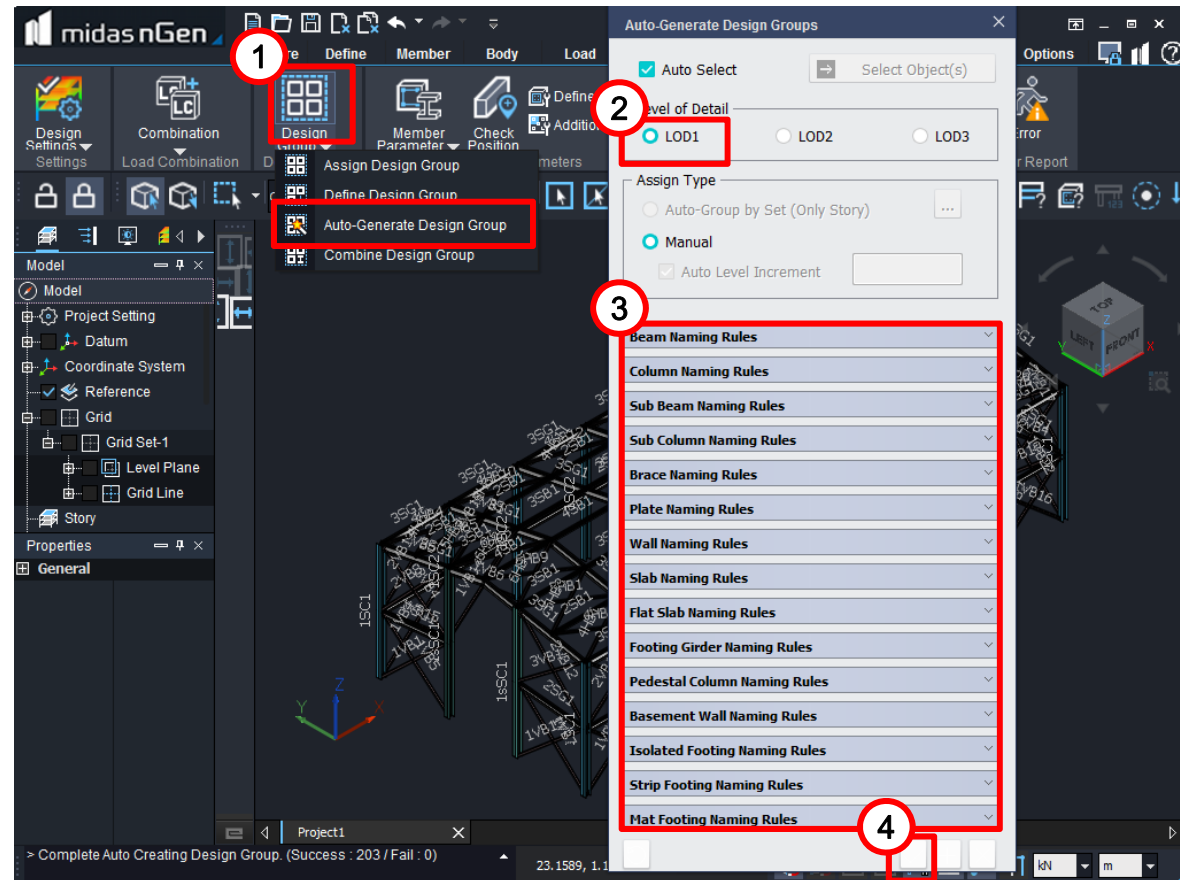


03 Design Groups

Design Group

Generate Design Group

1. Select [Design > Design Group > Auto-Generate Design Group].
2. Select [LOD1].
3. Define [Naming Rules] for each Member.
4. Click [OK].

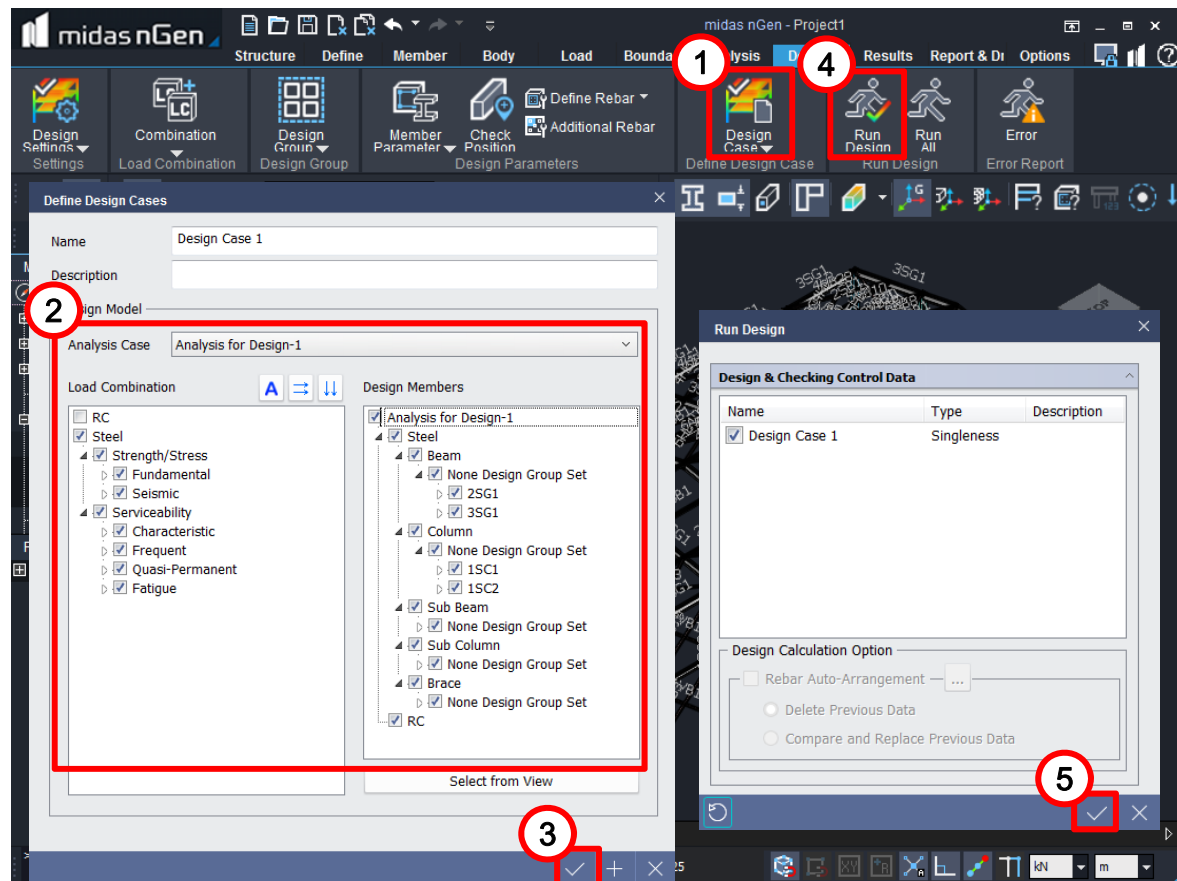


03 Design Groups

Design Data

Define Design Cases

1. Select [Design > Design Case].
2. Confirm Design Case.
3. Click [OK].
4. Select [Design > Run Design].
5. Click [OK].



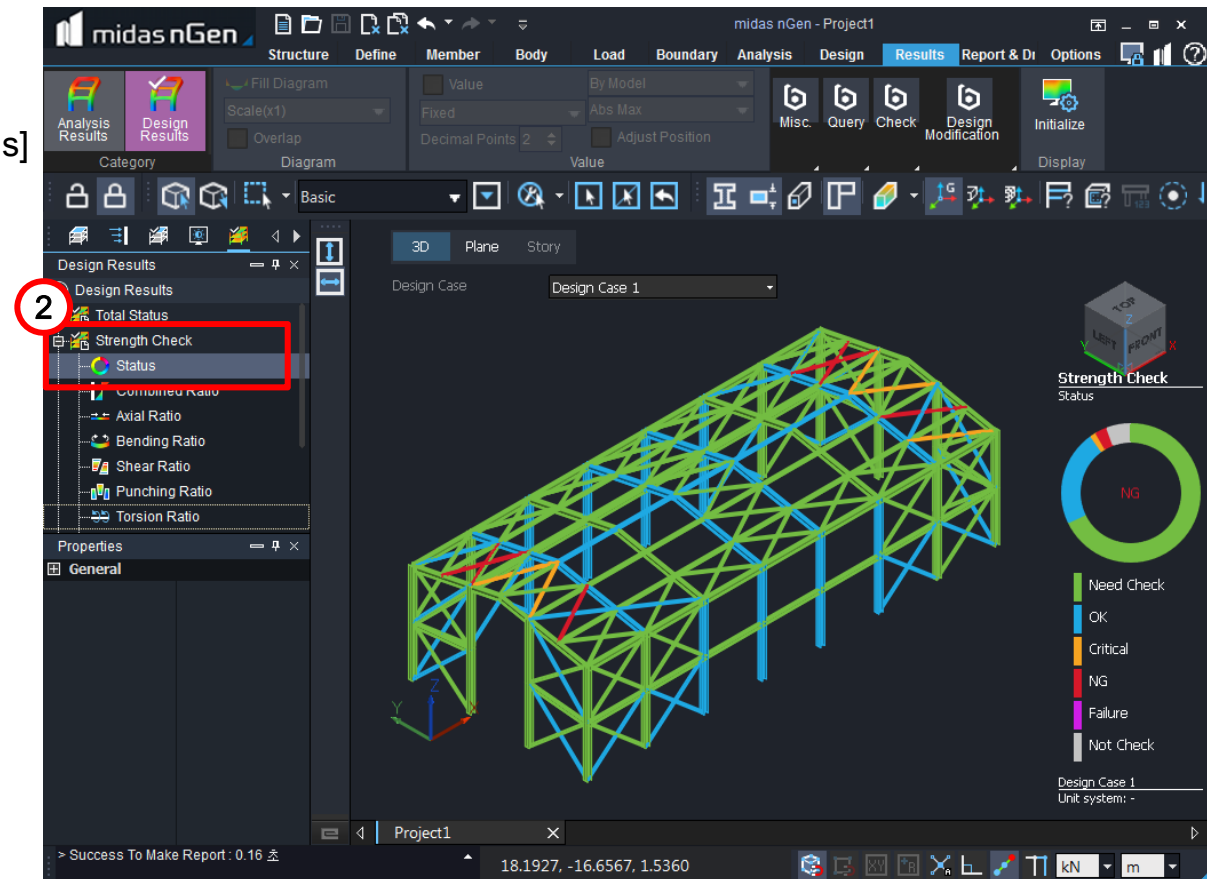
04 Ultimate Limit States (ULS)

Strength Check

Strength Check

1. Select [Strength Check > Status]
to check all members' strength level.

Design	
Total Result	
Under Target Ratio	Need Check
In Target Ratio	OK
Over Target Ratio	Critical
Over 1.0	NG
Change Properties	Failure
	Not Check



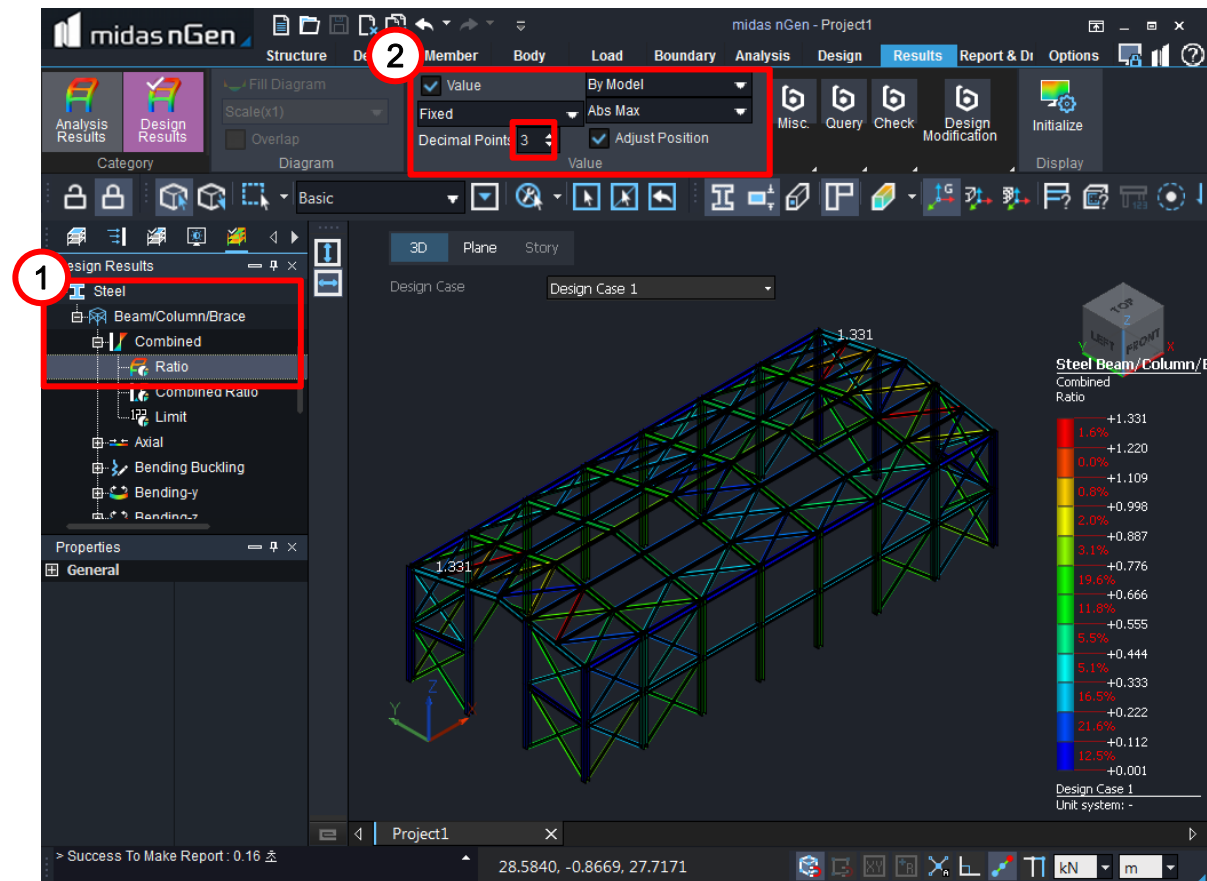
04 Ultimate Limit States (ULS)

Steel Check

Steel Check

1. Select [Steel > Beam/Column/Brace > Combined ratio > Ratio]
2. Check on [Value], change Decimal Points [3].

Similarly check results for
[Beam/Column/Brace > Axial]
[Bending Ratio], [Shear Ratio]

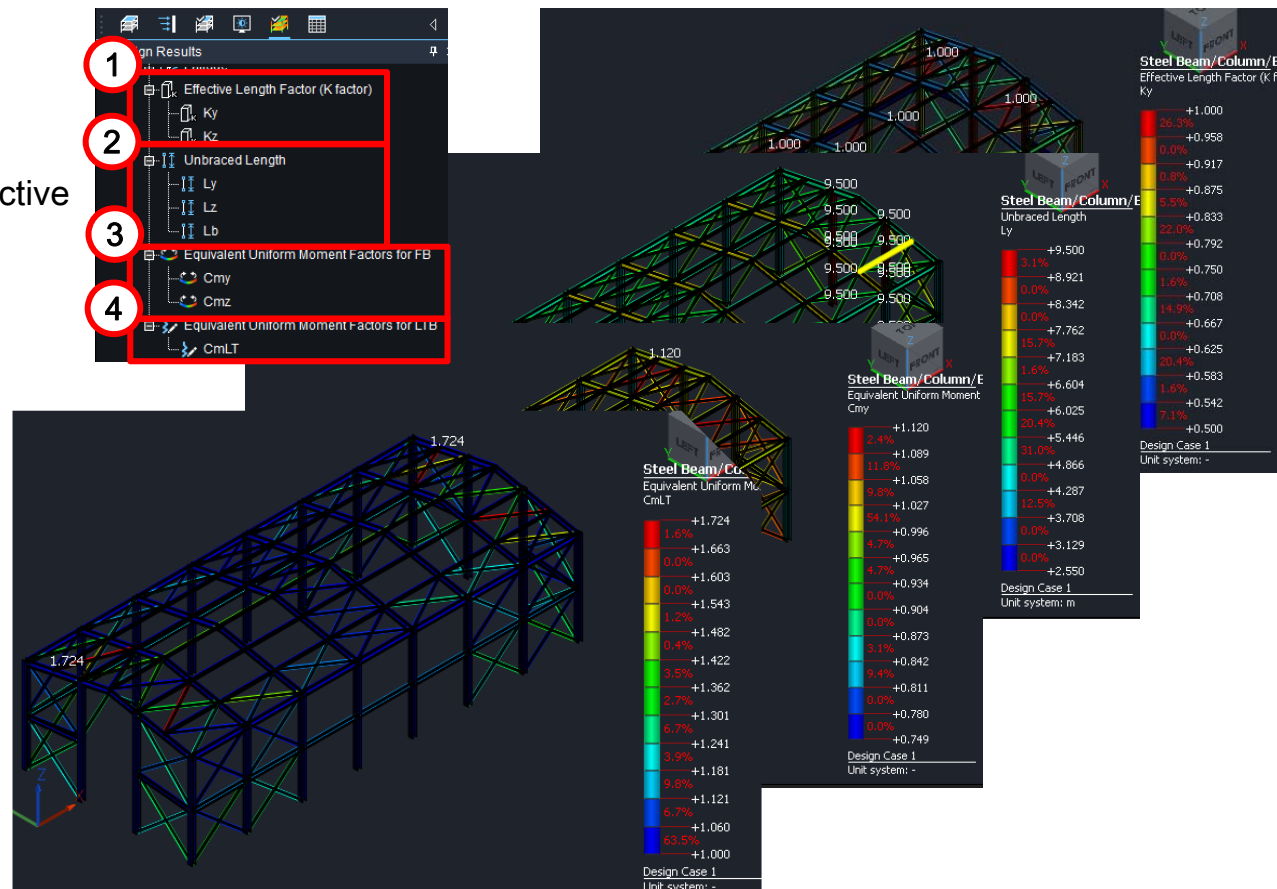


04 Ultimate Limit States (ULS)

Steel Check

Steel Check

1. Select [Steel > Beam/Column/Brace > Effective Length Factor (K factor)]
2. Select [Unbraced Length]
3. Select [Equivalent Uniform Moment Factors for FB].
4. Select [Equivalent Uniform Moment factors for LTB].

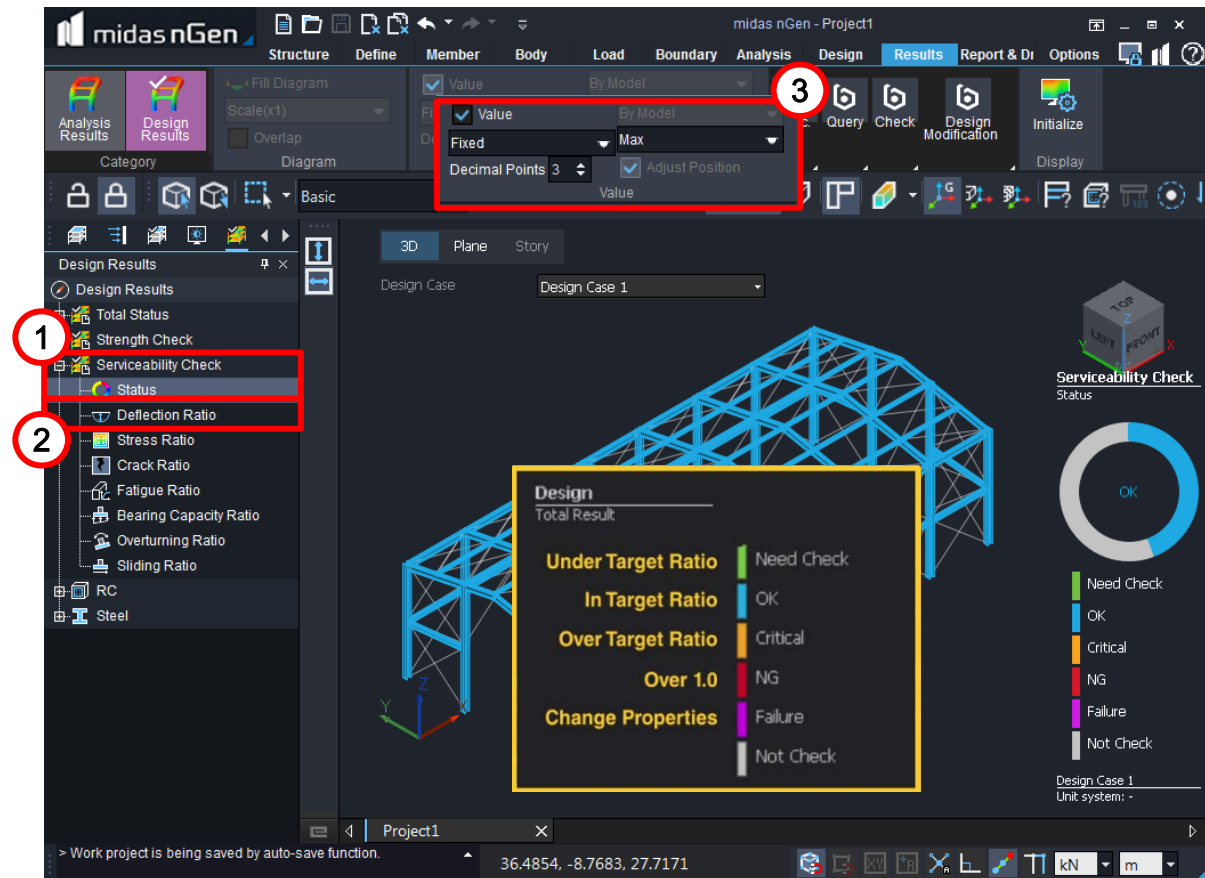


05 Serviceability Limit States (SLS)

Serviceability Check

Serviceability Check

1. Select [Serviceability Check > Status] to check all members' strength level.
2. Select [Serviceability Check > Deflection Ratio]
3. Select [Value > Fixed] > Adjust [Decimal Points] if necessary.

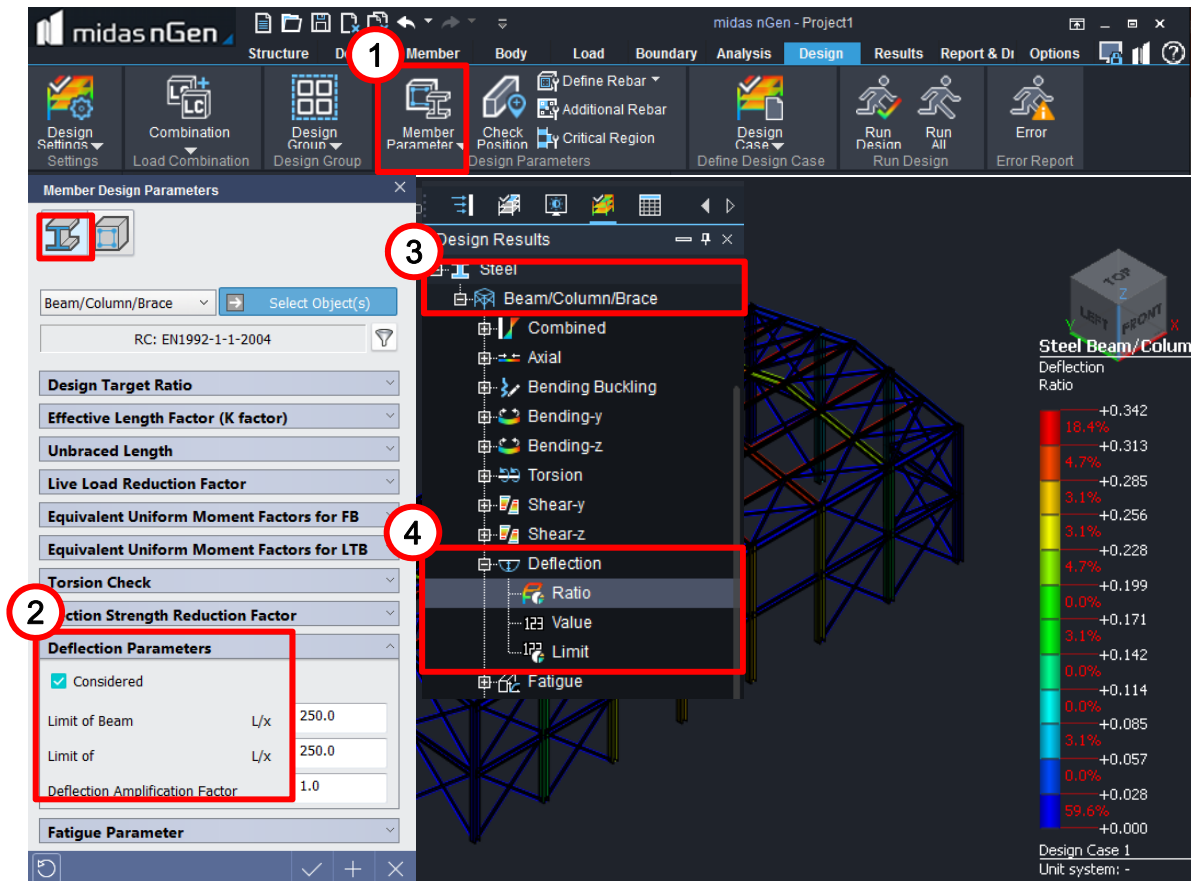


05 Serviceability Limit States (SLS)

Steel Check

Steel Check


1. Select [Design > Member Parameter].
2. Define [Deflection Check]
3. Select [Steel > Beam/Column/Brace].
4. Check [Deflection Ratio].

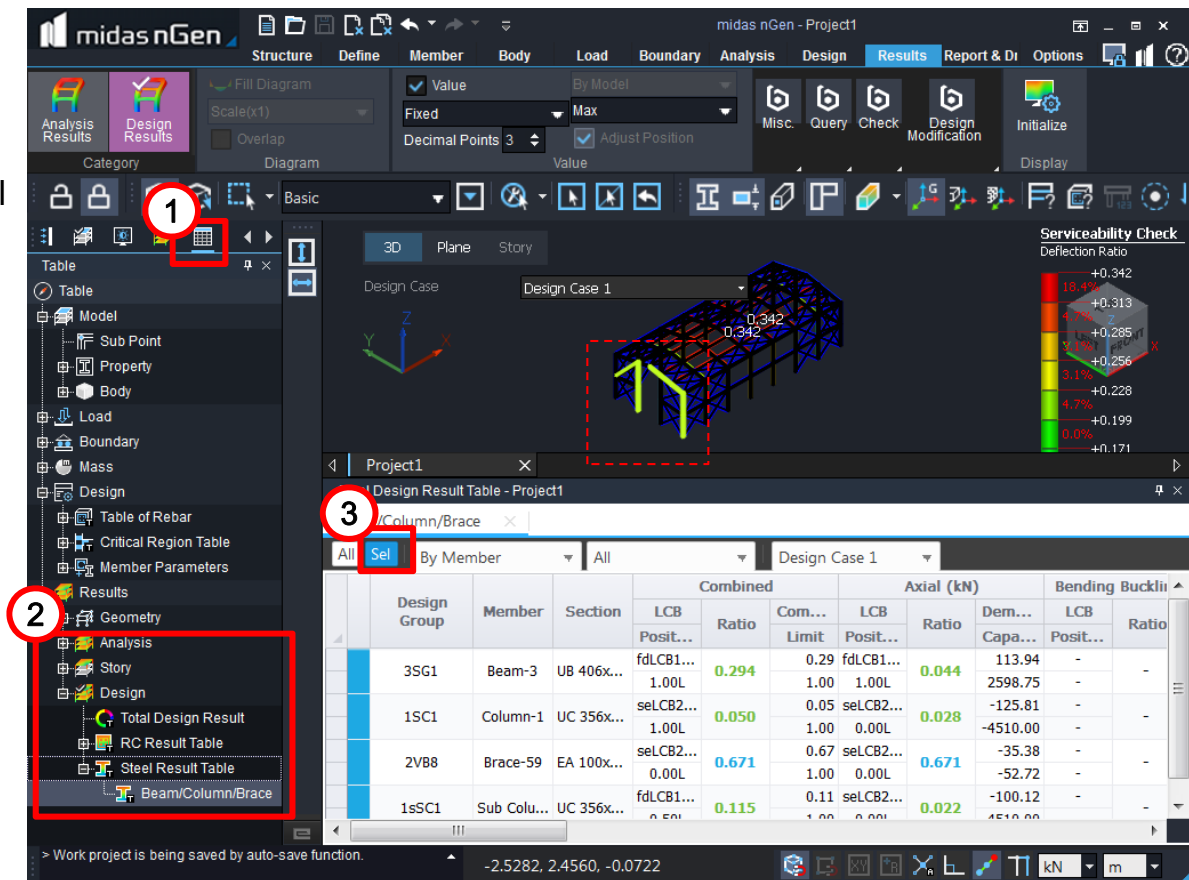


05 Serviceability Limit States (SLS)

Steel Check

Steel Check

1. Click 
2. Select [Results > Design > Steel Result Table > Beam/Column/Brace].
3. Click [Sel] > Confirm all design results in a table for selected members.



The screenshot shows the midas nGen software interface. The left-hand tree view is expanded to the 'Results' folder, and the 'Steel Result Table' is selected. The 'Beam/Column/Brace' sub-item is also selected. The bottom table window, titled 'Design Result Table - Project1', shows a table with columns for Design Group, Member, Section, LCB, Ratio, Combined, Axial (kN), and Bending Buckli. The table contains data for various design groups and members, including 3SG1, 1SC1, 2VB8, and 1sSC1.


Design Group	Member	Section	LCB	Ratio	Combined	Axial (kN)	Bending Buckli
3SG1	Beam-3	UB 406x...	fdLCB1...	0.294	0.29	fdLCB1...	113.94
1SC1	Column-1	UC 356x...	seLCB2...	0.050	0.05	seLCB2...	-125.81
2VB8	Brace-59	EA 100x...	seLCB2...	0.671	0.67	seLCB2...	-52.72
1sSC1	Sub Colu...	UC 356x...	fdLCB1...	0.115	0.11	seLCB2...	-100.12



05 Report & Drawing

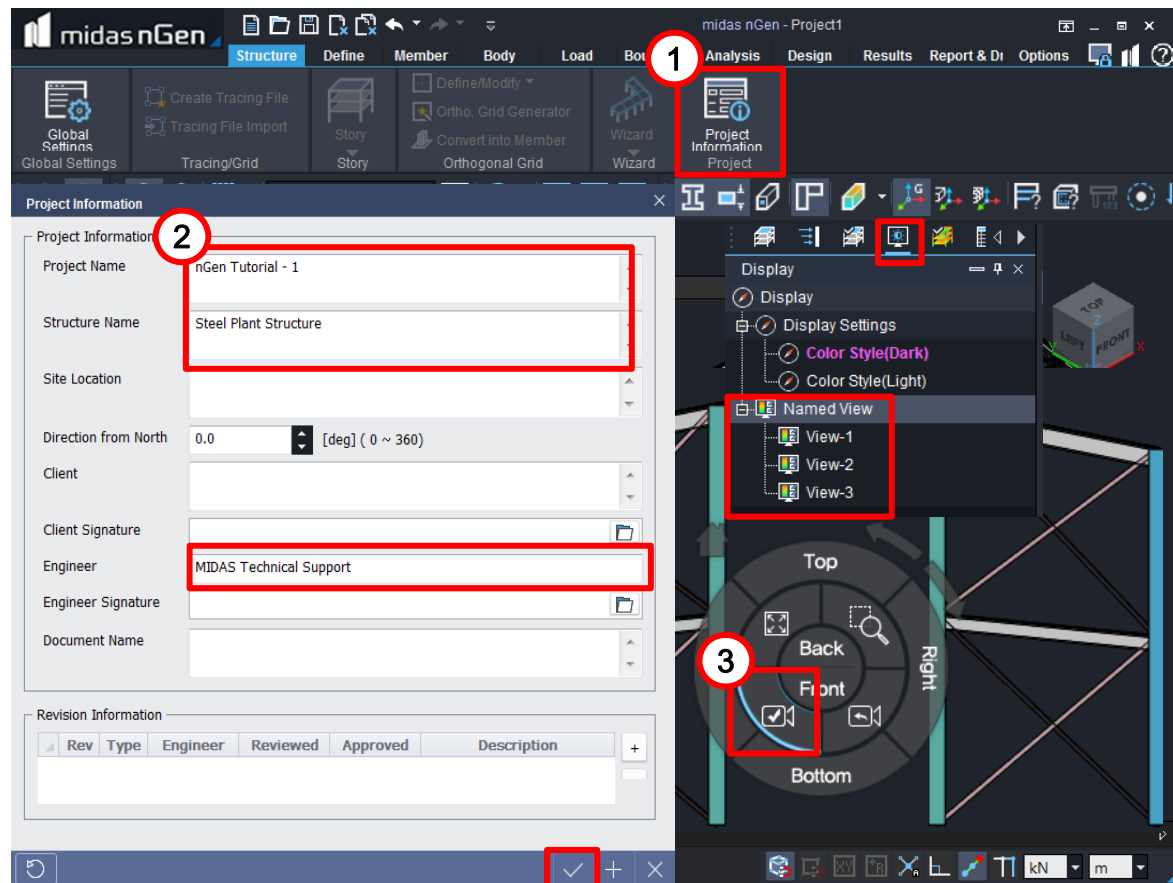
01 Generate Report

Information Setting

Information Setting

1. Select [Structure > Project Information].
2. Enter [Project Name, Structure Name, Engineer and etc.] > Click [OK].
3. Go to [Left] view > Create Named View to include it in the Report > Click .

Similarly, Go to [Front] view > Click , Go to [Top] view > Click .

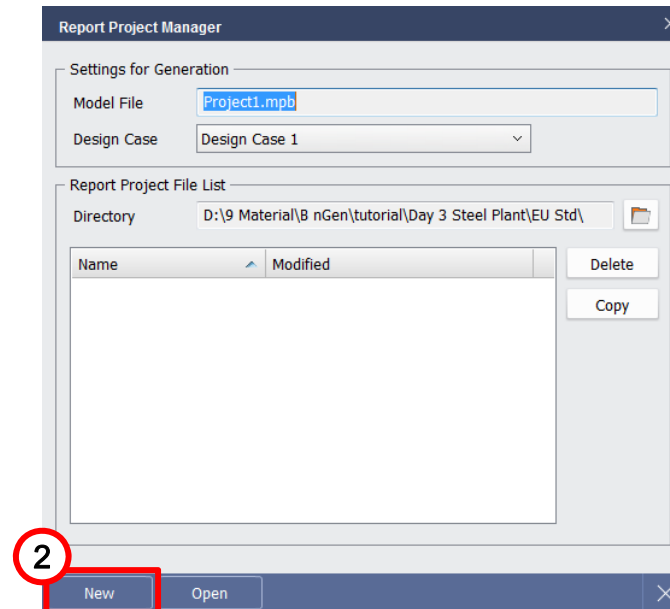
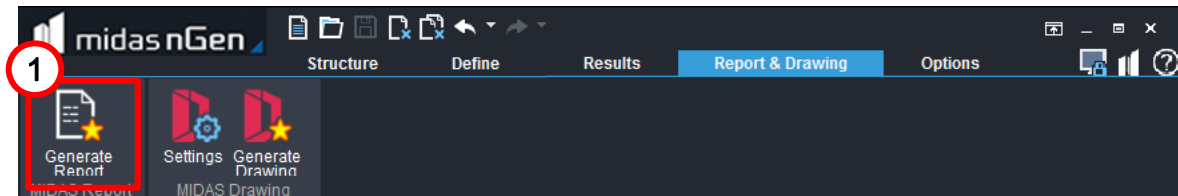


01 Generate Report

Information Setting

Information Setting

1. Select [Report & Drawing > Generate Report].
2. Click [New].



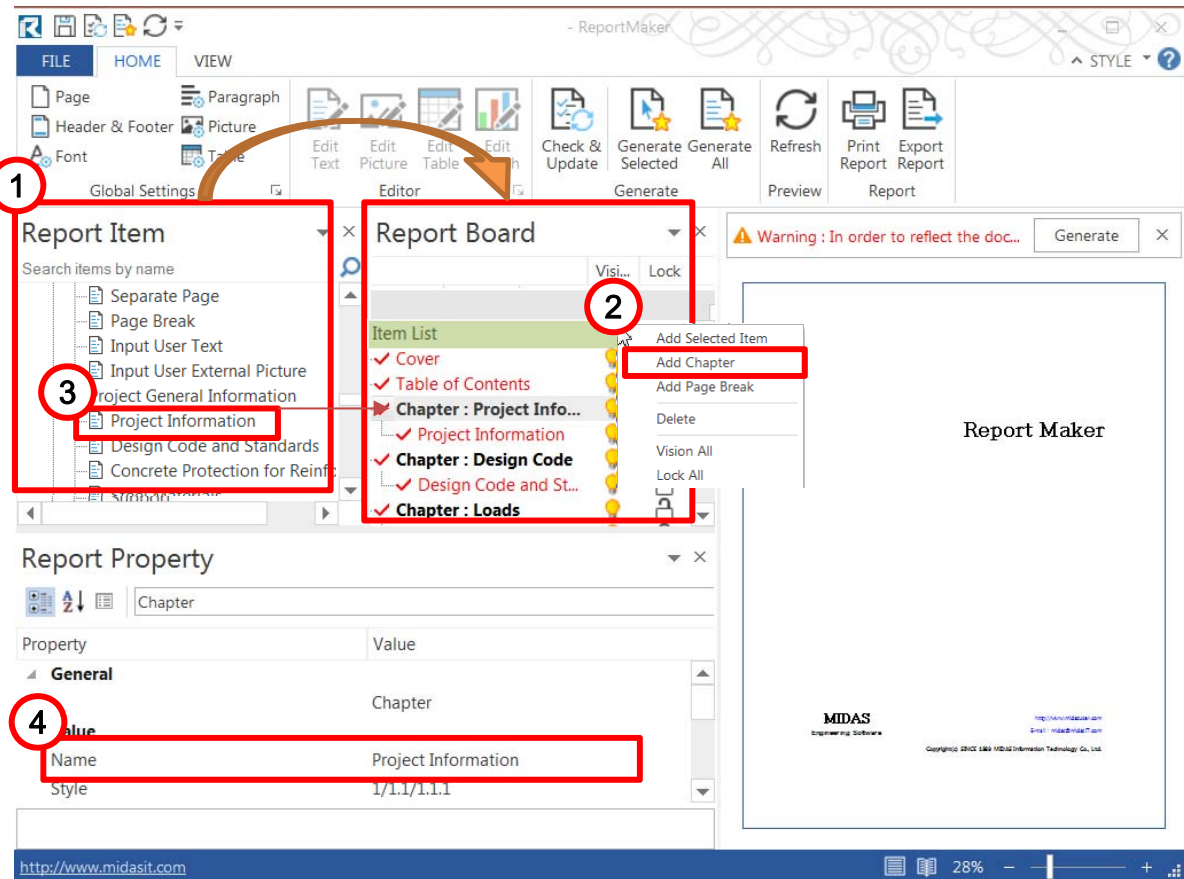
01 Generate Report

Create Report

Create Report

1. Double-click on items to move [Report Items] to [Report Board].
2. Mouse Right-click [Item List] > Select [Add Chapter].
3. Drag and drop [Project information] on [Chapter] to put it under.
4. Name Chapters accordingly.




Right-click on Chapters to create sub-chapters.

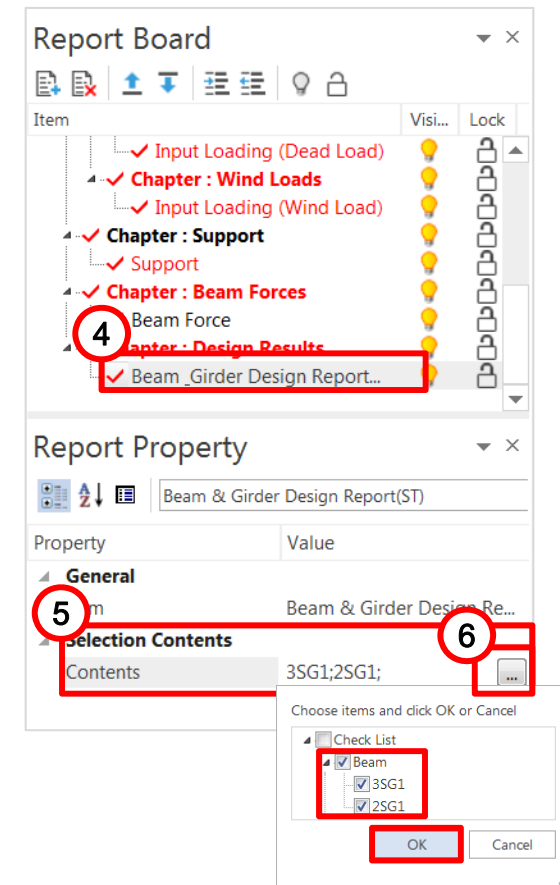
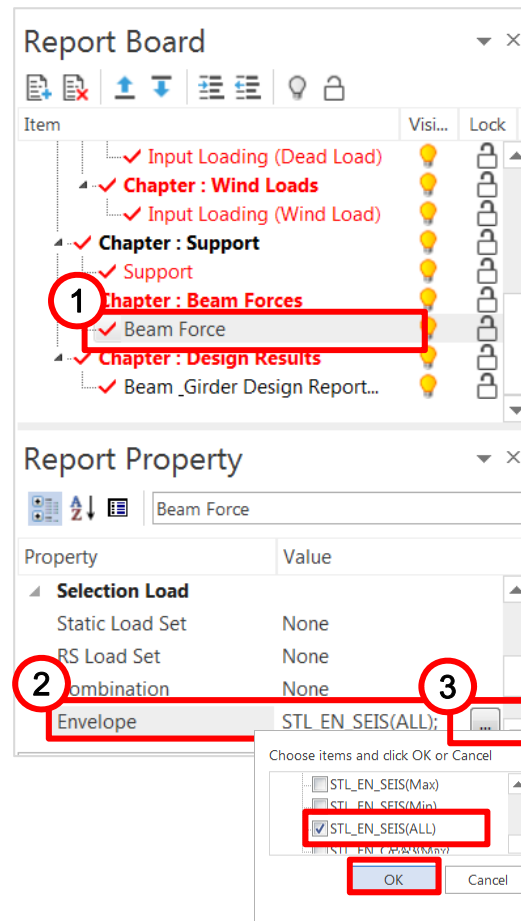


01 Generate Report

Edit Report

Edit Report

1. Click [Beam Force]
2. Select [Selection Load] to include in the report.
3. Click  Select only [STL_EN_SEIS(ALL)] > Click [OK].
4. Click [Beam_Girder Design Report...]
5. Select [Selection Contents] to include  the report.
6. Click  > Select [3SG1, 2SG1] > Click [OK].



01 Generate Report

Edit Report

Edit Picture

1. Click [Beam Force] > Select [Edit Picture].

2. Select [Picture-1]

3. Live Picture Link > View-1]

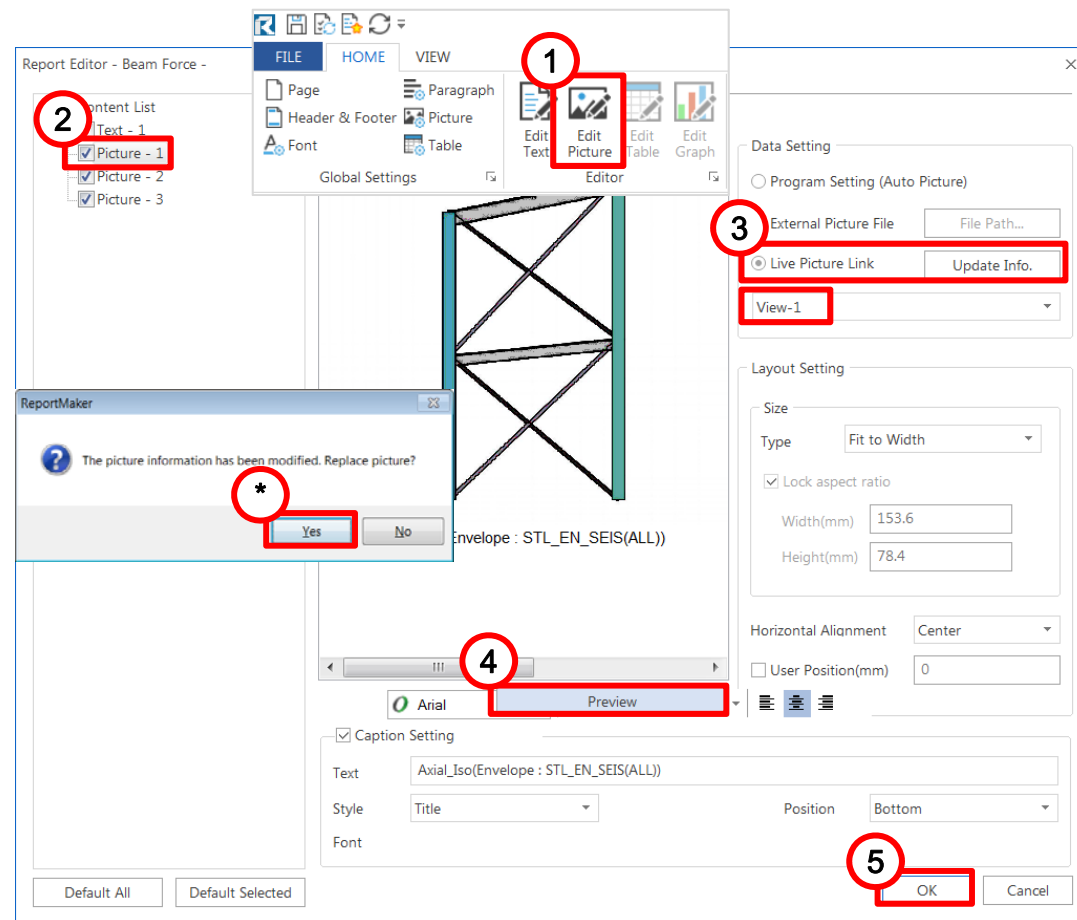
4. Click [Preview].

Similarly, Select [Picture-2 > Live Picture Link > View-2].

Select [Picture-3 > Live Picture Link > View-3].

5. Click [OK].

*Click on [Yes] on other Content List to [Replace Picture?] for each edit.

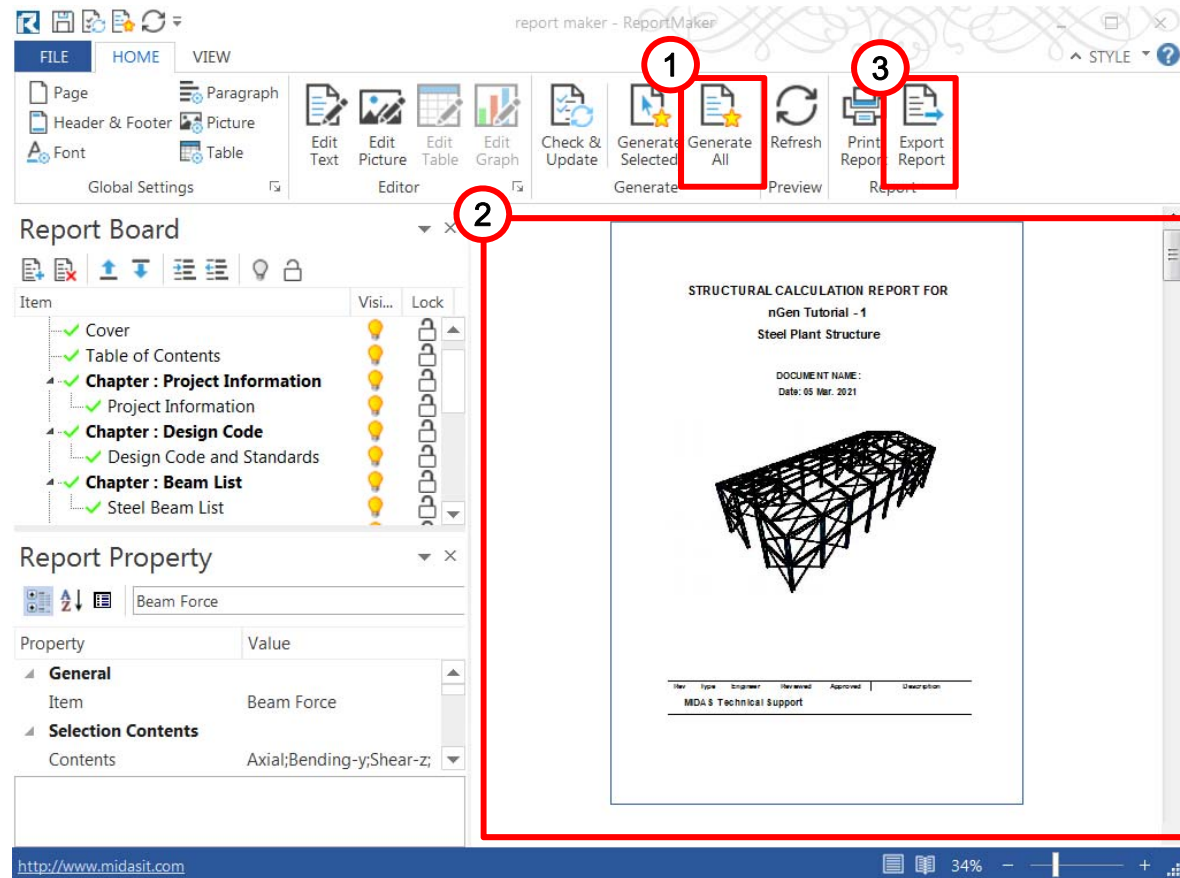


01 Generate Report

Export Report

Export Report

1. Select [Generate All].
2. Confirm Report.
3. Select [Export Report] to export report to word file > Click [Export] > Click [Yes] > Save the Word file at a desired location.

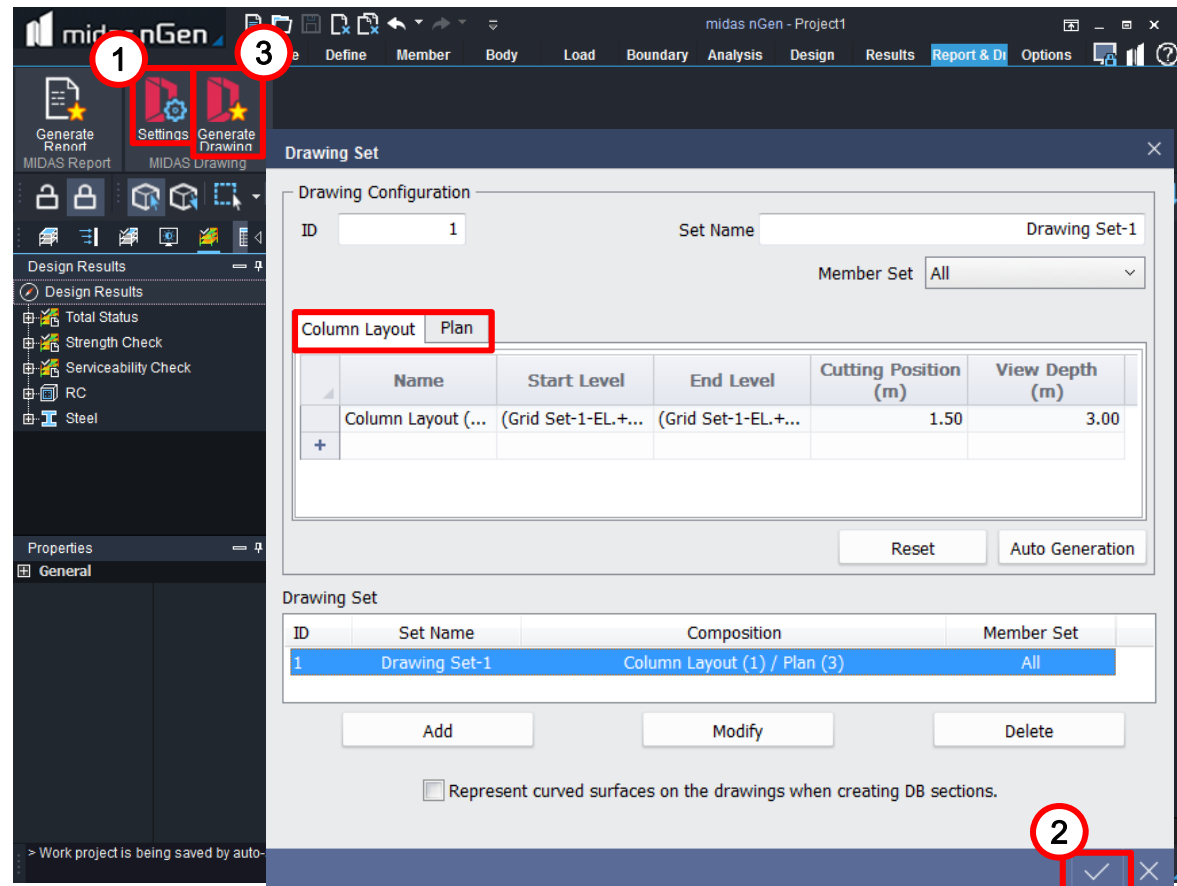
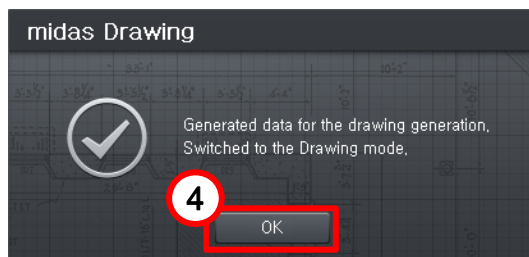


02 Review Drawings

Define Drawing Set

Define Drawing Set

1. Select [Report & Drawing > Settings].
2. Define [Column Layout], [Plan] that will be exported to drawing > Click [OK].
3. Select [Generate Drawing].
4. Confirm to Switch to Drawing Mode.

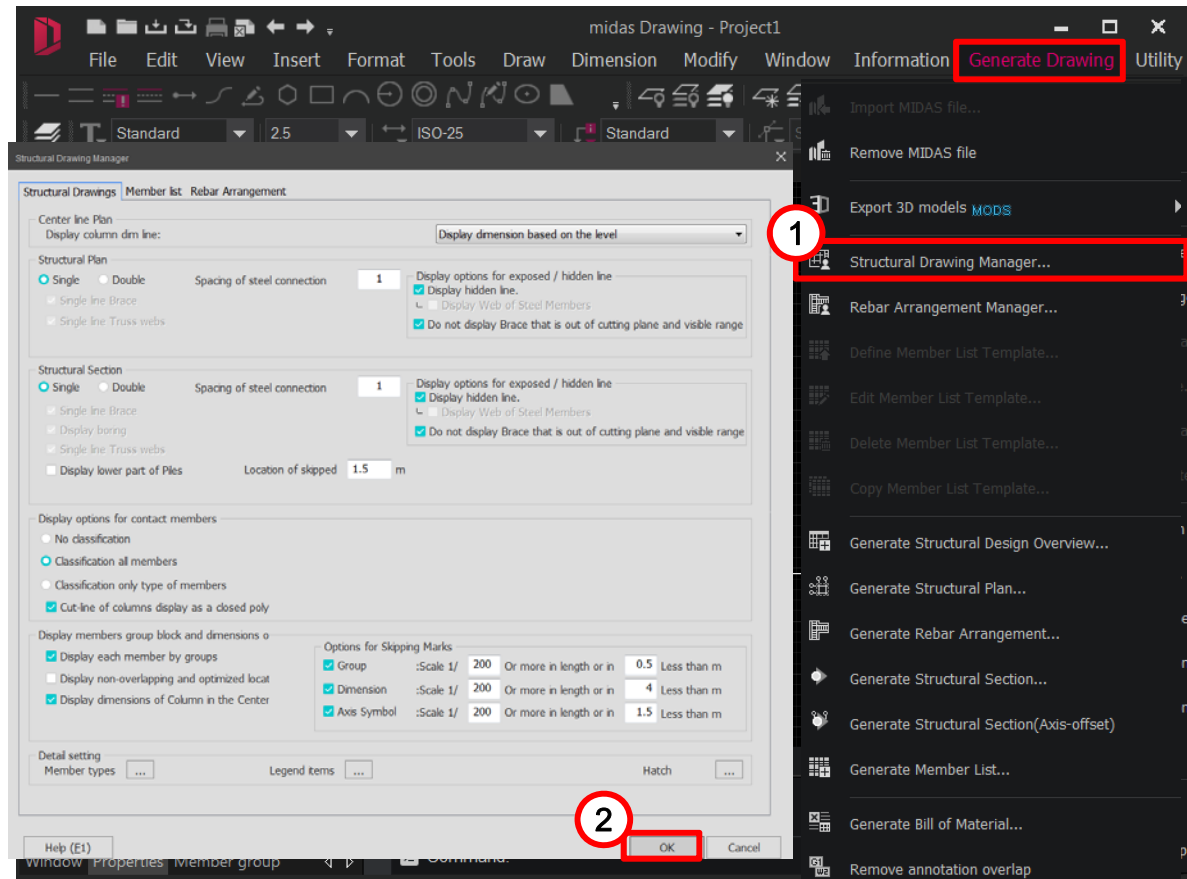


02 Review Drawings

Generate Drawings

Generate Drawings


1. Select [Generate Drawing > Structural Drawing Manager].
2. Set options to create plans, sections and member list > Click [OK].

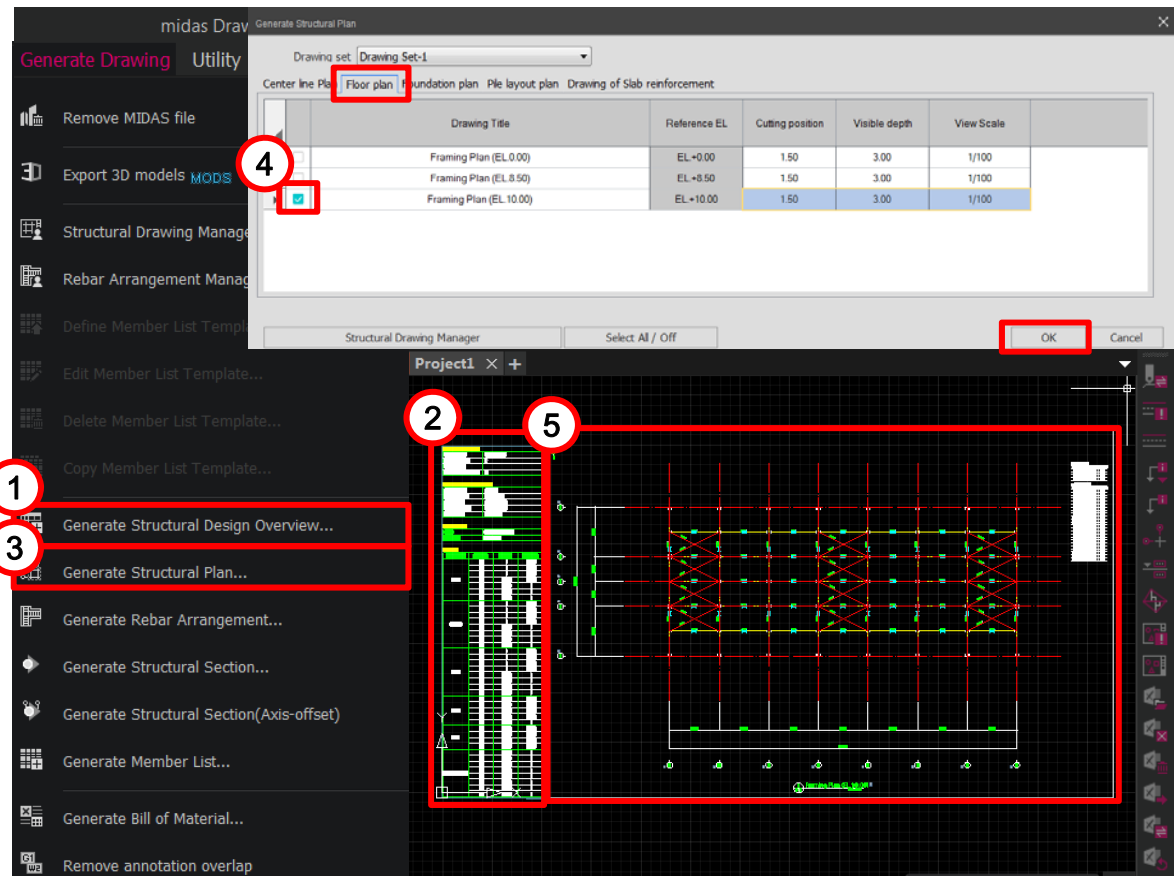


02 Review Drawings

Generate Drawings

Generate Drawings

1. Select [Generate Drawing > Structural Design Overview produce].
2. Click on the workspace > Confirm Overview.
3. Select [Generate Drawing > Generate Structural Plan].
4. Click  > Adjust [view scale], [Cutting position], [Visible depth]
5. Click [Confirm] > Click on the workspace > Confirm [Structural Plan].

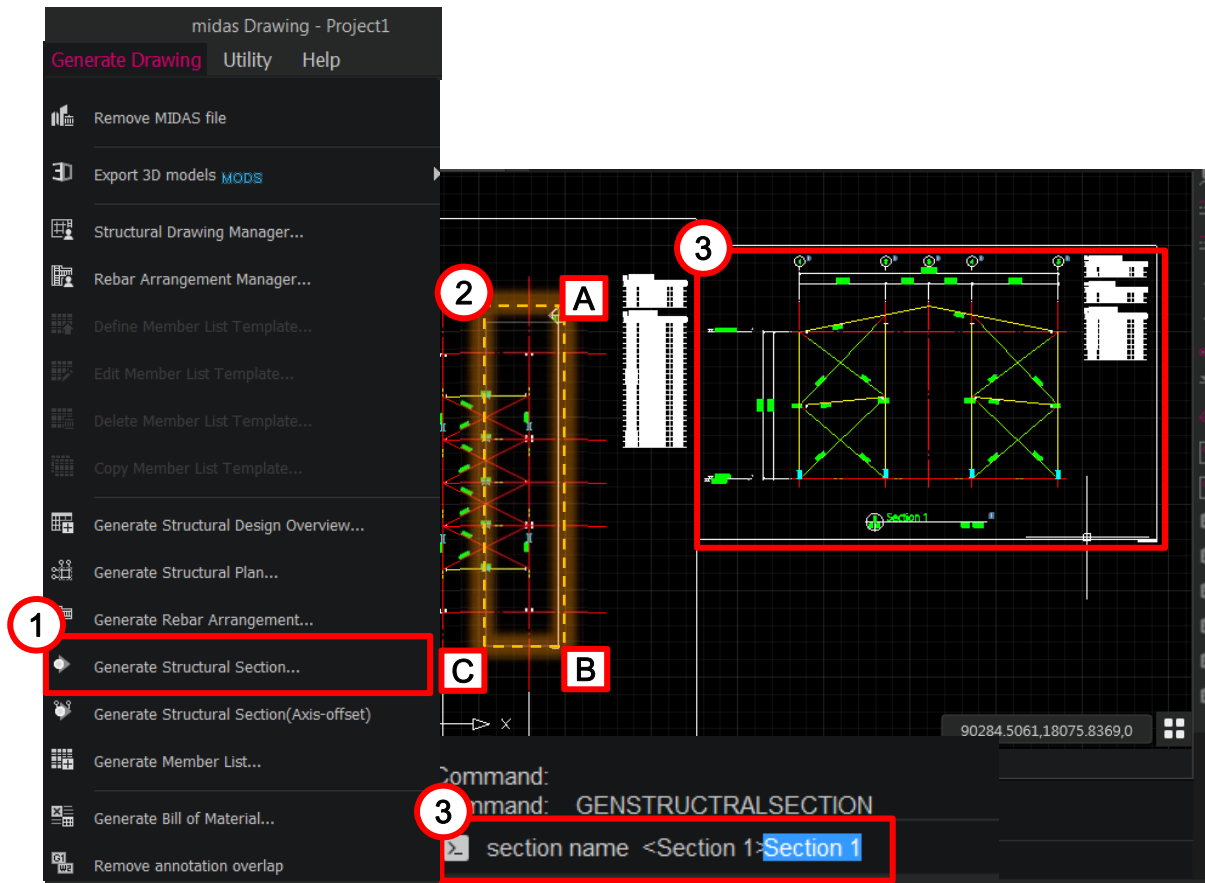


02 Review Drawings

Generate Drawings

Generate Section

1. Select [Generate Drawing > Generate Structural Section].
2. Click [A, B]> Right-click [C] to Select [Section]
3. Section Name [Section 1] > Press [Enter].
4. Click on the workspace > Confirm section.

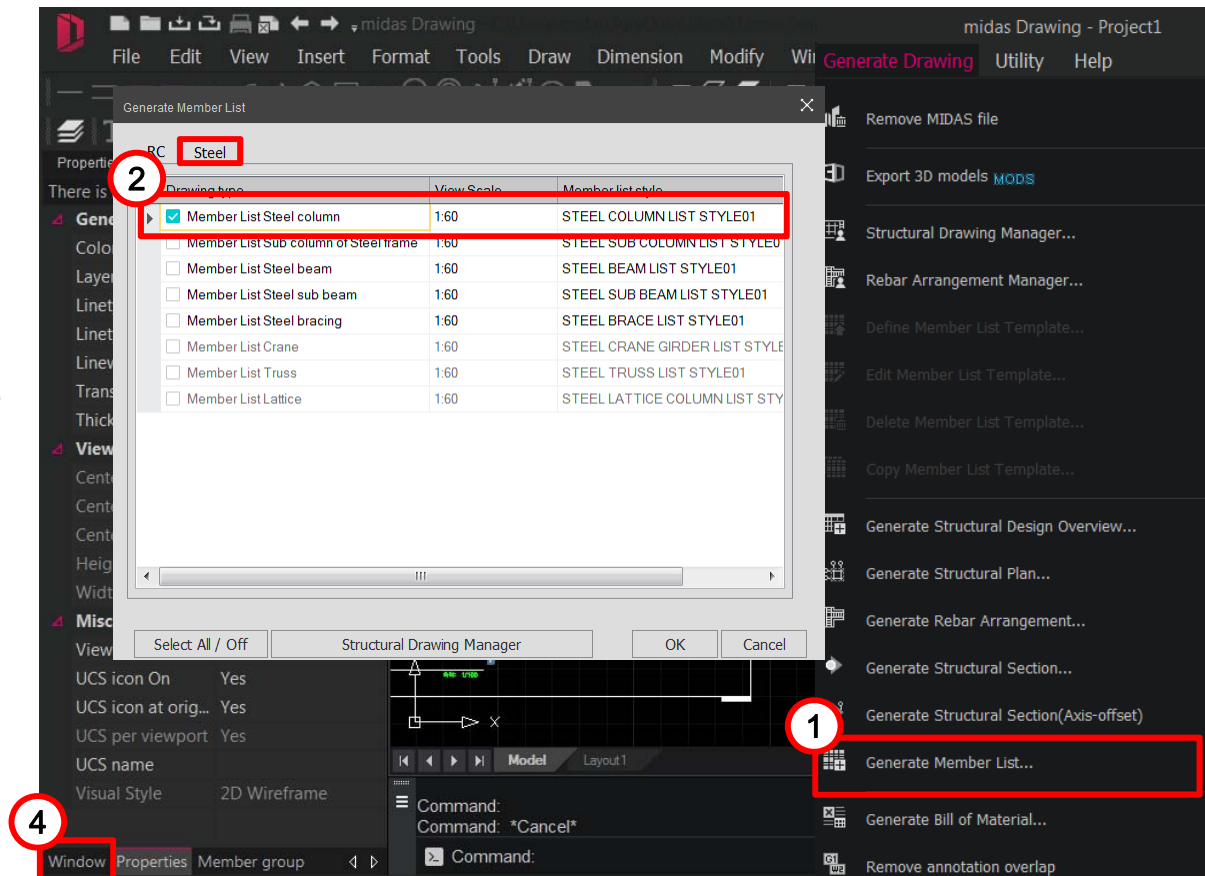
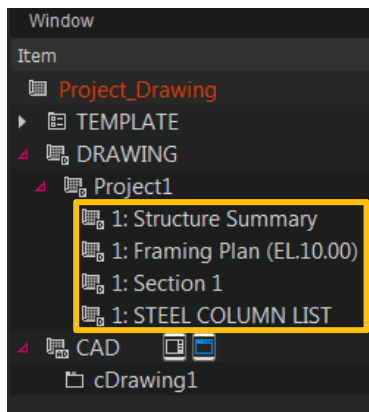


02 Review Drawings

Generate Drawings

Generate Section

1. Select [Generate Drawing > Generate Member List].
2. Select [Member List Steel Column]
3. Confirm Column List.
4. Click Window to Confirm Work.

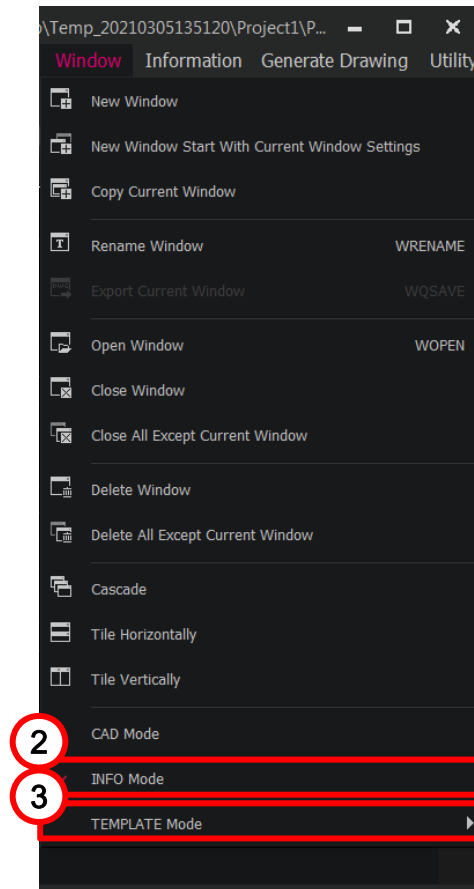
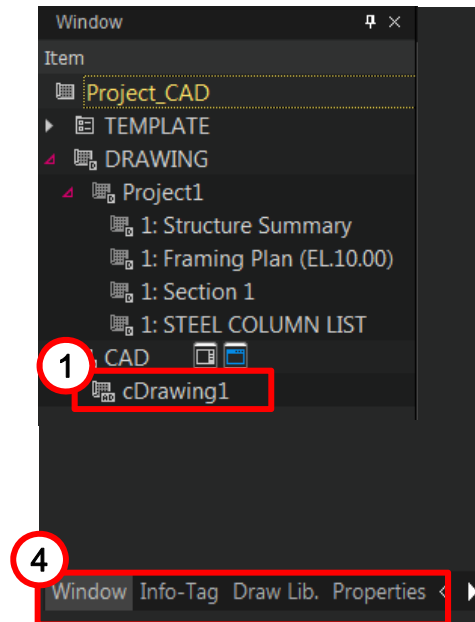


03 Drawings

Modes

Modes

1. Select [CAD Drawings > cDrawing1] to switch from drawing mode to CAD mode.
2. Select [Window > INFO Mode] to return to Drawing mode.
3. Select [Window > Template Mode] to switch to template mode.
4. Select [Window > CAD Mode] > Confirm CAD mode tabs; [Window], [Info Tag], [Draw Lib], [Properties].

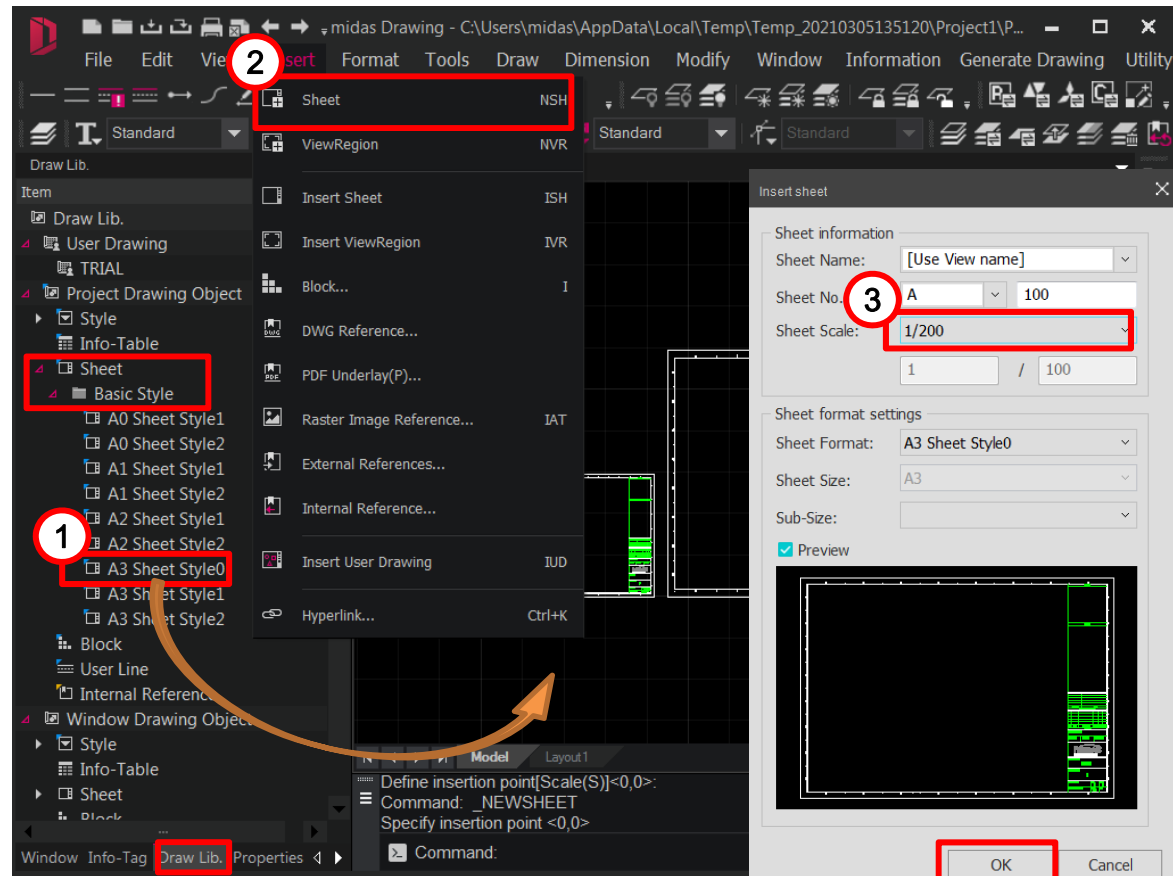


03 Drawings

Modes

Create Sheet

1. Select [Draw Lib]> Drag & Drop [A3 Sheet Style0].
2. Select [Insert > Sheet]
3. Select [1:200] > Click [OK].
4. Confirm Sheets.

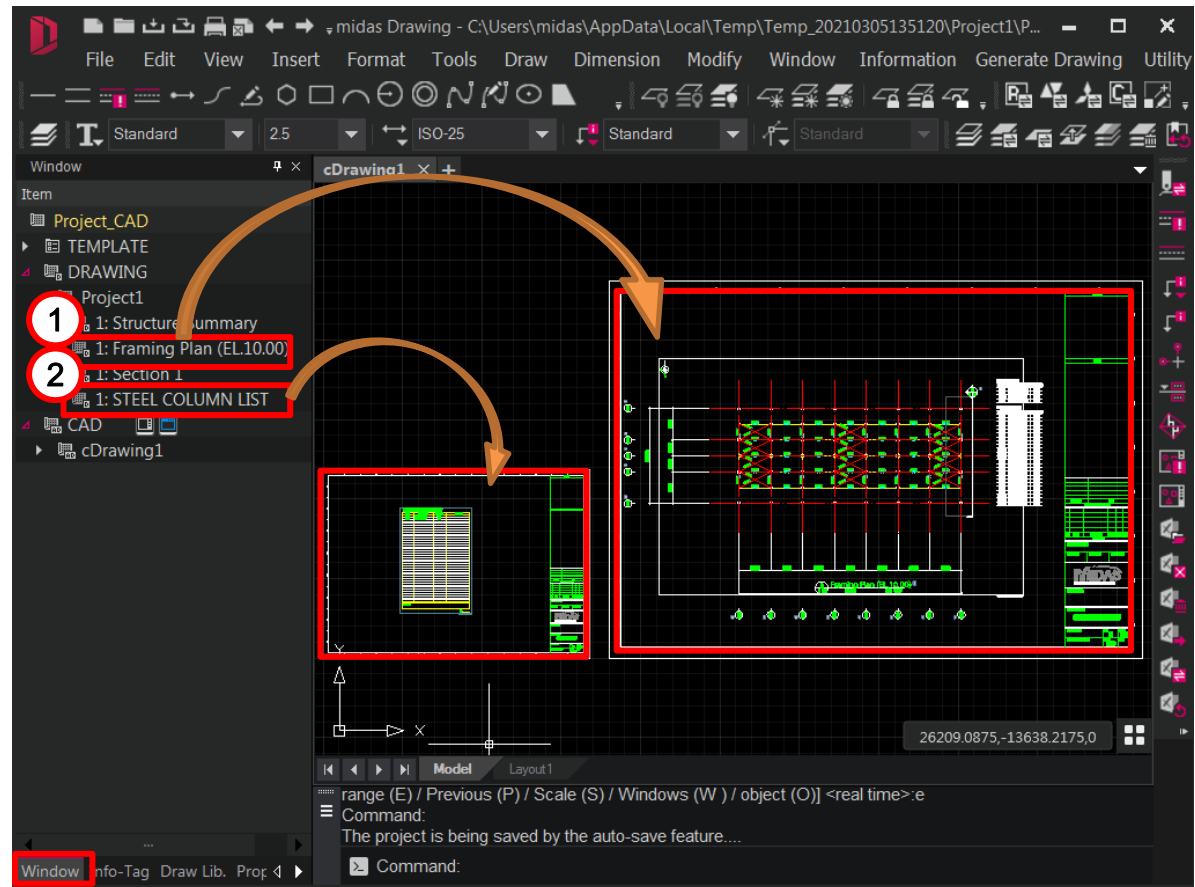


03 Drawings

Modes

Add Drawings

1. Select [Window]> Drag & Drop [Framing Plan (EL.10.00)].
2. Drag & Drop [1 : Column List 1]
3. Confirm the scale of each drawing.

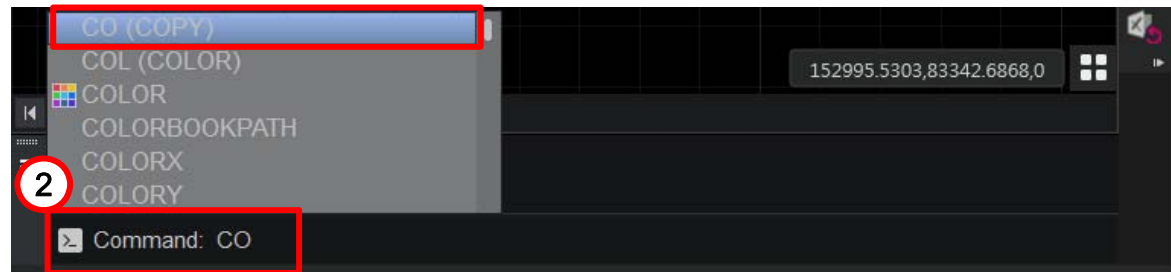
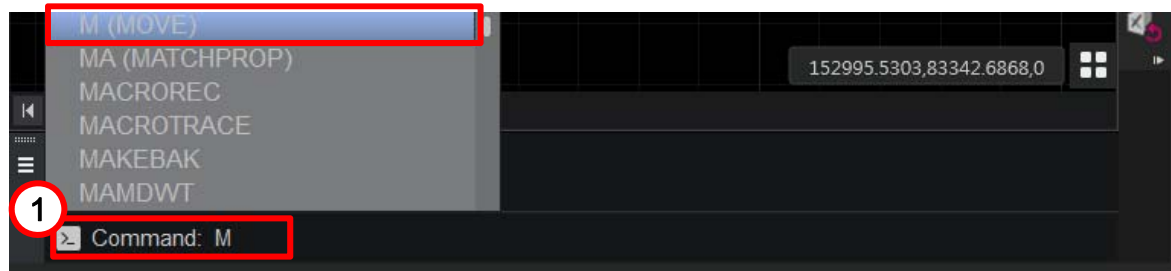


03 Drawings

Move and Copy Sheets

Move Drawings

1. Enter [m] to move drawings.
2. Enter [co] to copy drawings.



03 Drawings

Move and Copy Sheets

Edit Sheet

1. Select [Info Tag] > Drag and drop [Project Name] > Edit Name.
2. Edit Drawing Title.

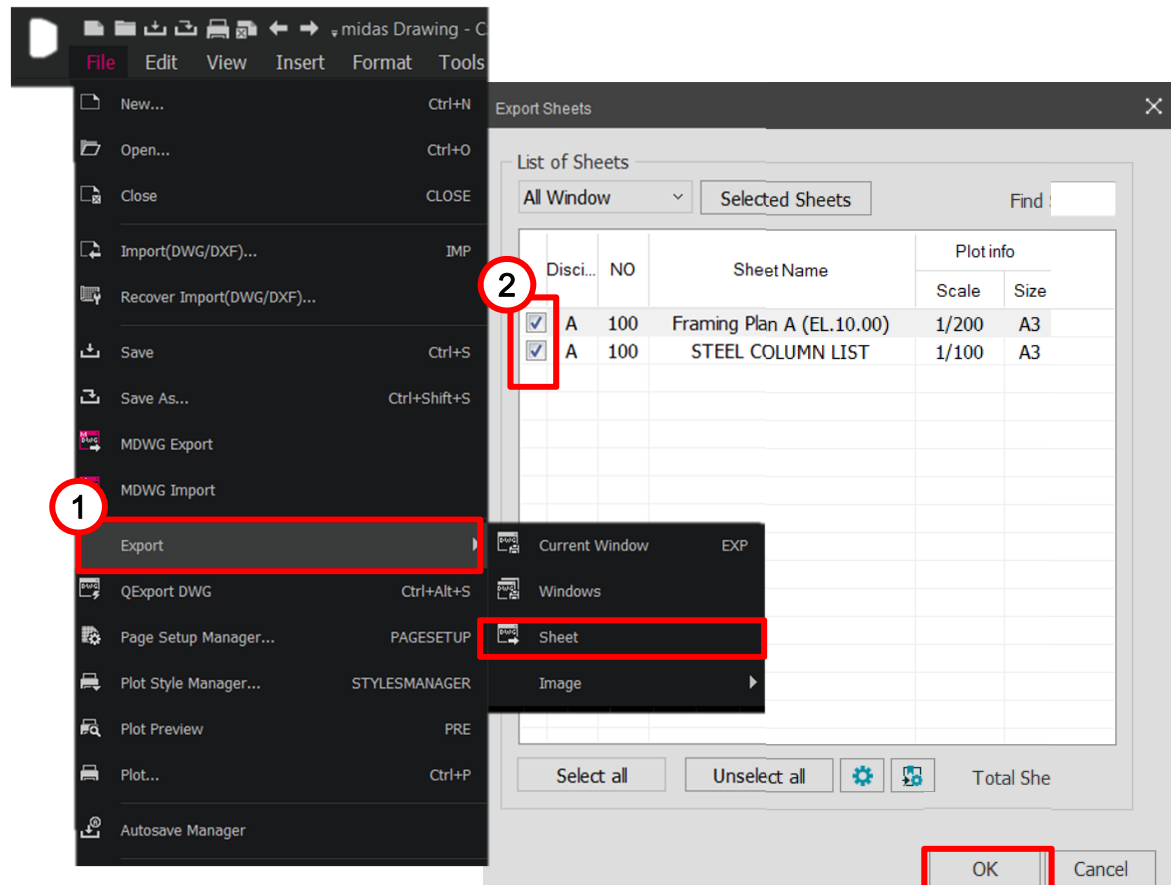


03 Drawings

Export and Import Drawings

Export Drawings

1. Select [File > Export > Export Sheets as dwg file].
2. Select [Sheet] to export in [.dwg].

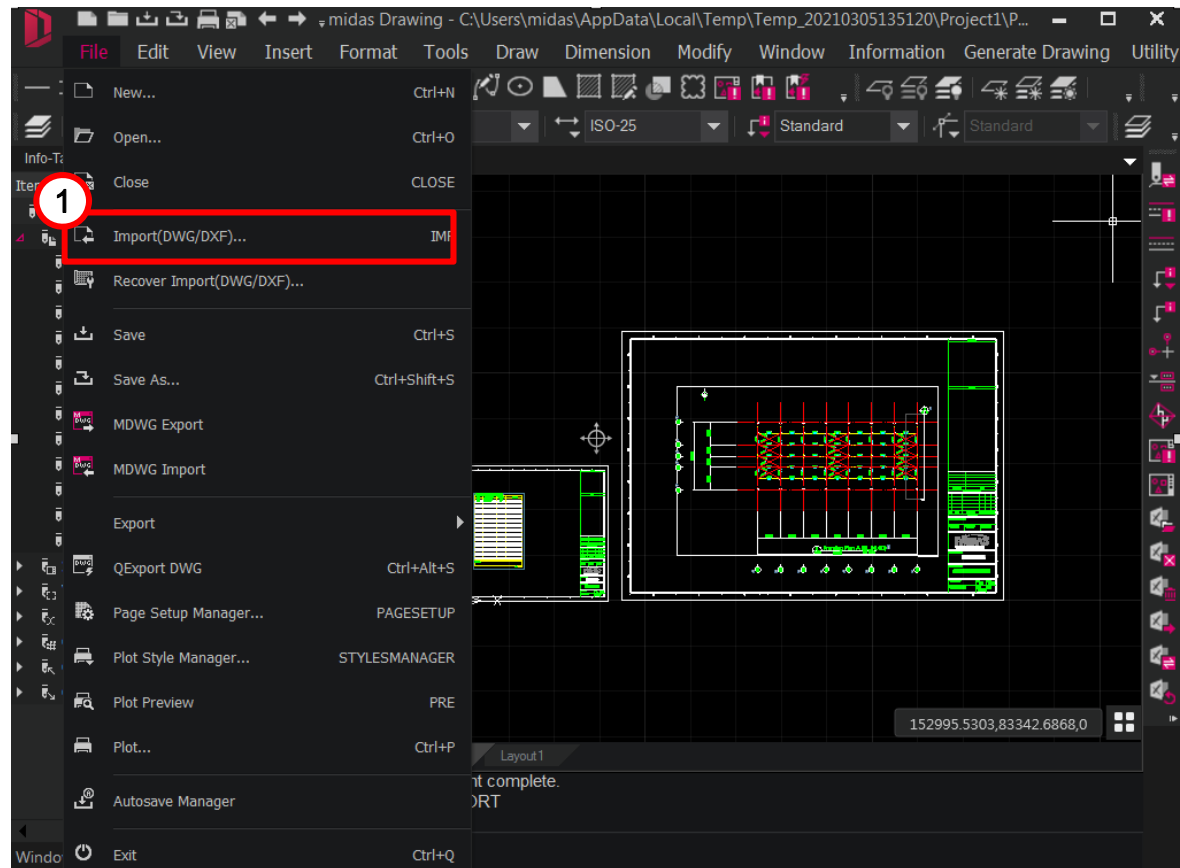


03 Drawings

Export and Import Drawings

Import Drawings

1. Select [File > Import].
2. Select [Sheet] to export in [.dwg].



The background is a solid blue color with a fine, light blue halftone dot pattern. Overlaid on this are several large, dark blue geometric shapes, primarily triangles, that overlap each other in a layered fashion, creating a sense of depth and movement. The shapes are oriented diagonally across the frame.

Thank you.