

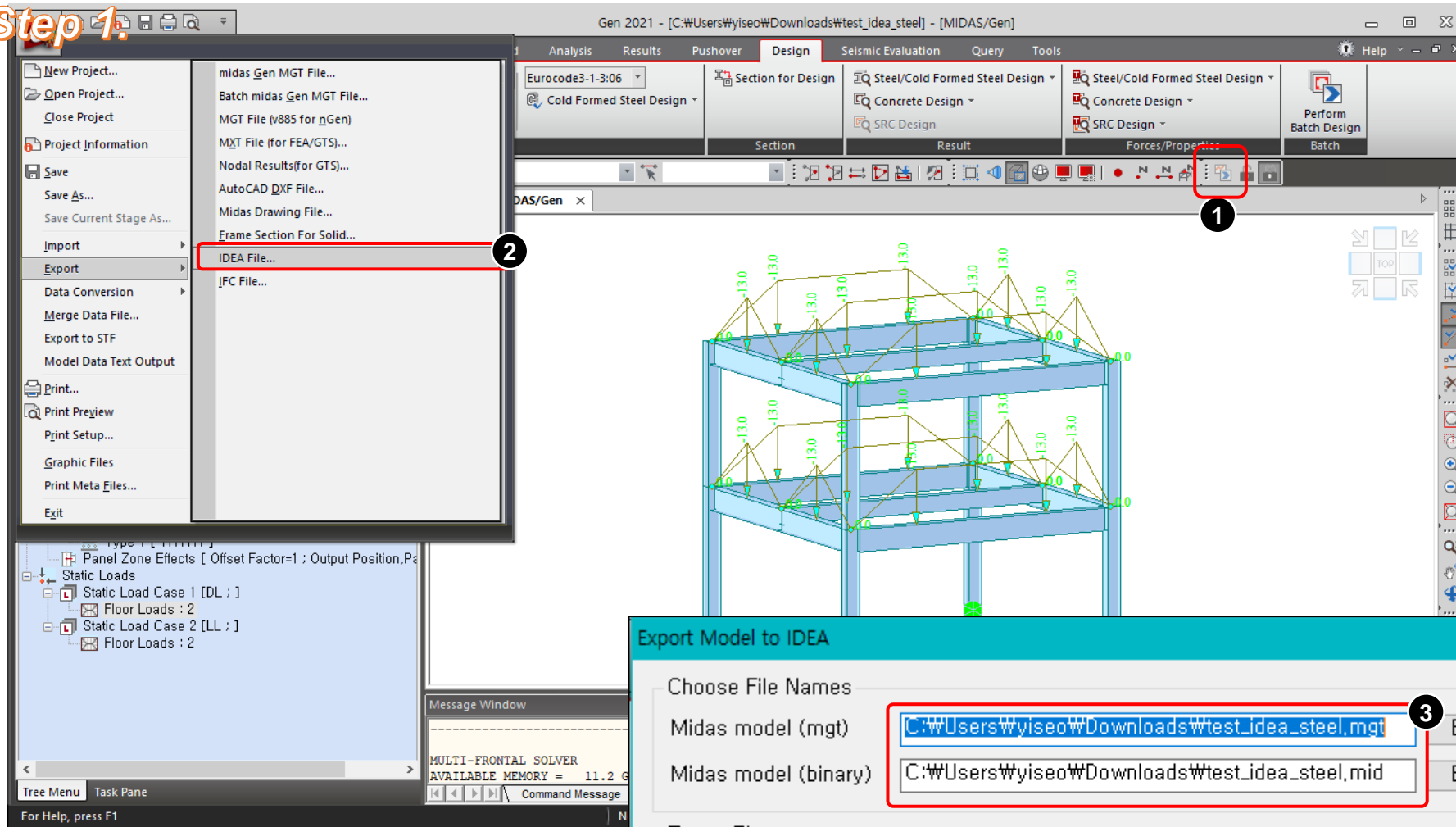
midas Gen – IDEA Statica Interface



Steel Connection Design

Steel Connection Design

Step 1:



Firstly, it is necessary to check whether the license for “Export IDEA” is supported.

- 1 Run an analysis.
- 2 Run “IDA file....” in File > Export.
- 3 Modify the model names in dialog box.
- 4 Click “Export”.

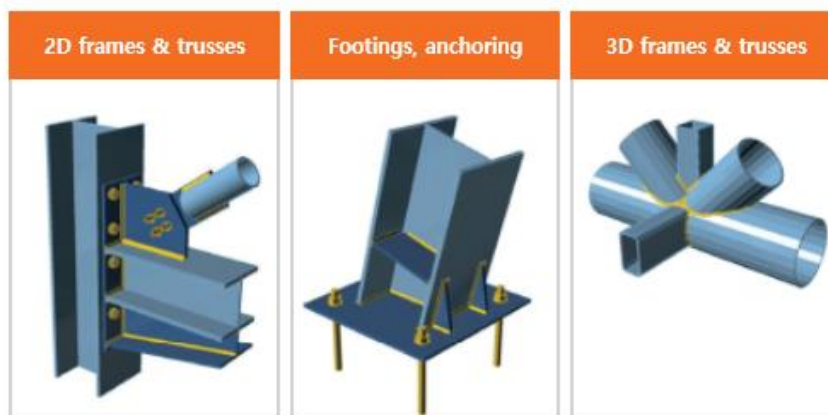
Steel Connection Design

Step 2.



- Connection
- Member
- Connection Lite
- Viewer

Steel connection design – reinvented
A novel way to design and check all structural connections and joints according to the code, in minutes.



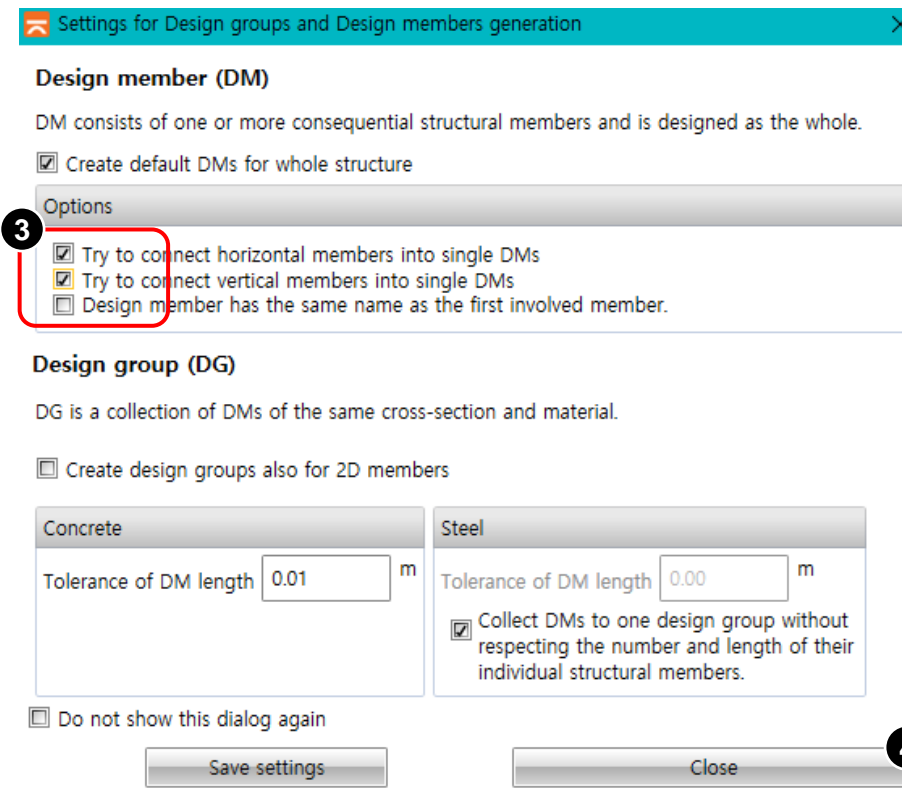
- Open existing project
- Import from other program

Want to get certified?

Keep in touch at [in](#) [f](#) [▶](#)

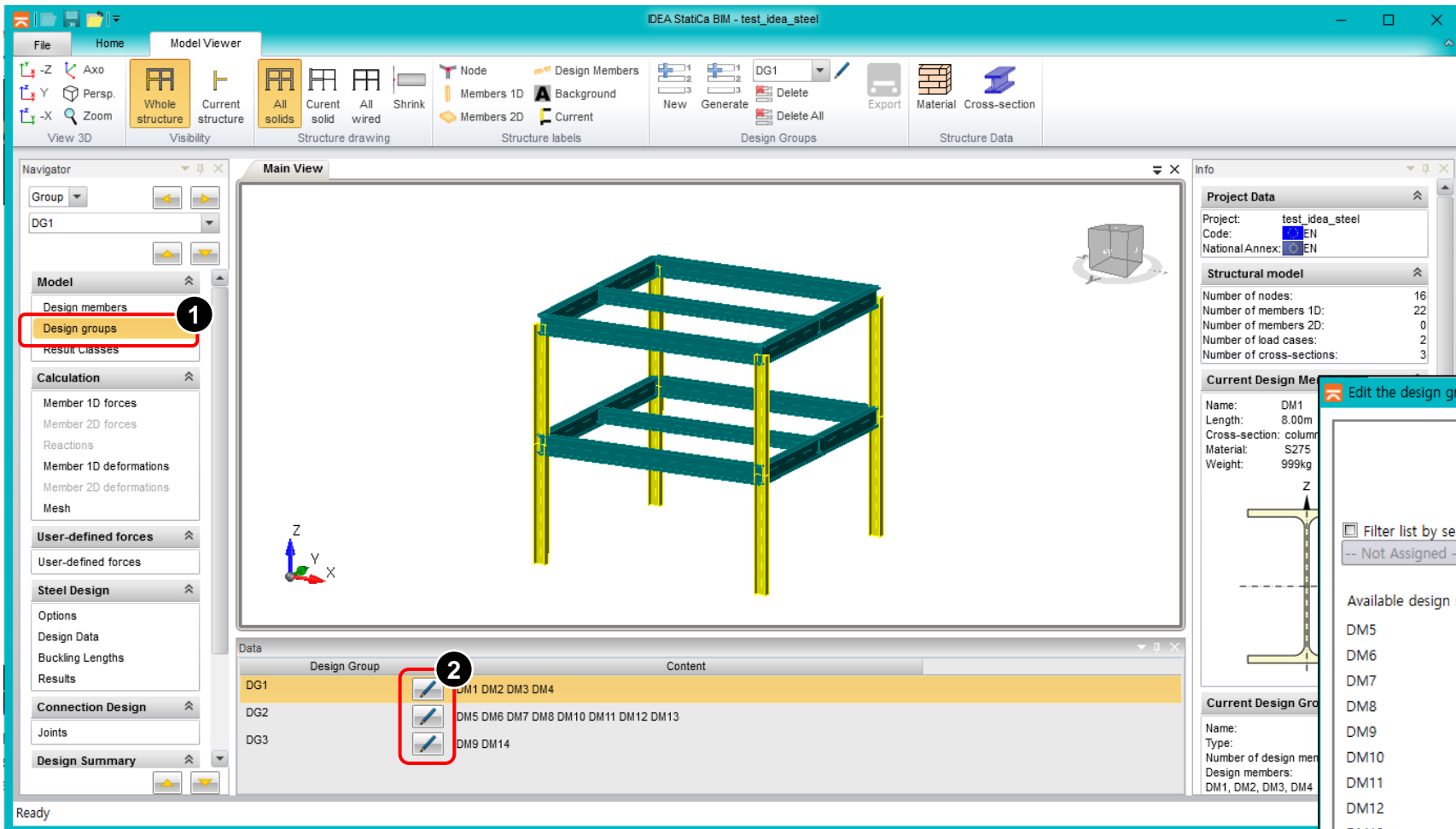
Run IDEA Statica



- 1 Click “Steel” tap.
- 2 Click “Import from other program”.
- 3 Check on the options.
- 4 Click “Close”.

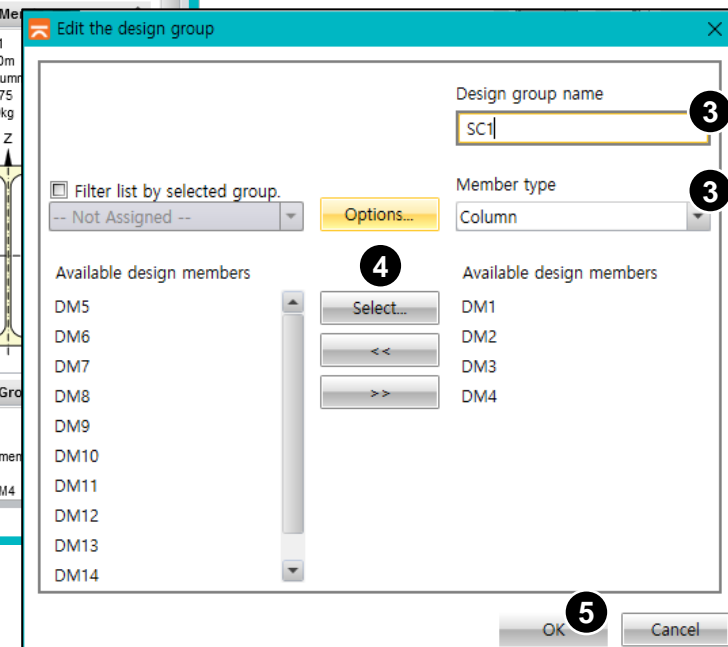


Steel Connection Design

Step 3.

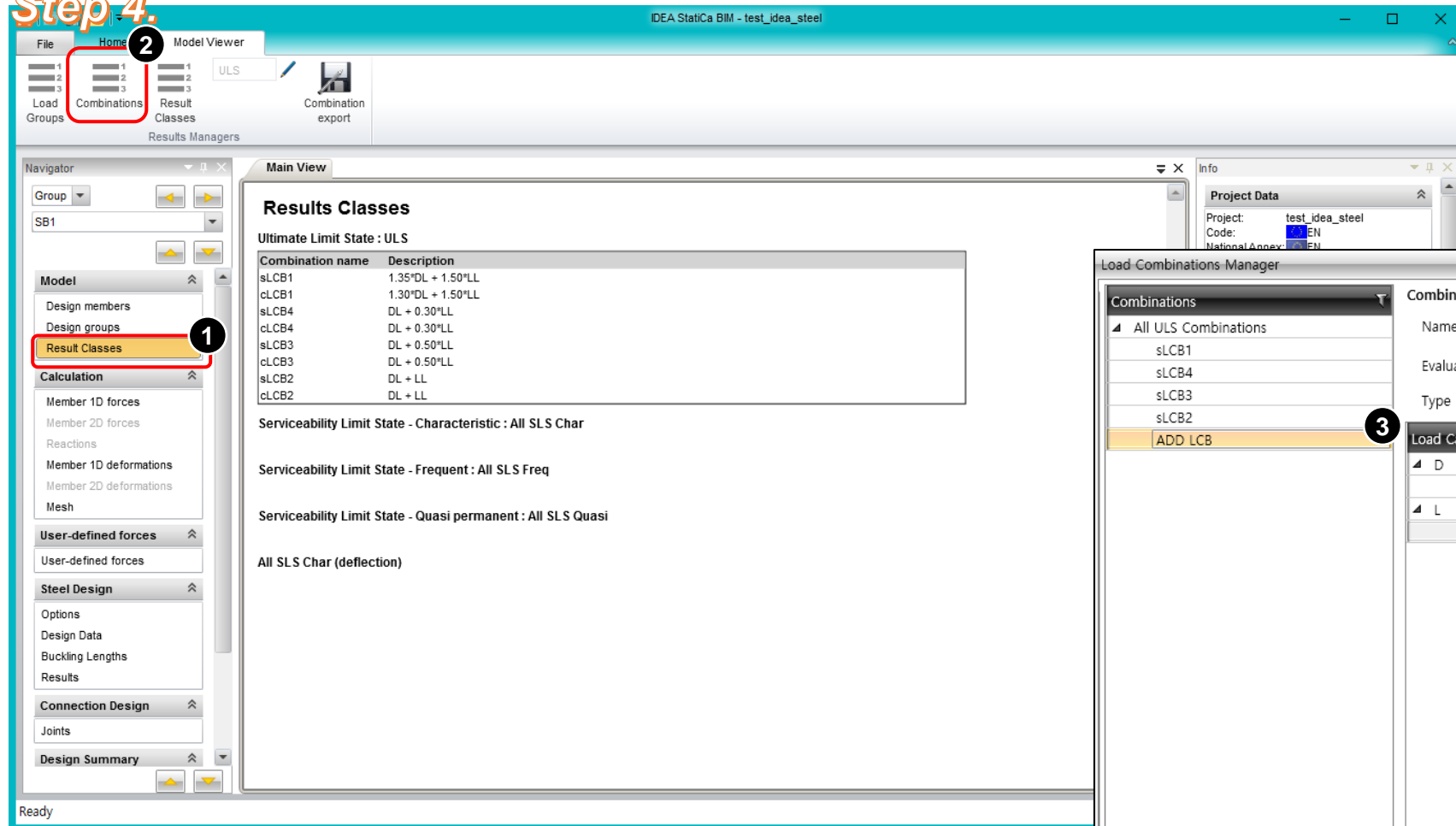


- 1 Click "Design Group".
- 2 Click .
- 3 Modify the group name and member type.
- 4 Modify the design members.
- 5 Click .



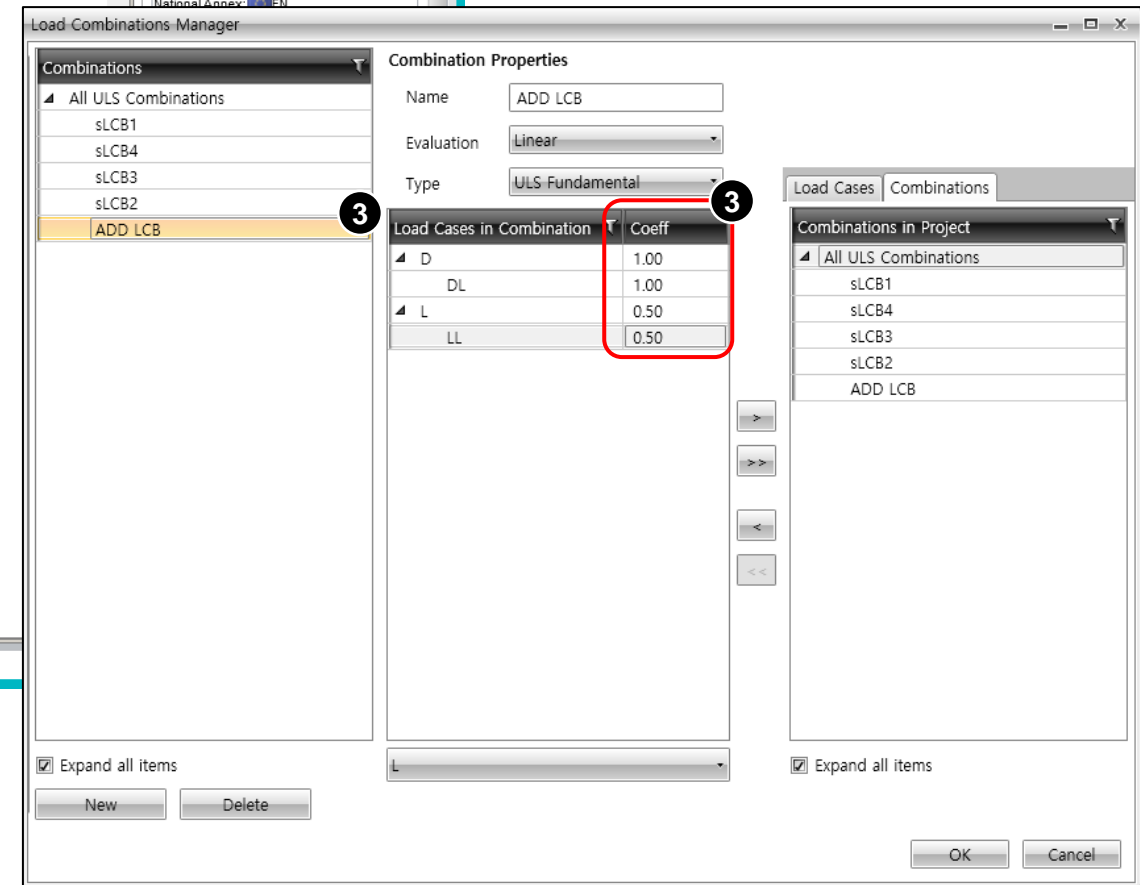
Steel Connection Design

Step 4.



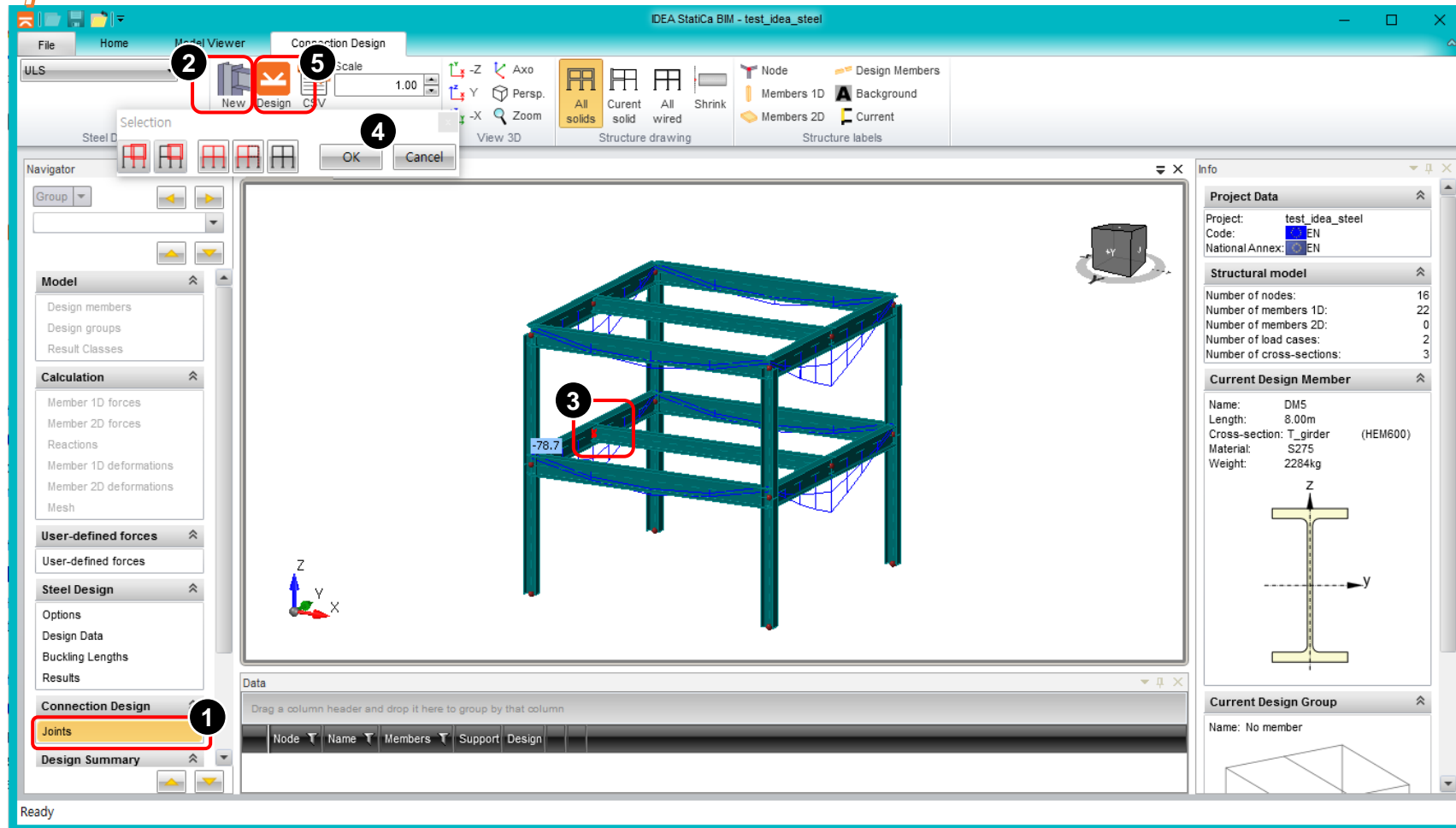
If there are the load combinations generated in Gen, these combinations are automatically applied.

- 1 Click "Result Classes".
- 2 Click "Combinations".
- 3 Add or Modify the combinations.



Steel Connection Design

Step 5.



[Joint Design]

- 1 Click "Joints".
- 2 Click "New".
- 3 Select the target Joint in the model window.
- 4 Click "OK".
- 5 Click "Design".

Steel Connection Design

Step 6.

The screenshot displays the StataCa CONNECTION software interface. The main window shows a 3D model of a steel beam-to-column connection. The beam is blue, and the column is orange. The connection is labeled DM9. The software interface includes a menu bar (Project, Design, Check, Report, Materials) and a toolbar with various icons for file operations, design, and analysis. The Properties panel for member DM9 is highlighted with a red box and a circled '1'. The Properties panel includes sections for Properties, Position, and Model.

Production cost - 0 €

Members

- DM5
- DM9**

Load effects

- sLCB1(1)
- sLCB4(2)

Operations

- SEP1

Properties

- Cross-section: 3 - beam (HEB4)
- Mirror Y:
- Mirror Z:
- Geometrical type: Ended

Position

- Axis X [m]: 1.00 0.00 0.00
- Axis Y [m]: 0.00 1.00 0.00
- Axis Z [m]: 0.00 0.00 1.00
- Connected by: Begin
- α - Rotation [°]: 0.0
- Offset ex [mm]: 0
- Offset ey [mm]: 0
- Offset ez [mm]: 0

Model

- Model type: N-Vy-Vz-Mx-My-Mz
- Forces in: Position
- X [mm]: 0

One member of the joint is considered as 'bearing'. The other member is 'connected'. The support in analysis model is applied to the bearing member.

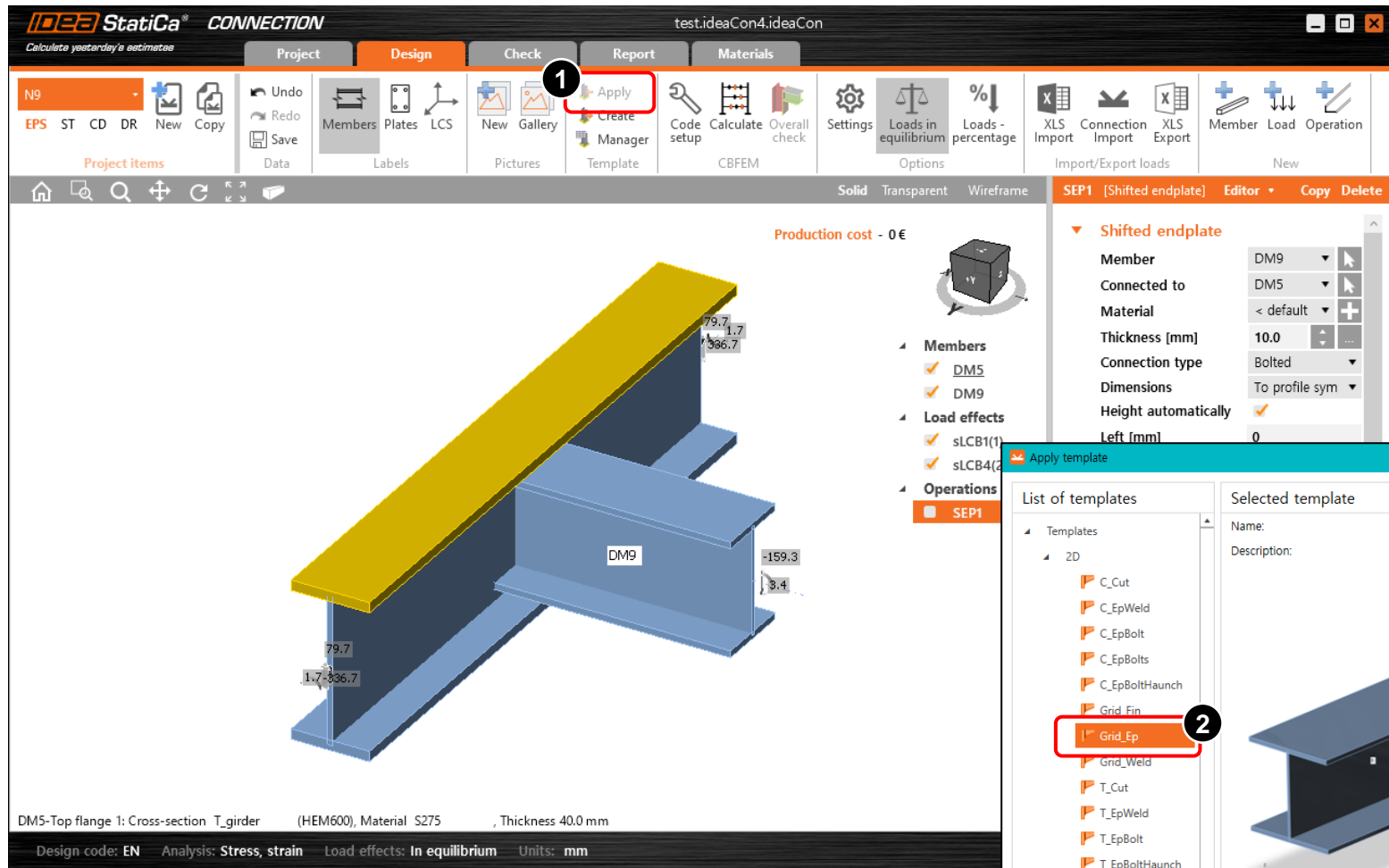
Design code: EN Analysis: Stress, strain Load effects: In equilibrium Units: mm www.idealstataca.com

[Joint Design]

- 1 Modify the member properties and position

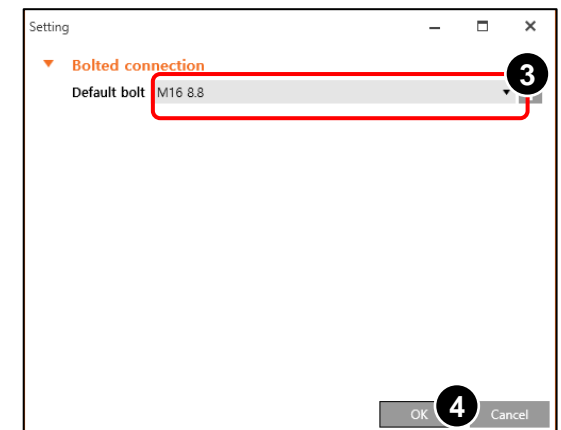
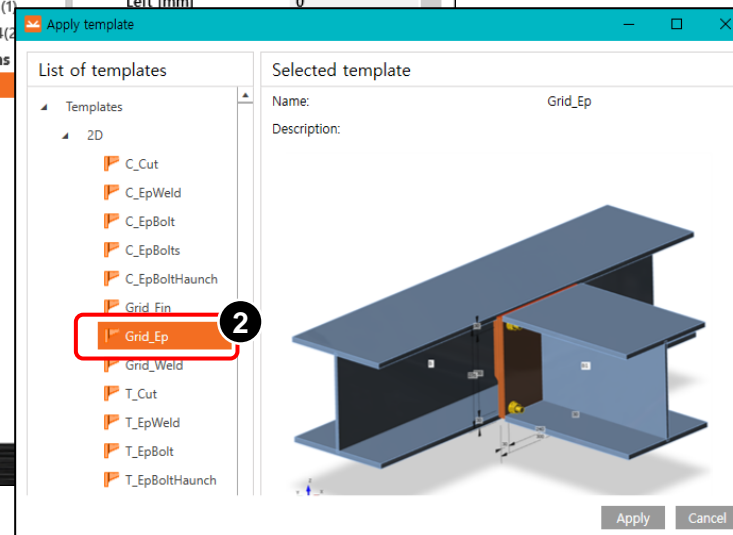
Steel Connection Design

Step 7.



[Joint Design]

- 1 Click "Apply" in Design tap > Template.
- 2 Select the connection detail in the template list.
- 3 Select the bolt type.
- 4 Click "OK".



Steel Connection Design

Step 8.

The screenshot shows the IDeA StatiCa CONNECTION software interface. The top menu bar includes tabs for Project, Design, Check, Report, and Materials. The Design tab is active, showing various tool icons. A 3D model of a steel connection is displayed in the center, with dimensions and labels like DM9 and DM5. A 'Code and calculation settings' dialog box is open on the left, and a 'Shifted endplate' properties panel is open on the right. Red boxes and numbered circles (1-4) highlight specific steps in the workflow.

Code and calculation settings

- Analysis and checks
 - Stop at limit strain
 - Geometrical nonlinearity (GMNA)
 - deformations for hollow section joints
 - Concrete breakout resistance
 - Local deformation check
 - Pretension force factor k [-]: 0.70
 - Friction coefficient in slip-resistance [-]: 0.30
- Partial safety factors
 - γ_{M0} : 1
 - γ_{M1} : 1
 - γ_{M2} : 1.25
 - γ_C : 1.5
 - γ_{Inst} : 1.2
 - γ_{M3} : 1.25
- Concrete block
 - Anchor length for stiffness calculation [d]: 8
 - Joint coefficient β_j : 0.67
 - Effective area - influence of mesh size: 0.1
 - Friction coefficient - concrete: 0.25
 - α_{cc} : 1

Shifted endplate

- Member: DM9
- Connected to: DM5
- Material: < default
- Thickness [mm]: 12.0
- Connection type: Bolted
- Dimensions: To profile sym
- Height automatically:
- Left [mm]: 0
- Beam endplate
 - Thickness [mm]: 0.0
 - Dimensions: Identical
- Stiffener
 - Type: Full
 - Material: < default
 - Thickness [mm]: 0.0
 - Chamfered corners:
 - Chamfer cut size [mm]: 0
- Bolts
 - Type: M16 8.8
 - Top layers [mm]: -30

[Joint Design]

- 1 Modify the connection information.
- 2 Click "Code Setup" in Design tap > CBFEM.
- 3 Modify the factor values for design.
- 4 Click "Calculate" in Design tap > CBFEM.

Steel Connection Design

Step 9.

StatiCa CONNECTION test.ideaCon4.ideaCon

Project Design **1** Check Report Materials

Analysis Plates Bolts Welds **2**

Equivalent stress Plastic strain Stress in contacts Bolt Mesh Deformed

FE analysis **3**

Analysis Plates Bolts Welds **4**

Status of FE analysis

Status	Loads	Applied [%]
✓	sLCB1(1)	100.0
✓	sLCB4(2)	100.0

Production cost - 150 €

[MPa]

15.50
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.00

Analysis 100.0%
Plates 0.1 < 5.0%
Bolts 92.8 < 100%
Welds 35.7 < 100%
Buckling Not calculated

Design code: EN Analysis: Stress, strain Load effects: Equilibrium not required Units: mm

www.ideastatica.com

[Joint Design]

- 1 Click "Check" tap.
- 2 Select the analysis result.
- 3 Select the element type.
- 4 Check the design result.

Analysis Plates Bolts Welds

Check of members and steel plates for extreme

Status	Item	Th [mm]
✓	DM5-bfl 1	40.0
✓	DM5-tfl 1	40.0
✓	DM5-w 1	21.0
✓	DM9-bfl 1	26.0
✓	DM9-tfl 1	26.0
✓	DM9-w 1	14.0
✓	SEP1a	12.0
✓	SEP1b	6.0

Analysis Plates Bolts Welds

Check of bolts for extreme load effect

Status	Item	Loads	Ft [kN]	V [kN]
+	B1	sLCB1(1)		
+	B2	sLCB1(1)		
+	B3	sLCB1(1)		
+	B4	sLCB1(1)		

Analysis Plates Bolts Welds

Check of welds for extreme load effect (Plas)

Status	Item	Edge	Th [mm]
+	SEP1b	DM9-bfl 1	6.0
+	SEP1b	DM9-tfl 1	6.0
+	SEP1b	DM9-w 1	6.0
+	SEP1b	DM9-w 1	6.0
+	DM5-bfl 1	STIFF	6.0
+	DM5-bfl 1	STIFF	6.0

Design data

Item	Ft,Rd [kN]	Bp,Rd [kN]
M16 8.8 - 1	90.4	194.5

Equivalent stress [MPa]

49.0
5.8

Steel Connection Design

Step 10.

[Reporting]

StatiCa CONNECTION test.ideaCon4.ideaCon

Project Design Check **Report** Materials

Report view: Print Preview DOC PDF DXF **Print**

Type of report: Brief One page Detailed **BOM** Current All Selected

Items in report: Current All Selected

Boils

Name	Loads	$F_{t,Ed}$ [kN]	V [kN]	U_t [%]	$F_{b,Rd}$ [kN]	U_s [%]	U_{ts} [%]	Status
B1	sLCB1(1)	4.3	41.1	4.7	165.1	68.2	71.6	OK
B2	sLCB1(1)	4.3	41.1	4.7	165.1	68.2	71.6	OK
B3	sLCB1(1)	36.6	38.5	40.4	165.1	63.9	92.8	OK
B4	sLCB1(1)	36.6	38.5	40.4	165.1	63.9	92.8	OK

Design data

Name	$F_{t,Rd}$ [kN]	$B_{p,Rd}$ [kN]	$F_{v,Rd}$ [kN]
M16 8.8 - 1	90.4	194.5	60.3

Symbol explanation

- $F_{t,Rd}$: Bolt tension resistance EN 1993-1-8 tab. 3.4
- $F_{t,Ed}$: Tension force
- $B_{p,Rd}$: Punching shear resistance
- V : Resultant of shear forces V_y, V_z in bolt
- $F_{v,Rd}$: Bolt shear resistance EN_1993-1-8 table 3.4
- $F_{b,Rd}$: Plate bearing resistance EN 1993-1-8 tab. 3.4
- U_t : Utilization in tension
- U_s : Utilization in shear

Welds (Plastic redistribution)

Item	Edge	Throat th. [mm]	Length [mm]	Loads	$\sigma_{w,Ed}$ [MPa]	ϵ_{pl} [%]	σ_{\perp} [MPa]	T_{\parallel} [MPa]	T_{\perp} [MPa]	U_t [%]	U_{ts} [%]	Status
SEP1a	DM5-flt 1	6.0	300	sLCB1(1)	35.3	0.0	2.7	-20.3	-1.6	8.7	6.0	OK
		6.0	300	sLCB1(1)	20.0	0.0	-11.9	3.3	8.7	4.9	4.2	OK

Design code: EN Analysis: Stress, strain Load effects: Equilibrium not required Units: mm

- 1 Click "Report" tap.
- 2 Select the type of design report.
- 3 For BOM, Click "BOM".
- 4 Select the output type.

Report

- Project data
- Paragraph
- Materials
- Project items
 - N9
- Code settings
- Theoretical background
- Software info

Project items settings

- Drawings - model
- Drawings - results
- Bill of material
- Cost estimation
- Formulas
- Explanations
- Picture colors

Design

Name: N9
Description: Stress, strain/ simplified loading

Bill of material

Manufacturing operations

Name	Plates [mm]	Shape	Nr.	Welds [mm]	Length [mm]	Bolts	Nr.
SEP1	P12.0x300.0-580.0 (S275)		1	Double fillet: a = 6.0	2880.0	M16 8.8	4
	P12.0x300.0-580.0 (S275)		1				
	P12.0x142.0-540.0 (S275)		1				

Welds

Throat thickness	Leg size	Length
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Steel Connection Design

Step 11.

Welds

Type	Material	Plate thickness [mm]	Leg size [mm]	Length [mm]
Double fillet	S275	6.0	8.5	2880.0

Bolts

Name	Grip length [mm]	Count
M16 8.8	24	4

Drawing

SEP1 - SEP1a
P12.0x580-300 (S275)

midas Drawing - Project1

File Edit View Insert Format Tools Draw Dimension Modify Window Information Generate Drawing Utility Help

Import(DWG/DXF)...

Import(DWG/DXF)...

In addition to the DWG file and import data created in other applications into the current working projects.

[Drawing]

- 1 Click "DXF" and save as new name .
- 2 Import the dxf file in midas Drawing.