



Tutorial

Get started with SDC Verifier

Updated on: 30 May 2023

Tested with: SDC Verifier 2023 R1

Simcenter Femap with Nastran 2022.2 MP2

SDC Verifier is a powerful FEMAP add-on that helps verify structures according to standards and generates full calculations reports.



The goal of **SDC Verifier** is to automate all possible routine work and speed up a verification of the engineering projects significantly.

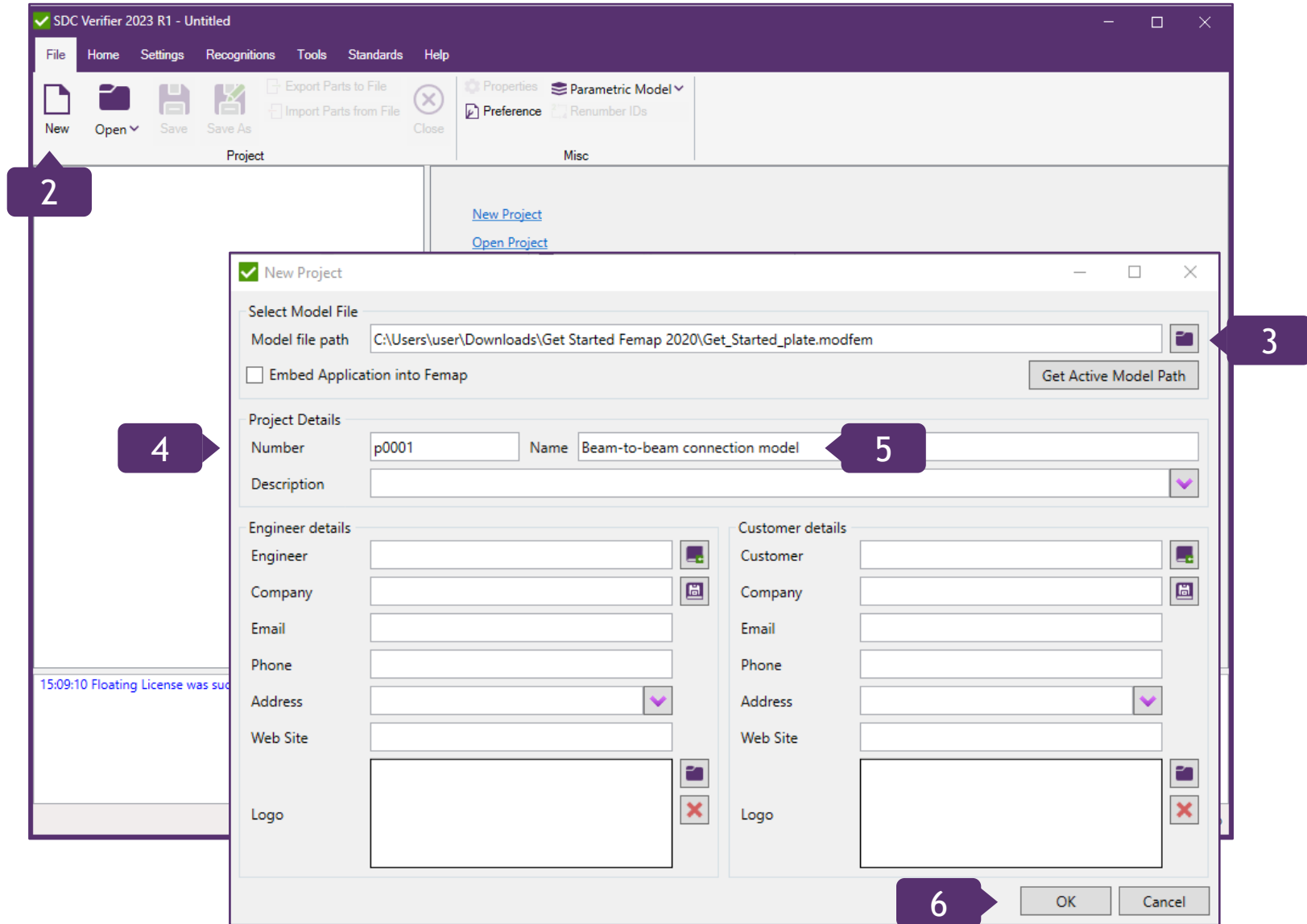
This step-by-step tutorial is designed to *get* you *started* with the main SDC Verifier features.

You will learn how to:

- Create new project;
- Create Individual Loads, Load Sets, and Load Groups;
- Analyze Job;
- Create Views;
- Create Model Setup Report (Wizard);
- Create Calculation Report (Wizard);
- Open as template feature;

Create New Project

- 1 Launch SDC Verifier for FEMAP 
- 2 Execute *File - New*
- 3 Press  and select *Get_Started _plate* Femap model
- 4 Number: p0001
- 5 Name: Beam-to-beam connection model
- 6 Press *OK*



Job Explanation

1 Select 1..Job 1

2 Title: Linear Static Analysis

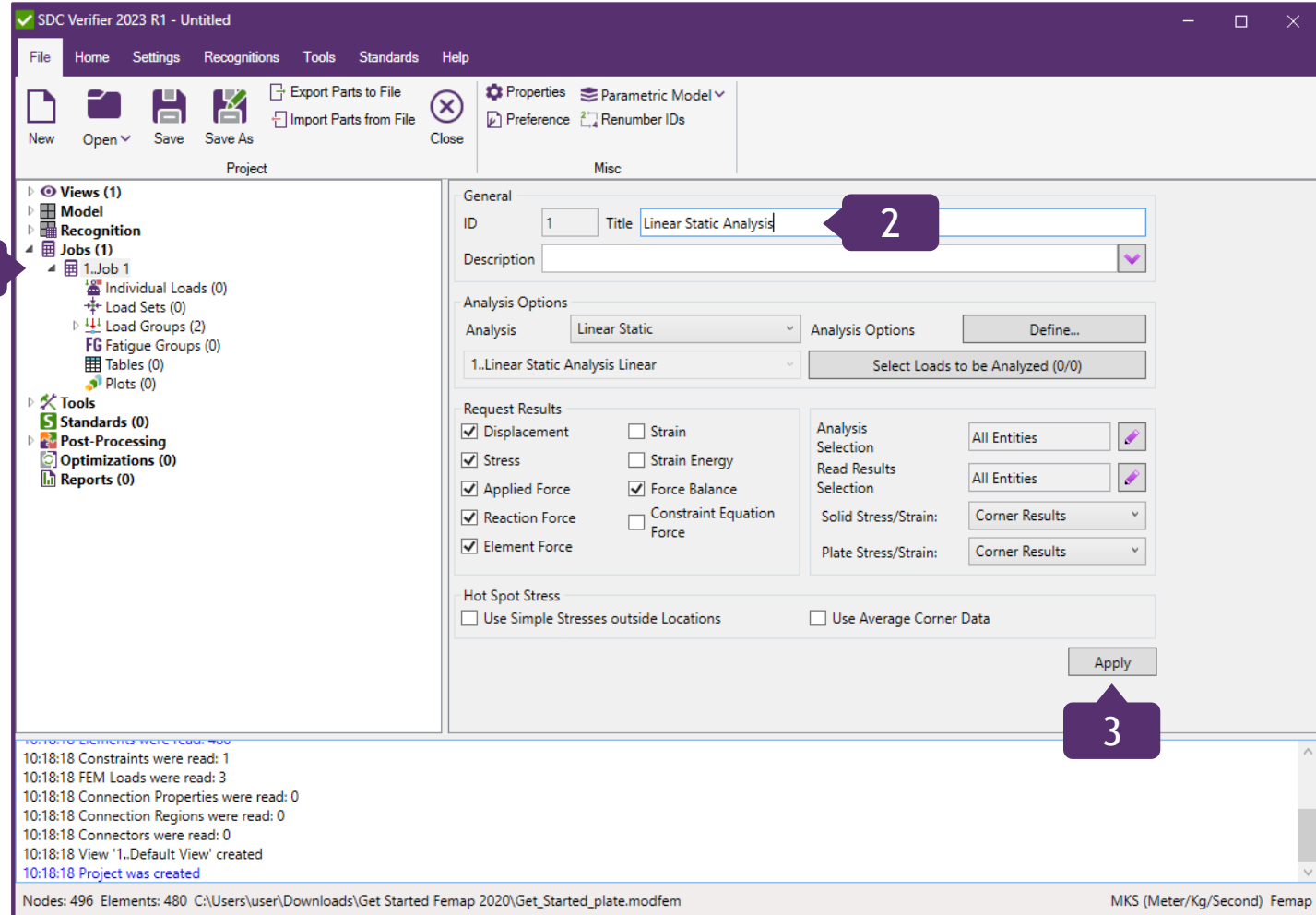
3 Press *Apply*

Job is a calculation set that contains analysis with options, boundary conditions, load combinations, envelopes and tables/plots.

Individual Loads = FEM load + Constraint.
Boundary condition + Output Set;

Load Sets - combination of Individual Loads with factors;

Load Groups (envelop - worst results among loads)



FEM Load



Constraint



Individual Load

Create Individual Loads

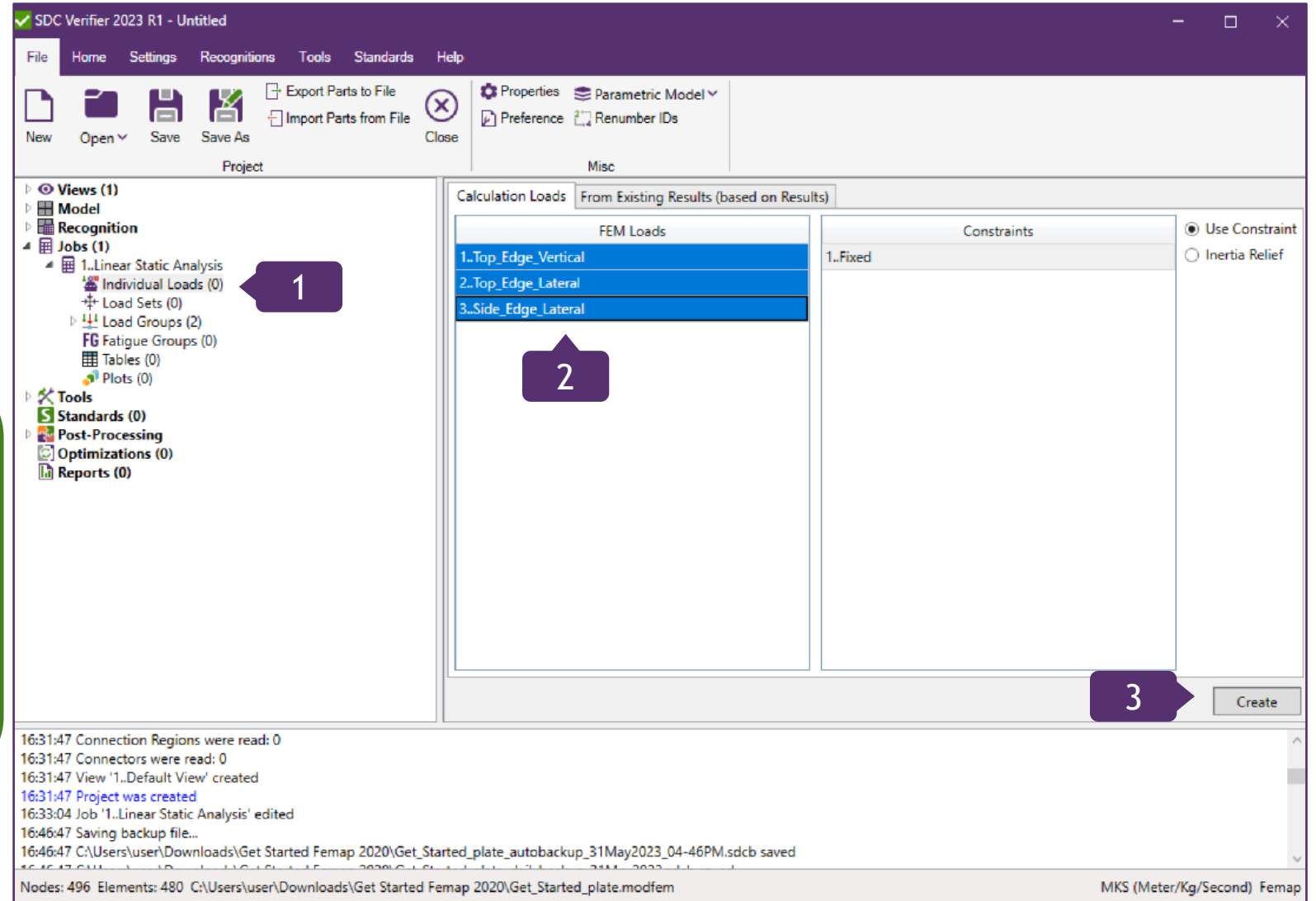
1 Select *Individual Loads* in the *Model Tree*

2 Select all *FEM Loads*

3 Press *Create*

Individual Loads will be created automatically from combinations of all selected FEM Loads and Constraints. In our case 3 Individual loads.

If the model already contains Output Sets it is possible to create Individual Loads based on results without boundary conditions (see next slide).



Note: Use option “Inertia Relief” to create Individual Loads, based on FEM Loads only (without constraint).

Create Individual Loads from Existing Results

This slide demonstrates alternative method of how to create Individual Loads based on Output Sets. Tutorial model does not contain any results yet; steps from this slide should be skipped.

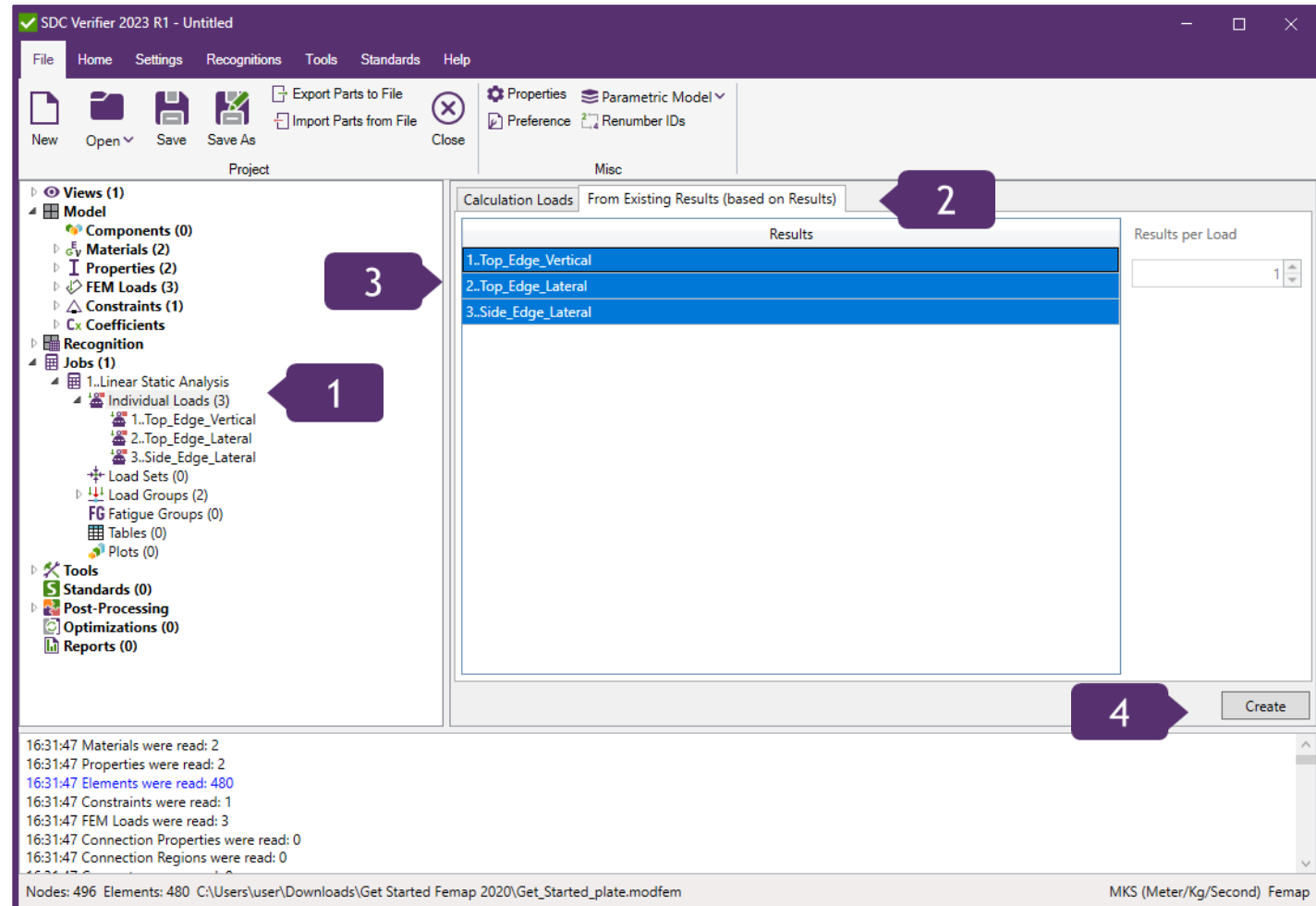
1 Activate *Individual Loads* in the *Model Tree*.

2 Select *From Existing results* option.

3 Select all Output Sets.

4 Press *Create*.

3 Individual Loads will be created based on 3 Output Sets



Analyze Job

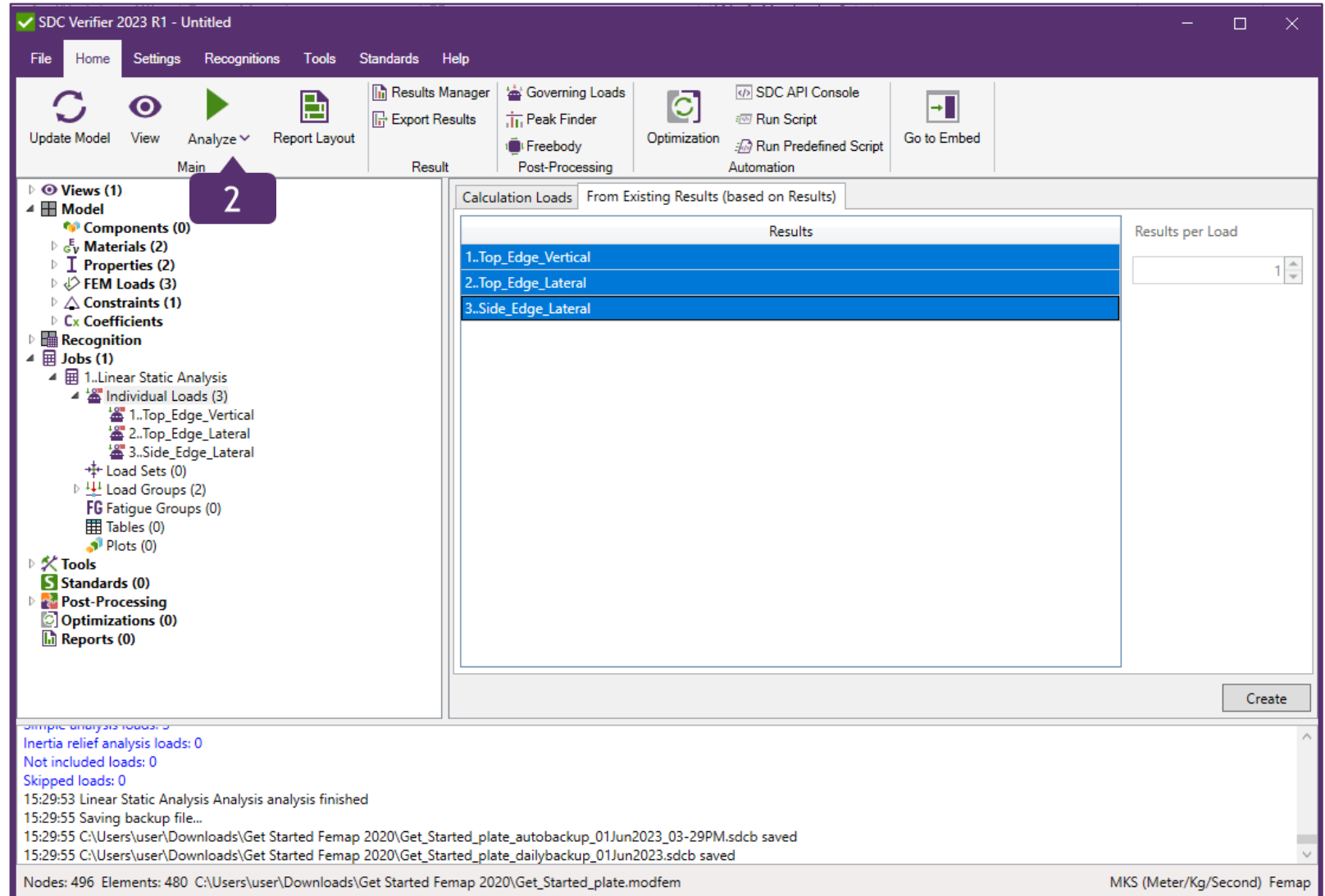
1 Go to *Home* section on the Ribbon

2 Press  on the toolbar to analyze job.

Analysis with 3 cases will be created and run. When finished, Output Sets will be linked automatically to correspondent Individual Loads.

Analysis Set : 2..linear Static Analysis Linear

- Solver : Simcenter Nastran
- Type : Static
- Integrated Solver : Simcenter Nastran
- Options
- Master Requests and Conditions
- Case : 1..Top_Edge_Vertical
- Case : 2..Top_Edge_Lateral
- Case : 3..Side_Edge_Lateral



Note: If Individual Loads were created based on Output Sets running analysis is not required.

Create Load Combinations (Logic LS)

1 Activate *Load Sets* in the *Model* tree.

2 Title: All_combinations

3 Select all *Individual Loads* from the list of loads.

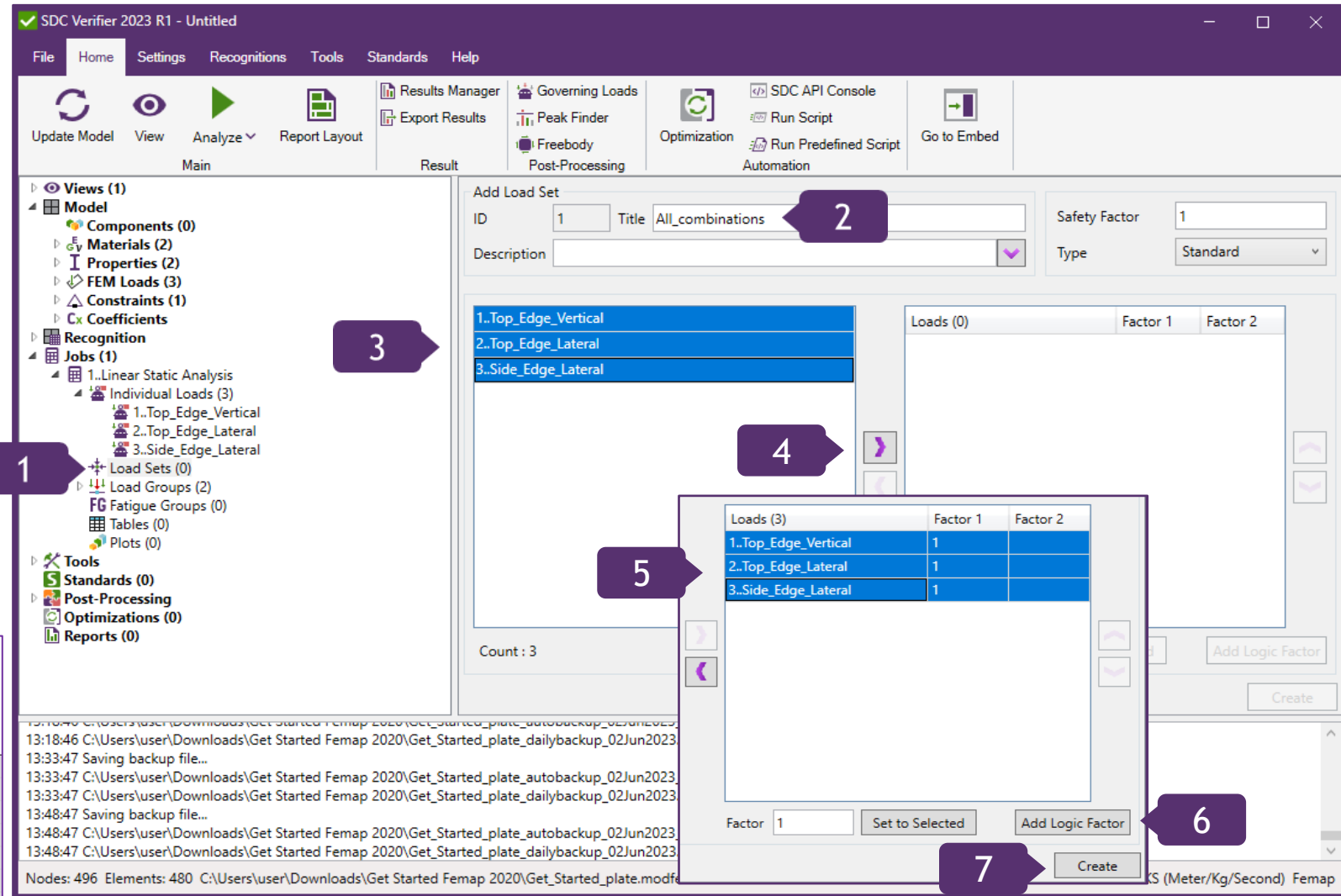
4 Press  to add items to load set.

5 Select all *Individual Loads* from the list of loads.

6 Press *Add Logic Factor* (each item will be added with positive and negative factor).

7 Press *Create*

| | Safety Factor | IL1_Top_Edge_Vertical | IL2_Top_Edge_Lateral | IL3_Side_Edge_Lateral |
|--------------------|---------------|-----------------------|----------------------|-----------------------|
| All_combinations.1 | 1 | 1 | 1 | 1 |
| All_combinations.2 | 1 | -1 | 1 | 1 |
| All_combinations.3 | 1 | 1 | -1 | 1 |
| All_combinations.4 | 1 | -1 | -1 | 1 |
| All_combinations.5 | 1 | 1 | 1 | -1 |
| All_combinations.6 | 1 | -1 | 1 | -1 |
| All_combinations.7 | 1 | 1 | -1 | -1 |
| All_combinations.8 | 1 | -1 | -1 | -1 |



Edit Multiple Load Sets

1 Execute *Create/Edit multiple* in the *Load Sets* node in the *Model* tree.

2 Select cells for All_combinations with IDs 1-4 in column *IL3*

3 Factor: 1.1. Press *Set*

4 Select cells for All_combinations with IDs 5-8 in column *IL3*

5 Factor: -1.1. Press *Set*

6 Press *OK*.

Tip: It is possible to export/import table to excel using *Copy* and *Paste* buttons.

| | Safety Factor | IL1..Top_Edge_Vertical | IL2..Top_Edge_Lateral | IL3..Side_Edge_Lateral |
|------------------|---------------|------------------------|-----------------------|------------------------|
| l_combinations.1 | 1 | 1 | 1 | 1,1 |
| l_combinations.2 | 1 | -1 | 1 | 1,1 |
| l_combinations.3 | 1 | 1 | -1 | 1,1 |
| l_combinations.4 | 1 | -1 | -1 | 1,1 |
| l_combinations.5 | 1 | 1 | 1 | -1,1 |
| l_combinations.6 | 1 | -1 | 1 | -1,1 |
| l_combinations.7 | 1 | 1 | -1 | -1,1 |
| l_combinations.8 | 1 | -1 | -1 | -1,1 |

SDC Verifier 2023 R1 - Untitled

File Home Settings Recognitions Tools Standards Help

Update Model View Analyze Report Layout Results Manager Governing Loads SDC API Console Export Results Peak Finder Run Script Freebody Post-Processing Optimization Run Predefined Script Automation Go to Embed

Views (1)
Model
Components (0)
Materials (2)
Properties (2)
FEM Loads (3)
Constraints (1)
Coefficients
Recognition
Jobs (1)
1..Linear Static Analysis
Individual Loads (3)
1..Top_Edge_Vertical
2..Top_Edge_Lateral
3..Side_Edge_Lateral
Load Sets
1..All
2..All
3..All
4..All
5..All
6..All
7..All
8..All
Load Groups
Fatigue Groups
Tables (0)
Plots (0)

Add Load Set
ID: 9 Title: Safety Factor: 1 Type: Standard
Description: Loads (0) Factor 1 Factor 2


1..Top_Edge_Vertical
2..Top_Edge_Lateral
3..Side_Edge_Lateral

Create/Edit Multiple LoadSets

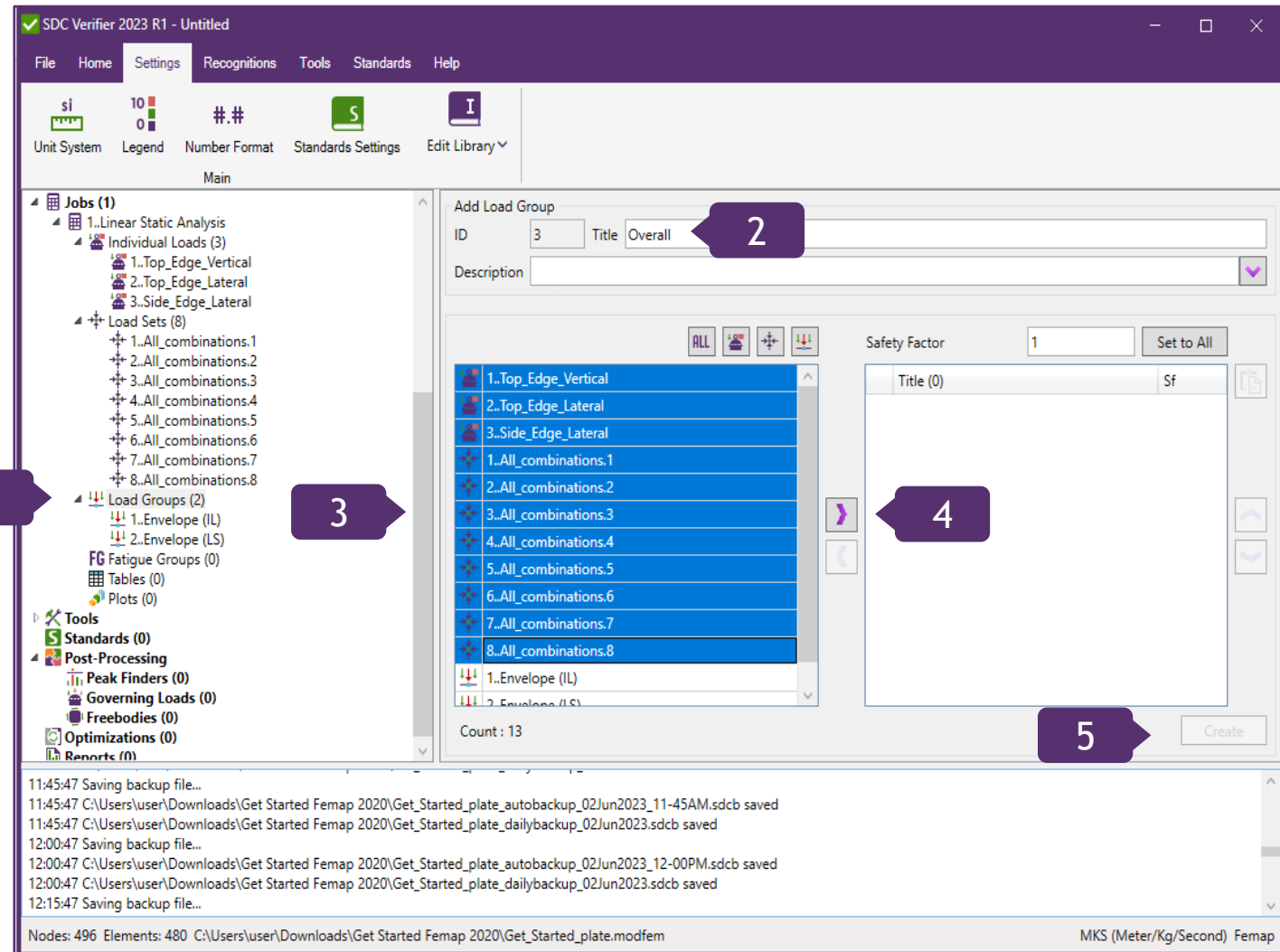
| | Safety Factor | IL1..Top_Edge_Vertical | IL2..Top_Edge_Lateral | IL3..Side_Edge_Lateral |
|--------------------|---------------|------------------------|-----------------------|------------------------|
| All combinations.1 | 1 | 1 | 1 | 1,1 |
| All combinations.2 | 1 | -1 | 1 | 1,1 |
| All combinations.3 | 1 | 1 | -1 | 1,1 |
| All combinations.4 | 1 | -1 | -1 | 1,1 |
| All combinations.5 | 1 | 1 | 1 | -1,1 |
| All combinations.6 | 1 | -1 | 1 | -1,1 |
| All combinations.7 | 1 | 1 | -1 | -1,1 |
| All combinations.8 | 1 | -1 | -1 | -1,1 |

Add Load Sets
Count: 1
From Clipboard
Factor: 1.1 Set
Set Diagonally
Clean Selected
Clipboard
Copy Paste
Copy with Title
Export to Excel
Selected Rows
Copy Remove
OK Cancel

Create Load Group (Overall)

- 1 Activate *Load Groups* node in the *Model* tree.
- 2 Title: *Overall*
- 3 Select all Loads from the list of loads, except Envelope (IL) and Envelope (LS).
- 4 Press  to move selected Loads to Load Group.
- 5 Press *Create*.

Load Group is envelope for Individual Loads, Load Sets, and other Load Groups. It allows to determine minimum, maximum and absolute values of stresses, displacements, forces, etc.



Create Views

1 Locate Model in Femap as shown on pic. Front View

2 Execute *View - Add* from context menu

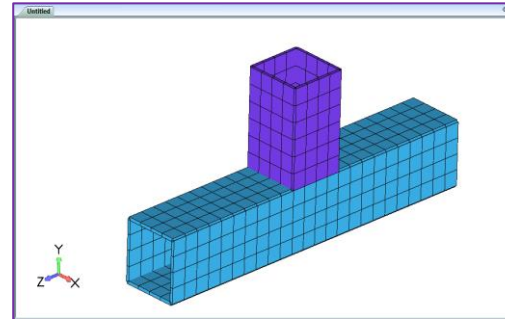
3 Title: Front View. Press *OK*

4 Locate the Model in Femap as shown on pic. Back View

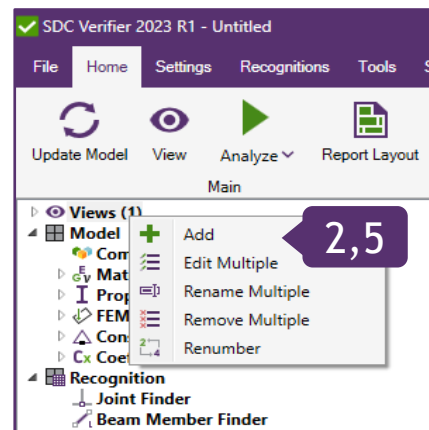
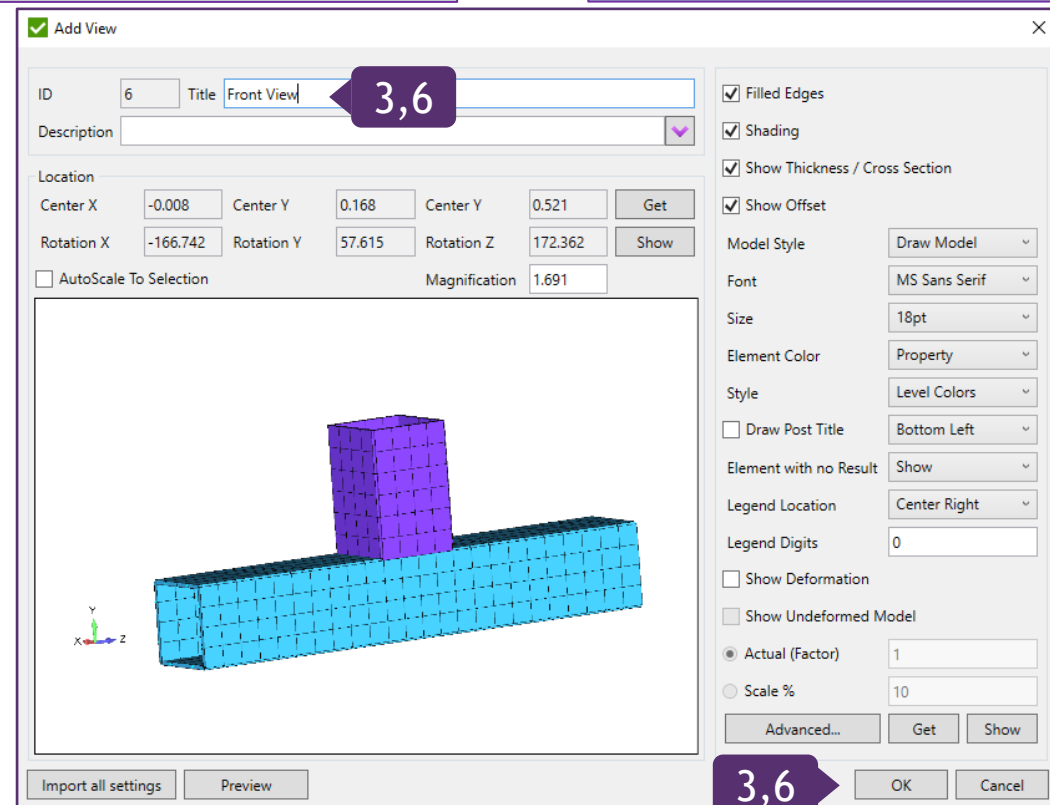
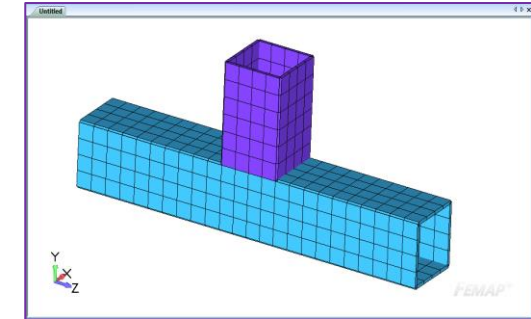
5 Execute *View - Add* from context menu

6 Title: Back View. Press *OK*

Front View



Back View



Create Views

1

Locate Model in Femap as shown on pic. Front Detail

2

Execute *View - Add* from context menu

3

Title: Front Detail. Press *OK*.

4

Locate the Model in Femap as shown on pic. Back Detail.

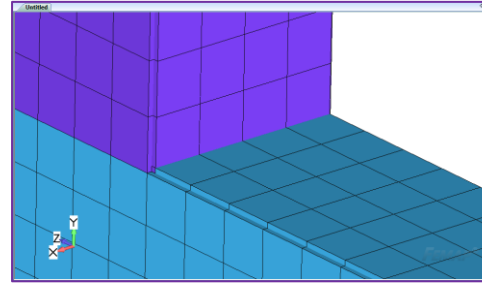
5

Execute *View - Add* from context menu

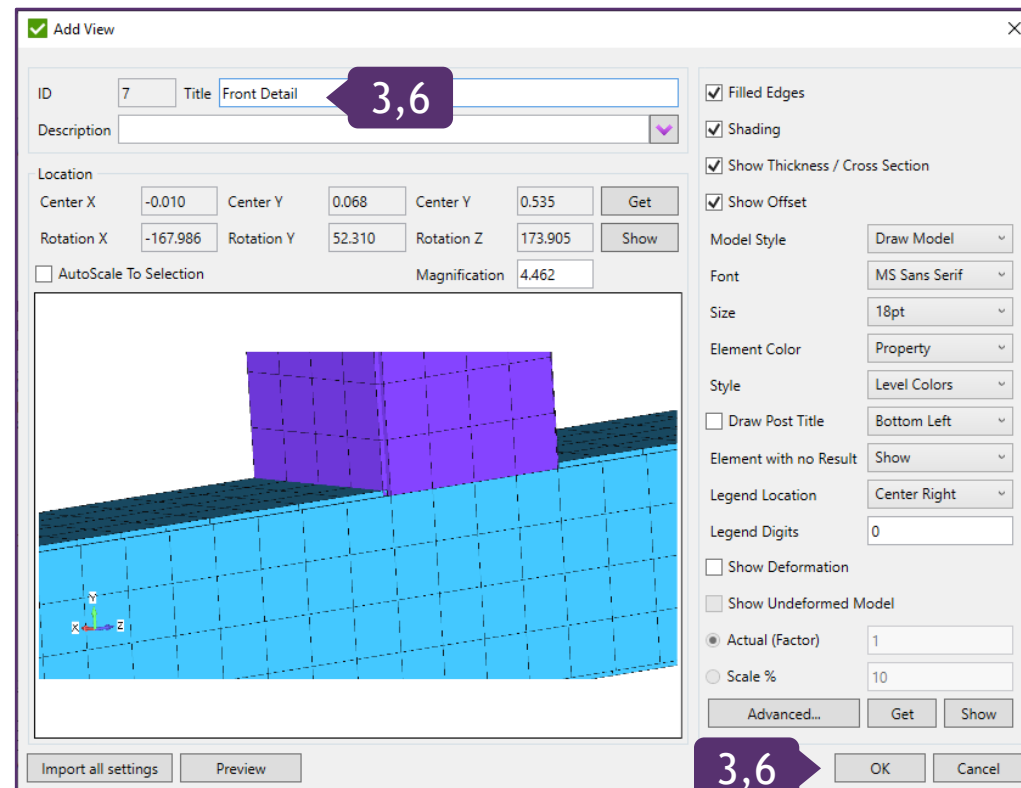
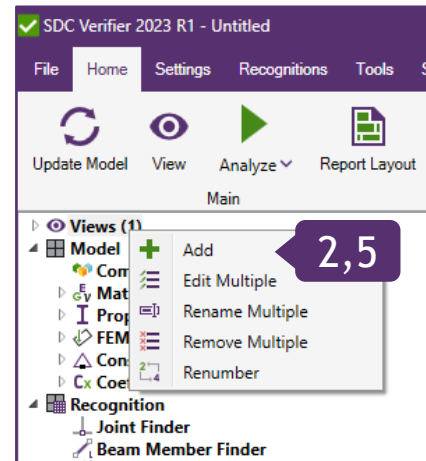
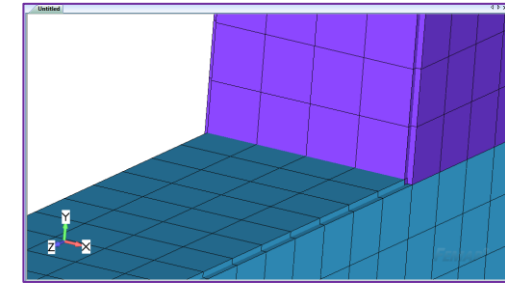
6

Title: Back Detail. Press *OK*.

Front Detail



Back Detail



Report Wizard - Model Setup report

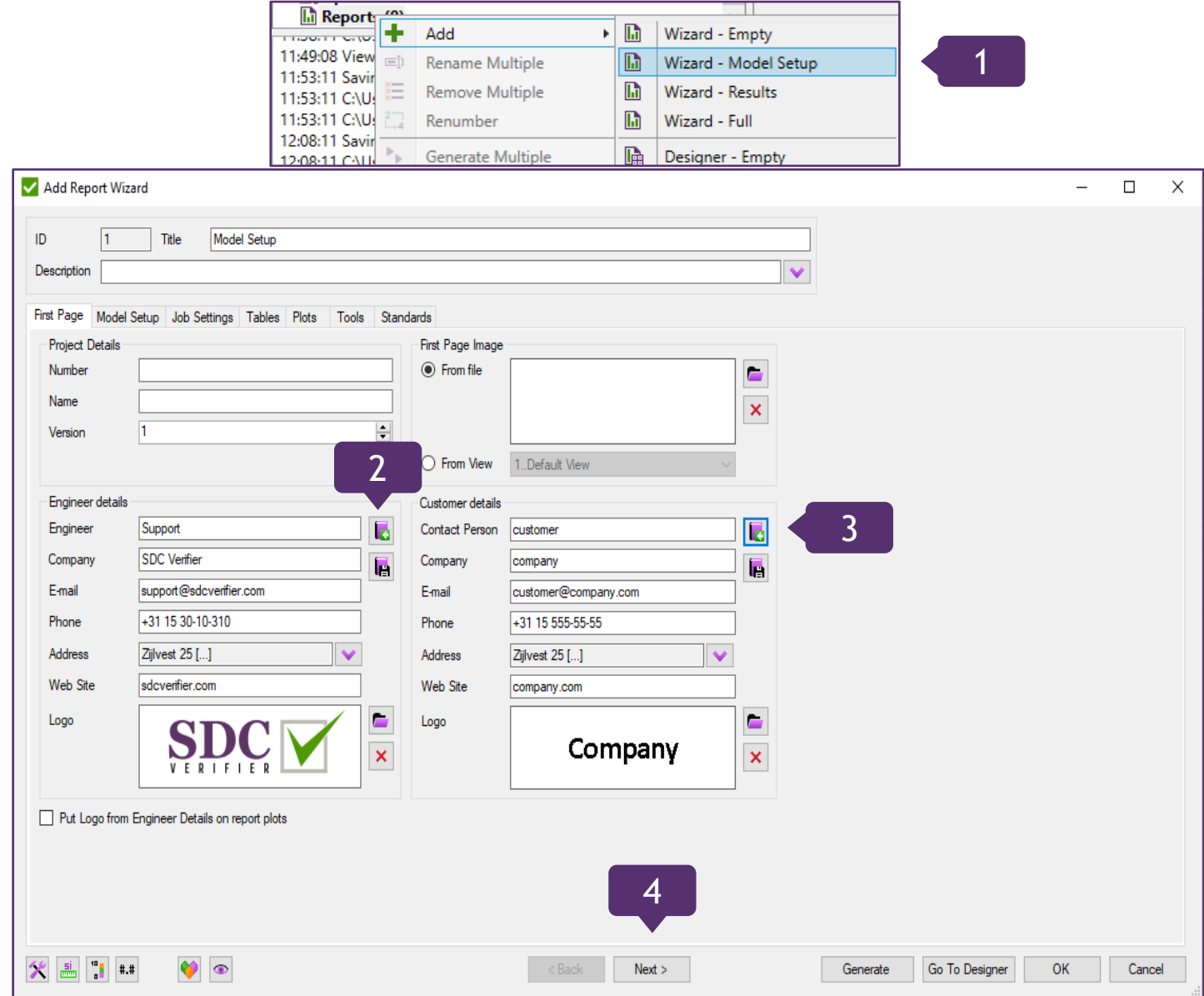
1 From *Reports* in the *Model* tree execute *Add -> Wizard - Model Setup*

2 Press  and select *Support Engineer* from the library

3 Press  and select *Customer* from the library

4 Press *Next*

Note: Engineer and customer information is used on the report's first page and in footer (company name and logo).



1

2

3

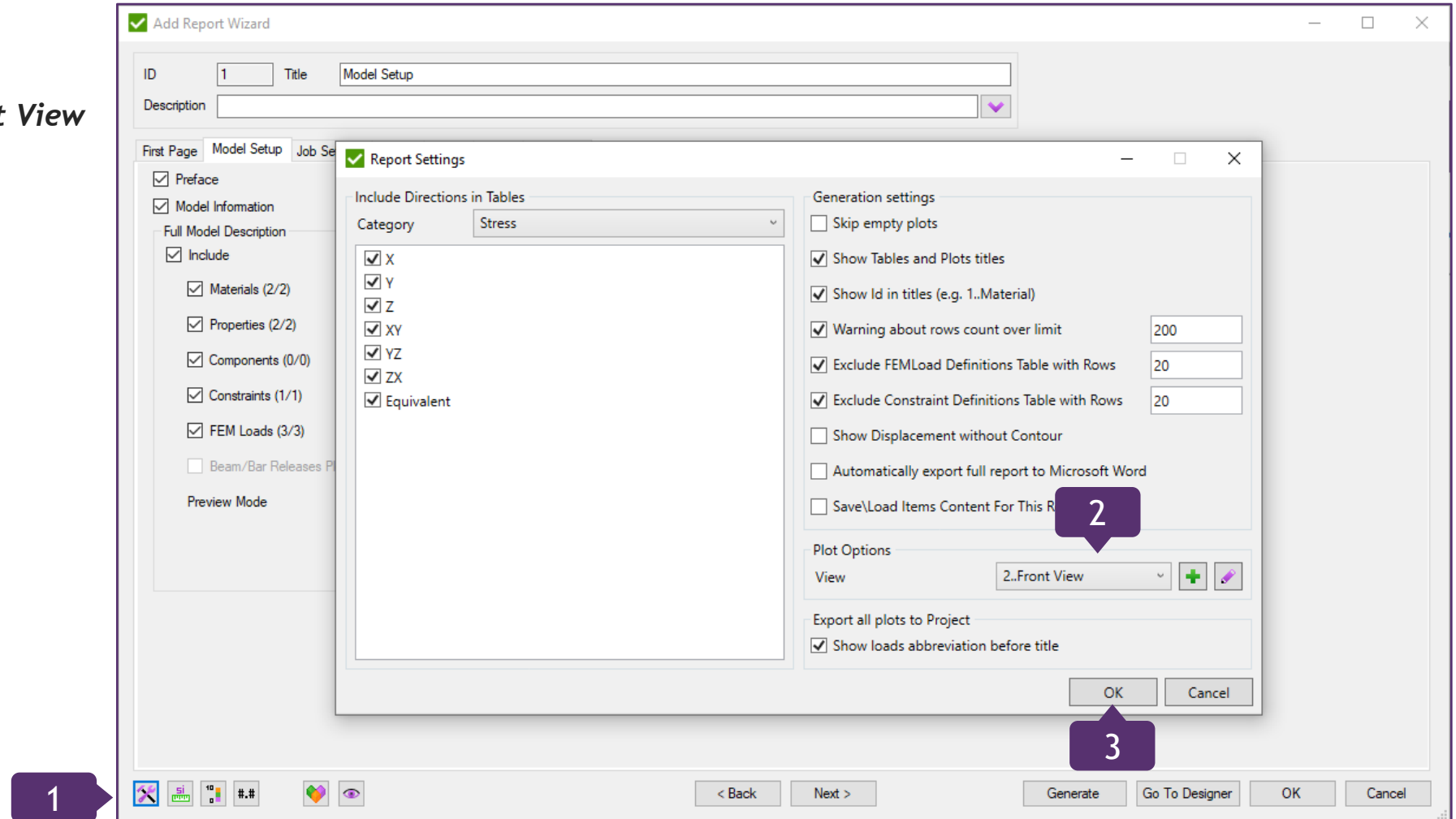
4

Report Wizard - Plot Options

1 Press  Report Settings

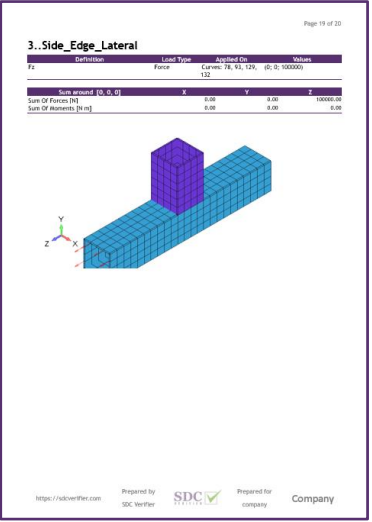
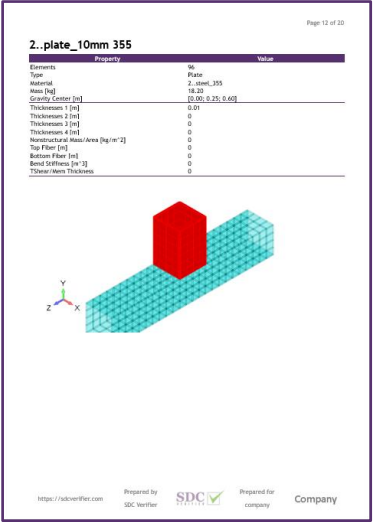
2 In Plot Options, select 2..Front View

3 Press OK



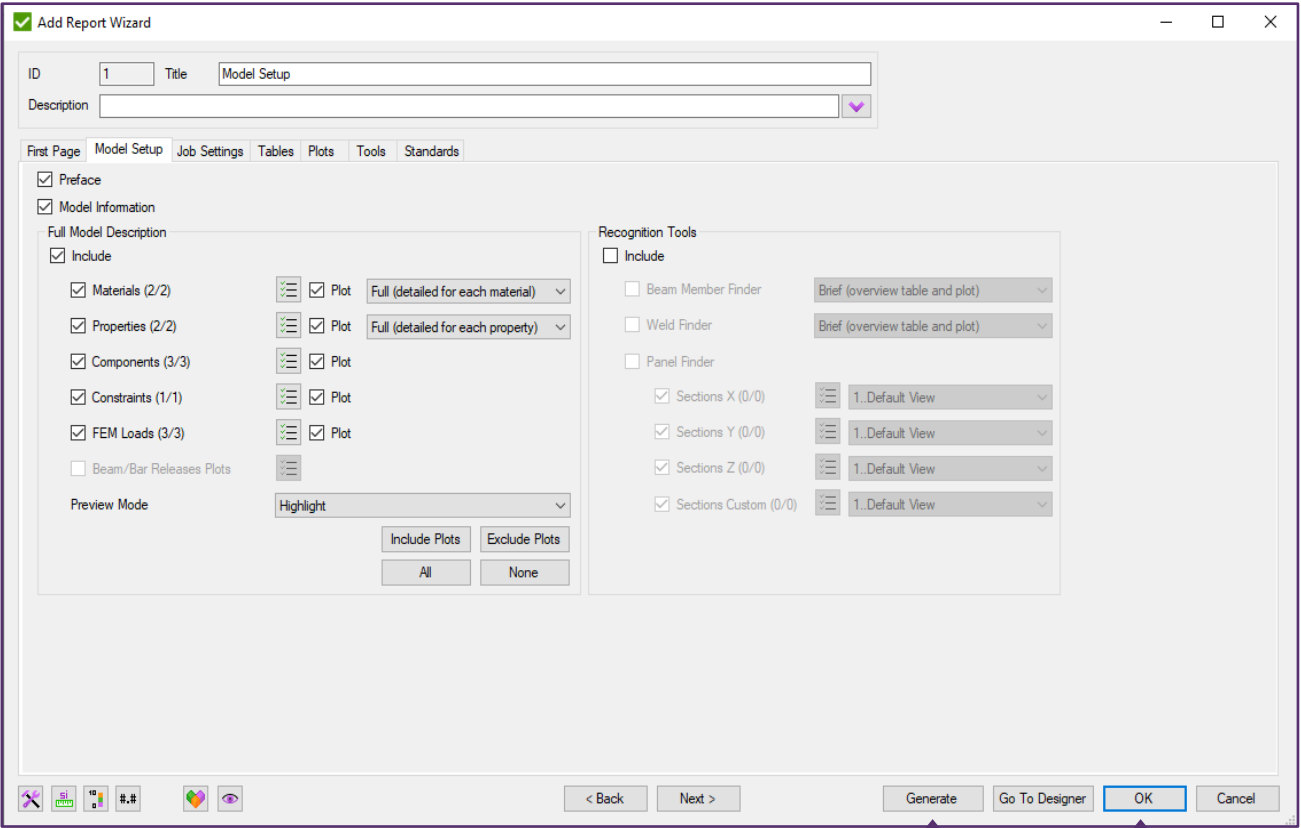
1 Press *Generate*

2 Press *OK*



Model setup report has been generated and opened in MS Word.

Using the *Report Designer* you can print out the report without any text editor installed.



1

2

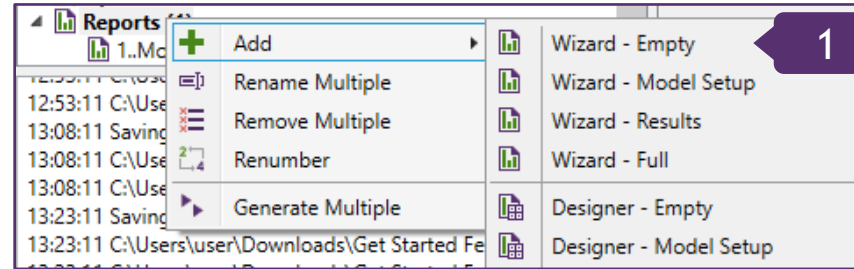
Create Calculation Report

1

From *Reports* in the *Model* tree, Execute *Add -> Wizard - Empty*

2

Press *Next* twice

A screenshot of the 'Add Report Wizard' dialog box. The 'First Page' tab is selected. The 'Project Details' section includes fields for Number (2), Name (Report), and Version (1). The 'Engineer details' section includes fields for Engineer (Support), Company (SDC Verifier), E-mail (support@sdcverifier.com), Phone (+31 15 30-10-310), Address (Zijvest 25 [...]), Web Site (sdcverifier.com), and Logo (SDC Verifier logo). The 'Customer details' section includes fields for Contact Person (customer), Company (company), E-mail (customer@company.com), Phone (+31 15 555-55-55), Address (Zijvest 25 [...]), Web Site (company.com), and Logo (Company logo). The 'First Page Image' section has radio buttons for 'From file' (selected) and 'From View' (1..Default View). A checkbox at the bottom is labeled 'Put Logo from Engineer Details on report plots'. A purple callout bubble with the number '2' points to the 'Next >' button at the bottom right.

1 Jobs: ON

2 Include Sum of Forces: ON

Add Report Wizard

ID: 2 Title: Report
Description:

First Page | Model Setup | **Job Settings** | Tables | Plots | Tools | Standards

☒ Include Jobs

1..Linear Static Analysis

Job Settings

☐ Job Description

☐ Plot Individual Load

☐ Modes Table for Individual Loads and Load Sets

☒ Include Contents

☐ Individual Loads Content

☐ Load Sets Content

☐ Load Groups Content

☐ Fatigue Groups Content

Advanced Tables (Overall)

☒ Include Sum of Forces

☒ Individual Loads Applied Forces

☒ Individual Loads Reaction Forces

☒ Load Sets Applied Forces

☒ Load Sets Reaction Forces

☐ Absolute Maximum Displacement

☐ Absolute Maximum Stresses

☐ Individual Load

☐ Load Set

☐ Load Group

Advanced Tables (For Each Load)

☐ Include Sum Of Forces

☒ Individual Load Reaction Forces

☒ Load Set Reaction Forces

☐ Stress Over All Properties

☐ Stress Over All Components

☐ Individual Load

☐ Load Set

☐ Load Group

☐ Automatically sort tables and plots by result category

All None

< Back Next > Generate Go To Designer OK Cancel

Add Displacements Plots

1 Click on *Plots* in the Navigation list

2 Select All loads from the list

3 Press  to add contour plot

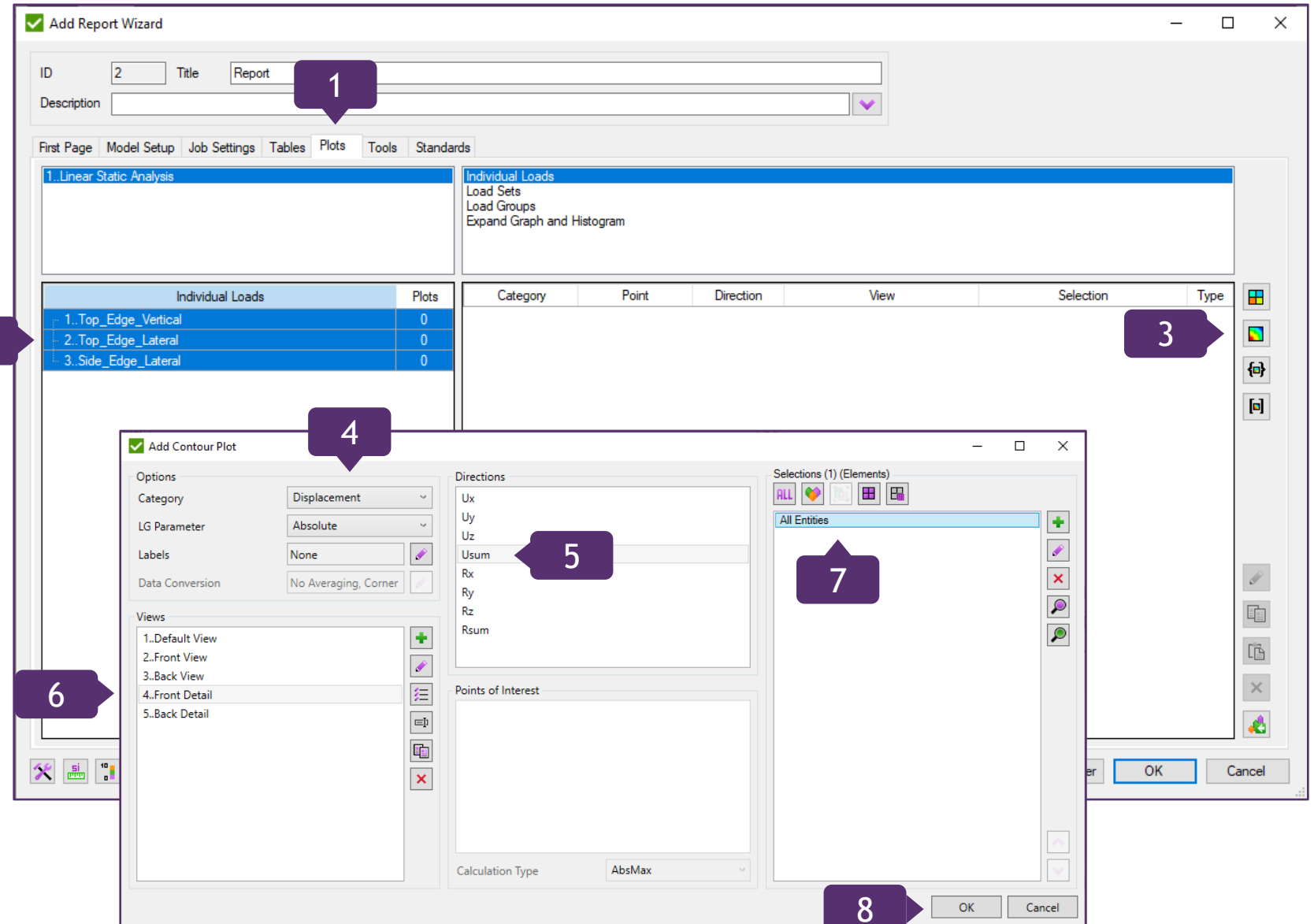
4 *Category*: Displacement

5 *Direction*: Usum

6 *Views*: Front Detail

7 *Selection*: All Entities

8 Press *OK*



Add Stress Plots

1 Press  to add contour plots

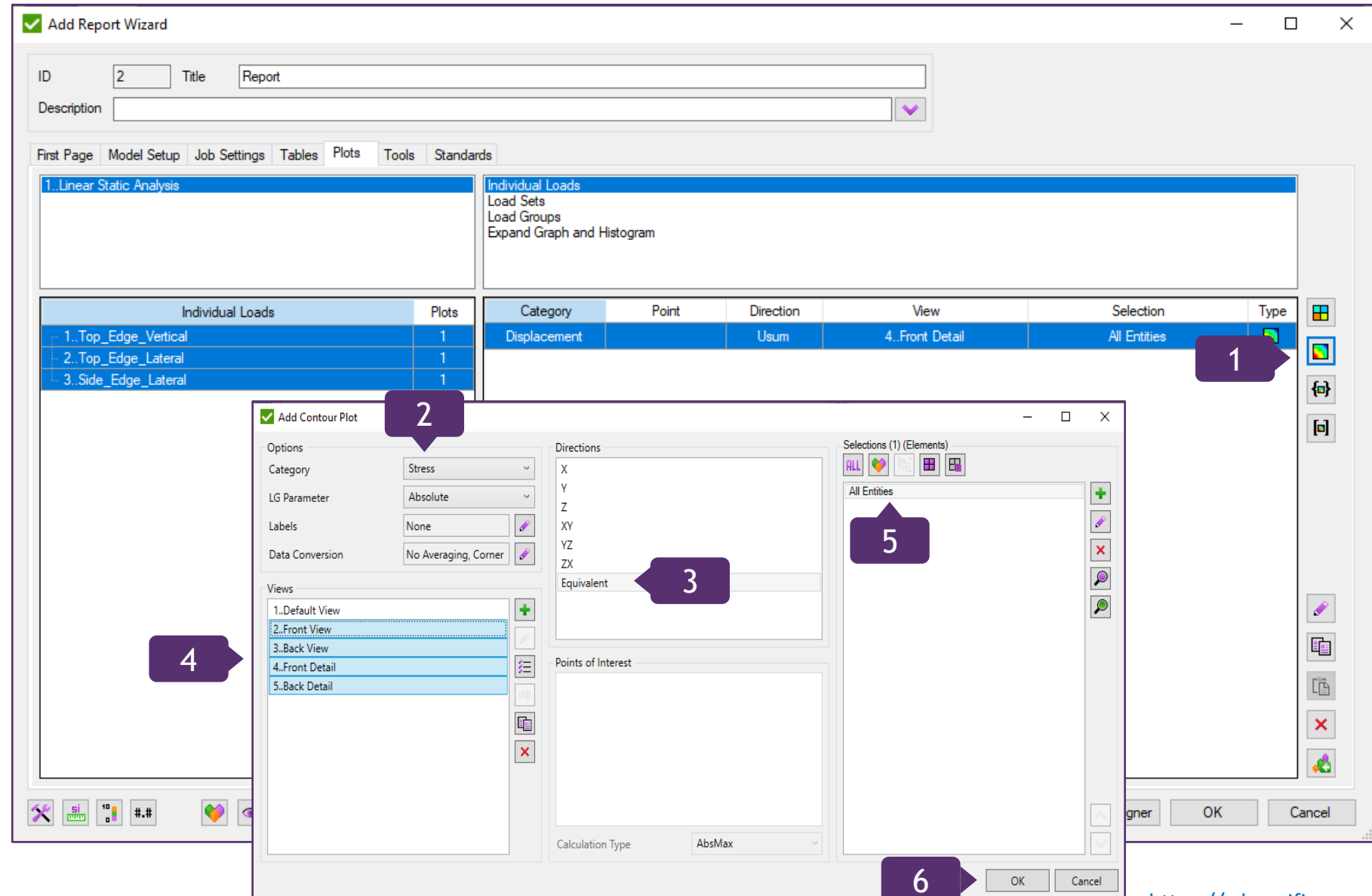
2 *Category: Stress*

3 *Direction: Equivalent*

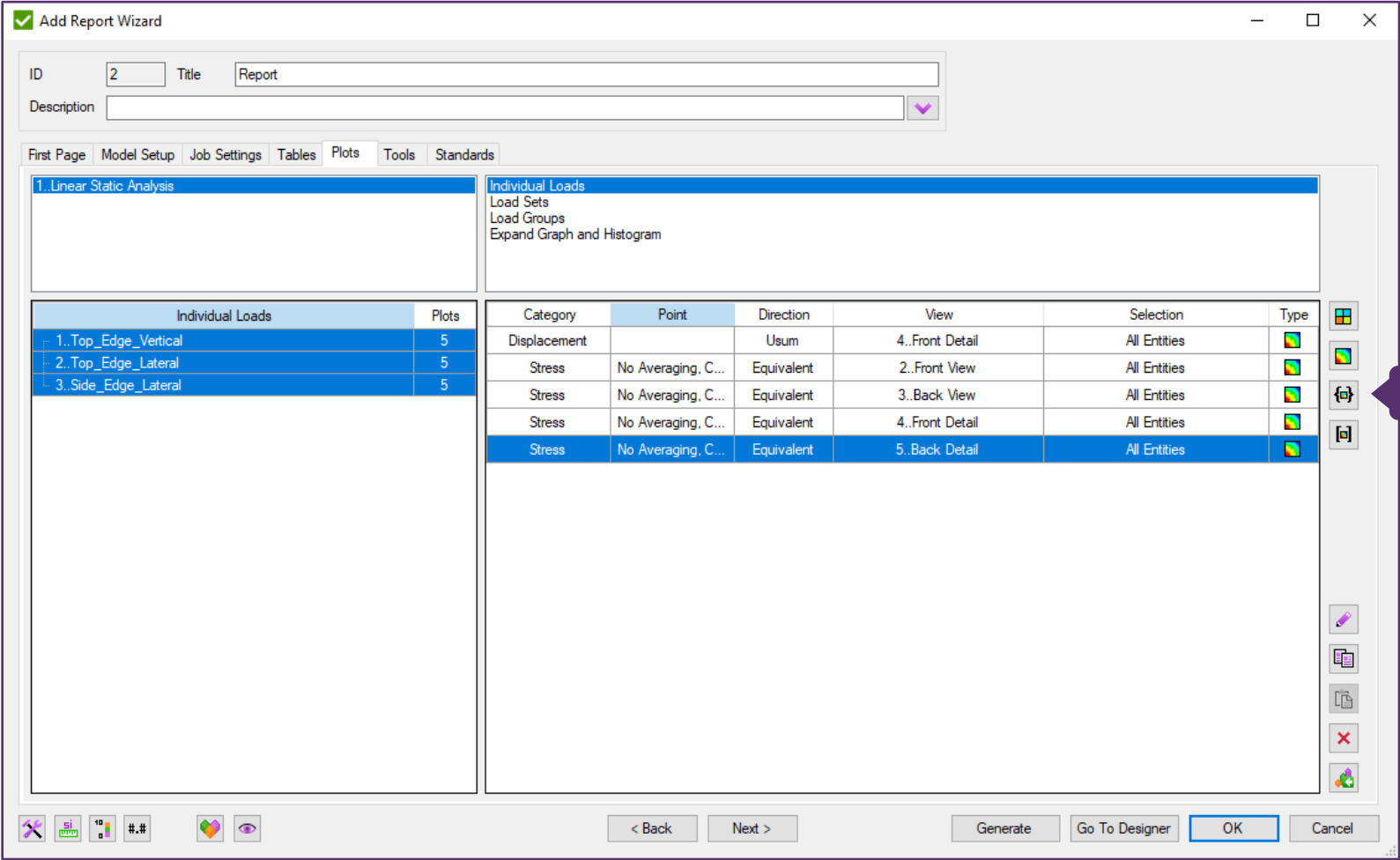
4 Select 4 created Views

5 *Selection: All Entities*



6 Press **OK**

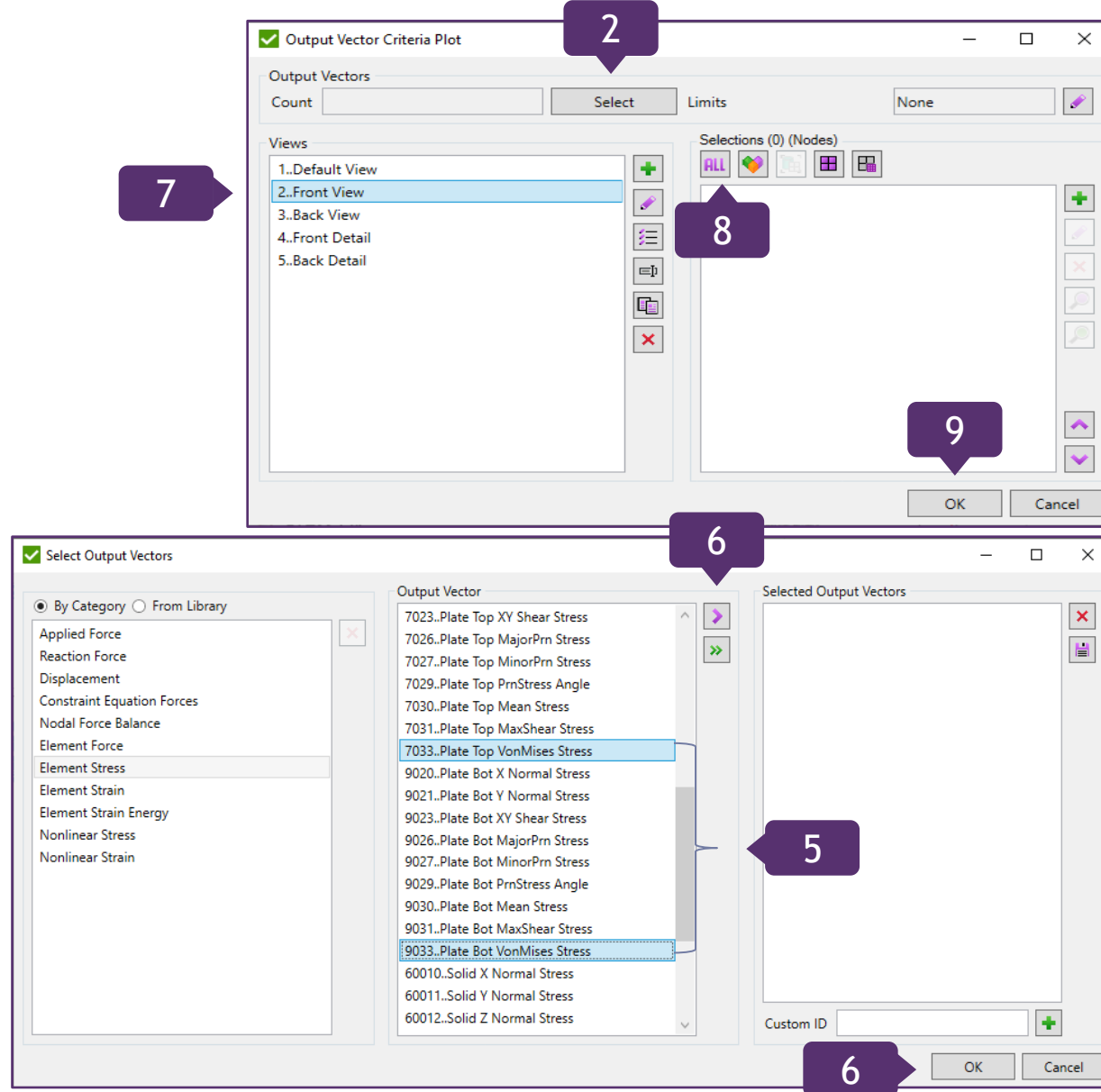


1 Press  to add output criteria plots



Add Output Vector Plots (Continuation)

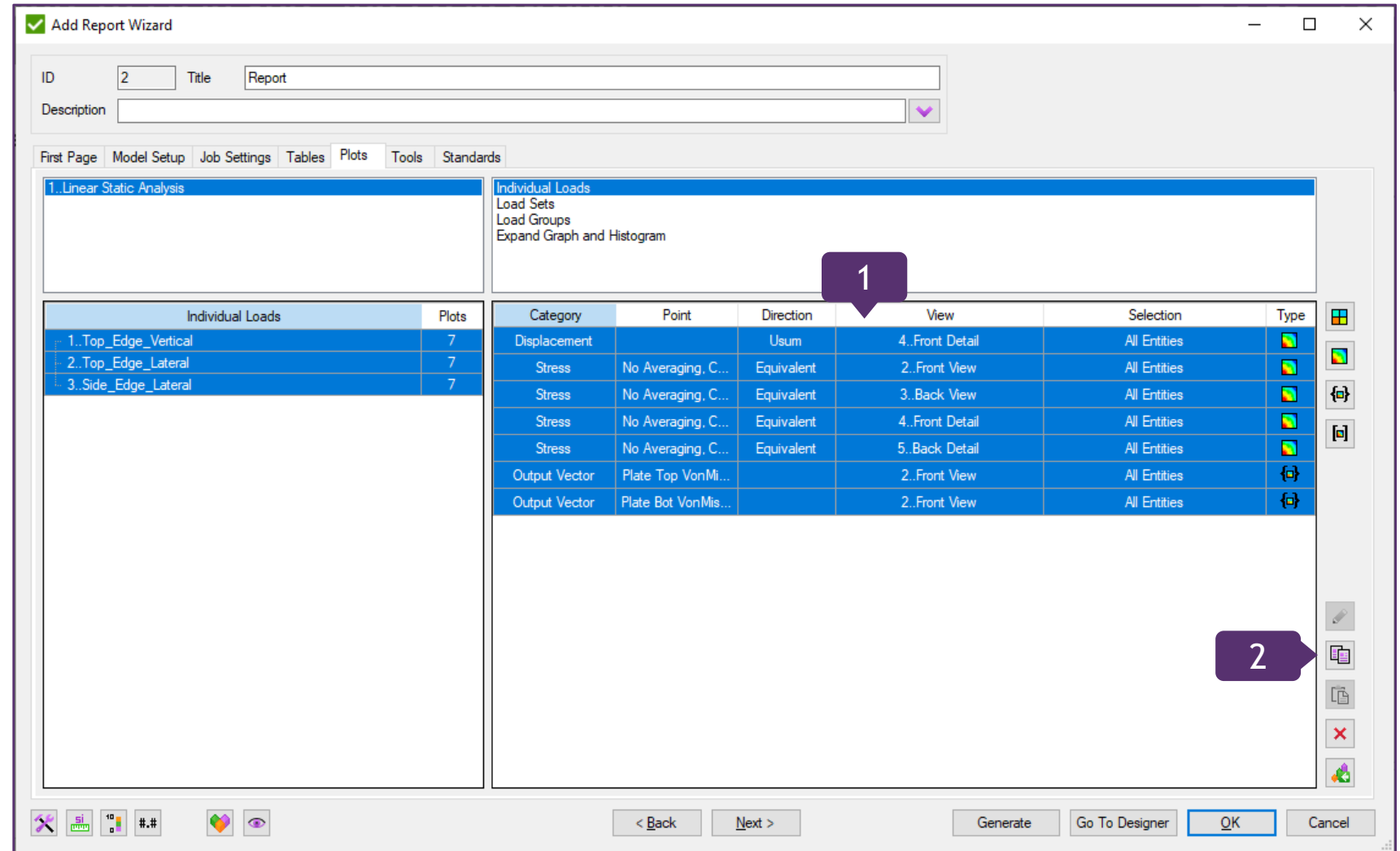
- 2 Press *Select* button
- 3 Select option: *By Category*
- 4 Select: *Element Stress*
- 5 Select Vectors: *7033 and 9033*
- 6 Press  and OK
- 7 Views: *2..Front View*
- 8 Add  Entities
- 9 Press OK



Copy Plots to Load Sets and Load Groups

1 Select all plots from the list

2 Press Copy

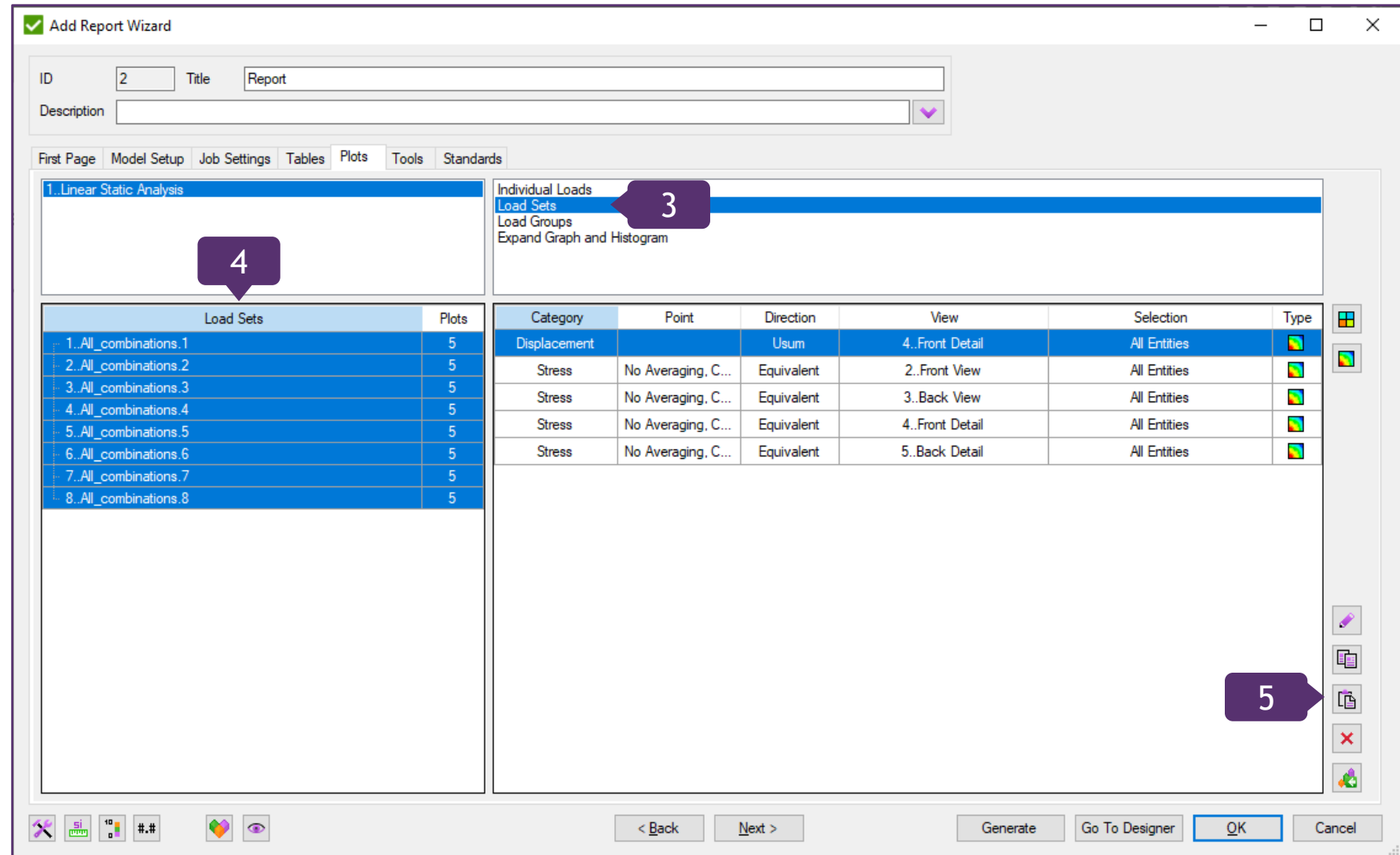


Copy Plots to Load Sets and Load Groups (Continuation)

3 Plot Type: *Load Sets*

4 Select all Load Sets

5 Press  to paste



Copy Plots to Load Sets and Load Groups (Continuation)

6 Plot Type: *Load Groups*

7 Select 3..*Overall* Load Group

8 Press  to paste

☒ Add Report Wizard

ID: 2 Title: Report

Description:

First Page | Model Setup | Job Settings | Tables | **Plots** | Tools | Standards






1..Linear Static Analysis

Individual Loads
Load Sets
Load Groups
Expand Graph and Histogram


6

| Load Groups | Plots |
|-------------------|-------|
| 1..Envelope (IL) | 0 |
| 2..Envelope (LS) | 0 |
| 3..Overall | 5 |

7

| Category | Point | Parameter | Direction | View | Selection | Type |
|--------------|--------------------|-----------|------------|-----------------|--------------|---|
| Displacement | | Absolute | Usum | 4..Front Detail | All Entities |  |
| Stress | No Averaging, C... | Absolute | Equivalent | 2..Front View | All Entities |  |
| Stress | No Averaging, C... | Absolute | Equivalent | 3..Back View | All Entities |  |
| Stress | No Averaging, C... | Absolute | Equivalent | 4..Front Detail | All Entities |  |
| Stress | No Averaging, C... | Absolute | Equivalent | 5..Back Detail | All Entities |  |

8

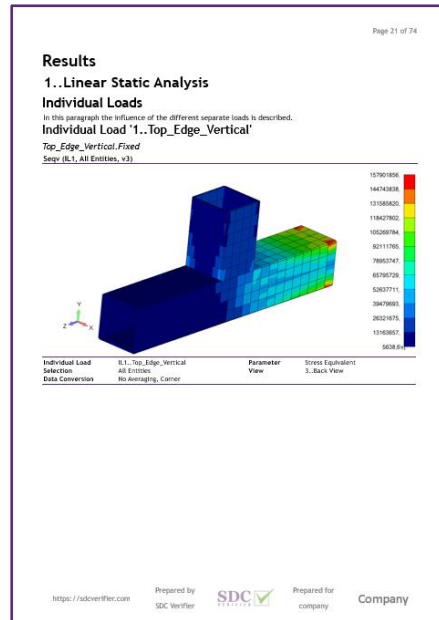
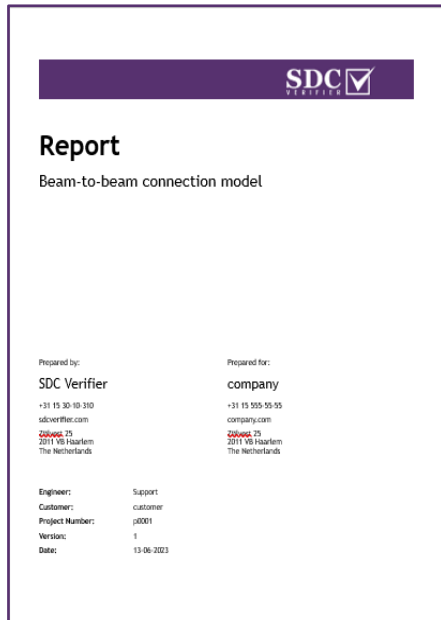


< Back Next > Generate Go To Designer OK Cancel

Result Report Generation

1 Press *Generate*

2 Press *OK*



✓ Add Report Wizard

ID 2 Title Report
Description

First Page Model Setup Job Settings Tables Plots Tools Standards

1..Linear Static Analysis

Individual Loads
Load Sets
Load Groups
Expand Graph and Histogram

| Load Groups | Plots |
|------------------|-------|
| 1..Envelope (IL) | 0 |
| 2..Envelope (LS) | 0 |
| 3..Overall | 5 |

| Category | Point | Parameter | Direction | View | Selection | Type |
|--------------|--------------------|-----------|------------|-----------------|--------------|------|
| Displacement | | Absolute | Usun | 4..Front Detail | All Entities | |
| Stress | No Averaging, C... | Absolute | Equivalent | 2..Front View | All Entities | |
| Stress | No Averaging, C... | Absolute | Equivalent | 3..Back View | All Entities | |
| Stress | No Averaging, C... | Absolute | Equivalent | 4..Front Detail | All Entities | |
| Stress | No Averaging, C... | Absolute | Equivalent | 5..Back Detail | All Entities | |

< Back Next > Generate Go To Designer OK Cancel

1

2

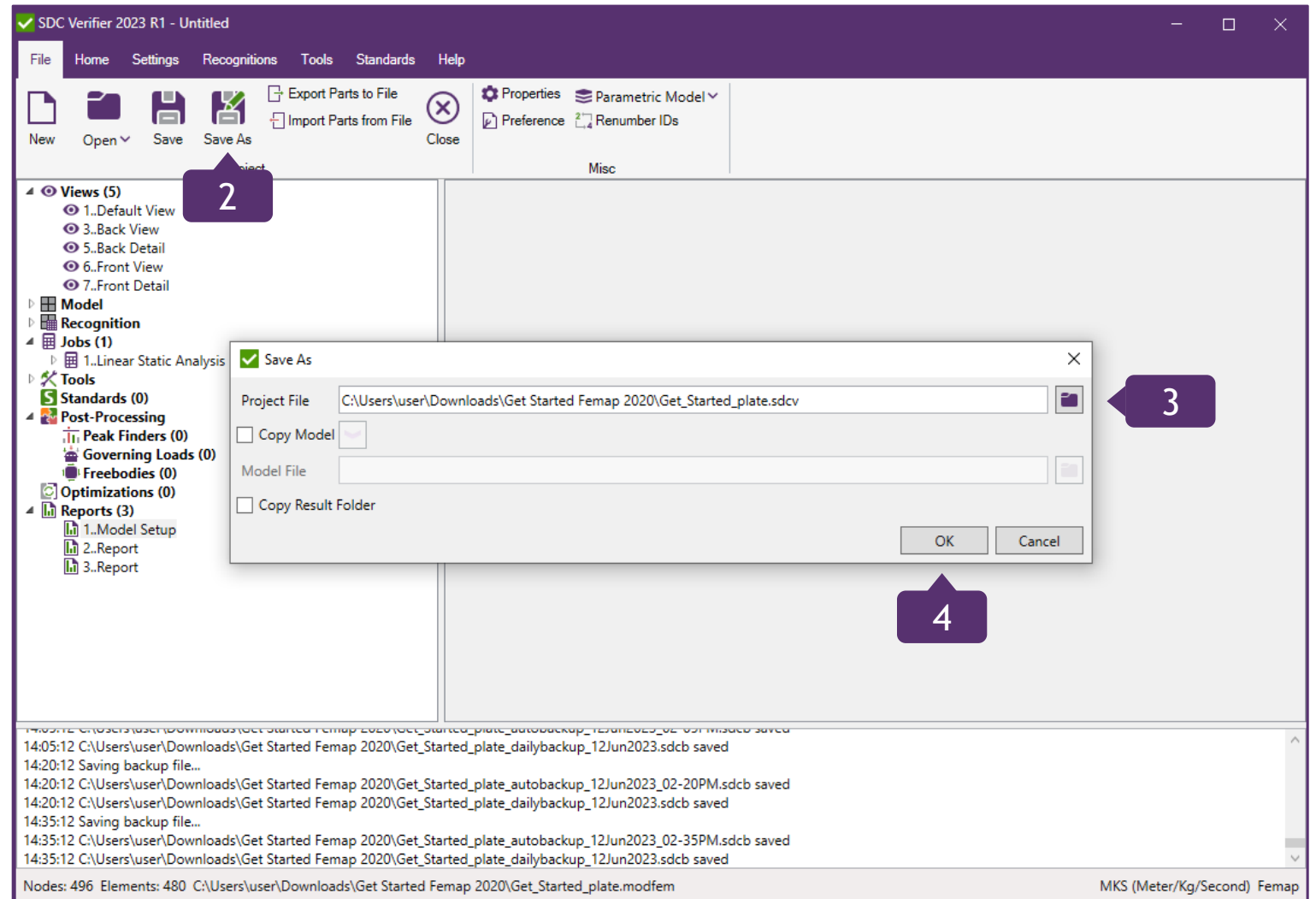
Save SDC Verifier Project

1 Go to *File* section

2 Press  *Save As*

3 Press  to browse location and define the filename

4 Press *OK*



Open As Template feature allows to reuse project for similar Femap model. In our case, a solid model with same boundary conditions

1 Go to *File* section

2 In *Open* folder execute *Open As Template*

3 *Template Project: Get_Started_plate.sdcv*

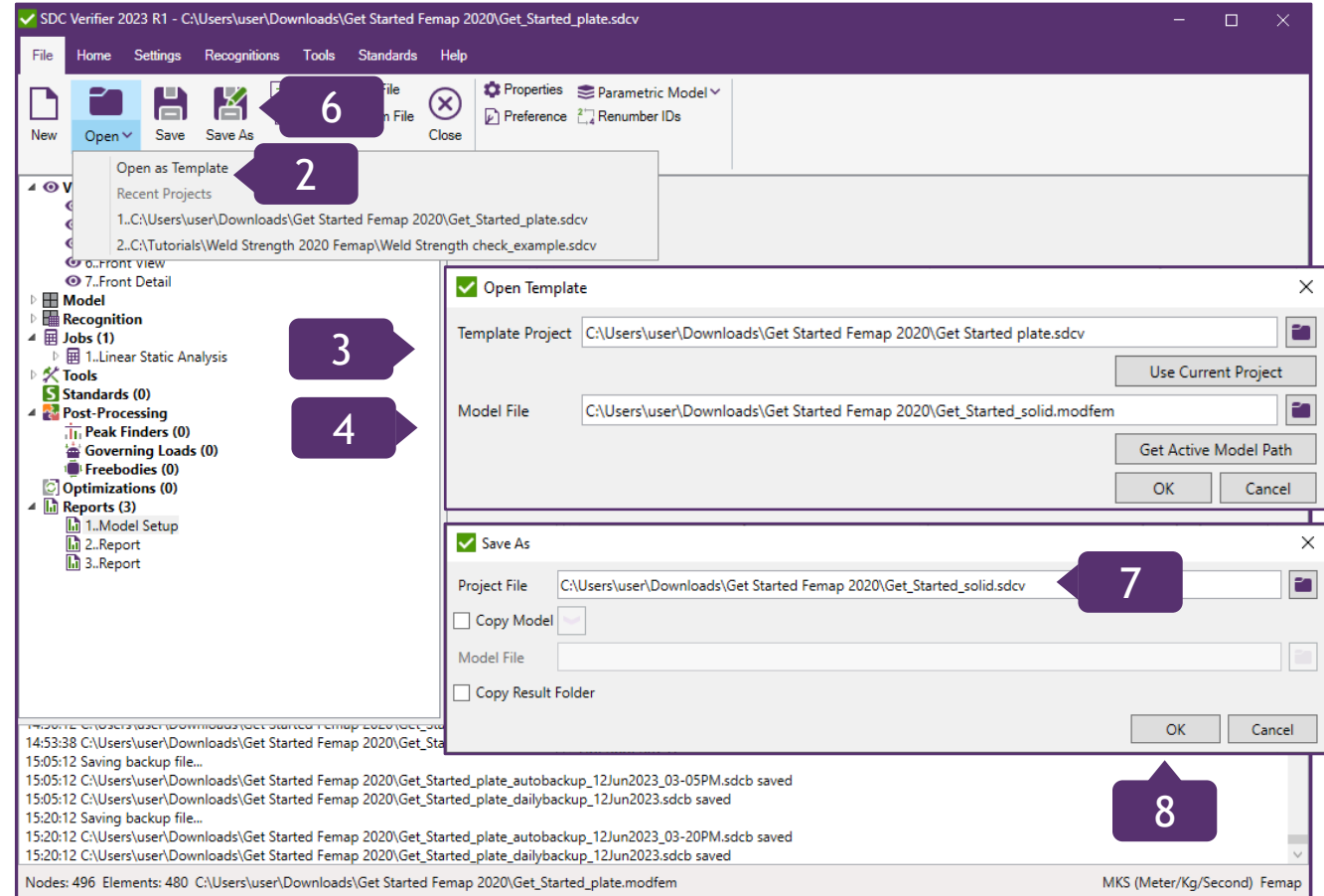
4 *Model File: Get_Started_solid.modfem*

5 Press *OK*


6 In *File* section, execute *Save As*

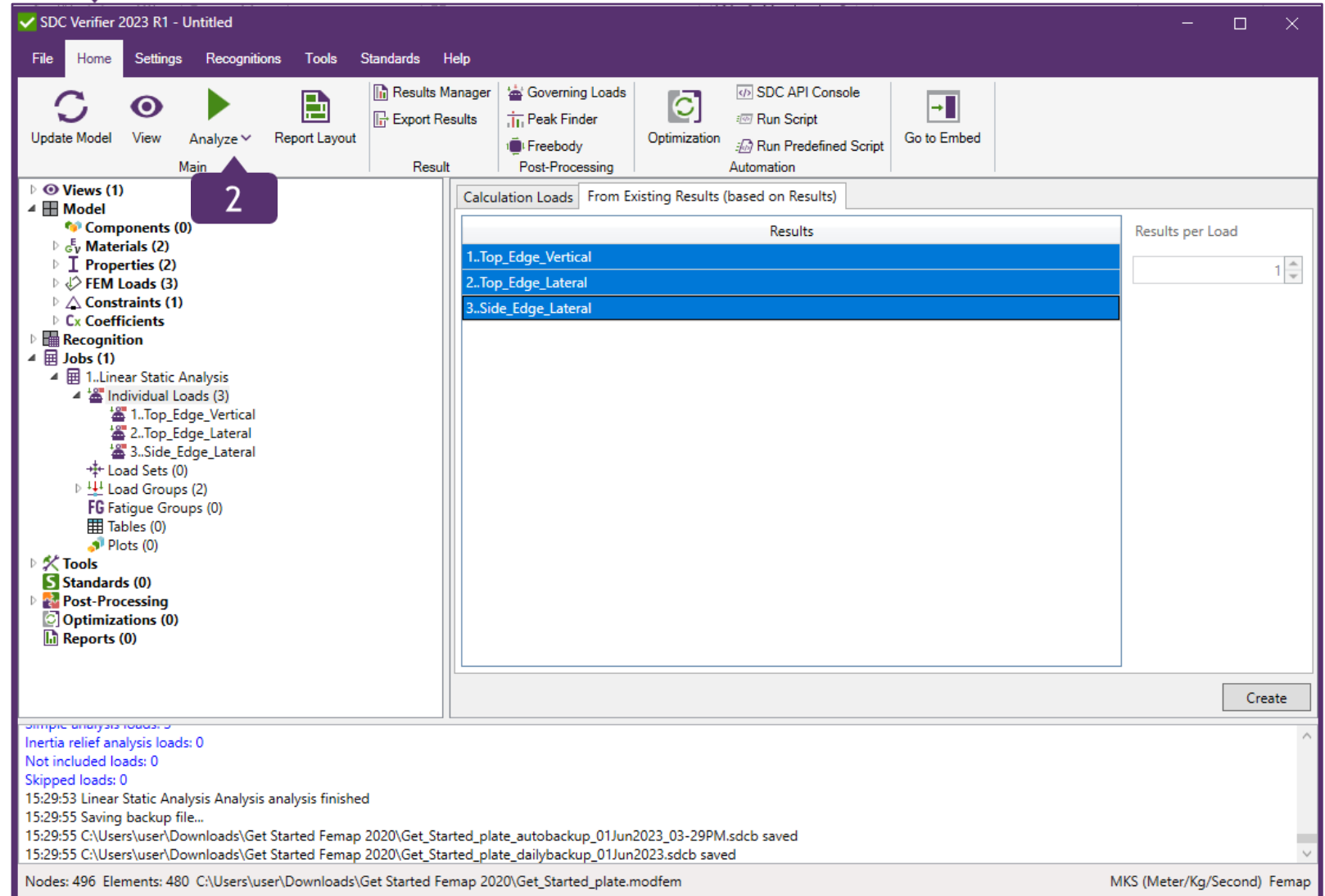
7 *Project File: Get_Started_solid.sdcv*

8 Press *OK*



Analyze Job

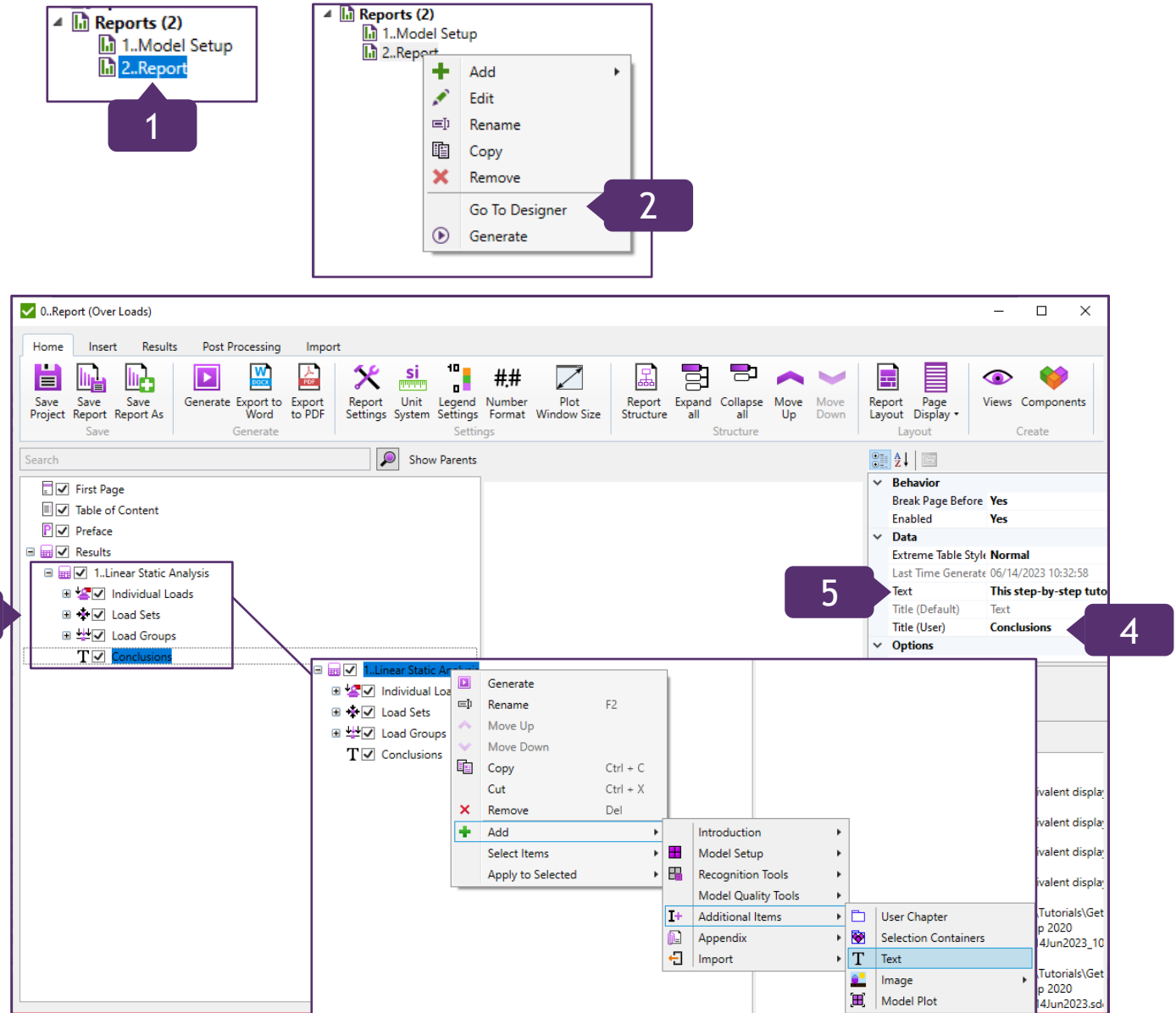
- 1 Go to *Home* section on the Ribbon
- 2 Press  on the toolbar to analyze job.



Generate a Report for a Solid Model

- 1 Select 2..Report in the *Model* tree
- 2 Execute *Go To Designer* from the context menu
- 3 Expand Linear Static Analysis => Add => Additional Items => Text
- 4 Title (User): Conclusions
- 5 Text: This step-by-step tutorial is designed to *get* you *started* with the main SDC Verifier features

Report Wizard guides you through the steps of building and running the report. Whereas the Report Designer gives added ability to design your own reports.



Generate a Report for a Solid Model

1

Expand Individual Loads => Expand Individual Load 1..Top_Edge_Vertical

2

Select Plate Top VonMises Stress and Plate Bot VonMises Stress plots

3

Remove selected plots

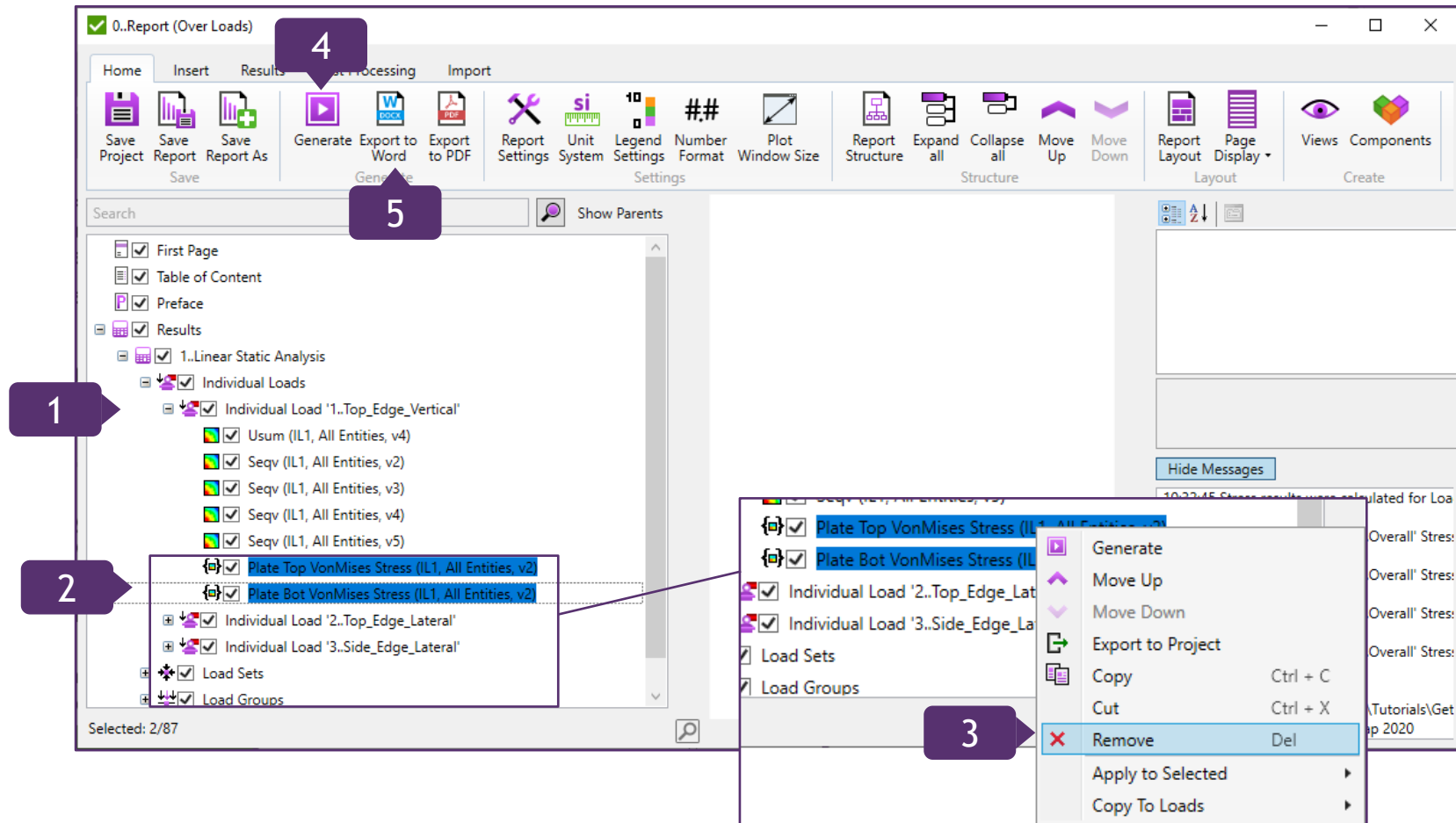
4

Press  to generate report

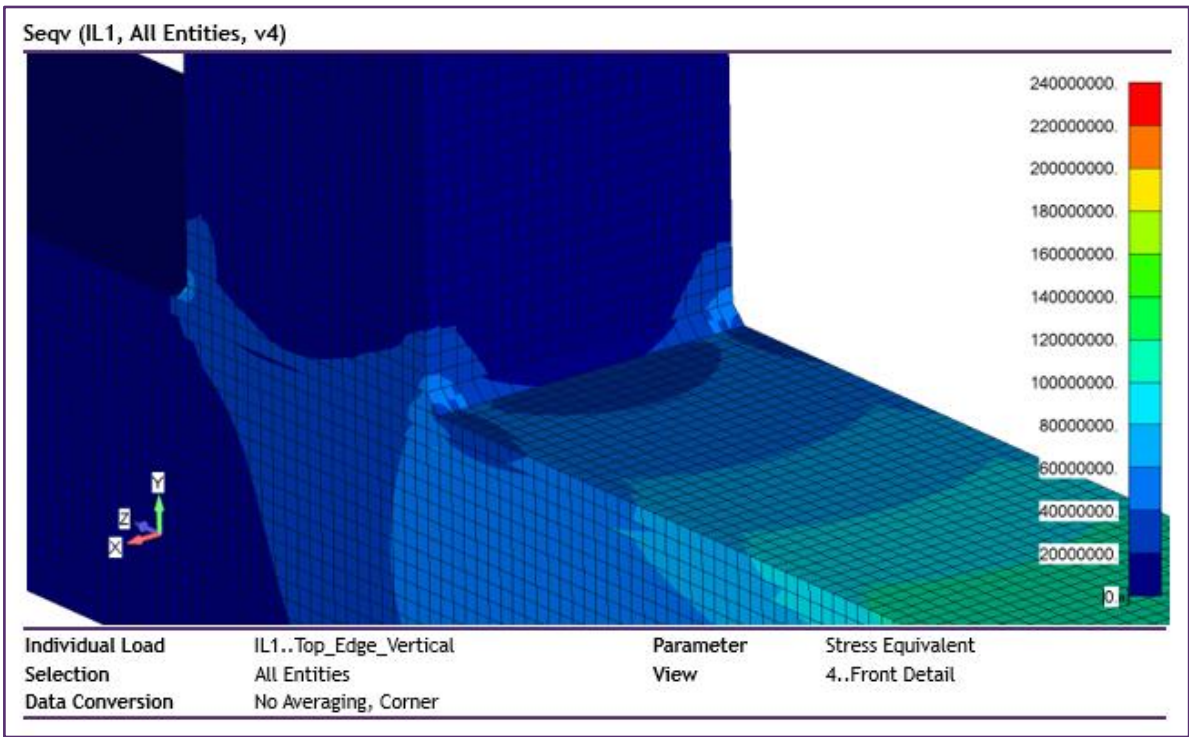
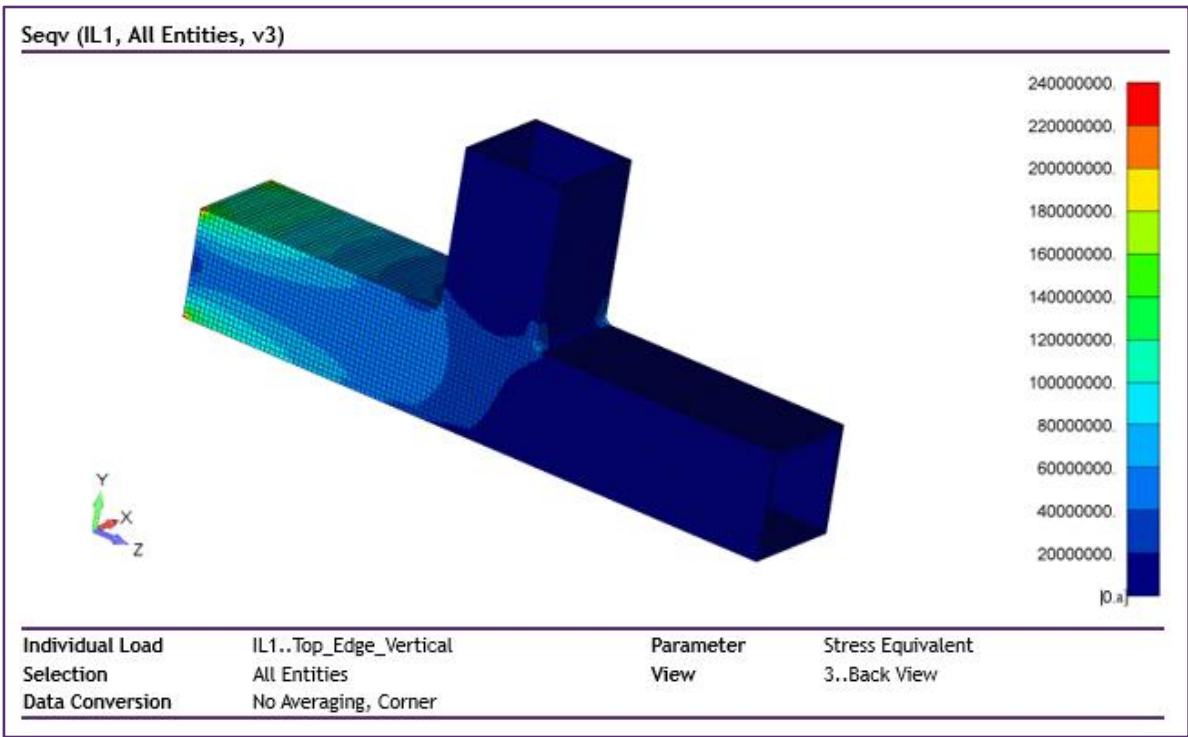
5

After generation is finished press  to export generated report to Word

Remove Output Vector Plots that were created for plate model, as they do not exist for the solid model.

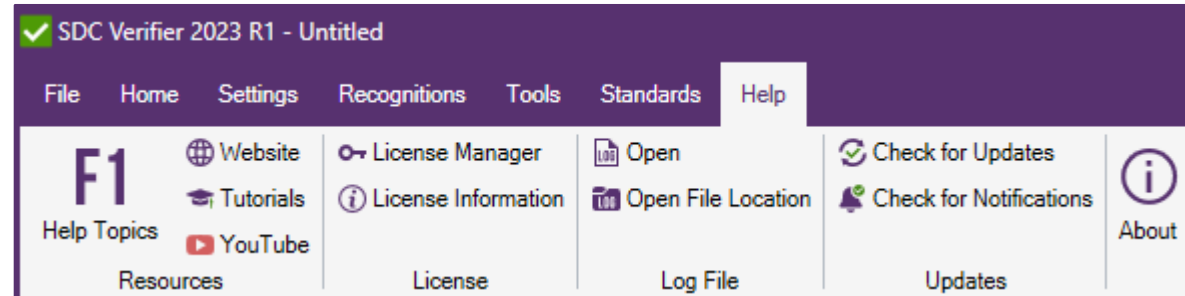


Equivalent Stress plots are automatically displayed for solid model.



1

On the Ribbon, go to *Help* section, where informational resources, tutorials, License Information, Checks for Updates etc. can be found.



In order to clarify any queries or resolve issues that might arise throughout SDC Verifier usage, customers can contact our Support Team by the following communication channels:

Skype: sdcverifier_helpdesk;
phone: +31 15 30-10-310;
email: support@sdcverifier.com

Additionally, if the screen demonstration is required, we offer a possibility to schedule a Teams meeting call with our Engineering or Development Team. In this case, we will need the customer's email address to agree on the date and time, and send the customer a meeting invitation.