



# Tutorial

## **Get Started Tutorial**

**ANSYS<sup>®</sup>**

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

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

- ▶ Launch SDC Verifier;
- ▶ Creating new project;
- ▶ Create Combinations and Envelope;
- ▶ Define Views;
- ▶ Model Setup report;
- ▶ Calculation report;

# Launch SDC Verifier

1

Open in Ansys Workbench  
GetStarted.wbpz

2

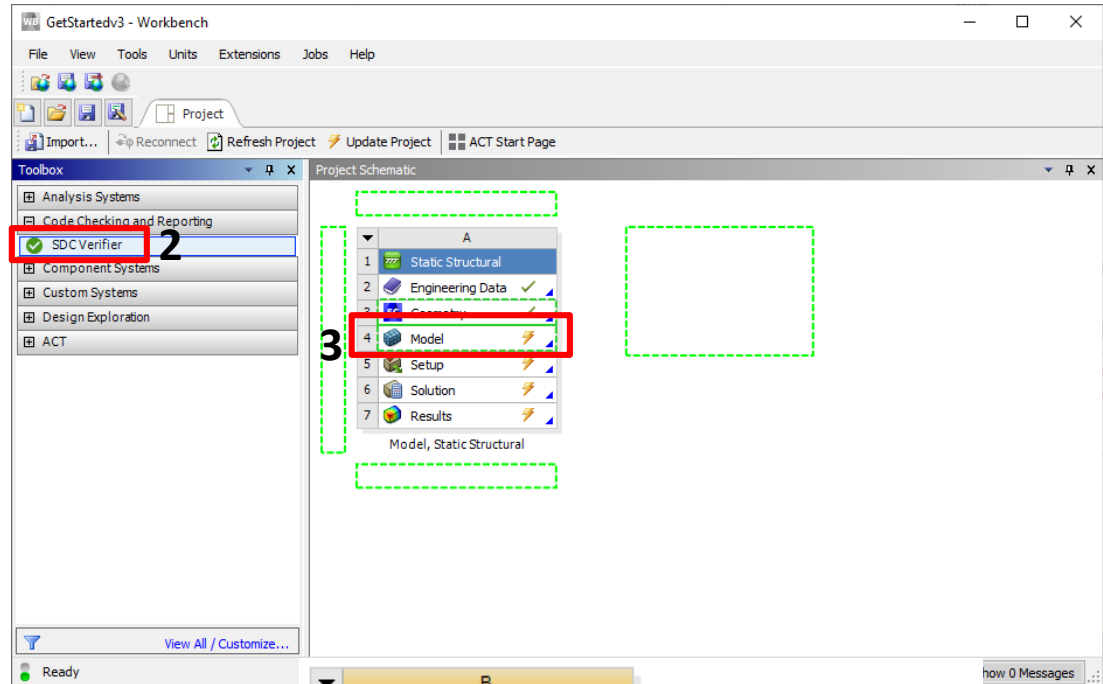
Drag **SDC Verifier** from Toolbox **Code Checking and Reporting** category

3

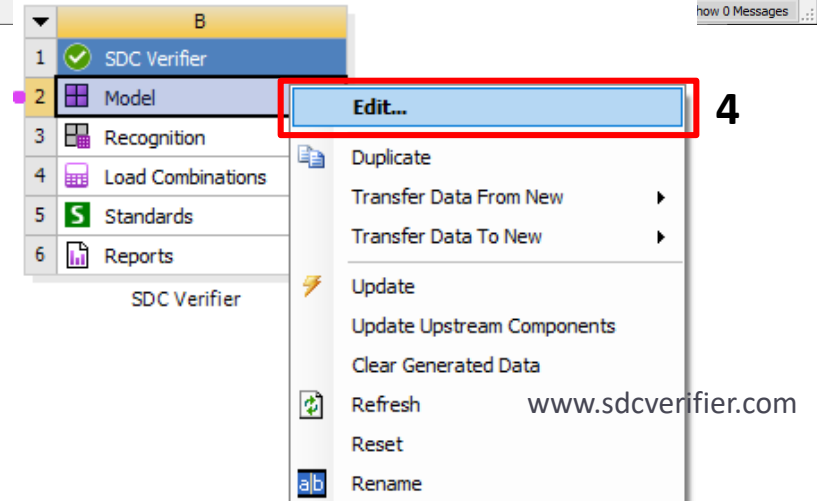
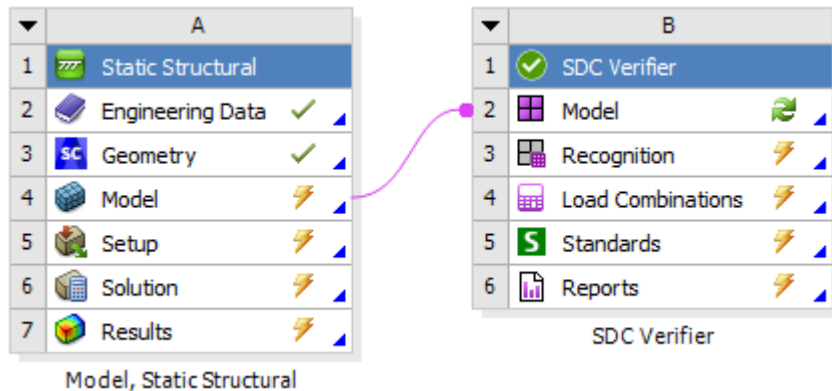
Drop on **Model** Task of **Static Structural** Task Group.

4

Double Click on **Model** or in context menu click **Edit**



After step 3 Project Schematic:



www.sdcverifier.com

# Create new project

1

Number: **p0001**

2

Name: **Beam-to-beam connection model**

3

Press *Next*

Project Wizard

## Project Details

General project information with an engineer and a customer details can be filled in and used on the first page of the report

Project Details


Jobs

Load Sets

Load Groups

Report Wizard

Select Model File

Model file Path  


Project Details


Number  Name

Description

Unit System


Engineer details

Engineer  



Company  

E-mail


Phone


Address  

Website

Logo   


Customer details

Customer  



Company  

E-mail

Phone

Address  

Website

Logo   

☒ Show on startup

# Create new project

1

Press *Next*

Project Wizard

## Jobs

Job – a link to the Ansys Mechanical analysis. Select analysis to import:

Project Details  
Jobs  
Load Sets  
Load Groups  
Report Wizard

☒ Static Structural

☒ Show on startup

Previous **Next** 2 Finish

**Job** – the calculation set that contains loads and their combinations to be calculated with the defined calculation options. Job creation is based on analysis from Ansys Mechanical.

**Individual load** is a step result.

**Load set** is individual loads combination with factors.

**Load Groups** (envelope) – worst results among loads.

# Job explanation

**Individual Loads** – each load will be created automatically from steps in Ansys Mechanical. In our case 3 Individual loads. Load sets are individual loads with factors.

The screenshot displays the Ansys Mechanical interface with the following components:

- Static Structural (A5) Tree:** Shows Analysis Settings, Fixed Support, Force, and Force 2.
- Details of "Analysis Settings":**

Step Controls	
Number Of Steps	3.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
- Jobs (1) Tree:** Shows 1..Static Structural, Individual Loads (3), Load Sets (8), Load Groups (1), Fatigue Groups (0), Tables (0), and Plots (0).
- Edit Load Set Dialog:**
  - ID: 3, Title: All\_combinations 3, Safety Factor: 1
  - Description: (empty)
  - Loads Table:

Loads	Factor 1
1..Force - Step #1 (1)	1
2..Force - Step #2 (2)	-1
3..Force 2 - Step #3 (3)	1.1
  - Buttons: Clear Results, Factor 1, Set To Selected, Apply

# Create load combinations

- 1 Open load sets excel file from tutorial folder and copy data to clipboard.
- 2 Press **From Clipboard** to add load sets copied from excel
- 3 Press *Next*

**Project Wizard**

## Load Sets

Load set is a summation of individual loads (different analysis steps) multiplied on factors;

Project Details

Jobs

Load Sets

Load Groups

Report Wizard

	Safety Factor	IL1..Force - Step #1 (1)	IL2..Force - Step #2 (2)	IL3..Force 2 - Step #3 (3)
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

Set

Set Diagonally

Clean Selected

Clipboard

Copy

Paste

Selected Rows

Copy

Remove

☒ Show on startup

Previous **Next** Finish

	A	B	C	D	E
1		Safety Factor	IL1..Static Structural - step #1	IL2..Static Structural - step #2	IL3..Static Structural - step #3
2	All_combinations 1	1	1	1	1.1
3	All_combinations 2	1	-1	1	1.1
4	All_combinations 3	1	1	-1	1.1
5	All_combinations 4	1	-1	-1	1.1
6	All_combinations 5	1	1	1	-1.1
7	All_combinations 6	1	-1	1	-1.1
8	All_combinations 7	1	1	-1	-1.1
9	All_combinations 8	1	-1	-1	-1.1


Factor – set factor to selected cells

Clipboard – copy/paste data from/to clipboard

Selected rows – copy (default title and factors) and remove selected load sets in the list

# Create Load Group (Envelope)

1

Press 

2

Title (first column): **Overall**

3


Select all cells in the second row except title column

4

Press *Include*

5

Press *Finish*

 Project Wizard

### Load Groups

Load Group (or result envelope) can be created using individual loads, load sets or other load groups and find the worst extreme values over its items on the model. Using load groups together with a governing load tool it is easy to determine the worst loads or load combinations and save time by focusing the analysis of the structure only on them.

Project Details

Jobs

Load Sets

Load Groups

Report Wizard


	IL1_Force - Step #1 (1)	IL2_Force - Step #2 (2)	IL3_Force 2 - Step #3 (3)	LS1_All_combinations 1	LS2_All_combinations 2	LS3_All_combinations 3	LS4_All_combinations 4	LS5_All_combinations 5	LS6_All_combinations 6	LS7_All_combinations 7	LS8_All_combinations 8	Load Group 1
Safety Factor	1	1	1	1	1	1	1	1	1	1	1	
Overall												

2

3

4

Add load Groups

Count 1 

From Clipboard

Safety Factor

1 Set

Selected Cells

Include

Exclude

Include Diagonally

Clipboard

Copy Paste


Copy with Title

Selected Rows

Copy Remove

☒ Show on startup

Previous Next

5 

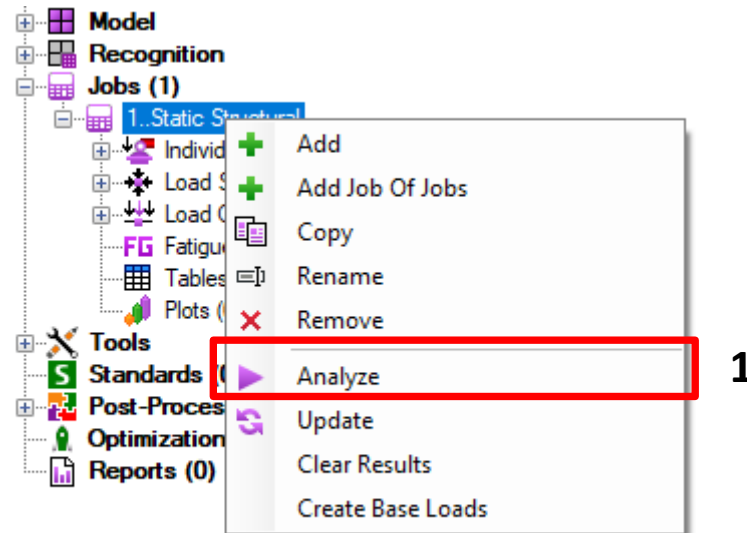
Load Group is an envelope for Individual Loads, Load Sets, and other Load Groups. It allows to determine minimum, maximum and absolute values of stresses, displacements, forces, etc.



# Analyze Job

1

Execute Analyze from Job “**Static Analysis**” context menu



# Create 2 general Views for plots

1 Locate Model in Ansys Mechanical as shown on pic. Front View.

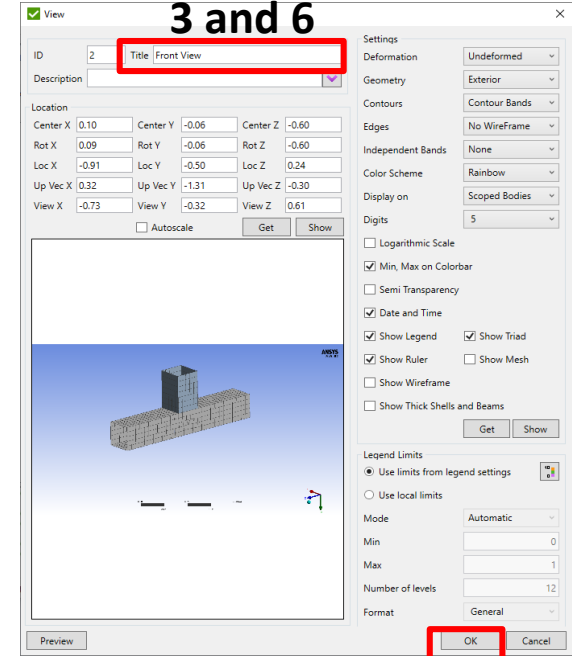
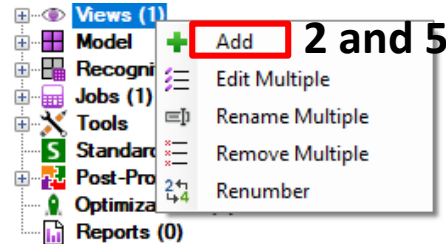
2 From View context menu execute – Add

3 Title: **Front View**. Press **OK**.

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

5 From View context menu execute – Add

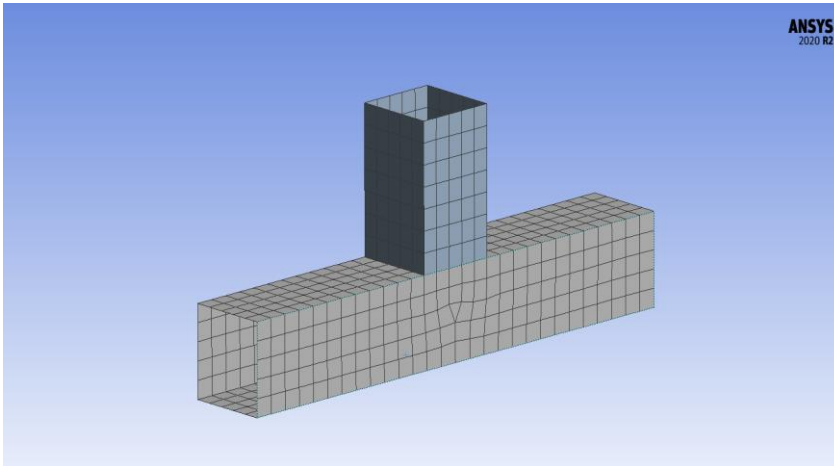
6 Title: **Back View**. Press **OK**.



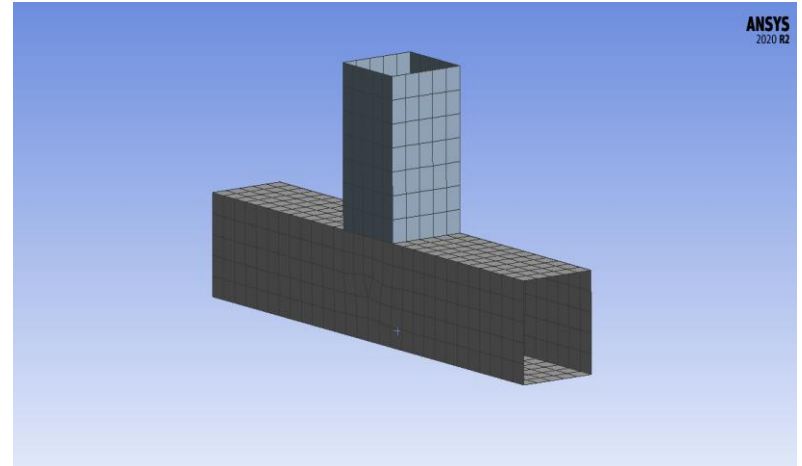
Front View

Back View

1



4



# Create 2 detailed Views

1 Locate Model in Ansys Mechanical as shown on pic. Front Detail.

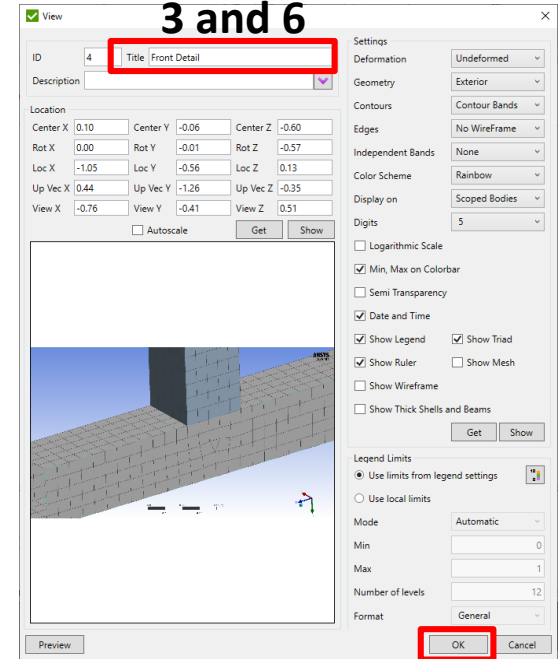
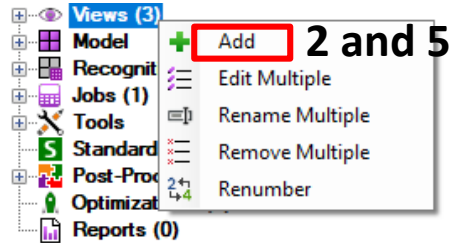
2 From View context menu execute – Add

3 Title: **Front Detail**. Press *Get and OK*.

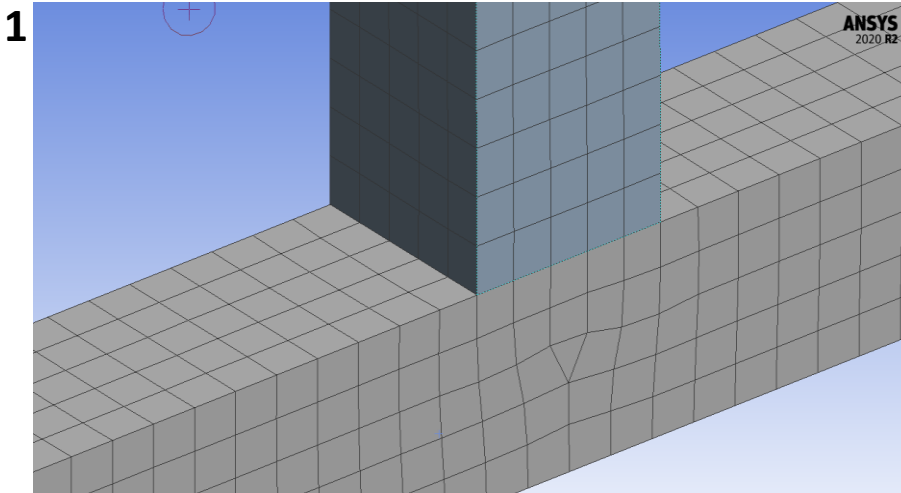
4 Locate the Model in Ansys Mechanical as shown on pic. Back Detail.

5 From View context menu execute – Add

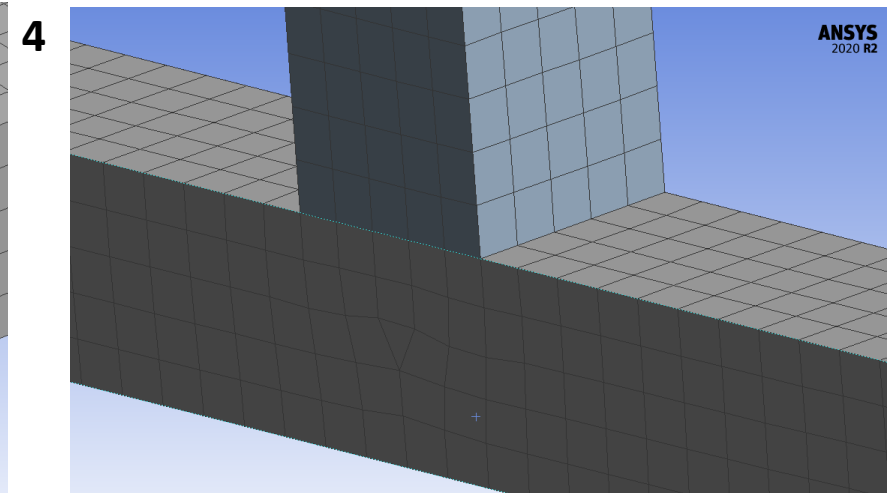
6 Title: **Back Detail**. Press *Get and OK*.



Front Detail



Back Detail




# Report Wizard – Model Setup report

1

Execute *Add -> Wizard - Model Setup* from *Reports* in the *Model* tree.

2

Press  and select *Support Engineer* from the library

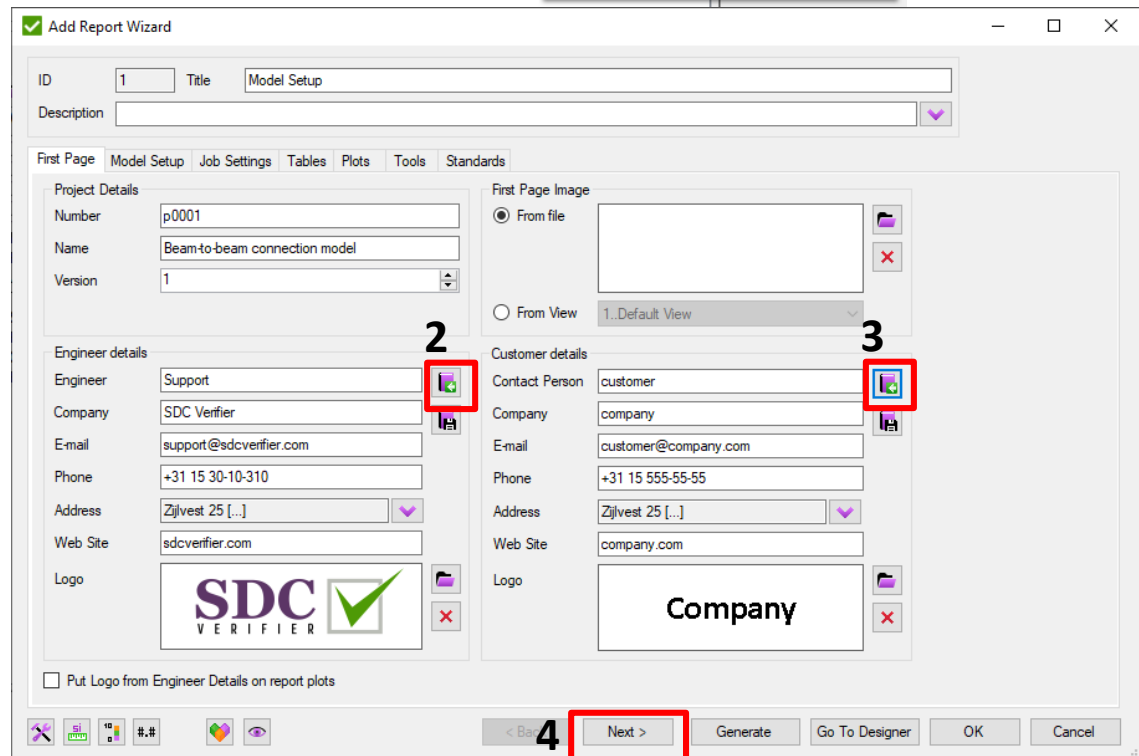
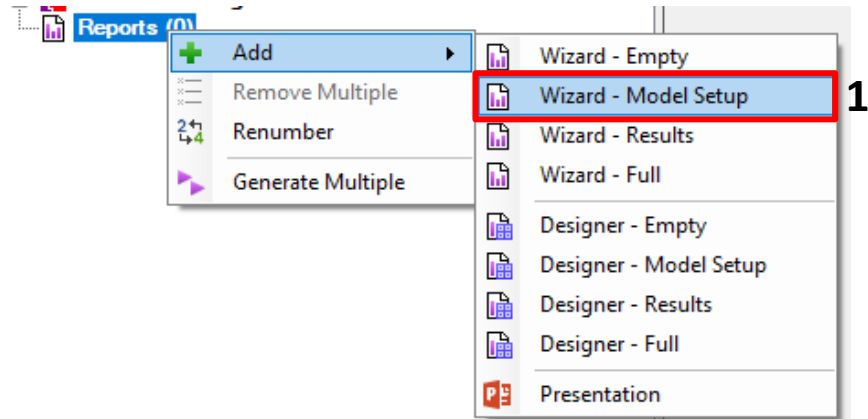
3

Press  and select *Customer* from the library

4

Press *Next*

An engineer and a customer information is used on the report's first page and in footer (company name and logo).



The screenshot shows the 'Add Report Wizard' dialog box with the 'Model Setup' tab selected. The dialog contains fields for Project Details, Engineer details, and Customer details. The 'Engineer' field is set to 'Support' and the 'Customer' field is set to 'customer'. The 'Next >' button is highlighted with a red box and the number '4'. The 'Put Logo from Engineer Details on report plots' checkbox is unchecked.

1

2

3

4

# Model Setup options

1

Press *Generate*.

**Add Report Wizard**

ID: 1 Title: Model Setup

Description:

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

☒ Preface  
☒ Model Information

Full Model Description

☒ Include

☒ Materials (1/1) ☒ Plot Full (detailed for each material)  
☒ Properties (2/2) ☒ Plot Full (detailed for each property)  
☒ Components (0/0) ☒ Plot

Recognition Tools

☐ Include

☐ Beam Member Finder Brief (overview table and plot)  
☐ Weld Finder Brief (overview table and plot)  
☐ Panel Finder

☒ Sections X (0/0) 1..Default View  
☒ Sections Y (0/0) 1..Default View  
☒ Sections Z (0/0) 1..Default View  
☒ Sections Custom (0/0) 1..Default View

Preview Mode: Highlight

Include Plots Exclude Plots  
All None

< Back Next > **1 Generate** Go To Designer OK Cancel

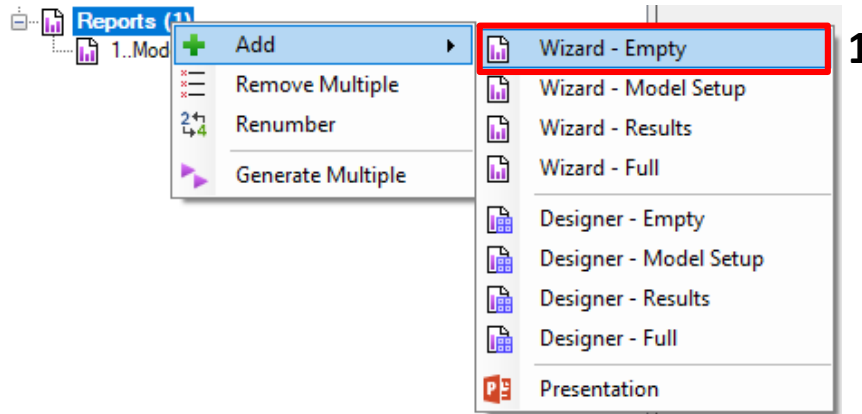
Model setup report has been generated and opened in MS Word.

Using the *Report Designer* you can customize report structure and generate items separately.

# Create calculation report

1 Execute Add -> Wizard - Empty on Reports in the Model tree.

2 Press Next twice



The screenshot shows the 'Add Report Wizard' dialog box. The 'First Page' tab is selected. The 'ID' field contains '2' and the 'Title' field contains 'Report'. The 'Description' field is empty. The 'Project Details' section contains: Number 'p0001', Name 'Beam-to-beam connection model', and Version '1'. The 'Engineer details' section contains: Engineer 'Support', Company 'SDC Verifier', Email 'support@sdcoverifier.com', Phone '+31 15 30-10-310', Address 'Zijlvest 25 [...]', Web Site 'sdcoverifier.com', and a logo of SDC Verifier. The 'First Page Image' section has 'From file' selected. The 'Customer details' section contains: Contact Person 'customer', Company 'company', Email 'customer@company.com', Phone '+31 15 555-55-55', Address 'Zijlvest 25 [...]', Web Site 'company.com', and a logo of 'Company'. At the bottom, the 'Next >' button is highlighted with a red rectangle. A large number '2' is placed to the left of the 'Next >' button.

# Predefined Job Tables

1

Jobs: **ON**

2

Include Sum of Forces: **ON**

3

Press *Next*

**Add Report Wizard**

ID: 2 Title: Report Description:

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

1 ☒ Include Jobs

1..Static Structural

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

2 ☒ Include Sum of Forces

Advanced Tables (Overall)

- ☐ Individual Loads Applied Forces
- ☒ Individual Loads Reaction Forces
- ☐ Load Sets Applied Forces
- ☒ Load Sets Reaction Forces
- ☐ Absolute Maximum Displacement
  - ☐ Individual Load
  - ☐ Load Set
  - ☐ Load Group
- ☐ Absolute Maximum Strain
  - ☐ 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
  - ☐ Individual Load
  - ☐ Load Set
  - ☐ Load Group
- ☐ Stress Over All Components
  - ☐ Individual Load
  - ☐ Load Set
  - ☐ Load Group

☐ Automatically sort tables and plots by result category

3 < Back **Next >** Generate Go To Designer OK Cancel

# Add tables

1 Click on *Tables* in the Navigation list.

2 Table Type: Load Groups.

3 Press  to add tables.

4 *Table Type* – **Extreme**;

5 *Categories*: **Stress, Displacement**;

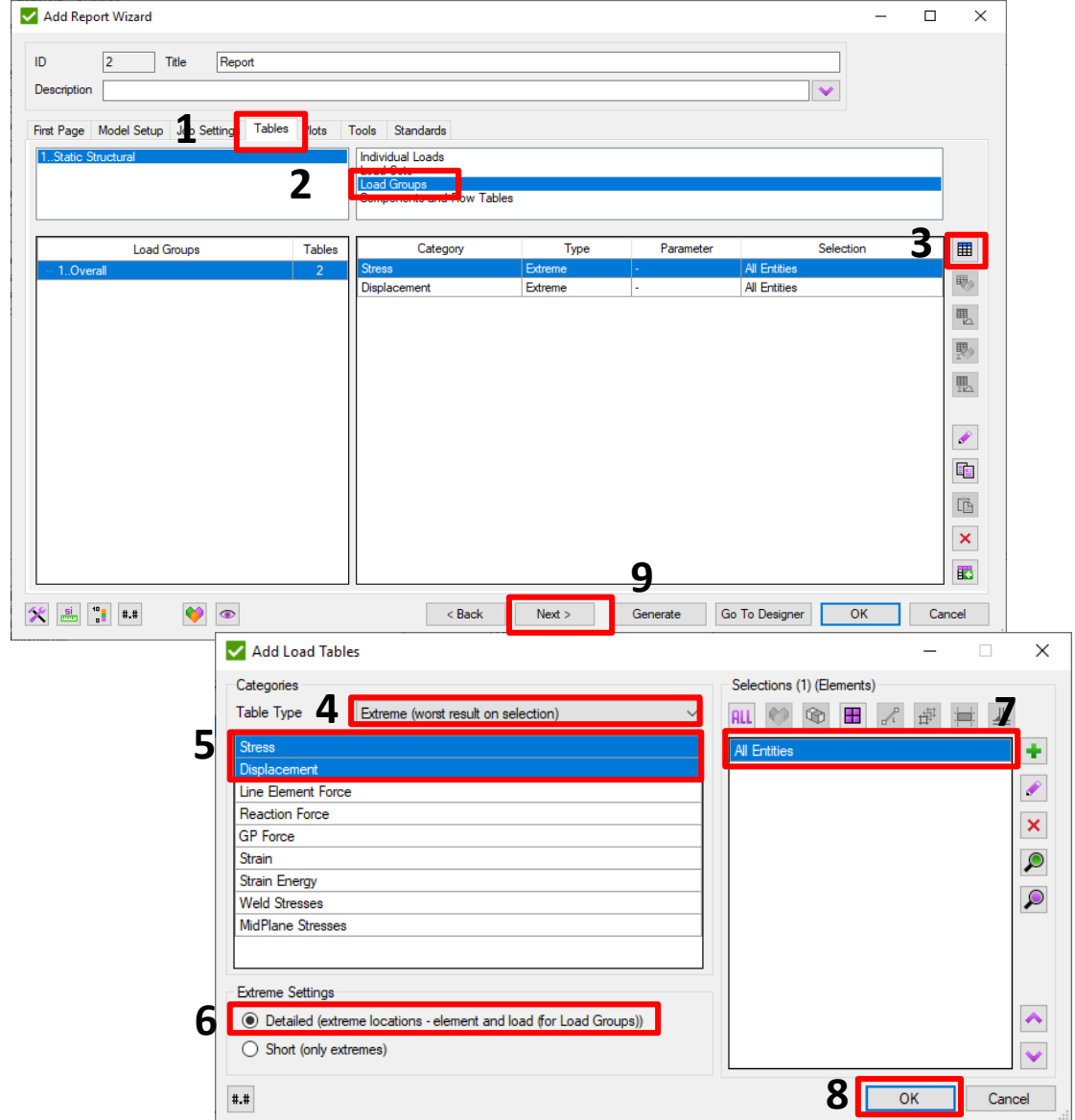
6 *Extreme settings*: **Detailed**;

7 *Selection*: **All Entities**;

8 Press **OK**.

9 Press **Next**.

In **Advanced Table Type** it is possible to create tables on multiple loads or selections (e.g. extreme table over all loads)



The image shows two screenshots from the SDC Verifier software. The top screenshot is the 'Add Report Wizard' dialog, and the bottom screenshot is the 'Add Load Tables' dialog. Both are annotated with numbers 1 through 9.

**Add Report Wizard:**

- 1: 'Tables' tab in the wizard.
- 2: 'Load Groups' table type selected in the list.
- 3: 'Add Table' button (grid icon) on the right.
- 9: 'Next >' button at the bottom.

**Add Load Tables:**

- 4: 'Extreme (worst result on selection)' table type.
- 5: 'Stress' and 'Displacement' categories selected in the list.
- 6: 'Detailed (extreme locations - element and load (for Load Groups))' extreme setting.
- 7: 'All Entities' selection.
- 8: 'OK' button.

Load Groups	Tables
1. Overall	2


Category	Type	Parameter	Selection
Stress	Extreme	-	All Entities
Displacement	Extreme	-	All Entities



# Add displacement plots

1 Click on *Plots* in the Navigation list.

2 Select All Loads from the list.

3 Press  to add contour plot.

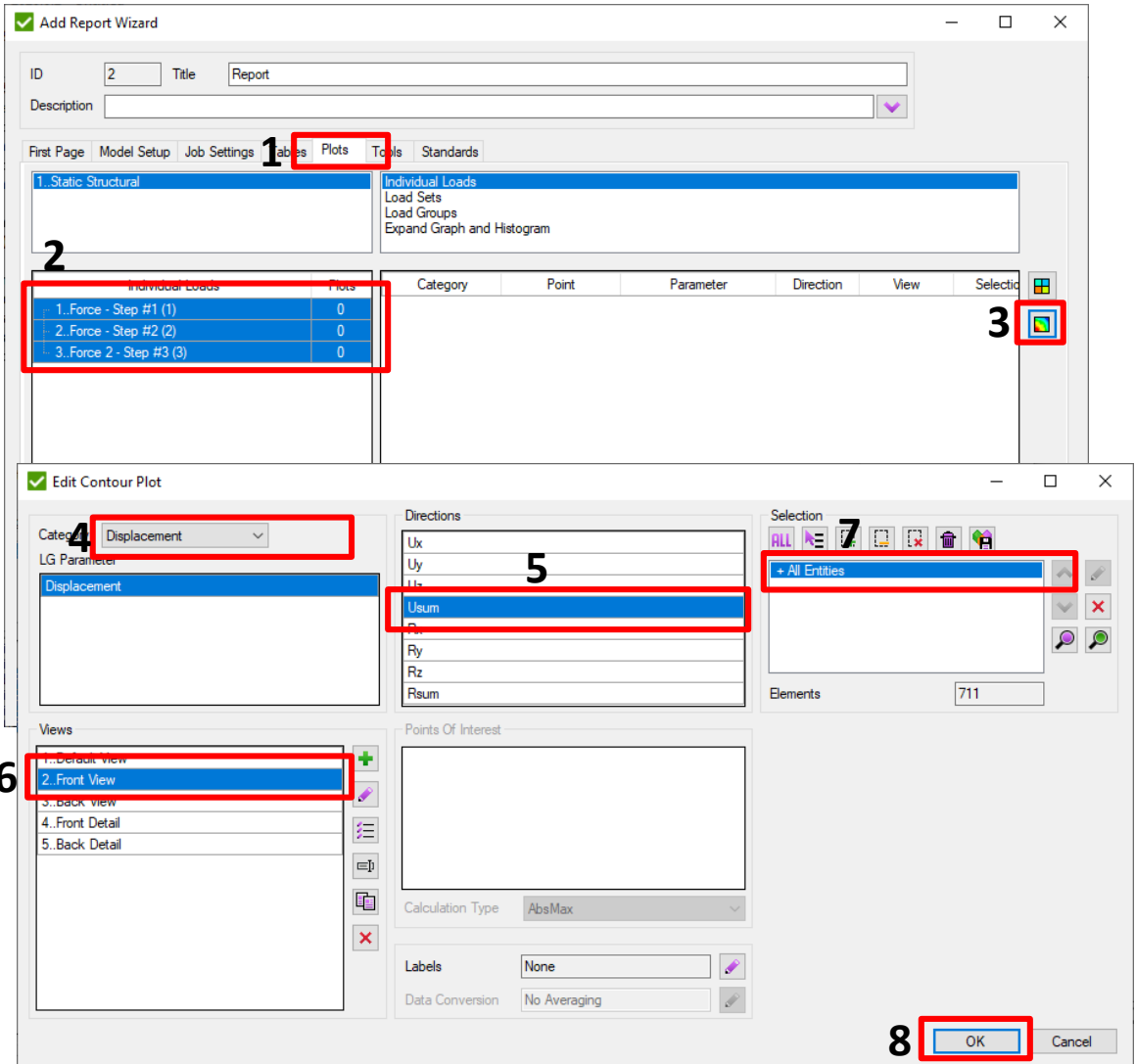
4 *Category: Displacement*

5 *Direction: Usum*

6 *Views: Front Detail*

7 *Selection: All Entities*

8 Press OK.



The screenshot displays two overlapping dialog boxes in the SDC Verifier software. The top dialog is the 'Add Report Wizard' and the bottom is the 'Edit Contour Plot' dialog. Numbered red boxes and arrows indicate the following steps:

- Click on *Plots* in the Navigation list.
- Select All Loads from the list.
- Press the Contour Plot icon to add contour plot.
- Category: **Displacement**
- Direction: **Usum**
- Views: **Front Detail**
- Selection: **All Entities**
- Press OK.

**Add Report Wizard Details:**

- ID: 2, Title: Report
- Description: [Empty]
- Navigation: First Page, Model Setup, Job Settings, **Plots** (Step 1), Tools, Standards
- Left List: 1. Static Structural (Step 2)
- Right List: Individual Loads, Load Sets, Load Groups, Expand Graph and Histogram
- Table:


Individual Loads	Plots
1. Force - Step #1 (1)	0
2. Force - Step #2 (2)	0
3. Force 2 - Step #3 (3)	0

**Edit Contour Plot Details:**

- Category: **Displacement** (Step 4)
- LG Parameter: Displacement
- Directions: Ux, Uy, Uz, **Usum** (Step 5), Rx, Ry, Rz, Rsum
- Selection: **+ All Entities** (Step 7)
- Elements: 711
- Views: 1. Default view, **2. Front View** (Step 6), 3. Back view, 4. Front Detail, 5. Back Detail
- Points Of Interest: [Empty]
- Calculation Type: AbsMax
- Labels: None
- Data Conversion: No Averaging
- Buttons: OK (Step 8), Cancel

# Add stress plots

1 Select All Loads from the list.

2 Press  to add criteria plots.

3 *Category:* **Stress**


4 *Direction:* **Equivalent**.

5 Select 4 Views: ID from 2 to 5

6 *Selection:* **All Entities**

7 Press *OK*.

**Add Report Wizard**

ID: 2 Title: Report Description: 

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

1..Static Structural Individual Loads  
Load Sets  
Load Groups  
Expand Graph and Histogram

Category	Point	Parameter	Direction	View	Select
1..Force - Step #1 (1)	0				
2..Force - Step #2 (2)	0				
3..Force 2 - Step #3 (3)	0				

**Add Criteria Plot**

Category: Stress LG Parameter: Stress

Directions: X Y Z XY YZ ZX


4 Equivalent

Views: 1..Default View 2..Front View 3..Back View 4..Front Detail 5..Back Detail

Points Of Interest: End I / Top End J / Bottom Total




Calculation Type: AbsMax

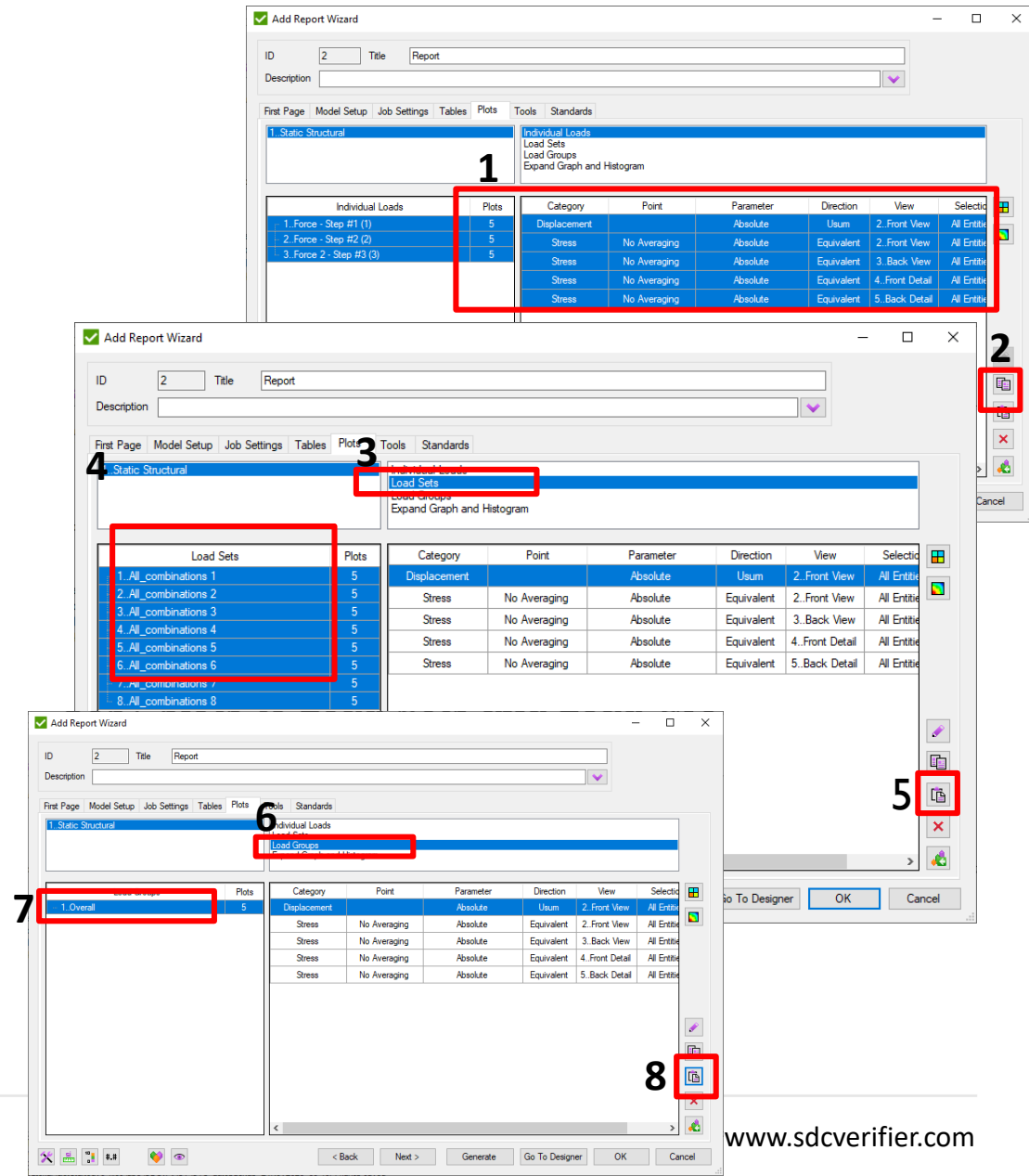
Labels: None Limits: None

Selections (1) (Elements): ALL  All Entities

7 OK Cancel

# Copy plots to Load Sets and Load Groups

- 1 Select all plots from the list.
- 2 Press  to copy plot to clipboard.
- 3 Plot Type: **Load Sets**
- 4 Select all loads sets.
- 5 Press  to paste.
- 6 Plot Type: **Load Groups**
- 7 Select all loads groups.
- 8 Press  to paste.



The screenshots illustrate the steps for copying plots to Load Sets and Load Groups in the 'Add Report Wizard' dialog box.

**Screenshot 1:** The 'Plots' tab is selected. The 'Individual Loads' table is shown with 5 plots. A red box highlights the 'Plots' column, and a red box highlights the 'Category' column.

Individual Loads	Plots	Category	Point	Parameter	Direction	View	Select
1. Force - Step #1 (1)	5	Displacement	Absolute	Usdm	Equivalent	2. Front View	All Entities
2. Force - Step #2 (2)	5	Stress	No Averaging	Absolute	Equivalent	3. Back View	All Entities
3. Force 2 - Step #3 (3)	5	Stress	No Averaging	Absolute	Equivalent	4. Front Detail	All Entities
		Stress	No Averaging	Absolute	Equivalent	5. Back Detail	All Entities

**Screenshot 2:** The 'Load Sets' tab is selected. The 'Load Sets' table is shown with 8 load sets. A red box highlights the 'Load Sets' column, and a red box highlights the 'Category' column.

Load Sets	Plots	Category	Point	Parameter	Direction	View	Select
1. All combinations 1	5	Displacement	Absolute	Usdm	Equivalent	2. Front View	All Entities
2. All combinations 2	5	Stress	No Averaging	Absolute	Equivalent	3. Back View	All Entities
3. All combinations 3	5	Stress	No Averaging	Absolute	Equivalent	4. Front Detail	All Entities
4. All combinations 4	5	Stress	No Averaging	Absolute	Equivalent	5. Back Detail	All Entities
5. All combinations 5	5						
6. All combinations 6	5						
7. All combinations 7	5						
8. All combinations 8	5						

**Screenshot 3:** The 'Load Groups' tab is selected. The 'Load Groups' table is shown with 1 load group. A red box highlights the 'Load Groups' column, and a red box highlights the 'Category' column.

Load Groups	Plots	Category	Point	Parameter	Direction	View	Select
1. Overall	5	Displacement	Absolute	Usdm	Equivalent	2. Front View	All Entities
		Stress	No Averaging	Absolute	Equivalent	3. Back View	All Entities
		Stress	No Averaging	Absolute	Equivalent	4. Front Detail	All Entities
		Stress	No Averaging	Absolute	Equivalent	5. Back Detail	All Entities

# Result Report Generation

1

Press *Generate*.

☒ Add Report Wizard

ID:  Title:   
Description:

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

**1. Static Structural**

Individual Loads  
Load Sets  
**Load Groups**  
Expand Graph and Histogram

Load Groups	Plots
1. Overall	5

Category	Point	Parameter	Direction	View	Select
Displacement		Absolute	Usun	2. Front View	All Entities
Stress	No Averaging	Absolute	Equivalent	2. Front View	All Entities
Stress	No Averaging	Absolute	Equivalent	3. Back View	All Entities
Stress	No Averaging	Absolute	Equivalent	4. Front Detail	All Entities
Stress	No Averaging	Absolute	Equivalent	5. Back Detail	All Entities

< Back Next > Generate Go To Designer **OK** Cancel

# Quick Support – remote access to your PC

1

Select *Help - Quick Support*

2

Contact helpdesk by phone or skype

3

Tell your ID to SDC specialist

Quick Support allows to get remote access to your PC by SDC Verifier specialist to solve your problem. All you need is to send your ID to us:

by Skype: [sdcverifier\\_helpdesk](https://www.skype.com/en/contacts/sdcverifier_helpdesk/);  
by phone: +31 15 30-10-310;  
by email: [support@sdcverifier.com](mailto:support@sdcverifier.com)

Quick Support tool is standalone program.  
Team Viewer is not required to be installed.

