



SESAM EXAMPLE

## Tension/Compression Analysis of Module

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## 1 Introduction

This example demonstrates tension/compression analysis.

The module below is analysed. Colours show that some of the vertical columns are compression-only elements while all diagonal braces are tension-only elements.

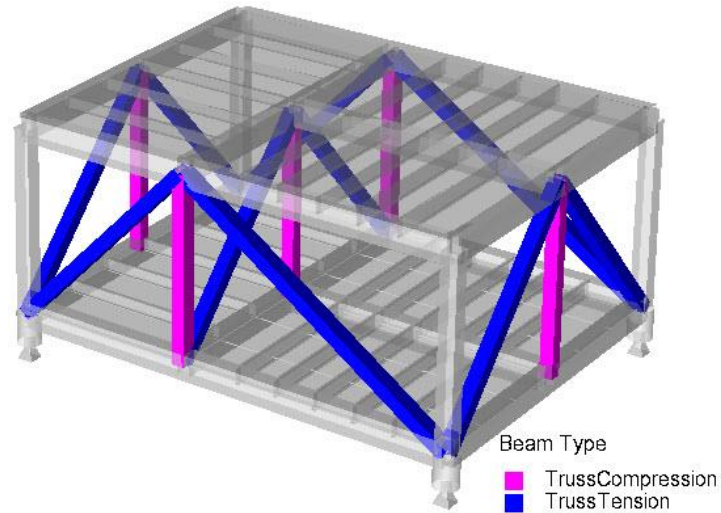


Figure 1-1 Module structure with tension-only and compression-only members

## 2 Loads

The following loads are analysed:

- LC\_Gravity: Gravity
- LC\_Equipm: Equipment as shown in the figure below

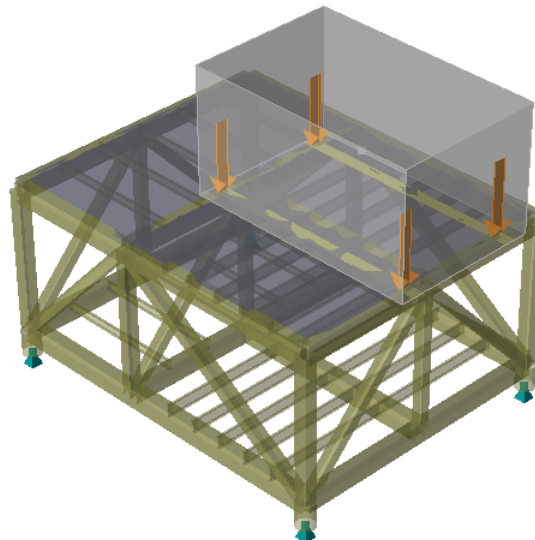


Figure 2-1 LC\_Equipm

- LC\_PointLoad: Point load as shown in the figure below

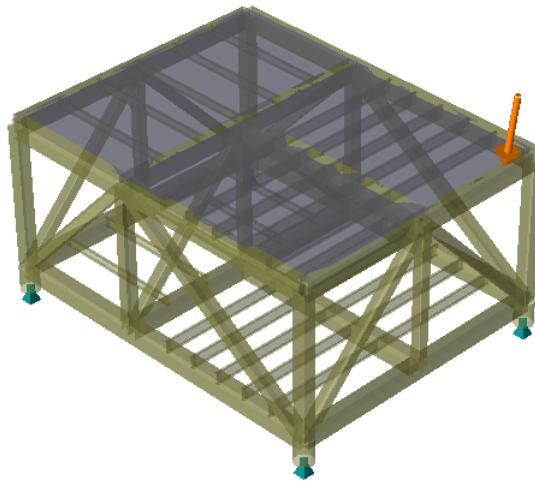


Figure 2-2 LC\_PointLoad

- LC\_BlanketLoad: Blanket load as shown in the figure below

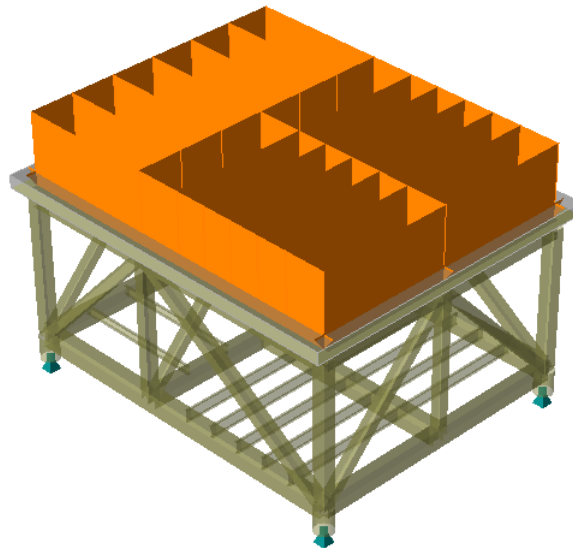


Figure 2-3 LC\_BlanketLoad

- LC\_LineLoad: Line load as shown in the figure below

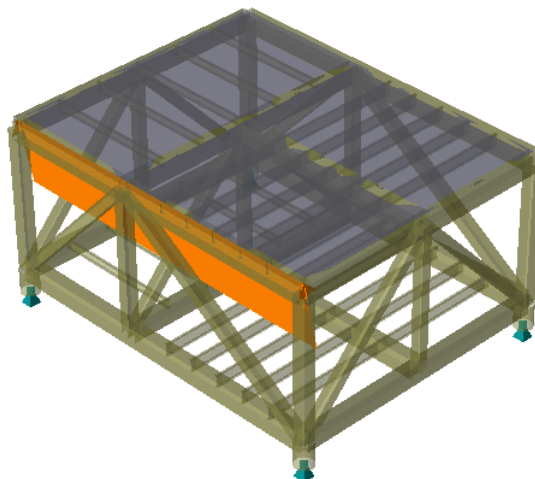


Figure 2-4 LC\_LineLoad

### 3 Tension/Compression Analysis

A tension/compression analysis is set up and run from GeniE as illustrated by the screen dumps below.

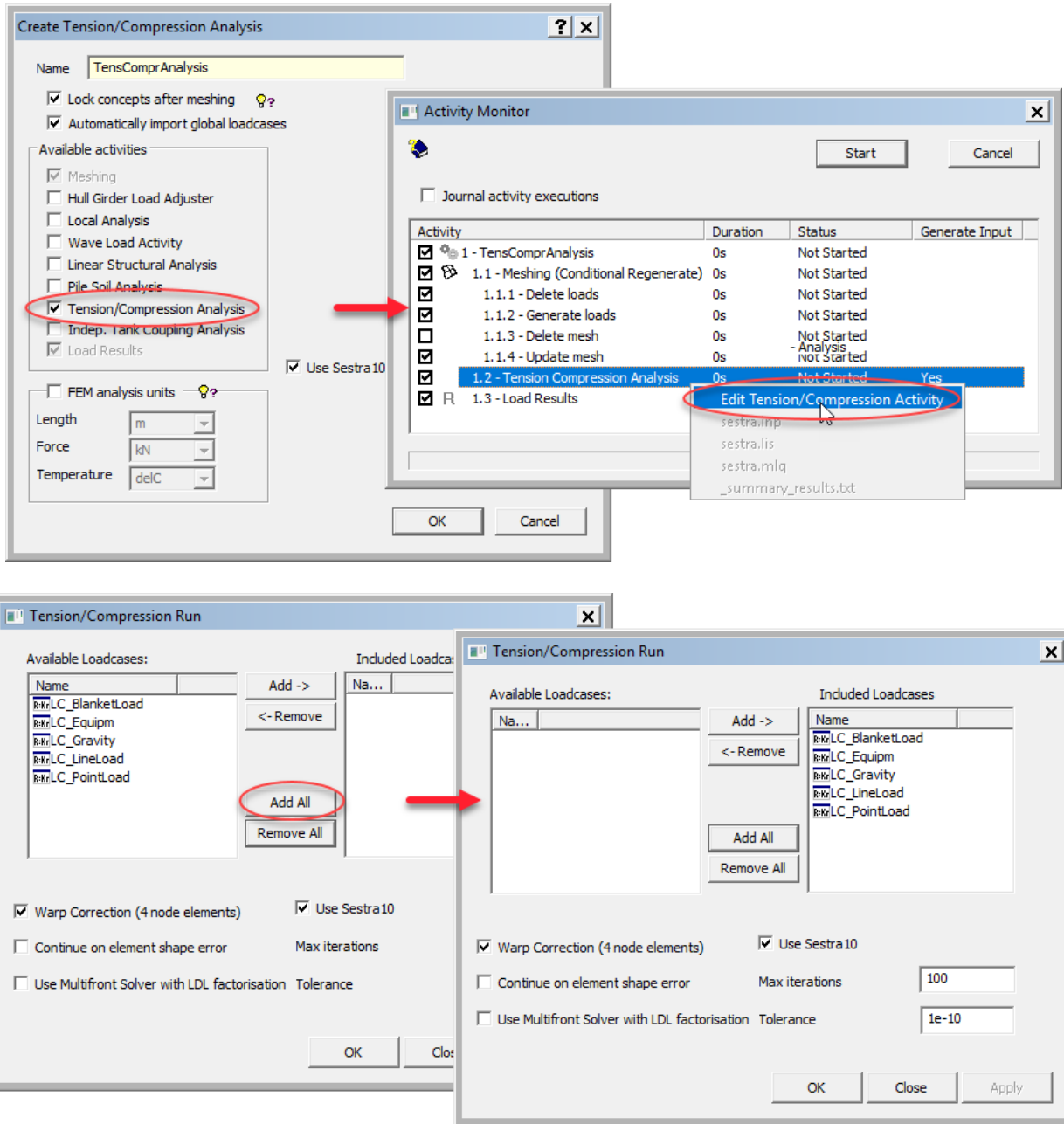


Figure 3-1 Tension/compression analysis setup in GeniE

## 4 Results

The figures below are produced by Xtract and show that the axial stress is positive only for tension-only elements and negative only for compression-only elements. The axial stresses (SIGXX) are colour coded and labelled. Deformed shape and loads are also shown.

Note that due to numerical issues, zero stress values appear as very small positive or negative values.

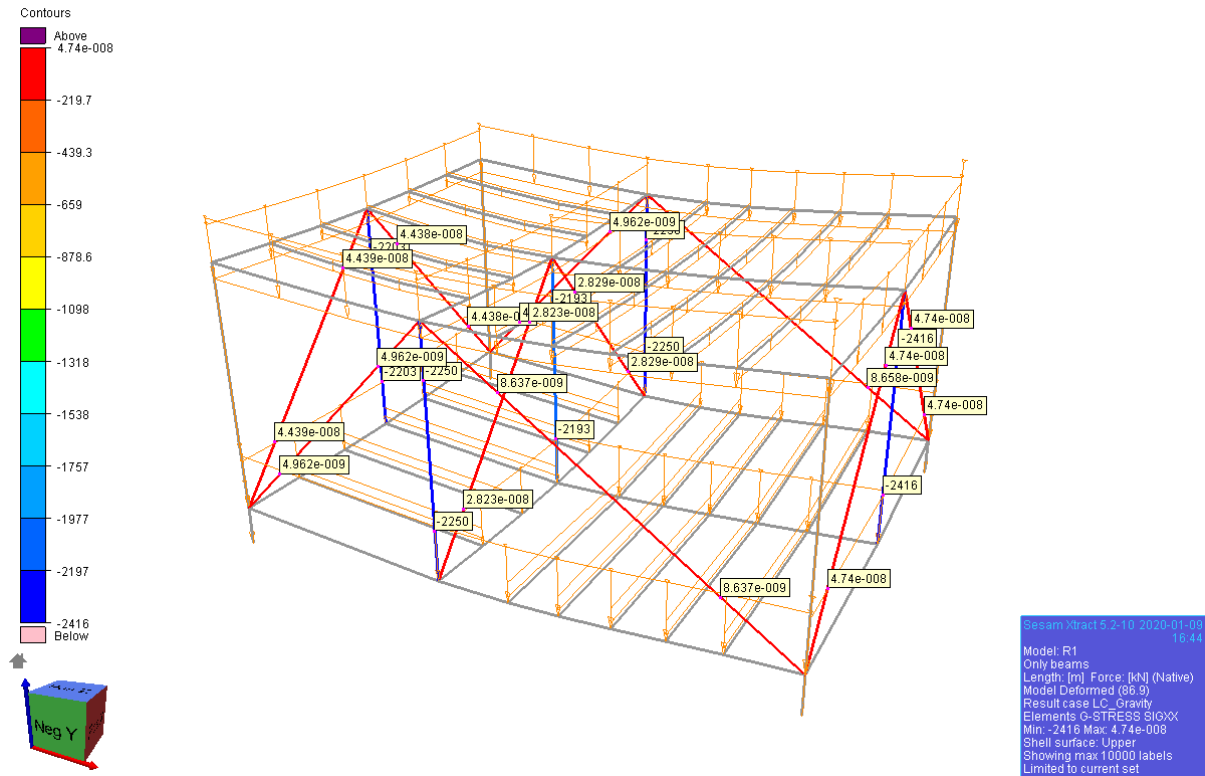


Figure 4-1 LC\_Gravity: Deformed shape, with loads – axial stresses colour coded and labelled

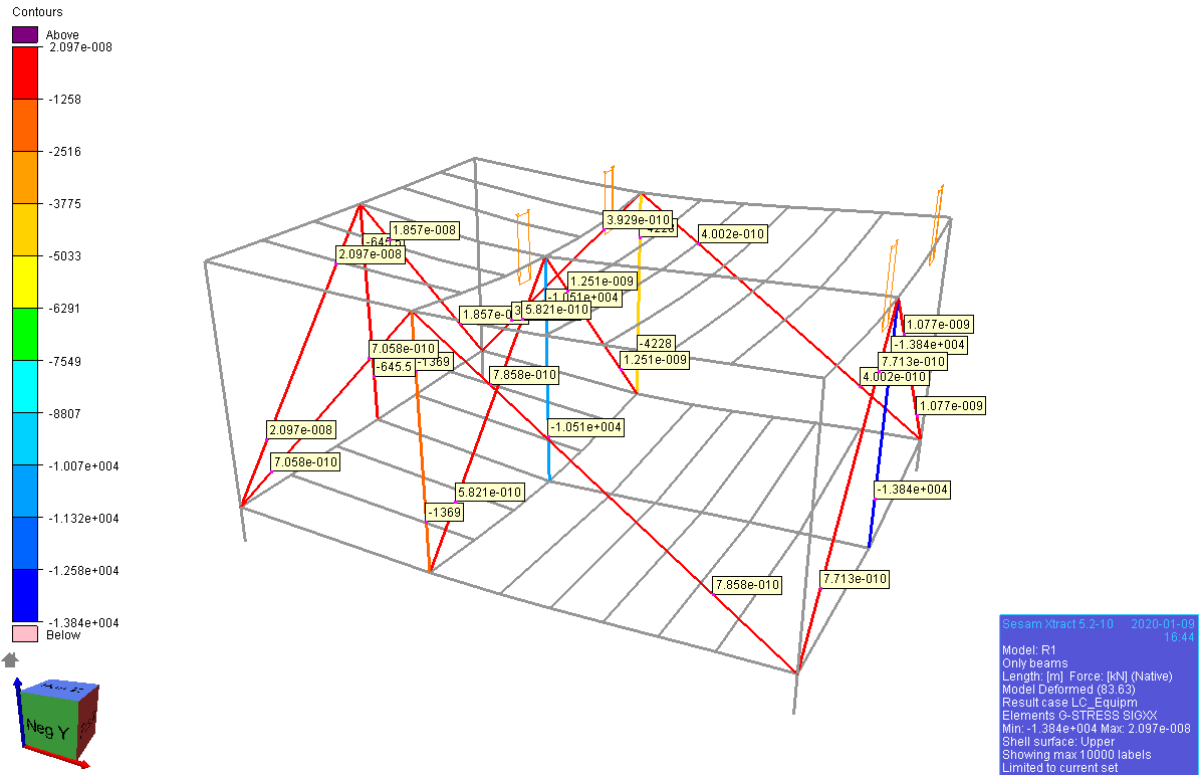


Figure 4-2 LC\_Equipm: Deformed shape, with loads – axial stresses colour coded and labelled

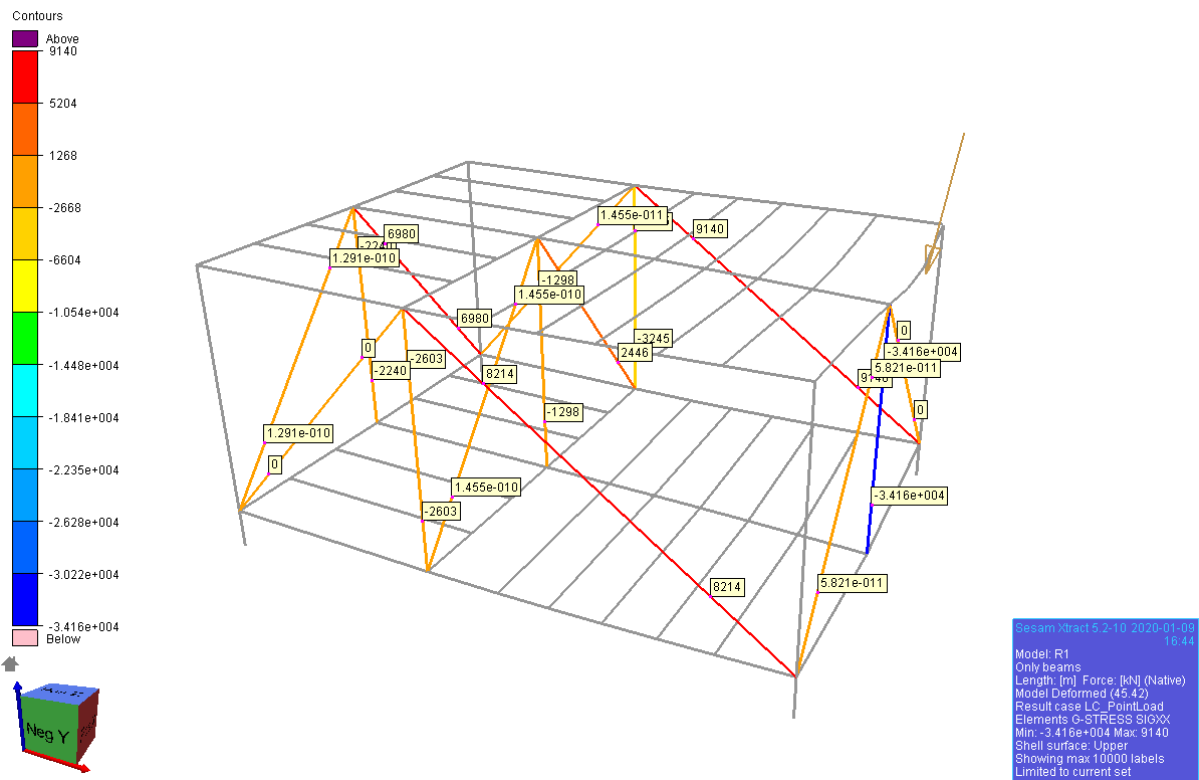


Figure 4-3 LC\_PointLoad: Deformed shape, with loads – axial stresses colour coded and labelled



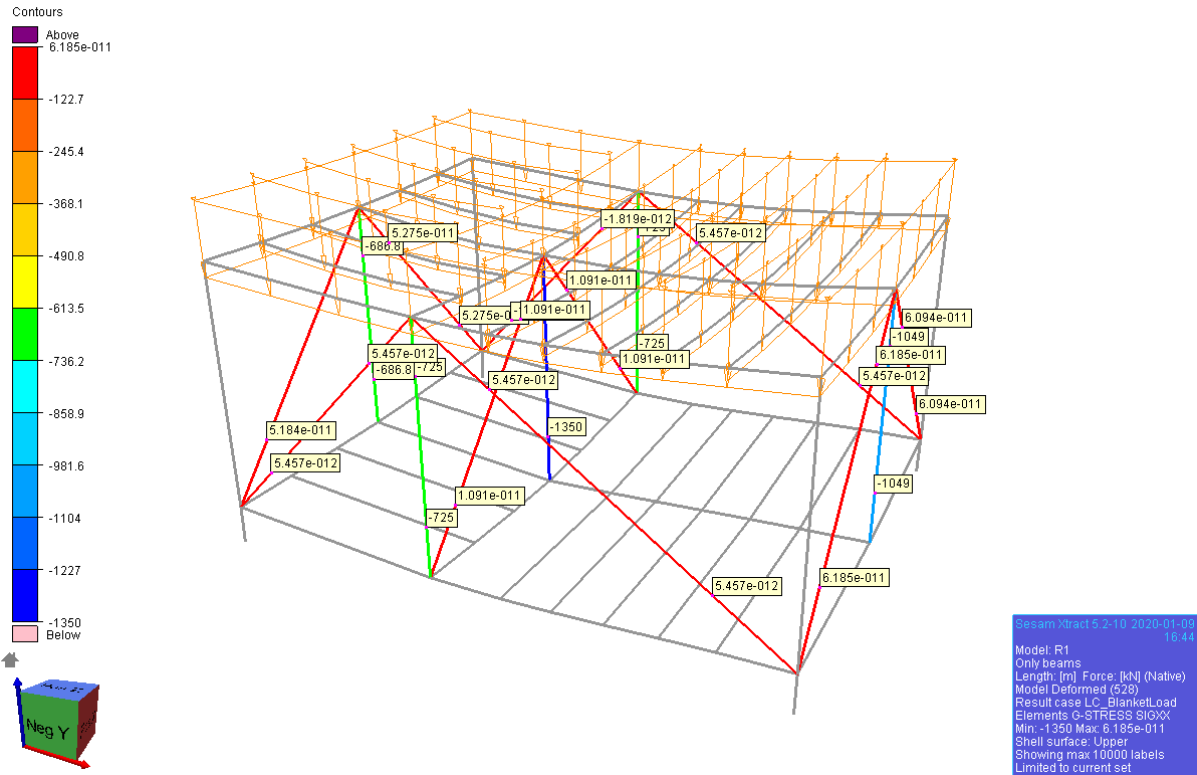


Figure 4-4 LC\_BlanketLoad: Deformed shape, with loads – axial stresses colour coded and labelled

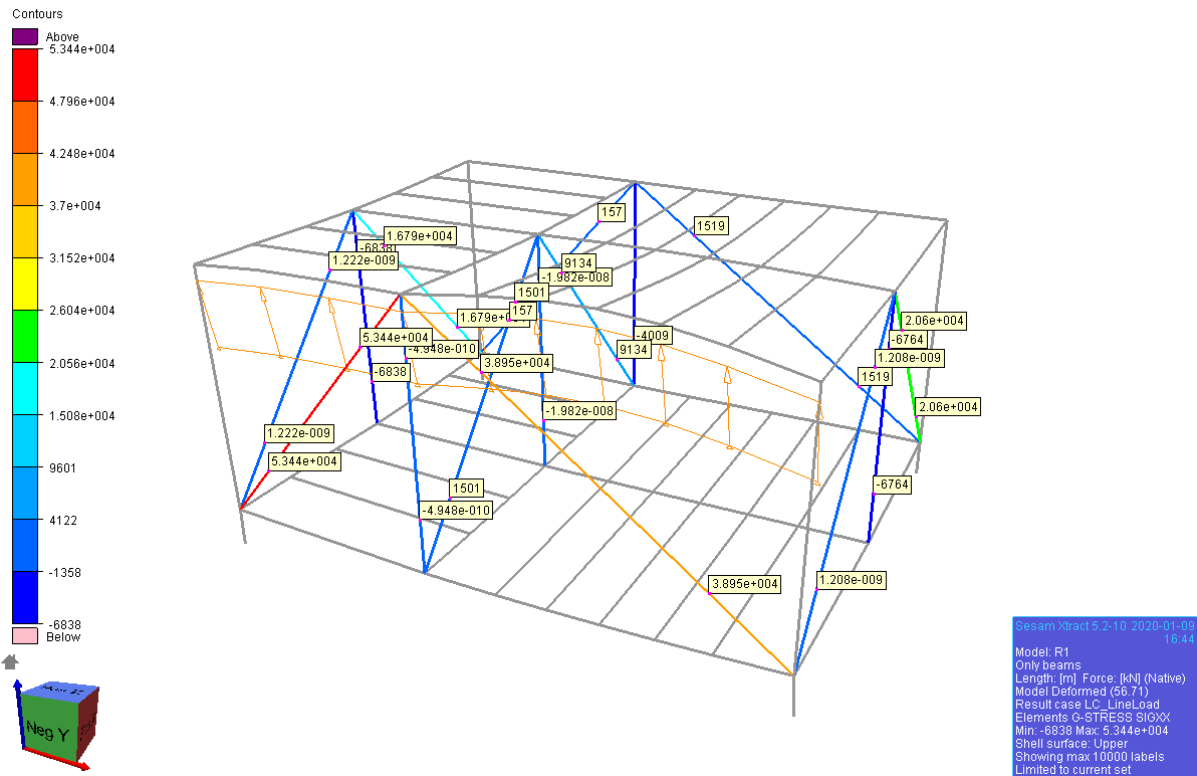


Figure 4-5 LC\_LineLoad: Deformed shape, with loads – axial stresses colour coded and labelled



## About DNV

We are the independent expert in risk management and quality assurance. Driven by our purpose, to safeguard life, property and the environment, we empower our customers and their stakeholders with facts and reliable insights so that critical decisions can be made with confidence. As a trusted voice for many of the world's most successful organizations, we use our knowledge to advance safety and performance, set industry benchmarks, and inspire and invent solutions to tackle global transformations.

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