

STRUCTURAL PERFORMANCE EVALUATION 16 3TS WITH LONGITUDINAL PURLIN

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A decorative graphic consisting of two overlapping wavy lines, one blue and one orange, spans the bottom half of the page.

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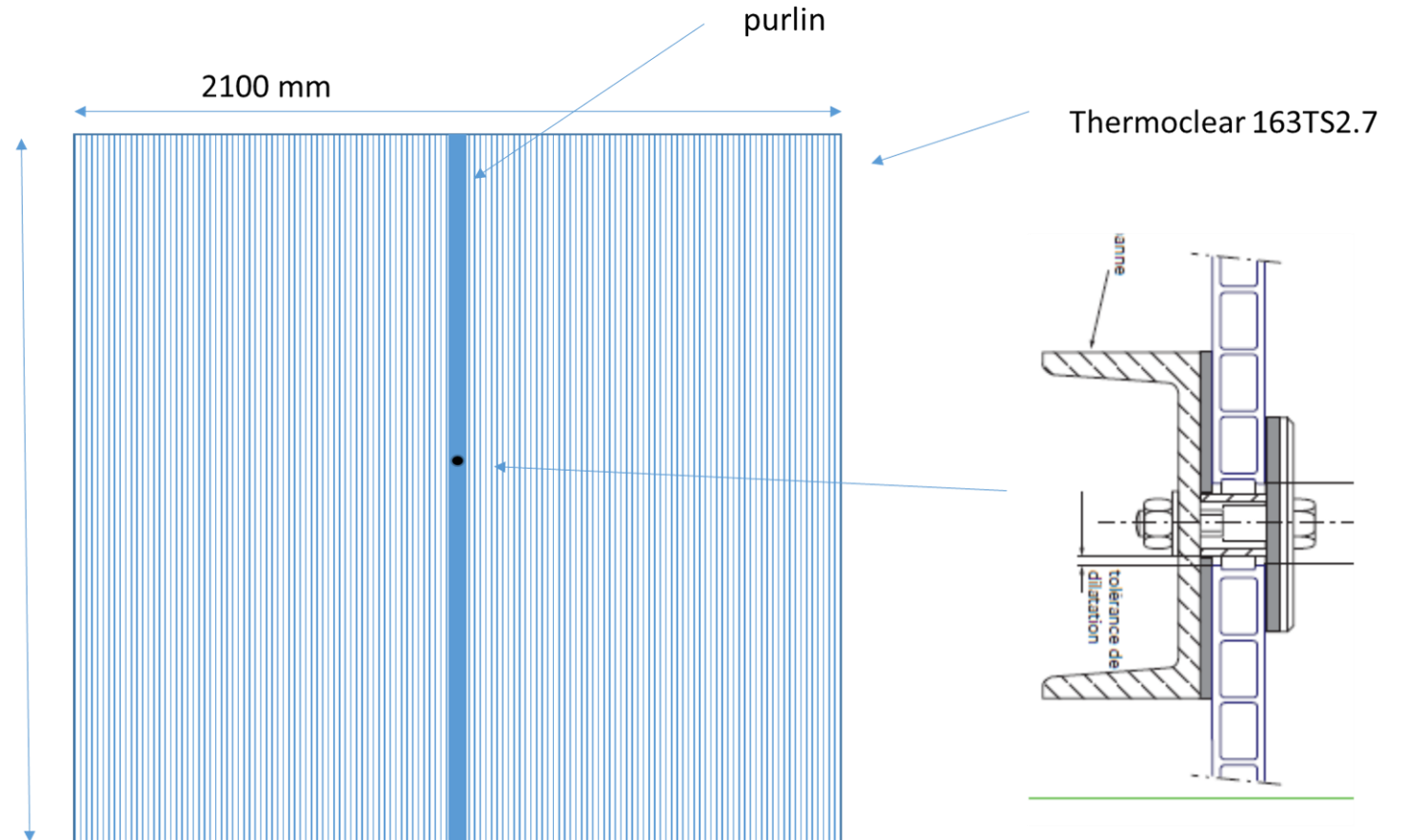
INPUT

SHEET CLAMPED 4 SIDES
ONE PURLIN IN THE MIDDLE OF
THE SHEET // TO THE RIBS

WITH EXTRA FIXING IN THE
MIDDLE (SCREW + WASHER)

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2000mm



CASE 1 FEM ANALYSIS FORMULATION/ ASSUMPTIONS:

Case1: LTC16 3TS

Pressure Load Case

Four side clamped with middle purlin

Panel size :

2000 mm x 2100 mm

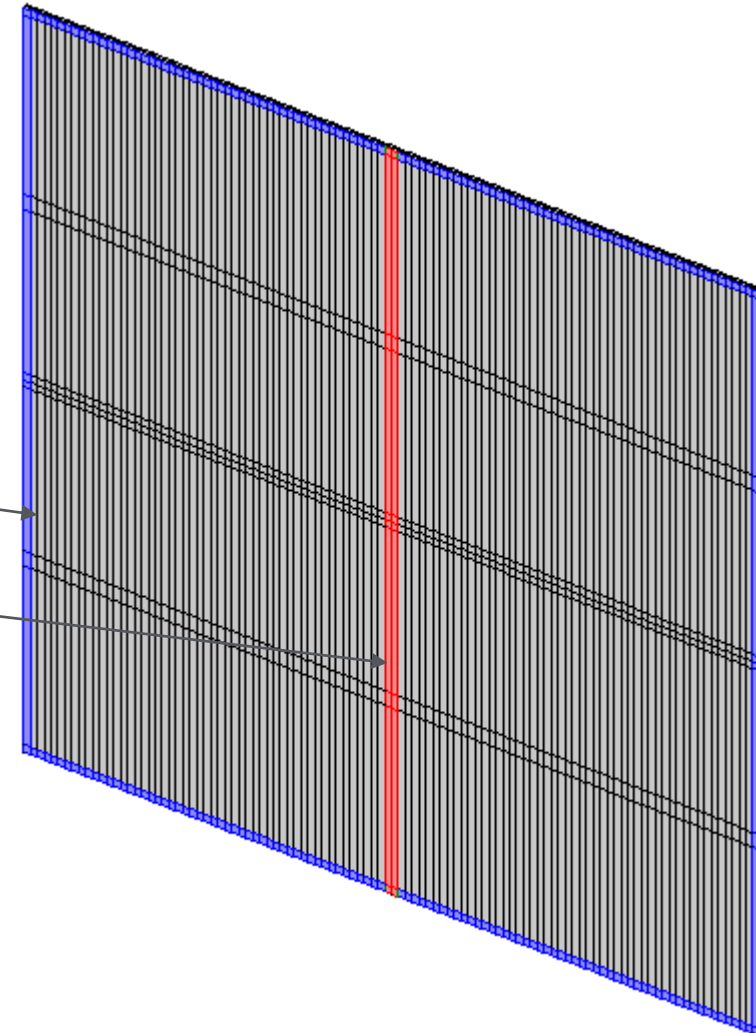
20 mm sheet engagement

Mid purlin width 40 mm

Wind pressure load 1500 N/m²

Typical FEA mesh

Geometric Nonlinear Elasto Plastic Structural
Performance Evaluation



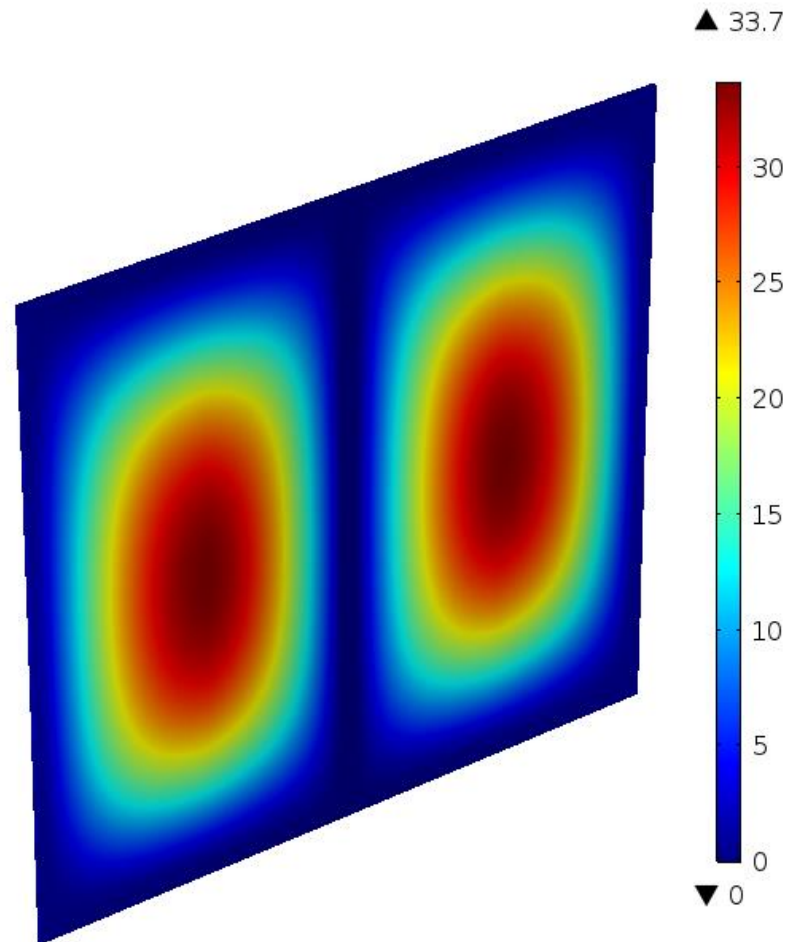
CASE 1 RESULTS : PRESSURE LOAD 1500 N/M2

Typical Deflection and
Stress contour plots

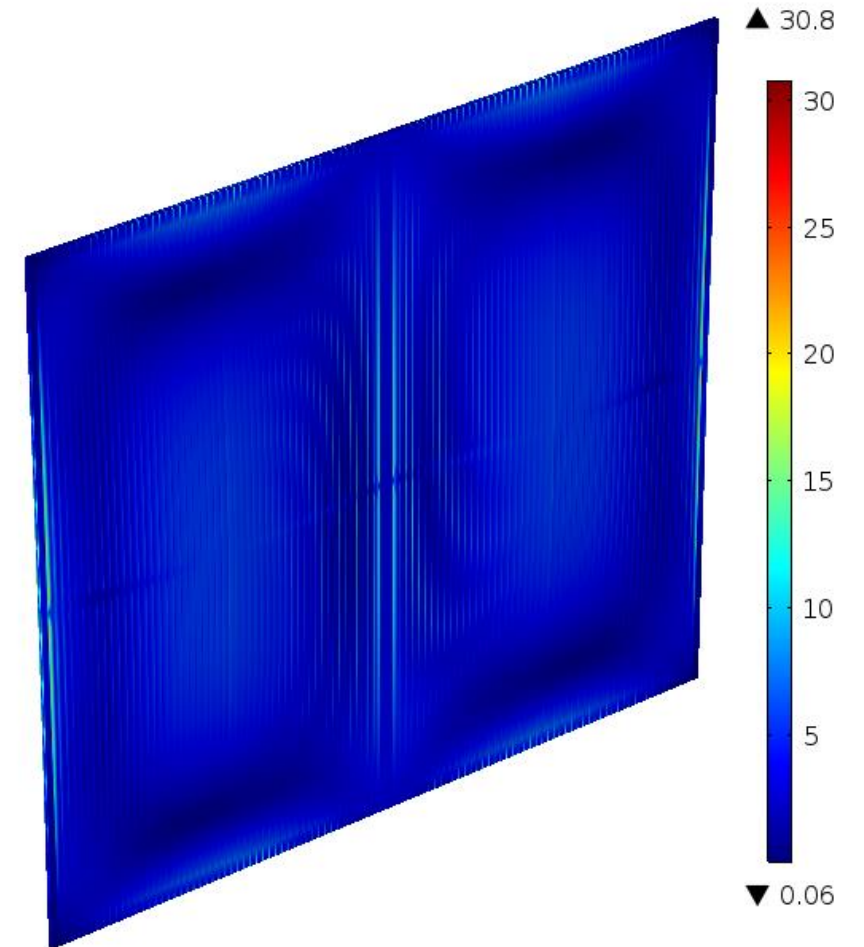
Max deflection
33.7 mm

Max stress
30.8 MPa

Load(15)=1500 Surface: Total displacement (mm)



Load(15)=1500 Surface: von Mises stress (MPa)



CASE 2 FEM ANALYSIS FORMULATION/ ASSUMPTIONS:

Case1: LTC16 3TS

Suction Load Case

Four side clamped with middle purlin

Panel size :

2000 mm x 2100 mm

20 mm sheet engagement

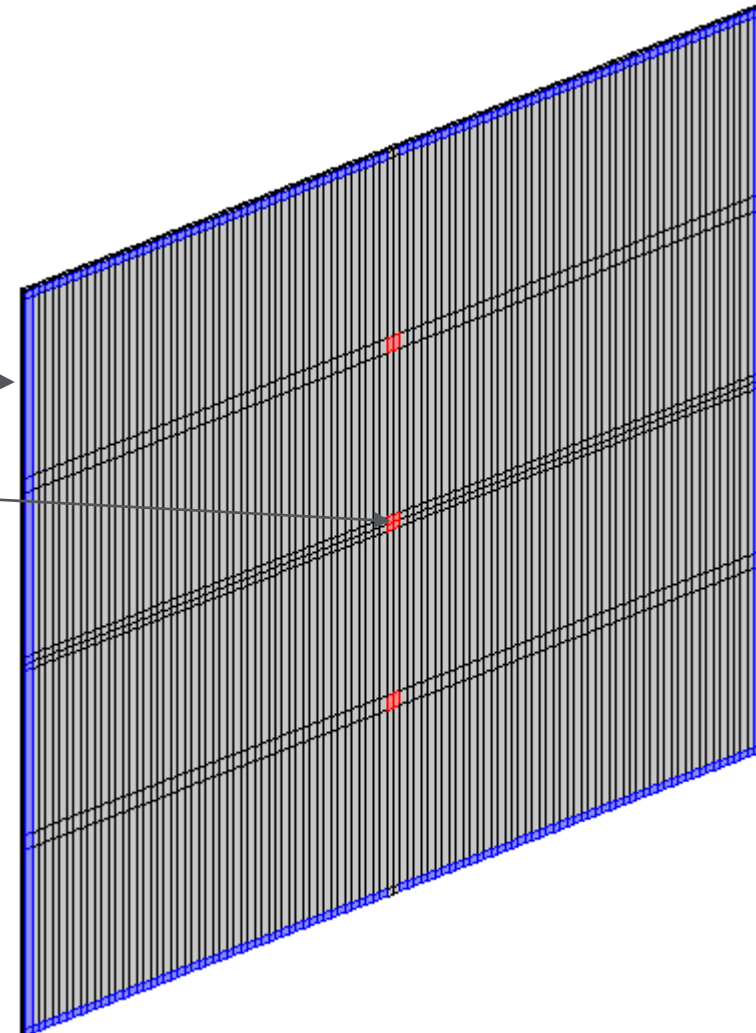
Mid supported with 40 mm dia washer at 500 mm c/c

Wind Suction load 1500 N/m²

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Typical FEA mesh

Geometric Nonlinear Elasto Plastic Structural
Performance Evaluation

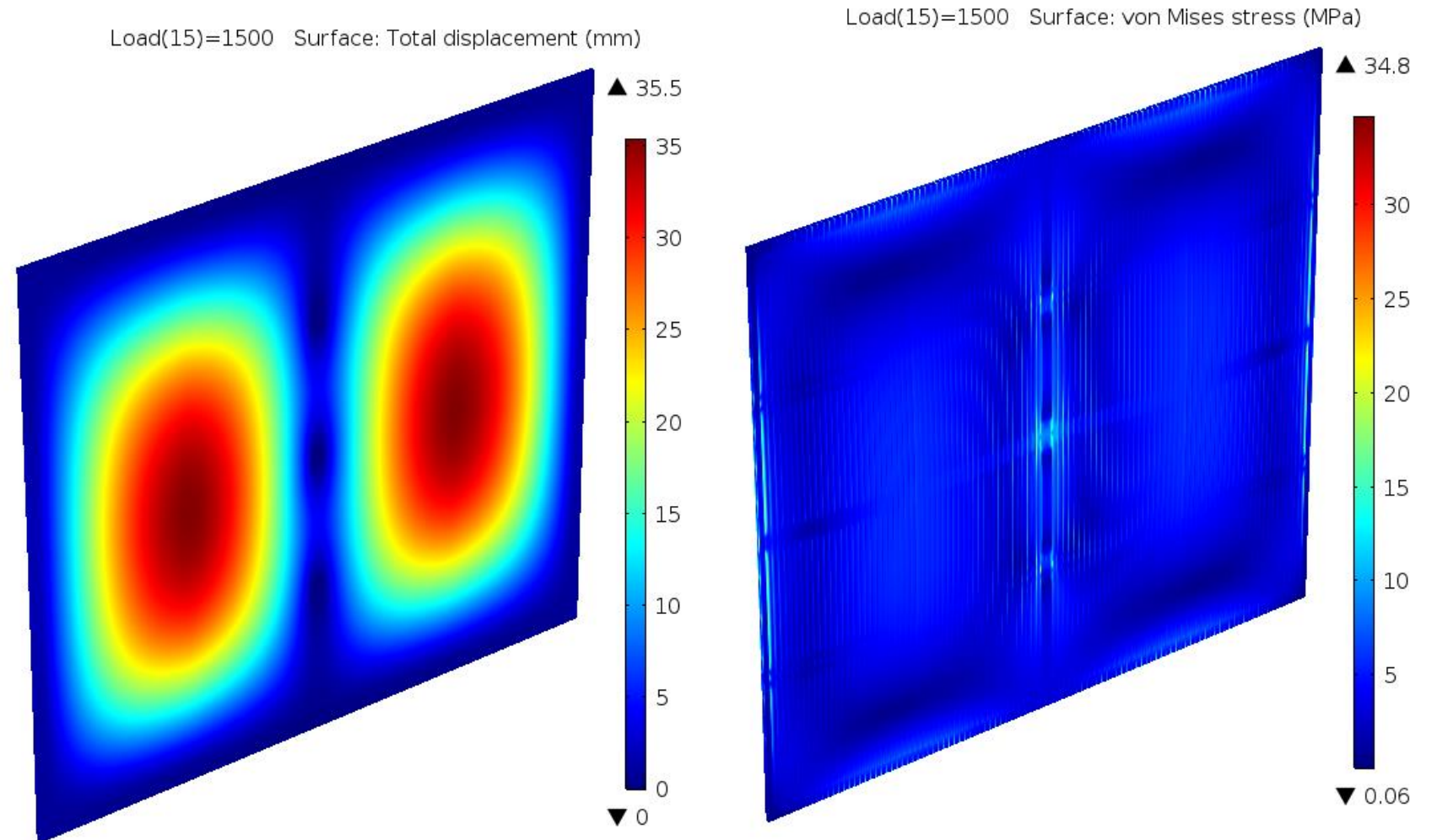


CASE 2 RESULTS : SUCTION LOAD 1500 N/M2

Typical Deflection and Stress contour plots

Max deflection
35.5 mm

Max stress
34.8 MPa



CASE 3 FEM ANALYSIS FORMULATION/ ASSUMPTIONS:

Case1: LTC16 3TS

Pressure/ Suction Load Case
Four side clamped

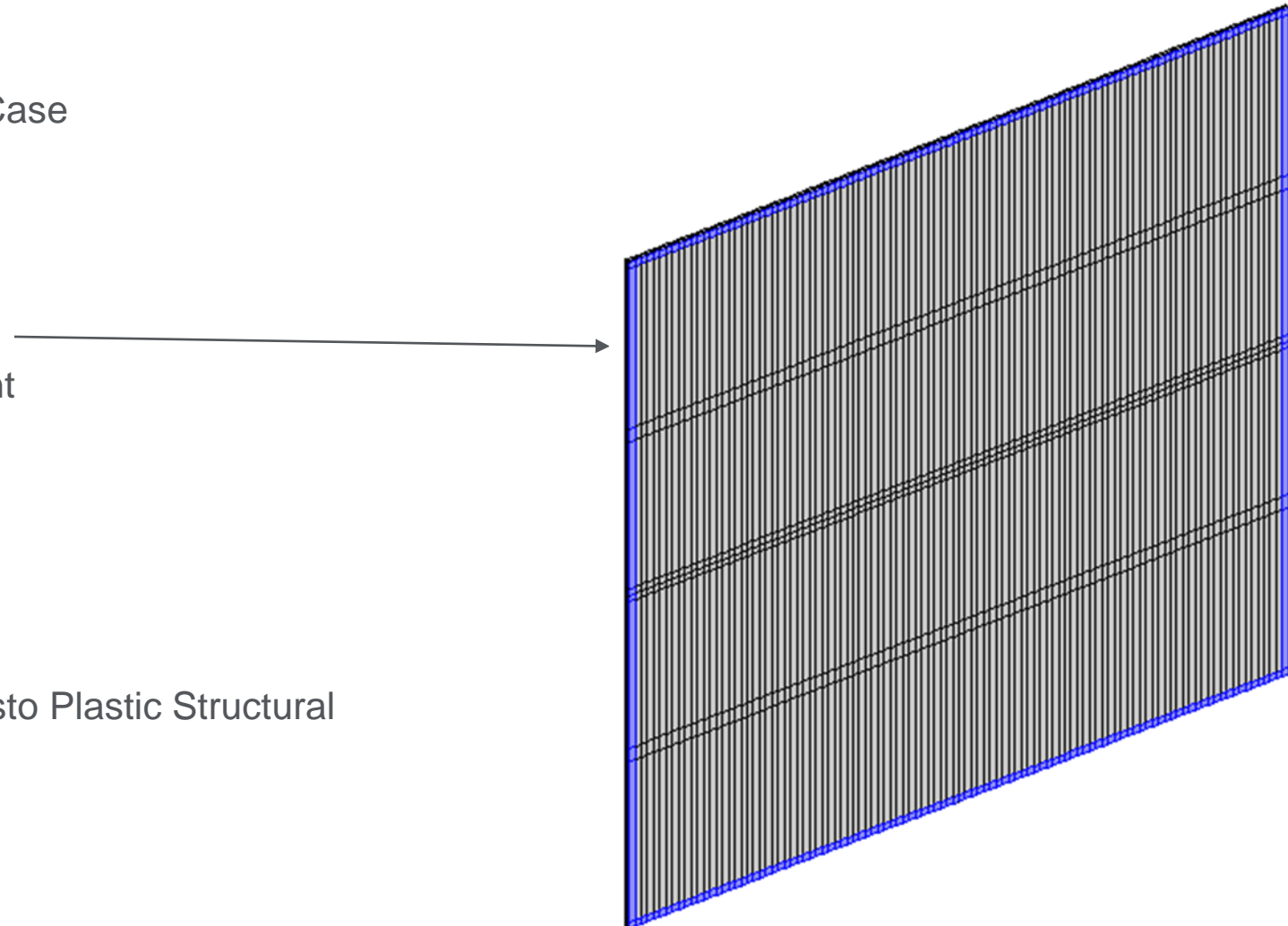
Panel size :
2000 mm x 2100 mm

20 mm sheet engagement

Wind load 1500 N/m²

Typical FEA mesh

Geometric Nonlinear Elasto Plastic Structural
Performance Evaluation



CASE 3 RESULTS : WIND LOAD 1500 N/M2

Typical Deflection and Stress contour plots

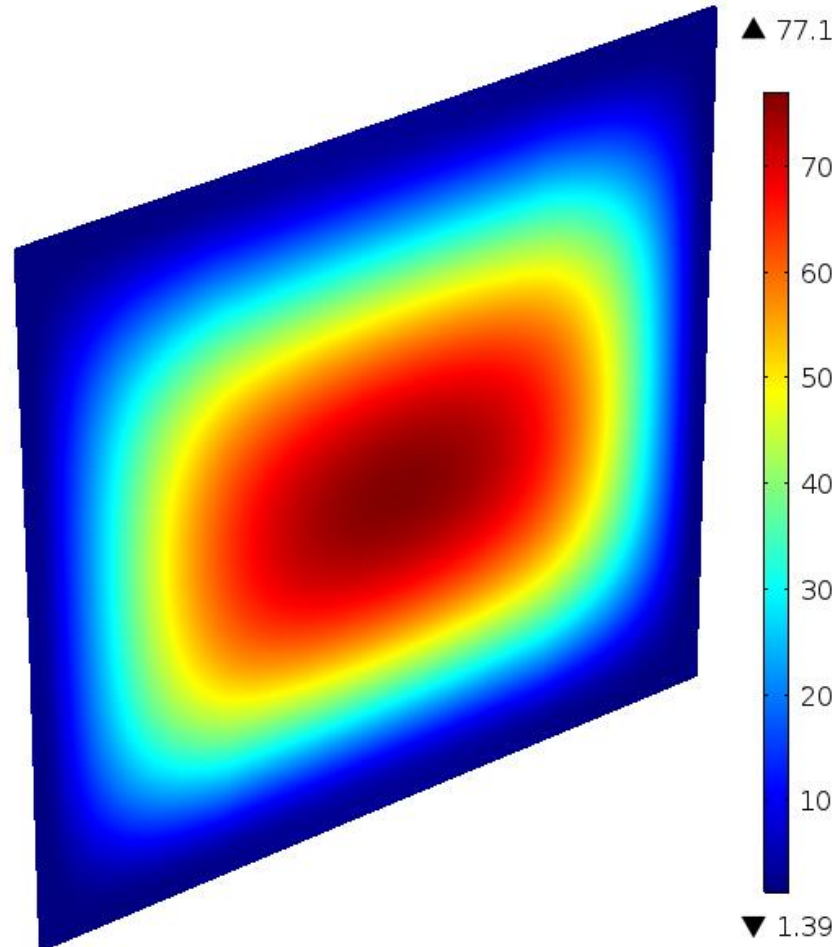
Max deflection
77.1 mm

Max stress
56.6 MPa

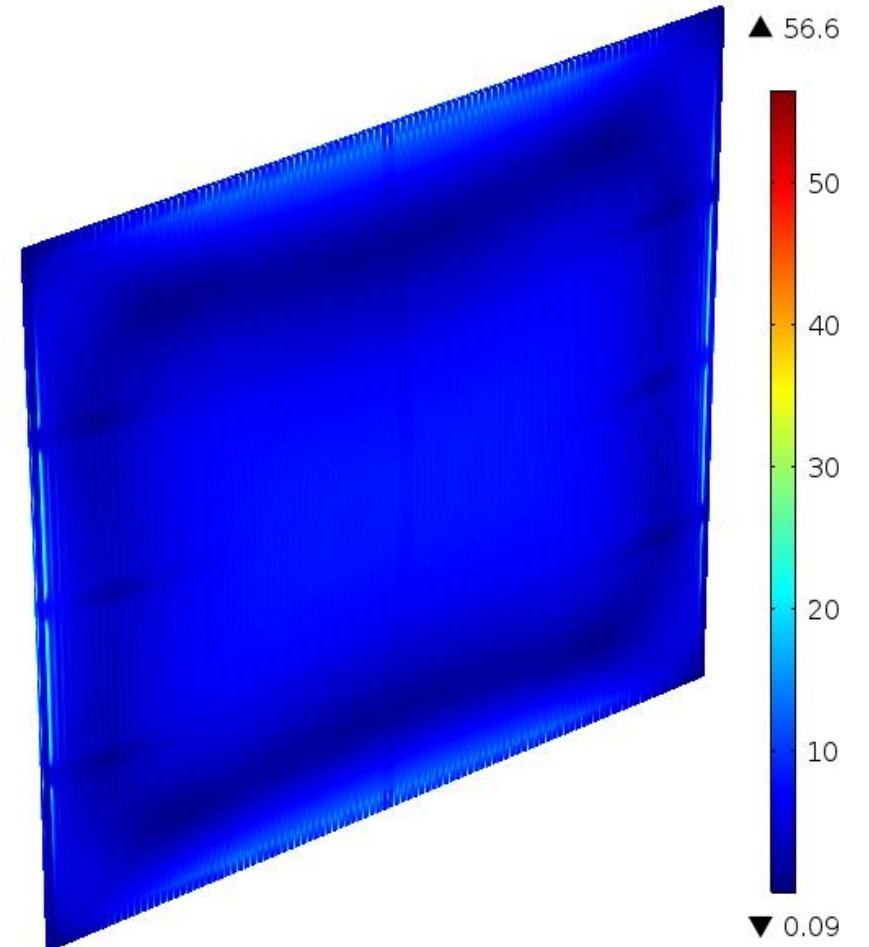


These values
Are really close to the
acceptable limit.
With a wind load of 1500 N/m²

Load(15)=1500 Surface: Total displacement (mm)



Load(15)=1500 Surface: von Mises stress (MPa)



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