Example 4.2.1 (project <B_422-1>)

The project deals with a simple one-storey building consisting of 9 columns, 12 beams and 4 slabs, as illustrated in the figure.

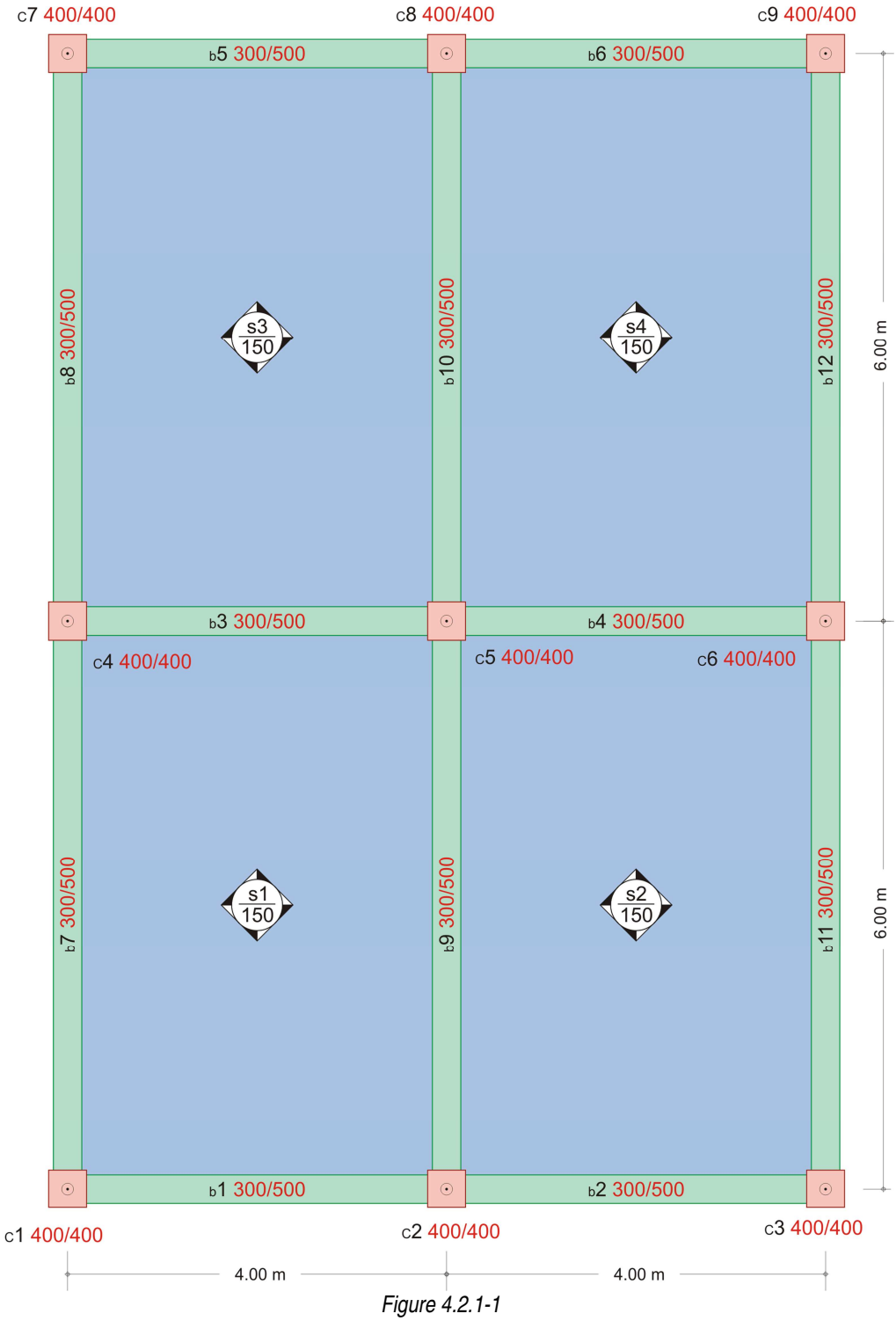

Figure 4.2.1-1

The four slabs have identical dimensions of 4.0 mx6.0 m, thickness of 150 mm, covering load g_e=1.0 kN/m^2 and live load q=5.0 kN/m^2. Concrete class: C30/37.

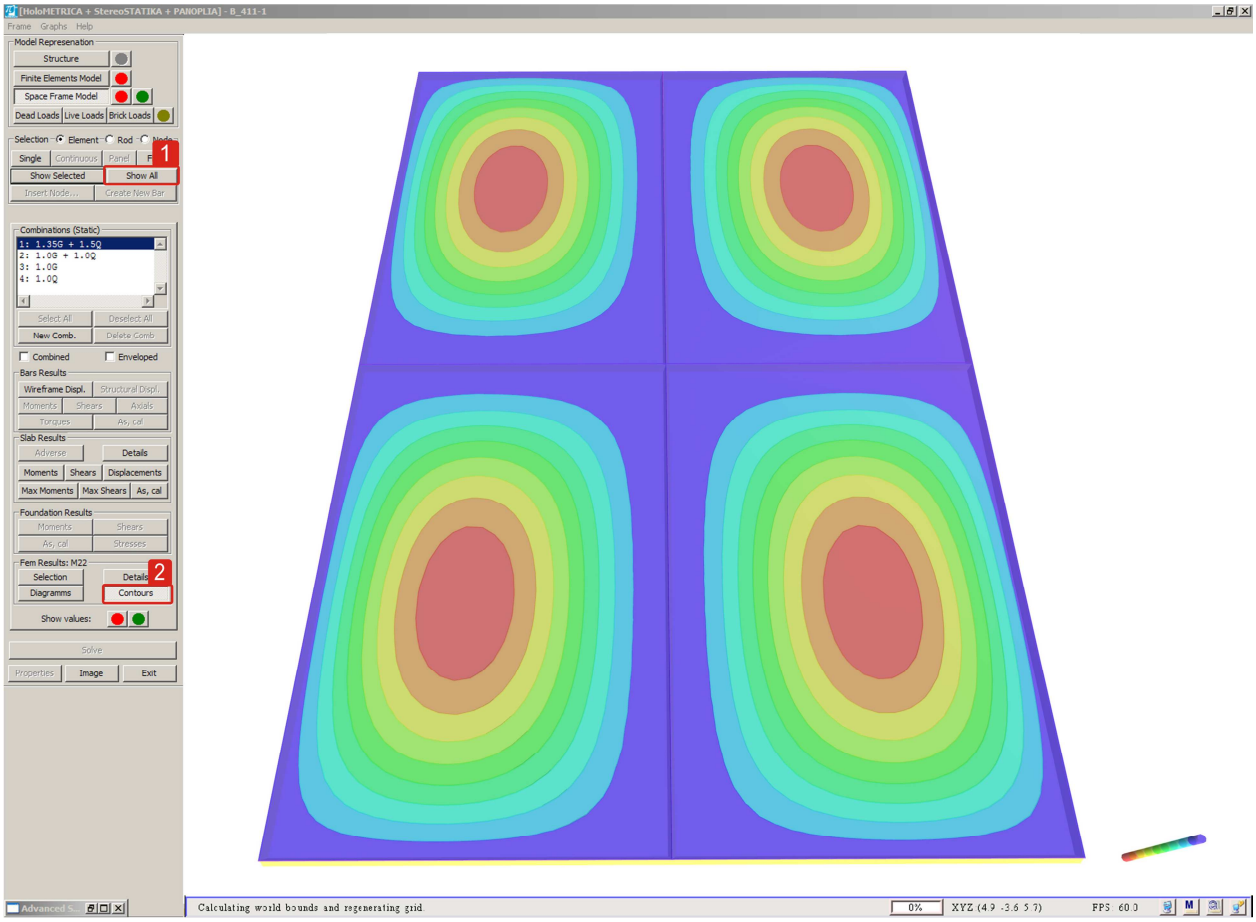

Figure 4.2.1-6: Button "Show All"① re-diplays the model.
Button "Contours" shows, using color gradation,the displacements contours.

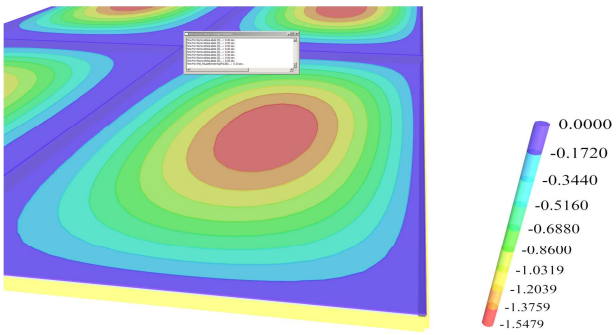

Figure 4.2.1-7

Each color (on the 3D color scale bar) corresponds to a range of displacements (mm).

For many years, the method of color gradation display of displacement contours was a 2D method of representing 3D information.

Today, provided the 3D abilities, the direct 3D or 4D display is preferable, especially for stereoscopic display.

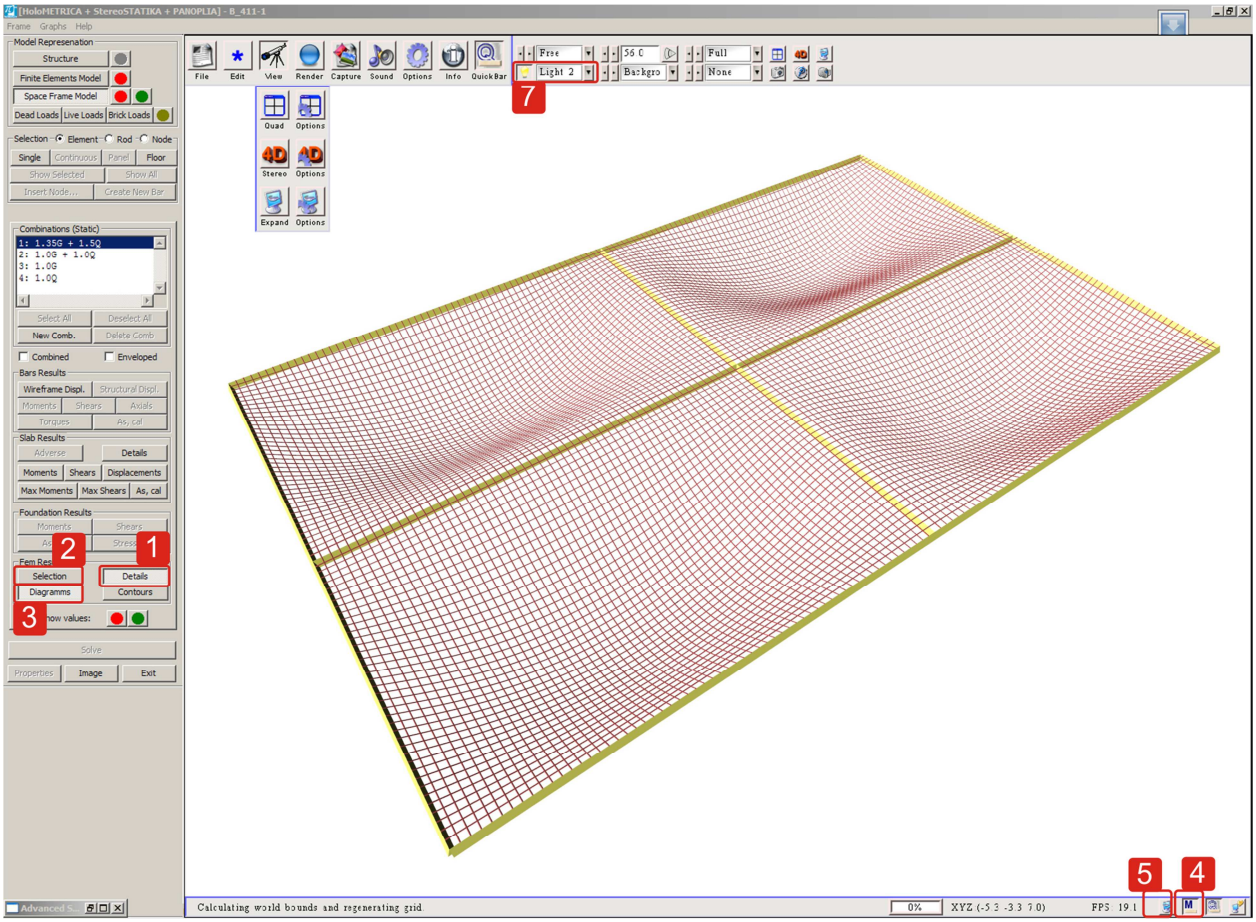

Figure 4.2.1-8: The following button sequence displays the 3D deformation of the structure:

"Details" ① in FEM results, "Diagrams at Dx=Dy=0.1m", "OK", "Selection" ②, "Displacements" "Z" & "Diagrams" ③. For better viewing "Light 2" ⑦ is switched on.

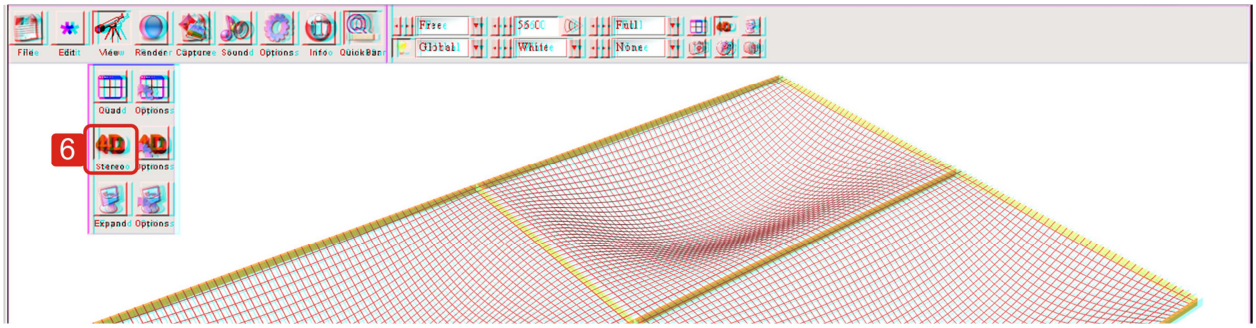

Figure 4.2.1-9: In the previous screen button sequence "Menu" ④, "Full Screen Mode" ⑤ and "4D" ⑥, provides stereoscopic display using "blue-red glasses".

Displacements which induse stresses help the engineers understand better the structural behaviour (engineering perception). When the deflected structure is concave upwards, the bending moments are positive, considering that the fibers under tension are located at the bottom face of the slabs.