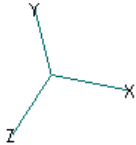
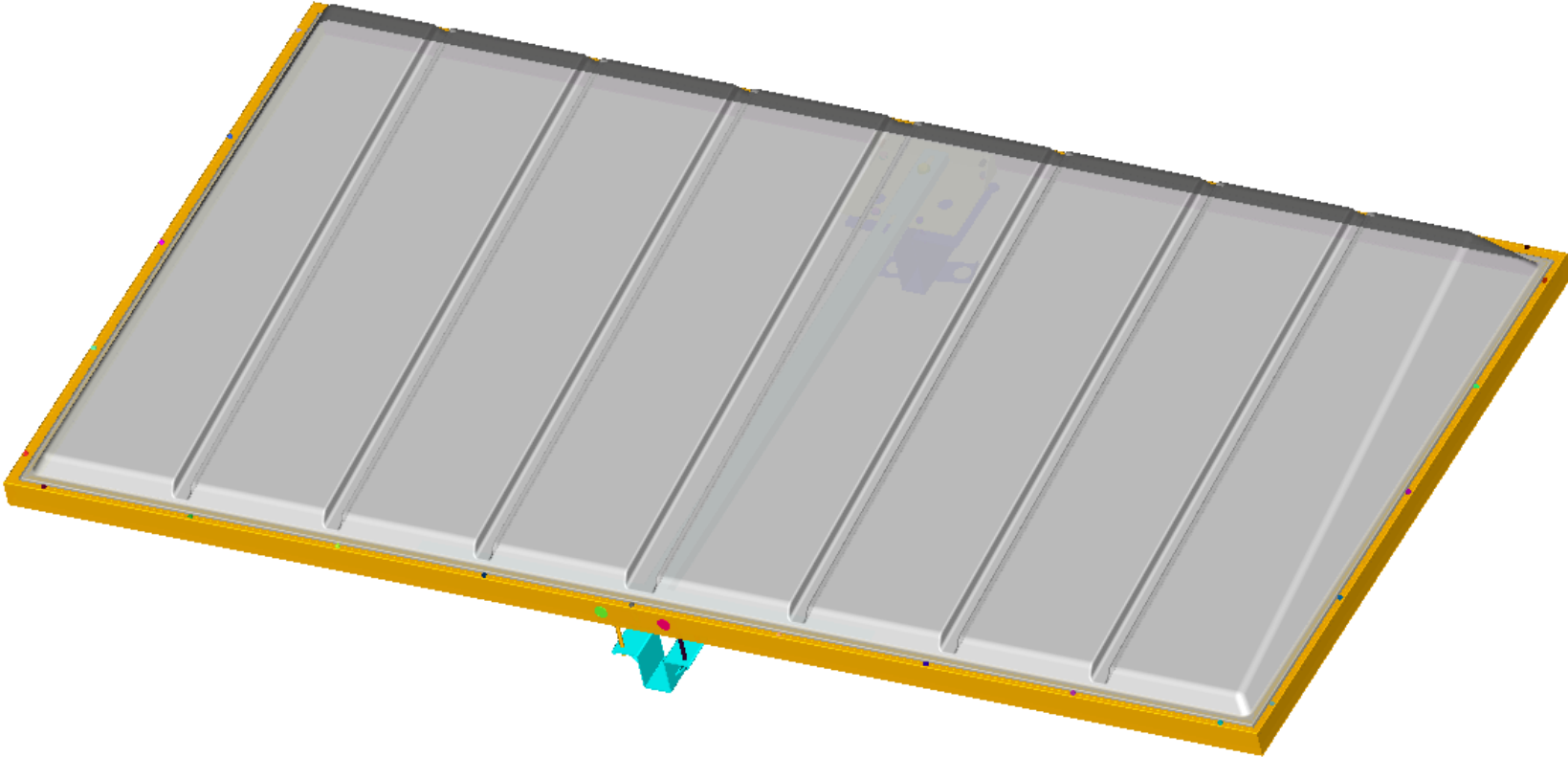
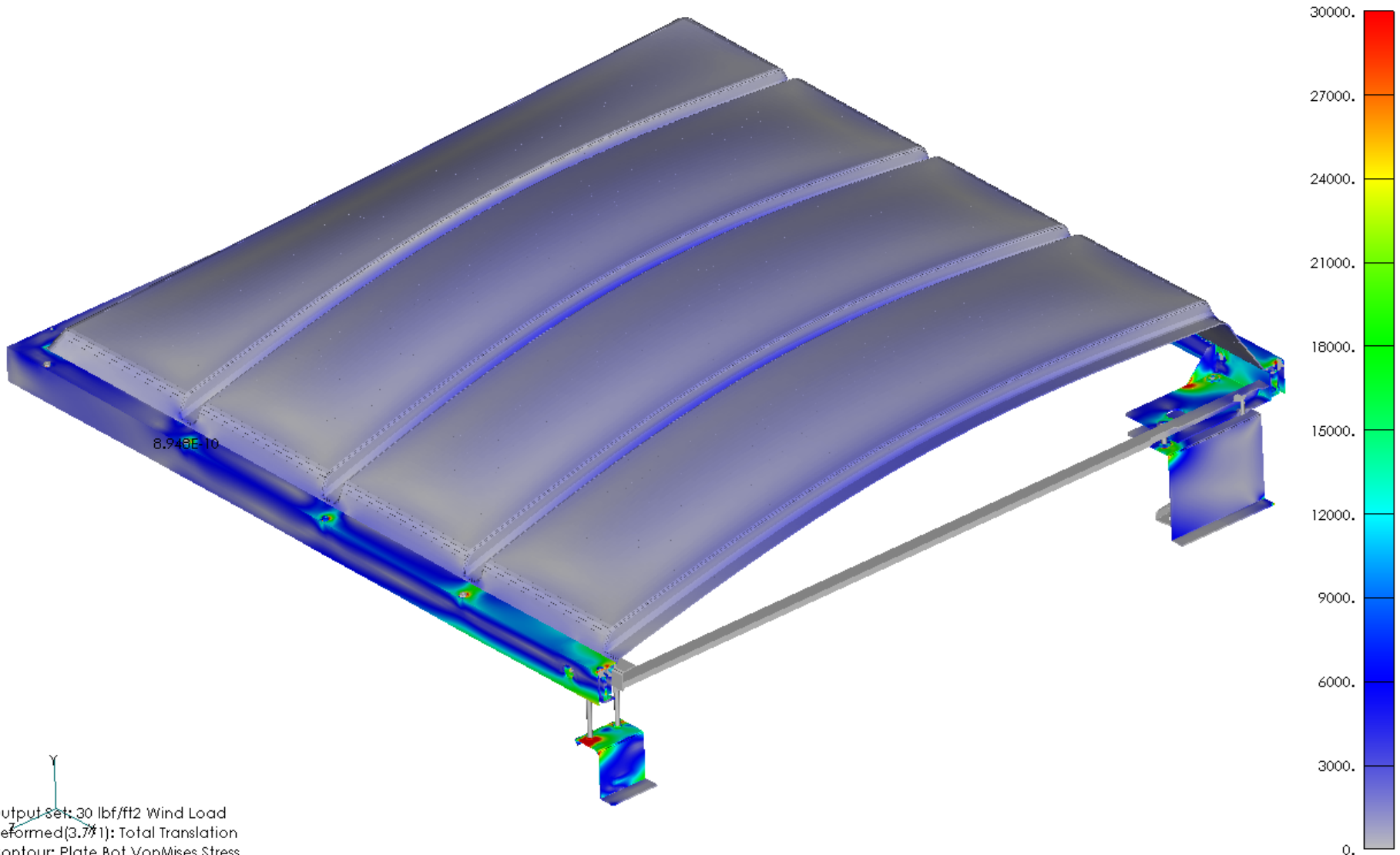


Davis Energy Group / National Energy Renewal Laboratory (NREL):
Structural analysis modeling and optimization of a low-cost, plastic solar panel for the heating of water. FEA results were used to ensure the structural integrity of the panel under high wind loads. Modeling notes: stress-stiffening was incorporated into the model to more accurately predict the polycarbonate glazing's deflection and stress behavior.



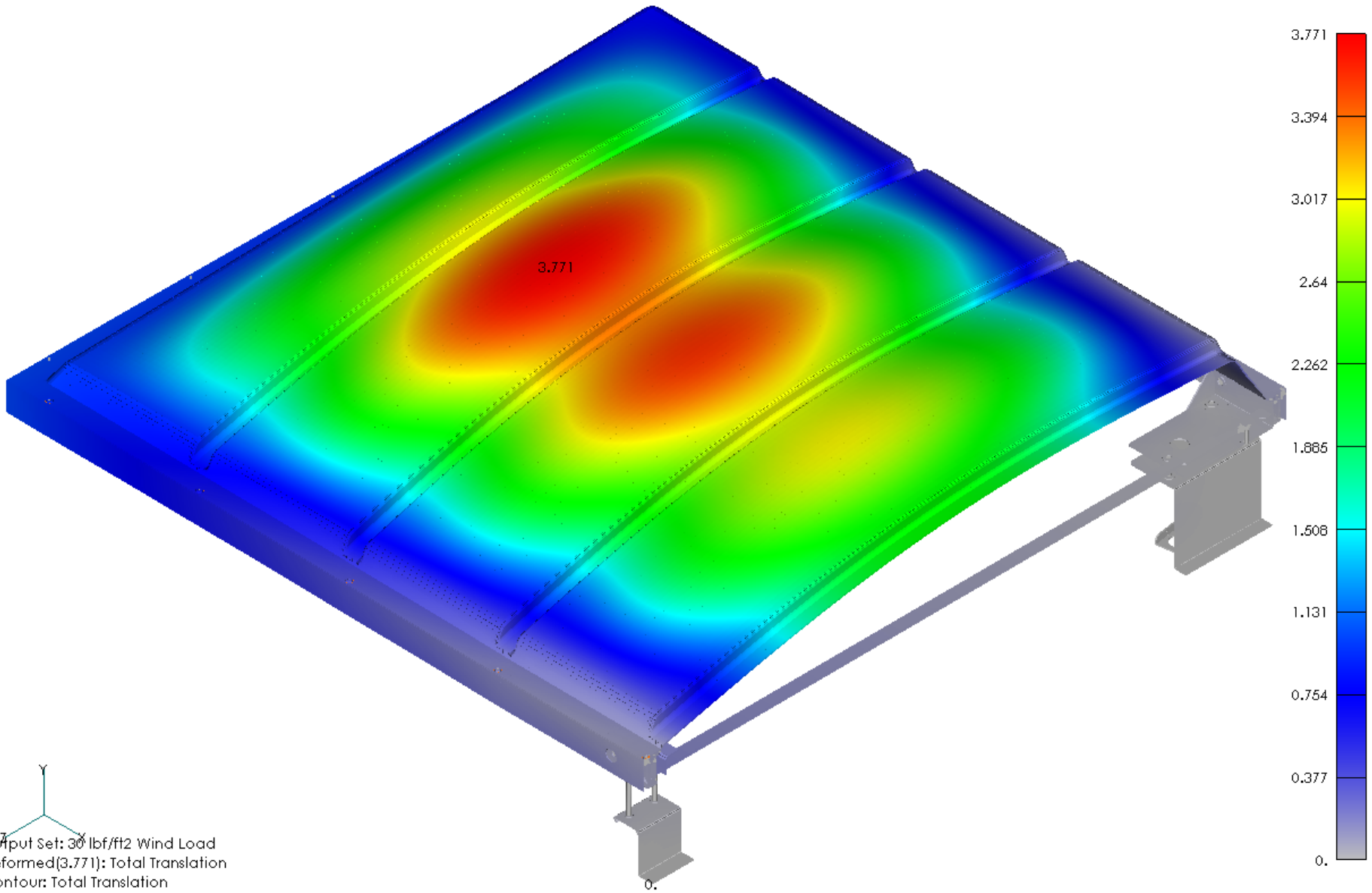
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Davis Energy Group (DEG) SunCache CAD geometry used for this analysis.



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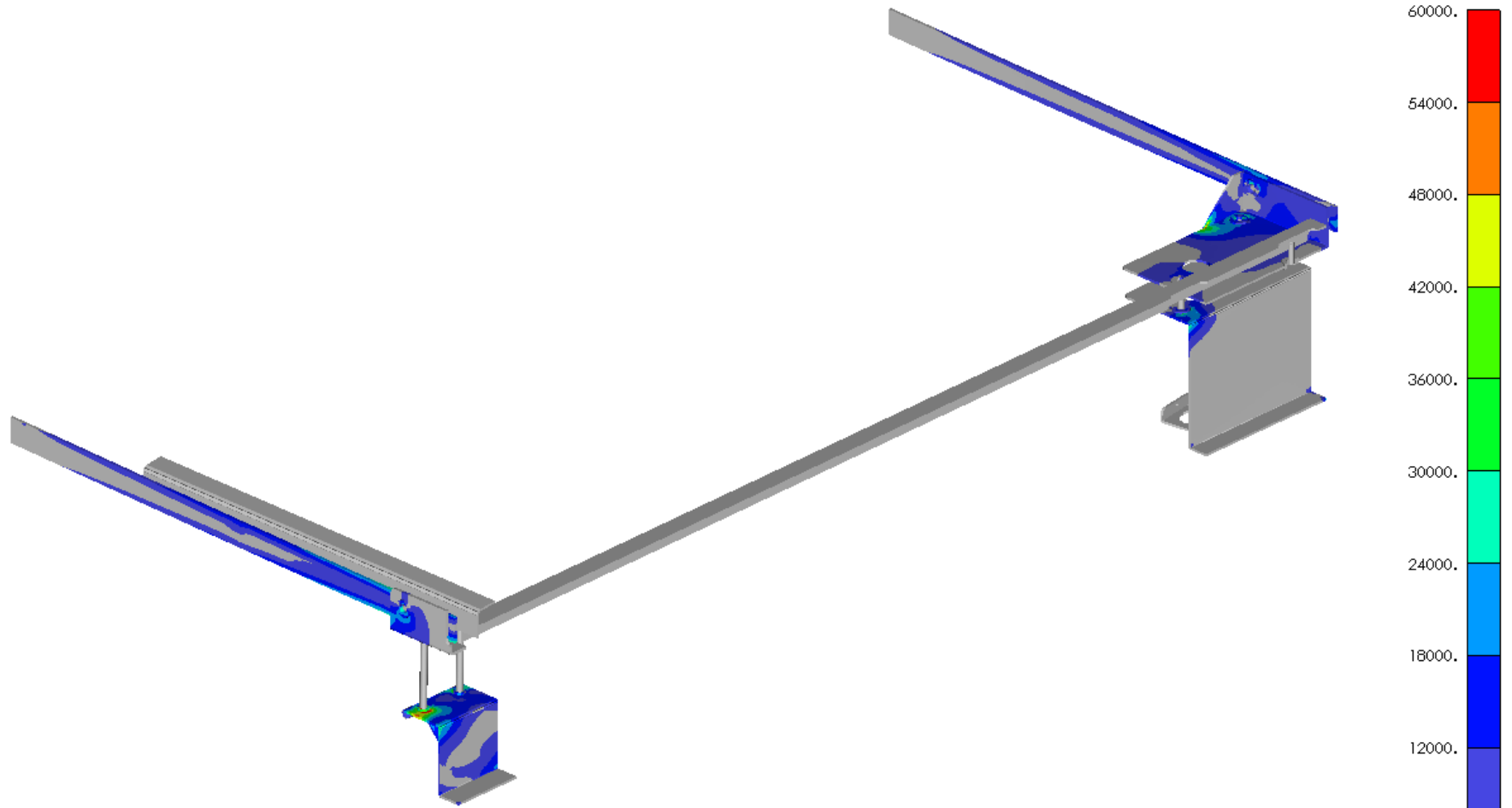
The von Mises stress is contoured over the structure. The stress legend is capped at 30,000 psi. Additional, more detailed structural information is given later in this report.



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Output Set: 30 lbf/ft2 Wind Load
Deformed(3.771): Total Translation
Contour: Total Translation

Peak deflection in the panel is 3.8 inches.



Output Set: 30 lbf/ft² Wind Load
Deformed(3.771): Total Translation
Contour: Plate Bot VonMises Stress
Contour double: Plate Top VonMises Stress

August 2003

The structural steel components all fall within the targeted stress level of 60,000 psi.