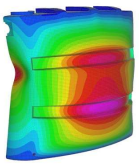


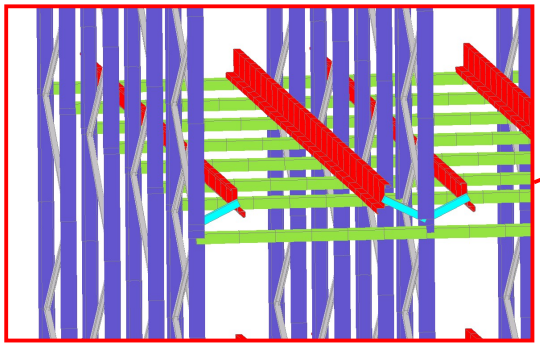
David Beneke Consulting

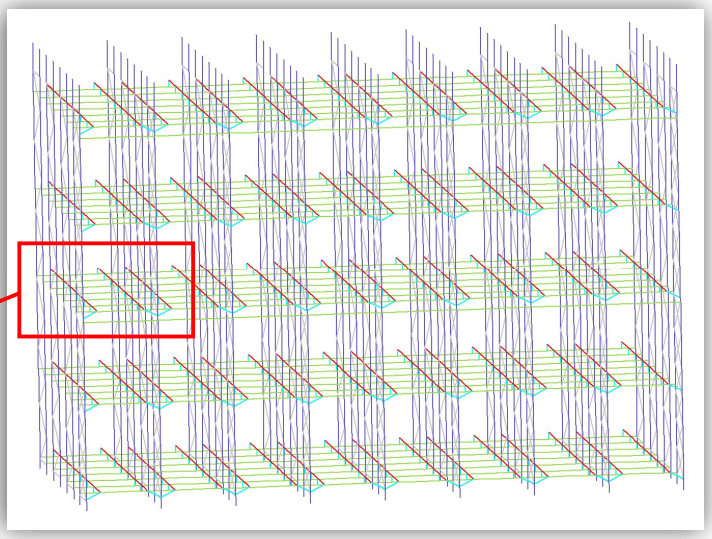
Finite Element Analysis for Engineering

SCHEFER PEPSICO - SATELLITE RACKING PROOF CHECK
Non-Linear Geometric Analysis

Date: February 2010

Client: Schaefer Systems International





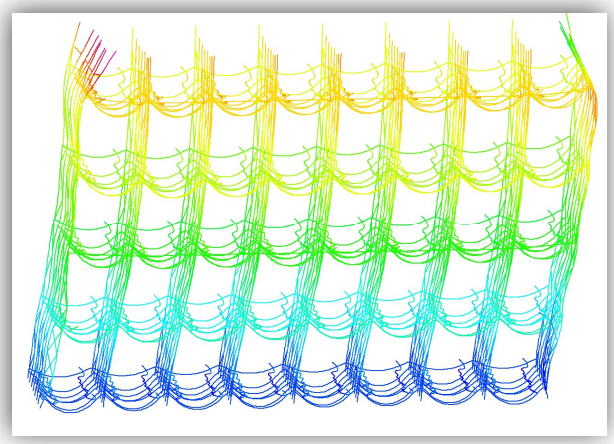
Isometric elevation of the satellite racking system at the Bazpur site with local view adjacent.

Project Description:

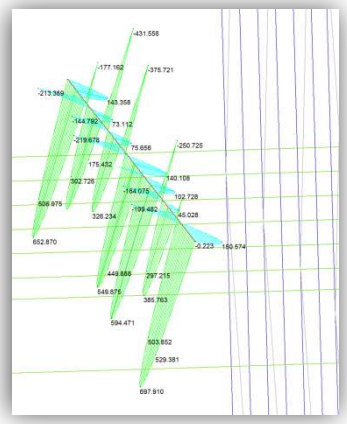
David Beneke Consulting was commissioned by Schaefer Systems International to undertake a proof check of two satellite racking systems for their client Pepsico. The racking systems were to be installed for sites at Mahul and Bazpur, India.

Each rack system was modelled in 3 dimensional form using 1 dimensional line elements to represent the uprights, beams, pallet rails and frame bracing. Properties such upright base and beam/upright rotational stiffnesses were incorporated into the finite element analysis model (FEA) via discrete moment end releases. Out-of-plumb, placement and impact loads were incorporated into the FEA model and combined together all consistent with FEM10.2.02. Earthquake loading was derived in accordance with Indian Standard IS1893 Part 1 (2002) and applied as static loads at the centre of gravity of the pallets.

A non-linear geometric analysis was conducted with the resulting member moments and axial forces extracted. Using AS/NZS4600:2005, members were checked for ultimate strength. Serviceability deflections were also assessed as with overall down-aisle sway buckling. Connection checks were then undertaken based on actions derived from the analysis compared to tested capacities and/or hand calculations.



Down-aisle sway displacement



Major and minor principal axis bending moment distributions on a typical pallet rail

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