



CAR SHADE STRUCTURAL DESIGN

KSA, February 2009

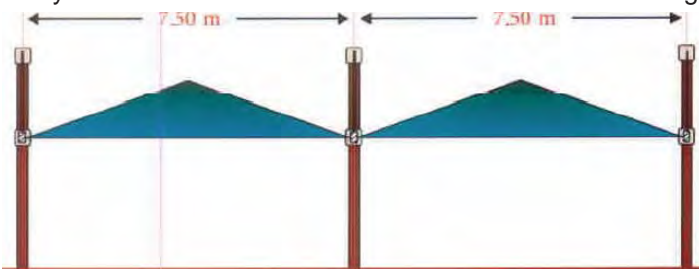
Dynamic Wind Analysis & Design Optimization

One of the cases where ASI expertise was used to optimize the structural design of a structural system was the case of newly developed innovative car-shade system. The producer had a successful product that has been installed in numerous locations. However, on installing the car shed at a certain location with relatively high wind loads it failed catastrophically.

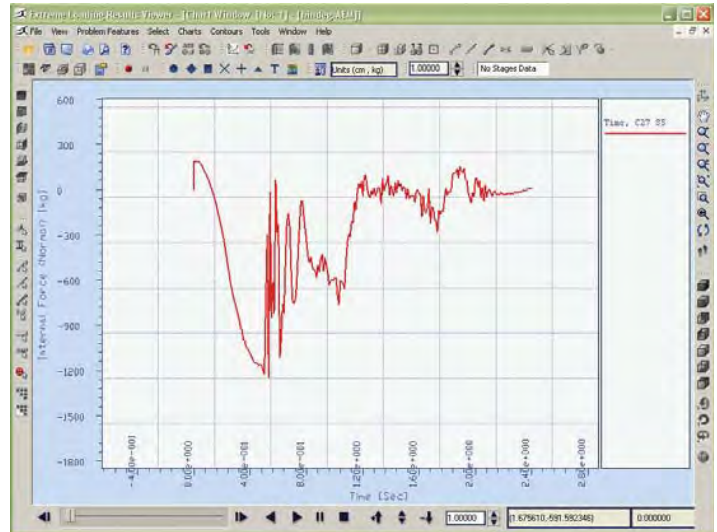


Car Shade Before & After Wind Storm

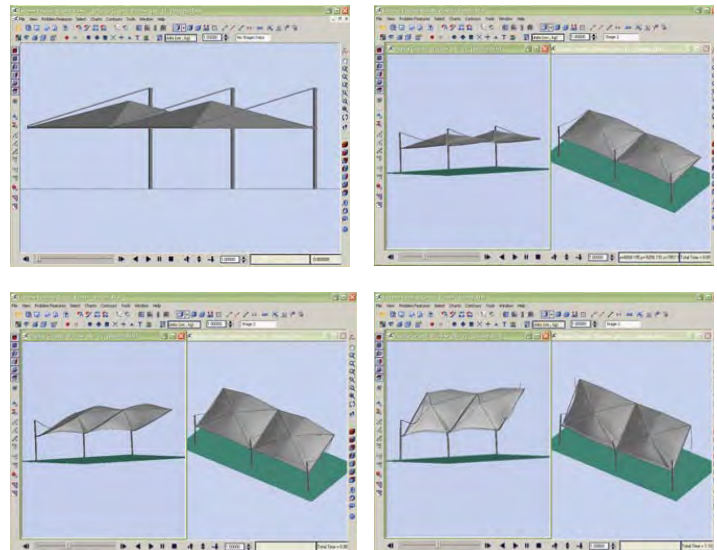
Applied Science International used its in-house structural analysis software Extreme Loading® for Structures (ELS) to create a three-dimensional model for the car-shed taking all construction details and material properties into consideration. ASI engineers performed nonlinear dynamic analysis of the structure under the effect of the wind loading.



Car Shade Construction



Time Deformation History for the Car Shade



ELS Nonlinear Dynamic Analysis of the Car Shed Showing Failure Points

Based on the 3-D nonlinear analysis, ASI was able to show the sequence of failure for the specific wind load case. ASI engineers provided recommendations for strengthening specific diagonal members which were designed as tension members but which were subjected to compression loads in this specific wind load case.

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