

## Optimizing Tensile Membrane Design utilizing CFD

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### Abstract

CFD is a process that assists designers in optimizing the design configuration of a Tensile Membrane structure. In the main small to medium creative tensile projects are not feasible to wind tunnel test due to both time deadlines and financial constraints. While forms including Hypar, Barrel Vault, Monopitch and Duopitch are documented in various international codes the conic shape and other freeform canopy profiles are not. The use of CFD coupled with FEA provides a cost effective solution in determining the anticipated wind action on complex canopy profiles. Identifying wind pressure co-efficient reactions within a canopy allows for the accurate nomination of structural steel supports and foundation detail thus elevating the issue of either over compensating or underestimating design criteria.

The following paper outlines the engineering analysis of a 80 sq mt double conic profile used as the basis of a porte cochere structure designed to 235 km/hr wind code using coupled FEA, CFD analysis.

Refer to presentation file