Project Overview

Client:	iAP G3
Status:	Final Fit Out
Date:	August 2011

H57 – GENERATOR SOLAR SHADE, AFGHANISTAN

The building is a 'scissor truss' portal frame manufactured from light gauge steel structure located in NATO base Camp Bastion in Afghanistan. The structure is approximately eight metres square on plan with purlins cantilevering over gable frames and frame cantilevering at eaves. The roof is remove-able to allow removal of the generators for repair. The frames are also spaced such that the generators can be slid out without structural alteration. Design was carried out to British Standards, and wind speed of 25m/s generated a wind load of 1.3kN/m^2. Holding down requirements were two twelve millimetre bolts per base.

Light steel framing uses galvanized cold form steel sections which were used as the main structural component with 'C' sections acting as the purlins spanning between frames. 'Portal frame' (Scissor Trusses) were prefabricated in a factory and later combined on site. Single skin cladding was used as the external skin, as the structures are to provide shade only. Light gauge steel can be designed to carry any skin or finish.

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The mono pitched roof consists of trusses assembled from C-section members. Trusses were spaced to suit the clients requirements and optimal material use age The frames were designed to provide lateral stability in the plane of the frame, and eaves frames were added to provide stability in the perpendicular direction..

The frames are connected to each other on site using conventional techniques, i.e. self-drilling screws. Frames are fixed onto previously installed concrete floor using bolts to meet holding down and shear requirements. Due to the relatively high wind speed there was a need to check the racking and overturning resistance of the building. The frames with the eaves frames provide their own inherent racking stability.

The project is one of many that the practice and iAP G3 have designed and manufactured together. Previous projects have included a working dog compound, generator farm solar shades and many other enclosed buildings such as the two storey conference centre designed to Eurocodes with Seismic design included.

The structural system is designed and erected in accordance with the guidance of Steel Construction Institute for light gauge steel framing in residential construction, P301. This design highlights that Light steel framing extends the range of steel framed options into commercial construction, which has traditionally been in hot rolled steel and masonry. Overall the project benefited from adopting light steel framing solution which combines the benefits of a reliable quality controlled product with speed of construction on site and the ability to create existing structural solution.

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