FALE PASIFIKA - UNIVERSITY OF AUCKLAND

Constructed in 2003 and 2004, the University of Auckland Fale Pasifika is a landmark structure, both in its form and its use of traditional materials. It was an interesting and absorbing project for all of the design team and presented many creative and technical challenges.

Traditional Influences

The University of Auckland Fale Pasifika is a fusion of traditional form and function with modern technology. Its iconic upturned boat form was developed over time based on functional requirements, natural material availability and tools and building skills available.

The Samoan culture is historically an ocean going one and a need for the shelter of large canoes led to the development of the first canoe houses.
This original structural form was determined the abundantly available naturally curved coconut rafters, creating a structurally efficient arched form.

This initial basic arched "shed" structure developed with time into the "long house". Roof spans were increased with the use of a king post and transfer beams. This form of the building was traditionally used as a guest house.

The next development was the addition of rounded ends and some enclosure of the walls creating a larger and more secure volume which could serve as a meeting place.

With the passage of time, a highly skilled guild of Fale builders was developed. Skills and techniques were nurtured and passed into tradition. Complex shape and intersection problems were solved, resulting in systems that ensured flexibility in detailing and site assembly. This flexibility compensated for the variation in natural materials and limitations in the available technology.

Structural Design Challenges

The main structural challenge was to make the building comply with current practice, design codes and legislation while being as faithful as possible to traditional methods, materials and aesthetics.

This was achieved by adopting a "reverse" engineering approach. The finished appearance of the structure, particularly the main structural intersections was used to develop the detailing and geometry of the connections.

This enabled traditional structural configurations to be maintained while the connections were updated to produce structurally determinate and reliable load transfer mechanisms.

Typical examples include the use of timber for all the main structural members, traditional lashed connections which conceal steel plates and bolts and concealed SHS purlins added to the curved roof ends to help achieve the required dimensions.

Structural System

Gravity loads are collected by the roof plywood membrane on secondary rafters at 600 centers then transferred to the main frames by longitudinal purlins. The main frames act as arches, carrying most of this load axially.

Lateral wind and earthquake loads are resisted by the base cantilever action of the main 400 diameter round pole columns. Bolted knee joints contribute to the strength and stiffness of the frames.

A steel hollow section ring beam at eaves level act as a longitudinal tie and contains spreading forces from the curved roof ends.