

Longitude 131 Degrees – Luxury Tents & Central Facilities

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INTRODUCTION

Longitude 131 Degrees is an exclusive hotel located on the edge of the Uluru-Kata Tjuta National Park, some 15km's north of Uluru and 2km's from other accommodation at Ayers Rock Resort. It contains 15 luxury hotel rooms, housed within individual tents, and a central facilities structure containing guest lounge and dining functions.

The site is a remote, crescent-shaped dune with uninterrupted views of Uluru, reached only by 4wd vehicle. Environmental protection of the dune flora and fauna during both construction and occupation formed an important part of the brief and led to some important design decisions. One such decision was to elevate the individual tents on steel piles to leave the sand untouched below and allow the rooms to be removed or relocated at a later date, leaving minimal remnants that the rooms ever existed.



Figure 1 - Location – Uluru-Kata Tjuta National Park

The 15 hotel rooms are located along the crescent of the dune and look towards Uluru. They are accessed on foot via a compacted earth path on the low side of the tents to minimise damage to the dune. The elevation of the rooms allows them to look over the path without loss of privacy.

The rooms are a simple box in plan, with a fully-glazed south-facing wall encapsulating the expansive view and sliding panels that open half the façade. Each room is roofed in three layers of fabric. The outer layer is a fly in the traditional sense, providing shade and a majority of weather protection, and shaped to evoke little dunes using a central prop and inclined struts. Cable ties drop vertically on to screw piles around the perimeter of the tent. Below the fly are two layers which form a sealed cavity for thermal insulation, stretched from the mast to a head member running around the tops of the walls.

The central facility building is split into two forms which address the functions housed within. A lounge and dining area exist under a voluminous, masted tent with open sides which can roll

down for insect or weather protection. The back-of house functions are walled with masonry which is concrete reinforced at tie-down points for the fabric structure.

The climate in Central Australia is harsh. Clear skies result in summer daytime temperatures that routinely top 40 degrees C. The same clarity gives unequalled night views of the heavens but in winter cause the mercury to fall below zero. A luxury tent has to insulate against all of this.

STRUCTURAL SYSTEMS

The structural system was a product of the design intent.

- i) Individual luxury tents.

The structural system was designed to suit not only the architectural brief but also keeping in mind the remoteness of the site and the extreme environmental sensitivity during construction. Plant and equipment were both scarce and access limited to small areas of sandy tracks in the construction area. Consequently all pieces had to be light enough to be erected using limited equipment.

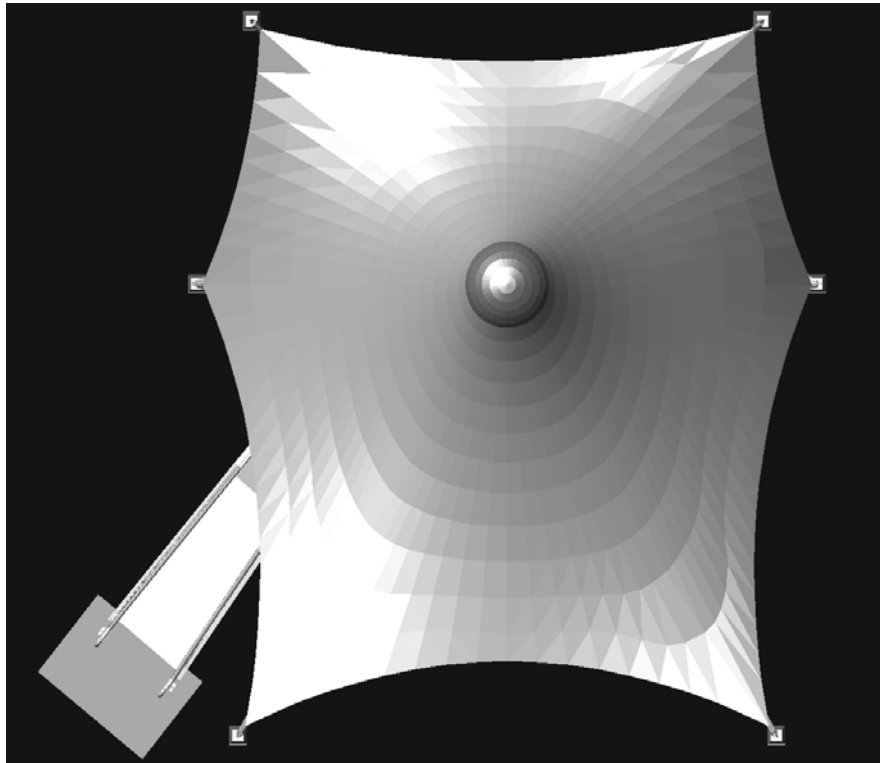


Figure 2 - Top View – Individual Luxury Tents

A platform was established to enhance views of Uluru whilst making minimal impact on the dune.

Screw ground anchors were chosen for the foundation system for their rapid installation, low environmental impact, and light weight. The geotechnical conditions were simple – sand. Excavation was kept to a minimum. Accuracy of installation of these anchors was paramount but by clever detailing required tolerances were maximized. The superstructure was fixed directly to the top of the steel anchors.

This floor platform is of steel beam and joist construction with chipboard flooring. It also acts as a diaphragm to distribute lateral loads to the brace sets of the supporting structure.

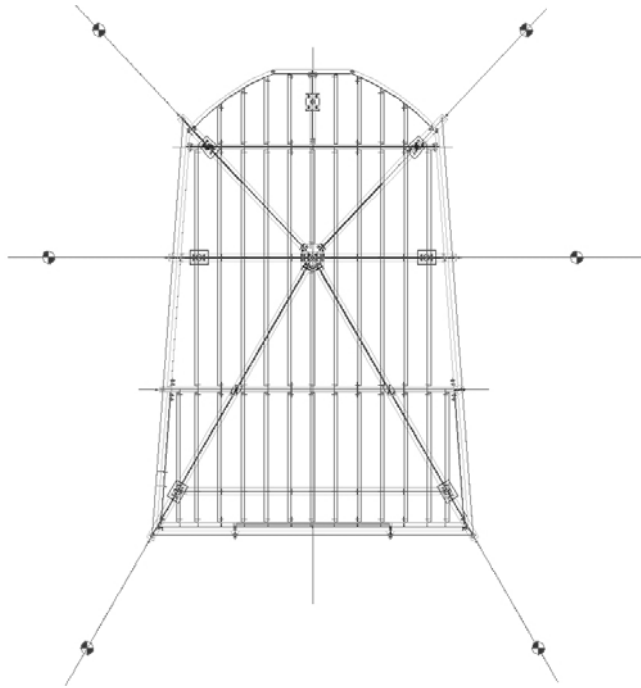


Figure 3 - Floor Plan – Individual Luxury Tents

A steel ring beam at the top of the wall supports both inner skins of the roof system as well as the top of the walls. The walls are simply panels placed between the supporting columns of the ring beam but they do provide a substantial bracing effect. The external bracing was necessary on the clear span glazed front walls but on the side walls was really only a construction aid.

A central column supported all the fabric cone tops. The outer skin had a fixed bale ring but the inner skin rings were adjustable to allow proper tensioning.

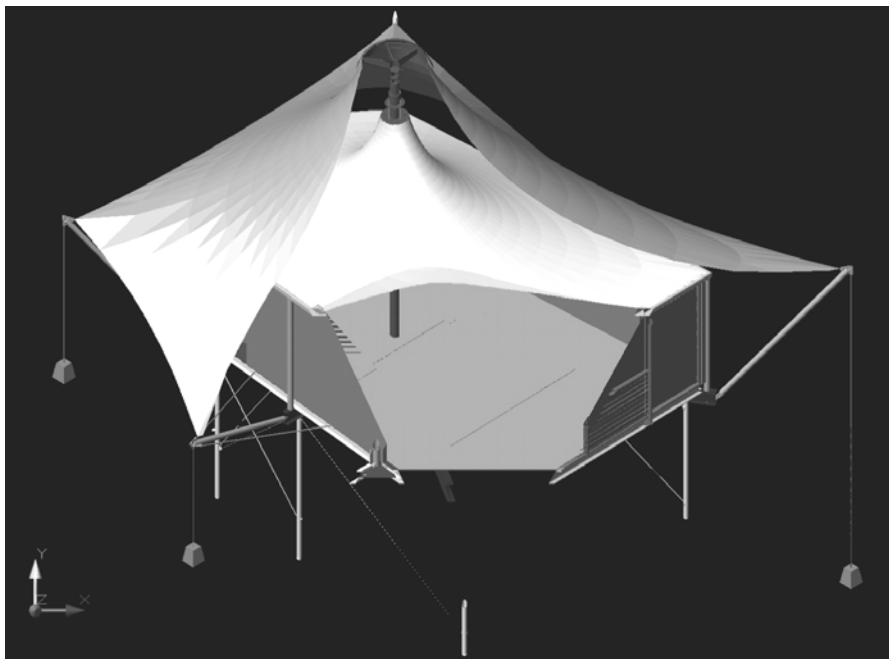


Figure 4 - Cross Section – Individual Luxury Tents

To minimize racking loads to the structure, guy cables to the ground were kept as vertical as possible. This kept the design of the screw anchors to mostly vertical loads and a clean appearance of the structure.

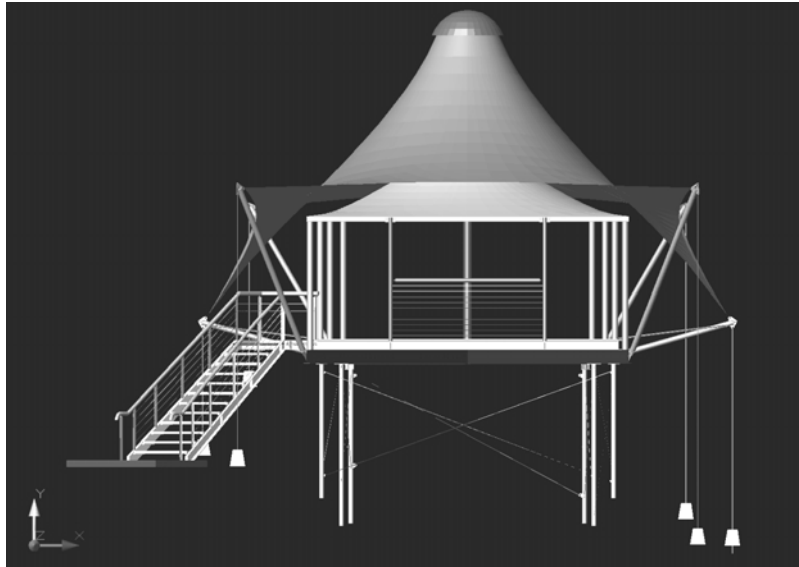


Figure 5 - Side View – Individual Luxury Tents

The outer of the three skins is the primary protection against radiant heat. It protects the structure beneath from both solar gain and “clear sky” heat loss. The space underneath this layer is ventilated freely from all sides.

The inner two layers form a blanket that traps a layer of air to provide an insulating effect against conductive heat. The system is designed to give a total coefficient of heat transfer (U value) of 2.4.

ii) Central facilities.



Figure 6 - Central Facilities

The sheer size of the building led to the decision to house back-of-house facilities in masonry construction. Small concrete pours were possible and the blocks easily transported.

The lower level of the building contains plant and storage, bounded by block walls to create a plinth which support a concrete slab over. The upper level is split into guest and back-of-house functions using a curved masonry feature wall. The public areas are roofed in fabric with the remainder, behind the wall, simply sheeted in steel.

Twin, inclined masts provide the drama and volume of the public space with inclined struts on the front edge of the slab. The rear edge of the fabric is pulled on to the top of concrete blade walls and the sides to the curved feature wall.

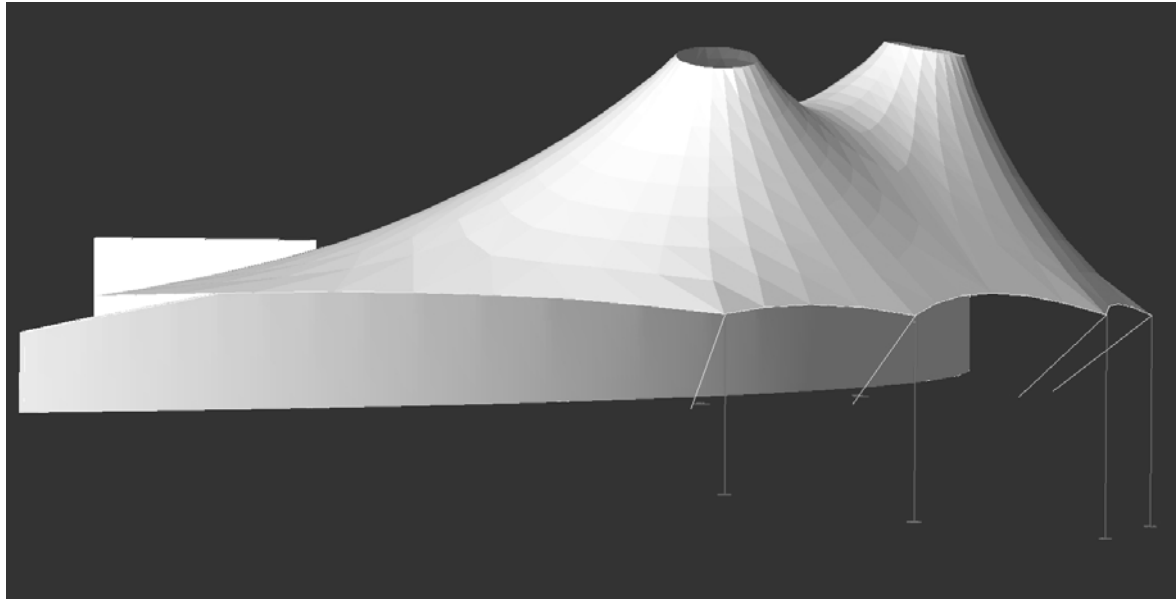


Figure 7 - Side View – Central Facilities

MATERIALS

Philip Cox & Partners designed Yulara Tourist Resort, as it was then known, for the Northern Territory Government in the early '80s.

Experience gained from the earlier buildings assisted in selections of materials successful with dealing with the harsh environment of central Australia. Steel can be adequately protected using relatively simple paint systems; polyester-coated fabric sails have endured 20 years of harsh sunlight relatively well, acquiring a pink hue from the red dust of the desert; single skin block walls work satisfactorily if they have a waterproof paint-system applied; colourbond steel sheet works well, whereas timber can only be used in enclosed situations, fully shaded from the sun.

The successful materials were implemented into the project, with an emphasis on ease of transport and erection at the remote location.

All fabrics used in the tents are PVC/Polyester fabrics (Ferrari 1002T external skin and Ferrari 502T on the inner skins).

Cables are all stainless steel.

FABRICATION

The building forms were kept relatively simple for ease of fabrication and erection. A majority of the materials were transported to site using utility vehicles. Large and complex structures could not be physically erected.

The largest vehicle to visit the site was the piling rig, which was small and lightweight enough to deal with the compacted sand service track.

CONSTRUCTION AND MAINTENANCE

A main part of the reason for the selection of PVC fabric is its self-cleaning properties and low maintenance required when used in this dry environment.

COSTS

The construction cost of the entire project, excluding interior fit-out and consultant fees, is approximately \$4 million.



Figure 8 - Individual Luxury Tents

ACKNOWLEDGMENTS

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