

**KOORALBYN VALLEY RESORT  
A LESSON IN THE INTEGRATION OF MEMBRANE STRUCTURES**

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**Kooralbyn Valley Resort Heart is a new hotel/convention development located in a picturesque valley 100km from Brisbane. It was conceived with membrane structures forming an integral part of the design.**

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1. **INTRODUCTION**

Rarely do membrane structure builders get the opportunity to be involved in new development where membrane structures are brought into the design process as a fully integral part.

Greenway architects David Oliver and Geoff Watts have used membrane structures previously and were familiar with the possibilities, unique properties and benefits they can give to the right development.

There are over 30 individual membrane structures in the project.

2. **PROJECT DESCRIPTION**

Kooralbyn Resort Heart includes a 100 room Hotel, Convention Centre, Health & Beauty Centre, Landscaped Walks and Amphitheatre.

The unique design includes use of rammed earth (Engineered Aggregate) walls, conventional metal deck roofing, steel frame supported, and conical membrane structures.

In total, over 2100 sq.m. of membrane structures are incorporated in the resort, being:

- Main Atrium : 500 sq.m.
- Large Walkway Shades: 600 sq.m.
- Small Walkway Shades: 750 sq.m.
- Porte Cochere & Amphitheatre: 150 sq.m.
- Gazebos & A-La-Carte: 100 sq.m.

The Main Atrium is a conical form rising from the fifth level, supported by a slender flying mast suspended on stainless steel cables (see photos 3, 4).

The large and small walkway shades are arch forms, some linear and some with 90° re-entrant angles. The large shades are based on a 4.5m x 4.5m module, the small, a 4.5m x 2.4m module. (See photos 5, 6).

The Main Atrium has a part circular and part rectangular form in plan.

Photo 1

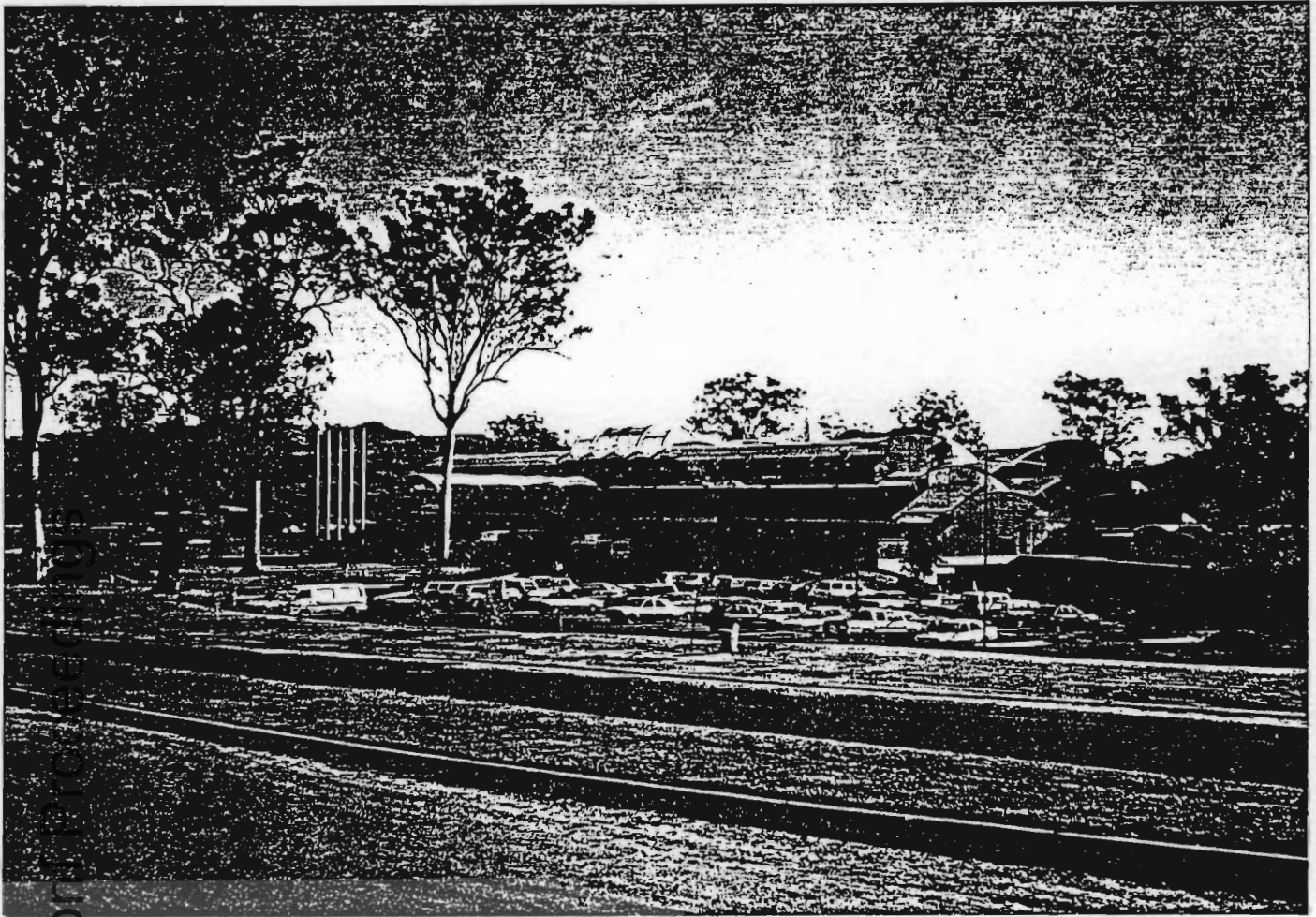


Photo 2



### 3. DETAIL DESIGN

#### Fabric Selection

For the Main Atrium and Porte Cochere Seaman Tedlar® 8032 (Type III) was chosen, and for the Walkway Shades Seaman Tedlar 8424 (Type II).

#### Support Structure

The Atrium was supported by a galvanised and powder coated flying mast. Walkway shades were supported on arch steelwork supplied under a separate contract.

#### Cables & Fittings

Edges were supported by stainless steel wire rope in catenary pockets, and fixed clamp plates. Exposed clamp plates were galvanised and powder coated fixed with stainless fasteners. Bolting to existing steelwork was galvanised.

Main Atrium flying mast was supported on six (6) 12mm Stainless cables with Ronstan rigging screws.

#### Patterning

Shapefinding was by finite element method and patterning used geodesic strings to optimise strip shapes.

Specialist consultants for this work were McWilliam Consulting Engineers and McLean Wade & Pnrs.

### 4. CONSTRUCTION

The construction was staged in two main periods: November - December 1990 and March - May 1991.

Photo 1 shows the overall view of "The Kooralbyn". Photo 2 shows the Porte Cochere, and small shades along the front of the hotel.

Photos 3, 4 shows the Atrium and detail of the flying mast support.

Photos 5, 6 shows completed Large Walkway Shades at the Health & Beauty area and the Conference Centre.

Photo 3

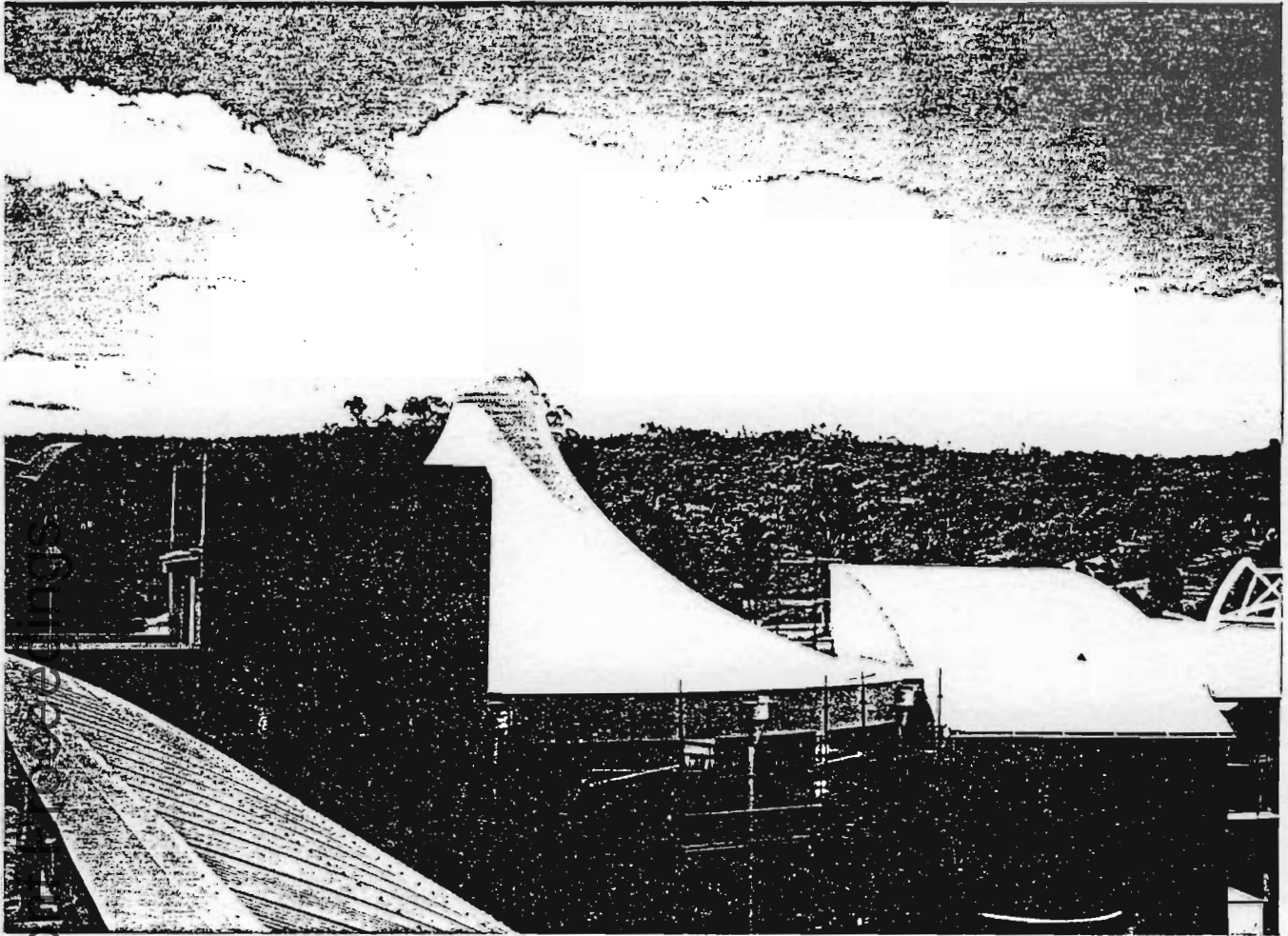
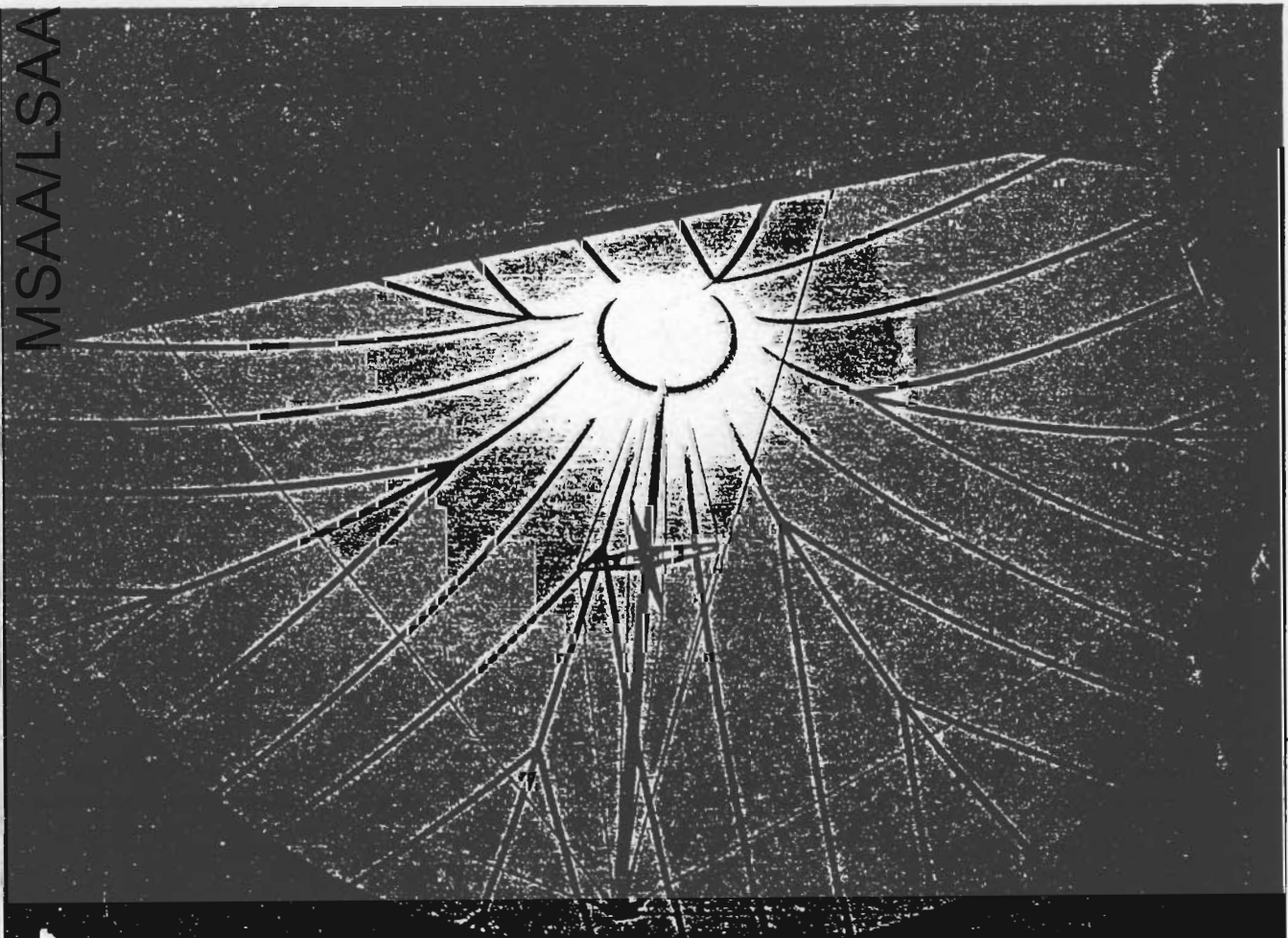


Photo 4



MSAA/LSAA ©



Photo 5



Photo 6



5. CONCLUSION

The project combines interesting and unique technologies: Rammed Earth and Membrane Structures to produce an exciting and attractive building which both blends into and enhances the country resort landscape.

This is another project which emphasises the growing maturity of the membrane structures industry and the confidence of architects in handling the form, and acceptance by clients developing high quality facilities.

MSAA/LSAA Conf Proceedings

**KOORALBYN VALLEY RESORT HEART**

Client:	Leisure Time Project Management
Architect:	Greenway Architects
Engineer:	G.H.D. Brisbane
Membrane Design	
Construction :	Vesl Tension Span®