

MALLS AND ARCADES - SOME CITY SOLUTIONS:

DAVID McCREADY

Director, Spacetech Pty. Ltd.
2 **Simpson** Street, Moorabbin, Victoria. 3189

As urban sprawl multiplies and the pace of modern life quickens we often look wistfully back to times when grace and form seemed more essential than maximal returns from space use.

Occasionally a contemporary building technology echoes some of those presentiments by accident or volition. Membrane structures are such a form which lately are partly invoking the light, curving style of the Victorian era as shelter in our busy public ways.

This paper looks at four projects using membrane structures in streetscapes.

Inner-city renewal programs have been rampant now for a decade in urban Australia. The push stems as much from quality of life issues as those which are purely commercial. Decentralization and the growth of suburban shopping palaces have disturbed traditionalist patterns of 'going to town' to shop.

The development response in the CBD citadels of merchandising is predictable and timely.

The notion of a street without vehicles was initially viewed as a great heresy by devotees of the automobile madness. Shoppers and merchants alike were appalled at the notion which was nevertheless pressed forward by modern designers.

Across Australia, dead hearts are being resurrected into living cities where human scale is again the rule. Almost every city has experienced this reconfiguration of its centre within the last few years and those which were earliest to understand the need for more human access to the centre of their city are now going through phase two, that is upgrade of previous developments.

The design vernacular for street malls and arcades was initially somewhat naive and apparently limited to a standard brace of choices covering street furniture, drinking fountains, lights, trees, a fountain and a few flagpoles.

Designers' understanding of open space design in urban environments have become more sophisticated and diverse in the last decade with projects ranging from pocket handkerchief malls such as Bourke Street in Melbourne to the vast and rightly acclaimed Darling Harbour project in Sydney.

Membrane structures are an ideal form for inclusion in public space due to their lightness, geometrical interest and complexity and their lack of intrusiveness as a shelter. While they are being designed increasingly into urban space, they are not endangered by over use or cliché while there remain creative designers to manipulate the versatile and almost limitless possibilities of the **form**.

This paper looks at four case studies where membrane structures were utilized successfully in small and large scale to enhance urban development.

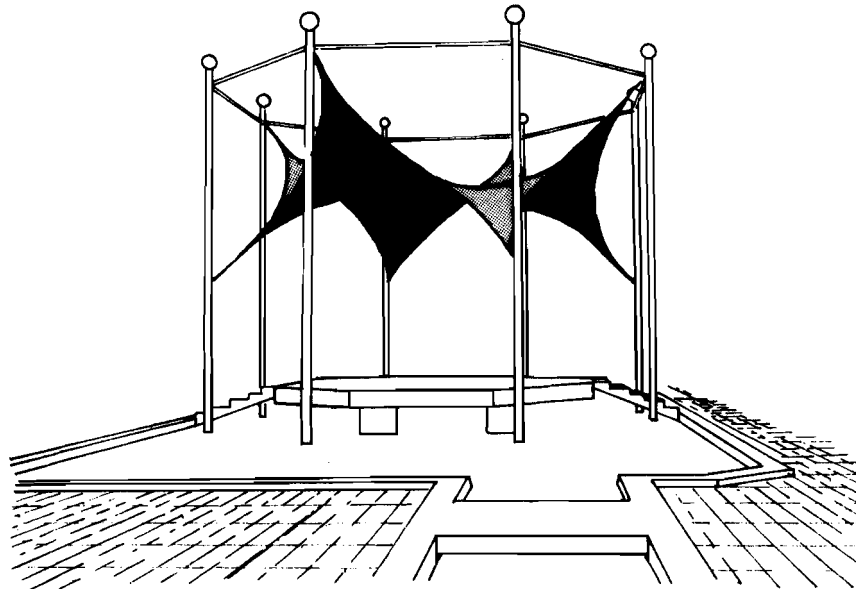
LANGTREE MALL PODIUM ROOF - MILDURA:

North of Mildura across the Murray, roads disappear and civilization disintegrates; the desert takes over. South, the dry Mallee stretches a long way to the fertile plains of central and southern Victoria, while around Mildura, irrigation has assisted the development of one of Australia's richest fruit growing areas. It is a country centre where on Saturday, social meetings are held on the main street as is typical of many country towns in Australia.

The traffic was never heavy on Langtree Street, but the Council saw the advantages of allowing free pedestrian flow through the heart of Mildura. It took steps to obtain funding assistance from the Victorian Government Department of Planning and the Environment for the Langtree Mall.

The mall covers a long city block and is constructed in the style of country living, unpretentious and open with shade trees and seating and large gathering spaces for the population to meet on their way from place to place.

A central feature of the mall is a shallow reflection pool surrounding a raised entertainment podium covered by a membrane structure suspended from elegantly finished stainless steel external framework.



LANGTREE PODIUM - PERSPECTIVE

LANGTREE MALL PODIUM ROOF:(cont)

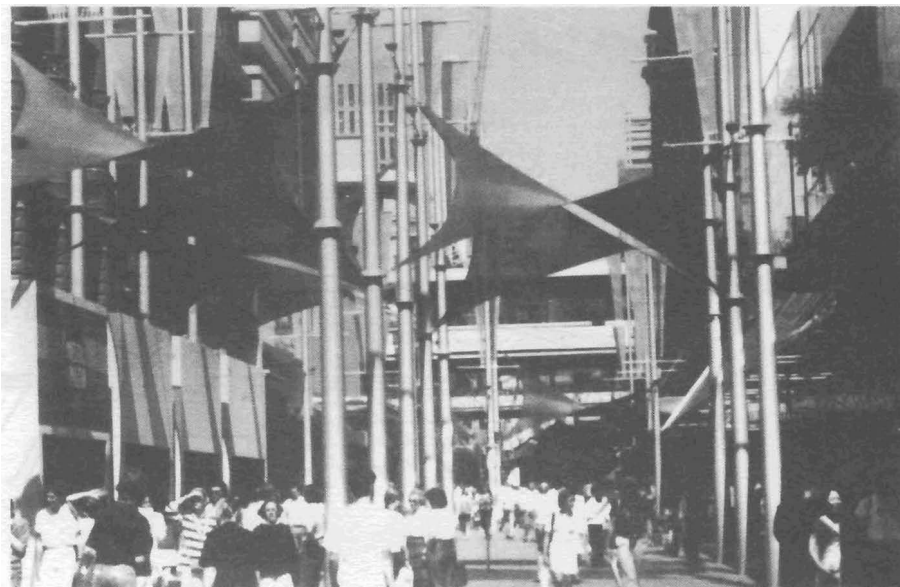
As the podium has no one aspect, a symmetrical design was used for all around approach. An octagonal plan gave maximal cover to the circular stage without extension past the pool's edge. Guy cables were wanted to maintain an uncluttered perimeter. The 8 polished stainless steel masts are set at regular intervals about the podium reaching to an equal height where they are braced by horizontal members. The masts are terminated by a spherical finial.

From this frame at two levels springs the curving octagonal shaped membrane structure carefully detailed in stainless steel fittings. Here we have membrane structure as sculpture. A highly curved form, somewhat reminiscent of rotunda structures, makes an understated focus for street activities and defines place for performance and entertainment.

PITT STREET MALL - SYDNEY:

Sydney is notorious for its traffic congested inner-city roads and the hectic pace of pedestrians weaving along crowded narrow pavements in the downtown region.

Throughout Sydney, areas of relative calm are being introduced by the creation -- pedestrian oriented plazas and malls. Ironically the development of these relatively peaceful zones exacerbates the traffic problems in the other regions, however the human face of Sydney certainly has improved with the completion of Darling Harbour, the Circular Quay parade to the Opera House and the Pitt Street Mall.



PITT STREET MALL

PITT STREET MALL: (cont)

In 1985 The Council for the City of Sydney commissioned Environmental Landscapes to develop designs for the pedestrian mall in Pitt Street and to carry out traffic flow studies to accommodate the consequent disruptions.

Following a prolonged development period, the mall was finally built with completion in 1987.

The mall occupies a city block in the busy heart of Sydney and although it met opposition from a few sources, the developer response has been more than favorable with numerous upgrades and new building projects going ahead in the street regions affected by traffic closure.

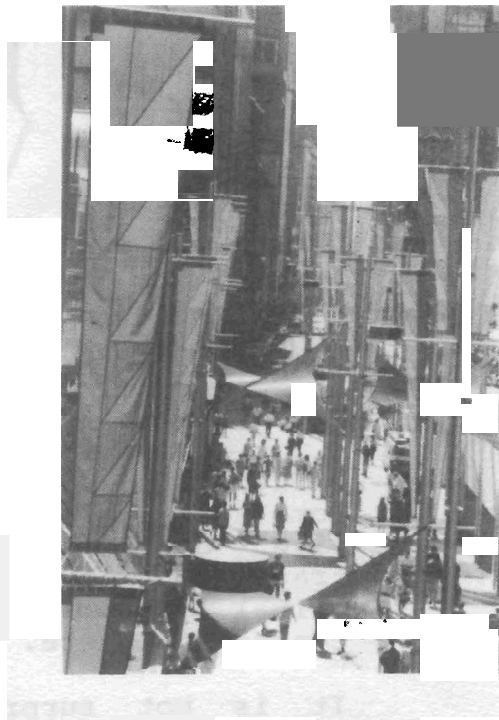
One creative aspect of the design is the use of membrane structures and banners designed to invoke the spirit of each season. Four times annually the livery of structures and banners is changed to present a new face to Pitt Street, including design and color changes in the banners and color and configuration changes in the structures.

The 8 hyper shapes span between un-guyed masts giving the impression of sailing in space. They do not attempt to be shelter against rain, but provide shade in summer as well as breaking down a vertical landscape to a more human scale.

In an environment of narrow streets and tall buildings, trees suffer slow growth through low sunlight levels and traffic fumes exacerbate this dilemma. The structures and banners are set on and among vertical cantilevered masts up to 15 metres in height, virtually replicating the tree form.

Designed to be changed regularly, the livery of 66 banners and 8 hypars are simply removed and replaced in a one day period each cycle.

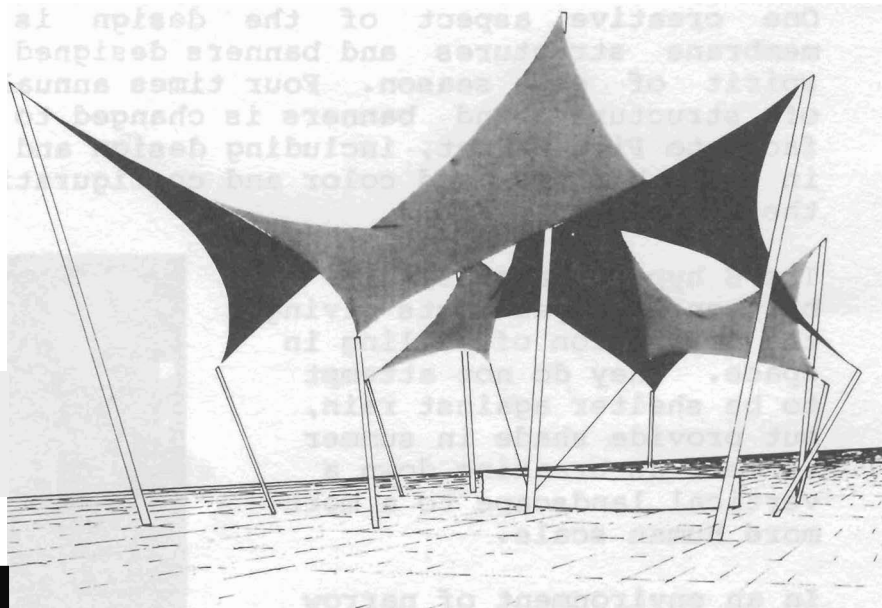
The result has been a welcome introduction into Sydney's grey canyons of colorful decoration along with a positive shift in the proportion of central Sydney devoted to people use.



TODD STREET MALL - ALICE SPRINGS:

Alice Springs is the gateway to Australia's heart. She stands as the guardian of The Dreaming, The Rock, The Olgas and much more. The area is an energy centre and consequently it attracts enormous numbers of travellers visiting a climatic area which has an extreme diurnal range.

Its population of 25,000 is outnumbered tenfold by annual tourism. Its basic form was that of a rambling and isolated desert town lacking big city formality. These qualities dichotomy, on the one hand interesting and quaint, and on the other unaccommodating to the increasing U.S. and Japanese tourist quotient.



TODD STREET MALL - PERSPECTIVE

Downtown, Todd Street runs parallel to the Todd River, home of the famous and satirical Henley-on-Todd dry river boat race. It has been through a transition from track to city centre in this century and still the tribal groups, Aranda, Pintubi and Pitjantjatjarra congregate there.

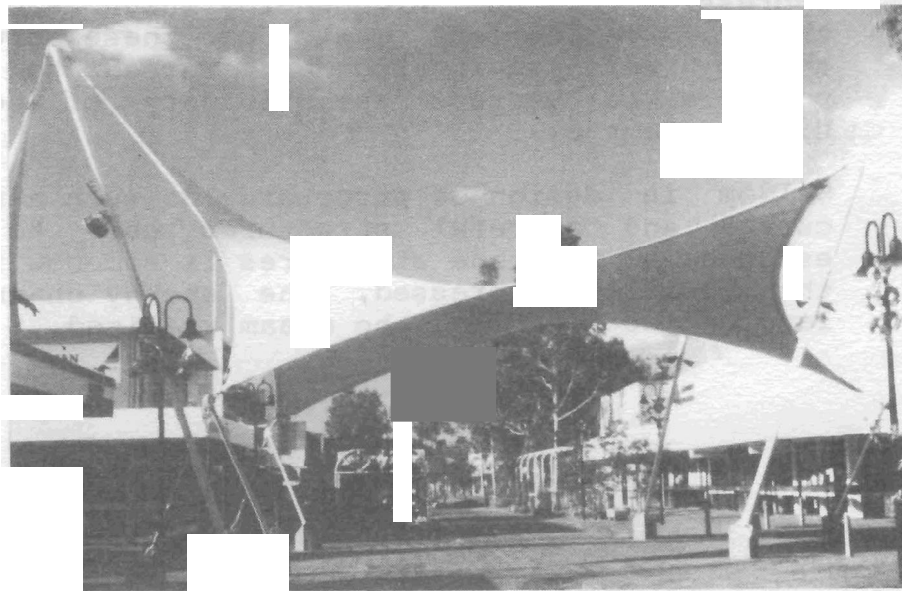
It is not surprising then for the basic design of the Todd Mall to reflect dot paintings, typical of these groups, in the paving patterns.



TODD STREET MALL:(cont)

The mall covers two blocks flowing into an intersecting street, forming a cruciform shape. Its arrangement provides an avenue through shady plantations dotted with seats. In an environment where 49 degrees C. plus temperatures are endured for months, shade is a must

The focus is the intersection of Parsons and Todd. Here, a set of most elegant membrane structures spreads across the intersection, sharing a common mast. The major structure forms a triumphal arch to Todd Street, while the smaller creates shelter over a podium set off the main pedestrian way.



The brief demanded that the structures accommodate efficiently the existing in-ground services, provide minimum pedestrian traffic interference with structural elements, while not overwhelming the largely single storey buildings surrounding the area with respect to height.

Further, they should provide much needed shelter with a form which was suited both to the needs of a booming international tourist town and one which has its roots deeply embedded in 40,000 years of culture.

The site parameters swiftly defined the outline requirements with the presence of in-ground services, awnings and buildings applying clearance requirements and the need to cover the intersection region, plus the podium causing the shape to be long and distended.

TODD STREET MALL:(cont)

Spanning over the major intersection appeared obvious to create the unencumbered gathering space under the central circle of the paving pattern in the street, while the achievement of the cover over the podium suggested a two structure solution with a unifying element being the main mast set just off the intersection to slightly downplay its scale in the street.

The main mast was set along the resultant of the forces between the two structures, this proving to be a fairly racy angle. Accordingly it was decided to strongly incline all of the perimeter masts to give the impression of the high energy which is constrained by the guy cables and masts of these structures. The shapes were sculptured and warped to the maximum possible to express the fluidity of the form to the highest degree.

Seldom in design of structures do such a set of highly curved and graceful structures come to life. The essence of membrane structures is somehow focused here, the fluidity expressed, the energy channelled. In a land of The Dreaming, the dream realized.

PRESTON MARKET REDEVELOPMENT - VICTORIA

A feature of all Australian cities was once their public produce markets dotted around the city region. Most cities have lost them to the needs of expensive real estate and high rise development or moved them into distant locations. Not so Melbourne which proudly continues the tradition with such wonderful centres as the Victoria Market complex.

At Preston in the early 1970's, a redevelopment was carried out which utilized probably Australia's first space frame in a highly contemporary piece of architecture.

Market squares are formed by blocks of shops covered with space frames which cantilever to form deep eaves. The passages left were open and exposed resulting in an uncomfortable bleakness during rain, cold and wind.

Upgrades had somewhat passed Preston by until recently when its new owner Interwest decided that the arcades should be covered to provide continuous shelter in Melbourne's often inclement weather.

Membrane structures seemed a natural choice for the project as they cover, but leave an impression of openness and light. In the design process we chose to not attach to existing buildings, but to independently support the lines of interconnected membrane modules from steelwork inside the arcades.

This allowed a differential design clearance between existing and new to take up site gradient and provided a venting gap to prevent high temperatures in summer.

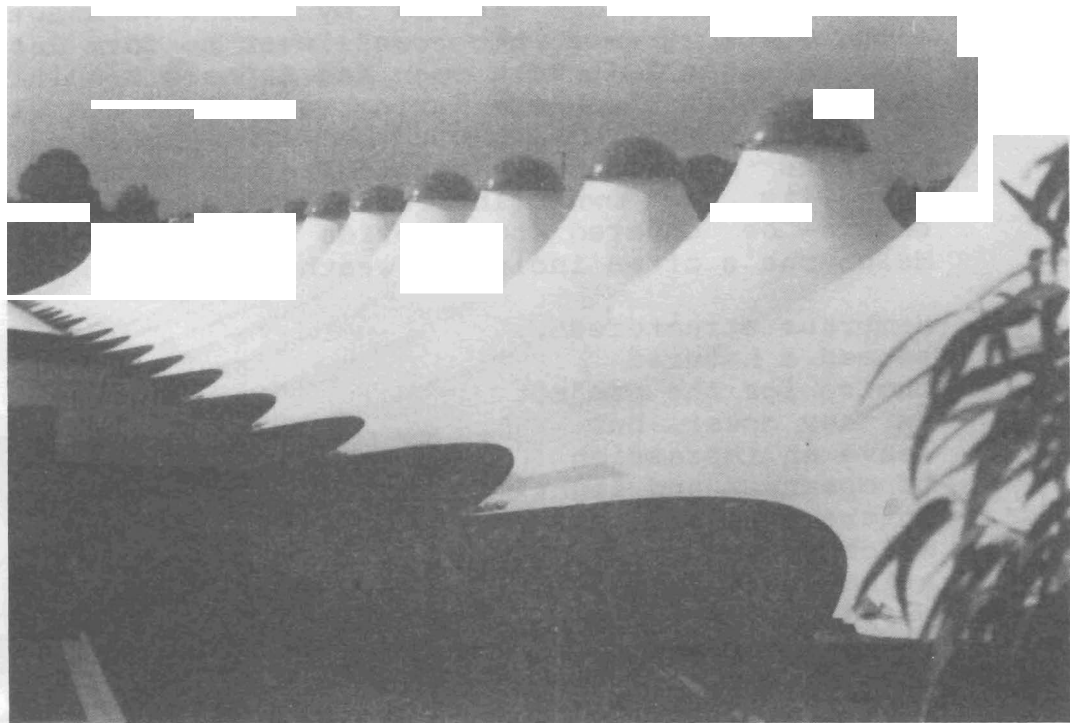
Columns on 4 metre centres support the beam frame and provide the **springing** point for cables thrusting a flying mast upward to the cone peak.



PRESTON MARKET REDEVELOPMENT (cont)

Vertical plane bracing is used down the long lines of the modules with the result that its repetition provides its own aesthetic appeal.

49 approximately 7m x 7m based cone forms were used to cover the nearly half a kilometre of arcades. These join at clamped connections to beams which form lateral gutters. The long edges were scalloped into catenaries. Intersection modules have four clamped edges.



The use of a translucent white material to roof in the arcades provides the best of both worlds giving shade and shelter to the arcades while allowing full natural light and air movement to occur.

The upgrade has transformed the market area and enlivened retail trading. The space now has lost the previous characteristics which were open and exposed. Unanimous applause has been received from shop keepers and shoppers alike who now benefit from all weather shelter to use a market, the style of which defers to nineteenth century design which has latterly been replaced by the cash register starting-gate model.

PROJECT: LANGTREE MALL - MILDURA

CLIENT: City of Mildura
DESIGNER: Geodome Space Frames Pty. Ltd.
ENGINEER: John Connell & Associates and
Connell Barrow McCready Pty. Ltd.
FABRICATOR: Covertex Australia Pty. Ltd.
FABRIC: Polymar Class I.

PROJECT: PITT STREET MALL - SYDNEY

CLIENT: City of Sydney
DESIGNER: Environmental Landscapes Pty. Ltd. and
Geodome Space Frames Pty. Ltd.
ENGINEER: Peter Kneen Pty. Ltd. and
George Clark Knox & Associates
FABRICATOR: Superspan Pty. Ltd. - Hypars
Southern Cross Flags Pty. Ltd. - Banners
FABRIC: Gale Shadex - Hypars
Bradmill Polyester - Banners

PROJECT: TODD STREET MALL - ALICE SPRINGS

CLIENT: City of Alice Springs
DESIGNER: Hunt King-Jones & Partners and
Geodome Space Frames Pty. Ltd.
ENGINEER: John Connell & Associates and
Connell Barrow McCready Pty. Ltd.
FABRICATOR: Gwilite Plaswelds
FABRIC: Polymar Class II.

PROJECT: PRESTON MARKET REDEVELOPMENT - PRESTON

CLIENT: Interwest Pty. Ltd.
DESIGNER: Spacetech Pty. Ltd.
ENGINEER: John Connell & Associates and
Connell Barrow McCready Pty. Ltd.
FABRICATOR: Covertex Pty. Ltd.
FABRIC: Polymar Class I.