

New life for Sydney's heritage

The Galleria- Capitol Square

Sydney's Hay Street region was, until recently, part of the fringe of Chinatown, catering mainly to Chinese produce shops, cafes and other small businesses. Close to Central Station it was, in the peak of rail travel, a fashionable end of town with large department stores, hotels and theatres including the magnificent Capitol Theatre.

Recent rejuvenation of the region included proposals to demolish the Theatre - an option that raised loud protests heard by Council. Fortunately the Theatre has been preserved, and in its renovated form is now a focal point of the area.

An article on the renovation of the Capitol Theatre was published in "Steel Structures" Issue No 7, January 1995.

Adjacent to the Capitol Theatre and across Parker Street is another development. This is Capitol Square, a heritage building which originally housed the AJS Bank, a saddlery and associated stables in a centre court, and the old Palace Hotel. Capitol Square will be renovated to house a new 94 room hotel and complimentary retail services. The complex is situated over a recently excavated 5 level carpark.

Interacting between the Capitol Theatre,

This case study was written at the time when OneSteel was part of BHP. In that context, in some instances within this case study, reference may be made to BHP.



Capitol Square Building and Parker Street, will be The Galleria, an enclosure to house a foodcourt at street level and a bar and retail facilities on a perimeter concourse level. The concourse at 4m above Parker Street links with the hotel lobby and retail area in the centre court of the Capitol Square building.

The Galleria will provide a breakfast to supper service for office workers, tourists and theatre audiences. It's patrons will enjoy an atmosphere combining old and new architecture, contrasting between the original detailed brick walls of the heritage buildings and the glazed containment of The Galleria.

The supporting steel structure is highly refined, with all the elements reflecting the roof curvature and demanding detailed fabrication. Roof curvature was driven by the interaction of the Galleria roof with the Theatre on one side and the lower roof of the Capitol Square building on the other. Connection plates for columns and beams are a near elliptical form with column base plates and capitols emerging

in the shape of a Bishops Mitre.

The roof structure spans 20m between the two buildings with a maximum height of 18m at the connection with the Capitol Theatre. In roof specifications, support from the walls of the Capitol Square building was allowed but at the Theatre end the structure had to be independent of the walls. Consequently, support was provided with 14m slender steel columns tapered in sympathy with the roof form. Fabricated from 400mm CHS, they are in 7 pairs inclined in two directions to form a 'V' with each supporting a 20m bow string truss. The base of each pair of steel columns is pin connected to the 'Bishops Mitre' base plates and capitols sitting atop 'elliptical' concrete pedestals, which support and penetrate the concourse level.

Curved 300x200mm fabricated 'H' sections form the top chord of the bow string truss with CHS web members and Macalloy bar tension chords. The trusses follow a 'V' formation across the roof space and support 125x75mm

Above and right: Architect's model showcases the refined steelwork and glazing.

2nd right: Steel plate fins adjoining steel base plate.

3rd right: Bow-string girders ready on-site.



RHS purlins which in turn support extruded aluminium glazing bars and 12.76mm thick tinted high performance laminated safety glass.

End walls of The Galleria are complete walls of glass. At the highest end of each wall a vertical bow truss runs the full height of the wall. Created from a 100mm SHS compression chord and a curved tension chord made from 100mm SHS. The chords are connected with diagonal web members made from 50x10mm steel flats. Running parallel with the truss at 4.5mm spacing are a series of 4 mullions. These are vertical for the top 5m and then cranked to provide a splayed section for the lower portion of the walls. Hollow sections 100x100mm provide transoms to support the glazing bars and the 10.38mm thick laminated safety glass.

A fire engineering approach to fire protection of the structure was necessary to allow it to remain unspoilt by the application of conventional protection systems. In conjunction with BHP Research, Melbourne Laboratories, the Architect developed a system that met with the approval of the Sydney Council. The system combined the application of water and intumescent paints.

The roof trusses have a system of water pipes concealed above the web of the 'H' section compression chord which, in the event of fire, would drench the roof steelwork and glazing. Similarly the columns would be drenched. The columns also have a coating of intumescent paint to provide a Fire Resistance Level for structural adequacy of 60 minutes. All other steelwork was coated with an organic epoxy primer and acrylic gloss finishing coat. The fire protection method devised satisfies the requirement for a Class 6 building.

Project Participants

Client:	First Scope Development Pty Ltd
Architect:	Noel Bell Ridley Smith & Partners Pty Ltd
Engineer:	Connell Wagner Pty Ltd
Builder:	Fletcher Construction Australia
Fabricator:	Bellingham Engineering

