

Adelaide gains a 'tree-mendous' shopping mall

Burnside Village, Adelaide



The need to preserve an 18 metre high, 100-year-old river red gum listed with the local authority as a significant environmental feature didn't stop the expansion of the adjacent Burnside Village shopping centre.

The new structure was simply built to readily incorporate it without undue disturbance to the prized tree.

Commencing in mid 2010, this latest stage of the shopping centre improvements involved expanding it by adding approximately 7300 square metres on its northern side, whilst maintaining the two existing parallel malls, the extension accommodates 37 new retail tenancies.

In essence, the old red gum takes pride of place as centrepiece of the new retail space covered by a spectacular 21-metre curved glass roof.

The structural steel approach created an expansive enough space to house the tree comfortably within a light slender form that complements, rather than dominates it.

The project engineer, Principal and Senior Structural Engineer with Wallbridge & Gilbert Consulting Engineers, **Stephen Inglis** said the tree is "positioned within a clear, open and voluminous hub."

"The tree would naturally be located in an external environment so to help recreate this environment the main roof areas over the public mall spaces utilised extensive curved roof profiles and full glazing coverage over the entire extent of the general mall areas, along with side ventilation louvers to facilitate natural ventilation," he said.

"However, the presence of the tree within the building envelope presented a spatial issue with regards to its height.

"The general roof line was set at a level to suit the adjoining side tenancy trading areas, but that meant the general roof was significantly lower than the tree crown.

"So the consultant team decided to provide a sweeping curved central mall main glazed roof area and a specific 'pop up' roof over the tree to encapsulate it within the building envelope.

"The 'pop up' roof curved rafters were required to span across the tree entirely in one free span with the end support stub columns being supported off the lower main curved roof structure."

He said that the curved roof areas are supported by a series of circular columns with four inclined 'branches' extending upwards to the roof which is a curved rafter line to replicate the feel of the main roof supported by a series of structural steel 'tree' elements.

"The desire was to replicate the retention of the river red gum by creating a feel and shape of a regular tree support structure for the support of the main roof."

"This forms a neat and essentially balanced loading support condition for the roof structure," he said.

Mr Inglis said that this approach was achievable using readily available standard grades steel, which made life easier for the steel fabricator.

"However the tree column-to-branch nodal points each used a specially created spigot unit to provide smooth transition from the vertical circular column element and to the inclined smaller circular branches," he said.



“The nodal spigot pieces were fabricated as scalloped lower main column pieces each marrying into the four smaller and inclined upper column pieces. The final curved sweep aspects from the verticals to the inclined branches were built up by using full weld infills to suit the desired architectural shape and the main connecting columns and branches were sleeved over the spigot pieces and fully site welded and ground flush to create a seamless jointing profile.”

He said that apart from the structural integrity of the approach, the build was also influenced by the architectural brief to honour the tree’s branching form.

“Much attention was paid to the form of the circular members of both the vertical main tree columns and their respective circular upper inclined branch elements,” he said.

“The desire was to replicate the retention of the river red gum by creating a feel and shape of a regular tree support structure for the support of the main roof.

“Use of four inclined branches off each of the main tree columns was the cleverest part of the design allowing firstly to reduce the span of the supported rafters (so thereby minimising its size) and to also reduce the number of support columns required. Each column can effectively support two lines of main roof rafters rather than every rafter line so the columns were spaced at a nominal two grid spacing of 16.8 metres apart.

The extended spacing of the columns opens up the interior retail area and further enhances the light airy feel of the shopping centre.”

Brookfield Multiplex Senior Project Manager Construction + Development for the work, **Davide Piantadosi** said the steel-intensive approach helped in maintaining a clear distance back from the tree without causing too much disturbance to its canopy.

“The structural steel design lent itself to ‘individual building pods’ to be constructed starting at the western end of the site and heading east,” he said.

“There were seven pods – five encompassing the main building works and two associated with the main roof structure.

“The ability of the structural steel fabricator to fabricate the structural steel ‘tree element’ off-site to the required angles and aesthetics to the exacting requirements nominated by the consulting engineer and architect assisted onsite erection.”

* Artist perspectives prepared by The Buchan Group

* Progress photos courtesy Brookfield Multiplex Australasia

Project Team

Client: Burnside Village

Architect: The Buchan Group

Project Manager: Mott MacDonald

Builder: Brookfield Multiplex Australasia

Structural and Civil Engineering: Wallbridge & Gilbert

Structural Steel Fabricator: SA Structural

Steel Detailer: SA Structural

ASI Steel Distributor: OneSteel

ASI Steel Manufacturer: OneSteel

