

CANOPY DESIGN, AURORA PLACE, PHILLIP STREET, SYDNEY, AUSTRALIA

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A Forum

Right from the projects early stages in 1996 Renzo Piano intended to introduce a different concept of sociability to the mixed use towers. (a 17-storey residential building and a 44-storey office complex)

Our first idea is to have a sort of elevated plaza every floor or two or three floors, a place where people can meet. It is clear this will have to have an equivalent at street level: a sort of forum, a piazza or perhaps a covered foyer. Something must make the place look like a place for meeting, a centre of urban life, from the outside.

Sociability

This desire to make a non-hermetic building and extend the overlap between inside and outside has resulted in the break out wintergarden spaces in the tower. They have an operable louvre exterior with opening fanlights in the internal glazed wall, which is divided from the office space. The climate of Sydney perhaps means the louvres can be open much of the time and this outdoor occupant controlled space should encourage sociability by providing a breakout area at the ends of a typical office floor. The same is expected of the ground plane except there is also a civic historical role to play at this meeting level.

Sydney is a young city. New projects should seek a very powerful role; they should complete and solidify an urban fabric that is not yet completely settled.

The ground plane unifies a network of walkways across the site and repeats the pattern of laneways off historic Macquarie Street that link with the smaller Phillip Lane. At pedestrian level the precinct is unified by the austral verde granite paving extending under both buildings to the road edge. The canopy was generated by extending the radial module grids between both buildings to create a spider web that binds the project together. The two-way grid of light tensile cables will support a plane of low iron glass slightly bellied to shield the rainwater. This will deflect the down draft from the buildings and shelter the piazza; more symbolically it will bind together the curved white fritted glass facades of both towers. It has always been one project for Building Workshop although Bovis LendLease has different partners and delivery teams for each tower.

Precedents

For Building Workshop precedents for this project go back as far as 1981 and the restructuring of the Schlumberger facilities. Here a tensile structure shelters the cut in the hill at the centre of a new park with car parking for 1000 vehicles below. This was built within a renovated industrial quarter and acts as a forum. It is a cohesive element between the park and the new office buildings and workshop.

More recently in 1991 the new Banca Popolare head office at Lodi is clad in terra cotta and contrasts with a light tensile structure of glass and cables. The plaza is a focus of movement between the various buildings of the development. The suspended glass links the buildings to a new central auditorium, which for a small town like Lodi represents an important addition to the quality of urban life. The double catenary cable above and below the glass was the start point of the Sydney project.

Cable Net

The cable net finds its optimum shape once the edge points were defined; most of the study was in understanding how the geometry shapes the individual node pieces. The edge plates all are positioned on the curtain wall mullion modules 1350mm on the tower side and 1750 mm on the residential side. The height is determined by the shaping requirements for the anticlastic curve and is discussed in detail by OAP.

Glass Plane

The spiders joining the glass panels are positioned vertically under the node points of the net. However the glass plane has the problem of water and several shapes were studied. OAP had recommended falls of 2.5% to assist in self-cleaning and to ensure there was no ponding, especially with local deflections of larger glass planes. Initial shapes considered falls from the centre through the facade on each side, to an internal perimeter gutter. The decision was taken to separate the building façade from the canopy glass and a 200mm-edge gap was designed around the perimeter. This separated the different trades and, perhaps more importantly, gave comfort to the fire consultants that we could dispense with sprinklers underneath the glass.

The next option considered was a large central hole creating a waterfall over the large marble Kan Yasuda sculptures. Too much splashing was the client consensus. The final solutions looked at a monopitch slope from Bent Street to Phillip Lane, into a suspended syphonic gutter.

After further modelling it was decided the canopy should be horizontal at the edge to align with the curtain wall transoms on either side. These constraints then generated the current belly shape draining to a single low point with a cantilevered scoop in Phillip Lane. This form has passed on a new set of challenges to OAP in terms of glass twist and getting a structural diaphragm to work.

Process

Before handing over to Austress and Arups to elaborate in more detail. I would like to comment on the process and mention the commitment of Bovis Lend Lease to the realization of the canopy as an essential part of the Aurora place project. Similar to landscaping the exterior canopy it is one of the last things to go into the project and as such usually absorbs cost overruns in other packages. I would like to acknowledge the delivery project manager Karl Winkler. His team have kept our wits sharpened with the challenge of initial GMP budget of \$2000m2 for the approx 650m2 canopy. This has been revised upward as the limitations have been understood and I think our continual insistence about lacing the building together, and lightness (Renzo calls this intelligent obstinancy!).

Olaf de Nooyer from Building Workshop Genoa has been primarily responsible for the many hours of work and discussion in developing the design. 20 A1 and 100 A3 drawings were discussed back and forth over the Internet and prepared for tender in October 1999. Then the tension of comparing complying schemes with more prosaic steel structures and finally the selection of Austress's rod scheme in November which found us at the beginning of another iteration. A new ball node concept using the rods was generated by Arups and then modelled full scale by Building Workshop. We search for consistency and lightness, trying to understand the hierarchy of the assembly and what is important, what we need to retain and refine to keep the essence of the project.

As I hope you have seen from the slide presentation, we are achieving some of these objectives. The Olympics this year will be the first real test of how the hovering light weight canopy together with the large, sensuous marble sculptures of Kan Yasuda can add Aurora place to the memorable civic meeting places in Sydney.