Darling Quarter

the five hundred million dollar challenge


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ATRIUMS EIGHT STOREYS HIGH COMBINED WITH THE USE OF ALMOST CLEAR GLASS ON A WESTERN FACADE TO PRESENT UNIQUE CHALLENGES FOR SHADING AT THE $500 MILLION REJUVENATION OF A 1.5 HECTARE SITE AT DARLING QUARTER. DAWN ADAMS _ REPORTS

MAXIMISING VIEWS and the availability of natural light while controlling solar loads was a primary concern when Lend Lease commissioned Horiso to address solar control issues at the Darling Quarter project.

Important was to address key areas to secure a 6 Green Star rating. These areas were the western glass facade, atrium skylights and partitioned glass office areas.

The project

Situated on a site previously occupied by SEGA World, this project was ambitious. It consisted of two eight-storey winged towers that included 55,000 square metres of office space and 800 underground car spaces. Architects Francis-Jones Morehen Thorp (FJMT) designed Darling Quarter in a campus style to encourage pedestrian traffic and to provide an interactive public space that would be used for commercial, retail and leisure purposes. It would also link the south end of Darling Harbour with the city.

Issues

An almost clear glass that had never before been used in a commercial building with a western elevation at these latitudes raised the potential for internal solar glare to become a significant issue, particularly, due to the facade's expanse.

Massive skylight ceilings with large panels of curved glass were also a feature of the twin buildings' atriums. Below were offices and meeting areas that had been designed with glass partitions facing the naturally lit atriums.

Horiso general manager Bruno Seguin confirmed the company provided the engineering knowledge and manufacture of three solar control systems for the project; internal roller blinds on the atrium edge for the office and meeting areas, a unique tension blind system for the atrium and specialty timber venetian blinds for the western facade.

"The atrium and the timber blinds were both ambitious," Seguin said. "Access was difficult and we needed to engineer things to make sure they would last."


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Timber blinds

Some 25,000 linear metres of timber venetian blinds were installed on the western side of the two building facades. The blind sections are synchronised and automatically tilt in response to the exact position of the sun throughout the day. The Horiso control system, which employed 500 Elero motors, is pre-programmed with other building control requirements including the geographical location and physical orientation of the building's curved design. It operates in conjunction with sun tracking software that enables individual blinds to react to the variations of the sun's position throughout the year. As a result, the tilt position of the blinds is optimised to control internal daylight, glare and thermal heat gain to secure maximum energy efficiency and ensure working conditions remain comfortable. The control motors are concealed using Horiso custom designed head boxes.

Seguin pointed to new techniques used for the plantation timber blinds. "The technique to fabricate the slats had not been done before." Cottonwood plantation timber was sourced for the project and an advanced lamination technique used to increase its strength while maintaining the desired weight.

Atrium

Horiso developed a unique tension blind system to address the issues of the atrium's curved ceiling. This system had to retract precisely to prevent fabric from sagging and to negate any operational difficulties over the entire length. Seguin confirmed that while the blinds are closed, the fabric openness allows light filtration and minimises solar gain.

The atrium is the equivalent of eight storeys high, spans 56 metres across and has a pitch of 37 degrees. Seguin claimed the size of the tension system, at 14 metres by 3.2 metres, had never been achieved before on any building in the world. The southern building blinds were also shaped to ensure they accurately fitted the curve of the ceiling's skylight panels.

The height of the atrium ensured access for installation was difficult and the time allocated for Turner Bros to install it quite short. "Turner Bros installed the skylight requirements in the two buildings in 15 days for Darling Quarter," Seguin said. "The product was big and heavy and the access difficult." Brackets were custom designed to fix to the skylight and made stronger for that purpose. "The quality of the engineering Horiso provided to Turner Bros allowed for the installation time to be reduced," he said.

THE PROJECT

Darling Quarter

OWNERS Australian Prime Property Fund Commercial in joint venture with an institutional investor

ARCHITECTS Francis-Jones Morehen Thorp (FJMT)

MANAGEMENT CONSTRUCTION AND DESIGN Bovis Lend Lease responsible for the project's design management and construction

LEND LEASE Project development services

PROJECT CONTRACTOR Turner Bros

ENGINEERING AND MANUFACTURING Horiso

MOTORS 500 Elero motors for timber venetians, 24 Somfy motors for the internal roller blinds and another 100 Somfy motors for roller shades.

Roller blinds

In an innovative step, the plantation timber venetians are also able to interact with the lighting controls for the facade. "We created a software interface with their system," Seguin said. Coloured LED lights are installed at the base of each bank of blinds. "They can do a light show on the facade using the timber blinds as the reflective surface," he said.

To complete the project, Horiso internal roller blinds were positioned on the office levels in the atrium areas to control glare and enhance the working conditions in the building. Control integration enables the roller blinds to automatically close when the audio visual device is activated.

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