



No. 1 Bligh Street
Best Tall Building 2012

horiso®

1/7



Owners - Co-owned by DEXUS Property Group, DEXUS Wholesale Property Fund (DWPF) and Cbus Property.

Architects - Australian Architectus and Germany's Ingenhoven who came together in 2006 for a design competition.

Builders - Grocon : Australia's largest privately owned development and construction company.

Facade Contractor - Arup.

Facade Consultant - Enstrust.

Awards - 1 Bligh has received a number of awards and has been highly commended for its sustainable design, development and architecture.

- Awarded Best Retail/Commercial Development - Urban Development Institute of Australia
- NSW Highly commended Office Development - Australia category, Asia Pacific Property Awards (May 2011)
- Highly commended Office Architecture - Australia category, Asia Pacific Property Awards
- Voted Best Tall Building 2012 for Asia and Australis by the CTBUH (Council for tall Building and Urban and Urban Habitat, IL, USA)

2012 NSW Architecture Awards

- Urban Design Award
- Sir Arthur G. Stephenson Award for commercial architecture 2012
- Milo Dunphy Award for sustainable architecture

Australia's first Six Star Green Star high rise office tower surpasses world's environmental best practise.

In a world first, the Horiso automated sunshade system is integrated within the elliptical glass cavity of the curved double skin ventilated facade which runs the full height of the building's 29 floor atrium. In addition, automated Horiso External Venetian Blinds with a 7.5 metre drop were installed on an exposed glass area on the building's roof top terrace.

No. 1 Bligh Street has 64 separate controllable windows per floor facing 64 different directions, each programmed to receive unique information combining the sun's Angle of Incidence, absolute position within the building and relative position to adjacent buildings.

The fully automated shading system comprises of 897 individually programmed controllers and 1,780 specilaty venetian blinds.

“The tower speaks of enduring presence attuned to emerging cultural, social and environmental concerns.” Christoph Ingenhoven, Principal Architect - Ingenhoven

The primary benefit of the shading system is reduced heat and optimised light which underpins high performance sustainability and unprecedented environmental innovation with the proven flow on effect of healthier and happier tenants and employees who are more productive.

No.1 Bligh Street was designed from first principals to meet environmental world-best practices.

The property has achieved a six star rating, which is the highest award under the Government's Australian-built environment rating system which scores buildings for their impact on the environment. Furthermore, the building was awarded a five star NABERS energy rating together with the Australian Green Building Council's six star rating in line with world's best practice.

To maximise the expansive views of Sydney harbour, the focus was on the clear untinted glass with a Visual Light Transmission (VLT) of 62 per cent.



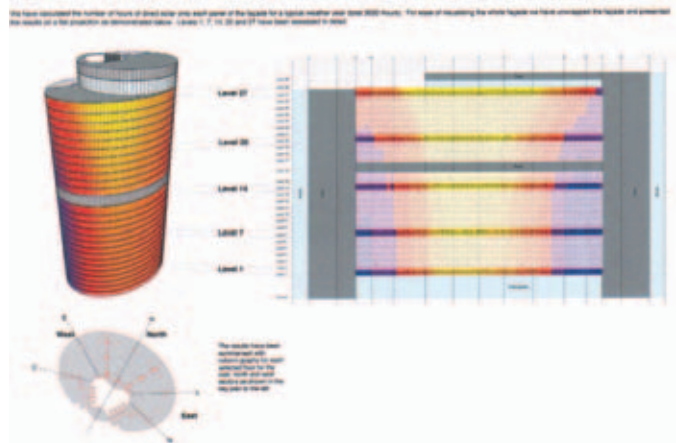
While a high VLT in commercial properties is an ambitious way to maximise views this invites the potential for excessive heat load into the mechanical systems. This in turn drives the need for a dynamic intelligent integrated shading system to eliminate glare and reduce energy consumption.

The environmental bar was raised even higher with the vast square meterage of glass dominating the eastern and western facades. Developing shading for the elliptical shape and the programming of the blind control system was an engineering triumph

of astronomy and mathematics. This drove the performance over the challenges of the geometrical nature of the building.

To design a shading system which operates in an elliptical shaped ventilated facade with only 600 mm void was an engineering master stroke. The programming of a fully automated shading control system had to take into account, not only the entire building surrounds but also the overshadowing and indirect glare from neighbouring offices and the harbour.

About 200,000 data points have been programmed into 890 decentralised controller units which are networked over the 28 floors.



Over 145,000 1m aluminium alloy coil material, 125,000 1m HDPE (PVC free) coated stainless steel cable, about 6,800 1m structural aluminium (about 6 ton) have been used for local manufacturing of the 1,780 external venetian blinds.

At the prestigious apex of Sydney's business district with surrounding views of Sydney harbour, the ellipse stands with its feet in Farrar Place, then, ingeniously turns and faces the harbour. One of the clever initiatives in design represents an engineering tour de force. Instead of trying to meet the irregular street frontage the architects turned the building foot print into an ellipse touching all the abutting streets but opening broadly to the north and Farrer Place to the east.

The sustainability features of No. 1 Bligh Street result in the lowest operating costs of a premium grade building in Sydney, equating to estimated savings of approximately \$2 million per annum.

Top graph shows proposed category scores of points to achieve for Green Star rating requirements.

Diagram above illustrates the number of hours the sun will directly hit each solar panel for a typical weather year.

Image left. A top floor The expansive view of Sydney's city landscape from one of No. 1 Bligh Street's top floors.

“It was a very competitive tender process. The input from Horiso was extraordinary. They have a very high technical capacity and commercial approach. We wanted to work with Horiso again. The project has very complex geometry in which Horiso excels. Because of this we had to continually refine and modify which they compensated for with a continual loop of feedback after ever iteration and adjustment, whether we wanted to hear it or not. The high density, built up environment of the business district is difficult from the angle of sun position. The design philosophy is about space and light and the delicate balance between space light and glare.”

Bruce Jones -
Grocon Project
Manager / Horiso's
direct report.

No.1 Bligh Street is born

The process took ten years (and that was before the owners started acquiring, amalgamating and demolishing the surrounding sites – which took several more years). Ninety four percent of the demolished buildings' materials were recycled including steel and concrete.

Half way through the first phase, the Global Financial Crises hit.

With foresight, the project was designed in two phases. Fortunately allowing for the unforeseen, which occurred, with the sudden economic downturn, half way through the first phase, heightening the risk for all concerned. Strong management combined with strong nerve saw the team forge ahead.

The Horiso control engineering and shading

At the outset this ambitious project was forecast to be the international front runner of innovation. From a competitive international tender process, Horiso was the first choice with the added benefit of a

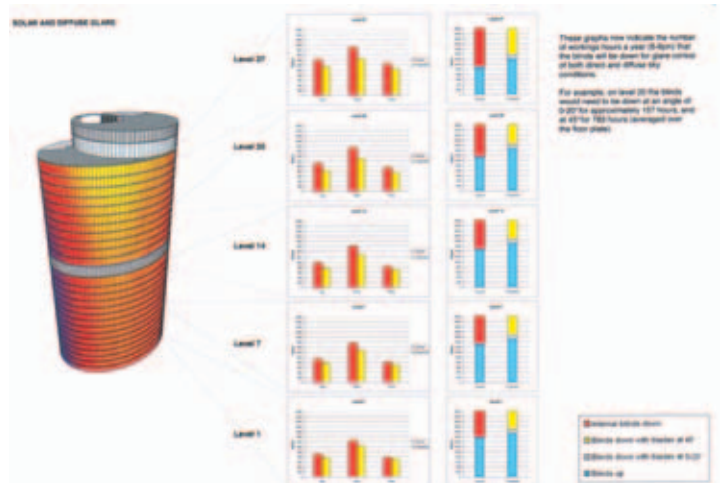
superior team of experts with international expertise already in place ready to hit the ground running. Furthermore, there was Horiso's credibility, gained from working on several significant commercial projects.

The German architects, Ingenhoven are leading proponents of the double skin facade – in Europe.

Sydney with its high density office towers, dramatic climatic conditions, and the sensational harbour views created a novel set of complexities. No. 1 Bligh Street has incorporated 64 angles in its glazed panels with individual geographical orientation for each angle. Standard shading control system can account for one, two or three angles and control these in one section. Every office has its own individual orientation and requires an exclusive program to account for the specific surrounding parameters for this particular orientation.

The double skin has a ventilated cavity and incorporates Horiso's fully automated shading system which reduces the heat load enormously.

At the same time, intelligent micro controllers allow highly complex mathematical and astrophysical calculations to take place within each controller device. This technology allows the energy consumption of the building to be kept to a minimum, and facilitates the maintenance of the energy performance at 5 Star NABERS Energy levels with a 42 percent CO₂ reduction when compared to a similar sized conventional office tower.



By integrating intelligent-control of the facade's venetian blinds into the building management system, micro processors ensure each set of venetian blinds adjust individually according to the angle of the sun guaranteeing the exact position required to achieve maximum heat and light control.



Horiso's dynamic facade technology factors for glare, shade and light reflection from sun, water, cloud cover, unseasonable weather and neighbouring buildings.

Diagram illustrates the working hours of the day that the blinds will be down and angled to control the internal sun glare.

Detail of Horiso's External Venetian Blinds at No. 1 Bligh Street.

Horiso control technology uses the native BACnet protocol. This ensures easy integration with the majority of other building management systems and can be remotely controlled from any location worldwide.

The entire shading control network consists of only three major hardware components. The intelligent distributive network enabled two motor controllers, a Control Point to connect sensors and provide contact to the BMS and a network router per floor for communication with the server. All mathematical processing of specific solar parameters are compiled and executed within the shading controller. All smarts are decentralised which means a server is unnecessary. Due to the very low complexity in the hardware the system runs on a safe operation level. Thus less interfaces equal less points of failure.

“The design of the building is attractive to the firm because it provides health benefits which are important for staff wellbeing and productivity. The building design helps increase collaboration. After one month I could already see the difference in terms of people talking to each other; and because they can see what's happening on their floors there's a heightened sense of being part of a whole.”

Julie Levis -
Clayton Utz, Sydney
Managing Partner.

The anchor tenant is a leading law firm. Their focus was firmly on staff wellbeing to foster an environment of productivity and professionalism in line with the firm's brand. The tenants, although provided with an option of a control system that they could manage themselves, favoured the Horiso automated system allowing the staff to concentrate on their work in a constantly controlled environment.

Project Collaboration

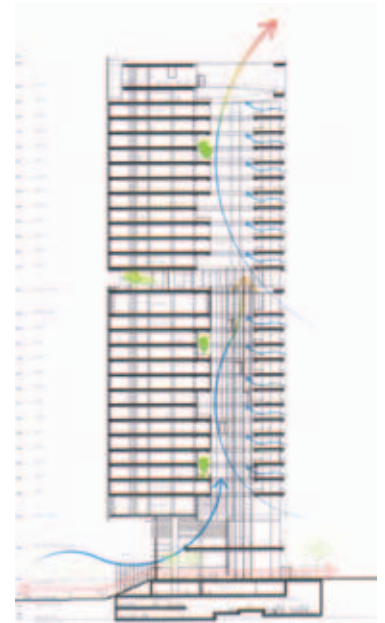
A building project of this scale and the challenges that were overcome during the many stages of the design and construction was a feat in itself. In particular, was the Specialty Venetian Blind design, delivery and installation component. This intrinsically important factor was

managed by the internationally acclaimed Australian based company Turner Bros. Furnishings Pty Ltd. The crucial building schedule required delivery and installation to be carried out in the exact time allocated to avoid any potentially expensive delays on the building's completion. On the onset, the unusual oval shaped curve of the glass facade meant that the original design specifications and installation details of the Specialty Venetian Blinds were amended to accommodate the building's curvature. Highly skilled communication, multiple detailed drawings and painstaking installation has enabled this project element to achieve its highly successful outcome.

Clear glass double skin facade

No.1 Bligh Street will be the first high-rise office tower in Australia to feature a double-skin, glass façade to reduce the significant heat load.

In an engineering feat the entire facade is cantilevered out from the ring beam. An outer glass skin protects the sun shades, allowing natural light into the building. This is the most energy efficient feature available in high-rise buildings today.



No.1 Bligh Street is designed to stay cool.

The air enters the cavity at the bottom of the building, allowing cool air to circulate within the cavity and exiting at the top of the building. This also protects the mechanised metal blinds from being buffeted by wind. Integrating the double skin facade in the floor space, also provided overall, an extra 10 per cent area for lease.

Central atrium

Australia's tallest naturally ventilated atrium provides dynamic views across floors through the building to the south. The atrium soars the full height of the building, providing a flow of fresh air and a sense of openness on every floor. Providing dynamic views through the building, the atrium is an arrival point for all floors, enhancing communication, connection and community.

Mechanical System

No. 1 Blighs Street's mechanical system consists of a hybrid arrangement of low temperature VAV air conditioning systems to the central zones of each office space floor, and passive chilled beam to the perimeter spaces. The system has been engineered to consume minimal amounts of energy in light of addressing minimal amounts of solar heat gain from the east, north and west facing facades.

The philosophy of the mechanical air conditioning system to the Class 5 net lettable office space is very much dependant on combating solar heat gains through the facade. Without a strong defence against solar heat gain, the mechanical system would be unable to address the absorbed heat loads resulting in discomfort for the occupants and unpredictable operational energy consumption.

Diagram above demonstrates the building's airflow to create natural ventilation.

Air conditioning

The ground floor heating/cooling which in combination with the open atrium and the vented roof top encourages an additional natural cooling/heating effect. A hybrid structure combining a variable air volume (VAV) with a chilled beam air conditioning system were installed to maximise comfort levels and reduce energy consumption.



Tri-generation energy and recycled water

No.1 Bligh Street uses an innovative tri-generation absorption chiller system powered by the hot water heated using the solar panels on the roof. A series of curved solar thermal collectors provide the energy to drive the cooling systems; an advanced hybrid of VAV and chilled beam air conditioning technology. This is Sydney's first CBD commercial office tower to incorporate black water recycling which is also used to irrigate a feature 9.7m high green wall.

The building atrium is shaded at roof level by a series of curved solar thermal collectors which inject high temporary energy into a solar cooling system. This process provides enough energy to allow 100 percent more fresh air to be pumped through the building without any additional running costs whilst providing all the heating for the building.

Press release excerpts 2012

Since the completion of No.1 Bligh Street, it has been given numerous awards and apart from its own achievements has sparked a great deal of media interest. The Prime Minister of Australia, Julia Gillard, officially opened the building in August 2011 and was reported saying, "For many Australians when they hear about carbon pricing and a sustainable future I think some of them think we are asking them to live without the creature comforts they have grown accustomed to. They should come and look at this building, a beautiful building."

The government's Commonwealth offices moved into No. 1 Bligh Street, in October 2011, having outgrown their 70 Phillip Street premises. Bligh Street had been chosen to fulfil the governments requirements for the following 25 years and with the building's green credentials it was deemed to be an appropriate move.

The Sydney Morning Herald's Andrew Taylor, interviewed architect Ron Wood and Tony Gulliver, the Development Manager at Dexus. Tony said the design brief included maximising investment return. The building had to appeal to legal, investment banking and other high end corporate clients. The brief focused on high quality but highly sustainable features making it relevant for decades into the future.

Sustainability was a key focus appealing to tenants in the short term. Ron Wood said the clients (owners) had high environmental requirements and a wonderful site. Facing directly into the sun was one of the biggest challenges to overcome. Control of heat gain in the building, taking advantage of the view and also shading the building. Hence the automatic sun shading in the double skin facade. Brown said the tower's features are not merely decorative.

"We intended to set a new bench mark and we think we've done that. It's only been in the last seven or eight years that the Green Star rating program has come in. "This system is world's best practice in architecture". It is fantastic for architects, because it has become common language in speaking with developers and tenants. The architect can converse around collectively as a team.



"A building they would be proud to work in, a building with a magnificent outlook with all the features that people would want in modern office accommodation, and here it is being done at six star sustainability."

Julia Gillard - Prime Minister of Australia.



"We did prescribe a focus on indoor environment quality which means quality of working space, fresh air and daylight. Connectivity between workplaces and workers between floors."

Tony Gulliver - Dexus, Development Manager.

"It's about how we bring light into the building, natural air, and that's what the atrium is about."

Ron Wood - Architectus, Architect.

“Because of the glass, because of all the open spaces and fresh air, as I said, it really doesn't feel like you're trapped in a building.”

Katie Wood - Clayton Utz, Lawyer.

“We liked that the sustainability features at Bligh Street were so well integrated into the larger design concept and sort of invisible to most people.”

Sandra Kaji-O'Grady
- Chair of the sustainable architecture jury for the 2012 Architecture Awards.

The anchor tenant at No. 1 Bligh Street, Clayton Utz, has been very impressed with the building's attributes. Kate Wood, a lawyer with Clayton Utz had an interesting revelation about how she personally found working in the building. “This building makes you feel like you're outside, which sounds like a crazy concept when you're working at your computer.”

It was also reported in the Sydney Morning Herald that more than 170 projects competed for recognition at the 2012 NSW Architecture Awards. No. 1 Bligh Street received 3 awards including the Sir Arthur G. Stephenson Award for commercial architecture and the Milo Dunphy Award for sustainable architecture. The commercial architecture jury chair, Andrew Cortese said “As a 21st century commercial office building, there is currently no peer in Australia.” The architectural achievement is exceptional, representing “the intelligence of a

well conceived and thoughtful architecture.

It describes the promise of what a tall commercial building in Australia can be, and its influence to development in the city of Sydney is potentially profound. Not only is it a benchmark for the investment value of its six star environmental performance and workplace amenity, but for the evolution of the city's urban planning framework.” The chair of the sustainable architecture jury, Sandra Kaji-O'Grady, added “There is a growing sense of corporate responsibility towards the environment, helped by recognition of how a green building might be good for business.”

Notes:

No. 1 Bligh Street's Specialty Venetian Blind project collaboration between Horiso, Turner Bros and Grocon has resulted in the three companies collaborating again on Sydney's latest significant building project at 161 Castlereagh Street.

It has been noted that employees in the building utilise the space closer to the facade, primarily due to controlled solar and natural light conditions, reducing floor space waste.

Image on page 5 shows the system of solar thermal collectors on the roof of No.1 Bligh Street.

www.horiso.com.au

Some content written by: HPR

Image & content references: Grocon, FJMT & DesignBuild.

Press release excerpts - Sydney Morning Herald and The Fifth Estate.

No. 1 Bligh Street's Environmentally Sustainable Design achievements

- Water recycling measures reduce mains water usage by up to 90%.
- Black water recycling of up to 100,000 litres per day (equivalent to one Olympic swimming pool of water will be saved every two weeks).
- Building design and features such as the double skin façade and sun-shading reduce air conditioning energy consumption by up to 50%.
- The use of gas and solar panels reduces electricity grid strain by up to 25%.
- 42% CO² reduction when compared with similar sized conventional office building towers.

Key building facts

- Double skin floor to ceiling glass facade.
- 90 per cent of the steel used comprises more than 50 per cent recycled content.
- 94 per cent of construction waste has been recycled
- Prime Sydney CBD location with commanding views of Sydney Harbour.
- Premium grade office design.
- 1 Bligh is the third premium quality office building
- Unique column-free floor plates designed to maximise workspace.
- Large 1637sq m floor plates and suites from 320 sqm.

- Horizontal and vertical connectivity between floors.
- Expansive feature roof top terrace.
- Glazed and naturally ventilated wintergarden space.
- Australia's largest green wall (vertical garden).
- A naturally ventilated internal atrium (approx. 135 metres in height).
- Stylish foyer café and outdoor green wall café.
- Dedicated child care facility (opening 2012).
- 24 hour on-site security monitoring and patrol services.
- Bicycle storage, locker and shower facilities.
- On-site car park and loading dock.