



Commercial Real Estate Case Study – Sydney, Australia

Johnson Controls Enterprise Management

Showcase of Environmentally Sustainable Design

A 37-story, premium-grade office complex in the heart of Sydney, Australia's central business district is one of Australia's most environmentally advanced and sustainable buildings. The building represents world leadership in environmentally sustainable practices, having achieved a 6-Star Green Star rating by the Green Building Council of Australia. Among other industry firsts, it is the first building in the country to be certified GOLD under the International WELL Building Institute's WELL Building Standard.

The design embraces innovation and technology to produce a structure that is organic and responsive, rejecting the alienation of the cold metallic box in favor of a warm and more human form. Automated timber blinds, combined with vertical timber shading elements and three layers of performance glazing create an advanced environmental skin. The unique system automatically adjusts to external factors and occupant comfort and, is the first of its kind in Australia. Internal spaces reflect contemporary thinking for a flexible workplace, creating an advanced urban environment in which to work and with spectacular views of Sydney's most recognized places – the Opera House and Harbour Bridge.

Innovative Building Systems, Equipment Support Sustainable Design

As a leading developer in Australia and with its focus on sustainability, Mirvac sought an industry partner who could deliver results, and provide single-source responsibility for building management systems and HVAC equipment that support the building's advanced design. At the same time the partner needed to incorporate environmental systems that reinforce the human focused qualities and provide a platform for the long-term success of its tenants.

Johnson Controls assembled a solid team with cross-functional expertise to deliver a comprehensive building technology solution

Solution:

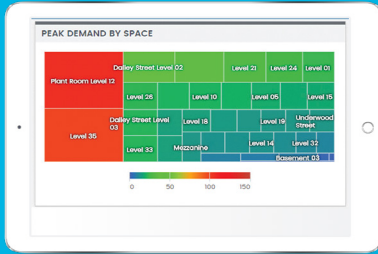
- Johnson Controls Enterprise Management monitors and measures energy and operational performance, and optimizes efficiency
- Indoor air quality is monitored by Johnson Controls Enterprise Management
- Smart Tenancy Kiosk on each floor with data intake from BAS, Security, Lifts and End of Trip facilities
- Central Plant Optimization to help minimize costs
- Johnson Controls Metasys Building Automation System
- P2000 security management system
- Two YORK® YK centrifugal chillers
- One YORK® YVWA screw chiller
- Two YORK® YCWL scroll chillers
- One YORK® YLAA air cooled scroll chiller
- Johnson Controls VAV boxes

Results:

- 6-Star Green Star rating for base building
- 5.5-Star NABERS Energy rating*
- 4-Star NABERS Water rating*
- WELL Building Standard GOLD rating
- Energy savings of 600,000 kWh and \$13,500, per month over 12 months
- High-efficiency chillers generate significant energy savings
- Closed cavity façade automated blinds are monitored
- Return on investment; less than two years

*Equal to USGBC, LEED Gold

Collaboration Brings a Sustainable Result



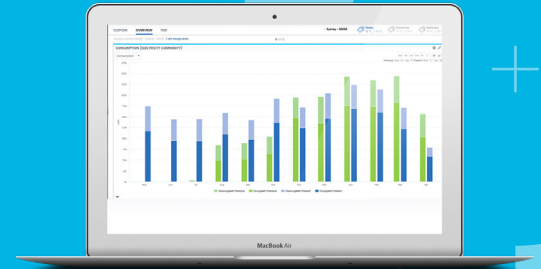
Heat Map

Efficiency

A primary requirement was to be able to identify energy and operational inefficiencies within the building using analytics. To meet this requirement, Johnson Controls also delivered Johnson Controls Enterprise Management, which is a comprehensive analytical platform with cloud-based versatility. Johnson Controls Enterprise Management is designed to proactively analyze the building's data and help find opportunities for improved performance and reduced costs by pinpointing inefficiencies, quickly diagnosing equipment problems and taking corrective action to fix them.

Collaboration

In a collaborated effort, Johnson Controls and building design consultant, ARUP, developed an innovative design process to determine baseline targets for key energy and water systems in the building under the National Australian Built Environment Rating System (NABERS). This process enabled the holistic analysis of the building's energy efficiency and provided an overview of the energy consumption of lighting and power, electrical chillers, AHU fans, and water pumps among others. The Johnson Controls Enterprise Management energy forecasting feature was used to keep track of monthly performance. The result was energy savings of 600,000 kWh and \$13,500, per month over a 12-month period. And the building achieved a NABERS 5.5-star energy rating and a NABERS 4-Star water rating.



Yearly Energy Consumption

Individual system inefficiencies were picked by Johnson Controls Enterprise Management fault detection and diagnostics rules, which pinpointed the root cause of the problems using a parent-child relationship. Accountability of each open fault detection diagnostic was achieved by the Johnson Controls Enterprise Management integrated work order process. This ensured the Johnson Controls service team was closing all the performance faults and working with a predictive service model. The team used open source Microsoft Power BI Business Visualization tool to do customer monthly reporting from Johnson Controls Enterprise Management data source.

Optimization

Johnson Controls also introduced Central Plant Optimization software, which uses up-to-the-minute data to help building operators optimize cooling and heating in a holistic way. System Plant COP of 5.5 and greater was achieved for the plant performance and is tracked by a fault detection diagnostic rule in Johnson Controls Enterprise Management.

Throughout the building design process, the Johnson Controls team offered significant input for the plant design, indoor air quality and control strategies, and collaborated seamlessly with the mechanical contractor, electrical contractor and business consultants. This tight collaboration helped to ensure stakeholder acceptance prior to onsite works and to minimize post completion rework during Beta testing of building systems.



Fault Detection & Diagnostics

Learn more about Johnson Controls Enterprise Management
at www.johnsoncontrols.com/digital