

**Australian Construction Achievement Award
Stage 1 Submission**

The EY Centre, 200 George Street, Sydney.

Overview

200 George Street is Mirvac's newest flagship building in Australia. Set across 37 storeys, the building has become a centerpiece of Sydney's resurgent Rocks precinct. Its world-first closed cavity façade makes it best-practice in environmental sustainability, and along with its distinctive curves, contributes a truly spectacular form to the city skyline.

**OUTCOMES ACHIEVED AGAINST PLANNED TARGETS FOR KEY PROJECT
PARAMETERS (40% WEIGHTING)**

200 George Street sets new industry benchmarks for sustainability, innovation and heritage integration. Input from the construction team from the development's inception ensured planned targets and parameters were developed, met and exceeded.

Workplace health and safety (no fatalities or permanent injuries)

The project has an exceptional WHS record:

- Total number of Project Lost Time Injury's (LTI) was two
- Mirvac Construction's divisional Lost Time Injury Frequency Rate (LTIFR) target was less than two. As of June 2016 the project's LTIFR was zero.
- Total number of Injury based incidents (non LTIs) was 41
- Mirvac Construction's divisional Total Recordable Injury Frequency Rate (TRIFR) target was less than 16. As of June 2016 the project's TRIFR was two

Timeline

The total construction duration, including demolition and fit-out components, was 41 months, with all milestones completed in line with original contract targets and industry benchmarks.

Cost

The complex world-first closed cavity façade meant it was a challenge to establish hard costings on a new, untried design and construction elements.

Mirvac's construction team were onboard early to provide input prior to Development Approval (DA), as well as during design and development to provide planning and cost input at all stages.

The property was built within budget and in line with project metrics (excluding approved client variations).

Quality



Mirvac was committed to the highest quality in all aspects of the development. A number of high-quality and bespoke elements included extensive use of natural timber products for the façade, wet areas and lobby, and stonework for the lobby desks and other furniture.

Environment and Heritage

Mirvac engaged specialist archaeology firm, GML Heritage, to enable archaeological investigations from the earliest stage and develop a process to manage 'finds' sensitively.

These processes meant archeological excavation had minimal impact on the construction program, taking just 4 weeks compared with an industry average of 3 months.

More than 23,700 artefacts from Sydney's colonial history were recovered onsite. The most significant artefacts are now integrated into the public domain and on panels of the building's façade.

Australia's colonial and Aboriginal history was also integrated into the modern, commercial building with features including:

- panels installed in the foyer tracing the Aboriginal history of the site; and
- bronze inlay cast into the floor which shows the original harbour foreshore line in the late 18th century

Sustainability (in the context of construction)

Sustainability was demonstrated through every aspect of 200 George Street's delivery. Through Mirvac's commitment and the ingenuity of Arup, who developed the Ecologically Sustainable Development strategy, 200 George Street is one of Australia's most environmentally advanced and sustainable buildings. These initiatives had no impact on construction cost or program.

Mirvac achieved the following sustainability outcomes:

- a 6 Star Green Star Office Design rating and a 6 Star Green Star As-Built rating;
- a 5 Star NABERS energy rating and a 4 Star NABERS water rating;
- Australia's first fully LED lit building;
- 90% of construction materials recycled with minimal use of landfill;
- construction lighting changed from 24 hour to motion sensor.

Innovation and new technologies utilized

200 George Street is one of the first of a new breed of 'Smart Buildings' in Australia. Prior to construction, prototyping and testing were undertaken to de-risk the introduction of new elements. 3D design coordination and surveying were also undertaken to clarify construction requirements of the building's complex roof feature.

Some key innovative features of the building include:

- Australia's first closed cavity façade (CCF) system, a world-first use of timber blinds in a CCF system. The blinds were pine treated in New Zealand to inhibit deterioration over time, and installed in a glass cavity, creating better temperature control and allowing window size to increase from 2.7m to 2.9m without any impact on energy usage or air conditioning;
- technology monitoring air quality, sunlight, power and water usage adjusting the internal environment according to the needs of the building and its occupants, allowing for real-time efficiency improvements to be made.

Stakeholder satisfaction

At 200 George Street, Mirvac's construction team completed the project on time and on budget, exceeding stakeholder expectations at every level.

Regular meetings were held with stakeholders to manage the various ongoing parameters and expectations:

- Sydney City Council
 - o Collaboration with Council from the beginning of the project ensured:
 - no fines incurred during the construction process;
 - extensive activation of the ground space completed to encourage activity in the precinct outside working hours;
 - provision of a link between George St and surrounding streets, provision of retail tenancies in the site;
 - public spaces and heritage art are accessible to the public and visible outside of working hours
- Community
 - o the project team set up, funded and staffed a breakfast service one morning a week for local homeless people. This initiative is ongoing and funded by Mirvac.
- Ernst & Young (as anchor tenant)
 - o involved in the design process, and taking possession of lower floors early

COMPLEXITY, DIFFICULTY AND OPTIMISATION OF THE CONSTRUCTION TASK (30% WEIGHTING)

A tight city site; close proximity of neighbours (as close as 6m); strict DA conditions and constraints from Council; construction of the light rail on George Street; and early handover requirements of the anchor tenant created a range of unique risks to be overcome.

Logistics

Extensive coordination was required so as not to impact vehicular and pedestrian access and included:

- deliveries managed to ensure efficiency, including the establishment of a work zone to George Street frontage;

- creation of a concrete pumping zone within the final building loading dock, utilizing a temporary high strutting space;
- extensive tower crane logistic review and management to utilize multiple work zones, and to allow for lifting of high load elements (up to 40 tonnes)

No complaints were made during the program, and there was no impact to the early handover requirements or to the footpath and public domain.

Interfaces

During demolition and excavation, two significant interfaces were maintained despite significant challenges, including:

- an Ausgrid tunnel containing crucial electrical infrastructure for the north Sydney CBD, sensitive to noise and vibration, which runs under the site. No damage or interruption to the service occurred
- a Telstra telephone exchange at 4 Dalley Street which was partly demolished while remaining operational and occupied.

Constraints

- requirement to excavate heritage site during demolition
- minimising vibration and noise, particularly during demolition. High pressure water (reducing both noise and vibration) was used to demolish concrete incurring no extra construction cost
- supplies restrictions as no storage available on site
- weekly meetings with community stakeholders meant concerns were addressed early

Unique Risks

- archaeological risk (covered above)
- CBD site meant restricted delivery times
- requirement to keep all roads and footpaths open to substantial traffic
- concurrent construction of the light rail added to congestions and logistical challenges
- sensitive telephone and electrical assets were required to remain operational throughout
- requirement to excavate and harvest large amounts of 'yellow block' sandstone and remove it in block form to the satisfaction of the NSW Department of Public Works

Design risks

- large structural, decorative steel elements transported onsite sequentially
- Australian-first façade system – delivered on budget outperforming initial concept
- specialist technical equipment and methods to create an Australian-first lobby and awning system – delivered on budget outperforming initial concept
- complex geometric shaped awning, transported sequentially onsite in prefabricated, modular forms

Use and development of new technologies

- CMC 5 axis routed timber panels – complex construction, made more difficult due to the level and quality of tolerance design required
- Australian-first ceiling created from three dimensional triangular plywood

LEADERSHIP AND MANAGEMENT OF THE PROJECT DELIVERY (30% WEIGHTING)

200 George Street is an industry-leading example of how an iconic, yet complex design, can be brought to life by a construction team working with all partners to achieve the delivery of a brand new office precinct and symbolic landmark.

The leadership team consisted of Simon Healy, General Manager of Commercial, Mirvac; David Chan, Senior Development Manager, Mirvac; Adam Sutherland, Senior Project Manager, Commercial Construction, Mirvac.

Project team relationships

Collaboration between Mirvac's design and construction teams began 10 years prior to DA, meaning a shared vision and open dialogue about considerations and solutions for more difficult aspects of the design.

As both the builder and long-term owner, Mirvac has a vested interest in ensuring strong ongoing team relationships following completion.

Generating a legacy for the construction industry

Coordination at all levels between the architectural, development and construction teams ensured exceptional delivery, allowing the Australian-first design concept to be built within budget.

Entrant's contribution in the design process

The construction team was central to decision making at every stage of the project, meaning they were able to propose innovative ways of addressing untried design features.

Workplace Health and Safety

The project played a key role in the implementation of the company wide *Work Safe, Stay Safe* program. In addition, key well-being initiatives included the 'My Simple Thing' program in the Building Balance initiative for Mirvac Construction staff.

Planning and control of design and construction operations

Mirvac's construction team was involved from the earliest stage in planning and control, providing input and recommendations on complex design visions.

Industrial relations

Mirvac's excellent health and safety record, combined with a structured process to enhance union and worker engagement meant a trouble-free construction program. Strong ongoing relationships were upheld with relevant unions and no health and safety issues required union investigation.

Training and development initiatives

Extensive on-site training and development for Mirvac employees, as well as contractors and sub-contractors, was undertaken ensuring:

- training programs tailored to specific roles and responsibilities; and
- excellent relationships and engagement with sub-contractors with minimal team changes, reducing staff turnover and reducing training costs.