Under the dome
High finance in downtown Sydney.
When Macquarie Group purchased Sydney’s 50 Martin Place in 2012, it set out to transform the iconic building into a modern workplace befitting of a global headquarters.

And transform it the finance firm did – such that it is the largest heritage refurbishment in Australia to be awarded a 6 star Green Star Office Design v3 rating by the Green Building Council of Australia (GBCA).

Through an intelligent re-use of this grand bank building, the inherent strengths of the original architecture have been enhanced – proof positive that heritage buildings can meet modern sustainability benchmarks without compromising their integrity.

"At 50 Martin, Macquarie Group’s new global headquarters, investment in the intelligent re-use of a neglected heritage asset demonstrates the latent value of such buildings and the economic viability of this sustainable approach to commercial development,” says Johnson Pilton Walker (JPW), architects on the project.

This commitment to building re-use led to an extensive internal rationalisation and two-storey rooftop dome addition, both of which have reinvigorated the

Under the **dome**

The columned, pink granite façade at 50 Martin Place in Sydney has long been a landmark of the Harbour City. Originally built as the headquarters of the Government Savings Bank of New South Wales in the 1920s, the building has recently undergone a remarkable transformation for the Macquarie Group, as Sean McGowan reports.

The glass-domed rooftop addition accommodates two levels of client and conference space.
building and restored its position as one of Australia’s most prestigious financial addresses.

**GREATER POTENTIAL**

The refurbishment of this iconic building first began under its previous owner, the Commonwealth Bank of Australia (CBA) – which remains as a tenant of the ground-floor banking chambers.

Architects JPW and building services engineers Arup were engaged by the bank to complete feasibility studies and achieve a development application to refurbish. This took place before Macquarie Group expressed interest in 50 Martin Place in late 2011.

Then as part of Macquarie’s due diligence, JPW had a discussion with the prospective buyer around the building’s greater potential.

Following Macquarie Group’s purchase in April 2012, both JPW and Arup were retained for the refurbishment project on the basis of their familiarity with the project.

According to Arup project director and New South Wales region leader, Andrew Pettifer, M.AIRAH, Macquarie Group was attracted to the building by its location, physical attributes and symbolic significance.

“The brief was to provide a contemporary workplace that enhanced connectivity, collaboration and sustainability within the business,” says Pettifer. “This was to be achieved within a highly efficient building that is a productive workplace and enhances the transparency of the organisation.”

While never a firm to let ratings tool drive the design process, Arup was nonetheless aware of Macquarie’s aspirations to achieve 6 star Green Star (Office v3) ratings in both Design and As-built.

“We first developed what we believed to be the right sustainability strategy for the building, and then measured it against Green Star,” says Pettifer.

“On this basis, we were in line for a high 5 star rating, so it didn’t take too much by way of further initiatives and tweaking of the performance of systems to get to 6 star Green Star. In the end, we achieved the rating quite comfortably.”

Pettifer says collaboration within the project team was a defining feature of the project.

And from an architectural perspective, JPW presented a design that demonstrated its belief that the heritage assets of such an iconic building could also set new standards for environmental sustainability design.

“The intensive and highly collaborative process was central to the successful outcome,” says JPW associate Matthew Morel.

“An existing structure within a heritage building sets numerous conditions, constraints and limits, and to achieve high-quality outcomes, everybody needs to bring their individual skills and experience to find innovative solutions to the challenges.”

**LIBERATING POTENTIAL**

Morel says the refurbishment project liberated the potential of the original building, built almost 90 years earlier.

Among the many alterations made to the building by JPW’s architectural design was the “activation” of the northern end of the sumptuous ground-floor banking chamber. This was achieved via the introduction of a new reception and round glass elevators.

On the tired and outdated typical floors, on-floor plant (added in the 1980s) was removed to create a typical floor plate of 2000 sq m with side cores and a central atrium.

The rooftop, previously covered in plant and disconnected from the office floors, was re-imagined to house two new levels of client and conference spaces under a magnificent steel and glass dome.

“The existing atrium and office floors were designed in the 1980s,” says Morel. “The atrium was fully glazed, clad in dark red granite and did not bring much light into the centre of the building.”

“This needed dramatic intervention to meet today’s workplace ideals.”

Existing building services, including the air-cooled VAV air conditioning system with floor-by-floor plant concealed behind the suspended ceiling, had reached the end of their serviceable life. So too had the central plant, the majority of which was located on the roof.

Similarly, all finishes and furnishings, other than in the heritage-preserved areas such as the lift, stair wells and banking chamber, were tired and due for replacement.
“This was actually helpful, as we didn’t have to worry about trying to re-use existing plant and services,” says Pettifer.

Otherwise, the basic fabric of the building was found to be in good condition.

In order to achieve Macquarie’s aspirations and functional briefing requirements, the whole building services strategy needed to be re-engineered. It had to make best use of the space available.

“The existing plant massing and reticulation strategy was far from meeting these requirements,” says Arup lead project engineer Janine Sidhom.

Therefore, re-purposing or refurbishing the existing system was discounted very early in the design process. That said, the majority of the existing air conditioning units servicing the CBA banking chamber have been retained, with only minor upgrades.”

CLEAR AND DIRECT STRATEGIES

According to Morel, a set of clear and direct strategies were central to meeting Macquarie’s objectives of a world-class workplace.

And central to these was the introduction of natural light across the floor plate.

Morel says with external fenestration limited by the heritage fabric, the atrium was widened by 70 per cent to flood the centre of the building with natural light.

“Beams and slabs were cut back and the remaining columns stripped of their granite cladding, leaving dramatic columns that play in the natural light,” says Morel.

“With stairs and bridges stimulating social connections, the atrium is now the heart of the organisation – visually and physically connecting the group’s different businesses across nine levels of workspace.”

The glass-domed rooftop addition accommodates two levels of client and conference space, allowing the spaces to be both separate from, and clearly linked to, the workplace.

It also allows natural light to flood the interior.

Morel says the symmetrical and ordered domed form integrates the addition with the original architecture. So much so that from a distance it could be original. Yet constructed in steel and glass, it is contemporary in its material and detailing.

LEAVING BEHIND THE 1980S

To restore the original proportions of the office spaces and create comfortable, high-ceiling work floors, Arup’s HVAC design allowed for the removal of all ceiling ductwork and suspended ceilings that had been installed in the 1980s.

“This in turn allowed the structural beams and soffits to be exposed overhead,” says Morel.

Arup’s building services strategy evolved in response to Macquarie’s aspirations for the building, and out of respect for the original heritage features.

Among the key drivers were the creation of function spaces on the roof, and the re-establishment and transformation of the atrium – both of which required the removal of major plant.

Arup’s Sidhom says each plant space needed to be scrutinised in intricate detail for every option that was conceived – a different approach to new building design that was extremely time-consuming.

“Plant that remained at roof level, including cooling towers, stand-by generators and smoke-exhaust fans, was carefully integrated into the new glazed structure to minimise the impact on the architectural form,” she says.

Other plant was sensitively relocated in a manner that minimised the impact on the building’s historic fabric.

This included the conversion of original water tanks into fan and boiler plant rooms, the utilisation of an existing light well to act as a fresh-air intake (working in tandem with the atrium, which acts as an exhaust-air path), and relocation of chillers from the rooftop to the basement.

A COMMERCIAL FIRST

After much consideration, an underfloor air distribution (UFAD) system was designed by Arup.

This was considered the only option that would eliminate the need for any high-
Opportunity to adjust the air distribution

In order to provide occupants with the opportunity to adjust the air distribution in their vicinity, swirl outlets were specified to have an adjustable throw pattern of +/- 30 degrees from the vertical. Working in concert with the UFAD system are passive chilled beams.

The interaction of the supply air from the floor outlets and the falling plume of cool air from the chilled beams needed to be carefully considered to prevent the risk of drafts. This prompted Arup to conduct full factory testing of the beams acting in combination with the specified floor diffusers, and allowed the design to be verified prior to installation.

Sidhom says this combination delivers superior performance while freeing the ceilings from bulky ductwork.

On level one, however, Arup encountered a problem with this design. Partway through demolition, it was discovered that sections of the original, ornate pressed-metal ceiling cornices remained. As the heritage value of these features was deemed to be significant, the air conditioning design serving the trading floor needed to be re-engineered to retain the pressed-metal ceilings.

This led Arup to adopt integrated desk cooling, which allowed the ceilings and chilled beams in these spaces to be omitted, and the cornices fully restored and exposed.

“The trading floor also extends across the base of the atrium, which, with no ceiling above, needed a bespoke solution for all ceiling services – particularly the air conditioning and lighting,” Pettifer says. “Macquarie’s trading floor is the first commercial installation of in-desk cooling in Australia.”

**THE FIFTH FACE MAKES A MARK**

The enlarged atrium and addition of the glass dome exemplify the “inside-out” approach taken on this project.

The result is that the central atrium acts as the primary source of daylight, and provides occupants with a visual connection to the sky.

Extensive daylight modelling and sun-path diagram analysis was undertaken by Arup to demonstrate – not only to Macquarie but also to the planning and heritage authorities – that this was a valid design rationale.
“Like many of the surrounding offices, Macquarie’s previous headquarters at 1 Martin Place looks down on the building,” says Pettifer. “Macquarie recognised that the roof – the fifth face of the building – was their opportunity to put their mark on the building while at the same time adding to the architectural merit in a contemporary way.”

Open-sided at the office floors, the atrium becomes the primary circulation space at the upper client floors in the new roof. As this is also the exhaust air path, Arup undertook detailed dynamic modelling of temperatures and air flows within the atrium to ensure that suitable conditions would be achieved year round.

Of course, all open-sided atria require an engineered approach to fire and smoke control. In this instance it was made all the more complex by the size and number of fire-escape stairs being lower than would typically be designed in a new building.

In order to achieve an open-edged atrium and provide the required interconnectivity, a performance-based fire engineering design was developed by Arup’s fire engineers.

The design solution provides for smoke-extract fans in the roof that also double as the general exhaust fans, operating at a lower speed in normal operation. Smoke curtains have been applied to the office spaces at levels three and above, and automatically opening doors at level two allow make-up air into the bottom of the atrium.

“Fortuitously, these doors already existed as part of the original building design,” says Pettifer, adding that the system was CFD modelled by Arup to demonstrate that it would operate satisfactorily.

He says occupants within the new client floors can reach fire escapes by travelling via the external roof terrace, which allowed these upper floors to do without smoke curtains.

**PRESERVING AND ENHANCING**

Delivered to a tight timeframe and financially prudent budget, the refurbishment of 50 Martin Place was completed in September 2014.

Morel says a highlight of this project is that, from the outside at least, the changes are subtle.

“From the street, 50 Martin Place looks much as it has done for almost 90 years,” he says. “From above, the roof hints at the internal transformation. But within, thanks to an intelligent client and brief, and an imaginative and innovative team, a building that had been put aside by others in favour of shiny new accommodation, has been transformed into a world-leading workplace.”

According to Pettifer, the building showcases what can be achieved to not only preserve, but enhance, the life and performance of a heritage building.

“To take such a distinctive property and fully modernise its working environment in a manner sympathetic to its heritage status was a complex task,” he says. “The intervention, and hence investment, was significant, and I do think that is a lesson in itself – that these types of projects are not for the faint-hearted!”

But for those with the vision and resolve to take on the challenges that heritage buildings present, the outcome can be outstanding.