

COMPLETE SUCCESS

161 Castlereagh Street developed by Grocon Group consists of a 50 level, 44 storey premium grade office tower containing 57,000m² of office and 2,800m² of retail.

161 CASTLEREAGH STREET / GROCON GROUP



Left The \$800 million 161 Castlereagh Street project under construction. Inset Artists Impression

Grocon was appointed as the builder and developer for the 161 Castlereagh Street project in Sydney in April 2010.

David Risbey, Project Manager, said, “My role involved leading the project team strategically and culturally to ensure that the project and company objectives were achieved”. Accordingly, the team from Grocon worked closely to provide seamless engagement with all stakeholders on the venture.

As one of the largest single-stage development projects currently being undertaken in Australia, 161 Castlereagh Street will redefine Sydney’s skyline.

This huge development consists of a 50 level, 44 storey premium grade office tower containing 57,000m² of office and 2,800m² of retail. It also incorporates Legion House which is a 5 storey development made up of an existing heritage building with 2 levels added on top plus a 2 storey office building with ground floor retail and a retail pavilion in an open plaza space.

With World Leadership Green Star rating targets and several community programs implemented throughout the life of the project, 161 Castlereagh St serves as an innovative model for sustainable development.

Premium tenants ANZ and Herbert Smith Freehills will move into 161 Castlereagh St on completion of the project. The joint venture is being carried out in collaboration with GPT Wholesale Office Fund, with 50 per cent ownership, and LaSalle Investment Management and ISPT who each own a 25 per cent stake.

The building itself is anticipated to have an end value of AU\$800 million, with a construction value of over AU\$300 million.

With innovation in mind, Grocon made sure the project was completed to the highest standards. The development introduced a curtain wall façade system with thermal shielding. This system is new to Australia and significantly enhances the thermal performance of the façade thus enabling improvements to the mechanical services systems.

The team has also used a new paint system which has zero Volatile organic compounds (VOC). This was particularly positive for the Green Star approach as most paint systems are specified as low VOC to satisfy Green Star Requirements. A paint manufacturer from Byron Bay supplied the zero VOC paint.

The building structure is essentially a reinforced concrete frame. However, between street level and level 5, Grocon designed and erected a structural steel jumpstart structure. This was for two main reasons, being to achieve the design intent for the large lofty volume of the building’s foyer and to expedite the structure.

At the top of the office tower is a 20m high roof feature, which consists of a highly complex structural steel frame that is clad with aluminum composite cladding. The team carried out an exhaustive number of design reviews and planning workshops to ensure the works were completed without an issue.

Grocon’s commitment to workplace safety was highlighted on the 161 Castlereagh Street project. In 2011, the team proudly won the NSW MBA Safety Award. This was two consecutive years for Grocon, who in 2010 won the same Safety Award for the Bligh Street project.

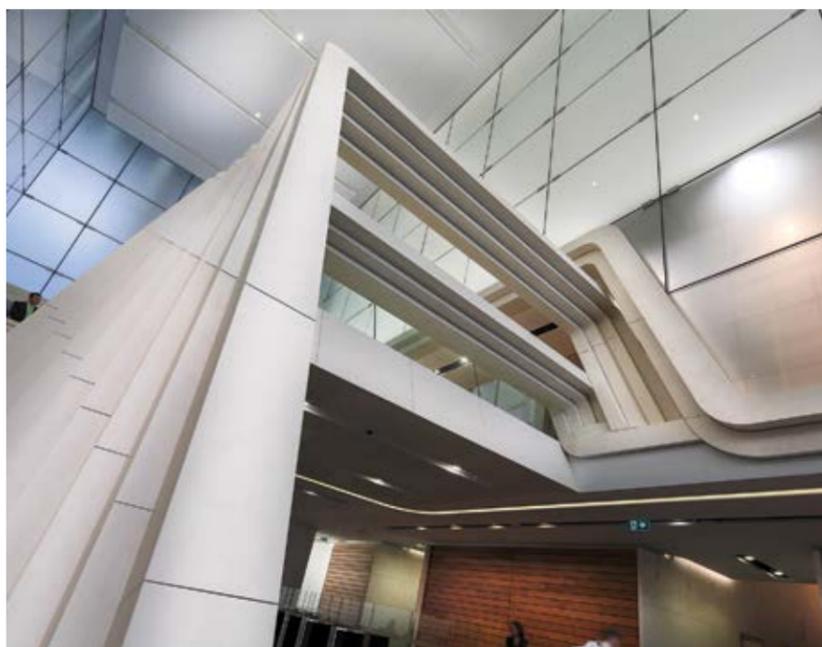
Grocon is Australia’s largest privately owned development, construction and investment management company. It has conceived and realised some of Australia’s largest and most recognised landmarks including Eureka Tower, the Rialto Towers, the redevelopment of the Melbourne Cricket Ground and No 1 Martin Place in Sydney.

Grocon is currently working on projects in Victoria, NSW and Queensland. They take pride in creating environments that people love to be in and lasting landmarks of which they can be proud.

For more information contact Grocon Group, Level 18, 420 George Street, Sydney NSW 2000, phone 02 8249 7000



161 Castlereagh Street, NSW



Cubic Interiors has positioned itself as a national leader in the building and construction industry. Starting operation in 1995, the company has seen significant growth and subsequently completed many notable projects.

The latest project to be completed by Cubic Interiors was the large-scale commercial development in Sydney, 161 Castlereagh Street. Cubic Interiors scope of works for the base building fitout included walls, ceilings and partitions. Works also involved all metal pan ceilings, linings, fire rated systems to the shaft rises, toilet fitouts and a portion of their work incorporated the heritage works. Following more than 18 months working on the development, the base building is now complete.

This premium development is spread over 43 levels and features unrivalled harbor and city views. It is situated in an ideal CBD location with a design that promotes optimal business accommodation. The interior features varying void sizes and a choice of acoustic metal ceiling systems or exposed ceilings.

As with all projects, Cubic Interiors carried out their specialised services with perfection and executed the project to best industry standards. All associated stakeholders were very pleased with the end result.

Cubic Interiors is a sub contracting entity that offers an extensive range of commercial

fitout and refurbishment services to all industries. They specialise in servicing the commercial, retail, hospitality, healthcare and government sectors.

The team at Cubic Interiors believes in building close, collaborative working relationships with their clients. This allows them to better understand their clients needs and in turn, exceed expectations on every job.

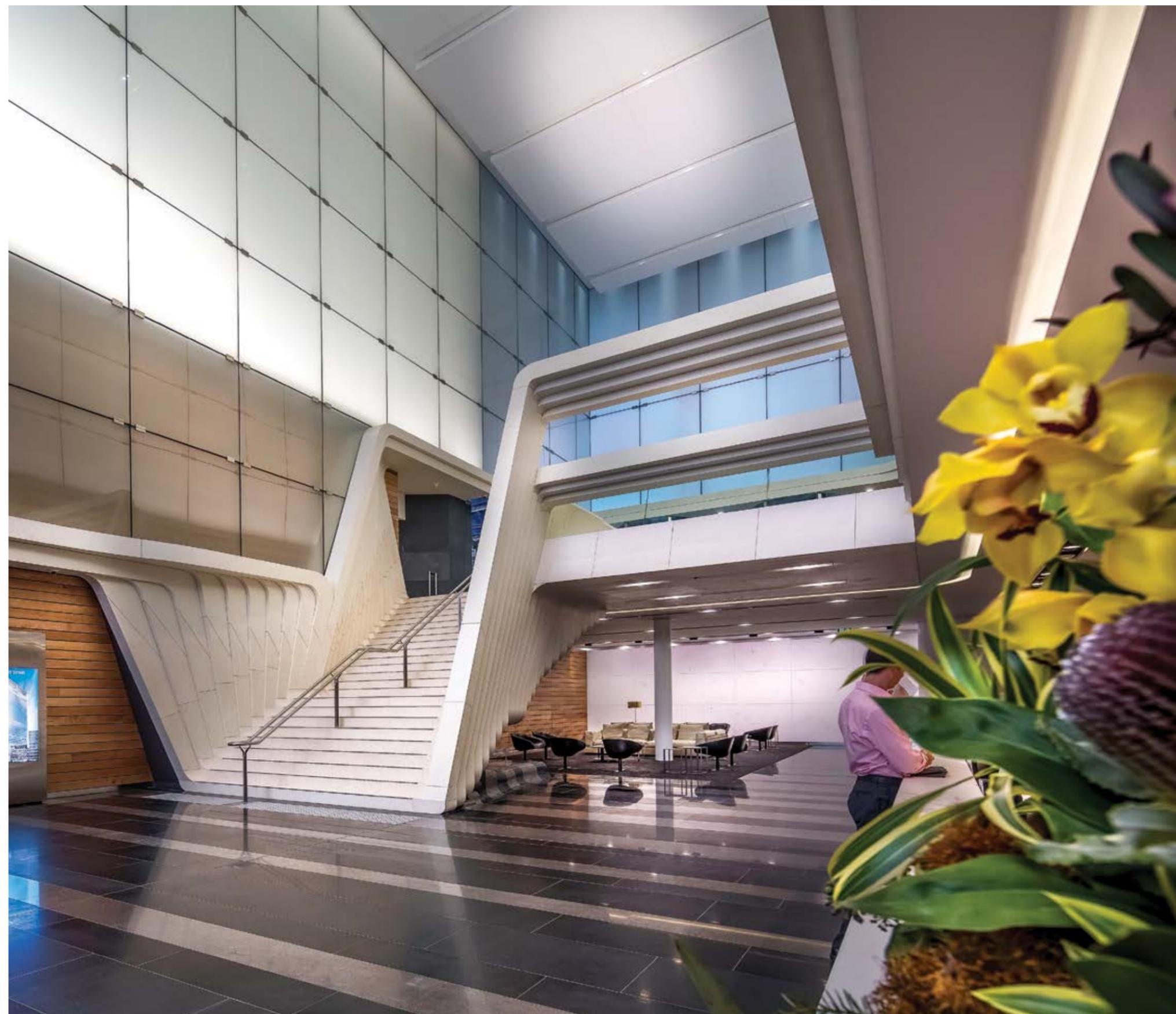
Cubic Interiors is committed to providing uncompromised quality and ensures this through the use of superior products and professional, dedicated staff.

The extensive experience held by Cubic Interiors allows them to handle the requirement of even the most complex of projects. The team work effectively to tight deadlines, limited access to premises and also accommodate the continuity of the workplace where needed.

The projects delivered by Cubic Interiors are not only functional, but capture the imagination and enthusiasm of their clients.



For more information contact Cubic Interiors, Unit 4, 4 Avenue of Americas Newington NSW 2127, phone 13000 CUBIC, email: info@cubicgroup.biz, website: www.cubicgroup.biz



Below De Martin and Gasparini were awarded the contract to supply, pump, place and finish approximately 36,000m³ of concrete

Below Wideform is one of the largest formwork companies on the east coast of Australia working on many major developments including Macquarie Centre pictured below.



De Martin and Gasparini (DMG) were awarded the contract for all in-situ concrete works required for the 161 Castlereagh Street, Sydney project. The scope included the supply, pump, place and finish of approximately 36,000m³ of concrete. The project brief required the supply and delivery of high strength, high performance 'green' concrete, having no less than 20% cement and 20% aggregate replacement, without compromising structural integrity.

The grand scale of the project meant that some challenges were expected. Critical to success was the efficient co-ordination of concrete supply due to the project being located in the heart of the CBD. To assist with limited construction zone availability, a high rise trailer pump was installed in the basement levels to minimise street congestion, noise pollution and the overall risk to the general public.

Another challenge that presented was the need to pour various structural elements on the same day to maintain program. DMG overcame this difficulty with the use of two self climbing tower placement booms strategically positioned on the floor plate and one static boom on the high rise core. The decision to implement three tower booms made concrete placement safer and more efficient effectively covering the complete building footprint from the drop hose.

In order to facilitate the Level 5 'jumpstart' construction methodology, 16m high 900mm diameter structural steel columns were introduced on ground floor that required in-filling with concrete.

Using specially designed connections and modified mix designs, DMG were able to pump 32m³ of high strength concrete into each column in one continuous operation from the 'bottom up' ensuring complete compaction was achieved. This solution offered Grocon significant time & cost savings.

With over 60 years of expertise and knowledge in the construction industry, DMG has proven time after time that no job is too difficult. DMG have extensive skill in all aspects of concrete works, from complete structural packages that includes formwork and reinforcement, to basic supply and place projects.

The company offers its clients proven, reliable performance with the security of being backed by Boral Limited - Australia's leading building products company.

For more information contact De Martin & Gasparini Pty Ltd, ABN 81 000 205 372, 16 Hill Road, Homebush Bay NSW 2127, phone 02 9748 5100, fax 02 9648 6161

Working closely with Grocon, Wideform provided formwork expertise for the design and construction of the 161 Castlereagh St project.

As one of the first components in a construction project, effective formwork is critical as it sets the pace, and standard, for the following trades. Wideform has over 35 years experience in the building and construction industry, and many of their employees have been involved in some of Australia's most iconic developments.

Continuous improvement in their systems and processes is integral to the Wideform policy, as is workplace safety. On the 161 Castlereagh project, Big Joes and Small Joes were utilised to install and strip the modularised formwork components, which has traditionally involved a high degree of manual handling. By identifying methods where mechanical means could be employed in the formwork processes, Wideform were able to further reduce the risks of injury to their employees. External access stairs were also used outside the safety screens to provide alternate entry and exit points and reduce the amount of pedestrian activity on working decks.

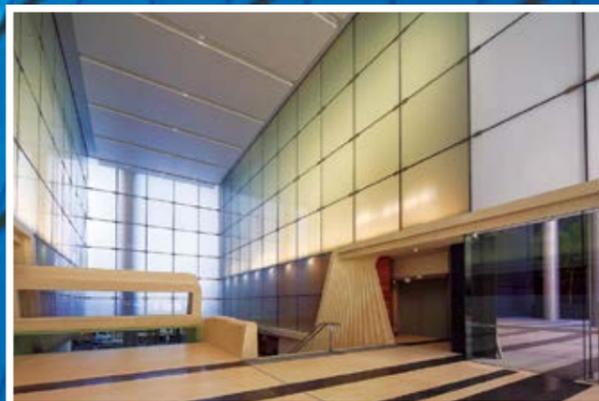
In addition to improving work methods, Wideform proactively contributed to Grocon's Green Star requirements. Their use of sustainable materials includes non-structural timber products that have been regenerated by their finger joining machine.

In what is the first project involving the two companies, both Wideform and Grocon are pleased with the delivery of 161 Castlereagh St. In particular, Grocon's senior management have suggested the performance of the jumpform is the most efficient they've seen on a Grocon project.

As a critical part of its strategic direction, Wideform has also recently achieved certification for its Integrated Management System (IMS), which combines the Safety, Quality and Environmental Standards. This is a significant accomplishment and positions Wideform as the only formwork contractor in Australia to hold this certification.

Wideform is one of the largest formwork companies on the east coast of Australia and is currently completing major developments in Sydney, Wollongong, Canberra and Brisbane. The company was recently awarded the Adelaide Oval Redevelopment in South Australia. The team at Wideform pride themselves on their ability to work closely with clients to deliver major projects on time, within budget and to the highest safety and quality standards.

For more information contact Wideform, PO Box 1183, Unanderra NSW 2526, phone 02 4224 0300, fax 02 4272 1047, email: info@wideform.com.au



JML were approached by Grocon to provide the design and subsequent implementation of the cable net support system for the development at 161 Castlereagh Street in Sydney. This type of glass wall construction was both challenging and complex due to the very high forces involved. There are very few engineers practicing in Australia who possess the level of expertise required for this type of development.

There were several details regarding support and connection to the main structure which had not been fully coordinated or developed in the early stages. It was critical to the completion of the JML design to finalise these details. These design issues included the following:

- Connection to the ground level floors on both sides
- Connection of the cable net system to the structure above.
- Anticipated deflection of the ground floor slab and level 5 above.
- Clear load path for each connection from soffit to ground floor.
- Custom made spring boxes to maintain the cables at a constant level of tension
- Glass selection as to required level of opacity.
- Custom made Stainless Steel glass support fittings had to be designed and fabricated.
- Anticipated wind loads

JML and their appointed consultants subsequently worked through the above details and information, which included some conflicting material, to

eventually derive the current design and details, through a collaborative and inclusive process. This involved all parties including the client appointed consultant team and the project management team from Grocon.

Each stainless steel glass support fitting was custom designed by JML. They were made specifically for this project by the investment casting process and then finished by hand. It was essential on this project that very detailed and accurate drawings of each building element were designed and fully dimensional. This was done to exacting standards to ensure all elements were fully aligned.

The significance of ensuring every detail was correct sees each 32 mm SS cable having the ability to accommodate a load exceeding 27 tonnes.

JML's expertise includes design & construction of curtain wall and architectural facade systems along with project management. The company features branches in Newcastle, Australia and the UAE and their projects span the globe. JML is heavily positioned towards complete turn-key design and construct projects with the emphasis on bespoke design solutions and challenging architectural details.

For more information contact JML Group, Suite 2, 57 Belford Street Broadmeadow NSW 2292, phone 02 4961 2688

Weir Phillips was involved in the development of 161 Castlereagh Street from the outset. The team provided heritage advice throughout the design and construction phases of the project.

The project set out to achieve a Six Star, Green Star rating, be carbon neutral and operate off grid. Achieving this required extensive consultation with a wide range of building professionals, as well as with the City of Sydney, to ensure the heritage significance of the building was maintained and able to be understood.

The major challenge of the project was reconciling the heritage significance of the building at 161 Castlereagh Street with the need to reticulate complex services throughout the building. There were also challenges in fitting two additional storeys on top of the building. The building had to keep its heritage significance whilst becoming far more energy efficient. As each challenge arose, solutions were found that maintained significance but resulted in high energy efficiency. For Weir Phillips, it was simply a matter of applying sound heritage principles to the project while best facilitating the additional services and specific requirements.

Weir Phillips is a firm of architects and heritage consultants, formed in 1997 when two former university friends, Robert Weir and James Phillips commenced the practice.

Weir Phillips has worked with several significant developers and undertaken a diverse range of projects during their 16 year history. Some of these include:

- Department of Defence, RAAF Bases at Darwin and Townsville
- Woomera Rocket Range
- Royal Botanic Gardens, Sydney
- Eveleigh Carriage works
- Former Water Board Buildings, Sydney

In their role as heritage consultants, Weir Phillips enjoyed the challenges of working on the 161 Castlereagh Street project with Grocon.

The entire Weir Phillips team felt they were part of a ground-breaking project and were inspired by Grocon's enthusiasm and determination to see the project completed to the highest standards.

For more information contact Weir Phillips, James Phillips, Heritage Consultant, 69 Regent Street, Chippendale NSW 2008, phone 02 9310 1010, email: james@weirphillips.com.au, website: www.weirphillips.com.au

Below Fredon Air was responsible for the design, implementation and installation of the Mechanical and BMCS services on the 161 Castlereagh Street project.

161 Castlereagh Street, NSW



Fredon Air Pty Ltd was responsible for the delivery of mechanical services on the latest development by Grocon in Sydney. The project, 161 Castlereagh Street, is a premium grade office tower and spans over 43 levels.

Fredon Air was involved with the design, implementation and installation of the Mechanical and BMCS services, and through the course of the project adopted innovative approaches in design and construction.

Fredon Air for example was faced with the challenge of re-engineering the Level 14 Plantroom to accommodate the mechanical services within 2/3rds of the spatial allocation originally offered.

This proved to be an extremely complex process as multi levels of plant were incorporated whilst ensuring safety in design requirements were met.

Fredon took the lead role in this process which resulted in an additional 300m² of net lettable area.

In another first, Fredon Air incorporated reed switches within the staircases for the stair pressurization systems. Air leakage and the stacking effect of high rise building stair cases can undermine

performance in relation to stair door opening forces in fire mode. This initiative ensured that the stair doors could easily be opened in fire mode. It proved very effective and streamlined the commissioning process.

Fredon Air were very focused in making sure the design for the tri-generation system was optimised and appropriately sized for real operational scenarios. They achieved this by ensuring that the matching and sizing of the plant closely complemented the expected energy usage of the building.

As project manager Zois Kotsis stated, "The team delivered an exceptional product, stood up to the many challenges faced and delivered on time. Everyone involved should take great pride in what we've accomplished."

For more information contact Fredon Air Pty Ltd, 123 Wetherill Street Silverwater NSW 2128, PO Box 6006 Silverwater NSW 2128, phone 02 9475 9400, fax 02 9748 0040, email: nsw@fredon.com.au, website: www.fredon.com.au, Contact: Vernessa Cook (Projects Administrator)