

ESD

ECOLOGICALLY SUSTAINABLE DEVELOPMENT

A NEW DECADE OF DISRUPTION

In 2015, we surpassed the milestone of 1000 Green Star projects. A massive 600,000 plus Australians now work in Green Star-rated offices – that's 4.5% of the nation's total workforce. More than 4,400 people now live in Green Star-rated apartments. Upwards of 16,800 students learn in Green Star-certified schools. And Green Star – Communities projects certified in the last year will be home to 100,000 people.

Australia has been recognised as the world's green leader by the Global Real Estate Sustainability Benchmark (GRESB) for five years in a row. Our largest property and development companies are committing to portfolio-wide Green Star certification, with Frasers Property Australia alone certifying 1.3 million square metres of space. And new finance mechanisms such as green bonds are reshaping a market that has set its sights on long-term value. If sustainability is no longer a disruptive force, then what is?

There are a multitude of emerging trends which will accelerate over the next few years, and the industry's leaders will again seize an unassailable market advantage by embracing them.

Zero in on net zero

Our buildings present some of the cheapest and fastest opportunities to reduce emissions – and we can do this with proven and readily-available technologies. The property and construction industry understands how to deliver low-carbon buildings – all those Green Star ratings are positive proof. Our next challenge is to move beyond 'low carbon' to 'no carbon'. The GBCA will introduce a 'net zero' label later in 2016, which will recognise buildings, fitouts and communities that are energy, carbon or water neutral. The label will also reward those projects that go beyond net zero and make positive contributions to, for example, generating more renewable energy than consumed. Is net zero the new 7 Star Green Star rating? Only time will tell.

Healthy buildings in the headlines

A number of Australian companies are looking at the WELL Building Standard, which takes the focus on healthy building to a new level. WELL is focused on the people within the building. More than two million square metres of space has gained WELL certification in 12 countries, and Macquarie Group, Lendlease, DEXUS, Frasers Property Australia and Grocon are all looking at certification in Australia. Investing in healthy interventions will enable companies to cut costs, boost productivity, enhance their brands and demonstrate their long-term commitment to their greatest asset – their people.

Ramp up the resilience factor

While our conversation around "resilience" has previously been centred on climate change impact, rising sea levels, heat waves and so forth, expect this to change. Consider the challenges facing our own cities. Infrastructure Australia says that, without significant investment, the annual cost of congestion will climb to \$53b by 2031. We can expect our new Minister for Cities and Digital Transformation, Angus Taylor, to have this high on his agenda in the months ahead – but the clever companies are already looking at how they build-in resilience. The 30-odd Green Star – Communities projects currently working with us are creating local jobs, ensuring people of all incomes can live in the same community, promoting social inclusion, and encouraging healthy and active living. These are all factors that make a resilient community.

Set your sights on social equity

Companies increasingly understand they have both an obligation and an opportunity to influence the communities within which they operate.

I'm inspired by the Homes 4 Homes project – a simple but effective response that aggregates the building industry's purchasing power to help get people off the streets. Using an innovative finance mechanism which encourages home owners to donate 0.1% of

their sale price to a fund, Homes 4 Homes is able to invest social housing projects. Grocon has committed to support the scheme, and it has been recognised in a new Green Star 'Social Enterprise for Affordable Housing' Innovation Challenge.

Move beyond the traditional renewables

The industry is taking to battery storage with gusto. Morgan & Stanley predict more than one million households will be using battery storage by 2020. Lendlease and West Australia's LandCorp are pioneering a major community-level battery storage project at Australia's first 6 Star Green Star – Community in Perth. The \$6.7m pilot project at Alkimos Beach will include 1.1MWh of lithium ion battery storage that will service more than 100 homes with rooftop solar panels.

Cash in on the diversity dividend

Finally, expect diversity to remain a talking point across industries. As former editor of BRW Narelle Hooper says in her book *New Women, New Men, New Economy*: "Everything's changed. The marketplace is choosing for us...organisations with more women in leadership roles are delivering superior financial returns, increasing productivity and tapping the ingenuity of their people." Expect to see more organisations embrace diversity not because it's the right thing to do, but because it's the smart thing to do.

So this year, the cutting-edge companies in our industry will be looking at bringing these trends together to create buildings, communities and cities that are healthy, resilient, equitable and, of course, sustainable.



Romilly Madew, Chief Executive of the Green Building Council of Australia (CGCA)



Left & Right : Bowden Village, the first community in Australia to mandate 5 Star Green Star for each building.



Insert : Lendlease's Alkimos Beach development achieved Australia's first 6 Star Green Star Communities rating.



Left & Right : The Tonsley urban renewal development on the site of the old Mitsubishi automotive plant, achieved a 6 Star Green Star - Communities rating in 2015.



GOING WITH THE FLOW IN BERRY

Berry on the NSW south coast, 145 km from Sydney, is a distinctive Australian rural coastal setting. Just seven kilometres inland from Seven Mile beach, Berry sits beside crystal clear waterways including Broughton Creek, a major tributary of the Shoalhaven River. Rolling hills, heritage sites and friendly people are all part in parcel here.

Situated between the Illawarra Ranges, nature reserves and National Parks, Berry's surrounds provide important passage between the coast and hinterland for native fauna species, including the iconic platypus and Australian Bass.

"We are working on a 12.5km upgrade of the Princes Highway to allow traffic to bypass Foxground bends and the nearby town of Berry," said Shannon Chisholm, the projects Community and Environmental Manager.

"A key component of the project is a 600m long super T bridge which crosses Bundewallah Creek and flood plain, a vital waterway servicing this thriving environment," said Shannon. "The bridge offers our team a great opportunity to get to know the community and work within the ecosystems which create this picturesque part of NSW."

"Minimising disturbance is key to all we do," said Marcus Gibson, Fulton Hogan's National Environment, Quality & IMS Manager. "Nine threatened species of birds and bats, and six migratory bird species were recorded during field surveys of the area... We want to make sure the wildlife prospers during and long after the project's completion."

A significant project milestone was the diversion of flows at Bundewallah Creek to allow construction of the Berry Bridge.

Steep river embankments, crossings and the inclement weather were a few of the challenges to bridge construction, but sound planning and innovative methodologies resulted in solutions to significantly minimise environmental disturbance.

With initial plans for the project including up to three diversions of the creek to facilitate bridge construction, Fulton Hogan really showed its commitment to the local environment by engineering a solution to reduce the number of diversions to just one.

"After getting to know the local environment, we found a solution where a single diversion could be constructed by seamlessly recreating the natural system complete with reclaimed river rock and natural features such as tree trunks and root balls," said Marcus. "Working with our Government partners, the single diversion provides a legacy that mirrors the natural channel morphology and will assist water quality and aquatic ecology, minimising disturbance."

Minimal disturbance was also evident in the innovative approach to 'tie-in' works of the waterways, completed with the assistance

of a water filled 'aqua dam'. The pioneering use of the impervious temporary dam helped the team contain and divert the flow of water during construction.

"Aqua dams are really portable, simple to install and their 'soft' impact leaves no environmental footprint... it's a friendly alternative to the traditional methodologies and the challenges normally faced when working in waterways," said Shannon. "We could get in and out of the area without the need to build hard solutions, such as earthen dams or sheet piling."

"The waterway is generally relatively low in velocity which enabled us to get the vegetation established... it's also home to some pretty special native species, like the Australian Bass, so creating natural pools and snags became an important design consideration" said Shannon. "We wanted to really minimise our time spent in the waterway and recreate a natural passage that enabled the fish, birds and other wildlife to continue on as normal during the works and well after we have gone."

With many of the Fulton Hogan team being area locals, they were extremely keen to get involved to support the great efforts of conservation groups in the Berry community.

"We teamed up with locals from the Landcare Association and Bushcare Group to salvage native plants and seeds, including some Illawarra Flame Trees saved from within the project footprint, and replanted them along creek banks to conserve the local seed stock and help prevent erosion," said Marcus.

The team also took the approach of using bio-degradable stabilisation matting with vegetation and natural elements salvaged during the clearing phase instead of the standard geo-fabric and rock along the river banks to minimise erosion. "We were conscious that some products on the market wouldn't easily break down or be assimilated by this environment."

"The matting is made of natural fibres to organically decompose over time, and helps keep this setting as beautiful and thriving as ever."

"The team and community were well prepared for the challenge of this project from the outset. We worked hard to put in place some innovative approaches to protect the wildlife that call this area home," noted Shannon.

"It's been a great opportunity to work within such an iconic setting, and ensure we do all we can to keep it that way."

For more information contact Fulton Hogan, Botanicca Corporate Park, Building 7, Level 1, 572 Swan Street, Richmond VIC 3121, phone 03 9340 6200, fax 03 9340 6299, email info@fultonhogan.com, website www.fultonhogan.com



For over 12 years PACT Construction has been a leading Western Australian mid-tier commercial construction company. PACT provides a unique point of difference with a ‘whole of project’ service approach, strength, experience and a growing reputation, ensuring success.

PACT Construction is also committed to delivering project outcomes in an ecologically sustainable manner. In 2014 they won the Master Builders Association Excellence in Construction Award for ‘Excellence in Energy Efficiency’ for the 170 Railway Parade project in West Leederville.

Their recent signature project, 999 Hay Street in Perth not only showcases their ‘whole of project’ approach and flair for collaborative management, but has already achieved a 5 Star Greenstar As-built v3 certification rating and 4.5 Star NABERS Environmental Efficiency rating.

The \$54.4 million 999 Hay Street project is QUBE Property’s largest office development to date. It comprises 11-stories, 10 open-plan office floor plates, a rooftop boardroom, office, entertainment deck, EOT facilities and a café integrated into the main lobby at ground level and surrounding streetscape. When viewed from any direction it’s immediately apparent that this is no ordinary commercial office building.

“We’ve had a strong working relationship with QUBE. This saw us identified as the right partner to see the job through successfully,” advised PACT Construction’s General Manager, Jason Kunkler. “Being engaged early enabled us to add value from the outset. We looked at a number of cost effective structural design solutions creating both time and cost savings for our client. We’ve also been responsible for Engineering Firm GHD’s 6,547m² integrated office fit-out.”

Environmental principles included in the design and construction of 999 Hay Street cover:

- High efficiency air conditioning using greenhouse friendly refrigerant to improve indoor air quality
- Solar control to the eastern and western façades
- High performance glazing to minimise solar heat loads on the western and eastern façades, whilst providing ample natural light;
- A sophisticated Building Management System that monitors and controls all mechanical and electrical services
- Water efficient fixtures, movement sensors for lighting in toilets
- Grey water recycling
- Utilisation of lighting management systems
- Proximity to public transport facilities, resulting in a lower employee reliance on private vehicles
- Provision of tenant and visitor bicycle spaces and lockers
- Employee shower and change room facilities.

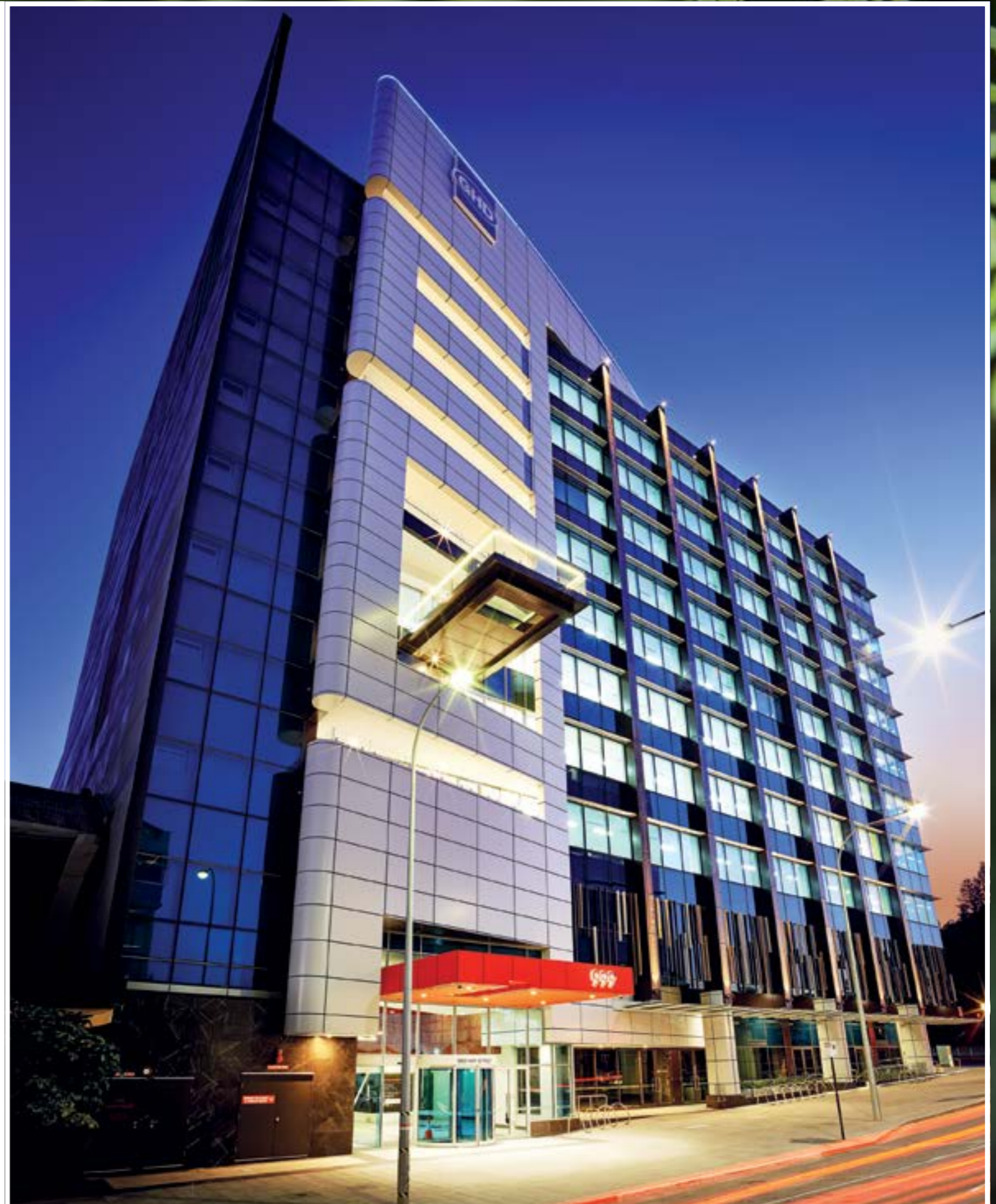
PACT Construction recognises the need to protect and wherever possible, enhance the natural environment as part of its business activity and is setting high standards in environmental performance, while continually improving the quality of projects delivered.

“Environmental excellence provides a benefit to our clients, tenants and the wider community, and reflects the need to ensure equity between social, economic and environmental goals,” said Jason.

As PACT’s GM, Jason is responsible for the effectiveness of their Environmental Policy that encompasses all services undertaken for their clients.

“We’re committed to setting and meeting objectives for local and regional conditions,” said Jason. “This includes applying appropriate technology and best management practices and supporting pollution prevention consistent with environmental regulations, laws and other criteria to which we subscribe.”

For more information contact PACT Construction Pty Ltd, Unit 4, 12 Cowcher Place, Belmont WA 6104, phone 08 9340 5900, fax 08 9201 8360, website www.pactconstruction.com.au





FLOTH - 69 ROBERTSON STREET

A new 1,000m² office building, 69 Robertson Street in Brisbane's Fortitude Valley, quietly beat the field to receive the first Green Star Design and As Built v1.1 certified rating. Remarkably the project team did this by achieving the highest possible rating of 6 Stars, representing world leadership in sustainable design and construction.

Floth Sustainable Building Consultants, an independent Australian specialist engineering firm, developed and occupy the three level office building. They undertook the building services engineering and Environmentally Sustainable Design (ESD) and moved into the upper two levels in August. The constrained zero lot line building includes green trellis walls with drought tolerant climbing vines growing up the external faces of the central light well and rear decks.

While the planting has been carefully selected to thrive without additional irrigation, roof rainwater is still being collected for green wall establishment and for toilet and urinal flushing.

The new office building is fitted with the latest occupancy- and daylight- controlled direct- indirect LED lighting systems. Heat recovery variable refrigerant flow air conditioning systems are literally able to move heating or cooling from one part of the building to another as required. High indoor air quality is assured with a 50% increase in outside air being delivered to occupants via variable air volume systems that are demand controlled in response to zoned carbon dioxide sensors.

Glenn Ralph, Floth's Managing Director, is elated with the achievement. "When we were originally designing the building, the Green Star Design and As Built rating system didn't exist and we were working to Green Star Office v3. As the project commenced construction, we were able to test the design and to upgrade to the new rating system once we knew we could achieve our goals."

"We are certainly pleased with the outcome, which goes one up on our previous achievements of designing the first 6 Star Green Star Office v2 As Built rated building in Queensland (Green Square

North Tower) and the first 6 Star Green Star Office v3 Design rated building in Queensland (180 Brisbane)."

Anthony Marklund, Floth's ESD Principal said, "We have leap-frogged the few other buildings in Australia that have undertaken Design Reviews to achieve the first complete Green Star Design & As Built version 1.1 certified rating. I am particularly proud of the 83.3 point round one result and the fact that we actually had to surrender an awarded innovation in order to fit within the maximum of ten allowable innovation credits."

"Beyond Green star, the building meets the Australian Sustainable Built Environment Council's (ASBEC) zero carbon building standard. A 53% reduction in operational carbon emissions is predicted from façade and integral building services improvements (compared to an equivalent Building Code compliant energy model). A roof-mounted solar photovoltaic system achieves a further 13% reduction, also equivalent to offsetting 28% of the building's final operational energy. 100% accredited GreenPower purchased from Origin is the final piece of the zero carbon puzzle."

"Over the base building, both Floth's and the eventual Level 1 tenant's fitouts will effectively be zero carbon in operation by virtue of the 100% GreenPower supply. Notably the free electricity generated by the solar photovoltaic system will more than offset the additional operational cost of the GreenPower. Given the cost effectiveness of the building, it would be difficult to come up with a better solution."

Level one of 69 Robertson Street, Fortitude Valley is a fully fitted out 370m² open plan office space served by lift, dedicated amenities and three carparks. One would think that the astute aspiring tenant would need to move quickly to secure this unprecedented opportunity to join Floth in benefiting from the sustainable features of this truly world leading building.

For more information contact Floth Pty Ltd, Level 2, 69 Robertson Street, Fortitude Valley QLD 4006, phone 07 3252 0977, email bnc@floth.com.au, website www.floth.com.au

The regenerative revolution

An evolving environment demands evolutionary design. In a community, all systems must work together to allow people to lead healthy lifestyles. Beyond sustainability - we are looking to the future; a **regenerative revolution**.

The regenerative revolution: taking sustainable urbanisation to a new level

The United Nations stated in a report titled, 'The World Urbanization Prospects, The 2014 Revision', that most urbanisation and global population growth will happen in cities all over the world from 2016 to 2030. As our cities become mega cities, we are facing the major threats associated with climate change and population growth. Engineers and technical specialists are in a unique position to help counter these threats, by approaching the design, construction and management of the sustainable components in a way that better ensures people can continue to live healthy and sustainable lives.

Now is the time to address these issues to future proof our communities.

At Aurecon, we believe sustainable urbanisation cannot be achieved one building, or one piece of infrastructure at a time. We need to look at a 'whole system' approach that includes clever thinking, and leveraging the opportunity of improved outcomes through integrated planning across all infrastructure, buildings, energy and resources. A shortage of resources means that each piece of infrastructure and each part of our built environment should work effectively as an intertwined network of sustainable elements - to help achieve this we are using tools such as the ISCA IS (Infrastructure Sustainability Council of Australia Infrastructure Sustainability) and Green Star ratings to help validate our sustainable design outcomes on projects.

There are many considerations that need to be made in order to create more liveable, sustainable precincts - these considerations include thought around the sustainable design of our roads, the size of our car parks, the implantation of more bike parking and creating more facilities where people can charge their electric vehicles.

We look to identify and optimise infrastructure and development priorities by leveraging our strong partnerships with our peers - this allows us to go far beyond our strong technical expertise in contemporary infrastructure development and planning.

The regenerative revolution

For our future world, we also need to look at blue and green infrastructure, the water and vegetation systems, which we could better use to solve problems that other infrastructure can't. Blue and green infrastructure are the fundamental initiators of realising future Eco Cities.

What if we use nature itself and build with nature to solve our problems in the city?

If we take our natural landscape and inject it into our urban environments, we could be more resilient and support our ecosystems. Recreating naturalistic terrain, wetlands and aquatic ecosystems is pivotal in achieving this.

Our design focus needs to align with people's lifestyles, and pay special attention to where they live, where they work and where they play. Sustainability is always changing but our end goal needs to be regenerative, and resilient - beyond just sustainability.

Using new methods that are centred on regenerative design and construction, combined with energy solutions that encompass carbon accounting, we will be able to regenerate our resources and also adapt them, so that we can have future cities in which we can all happily live and work in, be healthy, and prosper.

About Aurecon

Aurecon is a proud member of the Infrastructure Sustainability Council of Australia, and Green Building Council of Australia and the recipient of the 2015 ISCA Organisational Leadership in Infrastructure Sustainability Award.

We recognise the need to balance economic growth with social development and the protection of the environment, while furthering the capacity of the company and its stakeholders to survive, adapt and grow in an evolving world. Through Aurecon's Sustainability Policy, we are committed to making a real contribution to the sustainability challenge. We constantly review, test and adapt to what's possible. We look at non-traditional approaches, and fresh solutions.

Through our sustainability and resilience specialists, we offer an integrated approach to sustainability across all of our markets.

*Bringing ideas
to life*



Julian and Michael, Alltrade Industrial.

Alltrade Industrial Supplies has been supplying the construction industry with an extensive range of highly effective environmentally friendly products, along with site supplies, amenities, and general industrial supplies for over 10 years. Today Alltrade Industrial Supplies is renowned for their Bio Natural Solutions (BNS) eco friendly cleaning products, wastewater remediation solutions, water savings solutions and much more. These environmentally friendly products are based on Bio-Bacterial technology. "This innovative technology from the Australian owned BNS products consists of billions of specifically selected bacteria that target and digest organic matter eliminating the source of cleaning problems rather than masking them," advised Alltrade's Director Michael Mathison. "This process guarantees a natural way to treat common cleaning problems with no need for harsh chemicals, making cleaning tasks simpler and greener."

Bacteria reproduce themselves, creating enzymes to digest and degrade the bacterial food source. Enzymes on their own do not have the capabilities of consuming waste material or the ability to reproduce more enzymes. This reproductive characteristic makes Bacterial products more effective than harsh chemical treatments. "All of our biological cleaning products are significantly more effective than conventional chemical based cleaners, offering significant savings," added Michael. "The difference between our products

and other comparable products is that ours use naturally occurring friendly bacteria that also ensure odour decomposition occurs rather than masking the smells." BNS products avoid the use of hazardous ingredients, are biodegradable and 100% chemical free, guaranteeing that no harmful chemicals are transferred into our ecosystem through the waterways and disposal systems, reducing the effect on human health whilst also making a positive impact on the environment.

The benefits of Alltrade's biological cleaning products include reducing costs, odour elimination and water savings without the need for harsh chemical cleaners and toxic elements. These products provide solutions for the construction industry. "Our products are the only bacterial based cleaning agents on the market that have the GECA (Good Environmental Choice Australia) approval," said Michael. "Alltrade is already recognised throughout the construction industry for speed of delivery, in-depth product knowledge and understanding the demands of the industry. The biological cleaning range is yet another solution based product we can offer."

For more information contact Alltrade Industrial Supplies, F7/8 Commercial Court, Tullamarine VIC 3043, phone 03 9330 4953, fax 03 9330 3449, Michael 0431 010 845, email michael@alltradeis.com.au



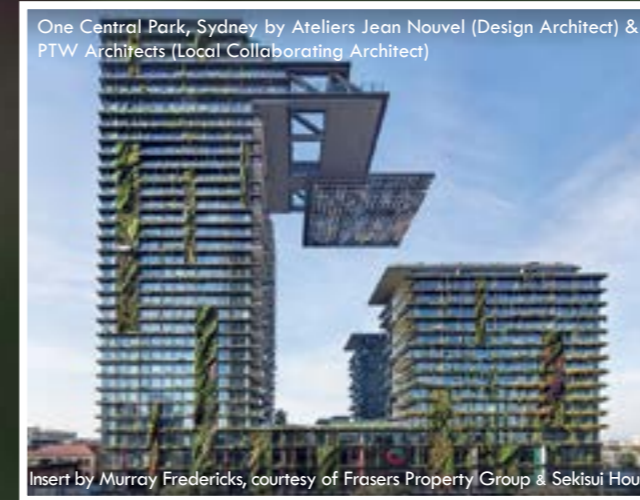
Alexander, Barangaroo

Insert by John Gollings



Alexander, Barangaroo

Insert by John Gollings



One Central Park, Sydney by Ateliers Jean Nouvel (Design Architect) & PTW Architects (Local Collaborating Architect)

Insert by Murray Fredericks, courtesy of Frasers Property Group & Sekisui House



Alexander, Barangaroo

Insert by John Gollings

International architecture and design firm PTW Architects has always been at the forefront when it comes to the development of sustainable architecture. As founding members of the Green Building Council, PTW are committed to the principle of ecologically sustainable design (ESD) and seeks to make ESD a priority on all its projects.

The company's commitment to cutting-edge sustainable architecture design is evidenced through its many awards. This includes the inaugural NSW Premier's Award for Sustainable Architecture on the Newington – Sydney Olympic Village project and the first 5 Star Green Star rating and Energy rating for a commercial building on the 30 The Bond, Lendlease Headquarters.

Employing more than 220 staff in Sydney, Shanghai, Beijing, Shenzhen, Ho Chi Minh City, Hanoi and Taipei, PTW has been producing the finest architectural solutions since its inception in 1889.

PTW believes that if ESD is to be successfully implemented, its principles must be used throughout all the stages of a project, from pre-design to the long-term operation and management of a development. PTW Architects works closely with each client to achieve

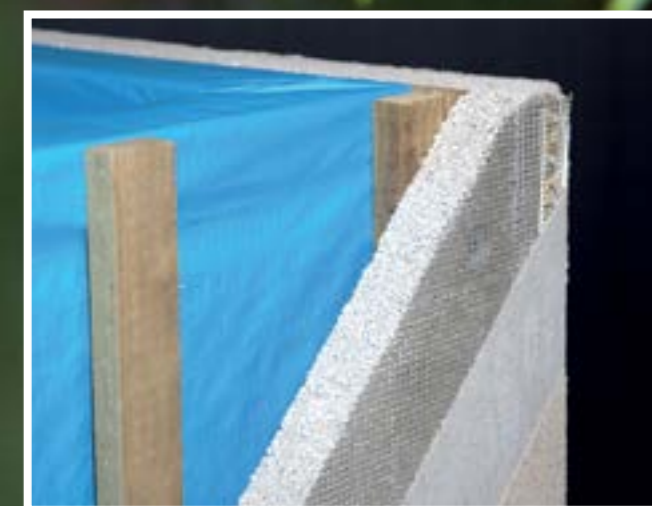
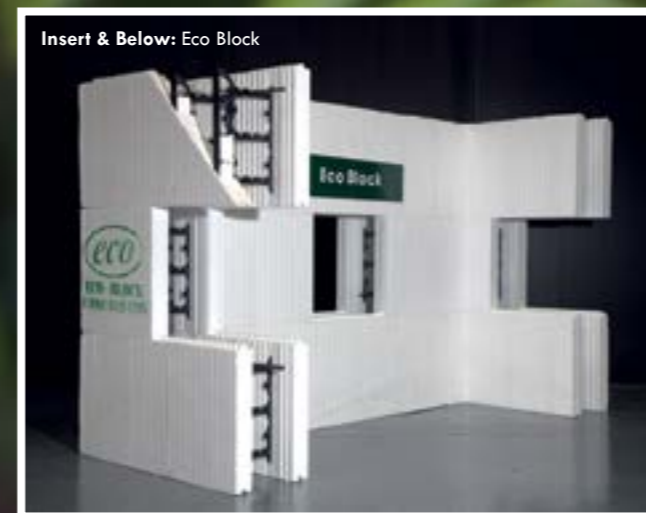
individual solutions that meet the client's full project aspirations each time in a sustainable and timely manner.

In approaching any project, regardless of the location and country, PTW's pre-design stage involves educating its clients around opportunities for ESD and active participation in the process of developing the brief to ensure spaces and services are designed efficiently for their end uses.

The suitability of the building project and its site are then evaluated to ensure any early decisions avoid detrimental environmental impacts. An inter-disciplinary approach with consultants, who are selected on their sustainable design credentials, help with the evaluation and then throughout all stages of the process.

PTW's extensive experience of using ESD features across diverse projects and can be seen most recently in projects such as Alexander in Barangaroo and One Central Park, Sydney.

For more information contact Lisa McAlinden at PTW Architects, Level 13, 9 Castlereagh Street, Sydney NSW 2000, phone 02 9232 5877, fax 02 9221 4139, email info-sydney@ptw.com.au, website www.ptw.com.au



Eco Friendly Building Solutions Pty Ltd (EFBS) is the licensed manufacturer and supplier of Eco Block and the QT EcoSeries Fire Rated Cladding – two superior quality building materials offering big benefits while leaving small ecological footprints. “The products that we sell, we use, so we know the products work,” says Steve Fava, Owner and Manager of EFBS. “We have been using them for the past 12 years.”

Eco Block is an insulated concrete wall system offering advanced structural integrity for multistorey and private residential as well as commercial buildings. BRANZ tested and BCA compliant, Eco Block incorporates structure, insulation, vapor barrier, firewall and battens into one system. The double insulated continuous steel reinforced concrete core, anywhere between 100mm-600mm thick, creates a structure up to 100% stronger than a conventional concrete block wall. Eco Block can be shaped to suit any design and is easily installed through a 3-step “stack, brace and pour” process. “There are three or four Eco Block houses in Sydney under construction as well as projects across Australia,” Steve reports.

Steve first came across Eco Block as an installer/distributor and “liked them so much I bought shares of the license to manufacture throughout Australia.” Similarly impressed by the QT EcoSeries, Steve now distributes nationwide.

QT EcoSeries Fire Rated Light Weight Cladding is an external walling system boasting high thermal and acoustic insulation. Its potential to create a 90/90/90 firewall makes it ideal for external firewalls or walls between units or townhouses. Made of Conpolcrete, a patented formulation comprising recycled polystyrene, cement and binders, the QT EcoSeries is a lightweight material certified to meet any regulatory standard and has been used in multi-story projects across Sydney and Melbourne. It also complies with all F2 Zone and BAL Requirements.

From its Blacktown shopfront, EFBS also offers general waterproofing and specialist crack injection for which it has been a contractor on projects including the Sydney Harbour Tunnel since 2011, repair works on ABC Studio Sydney, State Library, Channel 7 Studios Technology Park and works on state rail.



For more information contact Eco Friendly Building Solutions Pty Ltd, U2/10 Carnegie Place, Blacktown NSW 2148, phone 02 9676 5500, Steve 0418 248 323, fax 02 9676 5522, email steve@efbs.com.au, website www.efbs.com.au