BARANGAROO SOUTH 2018 SUSTAINABILITY REPORT

## **IMAGINE**





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### Acknowledgment of country

Lendlease acknowledges the Traditional Owners and Custodians of the land on which Barangaroo stands, the Gadigal people of the Eora nation, and recognise their continuing connection to land, waters and community.

We pay our respect to them and their cultures and to Elders past, present and emerging.

## SUSTAINABILITY IT'S IN I FNDI FASE'S DNA

Lendlease's founder, Dick Dusseldorp ("Duss"), understood that success in the property and construction business meant more than the financial bottom line. For Duss, real success lay in building communities, enhancing the natural environment and enriching the lives of the people who live there. He even stressed the importance of what is now known as the "triple bottom line" decades before the term was coined.

Over 40 years later, this value is everimportant. Environmental, social and economic outcomes must be emphasised to deliver places that respond to the complex global forces shaping the future, including rapid urbanisation, inequality, climate change and resource stress.

Sustainability is a principle and value pillar for Lendlease, enabling the creation of the best places. It is supported by a sustainability strategy and framework, that underpin Lendlease's commitment to contribute to ethical, social and environmental mega-trends.

"Companies must start justifying their worth to society, with greater emphasis placed on environmental and social impact rather than straight economics."

Dick Dusseldorp, 1973.

## YESTERDAY, TODAY...

The ambitious sustainability targets set by the project team for the precinct, back when Barangaroo was but a concrete slab for container storage, are coming to fruition as the first stage of the precinct enters operations.

As tenants and businesses move on site, the reality of the design intent and how it intersects with social and environmental objectives of day-to-day working life, can be seen.

Impressive environmental and social sustainability targets that were imagined in 2008 are being met, or exceeded. Initiatives deployed during the first phase of construction are setting new standards for high quality urban regeneration projects. Fundamental ethical questions were and are considered prior to making key decisions on the project. The rigour of our governance model deliberately challenges established thinking and ensures that all decisions made are ethical, financially sound, and in the best interests of our employees, our shareholders and investors.

Completion of the first stage of the development has proven that considered, clever design, complements and enhances business operations to create benefits for the environment, people and place.

The precinct's streets are abuzz with the footsteps of thousands. Some head to work, others visit for the day, and residents have made the place feel like home. Communal spaces are enriched with public art and cultural programs, a mix of boutique stores and restaurants extend the city westward, with a new neighbourhood in full swing, day and night. Barangaroo South has emerged and it is playing an integral part in the economic and social life of the city.

The precinct-wide approach to sustainability has been recognised with a 6 Star Green Star Communities rating—the first precinct of its kind to receive this rating. Barangaroo was selected as a C40 Cities Climate Positive Development, one of only eighteen projects worldwide.

Industry peers have also acknowledged the importance of this development and the key role sustainability has played in its success. Below are just some of the accolades Barangaroo South has been awarded:

- 2018 National Property Council of Australia Innovation and Excellence Awards: People's Choice Award; Development of the Year Award; Best Sustainable Development Award
- 2017 Urban Development Institute of Australia Awards: Development of the Year, President's Award; Excellence in Sustainability and Environmental Technology; Excellence in Mixed Use Development
- 2017 Urban Taskforce Development Excellence Awards, Development of the Year
- 2017 Australian Property Institute National Excellence in Property Awards: Environmental Development Award; Property Development Award
- 2016 Property Council of Australia Innovation and Excellence Awards, Innovation Award
- 2016 NSW State and Australian Training Awards, Industry Collaboration
- 2016 Australian Human Rights Commission Award, Business Category, for the Design for Dignity Guidelines







## ...AND TOMORROW

While energised by the successes to date, they did not come without significant challenges. The lessons learnt along the way will be vital to inform the journey to come.

As the next phase of development approaches, new challenges will include:

- Extending the successful sustainability strategies to the next construction phase of Barangaroo South — a predominately residential development.
- Engaging with all stakeholders, from builders and suppliers to tenants, to ensure the continuous evolution of innovation, business practices and behaviours needed to achieve our ambitious sustainability goals.
- Improving the processes learnt in the first phase of development that led to better training and skills development for workers in the construction industry.
- Executing one of the largest and most ambitious public art programs in Australia's history.

This report provides an overview of the progress to date at Barangaroo South. As preparations begin for the next phase of development at Barangaroo South, Lendlease redoubles its commitment to the triple bottom line and vision to create the best places.

## "OUR MANDATE

is to create the best places, and this can only be measured by how people use, experience and enjoy our precincts. Put simply, Barangaroo South has become a place where people want to be, and we could not be prouder. From the residents in our apartments and the people who work in our offices, to the eclectic mix of retailers and restauranteurs who entertain our visitors daily, to see Barangaroo embraced by the community it was built for, is very rewarding."

Rob Deck, Managing Director, Barangaroo South

Contributing to the sustainability excellence of the precinct are the individual buildings. The achievements of the offices, apartments and retail tenancies have been reinforced by the following Green Star ratings:



6 Star Community Rating



#### All commercial buildings certified to date:

- 6 Star Green Star Design Ratings Office v3: International Towers Sydney 1, 2 and 3, International House Sydney
- 6 Star Green Star Design and As Built v.1.1: Tower 2 International Towers Sydney.



#### All residential buildings certified to date:

- 5 Star Green Star Multi-Unit Residential Design: Anadara and Alexander
- 5 Star Green Star Multi-Unit Residential As Built: Anadara and Alexander



#### 25 Voluntary Green Star Certifications:

- 11 achieving 6 Star Green Star
- 13 achieving 5 Star Green Star
- 1 rated 4 Star Green Star

"When 1 in 20 CBD workers will be coming to Barangaroo South each day, the impact this development will have on people is obvious. This is what a sustainable city looks like."

Romilly Madew, Green Building Council Australia's Chief Executive Officer\*





- Solar Panels
- 2 Green Roofs/Edges (Solar Panels)

- 3 Ecological/Green Connections
- 4 Rainwater tanks within the building



- 5 Key Transport connections
- 6 End-Of-Trip facilities

7 Basement Under Stage 1A: Recycled Water Treatment Plant, District Cooling Plant, Waste Management Facilities, Embedded Network, Control Rooms

## ENVIRONMENT

Barangaroo South is a place that enhances Sydney's position as a must-see destination.

Just as the landmark architecture, waterfront location and vibrant retail offering are attracting interest, the precinct's environmental sustainability attributes are equally key to this success.

The environmental targets set for Barangaroo South of: carbon neutral, net water positive and net zero waste, have established new precedents for sustainable design, construction and operation of large scale precincts, both nationally and internationally.

Mindful that the decisions made at the conception of the project would affect the lives of many in the future, the Barangaroo South team considered the full scope of material environmental elements, and set the bar high.



We aim to divert

80%

of operational waste from landfill

TARGETING NET ZERO WASTE



of rainwater harvesting capacity in the precinct to date

TARGETING NET WATER POSITIVE



Solar panels with the capacity to generate

800kw

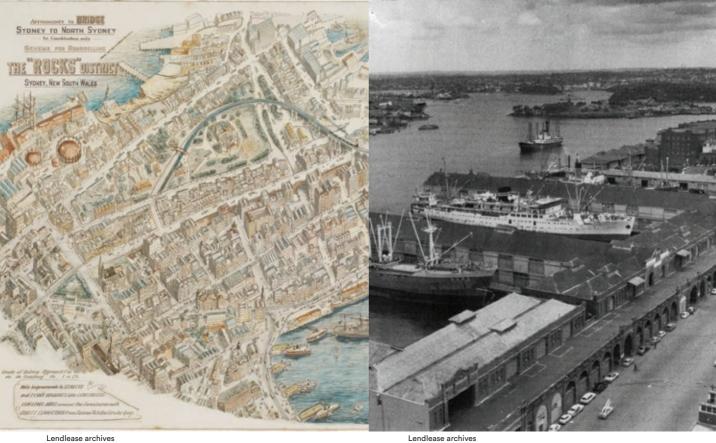
of clean, renewable energy currently installed, with more to come

TARGETING CARBON NEUTRAL



Lendlease archives

Robinson's Map of Sydney Australia, 1922



Lendlease archives



## UNDERSTANDING REMEDIATION

The physical site of Barangaroo has a long and textured history.

The site of Barangaroo is part of the land of the Gadigal people of the Eora Nation, the Traditional Custodians of the Sydney city region. Middens have been found in close proximity to the site, providing physical evidence of Aboriginal occupation. The shoreline at this time ran back along the edge of what is now Hickson Road, and the area of modern day Barangaroo was largely underwater.

After European settlement, the area became an increasingly busy shipping port with wharves, cargo stores and ship building activities clustered along the shoreline. This eventually included the Millers Point Gasworks. The by-product of the gasworks was black tar. Accompanying these activities was a process of gradual land reclamation, culminating in the rectangular 22-hectare strip of concrete that served Sydney Harbour into the 21st Century as a busy shipping container port.

In addition to land reclamation, this long history of industrial, wharf and port related activities left significant environmental degradation and contamination.

Before any construction of the precinct could commence, a clean up of black tar and asbestos on the site was needed to transform the many decades of contamination into a healthy space, fit for all the many activities envisaged for the site.

The first stage of remediation began in 2011 and took over five years to complete. It involved:

- Human Health and Ecological Risk Assessments to ensure the health of people and the environment would be protected.
- Safely disposing of contaminated material to licensed waste facilities.
- Retaining safe fill on site to stabilise the site and reduce wastage — above and beyond standard practice.
- Treating air and groundwater from the contamination area and discharging or venting back into the environment air and water that was cleaner than the ambient environment.
- Undertaking stringent validation methods that are audited by the Environmental Protection Agency, to ensure a high standard of work.

Today, the completed phase of Barangaroo South is an extraordinary place. It has risen from the ground to become a thriving business and community precinct and is quickly taking on a life of its own.

As Wayne Hitches, General Manager of Remediation and Infrastructure at Lendlease can attest, "We have done a lot to make it what it is and the next phase of works, on the One Sydney Harbour site, will conclude the remediation of the precinct. Our expertise in decontamination will ensure every centimetre of our growing precinct is a safe place that can nurture life and activity."



## BENEATH THE STREETS

Beneath the Streets of Barangaroo, invisible to the public, is the basement.

Sixty thousand square metres in size — as big as three Sydney Cricket Grounds — this cavernous space has allowed Lendlease to house some of the most sustainable, high tech equipment to support the buildings and people that work at Barangaroo.

Just as important as the technology is, so too are the many technicians and cleaners who are integral to the success of this process and its continual improvement.

Nowhere is this more true than for the waste strategy in place at Barangaroo South.

### Fertiliser and green energy production

The precinct converts around 50 tonnes of food waste into fertiliser and green energy every month.

Food scraps and compostable takeaway packaging are broken up in a macerator housed in the basement, a first at this scale, in Australia. The resulting pulp is stored onsite and then transported to an offsite facility where it is converted into fertiliser and green energy.

#### Smart, sustainable waste management

The basement is key to delivering the target of 80% diversion of operational waste from landfill — it is an ambitious goal, considering the thousands of people who use Barangaroo South every day.

Tenants separate their waste into any one of up to 20 waste streams. The waste is then taken to the basement to be weighed and logged before being sent off to different reuse and recycling facilities. Information is collected on the volume and types of waste generated. This data collection helps to develop targeted education and engagement programs, to drive continual improvement and progress waste diversion efforts into the future.

#### Imagine anew

Over time, the aim is to send zero net waste to landfill from Barangaroo South.

The basement waste management systems will play a vital role in achieving this.

Want to learn more? See how waste is separated for recycling at Barangaroo South on page 39.



## NATURE, RESILIENCE & ADAPTATION

The ability to cope with the growing impacts of climate change — from rising sea levels to more intense storms — and protect the local community was built into Barangaroo South from the beginning. Here's a snapshot of how it's done.

#### Sea level rise

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body that evaluates climate change science and research across the world. The IPCC predicts that sea levels in NSW will rise by 0.9 metres by 2100, due to the impacts of climate change.

This is not something one can ignore. In fact, this information was used to establish the ground level of Barangaroo South. Allowing for the IPCC predicted sea level rise, the ground plane at Barangaroo South is elevated well above the Sydney Harbour Foreshore's Development Control provisions. "Basing our precinct design on the best current science on climate change and predicted climate changes, is just one of the ways we are 'future proofing' Barangaroo South," said Graham Carter, Operations Manager of Applied Insight at Lendlease.

#### Interval storm events

While a 100-year storm event sounds like something in the very distant future, in the life of a building, a weather event like this is pretty much guaranteed.

Using this insight, the Barangaroo South Team looked closely at modelling of interval storm events, and upgraded the precinct's stormwater system accordingly.

As detailed by Peter Flynn, Senior Project Manager at Barangaroo South, "We used 50% contingency for blockage to guide stormwater pipe and collection pit sizing. And we completed surface regrading along Sussex Street between Napoleon Street and Shelley Street to improve stormwater drainage now and into the future — when more intense storms are likely to occur."

### Central city location, not so cool — urban heat islands

As cities grow, they heat up. Land, covered by hard surfaces and bitumen roads and buildings, largely comprised of concrete and steel, result in environments that absorb a lot of the sun's heat and limit air circulation. Combine this with heat pollution generated by industry and transport and a phenomenon called the "urban heat island effect" (UHI) is born.

This effect sees the heat of the sun absorbed into road and building surfaces and causes temperatures in cities to be hotter than surrounding greener areas.

This increased heat can affect people's health, safety, quality of life and productivity.\*

#### Good news: green roofs

Green roofs are proving to be a great way to mitigate the UHI effect. They don't just cool surfaces and surrounding areas, they also decrease the amount of heat being transferred into the atmosphere.

In addition to heat mitigation, green roofs help manage stormwater run-off, lower energy consumption and insulate buildings from noise. The city habitat provided supports biodiversity and can improve air quality, supporting healthier environments in built up and urban areas.\*

#### Planting new life at Barangaroo

At Barangaroo South, more than 1800m² of green roof, in the form of podium gardens of the International Towers Sydney, not only provide green oases and verdant views for tenants, they also play a significant role in mitigating the UHI effect described.

The gardens comprise over 13,000 mature stock shrubs and groundcover, a mix of native and drought-tolerant species, and a number of trees that will grow to provide structure and shade to the roof terraces.

Irrigation for the roof gardens comes from rainwater harvested from each of the towers, which is gravity-fed via water storage tanks housed in the mid-rise parts of each tower.

More actions are outlined in Lendlease's Climate Change and Resilience Action Plan found at:

 $www.barangaroosouth.com. au/Developments/AU/BR/\\ Home/About/Sustainability$ 

To date:

+1,800m<sup>2</sup>

ITS podiums house

+13,000

mature stock shrubs and groundcover plantings



Elevated ground planes improve climate resilience against predicted sea level rise.







"Integrating these low carbon and renewable energy strategies is the culmination of seven years' work to make the precinct one of the most sustainable in Australia, if not the world."

Kylie Rampa, Chief Executive Officer, Property

### **ENERGY**

Bold plans were made for Barangaroo South, most notably to become the first carbon neutral precinct of its size and scale in Australia.

It is one thing to design and build complex buildings that are energy and water efficient — it is altogether another to inspire cooperation from what will be 23,000 workers, 2,000 residents and more than 80 retail tenants, to also commit to working towards reducing their energy consumption and carbon emissions.

#### Taking a stand, now

As the first phase of Barangaroo South shifts from its building mode into a vibrant and active place — tens of thousands of office staff and dozens of shops, retailers and residents have been welcomed into the precinct.

Carefully modelled and considered in place design, the principles that underpin the approach to carbon neutrality at Barangaroo South are:

- Precinct wide approach
- Designing out embodied carbon

- Energy efficiency
- On-site renewable generation, and
- Carbon Offsetting

The influx of people to the precinct have put these systems to the test. As Michael McNelis, Barangaroo South Sustainability Manager said,

"To truly achieve carbon neutrality, we need all our partners, our tenants, our businesses to get on board. Lendlease has and continues to work with our tenants to help them understand their energy needs and how they can contribute to a lower energy, carbon neutral future."

Lendlease is taking a stand for carbon neutrality — not just to create Australia's best place for sustainability, but to contribute to the global effort of tackling climate change — and they are hitting the ball out of the park.

#### Precinct Wide Approach

At Barangaroo South, leveraging the scale of the project was key to Lendlease being able to achieve the significant environmental targets. Major infrastructure and systems are shared. They include: Recycled Water Treatment Plant, District Cooling Plant, embedded network, solar panels across all building roofs, building management and data systems, and centralised waste collection and management system. Stakeholders across the precinct collaborate to capitalise on technological advancements and best-practice sustainable services. This approach creates economies of scale, such that significant environmental benefits can be achieved without overburdening individual stakeholders, particularly those with fewer resources.

#### Designing out Embodied Carbon

The design for the precinct and the buildings not only considered how to reduce energy consumption when the building is in use, it also strived to reduce the amount of carbon embodied in the buildings themselves.

Embodied carbon is the amount of energy and carbon emissions that have been generated when a material is created, used and ultimately disposed of.

Lendlease carried out life-cycle assessments on the 20 top materials used in construction. By working with manufacturers, the embodied carbon in common construction materials such as steel and concrete were reduced. In addition to advanced material selection, smart design principles were used that reduced material use where possible. As a result, all buildings in the precinct are now exceeding the 20% reduction in embodied carbon target imagined.

Specific initiatives implemented to design out carbon:

- Reduced embodied carbon in our buildings by at least 20% from BAU.
- Life-cycle assessment of top 20 materials used in construction undertaken.
- 23% reduction in the carbon intensity of reinforced steel.
- · Carbon Neutral certified access floors.
- · Dematerialisation of Tower façades.
- Choice of less carbon intense materials, including: recycled steel, recycled timber, cross-laminated timber.
- Up to 40% cement replacement used for concrete components.
- Concrete mixes over 60 concrete mixes were tested for their carbon intensity and strength to ensure we didn't sacrifice structural competency.

# Over 20% reduction in embodied carbon in all buildings compared to BAU.

#### **Energy Efficiency**

The office, residential and retail buildings at Barangaroo South were designed and built to the highest standard of energy efficiency.

Efforts made in embodied carbon reductions are complemented by energy efficiency measures incorporated into the building design. No leaf was left unturned, from building layouts to refined solar shade fins on the building façades; from the precinct District Cooling Plant and chilled beam technology to energy efficient waste processing; and from 100% LED lighting across the precinct to rooftops lined with solar panels.

"What this means is that our buildings emit less carbon compared to business as usual (BAU), and our tenants get the benefit of working in buildings that use clever design and state-of-the-art technology to drive energy efficiency," said Darryl Stuckey, Manager Environment and Ethical Assessment.

What else is being done to achieve state-of-the-art energy efficiency?

- Precinct-wide energy metering and sub-metering to measure and track energy consumption.
- Designed the commercial base buildings to be, on average, at least 25% better than regular building performance — and we are on track to achieve precinct-wide savings of at least 30% better than the 5 Star NABERS energy requirements.
- Created passive design features that support building energy efficiency including external façade shading, energy efficient glass, automatic shading blinds, large floor plate design to maximise natural light into the buildings.
- Worked with occupants to understand and reduce energy demand in their tenancies.
- Developed a Sustainability, Education and Engagement Action Plan, to support all tenants to align their operations with the significant sustainability targets for the precinct.
- Supported tenants and visitors to reduce their carbon emissions from transport through good infrastructure (access to public transport, end-oftrip bike racks, showers and services), and tenant

engagement including the development of a Green Travel Plan to promote and support active transport options into the precinct.

- Installed an incredibly energy and water efficient District Cooling Plant, providing harbour water to cool all buildings within the precinct (in lieu of traditional air conditioning and cooling towers).
- Ecological and carbon footprint assessments carried out on site. For example, Lendlease undertook a carbon footprint analysis with each retailer that helped them understand where they could save energy and money by choosing more energy efficient appliances and creating systems that turn off non-essential equipment at the end of the day.
- Installed super energy efficient LED lighting throughout precinct — more than 50,000 LED fixtures.

#### Onsite Renewable Generation

Solar panels line the rooftops across Barangaroo South, with over 800kW currently installed. Plans are on track for this capacity to increase with the development of the next phase of Barangaroo South.

These panels will generate energy equivalent to the power needed for the public domain lighting and the Recycled Water Treatment Plant.

Other plans for supporting renewables are in the pipeline, with a target of an additional 1,706 tonnes of carbon abatement annually. This is the equivalent of removing 365 passenger vehicles from the road for a year. Studies are underway to determine the best way of generating efficient and renewable energy.

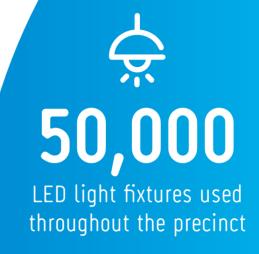
#### Carbon Offsetting

Notwithstanding the energy efficiency initiatives and onsite renewable energy supply, at a site like Barangaroo South that is high rise and in the heart of the city, there is still more energy consumed than is generated onsite.

To achieve carbon neutrality, community stakeholders are working together to offset all residual emissions associated with operations at Barangaroo South.

One form that this collaboration has taken is to include tenants from the start. Lucy Sharman, Barangaroo South Eco-concierge explained, "We engaged tenants around the precinct's sustainability goals even before they signed their leases and we are continuing to engage with them about how we can all work together to achieve the sustainability targets for Barangaroo South."

Another important example is the integration of the Community Carbon Fund into all 99-year building leases. Contributions to the Community Carbon Fund are built into the leases so that all tenants are contributing to a carbon neutral precinct and a more sustainable future.















## WATER

As cities grow and place greater demand on fresh water, and as climate change disrupts rainfall patterns, the need to find smarter ways to use and reuse water is a must.

Mastering this is crucial to meeting the needs of people and society now and in the future.

Barangaroo South was created with the aim of minimising its demand on water resources, and the end goal is for the precinct to be net water positive.

It will be achieved by:

- Enhancing water efficiencies
- Mitigating impacts to natural water cycles
- Reducing the precinct's potable water footprint

#### What is being done now?

On the ground, there is innovative precinct-wide infrastructure that manages stormwater, rainwater, recycled water and heating and cooling needs.

The infrastructure built into Barangaroo South is reducing the precinct's potable water consumption, ensuring that drinking water is not used when other water sources are available, and keeping the neighbouring harbour water clean.

Just as important as built solutions are in protecting and preserving this resource, so too is engaging Barangaroo South's tenants, residents and customers about the need to be water wise.



### Protecting water quality

At Barangaroo, stormwater screening practices that remove sediment and nutrients from stormwater runoff (that would otherwise go into the harbour), have been stretched.

Extensive stormwater treatment is achieving a greater than 80% reduction in suspended solids, and 45% reduction in nitrogen and phosphorus — exceeding National Best Practice Standards.

The precinct's stormwater catchment area extends beyond the boundary of Barangaroo South to include neighbouring precincts up to Kent Street.

Resulting from these efforts, stormwater runoff entering the harbour from this part of the city is better quality than that found in surrounding areas.

80% reduction in stormwater

suspended solids

45%
reduction in nitrogen and phosphorous

The Stormwater Treatment Plant is Exceeding National Best Practice

### Using less, recycling more

Roofs: a source of fresh rainwater capture

Built into Barangaroo South is the ability to harvest rainwater from all building roofs that are not being used as green roofs. Across the precinct today there is the capacity to capture 188,500 litres of rainwater.

### The basement: a technology centre for resource management

Deep below the precinct lies an infrastructure hub that serves all energy, water and waste functions. Centralising all the precinct's services brings crucial efficiencies of scale. Not only is water used and distributed more efficiently across the whole site, but the energy required to undertake this process is also reduced.

The two key water technologies housed in the basement are the Recycled Water Treatment Plant and the District Cooling Plant.

### Imagine only using drinking water for exactly that — the Recycled Water Treatment Plant

The Recycled Water Treatment Plant (RWTP) provides a new source of water for the precinct, and is key to Barangaroo South becoming water positive.

All black and grey water is taken through mechanical and chemical processes to convert used water into high quality recycled water. This water is then used for toilet flushing and irrigation.

With an ultimate capacity of more than a million litres a day, the RWTP can process not only used water from Barangaroo South, but also that from neighbouring buildings. This means that more recycled water could be exported from Barangaroo South than the potable water imported.

With the ability to generate more water than required in the precinct, infrastructure underpinning the RWTP includes provision for a connection into the wider city infrastructure. "Vital future planning to allow for the export of recycled water, sharing the sustainability benefits of our precinct with greater Sydney," emphasised Peter Flynn, Senior Project Manager at Barangaroo South.

### District Cooling Plant (DCP)

While common overseas, DCPs are novel in an Australian context. This innovative system uses seawater from Sydney Harbour to cool the chilled water plant that serves the air conditioning systems of all Barangaroo South's buildings.

Instead of using typical cooling towers that evaporate large amounts of clean water into the atmosphere to remove heat from buildings, this system uses the seawater as a heat sink.

Flynn attests that while extensive research was required in the DCP design process to ensure an optimal performance outcome, "The ability to save up to 100 million litres, that's 40 Olympic pools worth of potable water a year, proves it is a valuable investment."







## 97% of the waste from construction was recycled or reused.

### WASTE

Keeping as much waste as possible out of landfill has always been the main goal for the Barangaroo South Team.

When building the first phase of Barangaroo South, 97% of the waste from construction was recycled or reused.

Now, with over 16,000 regular retail, commercial and residential tenants and workers, as well as thousands of people visiting every month, things are a little more challenging. In order to hit the 80% diversion of operational waste from landfill target, efforts are dedicated to find out what waste is being generated, and how it can be reused.

"In a precinct with such a diverse mix of businesses and tenants, you would expect to achieve rates of between 25–30% diversion of waste from landfill. Achieving our goal of a minimum of 80% diversion of waste required a totally different approach and a mix of innovative systems, education and engagement," explains Lucy Sharman.

### A novel approach, in practice.

At Barangaroo South, a blend of recycling and waste diversion programs and systems allow for the processing and diversion of 20 different types of waste from landfill.

Every single tenant separates a minimum of five waste streams in their tenancy:

- Paper and cardboard
- Comingled recycling
- Food scraps and compostable packaging
- Dry waste soft plastics
- General waste

For tenants that have other waste streams, these are also collected and processed. Products can range from e-waste, printer cartridges, batteries and electrical goods, to cooking oil and much more!

## Measuring our footprint



All waste streams are separated to improve reuse and recycling at Barangaroo South.





Each waste stream is sent to different recycling facilities and reuse partners.

Barangaroo South processes up to twenty different waste streams



Each waste stream is weighed and recorded. This information is used to improve behaviour and recycling.

### Education & Innovation

As you can imagine, keeping tens of thousands of people focused on recycling right is a big job. Education and tenant engagement programs are key to ensuring that waste that can be recovered, is recovered.

More than 2,000 people have been taken on tours of the waste and sustainability features at Barangaroo. These tours aim to educate and engage staff, tenants and partners about sustainability and the way waste is managed at Barangaroo South.

### Collaboration is critical

Education is a two-way street when it comes to waste management. Collaboration with up-stream and down-stream stakeholders is a must.

"We work with the companies who take waste away from the site to trial new recycling methods. We talk with the cleaners who use the systems every day. Every week we run education and engagement programs to help our tenants and partners understand how to separate waste to get the best possible diversion and recycling results," says Sharman.

"We work with our residents and tenants to understand how we can better help them..."

### Food to fuel

Unique to Barangaroo South is how food scraps and takeaway packaging is processed.

Underpinning this process is plant-based packaging for takeaway containers in the precinct. While not an easy task, now all tenants in Barangaroo South are on board: "When you buy a fruit salad or takeaway burger from one of our retailers, it comes in a container made from corn starch, sugar cane or cardboard — not from petrochemical based plastic," says Sharman.

The hidden beauty of 100% plant-based packaging is revealed post use. Once discarded, the packaging can be processed with food scraps onsite and turned into a pulp. The pulp is then taken off-site to undergo anaerobic digestion, which produces gas (used to power the processing facility), and fertiliser. A beautiful closed-loop system, turning food and takeaway packaging waste into green energy and fertiliser.



In the first 2 years of operation more than

2,400 t

of waste was prevented from going to landfill. That's the same weight as more than 540 adult elephants.

### Re-use

A mixed-use precinct like Barangaroo South creates all sorts of waste. From fixtures and furniture, to e-waste and outdoor equipment, to plants, furniture and household goods.

The Lendlease team work with a range of charities to take unused items and provide them to others, be that people in need or artists and educators to use in their own work. Unused furniture has been sent to the Bower Reuse shop in Marrickville; tiles and carpet samples have been used by Reverse Garbage in their educational workshops; and household goods have found their way to local people in need through the Pyrmont Cares charity.

Reusing items and seeing them as a resource — instead of sending them off for recycling, or disposal, is the best possible 'waste' result.



of cooking oil are recycled each week and turned into biodiesel fuel for trucks

### Want to know more about waste at Barangaroo?

Check out Barangaroo South's 'What to do with Waste' and 'Coffee cups' videos - found at the Barangaroo South Youtube Channel.

# IMAGINE A REUSABLE CULTURE

At Barangaroo South, the sustainability team are calling into question the very best of what convenience has to offer — the disposable coffee cup.

Notwithstanding a goal to keep at least 80% of waste out of landfill, more than 12,000 single use coffee cups are being used in the precinct every single day. And that number is growing.

The journey from forest to factory to customer for Barangaroo South's annual supply of disposable cups creates the same emissions as powering 101 homes for a full year.\*

The time has come to fix the coffee fix!

### Eradicating disposable cups from landfill

Barangaroo South is one of the few places in Australia that has worked hard to provide a way to divert disposable coffee cups from landfill, and have joined the nationwide charge to eliminate their use altogether.

#### The team have:

- Worked to ensure all disposable coffee cups and lids are made from renewable resources such as corn starch.
- Engaged their waste management company to divert disposable coffee cups from landfill.
   Disposable coffee cups used at the precinct are turned into engineered fuel and used in cement manufacture.

- Provided key tenants with 6,000 reusable cups as a 'welcome to the neighbourhood' gift.
- Organised the sale of over 600 Keep Cups, inscribed with poetry by emerging Indigenous poets, with all proceeds donated to charity partner the Tribal Warrior Association.
- Encouraged precinct cafes to support coffee drinkers to bring their own reusable cup. For just one cafe, up to 5% of customers are now proactively bringing their own mug, equating to approximately 250 disposable coffee cups avoided each week.
- Increased the visibility of this issue by participating in forums such as the City of Sydney's new waste strategy launch and presenting to the Boomerang Alliance conference on plastic waste pollution.
- Set up a regular Sustainability Forum for International Towers Sydney tenants to work together on sustainability issues.
- Developed a video to help educate tenants about disposable coffee cups at Barangaroo
   — found at the Barangaroo South YouTube Channel.
- Started looking at how to eliminate the use of disposable coffee cups altogether!

<sup>\*</sup>Based on a five day working week, 52 weeks a year.

## Towards zero net carbon emissions

Barangaroo's waste contractor keeps a tab on the carbon emissions produced during the transportation and disposal of the precinct's waste.

With all emissions accounted for, they will then be offset to zero, helping Barangaroo become carbon neutral for the transport and treatment of its waste.

Here I find my feet in the foot holes of our people and I know that this is a place where I belong with Sounders, excerpt from Mother

"We love the poetry on these cups and I'm happy to do my bit to reduce single use cups."

- Barangaroo Worker

Red Room Poetry

Red Room Poetry and the poets: Kirli Saunders (sighted in photograph) and Eric Avery.



Completed in mid-2017, International House Sydney (IHS) occupies an important position in Australia's history of architectural and construction innovation.

The 6 Star Green Star building is a case study in Lendlease's efforts to combine design excellence and innovation with sustainability.

### World-first innovation

From a seven-story commercial building brief from Lendlease to Tzannes Architects, the country's first commercial office building constructed of mass engineered timber was imagined.

Two structural systems were investigated: a standard concrete frame, and a combination of glue-laminated (Glulam) timber for the beams and columns together with Cross Laminated Timber (CLT) panels for the cores, stairs and slabs.

The mass engineered timber construction amounted to a test case that, despite the slightly increased upfront cost, Lendlease was keen to explore.

Lendlease has reinforced their pursuit of this construction methodology through the founding of Design Make — an international division of Lendlease focusing on the commercial use of engineered timber construction.



### Understanding the whole story

The impact of the construction industry on the environment and the demand it has on the people who work in it, is front of mind for Lendlease — who strive to find the benefit for everyone in decisions they make.

IHS is an exceptional example of what is possible.

Impressive environmental sustainability outcomes were achieved in the development, largely thanks to the use of engineered timber rather than a concrete frame. These include:

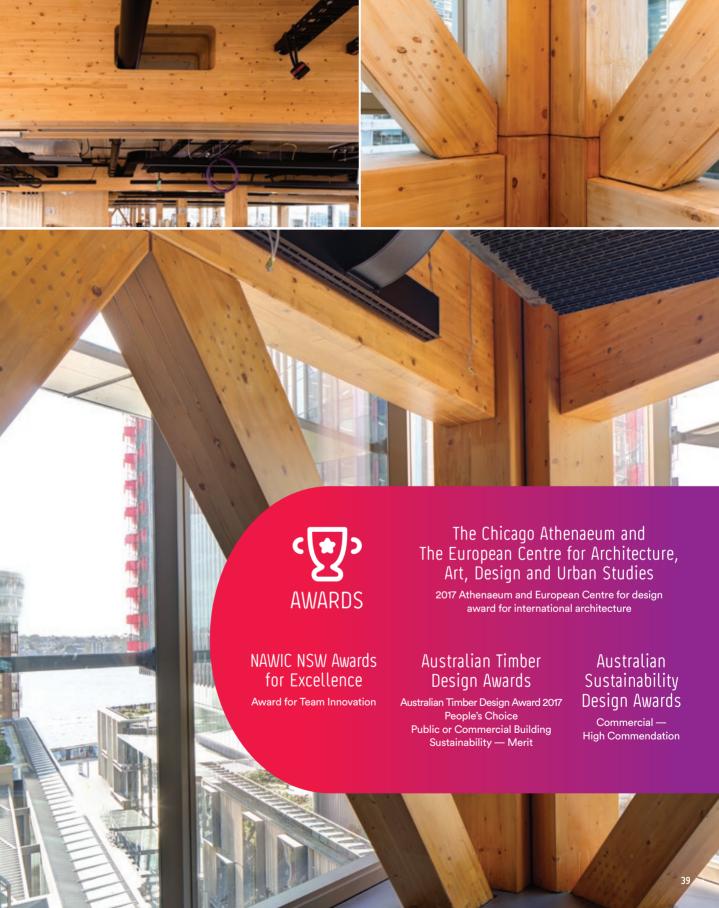
- A 40% reduction in embodied carbon. In terms of greenhouse gas emissions, this reduction is equivalent to removing 500 cars from the road for a full year.
- A reduction in the building's Global Warming Potential by 91%. Revealed via a Life Cycle Assessment.
- By attributing a monetary value to environmental impacts such as resource use and pollution, the natural capital of the building was assessed. The TruCost model\* revealed the 'true cost' of IHS was a third of that of a standard commercial building.

The benefits of this type of construction extend beyond environmental sustainability to the training outcomes and the wellbeing of workers.

- Feedback from the building team confirmed that this construction method was conducive to a highly satisfying work environment and improved health outcomes for workers.
- Reductions in dust, noise and vibration translated to zero time lost to injury and no complaints from adjacent tenants.
- The innovative aspects of the project provided an opportunity for up-skilling and training of construction workers. Skills tipped to prove useful as this building methodology expands into mainstream Australia.

\*Reference: www.trucost.com

WORLD FIRST: The invention of Glulam/LVL (Laminated Veneer Lumber) beams. Developed with the University of Stuttgart, this technology has enabled Lendlease to penetrate the primary beams with the mechanical, electrical and fire services necessary in a commercial building.





### **Guiding architectural strategy**

Highlighting the timber structure of the building became the guiding architectural strategy for Tzannes Architects.

A robust substructure of recycled ironbark columns supports the sustainably sourced European Spruce Glulam beam structure above. Salvaged Turpentine logs from the old wharf structures once found on this site have been used to line the ground floor lobby and soffit of the pedestrian colonnade. IHS demonstrates a respect for the marine heritage of the site.

A façade of high-performance glass wraps the building, celebrating the Glulam structure. Internally, the high-performance glazing provides superior environmental and acoustic performance, minimising the need for sun shading, thereby maximising access to light and views.

While the structural timber floor slab is topped with access flooring, all other timber surfaces are left exposed. Not only does this offer valuable dematerialisation benefits, recent research has suggested significant physiological and psychological benefits of exposed wood. Such benefits include reduced stress levels, lower blood pressure and heart rates, and improved feeling of comfort and sense of wellbeing.\*

### Plugged into the precinct

Chilled beams are connected to the Barangaroo South District Cooling Plant; water from the Barangaroo South Recycled Water Treatment Plant is used for toilet flushing; and solar panels covering the roof contribute 104KW of electricity to the precincts renewable capacity. The building, like Barangaroo South as a whole, will be carbon neutral in operations.

At ground floor, the careful mix of retail for Barangaroo South is continued with a selection of smaller cafes and everyday shops. Joining the global businesses already resident at Barangaroo, Accenture, the Fortune 500 management consulting and professional services company, moved its Sydney operations to IHS at the end of 2017.

<sup>\*</sup>Reference: Planet Ark's Wood, Housing, Health, Humanity Report 2015

## 

The success of a place depends on many things: the quality of the natural and built environments, the sustainability and functionality of its buildings, and convenience to public transport and amenities.

But importantly, creating a successful place is also about making people feel comfortable, secure and welcome.

When Annie Tennant, General Manager of Sustainability and Culture speaks of place making, she talks about how to make people feel part of a place: "It's important to connect to what makes a place special, supporting existing and new communities and creating a neighbourhood that people want to spend time in."

The public spaces of Barangaroo South amount to 50% of the total site area. The spaces are designed to respond to the unique topographical features of its harbour-side location by creating visual and physical connections between the city and the water.

"So now, for the first time in living memory, there will be a continuous public access along the 2.4km of waterfront from King Street Wharf to Walsh Bay," says Tennant.

And just as successful places enhance the natural features of a specific location, so too must the history of the place and the people be recognised and included.

It is in this spirit that the social and cultural agenda for Barangaroo South was envisioned and now, continues to be driven.

No fewer than 50 social programs will have been undertaken over the course of the two-phased development, addressing:

- Community investment
- · Active and healthy living
- Lifelong learning
- Culture and identity
- Human and community services
- Public Art and Culture



Surpassing the project's 50,000 learning outcomes target by

127%



Exceeding 20,000 new accredited skills qualifications target by

104%



of skilled trade work on site to be done by apprentices



In FY16/17, more than

\$1.4M

was spent supporting Indigenous artists and cultural initiatives



More than

230

Indigenous people involved in the project so far



Jver

30,000

visitors attended the November 2016 Barangaroo Street Fair





### THE BSX FACTOR:

## BUILDING GREAT WORKERS WITH THE BARANGAROO SKILLS EXCHANGE

It is people that make Barangaroo South.

Positive outcomes for people and the community have guided this development. Not only as a result of the finished product, but also throughout the journey. Ro Coroneos, Community and Social Strategy Manager at Barangaroo South speaks of investing in construction workers from the start of construction through the Barangaroo Skills Exchange (BSX).

The BSX, set up in 2013 in partnership with TAFE NSW, is an onsite learning hub at Barangaroo South. The hub provides on-the-job training to workers and apprentices as they build the precinct. It aims to overcome the challenge of sourcing appropriately skilled labour and to develop a workforce with "green skills" to help deliver sustainable solutions, from renewable energy, to sustainable water technologies, and more.

### The BSX provides onsite training for:

- Workplace English language literacy and numeracy
- Digital literacy, skills assessment and advice particularly for mature-aged workers
- · Apprentice mentoring
- Training at Certificate III and above
- Mental health awareness
- First aid and workplace health and safety
- · Communication skills and leadership training
- Work Cover Licence training

The ongoing success of the BSX means a skilled workforce is being created for the wider construction industry — today and tomorrow.



10,800

workers and apprentices trained since 2013

40,853

accredited and non-accredited training outcomes achieved

\$78.5 million

in socio-economic benefit delivered to workers, government and contractors\*

\$11.76

in net socio-economic value for <u>every</u> \$1.00 invested, after total investment inputs of \$6.15M\*

### **Awards**

- Winner 2016 Western Sydney Leadership Dialogue, Productive Partnerships
- Winner 2016 Property Council of Australia, Innovation and Excellence Awards, Innovation
- Winner 2016 NSW State Training Awards, Industry Collaboration
- Winner 2016 Australian Training Awards, Industry Collaboration

<sup>\*</sup> Lendlease Social Impact team report, outcomes measured from 2013-2015 inclusive, independently assured by Social Value International UK.







## **INSPIRING STUDENTS**

### TO DISCOVER BARANGAROO

A big part of social sustainability is to inspire others to bring about positive change in the community.

Offering Barangaroo South as a case study to inspire NSW high school students about sustainability is an exciting way this is being done by Lendlease.

'Discover Barangaroo' is an interactive website that gives school students an in-depth look into one of the largest and most significant urban regeneration projects anywhere in the world. Targeted at students studying geography in years 7 to 12, the site takes users on a journey of discovery through the past, present and future of a sustainable Barangaroo.

The Lendlease team hope to excite students beyond their school years about sustainability. "By learning more about the project, they are being exposed to new ideas about the sorts of careers they could have — occupations and professions they might never have imagined," says Katherine Bushell, Senior Community Development Officer at Barangaroo South. Visit the Discover Barangaroo website for more information: www.discoverbarangaroo.com.au

'The best health policy ... is one that keeps people out of hospital. By focusing on illness prevention, we can reduce the burden of chronic disease on the health system and keep our community active and healthy.'

Goal 11, A Plan to make NSW Number One, NSW 2021.



## AN OASIS FOR WELLBEING

A Healthy Living Action Plan for the precinct sets out health and wellbeing goals, with supporting actions that aim to benefit the precinct's residents and working population for the next three years. Five key goals underpin the Plan: healthy bodies, healthy minds, healthy environment, partnerships to promote good health for all, and safe, resilient communities.

To support the delivery of these goals, Barangaroo South has included provision of:

- End of trip facilities including: 22 change rooms and 1,100 bike storage racks
- The Studio Space at 400 Barangaroo Avenue: an intimate space for wellness
- Fitness First Barangaroo Titanium: 1,200m² space, state-of-the-art facilities
- More than 85 different fitness and wellness classes every week
- More than 500 memberships across both facilities, and growing
- Virgin Active has also moved into the precinct



# COMMUNITY PARTNERSHIP

Creating a sustainable place is more than the nuts and bolts of efficient building design.

As Ro Coroneos articulates, "People are at the heart of our sustainability goals, so our plan for Barangaroo South is to create a vibrant, diverse and inclusive place."

The Barangaroo South Community Partnership (BSCP, Partnership) is one key initiative helping to achieve just that.

The BSCP is a collaboration founded between the corporate businesses that have moved into International Towers Sydney. Organisations include: Westpac Group, KPMG, Gilbert+Tobin, PWC, HSBC, and, as a tenant, Lendlease. The Barangaroo Delivery Authority is also closely engaged with the BSCP.

The Partnership leverages the sustainability know-how and social leadership of the organisations to do good things for the whole Barangaroo South community.

"We are starting to see results and it is an ongoing project that will expand over time to include more precinct businesses and community participants. Its success depends on continuing collaboration and cooperation from major stakeholders across the precinct," said Coroneos.

### Indigenous engagement

Formed in 2014, the BSCP has had a strong focus on Indigenous engagement. Connecting Barangaroo, its businesses and the local Aboriginal communities of La Perouse, Redfern and Waterloo is core to BSCP's aims.

Projects being run by the BSCP aim to preserve and celebrate culture, develop commercial opportunities for local Indigenous small businesses, and establish employment and training initiatives for Indigenous youth. An example of this is Career Fit.

### Career Fit

In November 2016, the BSCP trialled Career Fit, an Indigenous youth careers day run in collaboration with the National Aboriginal Sporting Chance Academy (NASCA) and the Alexandria Park Community School.

Thirty Year 8 and 9 students were invited to Barangaroo to learn about a variety of career pathways, with an aim to spark the conversation amongst the students about the vast options available to them in the future. Talks from BSCP partners explaining the career opportunities available in their businesses enhanced this message.

The Barangaroo Delivery Authority gave a cultural tour of Barangaroo Reserve to reinforce the importance of Aboriginal culture and history in the area.

Following positive feedback about the program, the BSCP has made Career Fit an annual event. In 2017 more schools were included and the number of participating Indigenous students was doubled.

### What's next?

Buoyed by the success to date and harnessing the collective influence of the group, the BSCP is set to expand its activities into other areas.

Diversity and Inclusion managers from participating companies have begun to collaborate around initiatives to strengthen equity, diversity and inclusion in the workplace. Read about the Swedish Dad's Exhibition on the next page.

The group will also focus on preventative initiatives in community health and wellbeing. Moving forward, the Barangaroo South Healthy Living Action Plan 2017-2020 will provide a blueprint for precinct-wide strategies for promoting health and wellbeing.





## PARENTING AT BARANGAROO

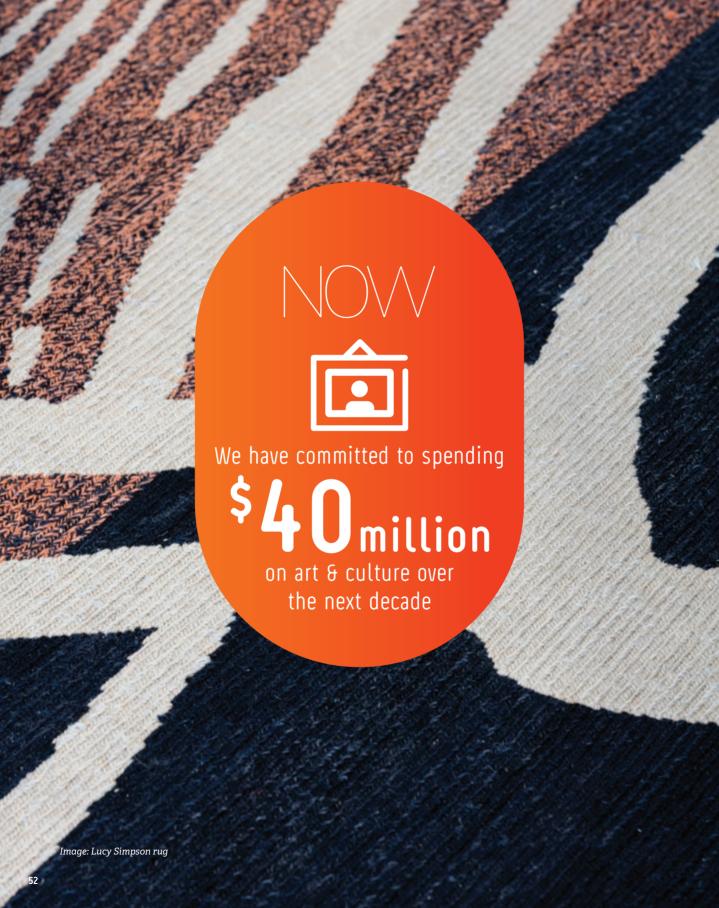
Barangaroo South has drawn attention to shared parental leave — a subject that's close to home for all companies in the precinct.

The 'Swedish Dads' photo exhibition is a project that resulted from the BSCP program. It was progressively staged in the lobbies of the three International Towers Sydney in September 2017. The project featured beautiful, at times humorous, images taken from the daily lives of Swedish fathers who chose to stay home caring for their babies, enabled by the country's generous parental leave scheme.

The aim of the exhibition was to challenge the stereotypes that still exist around parental leave. Partnered with the project was a series of parenting workshops with return-to-work experts 'Parents at Work'. It has sparked the conversation between men, their families and their employers about what the options are when it comes to caring for their young children.

Sponsors: The Swedish Dads exhibition was sponsored by the Barangaroo South Community Partnership members, KPMG, Gilbert+Tobin, PWC, HSBC, Westpac Group and Lendlease, with the generous support of the Swedish Embassy in Australia, The Swedish Institute, Parents at Work and Karitane.









## ART & CULTURE

The place now known as Barangaroo has great cultural significance — from the rich history of the Gadigal people, to more recent history as a European settlement and shipping port, and now — one of the most sustainable urban precincts in the world.

The aim of the social sustainability initiatives is to carry on this cultural landscape. Tennant explains, "We hope it will be a place where people feel a sense of belonging, a place that enriches people's lives, and that recognises and acknowledges the history of the people that have occupied this special land."

A Barangaroo Public Art and Culture Plan has been developed through a joint initiative between the Barangaroo Delivery Authority and Lendlease. The Plan is already being delivered and is enlivening the space and connecting people to the cultural and historic origins of Barangaroo.

Over the next decade more than \$40 million will be spent on creating significant works of art. Artworks that will create memorable public places, connect people to the area's unique history, and enrich the social and environmental landscape of Sydney and of Barangaroo.

Some of the interpretation projects are coming to life and are discussed over.

# THE ART PLAN — TAKING SHAPE

### Barangaroo and the Eora Fisherwomen

Barangaroo, the Cammeraygal woman after whom the precinct takes its name, left a legacy that resonates with the local Aboriginal community today. The oral history of her contribution has been told by influential Aboriginal women in the film Spirit of Barangaroo.\*

Another interpretation project is located on The Beacon, in Exchange Place. Embedded in the structure is a piece of poetic text honouring the life of Barangaroo: the woman for whom the area is named.

Barangaroo is important to remember for many reasons. A powerful Cammeraygal woman of the Eora Nation at the time of European colonisation, Barangaroo faced the devastation wrought on her community with courage and resilience.

As a fisherwoman, she also represents the day-to-day life of the Eora women who lived around Port Jackson at the time of European settlement.

Today, Barangaroo is a figurehead for Indigenous resistance. The Beacon is in sight of Shellwall, the beautiful artwork by Esme Timbery and Jonathan Jones. These elements together make a strong cultural statement about the importance and relevance of the living, breathing Indigenous cultural traditions of this place.

The poetic text is a collaboration between Lendlease, historian Professor Grace Karskens and Lucy Creagh, urbanist and historian; it was endorsed by Ngarigu woman and Director of Aboriginal and Torres Strait Islander Research at Sydney University, Professor Jakelin Troy, who is an expert in the Sydney Aboriginal language of 1788.

### The Hungry Mile

Another chapter in the history of the Barangaroo site is told through the short play The Hungry Mile.

The play explores the struggles faced by casual dock workers during the Great Depression, as they sought work along the area known as the Hungry Mile. This stretch of docklands included the district now called Barangaroo.

In the 1920s and 1930s, men in need of work presented themselves at the wharf gates along the Hungry Mile as the ships came in.

Under the so-called 'bull system', work was first allocated to 'the bulls' — the strong, young and compliant — with older, weaker and outspoken men regularly overlooked.

Those who were rejected at one gate quickly moved to the next in what was often a desperate bid to beat fellow workers to a few hours of work. There would sometimes be a thousand men congregated at the gates when there was only work for a hundred.

Written by Daniel Keene and presented by the Sydney Theatre Company, The Hungry Mile tells the story of Lenny, a casual dock worker, and his wife Alice.

Lenny struggles to find work and retain a sense of dignity under the injustices of the bull system. His struggles are mirrored by the worries and dreams of Alice as she awaits his return each day — reflecting the impacts of the depression not only on men, but on the women, families and communities of the time.

The play premiered at the Barangaroo Street Fair on November 13, 2016.

<sup>\*&#</sup>x27;Spirit of Barangaroo' - www.thestreetsofbarangaroo.com/discover/history-and-design

The Beacon



This installation features details of the life of Barangaroo in words that the Eora Fisherwomen would have used in everyday conversation (the Sydney Language), interspersed with English, for example:



Bara, burra (Fish hook)

Fish hooks were honed from broad sections of turban shell



...Keeping time with their paddles as they rowed.

Eora fisherwomen sang fishing songs together...



Kamaru nguwing
(day and night)
Eora women fished during
the day, at night, in all weather



Yeban, yibbun
(to sing)
Eora girls learnt the fishing songs, the fishing places



# SHELLWALL STANDS TALL

A stunning 'shell' artwork is a larger-thanlife symbol of how the vision for public art at Barangaroo is becoming a reality.

Shellwall, 2015 is a seven-storey high art installation made up of huge shell-like panels. Shellwall has been installed on the residential building 'Alexander' at the southern gateway to Barangaroo South.

It was created by Bidjigal elder Esme Timbery, a fourth-generation shell-artist in collaboration with Wiradjuri/Kamilaroi artist Jonathan Jones.

A goal of the Barangaroo Public Art and Cultural Plan is to showcase art that reflects and celebrates the many stories of Barangaroo, including the Aboriginal and waterfront histories.

This artwork celebrates the important shell-work tradition that is unique to the Aboriginal community of La Perouse and the contemorary work of senior artist Esme Timbery. It represents a continuation of traditional knowledge, and an enduring connection to country. Shellwall pays tribute to the cultural traditions of the La Perouse community, and stands as a reminder that we are always on Eora country.



## **AS THE CROW FLIES**

Indigenous artist Reko Rennie is celebrating the new energy and life of Barangaroo South with an exciting public artwork.

It is one of the ways that the aspiration for Barangaroo South — to energise the precinct with iconic works of public art — is now being realised.

As The Crow Flies by Kamilaroi artist Reko Rennie is a vivid installation that provides a colourful backdrop to the dining and retail area between International Towers One and Two.

Rennie has based the work around the fallen feather of a crow, using this as a repeated motif throughout. He says: "The feathers mirror a congregation of people — a meeting place of diverse individuals, philosophies and histories — coming together, reflecting the hive of activity that is unfolding in the redevelopment of Barangaroo."

Public space beside the artwork, the pocket parks, reflect the colours and vitality of the artwork. Designed collaboratively by Aspect Studios with Reko Rennie, these two outdoor areas have become popular places with office workers and visitors to Barangaroo.

## WHO IS REKO RENNIE?

Reko Rennie is an interdisciplinary artist who explores his Aboriginal identity through contemporary media. Through his art, Rennie provokes discussion surrounding Indigenous culture and identity in contemporary urban environments. Largely autobiographical, his commanding works combine the iconography of his Kamilaroi heritage with stylistic elements of graffiti. Merging traditional diamond-shaped designs, hand-drawn symbols and repetitive patterning, Rennie subverts romantic ideologies of Aboriginal identity.



This artwork connects the neighbourhood with the site's natural identity.

It will connect people with the area's Indigenous flora on a grand scale.

Shadows, by German artist Sabine Hornig, will transform the 170-metre walkway that connects the three International Towers into a translucent glass passage overlaid with images of Australian native plants and landscapes.

The passage will become a botanical discovery route along the Through Site Link — the visual and pedestrian corridor that links all three International Towers. It will invite pedestrians to become participants in the art as they see their own faces and bodies reflected in the glass.

"People will literally walk through the imagery," Hornig says.

The Lendlease Art Advisory Panel chose the artwork. Its Chair, Simon Mordant AM, said: "A robust art selection process has resulted in a world-class public artwork for Barangaroo South and the people of Sydney. Sabine's proposal was a standout on many levels including her engagement with the public domain and her connection between art, architecture and nature."



### Committed to the Sustainable Development Goals

As a signatory to the United Nations Global Compact Lendlease is committed to continuous improvement in human rights, the environment, anti-corruption and responsible labour practices and are aligning our work to the Sustainable Development Goals (SDGs).

### What are the SDGs?

The SDGs are a universal call to action to tackle a broad range of societal challenges, from climate change, to peace, justice and health and wellbeing. There are 17 Goals, with clear guidelines and targets to 2030 for all countries to adopt in accordance with their own priorities and challenges. Having come into effect in 2016, governments, private sector, civil society and citizens are mobilising and forming much needed partnerships, to make sure a better planet is left for future generations.

### LENDLEASE SUSTAINABILITY FRAMEWORK

#### **ENGAGED COMMUNITIES**



#### COMMUNITY DEVELOPMENT







50 social programs at Barangaroo South before 2025.

In excess of \$40 million public art and culture fund, provided via developer contributions, for site wide delivery of projects:

- · Building integrated art plan
- Temporary cultural activations
- Integrated public art on hoardings
- Range and diversity of art and culture projects

Supporting wider Lendlease Elevate Reconciliation Action Plan including:

- · Community engagement
- Supply chain
- · Employment and training
- Partnerships
- Reconciliation Action Week and NAIDOC Week initiatives



#### TRAINING, SKILLS AND EMPLOYMENT









- the Barangaroo Skills Exchange:

  \$78.5M in socio-economic benefits realised
- 20% of contractors required to be apprentices
- Over 11,000 workers received training to date

Over 12,500 registrations for the Discover Barangaroo e-learning portal for high school children

Eco-concierge dedicated to educating, engaging and supporting retailers, tenants and occupants in achieving sustainability targets in operation.













#### **External Ratings:**

- 1 of 18 C40 City's, Clinton Climate Initiative, Climate Positive Developments
- Certified World Best Practice Plan
- 6 Star Green Star Communities Rating
- All commercial buildings targeting 6 Star Green Star rating
- All residential buildings achieve at least 5 Star Green Star Rating
   Star Green Star Rating
- 15 Voluntary Green Star Retail Certifications, with 11 achieving 6 Stars

#### Partnerships

- BSCP
- TAFENSW
- Department of Education
- UNSW
- Tribal Warriors
- Sydney Theatre Company
- Social enterprises include: OzHarvest, Reverse Garbage, Pyrmont Cares













Over 230 Indigenous workers involved in the project

DIVERSITY AND CULTURE

- Indigenous Participation Plan 2016
- Barangaroo South Community Partnership

Barangaroo South Community Partnership Initiatives:

- Indigenous Engagement
- Career Fit, and annual Indigenous youth careers day
- Swedish Dads photo exhibition

60,000m<sup>2</sup> central shared basement serving entire precincts' commercial, retail and residential needs, providing significant efficiencies of scale.

Australia's first commercial building constructed of mass engineered timber: International House Sydney.

World first invention of glulam/laminated veneer lumber (LVL) beams.

Material choice and use revealed the 'true cost' of the building to be a third of that of a standard commercial building.

Integration of sustainability commitments into leases, supplier agreements and subcontracts to achieve the project vision.

HEALTH AND WELLBEING





Healthy Living Action Plan, 2017

Infrastructure Provision to support active transport including:

- End of Trip Facilities 22 change rooms, 130 showers, over 1,400 lockers and 1,120 bike racks
- Pedestrian access: Wynyard Walk, restoration of 2.4km of waterfront
- · Ferry wharves
- Equal access, mobility and CPTED principles
- · Design for Dignity Guidelines

Indoor Environment Quality:

- 100% outdoor air ventilation system
- High performance façade, maximises daylight, thermal comfort and views
- Use of low VOC and formaldehyde emitting products

  High level acoustic comfort and privacy
- provided where necessary

  WELL Shell and Core Platinum Rating targeted
- Commitment to achieve 5 Star NABERS Indoor Environment year on year





































### ENVIRONMENT



#### RESILIENCE AND ADAPTATION









Climate Change and Resilience Action Plan,

Raised ground plane, in line with the IPCC 2100 predicted sea level rise of 0.9 meters.

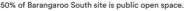
Stormwater upgrades were based on modelling of 100-year interval storm events and allowed contingency for 50% blockage.











Green Travel Plan: Encourage and support environmentally friendly and active transport modes via:

- Education, initiatives
- Infrastructure provision: ferry wharves, Wynyard Walk, overpass bridges, end of trip facilities, over 1,100 bike racks

**Ecological and Biodiversity Plans:** 

- Green roofs
- Green links
- Street tree planting
- · Inclusion of endemic species

Innovative site remediation strategies undertaken to restore land previously contaminated due to former gasworks and fill materials used in land reclamation.

Improving environmental management, energy efficiency and cost saving.



WASTE







97% diversion rate of construction waste from landfill.

80% diversion rate of operational waste from

Waste reduction initiatives:

- Up to 20 different waste streams
- 100% of takeaway packaging made from compostable materials
- Plastic bag free
- 2.000 tonnes of waste diverted from landfill in first 22 months of operations
- ~2,000L of cooking oil recycled weekly into biodiesel for trucks









Net water positive capability.

Recycled Water Treatment Plant:

- Replaces potable water use for all non-potable uses e.g. irrigation, toilet flushing
- Capable of exporting more recycled water than potable water on site

District Cooling Plant thermally regulates all buildings via a Harbour Heat Rejection System channelling sea water through chillers to reject heat.

In lieu of typical cooling towers, the use of sea water for heat rejection saves up to 100 megalitres of water per year.

On site rainwater tank capture capacity amasses to 188,500L.

Stormwater Treatment Plant exceeds National Best Practice Standards: greater than 80% reduction in suspended solids and 45% reduction in nitrogen and phosphorous.

Stormwater catchment area extends beyond the Barangaroo South boundary.











Australia's first large scale carbon neutral precinct:

Community Carbon Fund integrated into leases - to assist in funding carbon neutrality

Onsite Renewable Energy:

- Solar PV line the rooftops, currently with 800KW of capacity
- Carbon Abatement Technology in research

Energy Efficiency: targeting 75% reduction in energy use compared to BAU:

- Passive Design Features such as, 100% LED lighting, smart floor plate design and shading, use of chilled beams for thermal control of buildings, smart lifts that generate energy on the journey down
- 5 Star NABERS Energy Rating targeted for the buildings



MATERIALS AND SUPPLY CHAIN





Greater than 20% reduction of buildings











Supplier Engagement Strategy in place outlining: environmental and social sustainability considerations.

Supply Chain Examples:

- . 23% reduction in the carbon intensity of reinforced steel for construction · Carbon neutral certified access floors
- Dematerialisation of tower façades
- Onsite batch plant supply of concrete, saving over 60,000 truck movements
- Up to 40% cement replacement used for concrete components
- Greater than 95% of timber is AFS and FSC certified

## THE SUSTAINABILITY TEAM



Graham Carter



**Annie Tennant** 



Lisa Smoleniec



Darryl Stuckey



Michael McNelis



Ro Coroneos



Katherine Bushell



Emily Ravenscroft



Lucy Sharman



Dan Grunbaum



Peter Flynn



Natalie Evans

Barangaroo

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