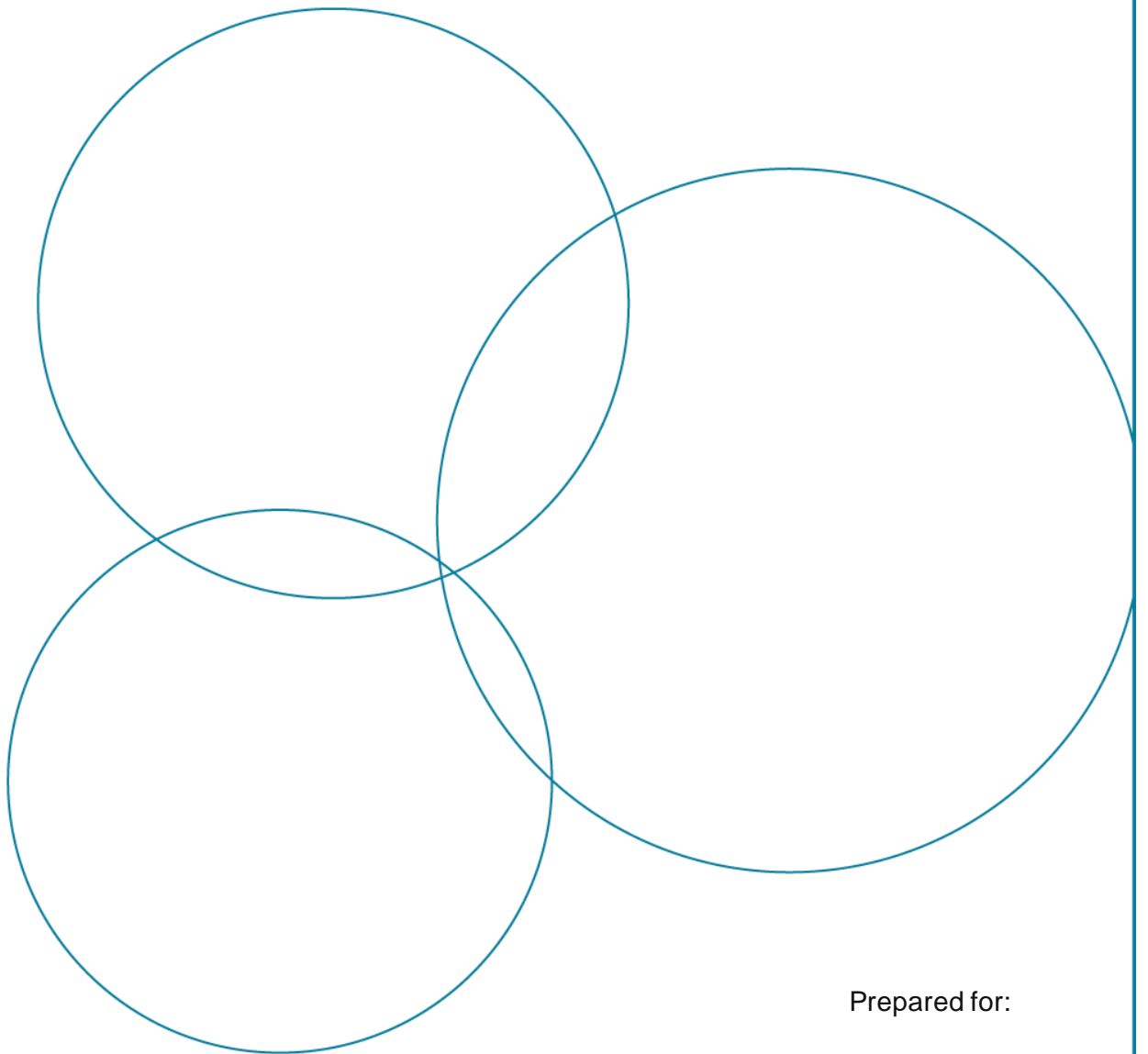


CUNDALL

13-February 2020

Ecologically Sustainable Design Statement

1019662 – Harbourside



Prepared for:

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<p>The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.</p>		

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Executive Summary

This report outlines how environmentally sustainable development (ESD) principles will be incorporated into the design, construction and ongoing operation of the Harbourside development at Darling Harbour, NSW. It supports the Stage 1 Development Application seeking approval for the land use and envelope and outlines strategies to be explored and investigated in the detailed design stages.

Mirvac are committed to environmental and social sustainability through their 'This Changes Everything' strategy which will be implemented on this project.

The project will consequently be designed according to best practice ESD principles across a wide range of environmental impact categories including energy, water, materials, ecology, emission, transport, indoor environmental quality and innovation. The development will be certified in accordance with independent third-party rating systems in design and construction.

The following environmental certifications will be targeted for the project:

- 5-Star Green Star Design & As Built v1.3 for the retail shopping centre
- 5-Star Green Star Design & As Built v1.3 for the commercial spaces
- 4-Star Green Star Design & As Built v1.3 for the residential tower
- 4.5-Star NABERS Energy for Shopping Centres
- 4-Star NABERS Water for Shopping Centres
- 5.5-Star NABERS Energy for Offices
- 3.5-Star NABERS Water for Offices

Strategies to be considered in the design include:

- Selection of non-toxic finishes to improve Indoor Environmental Quality (IEQ).
- Efficient fittings, fixtures and appliances to minimise water demand.
- Use of recycled water to reduce mains water consumption.
- Load reduction, passive design, energy-efficient building services and smart controls to reduce energy consumption.
- Promotion of healthy and active living through design and education strategies, including recreational and end-of-trip facilities, design for pedestrians rather than cars, prominent placement of stairs and access to fresh food.
- Enhanced commissioning and tuning practices to translate design intent into actual performance.
- Environmental and waste management to ISO14001 standard during demolition and construction.
- Incorporation of crime prevention through environmental design (CPTED).
- Innovative marketing and education strategies to convey sustainability practices to wider audiences.
- Selective procurement to consider the supply chain impacts of materials used in construction in terms of environmental and social responsibility, and to reduce embodied carbon.

Throughout the project, appropriate documentation will be collected to demonstrate that the chosen sustainability initiatives are incorporated into the design and delivery of the building.

1 Introduction

1.1 General

This report provides a response to submissions (as relevant) and assessment of the proposed amended Concept Proposal in relation to the State Significant Development (SSD) Development Application (DA) for the redevelopment of the Harbourside Shopping Centre (Harbourside) (SSD 7874). This report supports a State Significant Development Application (SSDA) submitted to the Minister for Planning and Infrastructure pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Mirvac Projects Pty Ltd (Mirvac) is seeking to secure approval to establish concept proposal details for the redevelopment of the Harbourside Shopping Centre (Harbourside), including a new retail shopping centre, residential apartment tower and substantial public domain improvements.

The project supports the realisation of the NSW State Government's vision for an expanded 'cultural ribbon' spanning from Barangaroo, around to Darling Harbour and Pyrmont. The project importantly will add further renewed diversity in tourism and entertainment facilities to reinforce Sydney's CBD being Australia's pre-eminent tourist destination.

1.2 Site description

The Site is located within Darling Harbour. Darling Harbour is a 60-hectare waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

More generally the site is bound by Pyrmont Bridge to the north, the Sydney International Convention, Exhibition and Entertainment Centre Precinct (SICEEP) to the south, Darling Drive and the alignment of the Light Rail to the west and Cockle Bay to the east.

A locational context area plan is provided in Figure 1 below.

The Darling Harbour precinct is undergoing significant redevelopment as part of the SICEEP, Darling Square, and IMAX renewal projects. The urban, built form and public transport / pedestrian context for Harbourside will fundamentally change as these developments are progressively completed.

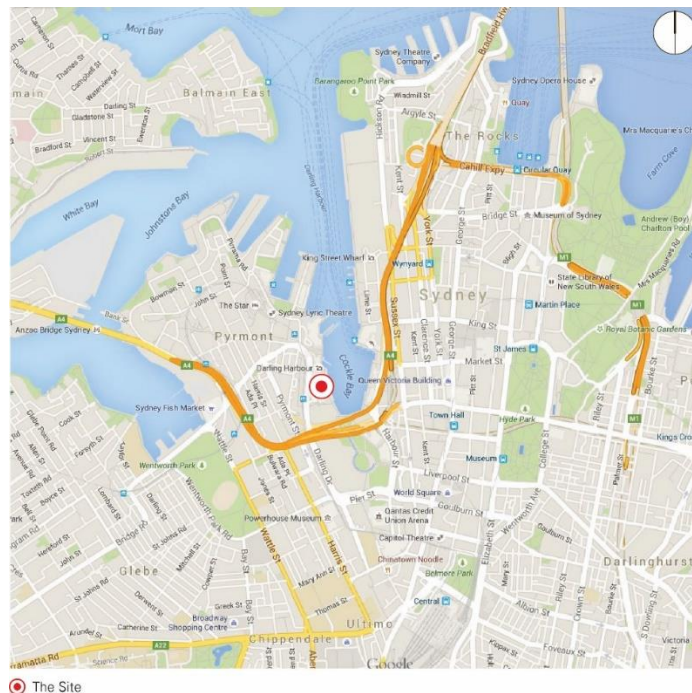


Figure 1 – Location Context Area Plan

1.3 Proposed Amended Development

Since exhibition of the proposal and given the nature and range of submissions made from agencies and the public, Mirvac has been reviewing the overall approach and elements of the Concept Proposal. This has accordingly led to developing an Amended Concept Proposal. The final Concept Proposal therefore includes substantial amendments made by Mirvac pursuant to Clause 55 of the Environmental Planning & Assessment Regulation, in the main to address matters raised in the submissions and deliver an overall significantly improved outcome on the site and for the broader Darling Harbour precinct.

The following key amendments have been made to the proposal:

Relocation of the Tower

The tower element of the Concept Proposal has been relocated from the north of the site to the centre of the site (the widest part of the site) to allow for an increased setback from the heritage listed Pyrmont Bridge, improved relationship to the waterfront and ICC Hotel, to minimise view impacts from 50 Murray Street, together with reducing overshadowing impacts on the public domain and improved solar amenity to the northern end of the retail centre.

Reduction in Height of the Tower

The height of the tower has also been reduced from RL 166.35 to RL 153.75. The reduction in the height will minimise overshadowing impacts to the public domain as well better relate to the height of the ICC Hotel.

Reduction in Height of the Podium

A portion of the podium height at its northern extent has been partly reduced from 30.5 RL to RL 25. The reduction in height provides for improved view sharing from 50 Murray Street.

Removal of Tower 'Tail' element

As part of the relocation of the tower and refinement of the podium, the stepped form of the lower tower element has now been removed. This design move has been made in order to again improve views from adjacent buildings from the west.

Building Footprint of the Tower

The building footprint of the tower has increased in width, to accommodate the floorspace from the reduction in height of the tower and removal of the 'tail'.

Gross Floor Area / Land Use Mix

The amended proposal retains the same overall 87,000sqm of GFA, however there is a minor adjustment in the split between non-residential and residential:

- Non-residential uses floor space – 49,000sqm; and
- Residential uses floor space – 38,000sqm

In response to market demand and the focus of local and regional strategic planning policies, it is proposed for the podium to include both retail and commercial land uses. Indicatively, comprising ~23,000sqm net lettable area of commercial and ~15,000sqm gross lettable area of retail.

The podium enables large campus sized commercial floor plates that are favoured by large multinational tech, finance and professional services companies.

Apartment numbers

As a result of a review of the mix and sizing of apartments, there is a minor reduction in the indicative number of apartments, from 364 to 357. Note, this yield is on the 'Indicative Design' only and will be subject to future design development and a Stage 2 DA. This Stage 1 DA only seeks approval for land uses and the building envelope comprising a total of 87,000sqm GFA.

Car Parking Spaces

The extent of the basement will remain the same, but there has been a minor increase of 11 car parking spaces from 295 spaces to 306 spaces. As above, this is based on the 'Indicative Design' only.

A more detailed and comprehensive description of the amended proposal is contained in the Response to Submissions and Amended Concept Proposal prepared by Ethos Urban.

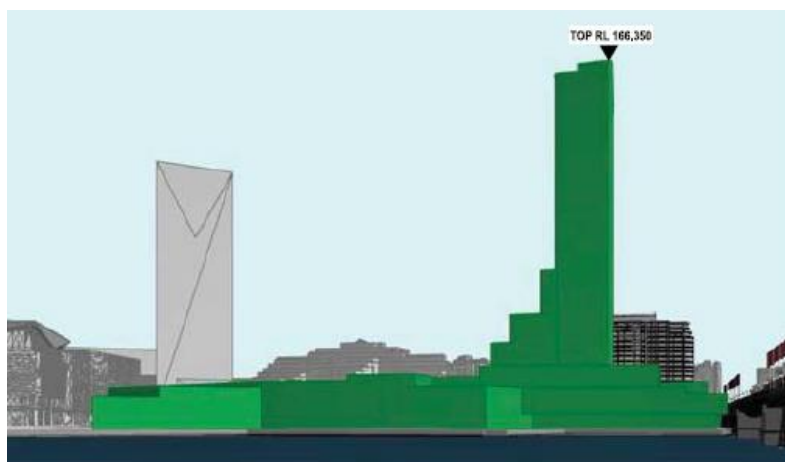


Figure 2 - Original submitted Concept Proposal

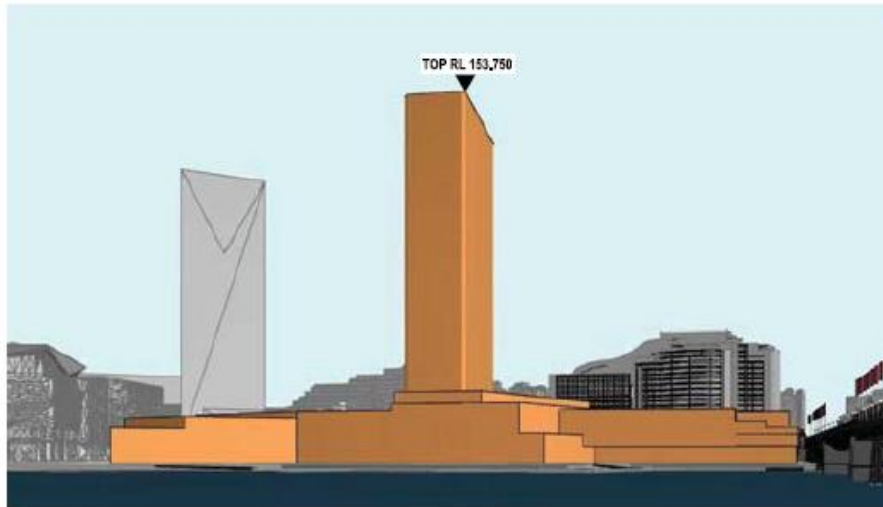


Figure 3 - Amended Concept Proposal

Landscaped Open Space and Public Domain

All of the key concepts and public benefits as originally proposed are retained under the amended Concept Proposal, with the addition of further landscaping opportunities on the northern rooftop extent of the retail podium, further enhancing views and outlook from 50 Murray Street.

The final Concept Proposal seeks approval for the following key components and development parameters:

- Demolition of existing site improvements, including the Harbourside Shopping Centre, pedestrian bridge link across Darling Drive, obsolete monorail infrastructure, and associated tree removal;
- A network of open space areas and links generally as shown within the Public Domain Concept Proposal, to facilitate re-integration of the site into the wider urban context;
- Building envelopes;
- Land uses across the site, non-residential and residential uses;
- A maximum total Gross Floor Area (GFA) across the Harbourside site of 87,000m² for mixed use development (49,000sqm non-residential and 38,000sqm residential development);
- Basement car parking;
- Car parking rates to be utilised in subsequent detailed (Stage 2) Development Applications);
- Urban Design and Public Realm Guidelines to guide future development and the public domain; and
- Strategies for utilities and services provision, drainage and flooding, and ecological sustainable development.

2 Response to Agency Submissions

The SSD DA was publicly exhibited for a period of 62 days from 15 December 2016 to 14 February 2017. During this time, ten (10) submissions were received from government agencies and City of Sydney Council and over 140 submissions were received from the public.

The following comments were made in the document '14657 – Agency Submissions Summary – 180607', which relate to ESD. The project team responses are outlined in the following table.

ESD	
Cundall's ESD report indicates that a range of initiatives are proposed for possible inclusion and refers to the consideration of a 4-Star Green Star Rating. The proposal should be targeting at least a 4 Star Green Star Design & As Built for the retail component, however a target of 5 star is more appropriate. The City seeks a high degree of confidence that environmental performance above current standards will be achieved for a high-profile site.	<p>The following ESD commitments are now made:</p> <ul style="list-style-type: none"> • Certified 5-Star Green Star Design & As Built v1.3 for retail • Certified 5-Star Green Star Design & As Built v1.3 for commercial • Certified 4-Star Green Star Design & As Built v1.3 for residential
There is currently no NABERS Commitment framework for shopping centres to address the design and construction stage of development. NABERS only comes into effect as a post-occupancy performance measure. The NABERS rating for energy and water at the design stage has no currency.	<p>While there is no Commitment Agreement for Shopping Centres, NABERS energy and water performance will be measured during the operational stage through certified ratings.</p> <p>The NABERS for Shopping Centres targets are:</p> <ul style="list-style-type: none"> - 4.5-Star Energy - 4-Star Water <p>The NABERS for Office targets are:</p> <ul style="list-style-type: none"> - 5.5-Star Energy - 3.5-Star Water
Mirvac should be accessing a full set of recent energy and water consumption data for the current site.	Energy and water data from the current retail site will be used for benchmarking purposes to assist in understanding likely performance of the new centre.
Other	
Submit a revised ESD report demonstrating sustainable building principles, particularly for the retail component	The previous ESD report outlined sustainable building principles across a wide range of environmental impact categories including management, indoor environmental quality (IEQ),

ESD	
	<p>energy, transport, water, materials, land use and ecology, emissions, community and innovation.</p> <p>The targeted ratings have been increased and now include a certified Green Star rating for the retail centre as per the response above.</p> <p>Please see response above.</p>
<ul style="list-style-type: none"> • BASIX40 for Energy and BASIX50 for Water for apartment development six storey's or greater. <p>BASIX40 for Energy equates to an intensity saving of 20% above minimum standards (i.e. BASIX mandated target, unchanged for a decade), this would actually align with Mirvac's own operational performance target.</p> <p>Regarding 4-Star Green Star Design & As-Built v1.1 for the residential component, it is critical that the applicant commits to maximise credit points in the GHG and mains potable water savings themes of the Green Star process.</p>	<p>The simplistic nature of the BASIX tool results in limitations to accurately demonstrating higher energy efficiency outcomes for high-rise buildings.</p> <p>The project commits to exceeding BASIX minimum requirements for energy and water but does not agree to the proposed targets of 40 for Energy and 50 for Water.</p> <p>Energy and water will be a focus in the achievement of the 4-Star Green Star Design & As-Built v1.3 rating¹.</p>

¹ The project commits to v1.3 noting that this is the current version at time of writing.

3 Environmentally Sustainable Design (ESD) Approach

The project will be designed according to best practice principles of environmentally sustainable development (ESD). Further detail is provided in the following sections.

3.1 Governance

The proposed development will establish and maintain strong governance practices, promoting engagement, transparency, and community and resilience to a changing climate.

Good environmental management practices will be adopted, including enhanced commissioning, ongoing tuning processes, building user information and environmental performance targets. Best practice construction environmental management processes will be implemented, as well as waste diversion targets from landfill. Metering and monitoring strategies will ensure operational performance can be tracked and optimised.

Performance will be measured in operation and the satisfaction of the building's occupants used as an indicator of the project's success.

The environmental credentials of the building will be verified by independent review. The following environmental certifications will be targeted:

- 5-Star Green Star Design & As Built v1.3 for the retail shopping centre
- 5-Star Green Star Design & As Built v1.3 for the commercial spaces
- 4-Star Green Star Design & As Built v1.3 for the residential tower
- 4.5-Star NABERS Energy for Shopping Centres
- 4-Star NABERS Water for Shopping Centres
- 5.5-Star NABERS Energy for Offices
- 3.5-Star NABERS Water for Offices

Governance and management strategies are outlined in further detail in this section.

3.1.1 Green Star Accredited Professional

A Green Star Accredited Professional will be appointed to provide sustainability advice from schematic design through to practical completion of the project.

3.1.2 Commissioning and Tuning

The project team and all relevant contractors will undertake commissioning process activities for all nominated building systems that serve the project, including the following:

- Environmental performance targets will be set and documented;
- A comprehensive services and maintainability review will be conducted to address Commissionability, controllability, maintainability, operability and safety;
- Best practice commissioning will be undertaken in accordance with CIBSE or ASHRAE standards;
- Tuning will be completed for all building systems, and at a minimum, quarterly adjustments and measurement must be undertaken for the first 12 months after occupation.

3.1.3 Adaptation and Resilience

Climate change adaptation and resilience will be considered to enable the building design to adapt to potential climate changes and extreme weather events with the intention of minimising risk and disruption to the occupants, the building and the community.

3.1.4 Building Information

Comprehensive building operation and maintenance information will be provided for all building systems, as well as building user information to educate building occupants and visitors on the sustainability features of the buildings and how to use these to reduce environmental impact.

3.1.5 Metering and Monitoring

A best practice metering and monitoring strategy will be implemented to track, and monitor energy and water use in the buildings. This will ensure that they are on track to achieving the performance targets, and promptly identify any leaks, faults or excessive consumption. Sub-metering will be provided for all major energy and water uses, supplying data to the Building Management System (BMS).

3.1.6 Construction Environmental Management

A best practice Environmental Management Plan (EMP) will be developed and implemented by the head contractor, to assist in managing environmental performance, conditions, and impacts arising from excavation, demolition and construction.

3.1.7 Operational Waste

A Waste Management Plan (WMP) will be provided for building operations. This will provide building management and occupants with guidance on how to manage waste to divert it from landfill.

Facilities will be provided for collection and separation of major waste streams for collection by the relevant waste contractor in operation.

Dedicated storage space will be clearly labelled for recycling and easily accessible by waste collection services.



3.2 Indoor Environmental Quality

Indoor Environmental Quality (IEQ) will be improved through consideration of indoor air quality, acoustic, thermal and visual comfort, as well as daylight and views. IEQ strategies are outlined in further detail below.

3.2.1 Indoor Air Quality

The ventilation systems will be designed to with consideration of maintenance access and minimum separation distances between pollution sources and outdoor air intakes.

Ductwork will be protected during construction to minimise contamination with debris and moisture prior to occupation.

Kitchens and other sources of significant contamination will be separately exhausted where possible without recirculation to minimise contamination at the source.

To minimise indoor air contamination and promote occupant health, preference will be given to paints, adhesives, sealants and floor coverings which have low Volatile Organic Compound (VOC) emissions and engineered wood products with low formaldehyde emissions.

2.2.2 Acoustic Comfort

Acoustic comfort will be improved through the following strategies:

- Design of internal ambient noise levels to be no more than 5dB(A) above the "satisfactory" sound levels in Table 1 of AS/NZS 2107:2000 in key spaces.
- Provide acoustic noise separation between sensitive enclosed spaces.

2.2.4 Visual Comfort

Glare control mechanisms such as internal blinds or curtains will help maximise visual comfort. Design will consider availability of daylight and maintain excellent connections to external views.

Artificial lighting will consider appropriate colour perception and lighting levels, reduced glare from lamps and uniformity.

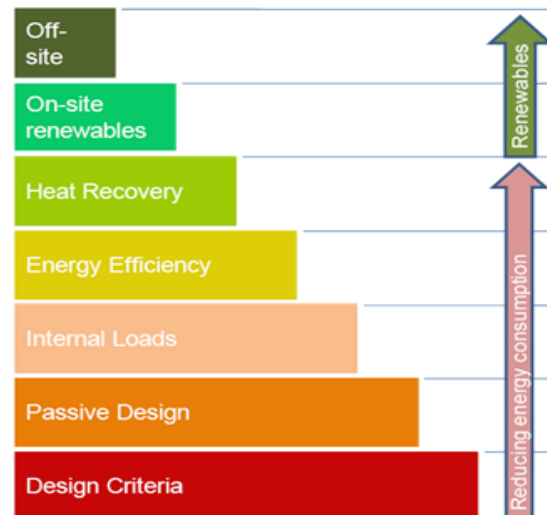
2.2.6 Thermal Comfort

Occupant thermal comfort will be improved through solar control glass, shading and careful design of air-conditioning systems.

2.3 Energy

The design will seek to reduce energy consumption, and thereby greenhouse gas (GHG) emissions, by combining a well-designed facade with high-efficiency systems, services and appliances as well as smart controls to ensure key services are only operating when required by occupants.

Before services are designed however, the first step will be to interrogate the design criteria to ensure the conditions being designed for match what occupants want for the building. Passive design principles will be applied to reduce the demand on active systems (e.g. HVAC and lighting).



2.3.1 National Construction Code (formerly Building Code of Australia) Section J

The National Construction Code/Building Code of Australia (BCA) Section J sets minimum energy performance requirements for all new developments, which cover air-conditioning, ventilation, lighting, power and hot water, as well as building fabric considerations including thermal construction and insulation, building sealing, glazing and shading. The proposed design will be developed to meet the BCA energy efficiency requirements. JV3 modelling will be undertaken to inform the design development.

2.3.2 NABERS

NABERS energy performance will be measured during the operational stage.

The NABERS target for retail is as follows:

- 4.5 Star NABERS Energy for Shopping Centres

Energy data from the current retail site will be used for benchmarking purposes to assist in understanding likely performance of the new centre.

The NABERS target for commercial is as follows:

- 5.5 Star NABERS Energy for Offices

The energy consumption of the commercial spaces of the building will be compared against a set of predetermined benchmarks.

2.3.3 BASIX

All new residential development in NSW is required to demonstrate a reduction in GHG emissions compared to an average benchmark. This project is required to demonstrate a 25% saving in GHG emissions. A preliminary BASIX assessment has been undertaken which shows that the proposed energy strategies can achieve compliance with BASIX energy targets. These strategies will be further developed during detailed design.

BASIX requires that each unit achieve a minimum thermal performance target. This is calculated using software approved by the National House Energy Rating Scheme (NatHERS), which predicts annual heating and cooling loads for each apartment. To pass BASIX requirements, the project must comply with individual heating and cooling load limits as well as average limits over the entire site.

2.3.4 Energy strategies

The following strategies could be used to achieve the project's energy saving and GHG emissions targets. These are subject to change as the design develops.

- High-performance façade incorporating low-e solar control glazing with appropriate shading.
- Efficient heating, ventilation and cooling (HVAC) systems including:
 - High efficiency chillers (potentially connected to the harbour for heat rejection).
 - Variable speed pumps.
 - Variable speed ventilation fans (including EC motors).
 - CO₂ demand control ventilation for high occupancy areas (retail only).
 - Sensible heat recovery for high occupancy areas.
 - Car park with Variable Speed Drive (VSD) ventilation and Carbon Monoxide (CO) controls.
 - Common area ventilation to include efficiency controls such as zoning, motion sensors, and time clock control.
 - Comprehensive BMS systems to monitor and control HVAC systems.
- Efficient lighting systems including LED lighting throughout, with efficiency controls such as zoning, motion sensors, daylight dimming and time clock control.
- Low-carbon heating hot water systems.
- High-efficiency appliances (where installed) such as gas cooktops, well-ventilated refrigerator spaces, dishwashers, clothes washing machines and clothes dryers.
- Renewable energy generation will be evaluated and installed where financially and technically viable. This is most likely to comprise photovoltaic panels on the roof.

The above-mentioned strategies could also contribute to reducing peak electrical demand from the development.

2.4 Transport

Low-impact transport will be addressed by the design as well as the site. Bicycle facilities will be provided for staff and retail visitors, while access to existing public transport networks, cycling paths and pedestrian walkways is facilitated and encouraged. The following alternative transport initiatives are being proposed to improve amenity, promote health and reduce transport related GHG emissions:

2.4.1 Active Transport Facilities

Bicycle parking and associated facilities will be provided to staff and retail visitors, including end of trip facilities for staff (showers, changing amenities with appropriate drying space, and lockers).

2.4.2 Walkable Neighbourhood & Public Transport

The site is located close to numerous amenities, with a 'walk score' of 98% and a 'transit score' of 100%, according to www.walkscore.com. A score above 90% is considered a 'walker's/rider's paradise'.

The project is being designed to optimise pedestrian links for enhanced walkability and access to abundant public transport.



2.5 Water

Mains water use will be minimised for the project by selecting efficient fittings, fixtures and appliances to reduce demand, and by utilising recycled water for non-potable uses.

2.5.1 BASIX

All new residential development in NSW is required to demonstrate a reduction in mains potable water consumption compared to an average benchmark. This project is required to demonstrate a 40% saving in mains potable water consumption.

A preliminary BASIX assessment has been undertaken which shows that the proposed water strategies can achieve compliance with BASIX water targets. These strategies will be further developed during detailed design.

2.5.2 Water strategies

The following strategies could be used to achieve the project's water saving targets. These are subject to change as the design develops.

- Water efficient fittings, fixtures and appliances.
- Fire test water system contained in a closed loop.
- Drip irrigation with moisture sensor override will be used for all landscaping.
- Cooling tower cycles of concentration will be limited to 6 to reduce cooling tower make-up water (or no cooling towers).

The most efficient use for an alternative water source will be determined during detailed design, based on water quality, availability and reliability of water supply, and the minimisation of energy required for treatment and pumping.



2.5.3 NABERS

NABERS water performance will be measured during the operational stage.

The NABERS target for retail is as follows:

- 4-Star NABERS Water for Shopping Centres

Water data from the current retail site will be used for benchmarking purposes to assist in understanding likely performance of the new centre.

The NABERS target for commercial is as follows:

- 3.5-Star NABERS Water for Offices

2.6 Materials

2.6.1 Material Selection

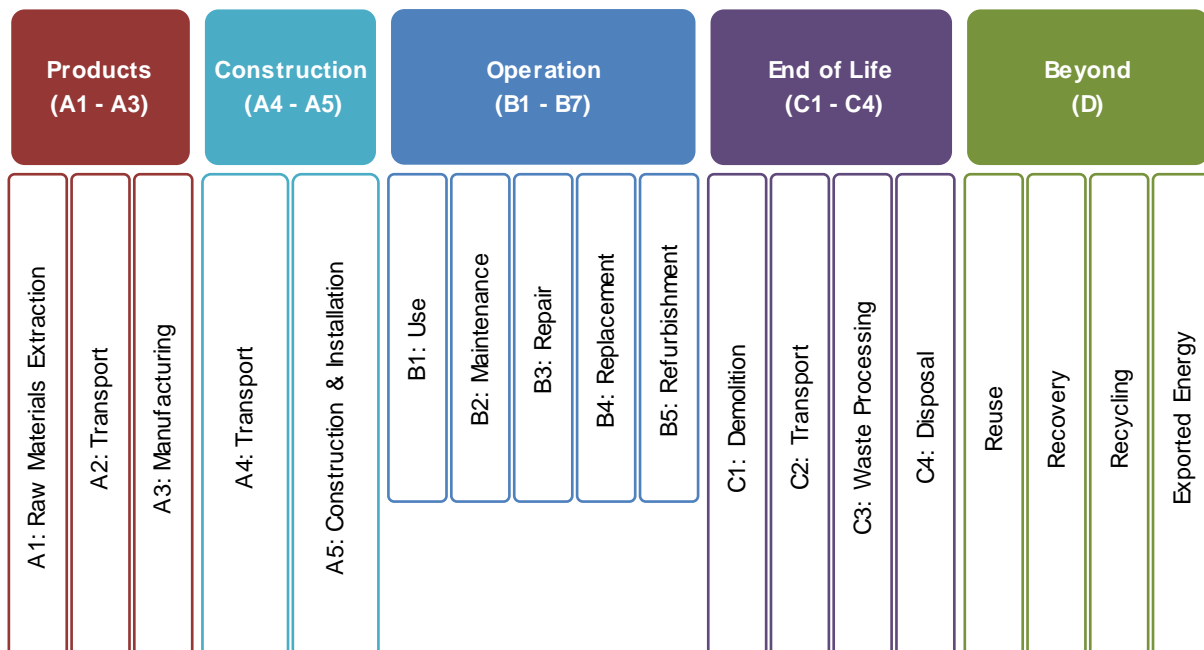
Materials used in construction are responsible for waste generation, resource depletion, GHG emissions and water consumption. To minimise these impacts compared to a standard development, the following principles could be applied to material selection on the site:

- Portland cement reduction in concrete mixes by using industrial waste product such as fly ash.
- Use of reclaimed water in cement mixes.
- Use of manufactured sand in cement mixes.
- Selection of responsible steel products sourced from accredited steel makers and fabricators.
- Selection of FSC or AFS certified timbers.
- Selection of Best Practice Certified PVC products.
- Specification of sustainable products where appropriate, such as those containing recycled content, third-party environmentally certified products, and those with product stewardship agreements in place.
- Local procurement to support the local economy and reduce transport emissions.



2.6.2 Life Cycle Impacts

Life cycle impacts will be considered to inform the design and specification of materials. In particular, the following major items could be targeted throughout the design development to determine options to reduce life cycle impacts: sub-structure; super-structure; envelope; internal walls; internal finishes and services.



2.6.3 Waste minimisation

A Waste Minimisation Plan may be implemented to deliver best practice waste management during the design, construction and operation of the project. A proposed waste strategy is:

- Establish waste targets (including a minimum of 80% construction and demolition waste diversion from landfill).
- 'Design out' waste.
- Implement best practice construction waste management plans and engage with the supply chain.
- Provide infrastructure and guidance to maximise waste recycling during operation.
- Set up operational waste agreements.

The project team will forecast waste quantities and reused / recycled content and set targets for waste reduction.

Before starting on site, the contractor will submit a copy of the plan identifying the actions to be taken to reduce waste in construction, increase the level of recovery, increase reused and recycled content, and quantify the resulting changes. The Construction Waste Management Plan will:

- Define responsibilities and actions to prevent, reduce and recover waste.
- Identify waste arising, reuse and recycling routes.
- Record waste movements and benchmark against best practice.

Initiatives to design out waste will be developed in the design and could include:

- Eliminating unnecessary elements.
- Standardising sizes and details to reduce offcuts.
- Reducing complexity to simplify construction process.
- Evaluating the reuse and recycling opportunities of materials before specifying.
- Maximising off-site fabrication of elements to reduce waste.

Initiatives to reduce waste during construction will be agreed with the contractor and could include:

- Setting up a logistics plan and utilising just-in-time delivery.
- Reducing the amount of surplus materials by ordering the correct amount at the right time.
- Providing safe, secure and weatherproof materials storage areas to prevent damage and theft.
- Establishing take-back schemes with suppliers to collect surplus materials.
- Engaging with the supply chain to supply products and materials using minimal packaging and segregate packaging for reuse.



2.7 Land Use & Ecology

The project will enhance existing ecological value by reusing a previously developed site with the addition of landscaping. The site is not currently ecologically valuable and does not contain any threatened species.

Heat island effect will be reduced through the selection of less absorbent roofing materials and increased landscaping.

2.8 Emissions

Emissions to water, soil and the sky will be minimised during construction and operation.

2.8.1 Reduced Peak Discharge to Stormwater

Stormwater discharged from the site will meet pollution reduction targets for total suspended solids, gross pollutants, total nitrogen, total phosphorus, petroleum hydrocarbons and free oils.

2.8.2 Light Pollution

Outdoor lighting on the project will generally be designed in accordance with AS 4282:1997 and external light pollution will be minimised.

2.8.3 Refrigerant impacts

Refrigerants will be selected with a low Ozone Depletion Potential (ODP).

2.9 Community & connectivity

The project will be designed to maximise community benefit, encourage active, healthy lifestyles, maintain good pedestrian and cyclist linkages and facilitate safe social interaction, exercise, community groups and events.

The following strategies will be considered in creating a successful public space which attracts visitors and maximises opportunities for interaction and integration with the rest of the Darling Harbour.

- Promotion of healthy and active living through design and education strategies, including recreational and end-of-trip facilities, design for pedestrians rather than cars, prominent placement of stairs and access to fresh food.
- Incorporation of crime prevention through environmental design (CPTED).
- Incorporation of elements which facilitate business diversity, innovation, economic development and resilience.
- Innovative marketing and education strategies to convey sustainability practices to wider audiences.
- Practices which encourage community ownership and leadership.
- Potential community carbon fund to place photovoltaic systems on the shopping centre rooftop.

2.9 Innovation

A range of innovations could be investigated by the project team during detailed design to determine whether they can be adopted for the project, including:

- Integrating Healthy Environments.
- Contributing to industry benchmarking.
- Energy metering integrity.
- Financial transparency: Declaration of the cost of environmentally sustainable design initiatives for the project, to promote transparency and the update of such initiatives on other projects;
- Occupant engagement & marketing excellence.
- Contractor education: Sustainably training for all contractors on-site.
- Soft landings: The building is designed, built, commissioned, and tuned by adopting a 'Soft Landings' approach.
- Green cleaning & grounds keeping practices.
- Design for Robustness: Reviewing the design and materials to ensure durability for high-traffic surfaces and high-use fittings.

4 Conclusion

The initiatives outlined in this report demonstrate how the Harbourside development will incorporate best practice ESD initiatives into its design, construction and ongoing operation. Through a combination of energy, water and other strategies, the project will exceed minimum requirements for sustainable development in Australia.

Strategies to be explored and investigated in later design stages include:

- Selection of non-toxic finishes to improve Indoor Environmental Quality (IEQ).
- Efficient fittings, fixtures and appliances combined with rainwater capture and reuse.
- Efficient building fabric and services to deliver operational energy savings.
- Active transport facilities to encourage healthier living while reducing carbon emissions from transport.
- Selective procurement of materials used in construction in terms of environmental and social responsibility.
- Innovative marketing and education strategies to explain sustainability practices to the public.