



**4 - 6 BLIGH STREET, SYDNEY NSW**  
Ecologically Sustainable Design

16 December 2022

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#### 4 - 6 Bligh Street, Sydney NSW

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#### 4 - 6 Bligh Street, Sydney NSW

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## Executive Summary

This Sustainability report has been prepared by Stantec to accompany a detailed State Significant Development Application (SSDA) for the mixed-use redevelopment proposal at 4-6 Bligh Street, Sydney. The site is legally described as Lot 1 in Deposited Plan 1244245.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-48674209).

This report concludes that the proposed mixed-use hotel and commercial development is suitable and warrants approval subject to the implementation of the following mitigation measures.

- An overview of the sustainability drivers for the proposed development (both regulatory & identified development drivers).
- An assessment of the energy and water uses, and proposed measures to ensure energy and water efficiency.
- Detail regarding specific ESD initiatives throughout all phases of the proposed development.
- A comparison of the proposed development's ESD principles and how they have been considered in line with the Environmental Planning and Assessment Regulation 2000.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

In accordance with the above, the proposed development will implement a number of sustainable design principles which include initiatives designed to mitigate the development's environmental impact across the following areas:

- **Energy** – including improved energy efficiency of the building operations.
- **Water Efficiency** – designed to reduce potable water demand and improve stormwater quality.
- **Passive Design Principles** – reducing the development's overall requirement for building services, increasing occupant comfort, control and amenity.
- **Ecology** - Maintaining ecology through landscaping where practical.
- **Materiality** – Considering the whole of life materials and considering their selection to minimise harm to the environment, including efficiency and construction.



#### 4 - 6 Bligh Street, Sydney NSW

The ESD outcomes of the proposed development are clearly demonstrated and even exceeded through the following:

- A formal **5 Star NABERS Energy** Base Building Rating (Commercial), demonstrated through a formal NABERS Commitment Agreement
- Design to achieve **4 Star NABERS Water** Building rating for the Commercial component
- A formal **4.5 Star NABERS Energy** Hotel rating, demonstrated through a formal NABERS Commitment Agreement
- Façade performance and Services Systems designed to exceed **Section J Compliance** requirements, rated under **NCC 2019**.

The above is in line with the specific project requirements for the LEP specific to the 4-6 Bligh St development at Sydney, 2000.



# 1 Introduction

This report has been prepared to accompany an SSDA for the for the mixed-use redevelopment proposal at 4-6 Bligh Street, Sydney (SSD- 48674209).

The Council of the City of Sydney, as delegate for the Minister for Planning and Public Spaces (the Minister), is the Consent Authority for the SSDA under an Instrument of Delegation issued by the Minister on 3 October 2019.

The application seeks consent for the construction of a 59-storey mixed-use hotel and commercial development. The purpose of the project is to revitalise the site and deliver new commercial floorspace and public realm improvements consistent with the City's vision to strengthen the role of Central Sydney as an international tourism and commercial destination.

A separate development consent (D/2018/892) relating to early works for the proposed application was granted for the site on 31 January 2020. Consent was granted for the demolition of the existing site structures, excavation and shoring of the site for three basement levels (to a depth of RL9.38m) to accommodate the proposed mixed-use hotel and commercial development. As such, this application does not seek consent for these components and instead seeks to rely upon and activate D/2018/892 for early works.

Specifically, development consent is sought for:

- Site establishment, including removal of three existing trees along the Bligh Street frontage and de-commissioning and removal of an existing substation (s2041) on the site.
- Construction of a 59-storey hotel and commercial office tower. The tower will have a maximum building height of RL225.88 (205m) and a total gross floor area (GFA) provision of 26,796sqm, and will include the following elements:
  - Five basement levels accommodating a substation, rainwater tank, hotel back of house, plant and services. A porte cochere and four service bays will be provided on basement level 1, in addition to 37 bicycle spaces and end of trip facilities on basement level 2, and 28 car parking spaces.
  - A 12-storey podium accommodating hotel concierge and arrival at ground level, conference facilities, eight levels of commercial floor space and co-working facilities, and hotel amenities including a pool and gymnasium at level 12.
  - 42 tower levels of hotel facilities including 417 hotel keys comprising standard rooms, suites and a penthouse.
  - Two tower levels accommodating restaurant, bar, back of house and a landscaped terrace at level 57.
  - Plant, servicing and BMU at level 59 and rooftop.



- Increase to the width of the existing Bligh Street vehicular crossover to 4.25m and provision of an additional 4m vehicular crossover on Bligh Street to provide one-way access to the porte cochere and service bays on basement level 1.
- Landscaping and public domain improvements including:
  - Replacement planting of three street trees in the Bligh Street frontage,
  - Construction of a landscape pergola structure on the vertical façade of the north-eastern and south-eastern podium elevations,
  - Awning and podium planters, and
  - Provision of a feature tree at the level 57 terrace.
- Identification of two top of awning building identification signage zones with a maximum dimension of 1200mm x 300mm. Consent for detailed signage installation will form part of a separate development application.
- Utilities and service provision.
- Installation of public art on the site, indicatively located at ground level.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 1 October 2022 and issued for the SSDA (SSD48674209).

Specifically, this report has been prepared to respond to the SEARs requirement issued below.

2018 (SSD 9527). Specifically, this report has been prepared to respond to the following SEARs:

#### **'Secretary's Environmental Assessment Requirements**

#### **11. Ecologically Sustainable Development (ESD)**

*The EIS shall:*

- detail how ESD principles (as defined in clause 7(4) Schedule 2 of the EP&A Regulation 2000) will be incorporated in the design, construction and ongoing operation of the development
- include a framework for how the proposed development will reflect leading national and international best practice sustainable building principles to improve environmental performance, including energy and water efficient design and technology and use of renewable energy.

The Development Application is based on the documentation developed and presented as part of the DA submission by Woods Bagot (Principal Architect), Urbis (Planner) and various other consultants.





## 1.1 Background & Site

The site for the purposes of this SSDA is a single allotment identified as 4-6 Bligh Street, Sydney and known as Lot 1 in Deposited Plan 1244245. The site has an area of 1,218sqm, and is identified in

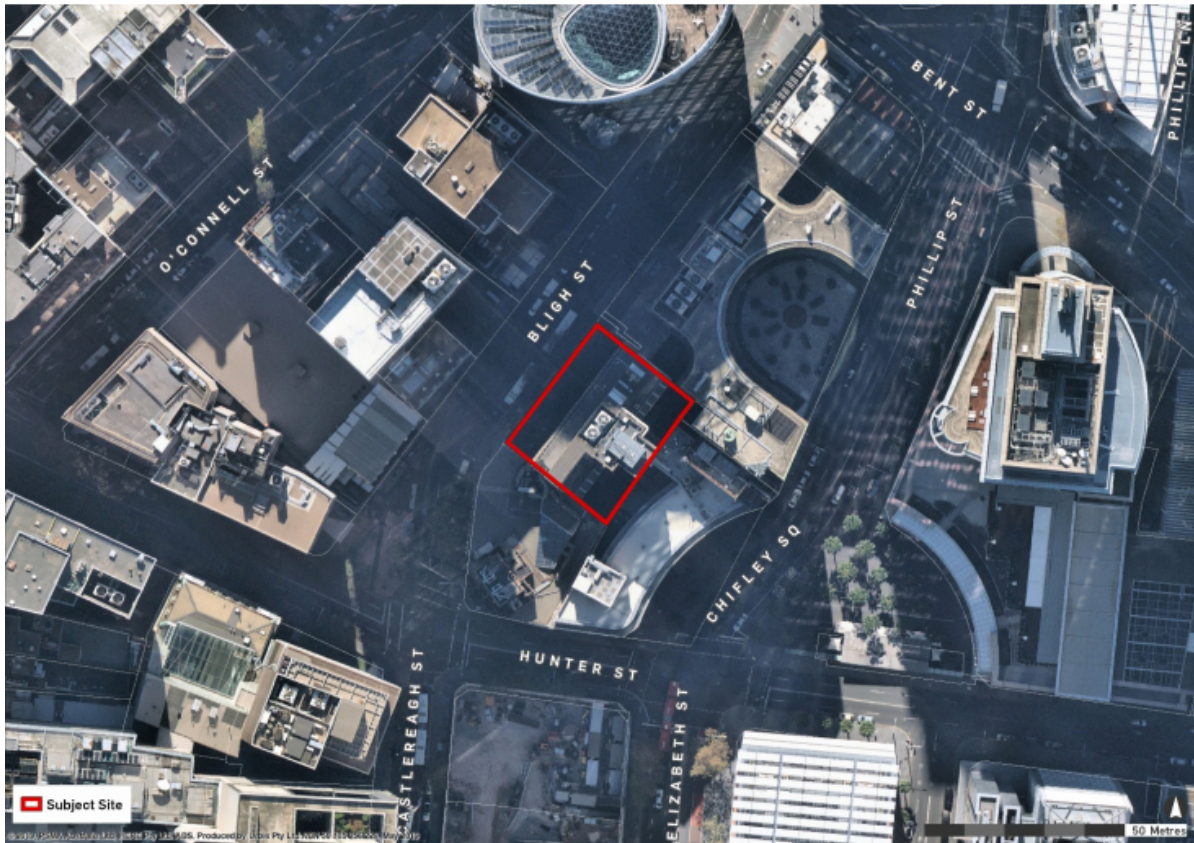


Figure 1: Site Context

## 1.2 Overview of Proposed Development

The Development Application seeks approval for construction of the following:

- 5 basement levels including loading spaces, plants, end of trip facilities and waste management facilities.
- Ground floor including the hotel entrance lobby, commercial lift lobby, lounge,
- 13 storey podium, food and beverage facilities, function area, meeting/conference rooms, commercial offices, plant and gym space.
- 43 storeys of hotel
- 2 levels at rooftop including hotel, restaurant, bar, and publicly accessible landscaped terrace



## 2 Sustainability Methodology

In pursuit of the environmental design excellence and to improve environmental performance of the proposed development, the proposed development will benchmark itself against a number of industry-leading sustainability frameworks. These include:

- Formal commitment to 5 Star NABERS Energy Base Building Rating through a Commitment Agreement
- Commitment to 4.5 Star NABERS Energy Hotel rating through a Commitment Agreement
- Design to achieve 4 Star NABERS Water Building rating for the Commercial component

The development will also comply with the relevant statutory provisions of the Environmental Planning and Assessment Regulation 2021.

### 2.1 Environmental Planning and Assessment Regulation 2021

Division 5 (193) of the Environmental Planning and Assessment Regulation 2021 states:

*193 Principles of ecologically sustainable development*

*(1) The principles of ecologically sustainable development are the following—*

- (a) the precautionary principle,*
- (b) inter-generational equity,*
- (c) conservation of biological diversity and ecological integrity,*
- (d) improved valuation, pricing and incentive mechanisms.*

*(2) The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*

*(3) In applying the precautionary principle, public and private decisions should be guided by—*

- (a) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
- (b) an assessment of the risk-weighted consequences of various options.*

*(4) The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*

*(5) The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.*

*(6) The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as—*

- (a) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and*
- (b) the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and*
- (c) established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*



### 2.1.1 PRECAUTIONARY PRINCIPLE

There are no threats of serious or irreversible environmental damage associated with building the proposed development on the 4-6 Bligh St site since the land was previously developed. No threatened or endangered species are located on the land due to the previous development of the site.

The operation of the 4-6 Bligh St development and activities of its future occupants also do not expect to have any threats as the location is in the Sydney CBD.

### 2.1.2 INTER-GENERATIONAL EQUITY

The 4-6 Bligh St development maintains inter-generational equity through minimising the consumption of resources whilst providing a workspace which will ensure the health and well-being of occupants into the future. The proposed development will ensure a lower demand for resources than a standard practice development by introducing a number of best practice energy and water conservation measures.

While two street trees are proposed to be removed as part of the development, this will be mitigated through the planting of an additional three street trees and landscaping in the development. . The development includes new landscaping and terraces to maintain pockets of planted environment greater than those currently present on the site.

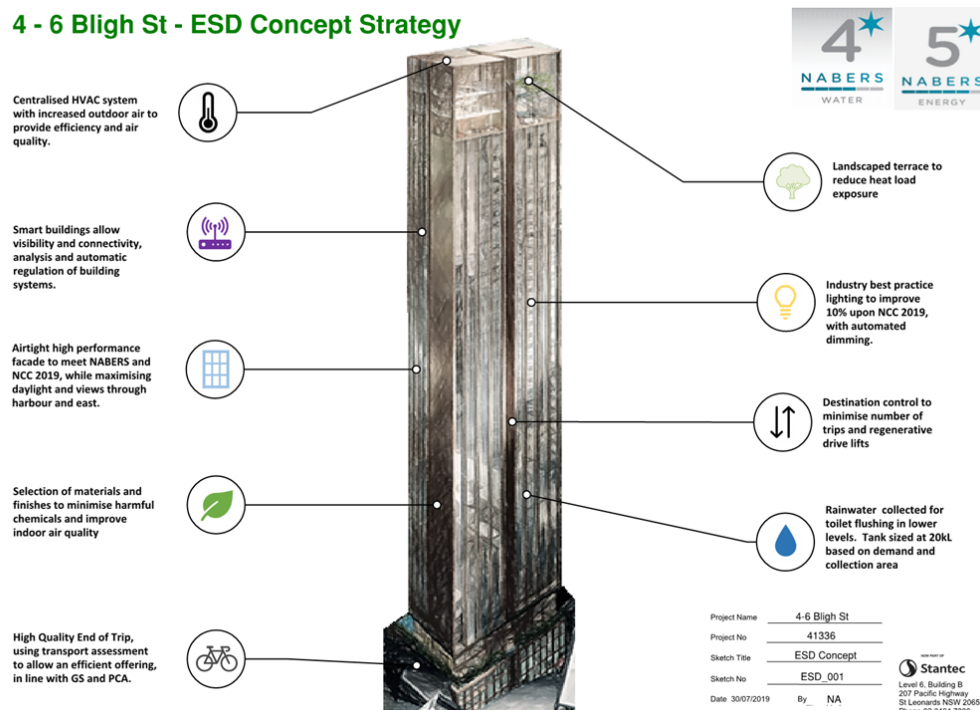


Figure 3: ESD Concept Strategy

All waste streams will be dealt with in ecologically safe methods; waste water and storm water will be plumbed to the sewers or storm water drains as required by law. In addition, sewerage will be lower for this development compared with a standard practice development as low-flow fixtures and fittings will be used to reduce water consumption throughout the building.

The below methods will be considered on this development and will contribute to a greater sustainable outcome for this generation and those following:

- 4.5 Star NABERS Energy Hotel design standard
- 5 Star NABERS Energy Office Base Building design (Formal Commitment Agreement)
- 4 Star NABERS Water Building rating for the Commercial component
- LED lights, which have longer lives, consume less energy and produce a higher quality light than their counterparts.
- Low-VOC paints, adhesives and sealants, which do not emit dangerous volatile components, risking the health of users and the environment.
- Best practice PVC. PVC is typically found in formwork, piping, cables and conduits. These materials have a reputation for damaging the environment in their production, both upstream and downstream of the manufacturing process.
- 90%+ of construction and demolition waste will be diverted from landfill through a contractual commitment
- Use of insulants in walls that are low or zero ozone depleting (ODP) and low global warming potential (GWP).



### **2.1.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY**

There is limited biological diversity on the current site due to the property being previously developed. The 4-6 Bligh St development will mitigate the impact on the level of biological diversity and ecological integrity on the current site. While two street trees are proposed to be removed as part of the development, this will be mitigated through the planting of an additional three street trees and landscaping in the development. The site is built out on all sides, and does not overshadow any surrounding parks or biodiversity.

### **2.1.4 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS**

The proposed development will integrate a number of initiatives which aim to internalise pollution and other undesirable environmental outcomes. Contractors will be requested to provide and abide by an Environmental Management Plan and Environmental Management System which are in accordance with NSW Environmental Management Systems Guidelines or a similar standard.

The project will be built to excellent environmental procedures, including high waste diversion from landfill, low damage, noise and general pollution during construction.

The costs of producing the following pollution: sewage, landfill waste, and CO<sub>2</sub> emissions are partially borne by the project team and accounted for in the sustainability initiatives. The development has voluntarily elected to:

- improve their water consumption efficiency, thereby paying to reduce their production of sewage;
- reduce their energy consumption, which means solutions to reducing CO<sub>2</sub> emissions will be paid to be investigated during the design phase;
- recycle waste streams in the construction and operation of the project, which will cost more than standard practice where all material waste is directed to landfill.



## 2.2 Greenhouse Gas Emissions & Energy Efficiency

### 2.3 Commercial Energy

The 4-6 Bligh St is targeting a 5 Star NABERS Energy Base Building Rating. The below graph shows the maximum energy consumption for 0 through to 6 stars and the target energy consumption for the proposed development. For a typical 50-hour usage profile (Monday – Friday, 8am – 6pm) in Sydney, a consumption of 383MJ/m<sup>2</sup> NLA or less is required for the development to meet its 5 Star NABERS target. Energy consumption of 306MJ/m<sup>2</sup> NLA (5 Star NABERS + 20% improvement) is targeted for the Base Building of 4-6 Bligh St.

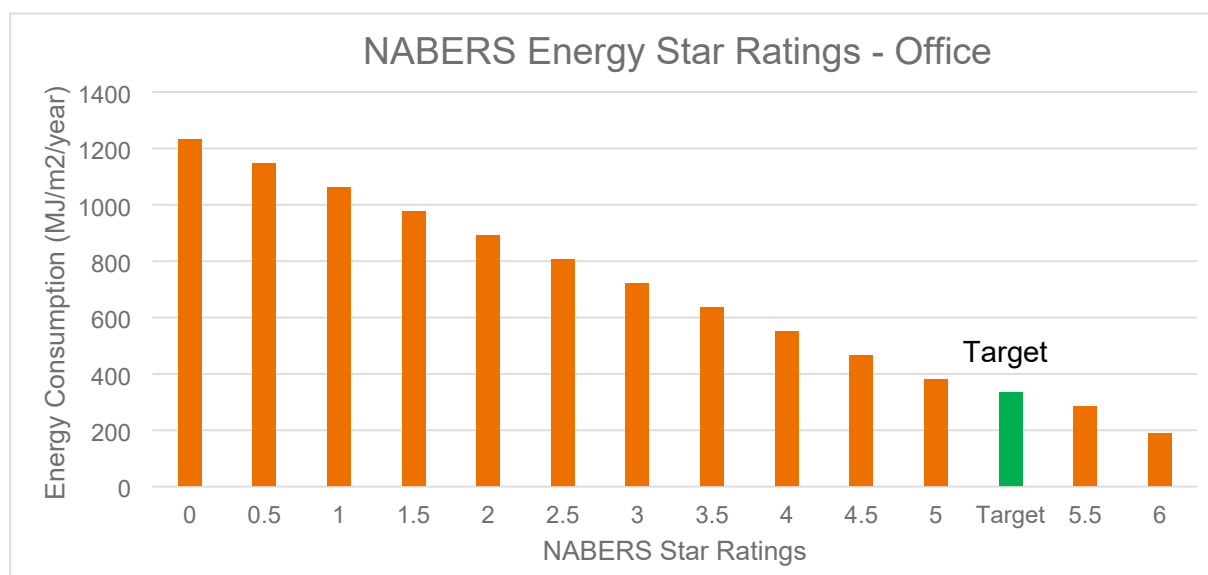
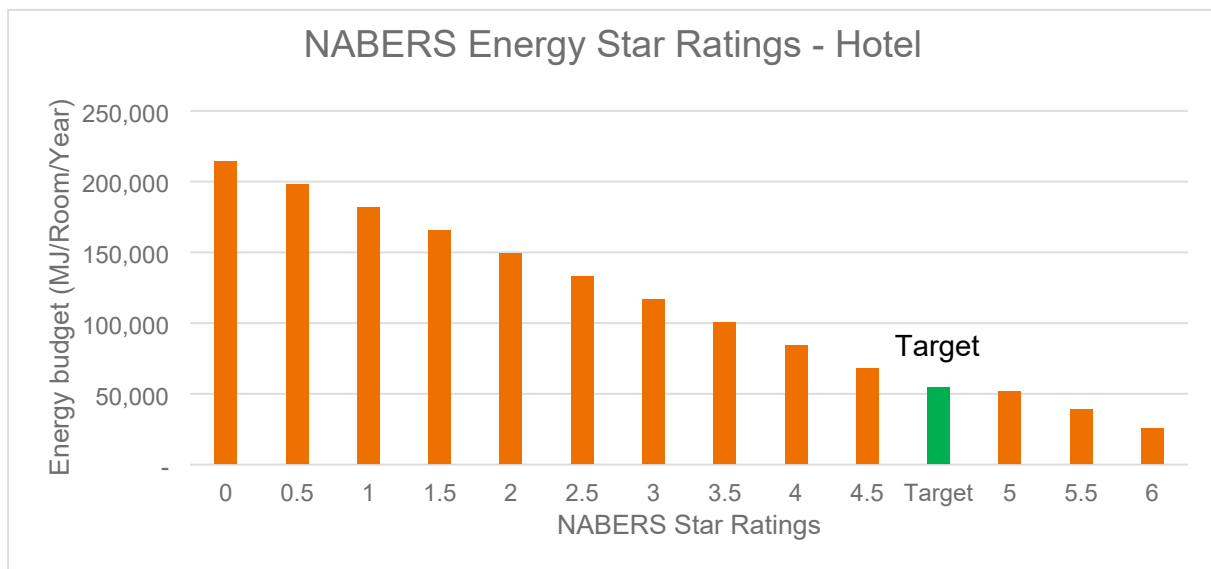


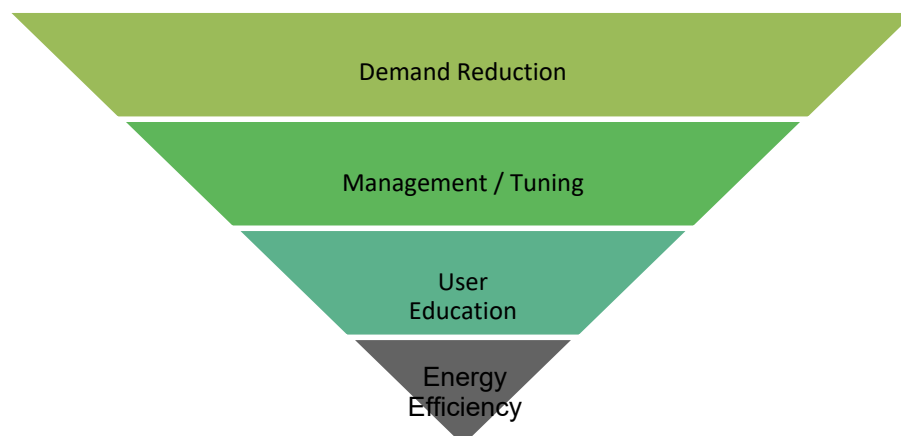
Figure 4: NABERS for Offices energy budget per Star rating

## 2.4 Hotel Energy



**Figure 5: NABERS for Hotels energy budget per Star rating**

The energy efficiency strategy generally follows the hierarchy pyramid below. Best practice energy conservation dictates that in the first instance demand for Greenhouse Gas emissions are reduced. This has a much greater benefit to the overall long-term sustainability of the site compared to efficiency measures or renewables/offsets. As such, the focus will be on the elements that provide the greatest return on investment.



**Figure 6: Energy Saving Hierarchy**



Energy efficiency measures which have been applied across the proposed development to reduce its energy consumption include:

- **Architecture** - Vernacular architecture principals, designed to maximise the specific needs of all occupants and users of the building. The building is designed to deliver comfort, practicality, daylight and connection to the outside through views and energy conservation through its architectural design intent.
- **Blinds** - Use of internal blinds, which reduces direct solar gains, controls radiant heat and increases comfort without compromising the connection to the outside.
- **Glazing** - High performance glazing, to exceed the thermal requirements of the Building Code of Australia.
- **Thermally Efficient Construction** – Airtightness in the façade design to reduce bulk airflow, a pragmatic approach to wrapping the entire building to exceed code requirements and using the appropriate colours and finishes.
- **Efficient HVAC System** - Efficient HVAC systems with high COPs, appropriately designed to meet the needs of the system. Active Chilled Beams in the perimeter and low-temperature VAV in the centre, designed to exceed the 5 Star NABERS target.
- **Custom HVAC** - Bespoke mechanical design systems sized appropriately for the development. These systems will have adequate efficiency, possible measures include economy cycles, CO<sub>2</sub> monitoring on all return points for temperature band fluctuation control to promote energy efficiency in the design commercial offices.
- **Energy Efficient Appliances** – High energy star rated refrigerators/freezers and dishwashers where installed in the base build.
- **Water Efficient Fixtures and Fittings** - Low-flow showers and taps, which will reduce the hot water demand across the commercial component of development associated with showering, sinks and hand basins.
- **Air-lock Doors** – Air-locks reduce infiltration rates, providing a higher quality seal for the building. These are pertinent to balconies on the upper levels more so than the entry lobby.
- **Efficient Lighting Systems** – Low power lighting (less than 4.5W/m<sup>2</sup> in accordance with NCC 2019 J6), lighting controls including timing, occupancy and daylight sensors to reduce the demand on the lighting system. This also reduces the mechanical loads and plant embodied energy.
- **Smart Energy Metering and Monitoring** - Metering will be designed to meet metering guidelines under the weights and measurement legislation, as outlined under the current National Measurement Regulations. A detailed monitoring system will be installed to help with early identification of excessive energy users.



### **2.4.1 BUILT FORM**

- Façade performance

Airtight high-performance stainless-steel façade and glazing to maximising daylight and views through harbour and east.

- Best Views

The tower is split into quadrants and each quadrant designed to open up the views to add scale and sense of wonder in every spaces e.g. easterly morning sun from the Botanic Gardens and westerly afternoon sun.

- Shaded podium

The grand spaces are designed to signal activity and configured to create a stronger engagement with the people and city by providing external meet area, café/bar, function room and offices spaces.



**Figure 7: 3D view of 4-6 Bligh St development**

## 2.4.2 ENERGY EFFICIENCY MODELLING

A number of different design elements and configurations of the proposed development have been modelled to analyse their impacts on energy consumption:

- Façade shading
- High performance glazing
- Increased mechanical equipment performance
- Increased lighting efficiency

Through detailed design of mechanical and electrical systems, and holistically considering the architectural needs of the site, the energy consumption will be reduced, and the site's impact mitigated. This is best achieved through selecting appropriate efficient mechanical systems, installing efficient low-energy lighting and orienting the building in a way that maximises functionality but maintains energy efficiency. All these will be pursued in the design of this development. Some of the tested scenarios will be incorporated into the design to aid the design in meeting the ambitious NABERS targets.

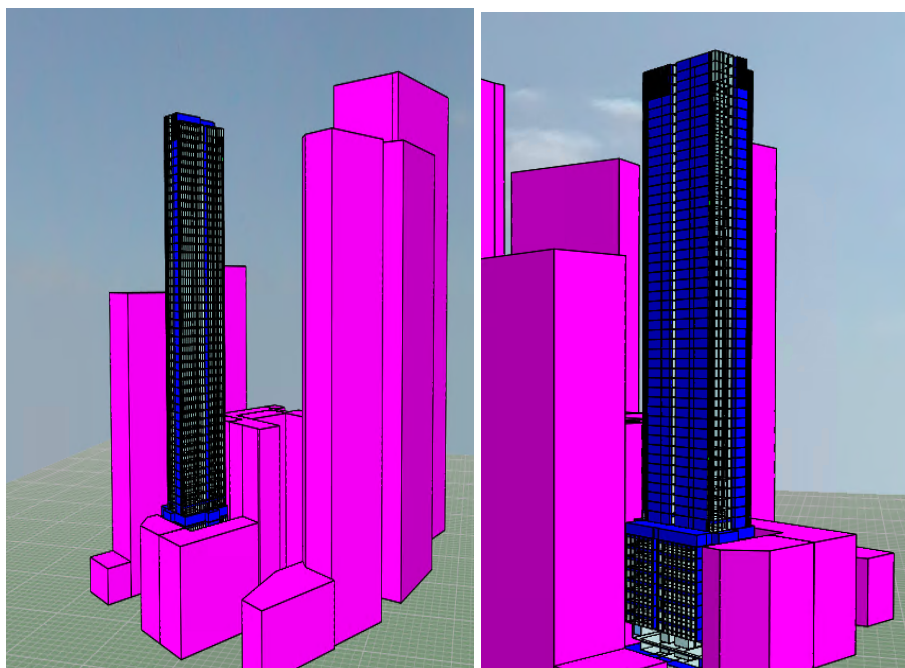


Figure 6 : Model of the development

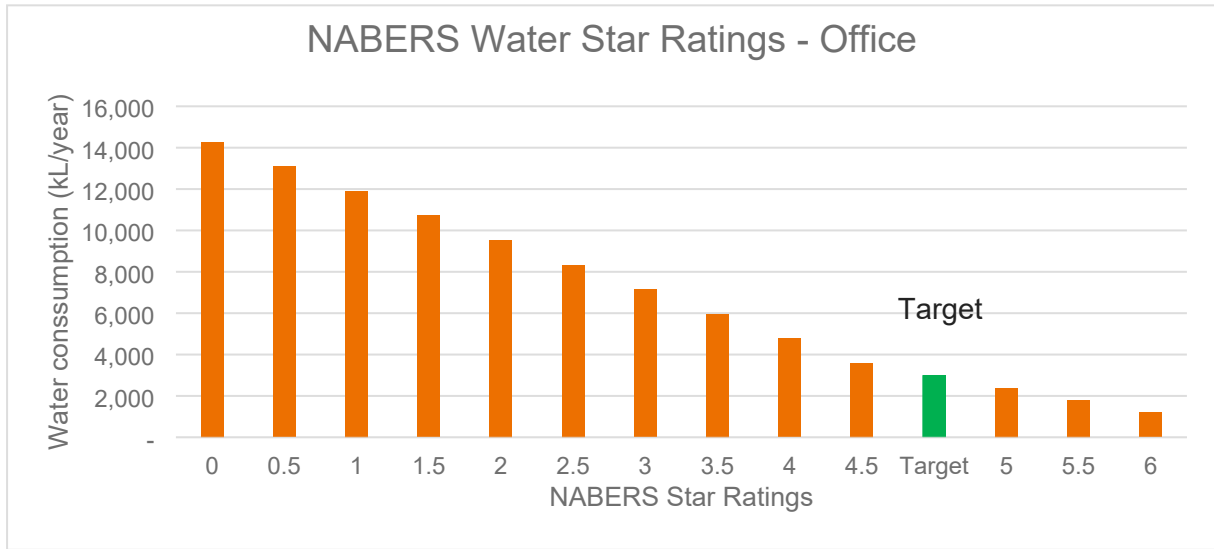
### 2.4.2.1 Glazing Performance

Thermal performance of the building envelope is maximized through the adoption of high-performance glazing. A high-performance glazing with a max SHGC of 0.20-0.25 shall be specified, pending further detailed thermal analysis to encourage both connection to the exterior through clarity of glass and thermal performance. The solar energy reflectivity of the glazing has been reduced to reduce the impact on the public domain.



## 2.5 Water Efficiency

Reduced potable water demand is a key ESD initiative identified within industry best practice standards. The commercial component of the development is targeting a 4 Star NABERS Water Rating. **Error! Reference source not found.** below shows the maximum water consumption for 1 through to 6 stars and the estimated water consumption. For a typical 50-hour usage profile (Monday – Friday, 8am – 6pm) in Sydney, an allowance of 2,988 kL/year targeted.



**Figure 8: NABERS Water Rating Allowance per Star rating**

The proposed development will reduce potable water demand via the following initiatives.

- **Utility Meters and Water Consumption Monitoring** - Metering will be designed to meet metering guidelines under the weights and measurement legislation, as outlined under the current National Measurement Regulations. A water monitoring system will be installed to help with early identification of leaks.
- **Sanitary Fixtures** - By implementing low-flow water fixtures, the consumption associated with the bathrooms will be significantly reduced. All sanitary fixtures are to be provided to the WELS ratings identified below:
  - Taps – 6 Star WELS
  - Urinals – 6 Star WELS
  - Toilet – 4 Star WELS
  - Showers– 3 Star WELS (<6.5l/min)
  - Dishwashers (where included) – minimum 4 Star WELS
- **Rainwater Reuse** - A rainwater tank is to be provided on site to serve landscape irrigation and cooling towers or toilets. Rainwater use has been sized at 20kL, based on the site area



and usage patterns estimated. The tank will be installed and designed in accordance with the appropriate design criteria.

- **Landscape Irrigation-** Landscape irrigation supply may be sourced from on-site rainwater system resulting in low potable water demand. Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Natives have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts.



## **2.6 Additional Measures to Reduce Resource Consumption**

### **2.6.1 CONSTRUCTION & BUILDING MANAGEMENT**

Due to targeting a minimum 5 Star NABERS Rating, the proposed design and built form will seek to respond to the ongoing environmental challenges of urban development and ensure the development implements a range of ESD initiatives aimed at improving ongoing building management.

By documenting design intent, the proposed development will seek to address environmental management & building operational performance through the following initiatives.

- Building Commissioning & Tuning Procedures – (prior to practical completion / 12 months post practical completion). By implementing a relevant commissioning process and building tuning the project ensures operational efficiency & building operation is optimised in accordance with the intended building design.
- Energy Metering – sub-metering will provide real-time data for the use & management of building staff, as is practical and usable within the development. This allows operational efficiency to be considered and maintained. Meters will be validated in line with NABERS/NMI protocols.

### **2.6.2 MATERIAL WASTE**

#### **2.6.2.1 Construction Waste**

Construction and demolition waste are becoming much easier to recycle as the traditional landfill evolves into waste recovery centres, which are able to achieve up to 90% recycling of all construction and demolition waste. 90% recycling for the construction and demolition waste produced will be achieved across the development. Construction waste will be managed through contractual requirements outlining the target recycling rate.

#### **2.6.2.2 Operational Waste**

Operational waste, which involves the waste produced in the day-to-day operations, can also be minimised through effective sorting methods. The two bins likely to receive the most use will be the garbage and paper recycling. The major waste streams are likely to arise from printing documents, and food preparation in office kitchens and café. It is important to provide accessible bins in many areas and locate the types of bins in the areas where the particular waste stream is likely to arise. A waste management plan has been developed by Waste Audit to appropriately size and allocate resources for recycling and general waste. General waste comingled and at least one other waste stream will be collected.

### **2.6.3 MATERIALITY**

The production of building materials can have serious impacts on the environment. Energy is used to extract, produce and transport materials; natural resources are exploited, and pollution created in their production. Further, dangerous materials can present health risks to occupants. The material impact



is reduced by limiting the quantities of virgin building materials and choosing the least harmful when using materials. This report encourages strategies to minimise resource intensive materials.

#### **2.6.4 ACTIVE TRANSPORT**

The development will encourage a reduction in the burning of fossil fuels associated with commuting by providing end-of-trip facilities. These facilities will provide occupants with the opportunity to take a shower, store a change of clothes, and securely park their bike. Ample end-of-trip facilities will be provided to meet PCA A-Grade Office requirements.

Initiatives to encourage alternative transport options to reduce the environmental footprint of occupants and carpark congestion:

- 105 secure bike racks
- Lockers
- Showers co-located with lockers.
- Covered walkways and outdoor waiting areas



### 3 Summary

The 4-6 Bligh St, Sydney development will incorporate a number of ecologically sustainable initiatives and energy efficiency measures in line with VPA. These have been developed as a specific response to *Division 5 (4193) of the Environmental Planning and Assessment Regulation 2021*.

The ESD initiatives outlined in this report are a reflection of the ESD investigations to date, and a summary of the implemented and proposed design and operational initiatives. The specific initiatives that will be installed across the development will be determined throughout the design process and will be subject to feasibility analysis, including that of the final use and layout. The initiatives will comply with the guidelines set out by the relevant authorities.

The proposed development's commitment to reducing the overall environmental impact is evident of the holistic approach taken to long-term sustainability. Documented initiatives cover a range of concepts including:

- Energy & Greenhouse Gas Emissions across the office and retail design.
- Potable water reduction through low flow fixtures and rainwater collection.
- Minimising waste to landfill.
- Occupant amenity and comfort.
- Land Use & Ecology of the site.
- Emissions that may affect surrounding businesses and the environment as a whole and,
- Building Management practices

We trust this report provides a sufficient overview of the proposed development's commitment to environmentally sustainable design and the sustainability vision for the 4-6 Bligh St, Sydney development.

The above is demonstrated through formal commitments to achieve the following:

- Formal commitment to 5 Star NABERS Energy Base Building Rating through a Commitment Agreement
- Formal Commitment to 4.5 Star NABERS Energy Hotel rating through a Commitment Agreement
- Design to achieve 4 Star NABERS Water Building rating for the Commercial component.

