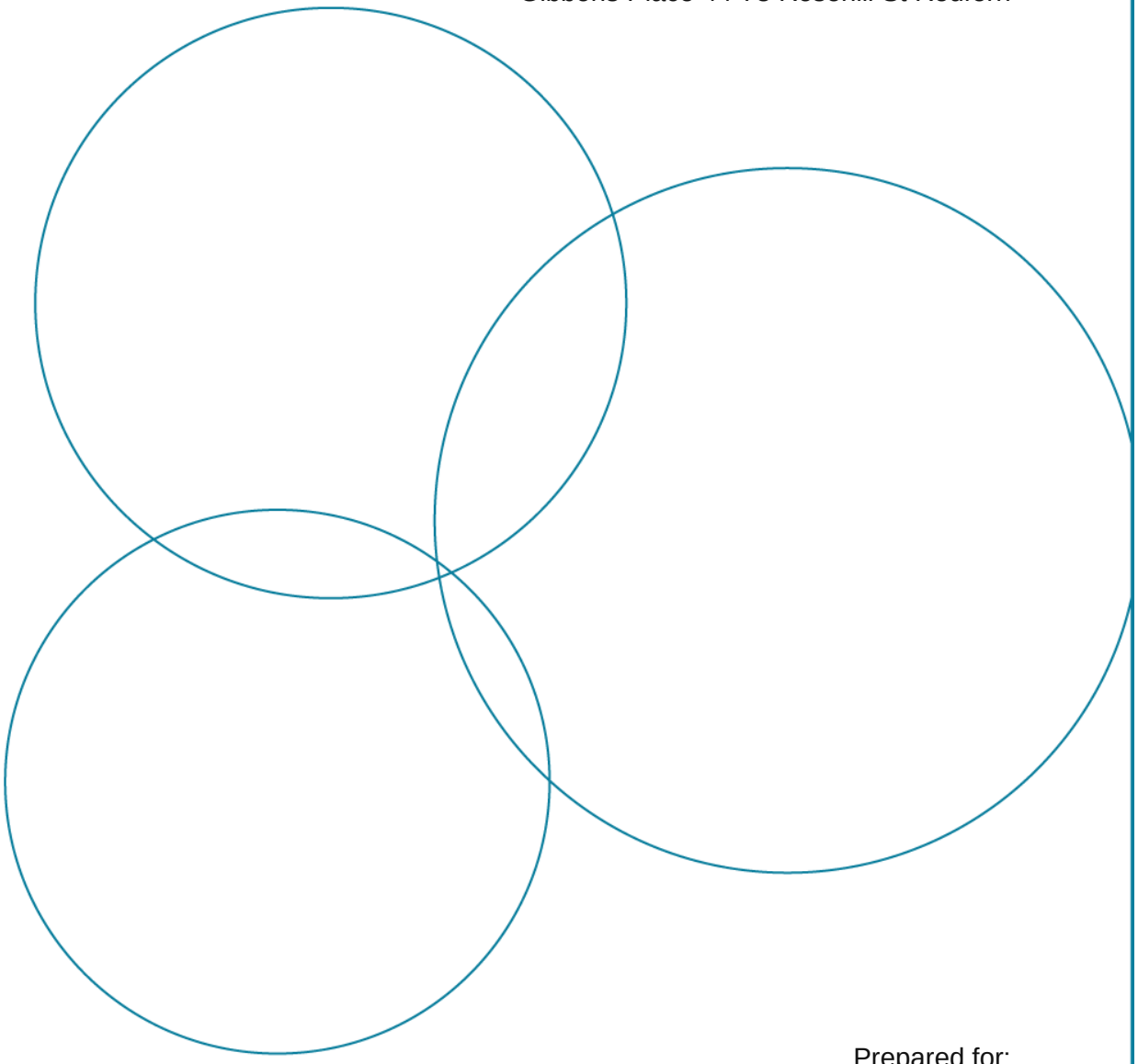
26 April 2018

# Environmental Sustainable Design (ESD) Strategy Report

Gibbons Place 44-78 Rosehill St Redfern



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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 also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.

# Executive Summary

This Environmental Sustainable Design (ESD) Strategy Report outlines how Ecologically Sustainable Design principles will be incorporated into the design, construction and ongoing operation of the proposed Gibbons Place development at 44-78 Rosehill St Redfern, Sydney, NSW.

The project will be designed according to best practice ESD principles across a range of environmental impact categories including energy, water, materials, ecology, emissions, transport, indoor environmental quality and innovation.

The project will be designed to comply with the City of Sydney Development Control Plan (DCP) 2012 General Provisions Section 3.6 Ecologically Sustainable Development as well as requirements pertaining to State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (BASIX SEPP) and NCC Section J for the commercial component.

Specific sustainability initiatives to be implemented include:

- Load reduction, passive design, energy-efficient building services and smart controls to reduce energy consumption
- Water-efficient fittings, fixtures and appliances to minimise water demand
- Selection of non-toxic finishes to improve Indoor Environmental Quality (IEQ)
- Promotion of active living through design and education strategies, including recreational and end-of-trip facilities
- Environmental and construction waste management during demolition and construction
- Enhanced commissioning and tuning practices to translate design intent into actual performance
- Improved ecological value through green roofs and terrace gardens
- Provision of diverse apartment sizes and types to support a range of demographics
- Activation of the rear lane to support commercial activities and offer additional amenities

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 Purpose

This document provides a summary of all sustainable design commitments and initiatives of the proposed development, Gibbons Place, at 44-70 Rosehill St Redfern, Sydney, NSW.

This document is prepared to demonstrate compliance with the following:

- Ecologically sustainable design (ESD) objectives set out in Clause 3.6 of the Sydney Development Control Plan (DCP) 2012
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (BASIX SEPP)
- NCC Section J for the commercial component

## 1.2 General Project Description

The development addressed in this report is located in the City of Sydney local government area, at 44-78 Rosehill St, Redfern. The site is 2,544m$^2$ and is currently comprised of existing commercial office and retail space.

The proposal relates to the development of two residential buildings of approximately 30,000-34,000m$^2$ with retail/commercial component on the ground and first floors of approximately 3,200m$^2$. It includes the demolition of all existing commercial office and retail space on the site.

Figure 1 and Figure 2 provide details on the context of the site and its surrounding area.


**Figure 1** – Local Context

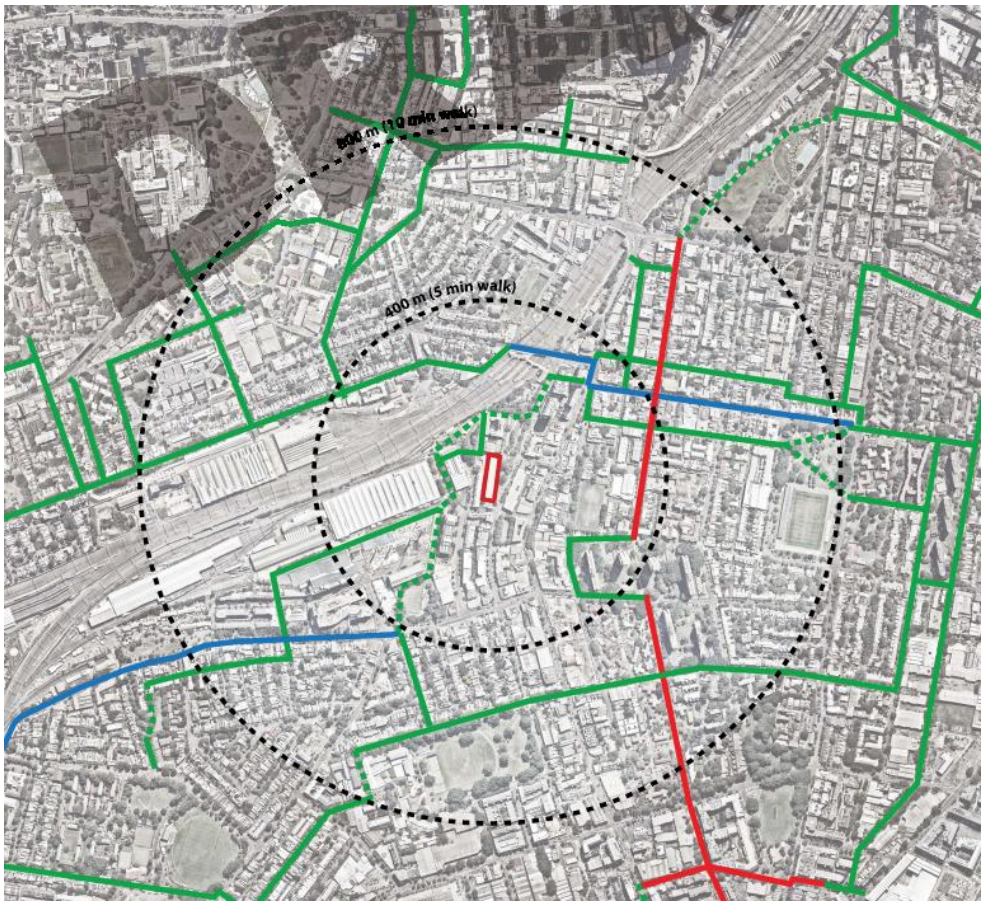


**Figure 2** – Surrounding Areas

## 1.3 Project's Design Objectives

Redfern Rosehill Pty Ltd recognises the importance of achieving a strong sustainable outcome for the proposed public realm and building development. As such the developer aims to promote excellence by constructing a residential development which protects the environment and provides a high level of amenity for tenants, occupants and visitors. The project will be designed based on best practice ecologically sustainable design principles not only in terms of resource efficiency, maintainability, safety, cost and flexibility, but also in terms of human experience and well-being.

The project's design objectives are as follows:

- To develop in accordance with the DCP and design brief.
- To develop a site that optimises investment consistent with best practice standards for ecologically sustainable development standards.
- To create a sustainable development which is in harmony with the surrounding area.
- Create a high quality, environmentally sustainable and efficiently designed development.

## 1.4 Sustainability Design Commitment

Minimum requirements apply to the proposed development including the National Construction Code (NCC) Section J for Energy Efficiency, State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (the BASIX SEPP), and City of Sydney Council Development Control Plan (DCP) requirements.

To implement ecologically sustainable development (ESD) principles during design and construction the following sustainability commitments are made:

- Reduce greenhouse gas emissions
- Use energy that is renewable and low carbon
- Reduce potable water consumption and waste water discharge
- Ensure that the development is resilient to climate change impacts
- Improve thermal comfort and indoor air quality for residential occupants
- Reduce construction waste
- Recycle waste and increase use of products from recycled sources
- To promote community health and wellbeing

The following sections provide details on how the project aims to achieve the project's sustainability design objectives.

# 2 Environmentally Sustainable Development Strategy

The project will be designed according to best practice principles of ecologically sustainable development (ESD). The following sections provide further detail on governance, indoor environmental quality, energy, water, transport, emissions, ecology, materials and community.

## 2.1 Governance

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

Good environmental management practices will be adopted, including enhanced commissioning, ongoing tuning processes, and building user information. 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.

### 2.1.1 Commissioning and Tuning

Relevant subcontractors will undertake commissioning and tuning for all major systems.

### 2.1.2 Adaptation and Resilience

Climate change adaptation and resilience will be considered to enable the building 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.

### 2.1.3 Building Information

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.

### 2.1.4 Metering and Monitoring

A metering and monitoring strategy will be implemented to track energy and water use, monitor progress against performance targets and assist with the identification of 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).

Energy sub-metering will be provided for significant end uses expected to consume more than 10,000kWh/annum.

Water sub-metering will be provided for major water uses..

### 2.1.5 Construction Environmental Management

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

### 2.1.6 Operational Waste

Facilities will be provided for collection and separation of distinct waste streams for collection by the relevant waste contractor in operation. A Waste Management Plan (WMP) will be provided for building operations.

## 2.2 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.

### 2.2.1 Indoor Air Quality

The ventilation system will be designed to comply with ASHRAE Standard 62.1 :2013 in regard to minimum separation distances between pollution sources and outdoor air intakes. Ductwork will be protected during construction to ensure it remains free of moisture and debris prior to construction.

In order 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

Design will consider acoustic comfort in terms of general noise levels, reverberation and noise separation.

### 2.2.4 Visual Comfort

Glare control mechanisms such as internal blinds will help maximise visual comfort. Design will consider availability of daylight and maintain 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

Performance glazing with fixed external shading will improve occupant thermal comfort.

## 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 and services as well as smart controls to ensure key services are only operating when required. Passive design principles will be applied to reduce the demand on active systems such as HVAC and lighting.

### 2.3.1 National Construction Code Section J for Energy Efficiency

BASIX and the National Construction Code (NCC) Section J sets minimum energy performance requirements for new development, 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 meet minimum BASIX and NCC Section J energy efficiency requirements.

### 2.3.4 Energy reduction strategies

The following strategies will be investigated to improve energy efficiency and reduce GHG emissions. These are subject to change as the design develops.

- Passive design measures including well-performing façade incorporating low-e solar control glazing and appropriate use of external shading
- Efficient heating, ventilation and cooling (HVAC) systems including:
    - High efficiency split AC units
    - Variable speed pumps & fans
    - Common area ventilation to include efficiency controls such as zoning, motion sensors, and time clock control
    - BMS to monitor and control building systems
- Low energy domestic hot water (DHW) systems
- Efficient lighting systems including LED lighting with efficiency controls. This includes internal as well as external and public domain lighting
- Rooms to have a shut-off switch for all non-essential power to be turned off when unoccupied
- Appliances (where installed) will have good energy efficiency ratings
- Efficient lift design and controls

Renewable energy generation via solar energy (thermal or electric) will be evaluated.

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

## 2.4 Transport

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 regular occupants, patrons and visitors, including end of trip facilities for staff (showers, changing amenities with appropriate drying space, and lockers). The design of the end-of trip facilities will encourage their use over that of private vehicle use.

### 2.4.2 Walkable Neighbourhood & Public Transport

The site is located close to numerous amenities, with a ‘walk score’ of 97% 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.

### 2.5.1 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 any substantial landscaping

## 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 will be considered for 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 certified timbers, and Best Practice Certified PVC products
- Specification of sustainable products where appropriate, such as those containing recycled content or holding third-party environmental certifications.
- Design major building components for longevity, adaptation, disassembly, re-use and recycling.
- Local procurement to support the local economy and reduce transport emissions
- Design for robustness - review the design and materials to ensure durability for high-traffic surfaces and high-use fittings.

### 2.6.2 Waste minimisation

A Waste Minimisation Plan will be prepared outlining 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 90% construction and demolition waste diversion from landfill).
- 'Design out' waste: Reduce the amount of materials used in the construction of a building wherever practical
- Implement best practice construction waste management plans and engage with the supply chain.
- Provide infrastructure and guidance to maximise waste recycling during operation.

The Contractor will develop a Construction Waste Management Plan (CWMP) which 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

## 2.7 Land Use & Ecology

The design will seek to enhance existing ecological value of the site through the following initiatives:

- Improve the diversity and abundance of locally indigenous flora and fauna through the inclusion of landscaped terraces and green roofs
- Ensure that the development comprises a mix of locally indigenous tree, shrub and groundcover species as outlined in City of Sydney's Landscape Code
- Link and enhance existing and potential biodiversity corridors wherever possible
- Ensure that the development is consistent with the Street Tree Master Plan, Park Tree Management Plans and the Landscape Code

In addition, the site is not currently ecologically valuable and does not contain any threatened species.

## 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

The post-development peak event stormwater discharge from the site will not exceed the pre-development peak event stormwater discharge. All 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 an Ozone Depletion Potential (ODP) of zero.

## 2.9 Community

The project will be designed to maximise community benefit by encouraging active, healthy lifestyles, maintaining good pedestrian and cyclist linkages and facilitating safe social interaction. The project will also be designed to minimise undesirable impacts such as glare and light pollution.

The following strategies will be considered:

- Promotion of healthy and active living through design and education strategies such as end-of-trip facilities
- Incorporation of crime prevention through environmental design (CPTED)
- Marketing and education strategies to convey sustainability practices to wider audiences
- Ensure that building materials do not lead to hazardous, undesirable or uncomfortable glare to pedestrians, motorists or occupants of surrounding buildings
- Minimise light spill to the sky
- Reduced heat island effect through the use of landscaped terraces and green roofs
- A diversity of apartment sizes and types to support different demographics
- Incorporation of community assets such as public art and a community plaza
- Activation of the rear lane to support commercial activities and offer additional community amenities

# 3 Conclusion

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

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

- Careful lighting design and selection of non-toxic finishes to improve Indoor Environmental Quality (IEQ)
- Water-efficient fittings, fixtures and appliances
- Energy-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 impact
- Management and governance procedures will improve sustainability outcomes in operation.
- Improved ecological value through green roofs and terrace gardens
- Various community benefits including provision of diverse apartment sizes and types to support a range of demographics and activation of the rear lane to support commercial activities and offer additional community amenities

The project can comply with the City of Sydney Development Control Plan (DCP) 2012 General Provisions Section 3.6 Ecologically Sustainable Development, BASIX, as well as NCC Section J Energy Efficiency provisions.