Heffron Centre

417 – 439 Bunnerong Road, Maroubra

ESD Strategy

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INTEGRAL GROUP

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1. INTRODUCTION

1.1 ACKNOWLEDGEMENT OF COUNTRY

This project acknowledges the Gadigal People of the Eora Nation as the traditional owners of land at the site. It acknowledge their elders, past, present and emerging.

1.2 PROJECT DESCRIPTION

This report supports two Development Applications for the development of the Heffron Centre at Heffron Park, 417-439 Bunnerong Road, Maroubra. The Heffron Centre is a new indoor multi-purpose facility, gymnastics facility and Community and High-Performance Centre (CHPC) which forms a major part of the ongoing upgrade works in Heffron Park and enables the community to have access to high-quality sporting facilities into the future.

Randwick City Council is the proponent for both of the DAs.

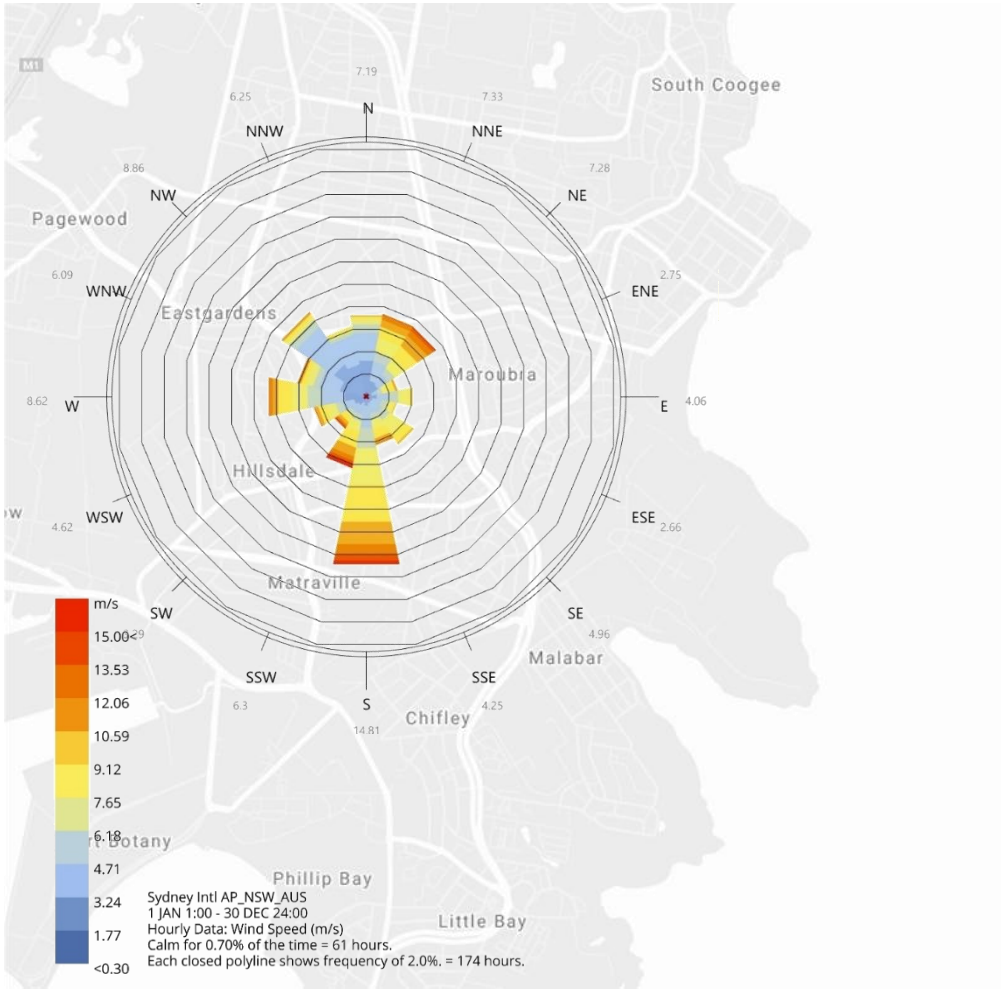
This Report has been prepared to provide an assessment of the design documentation submitted with this application against ESD objectives and requirements.

1.3 PURPOSE OF THIS REPORT

This report identifies the Ecologically Sustainable Development (ESD) strategy for the project, specifically with respect to:

- NCC Compliance requirements - Section J.
- ESD objectives and controls outlined in the Randwick Development Control Plan.
- Resource efficiency:
    - Energy,
    - Water,
    - Materials, and
    - Waste.

- ESD Benchmarking:
    - Governanace,
    - Health and wellbeing,
    - Biodiversity, and
    - Infrastructure.



1. INTRODUCTION

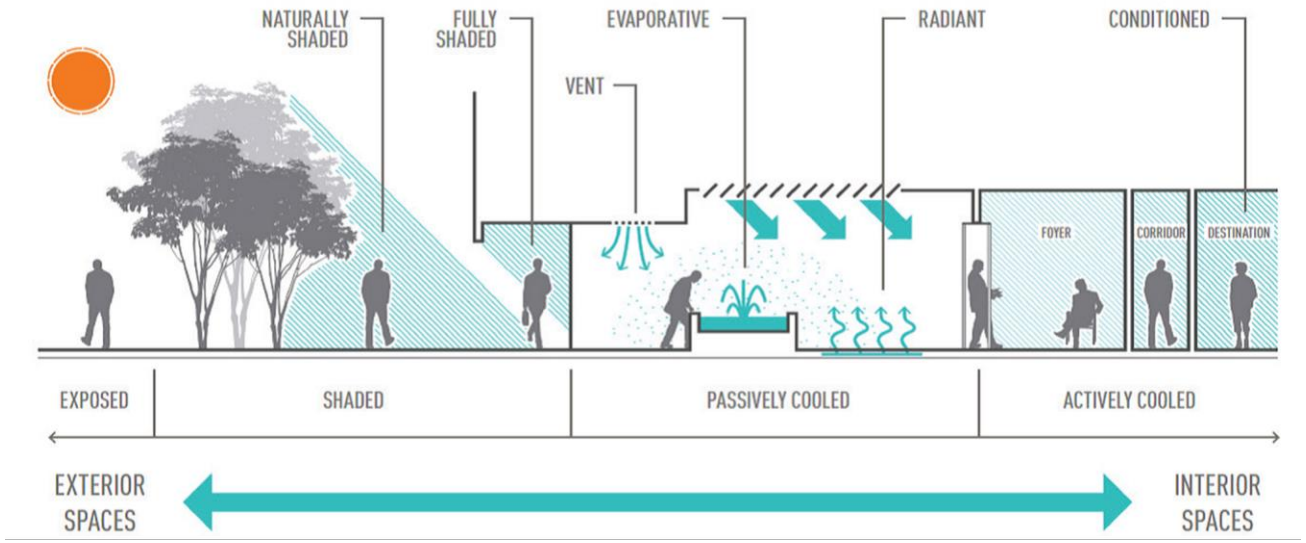
1.4 REPORT OUTCOMES

The principle outcomes from this report are:

- Preliminary building fabric performance and systems requirements to meet the requirements of Section J
- Demonstrating conformance of the design with the ESD requirements of the local Development Control Plan
- Validation of the building services design concepts in aiming to align with a range of ESD benchmarks

1.5 ESD OUTCOMES

The Heffron Centre will be aligned with a formulated from a wide range of ESD objectives, providing a holistic approach to sustainability, which offer a bespoke pathway to achieving a low impact building.



2. ESD STRATEGY

2.1 GHG EMISSIONS OPPORTUNITIES

The approach to energy efficiency has included both passive design and building systems strategies.

Passive design strategies include building orientation and massing responding to the site characteristics as well as local climatic conditions. The design of building envelope is a key strategy to achieve energy efficiency targets, by ensuring optimal window to wall ratios, shading devices, and tailoring the building performance according to space functionality and occupancy.

The systems approach to energy efficiency is based on:

- NCC 2019 Deemed-to-satisfy requirements +10% improvement
- Building services will surpass Section J requirements and be paired with an energy monitoring system for effective commissioning and tuning.

2.2 COMFORT AND AMENITY OPPORTUNITIES

The project has been designed to maximize solar incidence to the public, commercial and elite sport areas of the building, while at the same time achieving optimal functionality given the site's dimensions and proportions.

Considerations impacting the building envelope include:

- Solar access and Daylight
- Thermal comfort
- Views

2.3 BUILDING SERVICES OPPORTUNITIES

Opportunities in relation to ESD have been identified for each of the key spaces and systems in the building based on the preliminary architectural design.

This report provides an assessment of the following strategies:

- Building Fabric - glazing, shading and opaque fabric requirements for natural light performance and NCC 2019 Section J compliance.
- HVAC Systems – Prescriptive improvements for equipment from NCC DTS requirements
- Lighting - 5% improvement from the code through maximization of natural lighting, specifying LED lights, and using automated control systems.
- Rainwater system - tank optimization and fitting/fixture performance.
- 99 kWp PV system servicing the onsite electrical demand


Mechanical System


Horizontal Shading


Glazing Type


Insulation


Controls


Air Movers


Screens

2. ESD STRATEGY

2.4 WATER EFFICIENCY OPPORTUNITIES

The water balance strategy for the building is founded on efficient fittings and fixtures and the collection and re-use of rainwater for toilet flushing.

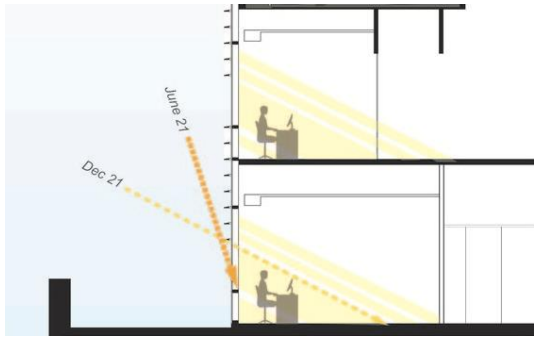
The fittings and fixtures will meet the following WELS ratings:

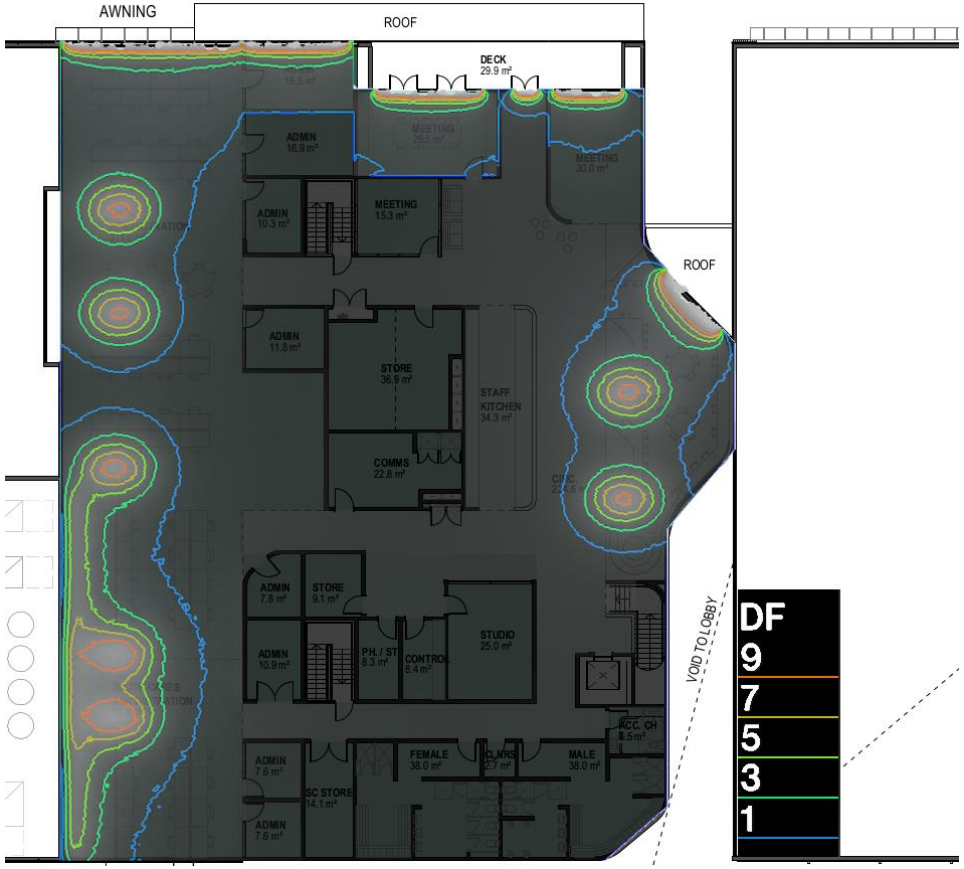
- Toilets 5 star WELS
- Urinals 6 star WELS
- Indoor Taps 6 star WELS
- Showers 3 star WELS

2.5 DAYLIGHT OPPORTUNITIES

Natural light access has been assessed, the strategies for providing natural light to internal spaces are a combination of the following:

- Glazing selections to balance superior natural light performance with thermal performance.
- Optimized Window to Wall Ratios
- Balancing daylight access with appropriate shading devices to avoid glare and thermal discomfort.



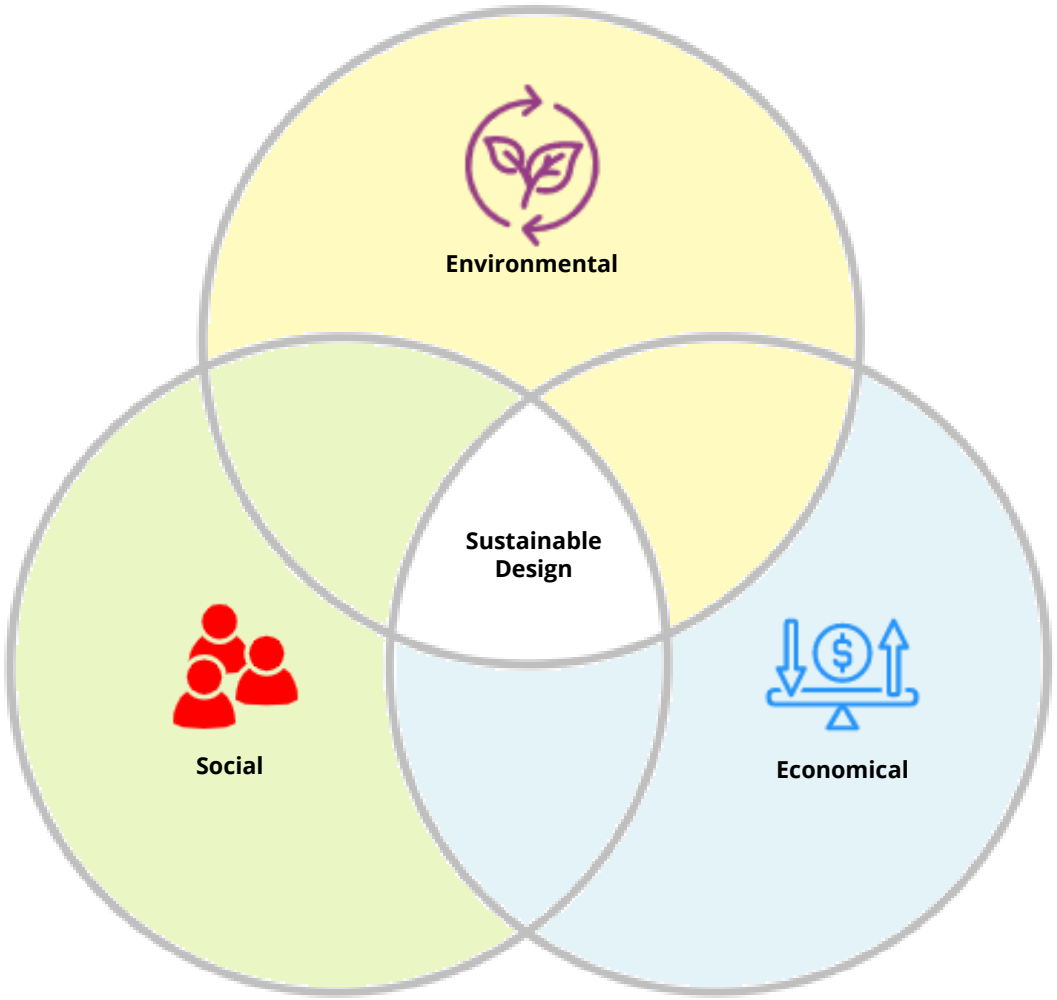


Daylight plot for the Lvl 01 floor plate

3.0 ESD BENCHMARKING

Several ESD concepts have been considered in the design of the Heffron Centre and the Centre aims to incorporate them throughout the design process.

Each of these concepts will be broken down in detail across the subsequent sections to provide an overview of the aspirations for the Heffron Centre.



3.1. MANAGEMENT

Comprehensive pre-commissioning and commissioning documentation of all nominated building systems, coupled with building tuning processes for nominated building systems will be put in place.

Building information will be provided to users. Along with metering and monitoring, the aim is to ensure operational performance is met.

During construction, environmental management practices and high-quality staff support will be addressed to lower, manage and remediate potential environmental risk, while improving social sustainability within the construction site.

An operational waste plan will be implemented in order to improve waste management and reduce environmental impacts of the building.

3.2. INDOOR ENVIRONMENTAL QUALITY (IEQ)

INDOOR AIR QUALITY

Indoor Air Quality will be improved through the ventilation system:

- HVAC will be designed for easy maintenance and cleaning prior to use/occupation
- Provision of outdoor air ether via natural or mechanical ventilation, at higher ratios than the standards.

ACOUSTIC COMFORT

Acoustic comfort will be addressed by assessing noise sources, managing reverberation, and designing for appropriate wall R ratings for acoustic separations. Internal Noise Level measurement and documentation must be provided by a qualified acoustic consultant.

LIGHTING

Flicker free lighting, colour quality and appropriate lighting levels for each space use will be designed for, including allowing occupants to dim and control lighting in their immediate environment.

VISUAL COMFORT

Design includes:

- Glazing selections to balance superior natural light performance with thermal performance.
- Design for glare reduction
- Providing good views to areas of frequent occupancy.

INDOOR POLLUTANTS

Several materials and finishes will have low VOC's / formaldehyde content, to reduce off gassing. This includes but is not limited to:

- Paints, Adhesives and Sealants
- Carpets
- Engineers Wood Products

3.3. ENERGY

The project can achieve high performance in terms of energy consumption, with a combination of the following:

- Passive design measures
- Shading design to minimize solar gains in summer
- Selection of highly efficient mechanical systems
- Selection low energy lights
- Specification of smart controls, such as daylight sensors for lights.
- Considerations for EV charging infrastructure (extent of design still to be finalized)
- Investigation of an energy monitoring system is on-going to allow for detail commissioning and tuning process

NCC IMPROVEMENTS

Performance improvements from NCC shall be achieved for:

- Building Envelope
- Glazing
- Lighting
- HVAC

RENEWABLES

- The project will include a 99 kWp Solar PV system to assist meeting the electrical loads on site
- Domestic hot water shall be powered by best in class hot water generating units
- Emissions from the Heffron Centre will be accounted for under Randwick Council's offset programme, as Randwick seek to retain their Carbon Neutral certification under Climate Active.
- Offsite PPA's will be investigated to meet the demands of the Centre as Randwick Council shift to meeting their target of Net Zero by 2030.

3.4. WATER

FITTINGS AND FIXTURES

Water efficient fixtures and fittings to reduce consumption of potable water will be included in for sanitary, kitchen and shower facilities.

- Taps: 6 star
- Urinals: 6 Star
- Toilet: 5 Star
- Showers: 3 Star
- Washing machines: 5 Star
- Dishwashers: 6 Star

RAINWATER REUSE

Harvested rainwater will be treated and re-used for non potable applications such as toilet flushing. Noting that irrigation will be served from bore water on-site.

HEAT REJECTION

No water is to be used for heat rejection

LANDSCAPE IRRIGATION

Drip irrigation with moisture sensors will be installed to reduce water wastage, and evaporation during hot weather

3.5. TRANSPORT

ACCESS TO PUBLIC TRANSPORT

The project will provide good access to public transport with a range of bus services running along Bunnerong Road.

ALTERNATIVE TRANSPORT MODES

The project will make provisions for EV charging infrastructure to be installed as part of this development.

Active Transport Facilities such as bicycle parking and associated facilities are provided to a proportion of the building's regular occupants and visitors.

PROXIMITY TO AMENITIES

Several amenities are location in the Southpoint Shopping Centre adjacent to the Heffron Centre

3.6. MATERIALS

RESOURCE EFFICENCY

The structural design has been considered to minimize material use through efficient design and material efficiency.

STRUCTURAL AND REINFORCING STEEL

Specification shall nominate procurement from a Responsible Steel maker and Responsible Steel fabricator. Requirements include:

- Having an ISO 14001 Environmental Management System (EMS) in place;
- Being a member of the World Steel Association (WSA) Climate Action Programme (CAP); and
- Being a member of the ASI's Environmental Sustainability Charter Group

TIMBER

At least 95% (by cost) of all timber used in the building and construction works is reused, or certified by a forest certification scheme that meets the GBCA's Essential' criteria for forest certification.

CONSTRUCTION AND DEMOLITION WASTE

The project will engage waste contractors and waste processing facilities who can demonstrate compliance with the Green Star Construction and Demolition Waste Reporting Criteria.

In addition, at least 90% of construction and demolition waste shall be diverted from landfill.

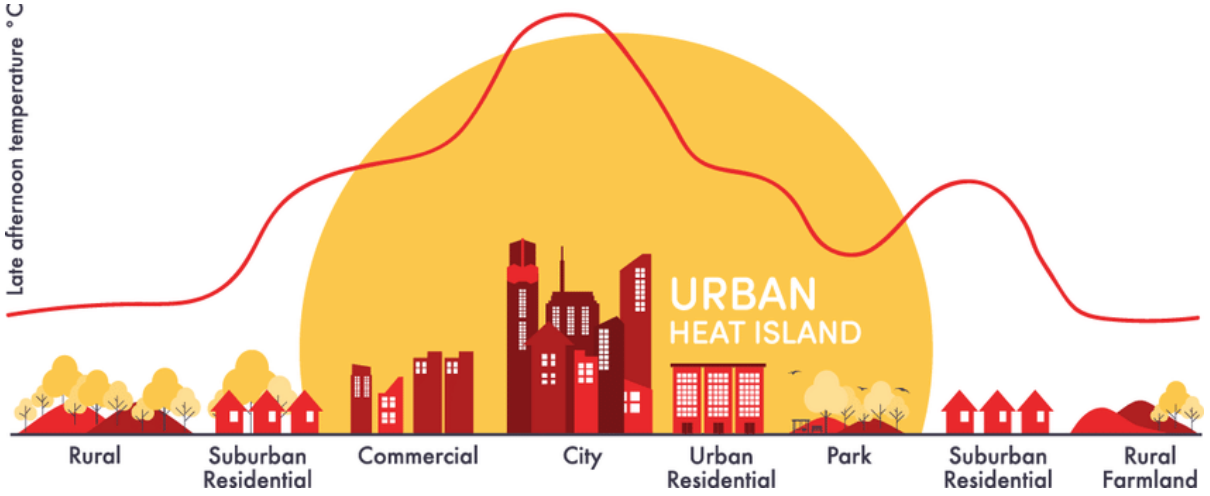
3.7. LAND USE AND ECOLOGY

LAND USE

- The project site does not include old forest growth or wetland that is considered of 'High National Importance', or did not impact on 'Matters of National Significance'; AND
- The development site was greater than 75% previously developed land, thus *The Proposal* is considered a reused land project.
- The landscape proposal aims to increase the biodiversity of local fauna using native species throughout the developing, situating the Heffron Centre within the wider development.

HEAT ISLAND EFFECT

At least 75% of the whole site area comprises of heat island mitigation solutions.



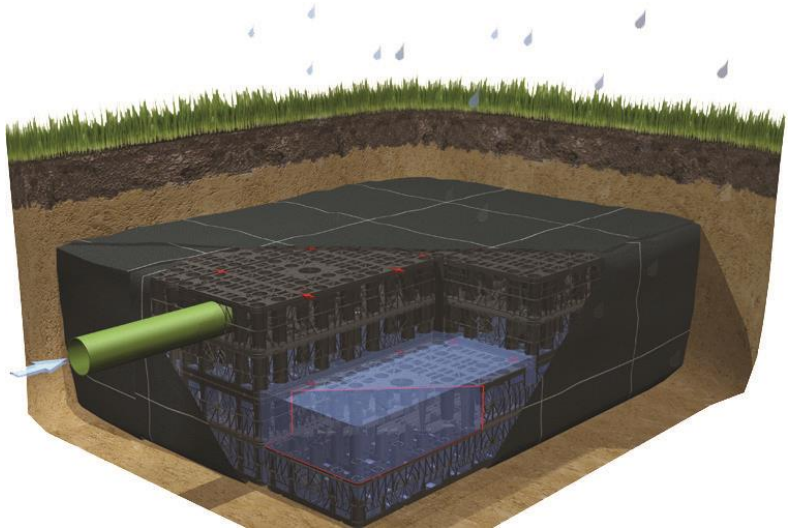
3.8 EMISSIONS

STORMWATER

Stormwater management systems will be designed to achieve that Post-development peak Average Recurrence Interval (ARI) event discharge from the site does not exceed pre-development levels.

Infiltration on site and the use of swales have been considered as part of this project.

The new stormwater treatment to achieve pollution reduction targets.

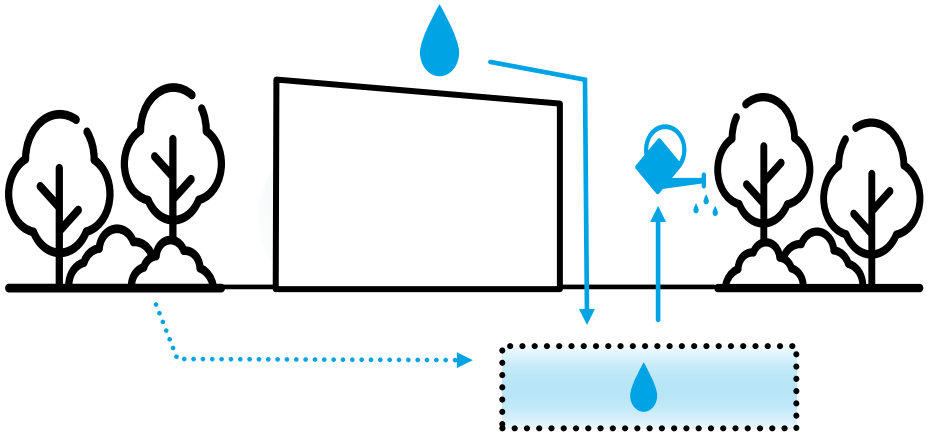


LIGHT POLLUTION

Light Pollution to neighboring bodies and night sky shall be minimised as per AS 4282:1997, and controls of Upward Light output ratio (ULOR) respectively.

MICROBIAL CONTROL

Microbial control can be achieved by designing waterless heat rejection systems.



4. SECTION J COMPLIANCE

Section J Energy Efficiency of Volume One of the National Construction Code (NCC) Series 2019 provides minimum performance requirements for the building to incorporate energy efficiency in the building and services design.

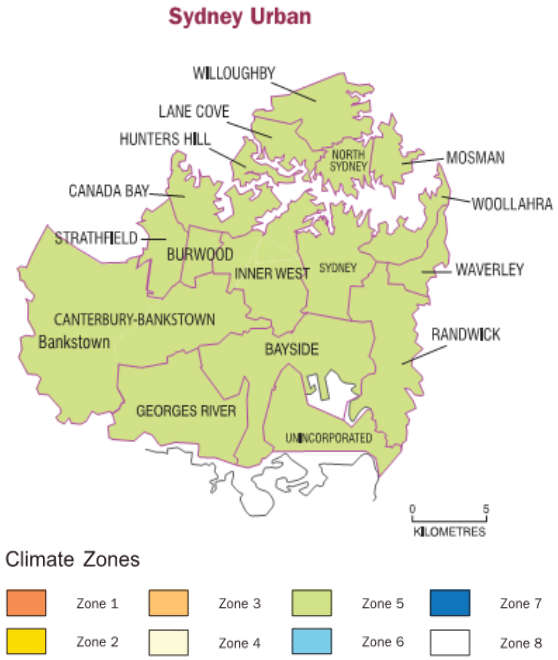
The building services for *The Proposal* must be designed to meet the minimum Deemed To Satisfy provisions of the relevant parts.

Recommendations for compliance have been addressed in our preliminary design analysis. We have assessed the proposal in terms of recommended window to wall ratios, glazing specification and building fabric thermal performance. By doing so we are confident that Section J compliance is achievable.

The project shall continue to address the opposite NCC requirements through the design of construction elements as well as product specification, during design development stages.

4.1 PROJECT DETAILS

- **BUILDING CLASS**
- 9b – Public Spaces
- 5 – Offices
- **CLIMATE ZONE**
- 5- Warm temperate



4.2 REQUIREMENTS

ROOF AND CEILING CONSTRUCTION

- *R3.7* for a downward direction of heat flow

TOTAL SYSTEM WALL-GLAZING CONSTRUCTION

	Class 5	Class 9b
U-Value	≤ 2.0	≤ 2.0
Solar Admittance	≤ 0.13	≤ 0.10

WALL COMPONENT

	< 80% of system	≥ 80% of system
R-Values	≤ 1.0	≤ 1.4

SHADING DEVICES

- Able to restrict at least 80% of summer solar light incidence; and
- If adjustable, will automatically respond to solar radiation levels.

FLOOR CONSTRUCTION

- *R2.0* for a downward direction of heat flow

THERMAL BRIDGING

- Needs to be calculated for compliance with the required Total System R-values for both wall-glazing and roof construction in accordance with AS/NZS 4859.2

5. DCP – ENVIRONMENTALLY SUSTAINABLE DESIGN

The Proposal will address the relevant Environmental Sustainability Design objectives covered in Randwick Council's Development Control Plan. The project's strategy to meet the outlined controls includes design features coupled with ESD benchmarking initiatives

PART B3 – ENVIRONMENTALLY SUSTAINABLE DESIGN - ESD

- General
- Building Materials and Finishes
- Energy and Water Efficiency
- Environmental Education

In the following charts, where a control has not been marked with a green tick under the 'considered' headline, compliance will need to be achieved either through design, specification or organizational measurements.

Randwick City Council
a sense of community

DEVELOPMENT CONTROL PLAN 2013

GENERAL CONTROLS, PART B3 - ESD

GENERAL OBJECTIVES	Strategy	Considered
To ensure that the design, construction and operation of development minimises adverse impacts on the natural and built environment.	Targeted in **Management, Energy, Transport, Water, Materials, Land Use & Ecology, and Emissions Categories**	✓
To reduce the use of resources, pollution and waste resulting from development activity.	Targeted in **Responsible Construction Practices, Life Cycle Impacts,** and **Construction and Demolition Waste**	✓
To improve the quality of life, health and well being of residents and workers	Targeted in **Indoor Environmental Quality** category	✓
To promote the use of renewable energy sources and materials.	Targeted in **Green Gas House** and **Materials category**	✓
To promote education on key elements of sustainable development and maintenance.	Targeted in **Building Information and Management**	✓

5.1 DCP – BUILDING MATERIALS & FINISHES

Building Materials & Finishes - OBJECTIVES

- To maximise the selection and use of environmentally responsible and robust construction materials and finishes.
- To ensure healthy indoor environments.
- To encourage use of materials that are non-polluting in manufacture, use and disposal.

Building Materials & Finishes - CONTROLS	Strategy	Considered
Submit a schedule of materials with the DA that maximises the use of:		
○ Materials that are durable with low maintenance requirements.	To be targeted in design / master specification	to be considered
○ Materials with low embodied energy content.	○ Targeted in **Life Cycle Impacts**: The project reduces the amount of building materials used, including specification of building materials manufactured with reduced energy processes.	✔
○ Renewable materials.	To be targeted in design / master specification	to be considered
○ Locally sourced products.	To be targeted in design / master specification	to be considered
○ Salvaged or recycled materials.	○ Can be targeted in **Timber**	
○ Timber from plantation or sustainable managed re-growth forests.	○ At least 95% (by cost) of all timber used is either certified by a GBCA approved certifier; OR from a reused source.	✔
○ Low volatile organic compound (VOC) emitting materials.	○ Targeted in **Indoor Pollutants**: At lest 95% of all internally applied paints, adhesives, sealants and carpets meet stipulated VOCs limits; OR no paints, adhesives, sealants or carpets are used. AND At least 95% of all engineered wood products meet stipulated formaldehyde limits or no new all engineered wood products are used.	✔
○ Toxin free flooring.	To be targeted in design / master specification	to be considered
○ Mechanical fittings instead of adhesives or glues.	To be targeted in design / master specification	to be considered
Rainforest timbers or timbers cut from old growth forest must not be used.	Targeted in **Timber**: At least 95% (by cost) of all timber used is either certified by a GBCA approved certifier; OR from a reused source.	✔
Design for the adaptive re use of existing building facades, building structures and fittings where feasible.	N/A	**N/A**

5.2 DCP – ENERGY AND WATER EFFICIENCY

Energy and Water Efficiency - OBJECTIVES

- To promote energy and water efficiency in the design and operation of buildings.
- To minimise greenhouse gas emissions.
- To reduce the reliance on mechanical heating and cooling.
- To reduce energy and water bills and the whole of life cost of energy services.

Energy and Water Efficiency - CONTROLS	Strategy	Considered
Buildings are to be oriented and designed to achieve optimum solar access and natural ventilation where practical.	The design adopts a north-south orientation for the building. This achieves the optimal balance between functionality and maximization of solar access to occupied zones where occupants will spend a large amount of time.	✔
On site renewable energy systems (e.g. solar energy, heat pump technology and the like) are to be installed where practical and effectively integrated to complement the overall building design.	Targeted in **Energy** – 99 kWp PV will be installed on site.	✔
New or replacement solar and heat pump hot water systems must be eligible for at least 24 Renewable Energy Certificates (RECs). All new or replacement domestic type gas hot water systems must be the most energy efficient option available at the time of development.	Additional to **Domestic Hot Water**: Domestic hot water systems are powered by either renewable energy, electric heat pump, or Waste/recovered heat. To be targeted in design / master specification	to be considered
Electric hot water heating must not be installed.	Additional to the above. To be targeted in design / master specification	to be considered
Heating and cooling systems are to be designed to target only those spaces which require heating or cooling at any one time, not the whole building.	To be targeted in design / master specification	to be considered

5.2 DCP – ENERGY AND WATER EFFICIENCY

Energy and Water Efficiency - CONTROLS	Strategy	Considered
All new or replacement air conditioners of domestic/residential scale are to be MEPs rated: minimum 4 star on one cycle and 3 star for reverse-cycle models.	N/A	N/A
All new or replacement electrical appliances must achieve the highest available energy rating at the time of development.	To be targeted in design / master specification	to be considered
Energy efficient LED lighting, dimmers, motion detectors and/or automatic turn off switches are to be installed where appropriate.	Targeted in **Lighting**: Automated lighting controls systems are required throughout the nominated area.	✔
Lighting systems should be designed to target only those spaces which require lighting at any “off-peak” time, not the whole building.	Additional to **Lighting**: At least 5% better aggregated illumination power than the code. To be targeted in design / master specification	to be considered
Openable windows are to be installed in common areas to improve natural ventilation where appropriate (e.g. staff rooms, bathrooms etc).	To be targeted in design / master specification	to be considered
Internal walls and partitions are to be positioned to provide cross flow ventilation through the building.	Depth of zones within the building, and the partition in the building into two tenancies, means cross ventilation is not appropriate in this context.	N/A
All new or replacement products regulated for water efficiency under WELs must achieve the highest rating at the time of development (e.g. dishwashers and washing machines).	All fixtures are within one star of the GBCA specified WELS ratings	✔
WELs rated water saving devices must be installed including: 4 star dual flush toilets, 3 star shower heads, 4 star taps, and 3 star urinals.	(see above).	✔
New commercial premises and hotel and motel accommodation with a floor area of 1,000 sqm or more must achieve a minimum 4 star NABERs rating for the base building and undertake a Commitment Agreement.	N/A	N/A
DAs must include an ESD Statement prepared by an accredited professional providing design evidence that the required NABERs rating can be achieved.	N/A	N/A

5.3 DCP – ENVIRONMENTAL EDUCATION

Environmental Education - OBJECTIVES

- To educate residents, workers and other building occupants on the sustainability features of development.
- To encourage the use and maintenance of water efficient and energy efficient design features of the development over time.

Environmental Education - CONTROLS	Strategy	Considered
Submit an Environmental Toolkit detailing the sustainability features of the development and maintenance requirements including (but not limited to): ○ Rainwater tanks. ○ Total water cycle management (including water conservation devices and stormwater treatment). ○ On site renewable energy systems (including information on connection options and wiring). ○ Lighting, energy and water efficient appliances, fixtures and fittings and associated ratings. ○ Composting. ○ Landscaping. ○ Transport (including access to public transport). ○ Any other site specific initiatives where relevant.	Comprehensive operations and maintenance information is developed and made available to the facilities management team; and relevant building user information is developed and made available to all relevant stakeholders. The documents developed to meet this targets are: ○ Operations and Maintenance Manuals (O&M); ○ Building Log Book ○ Building User Guide	✔
Maintenance instructions are to be attached to the particular feature where practical (e.g. rainwater tank, solar panel).	To be included as corporate approach	to be considered
The Environmental Toolkit may be complemented with information from Randwick City Council (such as the Local Native Plants for Sydney's Eastern Suburbs brochure) and/or other relevant material.	To be included as corporate approach	to be considered
The Environmental Toolkit is to be retained by building management with copies readily available to maintenance personnel, residents, tenancies and the like.	Targeted in **Building Information** (see above).	✔