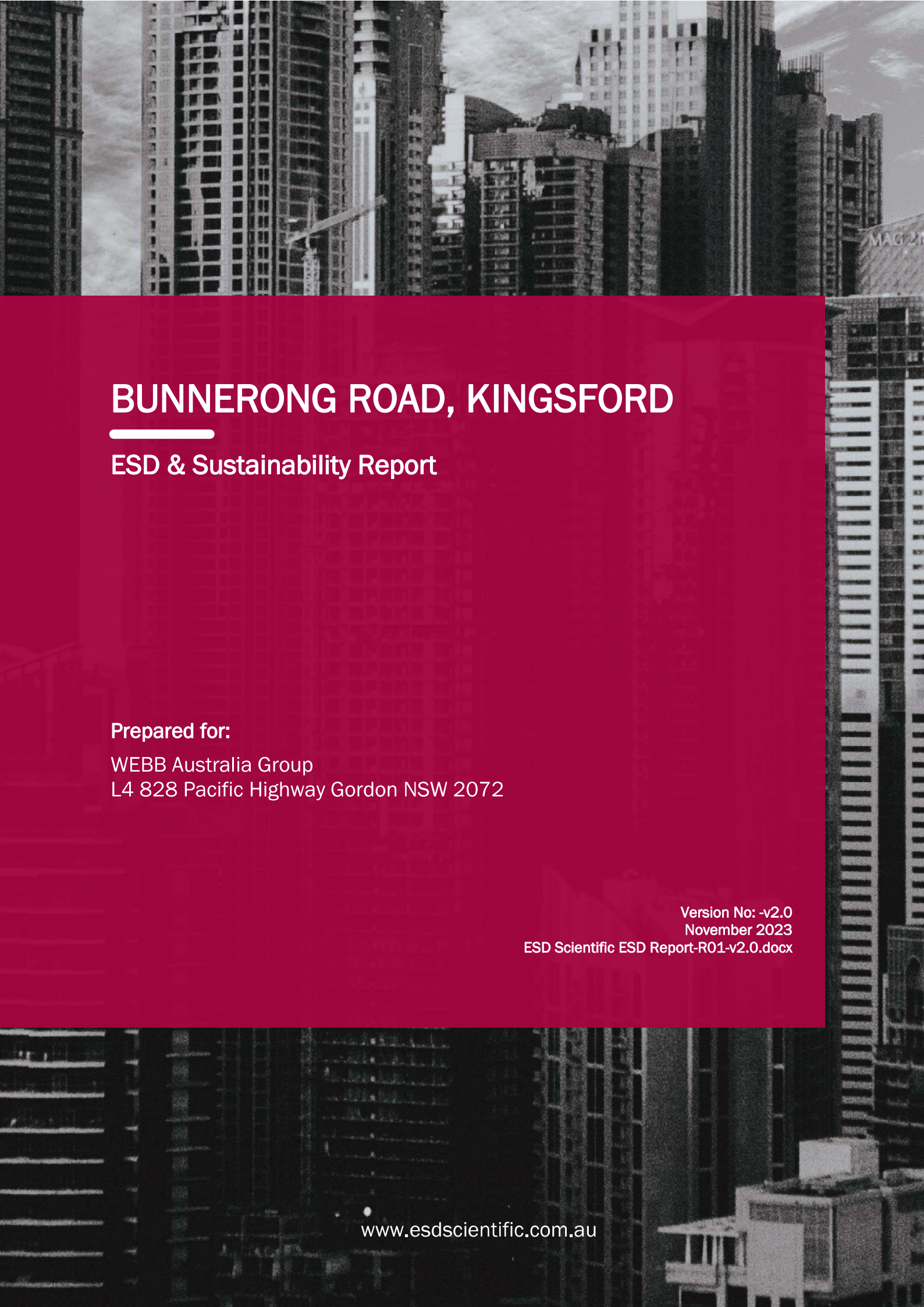




BUNNERONG ROAD, KINGSFORD

ESD & Sustainability Report

Prepared for:

WEBB Australia Group
L4 828 Pacific Highway Gordon NSW 2072

Version No: -v2.0
November 2023

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Revision History

Reference	Date	Details	Prepared	Authorised
-R01-v2.0	20 November 2023	Final	XS/HC	HC
-R01-v1.0	19 May 2023	Final	XS/HC	HC

EXECUTIVE SUMMARY

ESD Scientific has been engaged by WEBB Australia Group to provide a qualitative Ecologically Sustainable Design (ESD) assessment, including Energy Efficiency for the proposed new residential development at Bunnerong Road, Kingsford.

The proposed development will incorporate passive and active energy-saving measures to enhance building operating performance where appropriate. Overall, positive Ecologically Sustainable Design (ESD) and energy efficiency features are currently in place in a number of design areas, incorporating the following:

- High-performance thermal envelope with roof, floor and external wall insulations;
- Appropriate glazing selection in accordance with BASIX/Nathers to cut excess solar heat gains;
- All windows, doors, exhaust fans and pipe penetrations will be constructed to minimise air leakage as required by the provisions outlined in 2022 NCC;
- Thermal break to all structural steel passes through the insulation envelope (wall, Roof, ceiling floor) as per NCC 2022;
- Select centralised energy-efficient VRV/VRF air conditioning system;
- Select centralised energy-efficient electric heat pump hot water system;
- LED lighting to all areas with advanced controls to different locations;
- Light-coloured roofing (cool roof) with high reflectivity and appropriate insulation to reduce solar heat gain into the apartment;
- Incorporate thermal mass into the design;
- Maximise the size of PV system on roof to supply 100% renewable energy for public space and central systems;
- Provisions to allow future battery systems to store electricity under NCC 2022 requirements;
- Water-efficient and drought-tolerant landscaping;
- Rainwater collection for landscape irrigation and car wash bay;
- Install hot water recirculation system (on-demand) to all apartments;
- Select minimum 4- star water-efficient showerheads;
- Select minimum 5- star water-efficient toilets;
- Select minimum 6-star water-efficient taps;
- Water-efficient dishwasher and clothes washer;
- Incorporate water-sensitive urban design principles;
- Communal veggie gardens provide health, well-being benefits and Social resilience;
- Worm farms and composting facilities to treat organic waste on-site and use for gardens;
- The waste management plan will be prepared to minimise operational and construction waste going to landfills;
- Bicycle parking with racks and lockers to encourage active transport;

EXECUTIVE SUMMARY

- Provisions to allow 100% of the car parking with electric charging equipment under NCC 2022 requirements; and
- Car-share spaces are recommended along Anderson Street.

These features will help significantly reduce the energy and water required by the development from construction and operation. It is recommended that ESD initiatives continue to be developed and implemented during the detailed design stage of the project.

This report has been made based on our best engineering judgment and the experience gained from the past. ESD Scientific recommends that a review to be conducted during the detailed design stage of the project to confirm assessments made within this report.

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ESD Design Principles

1 Introduction

ESD Scientific has been engaged by WEBB Australia Group to provide a preliminary Ecologically Sustainable Design (ESD) assessment for the proposed new residential development at Bunnerong Road, Kingsford.

The report has been prepared in accordance with the Randwick Council DCP 2013.

1.1 Site and Project Description

The proposed development is situated in Kingsford within the Randwick LGA, bounded by Bunnerong Road from the west and Anderson Street from the south. The AusGrid zone substation facility is located to the immediate north and east of the site. The development is predominantly surrounded by residential houses. The site is within walking distance to light rail stop and shops.

An aerial image of the subject site and the local surroundings is shown in [Figure 1](#) and [Figure 2](#).

Figure 1 Site Location

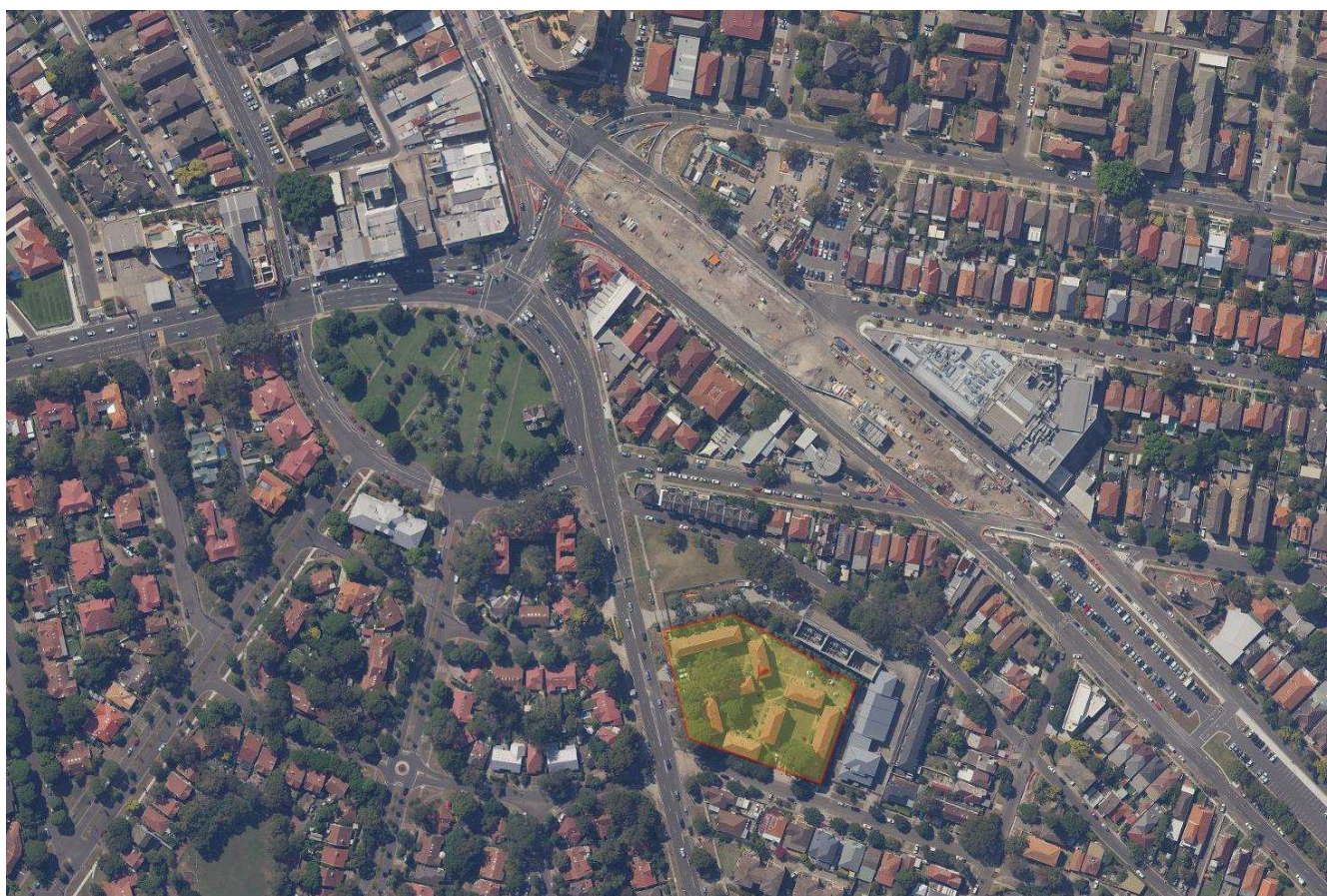


Figure 2 Site Plan View of the Proposed Development



1.2 Development Description

The proposed development will comprise two apartment buildings, inclusive of the following:

- The total site area is 6,052 m²;
- One five-eight storey building;
- 44% of apartments will be accommodated as social housing;
- 56% of apartments will be accommodated as private apartments; and
- Two basement car parking will be designed as per DCP requirements;

2 Sustainability Legislation and Guidelines

2.1 National Construction Code – Section J Energy Efficiency

The Australian National Construction Code (NCC) is a set of uniform technical standards for the design and construction of buildings and structures in Australia. Section J of the NCC outlines the Energy Efficiency provisions for buildings, which aim to reduce buildings' energy consumption and greenhouse gas emissions.

There are Deemed-to-Satisfy subsections from J1 to J9 that focus on separate aspects of energy efficiency as follows:

- J1- J4 - Building Fabric and Glazing
- J5 - Building Sealing
- J6 - Air Conditioning and Ventilation Systems
- J7 - Artificial Lighting and Power
- J8 - Heated Water Supply and Swimming Pool and Spa Pool Plant
- J9 - Energy Monitoring and on site distributed energy resources

2.2 The Building Sustainability Index (BASIX)

The Building Sustainability Index (BASIX) is a state government initiative to reduce the carbon footprint of new buildings and renovations. A BASIX certificate is a mandatory document that demonstrates the energy, water and thermal efficiency of new homes and renovations in New South Wales.

The building design must meet minimum sustainability standards outlined in the NSW government's BASIX guidelines to obtain a BASIX certificate. This includes water and energy reduction targets and the thermal comfort requirements under the Nationwide House Energy Rating Scheme (NatHERS) protocol.

The BASIX certificate is issued after submitting a BASIX assessment, which evaluates the proposed building's design and construction methods against a set of sustainability criteria. The assessment considers factors such as water and energy efficiency, renewable energy use, building fabric performance and thermal comfort.

BASIX sets water and energy reduction targets relative to the NSW average benchmark in the residential sector.

The Thermal comfort section of BASIX aims to:

- ensure thermal comfort for a dwelling's occupants, appropriate to the climate and season;
- reduce greenhouse gas emissions from artificial Cooling and heating through good building design and use of appropriate construction materials; and
- reduce the demand for new, or upgraded, energy infrastructure by managing peak demand for energy required for Cooling and heating.

BASIX outlines the minimum performance levels for thermal comfort of the dwelling and replaces the National Construction Code (NCC) Section J Energy Efficiency benchmarks within NSW. Thermal comfort levels are assessed on an individual dwelling basis via a simulation method in accordance with the Nationwide House Energy Rating Scheme (NatHERS) protocol.

The minimum improvement benchmark for each index is based on the project development's location, size, height, and dwelling density.

2.3 Specific Requirements for Compliance

Specifications for environmental design principles required for the proposed site are detailed in the following documents:

- Mandatory Randwick Council DCP 2013
- Mandatory NSW Building Sustainability Index (BASIX)
- Mandatory minimum project average 7-star rating under NatHERS
- Mandatory minimum 6-star rating under NatHERS for individual dwelling
- Mandatory NCC Section J 2022 Energy Efficiency
- Mandatory The State Environmental Planning Policy (SEPP) 2022, supported by the Apartment Design Guide
- Voluntary Green Star Rating Tool
- Voluntary WELL Building Standard Rating Tool

The Randwick Council DCP has outlined some key sustainable design principles, including Energy Efficiency, Passive solar design, Thermal Mass and insulation, Natural Ventilation, Colours and Materials and water conservation etc. The document discusses essential aspects of building design where there is the potential to increase the energy efficiency of development during the Concept Design stages of a project by ecologically sustainable means.

2.4 BASIX and NATHERS New Standards

The NSW government announced increases to the BASIX standards as part of the new Sustainable Buildings State Environmental Planning Policy (SEPP), which will come into effect on 1 October 2023. The increase in BASIX energy and thermal comfort standards will align with the proposed provisions of NCC in 2022. The proposed higher standards will vary by building type and climate zone.

Figure 3 compares the current targets to the new proposed targets for the project site.

- The energy target is increased from a current 25% reduction to a 60% reduction relative to the NSW average benchmark in the residential sector.
- Thermal comfort target –
 - A 24% reduction to the maximum allowable heating load (individual dwellings)
 - A 27% reduction to the maximum allowable cooling load (individual dwellings)
 - A 30% reduction to the maximum allowable heating load (project average)
 - A 23% reduction to the maximum allowable cooling load (project average)
 - First time introduce the new "Total load" requirement (heating + cooling)

Figure 3 BASIX Standards Calculator for Project Site

BASIX [®] off-line energy target and maximum allowable thermal loads calculator				Version 3.1		January- 23					
INPUT											
Postcode (please type)				Building type (please select)							
2032				High rise (6 - 20 storeys multi units)							
RESULTS											
NatHERS climate zone (primary)				Suburb							
56				KINGSFORD							
BASIX energy target				Current		Proposed					
				25		60					
Maximum allowable thermal loads (MJ/m ² /year)		Individual dwellings		Average of all dwellings							
		Current		Proposed		Current		Proposed			
		Total		-		38.0		-		30.0	
		Heating		45.4		34.4		40.0		28.1	
		Cooling		29.5		21.4		26.0		20.0	

3 ESD & Energy Efficiency Initiatives

3.1 Ecologically Sustainable Development Approach

To achieve a holistic approach to ESD design, a series of indicators and strategic goals have been identified for the development through the design, construction and operation phases.

The ESD and energy Efficiency objectives, proposed targets related to the objective and measures that have been recommended are listed in [Table 2](#).

3.2 Documentation

This report has been prepared based on the documentation provided by the project team and listed in [Table 1](#) below.

Table 1 Project Documentation Sources

Type	Document	Issue Date
Urban Planning	Urban Design Study	15/03/2022
Project Brief	Project Brief Email	03/02/2023
Planning Proposal	PTW Design Coordination Pack	17/11/2023

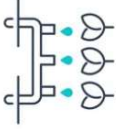
Table 2 Summary of ESD & Energy Efficiency Strategies

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Energy Efficiency 	Design and construct energy-efficient buildings and reduce greenhouse gas (GHG) emissions associated with using energy in building operations	High-efficiency lighting and controls	LED lighting to all areas with advanced controls (motion sensor, daylight sensor and zoned switch)	✓	
		High-efficiency mechanical ventilation and controls	Car park supply and exhaust fan with CO monitors and VSD fans, or naturally ventilated if possible	✓	
		High Efficiency domestic hot water system	Entry lobby and common corridor to be naturally ventilated without air conditioning	✓	Common corridors and entry lobbies with operable windows/doors for natural ventilation have been proposed
	Well-designed systems, aimed at lower operating emissions	Select energy-efficient air conditioning system	Central heat pump hot water system with piping insulation	✓	
		Select energy-efficient appliances	Centralised VRV/VRF air conditioning with EER/COP 3.5-5.5 or more than 5.5 for other centralise system	✓	
	The selection of high-efficiency equipment over less energy-efficient alternatives	Optimise insulation for energy and thermal comfort	Min 4-star dishwasher and 8-star drier if applicable	✓	PV solar system should be installed to the maximum extent on roof to power both common areas and individual apartments. Solar PV systems have been proposed on L8 roofs
	Onsite renewable energy sources	Reduce solar heat gain through the roof by providing a highly reflective roof	High-performance thermal envelope with roof, floor and external wall insulations	✓	
		Install onsite renewable energy generation	Use roofing material that has a high Solar Reflective Index	✓	
			Maximise the size of PV system on roof to supply 100% renewable energy for public space and central systems	✓	Provisions to allow future battery systems under NCC 2022 requirements

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Passive Design 	Passive design to reduce energy consumption by taking advantage of natural heating, cooling, ventilation and lighting	A key ESD objective should be to optimise site conditions and minimise energy consumed for cooling and heating loads through proper building orientation and internal layout selection	- DCP-compliant massing to give excellent solar exposure from north, east and west directions to apartments throughout the day, year-round - Design to maximise the north aspect and minimises the number of single-aspect south-facing apartments - Design to maximise dual-aspect apartments to provide good cross-ventilation throughout the day - To incorporate passive solar shading into the design, such as vertical louvres and screens, vertical blade walls, privacy screens and balconies - Add skylights for certain units to improve solar access and daylight - Minimise the overshadowing impact on development itself and surrounding buildings	✓ ✓ ✓ ✓ ✓ ✓	- At least 70% of apartments achieved 2 hours or more of direct sunlight under ADG design criteria - maximum of 15% of apartments receive no direct sunlight. The current design shows only 5% of apartments receive no direct sunlight - Vertical blades for east & west facing apartments, slab extensions/ balconies for north-facing apartments - at least 60% of apartments directly achieved cross-ventilation under the ADG design criteria - Design should take consideration of overshadowing impact to ground and lower-level apartments

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Building Fabrics Performance 	Optimise building thermal envelope performance to reduce heating and cooling loads	- Achieve performance requirements under BASIX - Achieve minimum 7 Star rating under NatHERS (Project Average) - Achieve minimum 6 star rating under NatHERS for individual dwelling - Incorporate thermal mass to the design - Reduce heat gain and heat loss through the building's thermal envelope	- Meet or exceed BASIX Thermal Comfort Section performance requirements - High-performance thermal envelope with roof, floor and external wall insulations - High-performance glazing system to all facades - Light coloured roofing with high reflectivity and appropriate insulation to reduce solar heat gain into the building - Hebel wall for the external wall, party wall, internal wall adjacent to common area and unconditioned space - Thermal break to all structural steel passes through the insulation envelope (wall, Roof, ceiling floor) as per NCC 2022 - All windows, doors, exhaust fans and pipe penetrations will be constructed to minimise air leakage as required by the provisions outlined in NCC 2022	✓ ✓ ✓ ✓ ✓ ✓ ✓	Bricks have been proposed for the façade design

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Indoor Environment Quality 	- Initiatives that enhance the comfort and well-being of occupants - Improvements to air quality through appropriate ventilation - The provision of high levels of thermal and acoustic comfort - Optimise natural light to indoor space - The creation of low-toxicity environments through reductions to pollutants - Reductions to occupant stress	- Provide sufficient fresh air and ventilation for indoor space - Provide thermal and acoustic comfort environment to occupants - Finishes: Use low-VOC paints, adhesives & sealants, carpet and flooring; use low-formaldehyde wood products - Use flicker-free lighting system - Lighting illuminance meets the levels recommended in AS1680.2.4 - Reduce visual glare - Visual Comfort	- Mechanical/natural ventilation to comply with AS 1668 - Satisfy BASIX Thermal Comfort requirements. Acoustic to comply with AS 2107 recommendations for internal spaces - Select low-VOC paints, adhesives, sealants and carpets - Select low-formaldehyde emission-engineered wood products - Maximised natural light to indoor space - Lighting levels comply with AS 1680 - Glare is reduced through a combination of blinds, screens and fixed devices - To provide clear line of sight to a high quality internal or external view	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	- Design should encourage occupants to open windows/doors for natural ventilation - LED lighting to all areas with advanced controls - High-quality view: internal sunlit landscaped communal courtyard. Unobstructed view to the north over grassy Ausgrid area, view over low scale residential and substation to south, east and west

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Potable Water Reduction and Reuse 	Reduce the consumption of potable water through measures such as the incorporation of water-efficient fixtures and building systems and water reuse	- Select water-efficient toilets, taps and showers - Select equipment that is more water efficient than comparable standard practice Equivalents - Water-sensitive landscape design - Utilise rainwater and/or recycled water for landscape irrigation and car washing bay - Reuse fire sprinkler test water	- Toilets – minimum 5 stars WELS rating and Watermark certified - Taps – minimum 6 stars WELS rating and Watermark certified - Showerheads - 4 stars WELS rating and Watermark certified - Install hot water recirculation system (on-demand) to all apartments - Water-efficient dishwasher and clothes washer - Water-efficient, drought-tolerant landscaping and native species - Provide sufficient rainwater collection for landscape irrigation and car wash bay - Fire sprinkler test water contained in a closed system for re-use	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	Below Ground tank (below deep soil area) with separate chambers to accommodate the OSD (On-site Stormwater Detention), WQ (Water Quality) measures and RWT (Rainwater Tank)

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Construction & Operational Waste 	- Minimising demolition, construction and operational waste going to landfill - Reuse, upcycling or conversion of waste into energy	- Reduce construction waste going to landfill by reusing or recycling waste - Contracted to builder as a requirement on site for construction waste - Reduce operational waste going to landfills - Maximise source separation and recovery of recyclables - Consider a design that can be disassembled at the end of the building's life.	- Management of waste in accordance with the NSW Waste and Sustainable Material Strategy 2041 - To provide a Waste Management Plan for the demolition, construction and operation of the building in accordance with Randwick DCP - To provide adequate recycling systems in the design of the garbage room - Centralise waster/recycling collection to reduce waste vehicle movement, transport emission and noise - Worm farms and composting facilities are provided to treat organic waste onsite - Management practices to prevent stormwater pollution - Management of wastewater during construction, including possible reuse on site for dust suppression - Ongoing management to improve avoidance of waste generation - Contractors and sub-contractors employed to undertake proposed construction works and waste removal should be educated about the waste objectives of the development	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	- Maximise predicted construction waste arising from development can be reused (onsite or at another development) or recycled off-site - Worm farms and composting facilities to treat organic waste on-site and use for gardens

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Materials 	Use of products and materials with lower environmental impact	- Building materials are responsibly sourced or have a sustainable supply chain - Select materials with high levels of recycled content, or the selection of reused products and materials - Minimise the environmental impacts of refrigeration and air conditioning equipment	- Structural and reinforcing steel is sourced from a responsible steel maker (hold ISO 14001 Environmental Management System) - Structural steelwork is supplied by a steel fabricator/steel contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI) - Use FSC-certified timber products, such as joinery - Use concrete with minimum 30% recycled content - Use flooring and blinds without PVC content - Use R410A refrigerant which has an ozone depletion potential of zero - Use Low-Carbon Aluminium	✓ ✓ ✓ ✓ ✓ ✓ ✓	

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Land Use & Ecology 	Reduce the negative impacts on sites' ecological value	- Selecting a site for development on 'previously developed land - Retaining existing vegetation and add more Landscaped areas - Reducing the impact of heat island effects from hard surfaces - Minimise light pollution from the site - Minimise peak stormwater outflows from the site and reduce pollutants entering the public sewer infrastructure and natural watercourses	- Installing native species appropriate to the area - Retaining existing trees along Bunnerong Road and Anderson Street - Design external lighting to avoid emitting light into the night sky or beyond the site boundary. The minimum requirement is met where the project complies with AS 4282:1997 Control of the obtrusive effects of outdoor lighting - Meet stormwater pollutant reduction requirements according to Randwick DCP - Maintain maximum green space and other deep soil for percolation - Construction phase erosion and sediment control measures will be installed and maintained in accordance with Council's requirements and Managing Urban Stormwater, Soils and Construction (Landcom, 2004)	✓ ✓ ✓ ✓ ✓ ✓	- The planting is a minimum 70% endemic and native to the area - The majority of the High Retention Value trees are able to be retained (especially along Bunnerong Rd and Anderson St.) - Selection of endemic and low-maintenance landscaping species - LED lights for all external lights, designed for low spill - Incorporate water-sensitive urban design principles - An Erosion and Sediment Control Plan to be prepared for the project

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Minimising Transport Impact 	- Reduction of carbon-intensive modes of transport - Consider the traffic impact on the local community	- Facilitating and encouraging alternative transport options, such as public transport, bicycles or electric vehicles. - Provide active transport facilities such as bicycle racks and locker rooms. - Provide support for the uptake of low-emission vehicles - Reduce operational fuel consumption through close proximity to major arterial roads.	- Easy access to public transport - Bicycle parking with racks and lockers to encourage active transport - Provide car-share spaces - Extra capacity to grow electric car charging to car spaces - Parking spaces for fuel-efficient and electric vehicles are clearly designated (different coloured line marking and signage). - The site is close to the Kingsford Juniors Light Rail station; bus services are located along Bunnerong Road; the site is located within walking distance to the Kingsford Town Centre - Existing pedestrian and cycle infrastructures are available around the site	✓ ✓ ✓ ✓ ✓ ✓ ✓	- Adequate substation capacity to be provided for future EV expansion - Adjacent substation supplies sufficient power to the site - Bus station on Bunnerong Rd directly in front of site, Light rail station 350m distance to site - Bicycle parking in the basement and on ground floor in communal open space - Provisions to allow 100% of the car parking with electric charging equipment under NCC 2022 requirements

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comments
Innovation 	Recognise the implementation of innovative practices, processes and strategies that promote sustainability in the built environment.	- Circular economy - Recycling waste onsite - Social resilience	- Communal veggie garden provide health and well-being benefits. - Residents can access fresh food and green space, stay active maintaining the garden, and connect socially. - Knowing your neighbours makes your complex safer and builds social resilience. - Worm farm and composting facilities to treat organic waste onsite - Recycling food scraps in nutrients that can be used in gardens.	✓ ✓ ✓ ✓ ✓	- Community gardens in the central internal courtyard with raised community planters citrus trees and edible gardens. - Start with a small garden managed by a group of residents. Expand the garden as interest grows - Worm farms and composting facilities to treat organic waste on-site and use for gardens

4 Conclusion

ESD Scientific has been engaged by WEBB Australia Group to provide a qualitative Ecologically Sustainable Design (ESD) assessment, including Energy Efficiency for the proposed new residential development at Bunnerong Road, Kingsford.

The proposed development will incorporate passive and active energy-saving measures to enhance building operating performance where appropriate. Overall, positive Ecologically Sustainable Design (ESD) and energy efficiency features are currently in place in a number of design areas, incorporating the following:

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- All windows, doors, exhaust fans and pipe penetrations will be constructed to minimise air leakage as required by the provisions outlined in 2022 NCC;
- Thermal break to all structural steel passes through the insulation envelope (wall, Roof, ceiling floor) as per NCC 2022;
- Select centralised energy-efficient VRV/VRF air conditioning system;
- Select centralised energy-efficient electric heat pump hot water system;
- LED lighting to all areas with advanced controls to different locations;
- Light-coloured roofing (cool roof) with high reflectivity and appropriate insulation to reduce solar heat gain into the apartment;
- Incorporate thermal mass into the design;
- Maximise the size of PV system on roof to supply 100% renewable energy for public space and central systems;
- Provisions to allow future battery systems to store electricity under NCC 2022 requirements;
- Water-efficient and drought-tolerant landscaping;
- Rainwater collection for landscape irrigation and car wash bay;
- Install hot water recirculation system (on-demand) to all apartments;
- Select minimum 4- star water-efficient showerheads;
- Select minimum 5- star water-efficient toilets;
- Select minimum 6-star water-efficient taps;
- Water-efficient dishwasher and clothes washer;
- Incorporate water-sensitive urban design principles;
- Communal veggie gardens provide health, well-being benefits and Social resilience;
- Worm farms and composting facilities to treat organic waste on-site and use for gardens;
- The waste management plan will be prepared to minimise operational and construction waste going to landfills;
- Bicycle parking with racks and lockers to encourage active transport;
- Provisions to allow 100% of the car parking with electric charging equipment under NCC 2022 requirements; and
- Car-share spaces are recommended along Anderson Street.

These features will help significantly reduce the energy and water required by the development from construction and operation. It is recommended that ESD initiatives continue to be developed and implemented during the detailed design stage of the project.

This report has been made based on our best engineering judgment and the experience gained from the past. ESD Scientific recommends that a review to be conducted during the detailed design stage of the project to confirm assessments made within this report.

APPENDIX A

Proposed PV system on roof



Proposed PV
systems on roof

APPENDIX B

ESD Design Principles

7. Communal Open Spaces



Communal open space on ground floor and level 5. Higher than standard solar access for open spaces and façades facing those.

Key

- Site Boundary
- Sunlit Balconies and Living Rooms
- Communal Open Spaces
- Public Green Spaces

8. Deep Soil

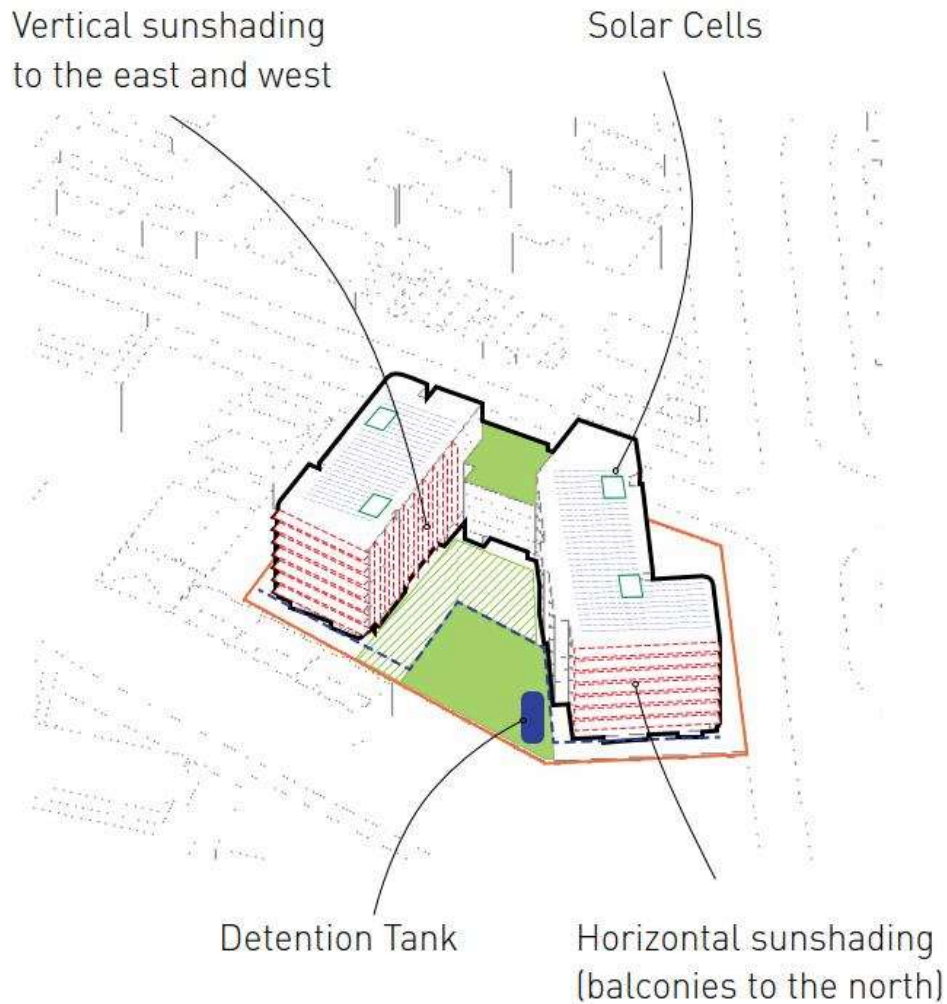


Basement carpark is setback from northern boundary to allow for large deep soil area and tree planting.

Key

- Site Boundary
- - - Basement Line
- /// Basement Below
- Deep Soil

9. ESD Initiatives



ESD Initiative include: Cross ventilated entry lobbies, PV solar system on roof, sunshading corresponding to facade orientation, OSD, WQ measures and RWT.