St Leonards South NSW – Area 1, 2 & 4

ESD DA Report

Prepared for: New Hope Evergreen Pty Ltd

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Revision

Revision	Date	Comment	Prepared By	Approved By
01	1/02/2022	DRAFT Stage 1 DA	HA	LAF
02	15/02/2022	DERP Meeting	HA	LAF
03	18/02/2022	DERP Meeting	HA	LAF
04	22/04/2022	DEP Submission	HA	LAF
05	29/06/2022	DA DRAFT Submission	HA	LAF
06	01/07/2022	DA Submission	HA	LAF
07	19/07/2022	DA Addendum Submission	HA	LAF
08	08/09/2022	DA Submission V2	HA	RD

Contents

1. Executive Summary

This Ecologically Sustainable Development (ESD) report highlights how the proposed buildings of Area 1: 1- 5 Canberra Avenue 4 Marshall Avenue, Area 2: 6-8 Marshall Avenue 2 Holdsworth Avenue, and Area 4: 4-8 Holdsworth Avenue St. Leonards, each part of the greater St Leonards South (SLS) Precinct, achieve high quality living and amenity spaces with excellent thermal performance and sustainable design features.

A focus on passive design principles enables generous glazing elements to amplify a feeling of openness, connection to nature and the outstanding views of this precinct. Solar access and natural ventilation are tuned in combination with façade shading and performance to minimise environmental loads and reliance on active conditioning systems.

Features of the design include:

- High quality daylight access into apartments. Glazing without body tint or coatings is proposed to ensure clear views and colour rendering, creating high quality residential amenity
- Double glazed windows, shaded by deep overhangs and paired with solid spandrels and opaque wall components ensure a high degree of thermal comfort and energy efficiency achieving **NatHERS 6.8 Star** average for Tower 1.
- The majority of apartments are oriented toward the views to east and south, while western exposure is reduced through configuring vertical circulation and unconditioned spaces on the western façade.
- Risks of a warming climate are mitigated through addressing a majority of apartments onto the *Green Spine* where a microclimate tempered by mature trees and shading of buildings remains passively cool. Additional mature trees have been retained along Holdsworth Ave which provide necessary shade from western solar exposure. High albedo, light-coloured roofing materials further reduce the Urban Heat Island effect. The majority of apartments are exposed to higher heating loads than cooling loads under NatHERS assessment, which suggests they will perform even better in a warming climate.
- Water sensitive design elements include water saving fixtures, a 30kL rainwater tank used for irrigation and basement washdown, and low irrigation landscaping with predominantly native, drought tolerant species. A dry riverbed concept for site water retention and filtration has been developed as a Green Spine feature.
- All car parking spaces are available for EV charging with conduit provided for ‘crimp ready’ connection to privately installed chargers. An embedded network manages the peak demand of concurrent car charging should a high proportion of residents take up charging allocations.
- Roofs spaces are prioritized for high quality private and communal amenity space for occupants and enable equitable access to views. As such, provision of a significant solar photovoltaic system is limited. Renewable electricity is therefore to be procured in a Power Purchase Agreement for a fixed term.
- Overall, significant sustainability measures have been incorporated into the project with consideration to the larger SLS masterplan strategy. These measures are described in further detail within the entailing report.

2. Sustainability in Design

This report documents incorporated design responses to; Lane Cove Council Development Control Plan (DCP) – 2010, St Leonards South – Precinct specific Development Control Plan (DCP) – 2020, and the Design Excellence Review Panel (DERP) minutes – Meeting 1 (Dec 2021) & Meeting 2 (May 2022), refer to **APPENDIX A: Sustainability Drivers** for further detail. The headline sustainability responses are further detailed under the following design categories:

2.1 Residential Amenity – Solar access, Ventilation and Wind

2.2 Energy

2.3 Water

2.4 Low Carbon Transport & Pedestrian Amenity

2.5 Low Carbon Structure

2.1 Residential Amenity – Solar access, Ventilation and Wind

2.1.1 **SOLAR ACCESS**

2.1.1.1 Building orientation, eave and façade design, ratio of glazing to solid and material selection have been integrated with the intent to achieve ample natural daylight to dwelling and amenity spaces. Thermal comfort has been maintained in exceedance of NatHERS thermal comfort provisions, ensuring real world comfort performance is achievable both today and in future climate scenarios.

2.1.1.2 Vertical shading elements have been incorporated to north and west facing facades that experience higher degrees of solar radiation in summer, improving passive solar performance

2.1.1.3 High VLT glazing without tints or films has been selected for use throughout the development, enabling high levels of daylight, and clear glazing connectivity to the outdoor tree canopies and harbor views.

2.1.1.4 Building form has been configured to turn apartments away from facades exposed to higher levels of sunlight, including articulation of the western façade with balconies opaque surfaces. The location of riser cores and lift lobbies against the western façade provides natural daylight and connection to the outdoors in circulation spaces, whilst also reducing the proportion of conditioned area on this exposed façade.

2.1.1.5 Solar access and overshadowing modelling have been undertaken to determine adequate annual solar exposure to primary living areas, private open spaces, and communal open areas, refer to Architectural solar access calculation drawings.

2.1.1.6 Green spine between buildings as set out in the St Leonards South DCP predefines available daylight. Design response orients toward the green spine and available natural light and solar access.

2.1.1.7 Tower floorplate configuration reduces the number of single aspect apartments, increasing the number of corner apartments. Corner apartments on the west ensure living rooms have direct access to the north or south façade, enabling useful daylight and views even if blinds are drawn on hot afternoons. In east-facing single aspect apartments, bedrooms are set back from the balconies rather than the living rooms, this prioritizes daylight to the primary living area.

2.1.1.8 Building cores located on western façade reduce overall solar exposure to conditioned areas and minimize overheating and energy consumption, shown below in figure 1.

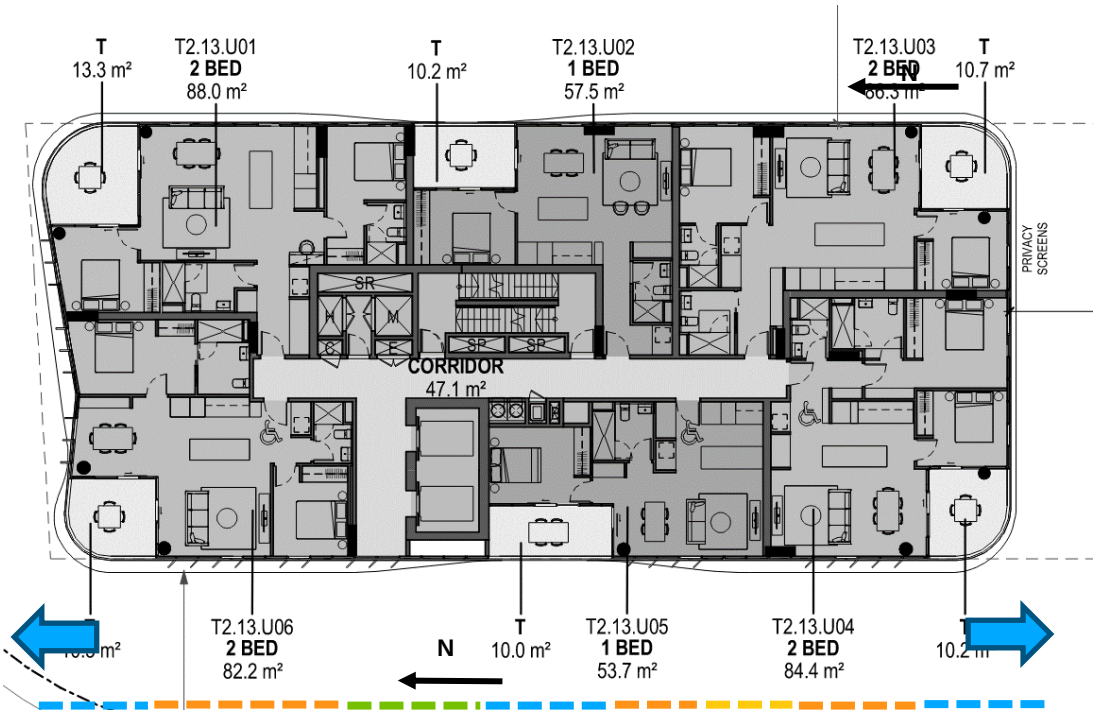

Figure 1 – Building 2 Western Façade. Rothelowman Architectural Drawing

(Rev B. DA Submission 08/09/22)

No western facades are untreated for solar protection. Riser core, lift lobbies and balconies reduce the overall conditioned area exposed to the western façade. Living spaces provided dual orientation to ensure access to daylight and fresh air during hotter afternoons.

- Deep Shade
- Vertical shaded Glazing
- Opaque wall
- Non-Conditioned Zone

2.1.2 VENTILATION

2.1.2.1 A high proportion of cross ventilated apartments are included across the development, these include cross-through, cross-over, and corner typologies. Single aspect apartments in the towers achieve ample ventilation by virtue of the wind pressures at higher elevations, which will drive air changes when windows are open.

2.1.2.2 Operable awning windows and sliding doors to terraces have been included for dwellings to encourage and allow for natural ventilation.

2.1.2.3 Mechanical ventilation energy use requirements are reduced through provision of natural ventilation amenity.

2.1.2.4 Refer to Architectural cross Ventilation calculation diagrams

2.1.1 THERMAL COMFORT

Thermal comfort levels are assessed via a simulation method in accordance with the NatHERS House Energy Rating protocol. The table below outlines the maximum NatHERS thermal comfort threshold across the St Leonards South development.

Climate Zone	BASIX Maximum Average Heating Load (MJ/m2/annum)	BASIX Maximum Average Cooling Load (MJ/m2/annum)
56 (East Sydney)	**45.4**	**29.5**

All apartments across the development have exceeded the benchmarks outlined through BASIX assessment, refer to the BASIX report submitted as part of this DA for further detail. With specific concern for increasing global temperatures anticipated as a result of climate change, a large majority of dwellings across the development achieve significantly lower cooling loads than the allowable maximum average when modelled under current conditions. Thus, through the sustainable design strategies outlined, the dwellings of SLS are in an advantageous situation over coming years and are able to preserve the stated level of comfortable living.

2.1.2 WIND

2.1.2.1 Passive wind comfort design features have been incorporated to increase habitability of private open space and communal open spaces, as well as public pedestrian thoroughfares, refer to Wind Comfort Report.

2.2 Energy

2.2.1 NatHERS ENERGY PERFORMANCE

Building	Compliance Minimum NatHERS Star Rating	Average NatHERS Star Rating	Site Average
Building 1 (Area 1)	**4.1**	**6.8**	**6.3**
Building 2 (Area 2)	**4.1**	**6.2**	
Building 4 (Area 4)	**4.1**	**6.1**	

A minimum of **6-star average NatHERS rating** is to be met across the development. Energy efficiency initiatives proposed for inclusion within the development are outlined below:

2.2.2 PASSIVE DESIGN STRATEGIES

2.2.2.1 Meet high standards of thermal comfort and energy efficiency while maintaining access to views and sun to living areas.

Window to wall ratio, horizontal and vertical shading, and apartment layout configurations have been assessed through numerous workshops which have balanced NatHERS performance with architectural priorities and intent in order to provide the optimal arrangement under design circumstances and specifications.

Solar shading strategies have been proposed to facades with the highest solar loads, using annual solar irradiance calculations and refined shading design.

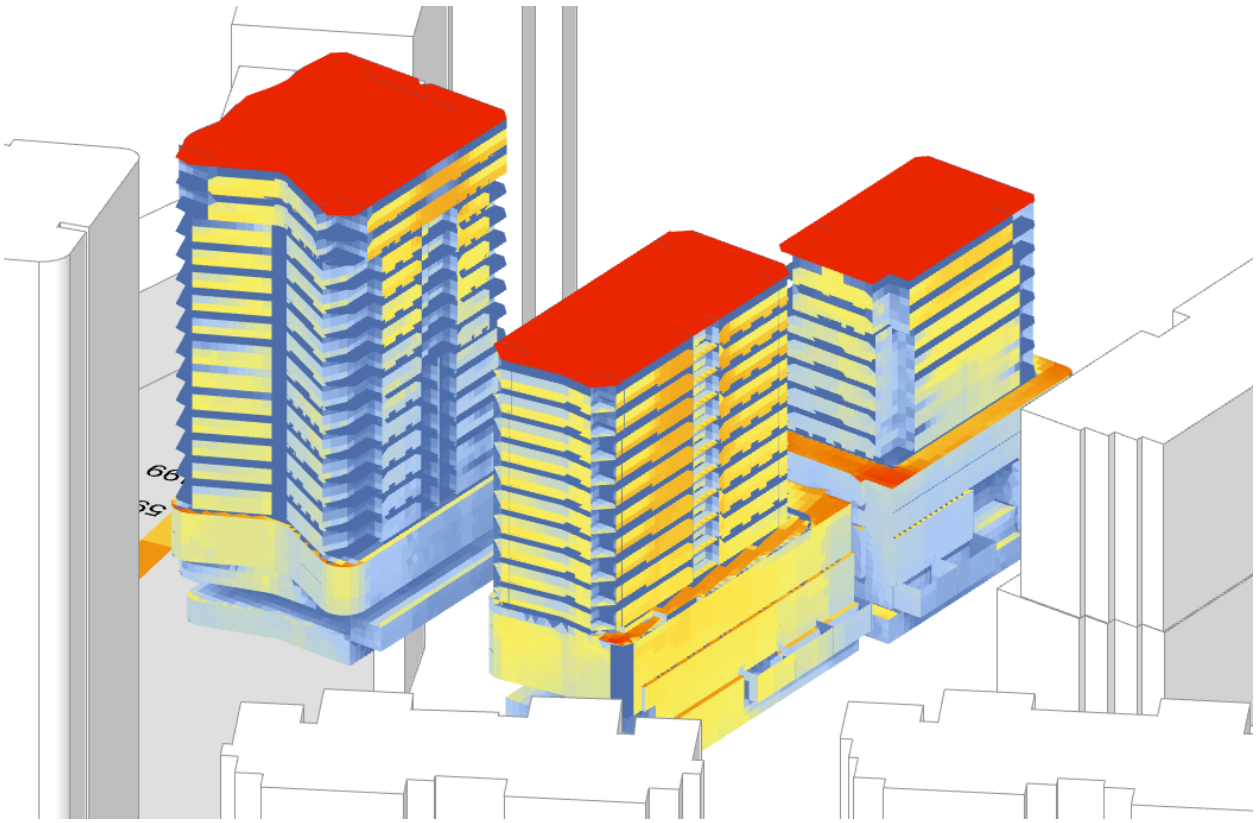

Figure 2 – Solar Irradiance Mapping

The above is a representation of solar gains on facades during hours where cooling is likely to be required. Solar gains during winter, or beneficial radiation, has been subtracted from this mapping.

2.2.2.2 High performance clear double glazing, used in tandem with external shading devices, has been incorporated to minimise additional heating and cooling loads on internal spaces and in turn – substantially reduce the energy consumption of mechanical HVAC systems.

2.2.2.3 Double insulation to floors that are exposed to open air below (R-value 4.0 to Level 3 soffits), and high levels of insulation to external walls and roofs for thermal efficiency and mitigation of heat loss in winter.

2.2.2.4 Horizontal shading elements reduce solar gains in summer whilst permitting warming winter sun.

2.2.2.5 Exposed thermal mass passively moderates heat and cool in internal spaces.

2.2.3 ACTIVE DESIGN STRATEGIES

2.2.3.1 Development wide electrification of air-conditioning systems – all-electric heating and cooling air conditioning systems have been incorporated.

2.2.3.2 Embedded network and metering system, proprietary system procurement with energy retailer underway.

2.2.3.3 New Hope is offering an option of induction cooktops OR gas hobs for tenants, and will install based on market uptake. This will be a valuable market research activity for New Hope and the broader residential market.

2.2.3.4 The developer anticipates negotiation with an Energy Retailer to:

- Lock in 100% Green Electricity supply at completion of the project for initial 3-year term with owners corporation
- Lock in 100% Carbon Offset Gas supply at completion of project for initial 3-year term with owners corporation (for gas cooking and hot water).

2.2.3.5 High energy efficiency whitegoods

2.2.3.6 Centralized, energy efficient VRV HVAC system serving each building

2.2.3.7 Operable windows supplementing occupant control.

2.2.3.8 The proposal provides for Electric Vehicle (EV) charging by integrating charging 'ready' infrastructure, allowing homeowners to opt in for EV charging parking spaces. Conduit access provided to all car spaces for future terminal installation to the maximum extent allowable under the substation capacity. Embedded network will enable management of peak charging demands should high uptake of EV charging eventuate.

2.2.4 LIGHTING

2.2.4.1 LED lights throughout the development, which have longer lifespans, consume less energy and produce a higher quality light than fluorescent or halogen light technologies, reducing overall building energy demand.

2.2.4.2 Lighting energy saving controls including timers, zone switching and occupancy sensors for common areas.

2.2.5 HEATING, VENTILATION & AIR CONDITIONING SYSTEMS

2.2.5.1 High energy performance HVAC systems are designed. At the current stage of the project, centralized Variable Refrigerant Volume (VRV) units which are air cooled with a heating and cooling COP within 3.5-5.5 has been selected. Refer to mechanical design documentation.

2.2.5.2 Common Area mechanical systems to include energy efficiency measures such as variable speed fan drives, timeclock or BMS control and Carbon Monoxide (CO) monitoring systems to basements to improve energy efficiency and ensure ventilation systems only run when required.

2.2.6 RENEWABLE ENERGY

2.2.6.1 Available roof space has been assigned to high quality resident amenity or mechanical plant spatial allocations. As a large portion of the rooftop space is habitable in accordance with St Leonards South planning priorities, large scale solar PV production potential of the site is limited. Renewable electricity is to be procured in a Power Purchase Agreement for a fixed term, see clause 3.2.4.3 above.

2.2.7 LIFTS

2.2.7.1 Lift systems incorporate regenerative drive and VVVF (Variable Voltage Variable Frequency) motors.

2.3 Water

In conjunction with demonstrating compliance with the project's BASIX Water targets, the following water saving strategies will be included or developed/investigated to reduce potable water consumption.

2.3.1 EFFICIENT FITTINGS, FIXTURES & APPLIANCES

Sanitary fixtures and fittings as well as water appliances where applicable across the development will be high performance to meet the development's prescribed BASIX water targets. Based on the Water Efficiency Labelling and Standards (WELS) scheme, the specifications outlined below are recommended:

Fixture	Specification	WELS Rating
Bathroom & Kitchen Taps	4.5L/min	6 Star WELS
Toilets	3L/half flush; 4.5L/full flush	5 Star WELS
Showers	>6 but <=7.5L/min	4-Star WELS
Dishwasher	Approx. 1L/place setting	4-Star WELS

2.3.2 RAINWATER

A 30kL rainwater tank has been selected to store non-potable water collected across the development to be used for on-site landscape irrigation, car washing and wash-down. This volume has been determined to offer the highest reliability and benefit for the intended end uses.

2.3.1 WATER SENSITIVE URBAN DESIGN

Landscape based stormwater management strategies including a dry riverbed concept for site water retention and filtration has been developed as a Green Spine feature to mitigate peak flows during high rainfall events. In addition, low irrigation landscaping with predominantly native, drought tolerant species are proposed as per the landscaping strategy to improve irrigation efficiency. An on-site detention tank supplements green infrastructure capacity.

2.3.2 METERING

All apartments and common use points across the development will incorporate water metering. This will assist in identifying system inefficiencies such as leaks and allow them to be detected prior to the significant loss of water.

2.4 Low Carbon Transport and Pedestrian Amenity

The proposed development will emphasise the benefits of walkability for residents. The site is connected with public transport network through St Leonards Bus and Train Station. Orientation of communal spaces toward the pedestrian link (green spine) to the public transport network promotes use, and associated reduction in carbon emissions from reduced personal vehicle transport.

2.4.1 PEDESTRIAN & CYCLE NETWORK

The St Leonards South development encourages a walkable community through orienting communal open spaces and apartment private open spaces toward the green spine, providing passive surveillance and activation of the key pedestrian links within the St Leonards South precinct masterplan.

Figure 2 – Access networks for St Leonards South Precinct. Source; DCP LCC Part C – Residential localities. Locality 8 – St Leonards South Precinct

2.4.2 BICYCLE PARKING

Secure bicycle spaces are provided for building occupants and visitors. Residential and visitor bike parking provisions are exceeded; statutory requirements are as follows allow 1 space per 4 units for residents and 1 space per 10 units for visitors. The development includes a total of 232 units and provides 90 bicycle parking spaces, exceeding requirements.

2.5 Low Carbon Structure

The development will integrate reclaimed or recycled materials, such as concrete aggregates and supplementary cementitious materials (e.g., fly ash, ground granulated blast furnace slag, amorphous silica, etc.).

Subject to structural engineering requirements, the project team has specified use of recycled material in structural concrete of 20% replacement where applicable. Portland cement is particularly carbon-intensive and reducing its quantity in the mix reduces the embodied energy/carbon of the project.

3. Conclusion

Ecologically Sustainable Design is a driving consideration in the development of the proposed St Leonards South, Areas 1, 2 & 4, residential development located at 4-8 Marshall Avenue, 1-5 Canberra Avenue and 2-8 Holdsworth Avenue, St Leonards, NSW, 2065. The proposal incorporates ESD initiatives in both design and operation aimed at ensuring the principles of sustainable development are both demonstrated and achieved in accordance with key project sustainability drivers:

- Lane Cove Council Development Control Plan (DCP) – 2010
- St Leonards South – Precinct specific Development Control Plan (DCP) – 2020
- Design Excellence Review Panel (DERP) minutes – Pre DA: Meeting 1 (Dec 2022) & Meeting 2 (May 2022)

4. APPENDIX A: Sustainability Drivers

This appendix outlines the proposed response to the following sustainability specific planning considerations:

Regulatory Frameworks:

- Lane Cove Council Development Control Plan (DCP) – 2010
- St Leonards South – Precinct specific Development Control Plan (DCP) – 2020
- Design Excellence Panel:
- Design Excellence Review Panel (DERP) minutes – Pre DA: Meeting 1 (Dec 2021) & Meeting 2 (May 2022)

4.1 Regulatory Frameworks

4.1.1 Lane Cove Council Development Control Plan (DCP) – 2010

Sections of the Lane Cove Council DCP with relevance to ESD design have been consolidated as follows, additionally how each item has been addressed within the design has been included:

PART B - GENERAL CONTROLS		
Section B.6 - Environmental Management		**Response In Design** *(Bold design response codes are clickable links)*
6.1 Sunlight to Public Spaces	**Objectives:** The objectives for sunlight to public spaces are: a) To create public spaces with high amenity that encourages visitors to linger. b) To ensure that there is adequate sun access to publicly accessible spaces during winter at times of the day when the space is likely to have its highest use by visitors and residents. c) To provide sufficient sunlight access for the growth of mature landscaping.	
	Provisions 6.1.1: New development must allow for a minimum of 2 hours of solar access to at least 50% of new and existing public open areas or plazas between the hours of 11am and 2pm on 21st June.	Refer to architectural solar access calculation drawings.
6.2 Wind standards for St Leonards	**Objectives:** The objectives for wind standards are: a) To ensure that new developments satisfy nominated wind standards and maintain comfortable conditions for pedestrians. b) To ensure that the moderate breezes are able to penetrate the streets of the St Leonards centres.	a-b: Refer to Wind Comfort Report.

	Provisions 6.2.1: 13 metres/second along major streets and public places and 16 metres/second in all other streets. A Wind Effects Report is to be submitted with the DA for all buildings within the St Leonards precinct taller than 40m above street level.	Refer to Wind Comfort Report.
6.3 Energy and Water Efficiency for Buildings	**Objectives:** The objectives of this section are to: a) Consider a balance of economic, environmental, cultural and social elements to enhance the quality of life in Lane Cove. b) Ensure that developments are water and energy efficient. c) Reduce the quantity of urban stormwater runoff. d) Ensure reasonable daylight and passive solar access to all development and provide adequate ambient lighting and minimise the need for artificial lighting during daylight hours. e) Provide building users with the ability to adjust the quantity of daylight to suit their needs. f)) Minimise the use of mechanical ventilation particularly air conditioning and maximize the opportunities for natural ventilation including cross ventilation for residential uses. g) Minimise fossil fuel use and greenhouse gas emissions through the promotion of energy efficiency in the design of building envelopes and internal layouts, construction and use of buildings. h) Ensure that materials are sourced from renewable sources and are capable of recycling wherever possible.	b) Dwellings in Tower 1 achieve an average minimum of 6.7-star NatHERS rating and exceed BASIX compliance for water targets (refer to ***2.3.1***) and energy targets (***2.2.1***) c) Refer to ***2.3.1*** d) Refer to ***2.2.2.2***
	Provisions: 6.3.1: Incorporate passive solar design techniques to optimise heat storage within the building in winter and heat transfer in summer.	Incorporated. Refer to ***2.2.2***
	6.3.2: Improve the control of mechanical heating and cooling by designing systems to allow individual control of different rooms, zones or tenancies combined with the ability to open windows and facades for natural ventilation when the climatic conditions allow.	Incorporated. Refer to ***2.2.3.7***
	6.3.3: Orientation of building and facade design of all developments should capture and manage solar access, natural ventilation and breezes into the building.	Incorporated. Refer to Architectural solar access calculations and natural ventilation compliance diagrams.
	6.3.4: Provide external sun shading - vertical shading for east and west windows and horizontal sun shading for north facing windows.	Incorporated. Refer to Architectural solar access calculations
	6.3.5: Use high performance glass with minimal glare impacts where possible	Incorporated. Refer to ***2.2.2.2***

	6.3.6: The use of light wells as the primary source of daylight is prohibited for habitable rooms. Where they are proposed for other rooms or spaces they are to have a minimum dimension of at least 6m by 12m.	Refer to Architectural solar access calculations.
	6.3.7: All developments are to capture and reuse rainwater for irrigation of landscape areas and for apartments, townhouses, villas and mixed use or commercial development also for toilet flushing and washing machines.	Incorporated. Refer to *2.3.2*
PART C - RESIDENTIAL DEVELOPMENT		
Section 3 - Residential Flat Buildings		**Response In Design** *(Bold design response codes are clickable links)*
3.14 Solar Access	**Objectives:** The objective for solar access is to provide reasonable solar access to habitable rooms and recreational areas of new and existing developments.	
	Provisions: These provisions apply to proposed developments and any residential development beyond the site. 3.14.1: Habitable rooms in at least 70 percent of dwellings in high density residential developments, should receive a minimum of three hours direct sunlight between 9 am and 3 pm on 21st June, in total between any portions of those rooms. A reasonable proportion of both the common and private open space in those sites is also to receive sunlight during that period, according to the circumstances of the sites.	Refer to architectural solar access calculation drawings
	3.14.2: The number of single-aspect dwellings with a southerly aspect (SW-SE) should be limited to a maximum of 10 percent of the total dwellings within a high-density residential development. Developments varying from the minimum standard due to site constraints and orientation must demonstrate how energy efficiency is addressed.	Refer to architectural cross ventilation and orientation diagram drawings
	3.14.3: Where adjacent dwellings and their open space already receive less than the standard hours of sun, new development should seek to maintain this solar access where practicable.	Refer to architectural solar access calculation drawings
	3.14.4: Council may accept a reduction in solar access for the subject site and adjacent development if the topography and lot orientation (as distinct from a preferred design) are such that the standard is considered unreasonable. Shadow diagrams are required with the development application to show solar access and the extent of overshadowing	Refer to architectural solar access calculation reporting

3.15 Natural Ventilation	**Objectives:** The objectives for natural ventilation are: a) To ensure that dwellings are designed to provide all habitable rooms with direct access to fresh air and to assist in promoting thermal comfort for occupants. b) To provide natural ventilation in non-habitable rooms, where possible. c) To reduce energy consumption by minimising the use of mechanical ventilation, particularly air conditioning.	a-c: refer to ***2.2.2***
	Provisions 3.15.1: Sixty percent (60%) of dwellings should be naturally cross ventilated.	Refer to Architectural Cross Ventilation calculation diagrams
	3.15.2: Ventilation provided to one end of a dwelling via windows onto an open access corridor does not satisfy this requirement due to privacy and acoustics' impacts.	Refer to Architectural Cross Ventilation calculation diagrams
	3.15.3: Twenty five percent (25%) of kitchens within a development should have access to natural ventilation.	Refer to Architectural Cross Ventilation calculation diagrams
PART C - RESIDENTIAL LOCALITIES		
Locality 8 - St Leonards South Precinct		**Response In Design** *(Bold design response codes are clickable links)*
3. Precinct Overall Objectives	**Objectives:** a) To create a highly liveable transit-orientated residential precinct that integrates with St Leonards Station and proposed over-rail public plaza that encourages community interaction, walking, cycling and use of public transport. b) To ensure that all new development will achieve design excellence, as well as providing suitable transition and interfaces to adjoining zones and open space. c) To provide a variety of housing (including affordable housing) that is sustainable, provides housing choice and that meet the needs of residents including access to community facilities. d) To minimise traffic impacts within the precinct and to and from Pacific Highway and River Road. e) To facilitate a new, accessible network for pedestrians, cyclists and families that integrate and connect to functional community infrastructure and open space. f) To create an accessible, well-designed public open space network that provides a variety of recreation spaces (active and passive) and communal open space that is functional and shared by residents. g) To create a Low Carbon Precinct that delivers sustainable and efficient buildings that provide energy, water and waste efficiency.	a) Refer to 2.4 c) Refer to Architectural Drawings e) Refer to 2.4

7. Built Form	**Objectives:** The relevant objectives for Built Form are to: a) Optimise solar access to all buildings, public domain and private open space. Solar Access: b) Compliance with ADG solar access requirements. c) Building design must ensure that overshadowing of public (i.e., Newlands Park and Local Park) and private open spaces (Green Spines) is minimised.	a-c: Refer to Architectural solar access and overshadowing assessment.
9. Environmental / Sustainability	**Objectives:** The objectives for Environmental/Sustainability are: a) To reduce the need for mechanical heating and cooling in buildings b) To reduce reliance on fossil fuels c) To minimise greenhouse emissions and environmental impact over the life cycle of development d) To promote renewable energy initiatives	a-d: Refer to 2.2
	Provisions 9.1: Environmental Performance. The design, construction and operations of any new building in this project, including its services and fit outs, must be capable of achieving a minimum 6-star rating under the Nationwide House Energy Rating Scheme (NatHERS) by a suitably qualified person.	Incorporated. Refer to ***2.2.1***
	9.2: Wind Impact. Buildings shall comply Part B Cl 6.2 of Council's Development Control Plan.	Refer to Wind Comfort Report
	9.3: Green Roofs. All developments are encouraged to consider inclusion of a green roof to provide thermal efficiency.	Incorporated. Refer to Architectural plans
	9.4: Green Walls/ Vertical Gardens. All developments are encouraged to consider inclusion of green walls/ vertical gardens.	Refer to Architectural plans
10. Water Management and Conservation	**Objectives:** a) New dwellings are designed to minimise potable water use.	a) WELS rated fixtures and whitegoods are specified, refer to ***2.3.1.*** Rainwater tank for irrigation, refer to ***2.3.2.***
	Provisions 10.1: Potable Water. Minimise potable water use by: Using water efficient appliances, explore rainwater collection and reuse & use drought tolerant plants.	Incorporated. Refer to section ***2.3***
	10.2: Urban Stormwater. Collect, store and treat on site. Maintain maximum Green Spine and other deep soil for percolation. Provide on-site stormwater and infiltration including bio-retention systems such as rain gardens. Buildings shall comply Part B Cl 6.3 of Council's Development	Incorporated. Refer to civil stormwater management report

	Control Plan. All other stormwater management measures are detailed in Council's Development Control Plan Part O (Stormwater Management).	
	10.3: Flood Management. Provide detention tanks desirably under paved areas, driveways, in retaining walls or in basement car parks.	Incorporated. Refer to civil stormwater management report.

4.1.2 St Leonards South – Precinct specific Development Control Plan (DCP) – 2020

8.0 Environmental/ Sustainability

In this section, sustainable design refers to measures and provisions relating to building materials, water conservation (including water sensitive urban design), and energy efficiency.

OBJECTIVES

- To reduce the need for mechanical heating and cooling in buildings,
- To reduce reliance on fossil fuels,
- To minimize greenhouse emissions and environmental impact over the life cycle of development,
- To promote renewable energy initiatives,

	Control	Provision	Notes/Location	Response In Design *(Bold design response codes are clickable links)*
8.1	**Environmental Performance**	- The design, construction and operations of any new building in this precinct, including its services and fit outs, must be capable of achieving **a minimum 6-star rating under** the Nationwide House Energy Rating Scheme (NatHERS) by a suitably qualified person.	Taller buildings should consider providing a centralised integrated air-conditioning system, located within the building plant.	Refer to ***2.2.1***
8.2	**Wind Impact**	- Buildings shall comply Part B Cl 6.2 of Council's Development Control Plan	A Wind effects report relating to all facades, internal and external to the site, is to demonstrate methods to achieve appropriate outcomes for public and private domains, e.g., awnings, baffles, articulation etc.	Refer to Wind Comfort Report.
8.3	**Green Roofs**	- All developments are encouraged to consider inclusion of a green roof to provide thermal efficiency.		Refer to Architectural plans & Landscape plans
8.4	**Green Walls / Vertical**	- All developments are encouraged to consider inclusion of green walls /		Refer to Architectural plans

	Gardens	vertical gardens.		& Landscape plans

8.5 Water Management and Conservation

The Building Sustainability Index (BASIX) ensures that all new dwellings are designed to minimize potable water use and reduce greenhouse gas emissions. To support the requirements of BASIX there are a number of planning and design considerations that are relevant to apartment developments.

	Control	**Provision**	**Notes/Location**	**Response In Design** *(Bold design response codes are clickable links)*
8.5.1	**Potable Water**	Minimize potable water use by; Using water efficient appliances, explore rainwater collection and reuse, and use drought tolerant plants.		Refer to ***2.3***
8.5.2	**Urban Stormwater**	Collect, store, and treat on site. Maintain maximum Green Spine and other deep soil for percolation. Provide on-site stormwater and infiltration including bio-retention systems such as rain gardens. Buildings shall comply Part B Cl 6.3 of Council's Development Control Plan All other stormwater management measures are detailed in Council's Development Control Plan Part O (Stormwater Management).	Stormwater can be collected and stored in combined storage tanks/retaining walls, which will be integrated with the stepped nature of green spines. This water can be used to irrigate garden areas.	- Refer to civil stormwater management report. - Refer to ***2.3.1***
8.5.3	**Flood Management**	Provide detention tanks desirably under paved areas, driveways, in retaining walls or in basement car parks.	See the LMP	Refer to civil stormwater management report.

4.2 Design Excellence Panel

4.2.1 Design Excellence Review Panel (DERP) minutes - Pre DA: Meeting 1 (Dec 2021)

The table below is organized under categories that represent topics raised during the DRP pre-DA meeting. Design responses have been incorporated:

DRP/Council Comment	**Response In Design** *(Bold design response codes are clickable links)*
ENERGY	

1.0	**Net-Zero Carbon Strategy**	Electrification of building heating and cooling has been achieved. Optional electric induction or gas cooktop offered to buyers. Gas domestic hot water. Coordination with building services and energy retailer ongoing to determine feasibility of full electrification – Refer to ***2.2.3.1*** Providing high energy efficiency whitegoods and appliances to dwellings – Refer to ***2.2.3.5*** Prioritizing energy efficient central HVAC – Refer to ***2.2.3.6*** Passive design strategies to reduce building energy loads – Refer to ***2.2.2*** 100% Green Electricity Supply. Refer to ***2.2.3.2*** On-site solar PV generation – Refer to ***2.2.6.1***
1.1	**Electric Vehicle (EV) Charging**	EV charging is ready, crimp into existing circuit - Refer to ***2.2.3.8*** Conduit access provided to all car spaces for future terminal installation - Refer to ***2.2.3.8***
1.2	On-Site **Photovoltaic System**	Onsite solar generation to available clear rooftop spaces, utilising pavilion roofs on T1 – Refer to ***2.2.6.1***
1.3	**Embedded Network**	Proprietary system to manage site energy distribution and peak load management procured through energy retailer – Refer to ***2.2.3.2***
WATER		
2.0	**Rainwater** capture and re-use	30kL rainwater tank will be included for the development - Refer to ***2.3.2***
RESIDENTIAL AMENITY & THERMAL COMFORT		
3.0	Maximise **natural Ventilation**	Floorplate configured to increase cross ventilation opportunity by including a mix of apartment typologies and multi-aspect apartments – Refer to ***2.1.2.1***
3.1	Maximise **daylight** in apartments and provide daylight to circulation areas	High clarity, high visual transmittance glazing proposed without performance coating - Refer to ***2.1.1.5*** Apartment configuration ensures living rooms have been prioritised for direct access to the façade, maximising useful daylight for residential amenity, bedrooms have been located back from balconies - Refer to ***2.1.1.7***
3.2	Design for **Thermal Comfort** in apartments	NatHERS 6 star development-wide average rating achieved, Tower 1 achieving 6.7 Stars - Refer to ***2.1.2.1*** High efficiency building envelope and mechanical systems will provide high levels of indoor thermal comfort - Refer to ***2.2.5.1*** Exposed glazing is moderated in extent and protected by horizontal and vertical external shading to limit solar gains - Refer to ***2.2.2*** Exposed thermal mass in structural walls proposed in occupied living spaces - Refer to ***2.2.2.5***

3.3	**Overheating** in west facing apartments, shading to west facing apartments	External shading device is most pronounced on western facades, including vertical shading elements – Refer to ***2.2.2.4*** Articulation of western facades includes horizontal and vertical external shading, services and vertical transportation cores, and balconies to create self-shading, reducing exposure to overheating of apartments - Refer to ***2.2.2.4***
3.4	**Single sided apartments** not supported for cross ventilation	Apartment layouts reconfigured for improved ventilation options and significant reduction of single aspect dwellings - Refer to ***2.1.2.1***
3.5	**Shading and Ventilation diagrams**	Single aspect apartments are shallow in floorplate depth, enabling effective ventilation - Refer to ***2.1.2.2***
3.6	Use of **too much glazing is** discouraged	Glazing extent is moderate, with solid elements prominent in façade composition. Façade designed to achieve high thermal performance - Refer to ***2.2.2.2***
3.7	**Serrated facades** to northwest and northeast recommended	Self-shading façade geometry developed for northern elevation – Refer to ***2.1.1.1*** Riser cores and non-conditioned spaces including bathrooms located to west façade to reduce exposure to overheating - Refer to ***2.1.1.1***
CONSIDERATION TO CLIMATE CHANGE		
4.0	**Mitigate climate change** and design for changes in climate over the next 50 years	Passive comfort strategies on extreme heat days addressed through external shading and moderated glazing areas - Refer to ***2.2.2*** Building majority electrified with electric central cooling and heating – Refer to ***2.2.3.1*** 100% Green Electricity agreement - Refer to ***2.2.3.2*** Low carbon construction materials including cement reduction technologies will reduce embodied carbon across the development – Refer to ***2.5*** Landscaping to cool ambient temperatures through transpiration and shading, and mitigate urban heat island effect with light coloured surfaces - Refer to Landscaping report Landscape based stormwater management strategies manage peak rainfall events – Refer to ***2.3.2*** Connection to nearby low carbon transit options such as train and bus routes – Refer to ***2.4***

4.2.2 Design Excellence Review Panel (DERP) minutes - Pre DA: Meeting 2 (May 2022)

DEP Comment		**Response In Design**
1.0	The Applicant has not responded to several of the Panels previous comments relating to carbon emissions, sustainable water, climate change resilience and	Carbon Emissions have been substantially reduced through a combination of high-performance building fabric and horizontal and vertical external shading elements, effective natural

	preparedness and caring for Country. The project has not demonstrated how greenhouse gas emissions have been minimized, particularly given the inclusion of fossil gas in the project and has not demonstrated how the future residents are being provided with homes that will be thermally comfortable in the context of rising global temperatures. The ESD Report dated 18th February and the architectural drawings demonstrate only standard practice and minimum compliance rather than design excellence as required within this precinct. Furthermore, whilst the design may satisfy some minimum standards of the DCP it is not considered as meeting higher level DCP's requirements such as being ecological sustainable or minimizing greenhouse gas emissions.	ventilation, efficient lighting and centralised mechanical systems, energy efficient whitegoods and a power purchase agreement for renewable electricity. Water sensitive design elements include water saving fixtures, a 30kL rainwater tank used for irrigation and basement washdown, and low irrigation landscaping with predominantly native, drought tolerant species. New Hope is offering an option of induction cooktops OR gas hobs for tenants and will install based on market uptake. Thermal Comfort is demonstrated through high NatHERS scores across the development, with the highest performance apartments being those that are west facing. These have shallow floorplans and are effectively ventilated. Overall NatHERS results show very low apartments experience high cooling loads. Most apartments in the development have a higher heating demand, which will be mitigated with increasing temperatures as the climate warms. To achieve compliance under the BASIX protocols for NatHERS assessment apartments can comply with as little as **4.1 Star** energy efficiency rating. Under Climate Zone 56 (East Sydney).
2.0	While some issues have been addressed in the Ethos Urban letter and ESD Report, the Panel requests further development of the sustainable design proposal in order to demonstrate design excellence. This includes but is not limited to: - Sustainable water ecosystem and wastewater, expand upon the proposed 30kl rainwater tank which is considered only standard practice - Water/green infrastructure - address drought tolerance and water restriction risk mitigation carbon emissions - Consider full electrification including cooking and domestic hot water - Electric vehicles: more detail required - consider allowance for 1 charger per car space in the future, substation design and locations should reflect the additional future demands of electrification of the development - NatHERS rating for apartments - the proposed 6-star rating is the minimum legislated requirement - consider implementing 7 and 8 stars - Climate risk/water initiatives - address heat events and landscape perishing - PV to roof gardens - report refers to these however cannot be seen on drawings	Sustainable Water: High efficiency fixtures and fittings, RWTs proposed for irrigation and washdown, low irrigation/indigenous species landscaping Water/Green Infrastructure: Indigenous species, low irrigation requirements. Dry riverbed/bioswale concept. Full Electrification: New Hope is offering an option of induction cooktops OR gas hobs for tenants, and will install based on market uptake. Electric Vehicles: All spaces are ready for EV charging with conduit provided for 'crimp ready' connection to private chargers NatHERS: BASIX Protocols regulate minimum requirements as **4.1 Stars**. Climate Risk: Green Spine microclimate with mature trees and shading of buildings remains cool passively. Light coloured roofing materials reduce Urban Heat Island effect. PV to roof Gardens: Roofs are a high-quality communal amenity space for occupants, so are prioritised for this use. PV is allowed for on unoccupied clear roofs, but not at the cost of reducing communal and private residential amenity spaces, or exceeding the height plane. Façade shading: Deep horizontal shading and vertical shading blades are provided to north and west. Shading device is articulated to form a horizontal spandrel on exposed facades, and more solid vertical panels have been incorporated.

	- Facade shading - report refers to these but cannot be seen on drawings, extent of exposed glazing not consistent with ADG or low carbon/energy efficient design - Green Electricity - how will this be delivered and guaranteed as a permanent feature	Exposed facades include lift cores which are unconditioned. Green Electricity: Procured in a Power Purchase Agreement locked in for 3 years.
3.0	The Panel has significant concerns regarding the facade design which relies too heavily on glazed walls and provides little to no solar shading. This effects a number of design review considerations including building massing, neighbourhood character and sustainability but in particular resident amenity. The minor horizontal slab projections will be ineffective in shading the facade particularly to the west. Furthermore, while the expressed design intent is for clear vision glass, in the absence of external shading the reality is likely to be a reliance on performance glass and coatings which may be opaque and dark in colour. This would not be supported by the Panel. The facade proposal is not considered consistent with the ADG Part 4A nor with the design excellence requirements of the precinct. The extensive use of glazing and lack of vertical sun-shading demonstrate a number of concerns including: - undesirable visual reflectivity - undesirable heat reflection to the surrounding streets and buildings exacerbating the urban heat island effect - excessive dark glass which is considered unsuitable in a residential neighbourhood - reduced building energy efficiency and resulting NatHERS ratings - reduced indoor thermal comfort - reduced solar heating benefits in winter and increased heating costs reduced - resident use of balconies and opening of facades for natural ventilation - lower visual light transmittance to the interior and resulting increases in the use of artificial lighting	*Reflectivity:* No performance coat is proposed *Heat reflection:* No performance coat is proposed *Dark glass:* No Performance coat is proposed *Improved building energy efficiency:* **Development Average NatHERS greater than 6 Star achieved.** *Improved indoor thermal comfort*: **Development Average NatHERS greater than 6 Star achieved.** *Solar heating benefits in winter:* No Performance coat is proposed, horizontal shades are best suited to allow low winter sun and prohibit high summer sun angles. *Passive shading devices*: Introduced vertical shading elements, in addition to the deep horizontal elements. All façades across the development have undergone extensive testing of NatHERS performance with respect to daylight and views under proposed shading strategies. *Opening of facades for natural ventilation*: Increased openings indicated in NatHERS modelling *VLT:* No performance coat is proposed, glazing ratio to remain generous enough to ensure high levels of daylight and openness to capture district and harbour views