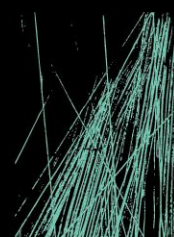


ESD SSDA REPORT

**NORTHSIDE WEST STAGE 2
WENTWORTHVILLE NSW 2145**

ESD SERVICES



JHA

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DOCUMENT CONTROL SHEET

Project Number	210190
Project Name	Northside West Stage 2, Wentworthville NSW 2145
Description	Ecologically Sustainable Design (ESD) SSDA Report
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Revision History

Issued To	Revision and Date					
Nick Weeks Erilyan	REV	Draft	A	B		
	DATE	04/06/2021	2/11/2021	15/11/2021		
	REV					
	DATE					
	REV					
	DATE					

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EXECUTIVE SUMMARY

This report has been prepared by JHA to identify and summarise the Ecologically Sustainable Design (ESD) initiatives that have been considered in the design of the proposed Stage 2 development of Northside West located at 23-27 Lytton St, Wentworthville NSW 2145.

This report demonstrates compliance with the Secretary's Environmental Assessment Requirements (SEARs) that apply to the project and has been prepared to accompany a State Significant Development (SSD) application to the NSW Department of Planning, Industry and Environment (DPIE). This report should be read in conjunction with the architectural design drawings and other consultant design reports submitted as part of the application.

The ESD objectives of this project is to encourage a balanced approach to designing new facilities for the project; to be resource-efficient, cost-effective in construction and operation; and to deliver enhanced sustainability benefits with respect to impacts on the environment and on the health and well-being of patients, staff, and visitors whilst providing the best possible facilities for a constructive environment.

The proposed key ESD commitments for the development are listed below:

- Appropriate insulation and glazing selection
- Energy-efficient air-conditioning systems with suitable control strategy
- Energy-efficient lighting systems with suitable control strategy
- Efficient water fixtures
- Use of more sustainable and healthier building materials
- Waste management strategy to increase the reuse and/or recycling of waste during construction and operation of the building

1 INTRODUCTION

JHA has been engaged to advise suitable Ecologically Sustainable Design (ESD) initiatives for the proposed Stage 2 development of Northside West located at 23-27 Lytton St, Wentworthville NSW 2145, in accordance with the ESD requirements as per the SEARS for this development.

The proposed project is committed to appropriately responding to the ESD requirements as per section 6 of the Planning Secretary's Environmental Assessment Requirements (SEARs) issued on the 13 May 2021.

1.1 PROJECT DESCRIPTION

The proposed Stage 2 extension of the Northside West Clinic will be constructed to the south and west of the existing Clinic. The proposed Stage 2 development of Northside West will entail a three-storey extension comprising of:

- Inpatient units;
- Consulting suites;
- Associated car parking; and
- Landscaping.

1.1.1 SITE LOCATION

The site is situated on the western side of Lytton Street with the existing clinic to the north, a southern boundary to a recreation reserve and a western boundary that adjoins an open space corridor. It is located within Cumberland Council LGA, approx. 600m SE of Wentworthville railway station and approximately 29 kilometres west of the Sydney CBD.

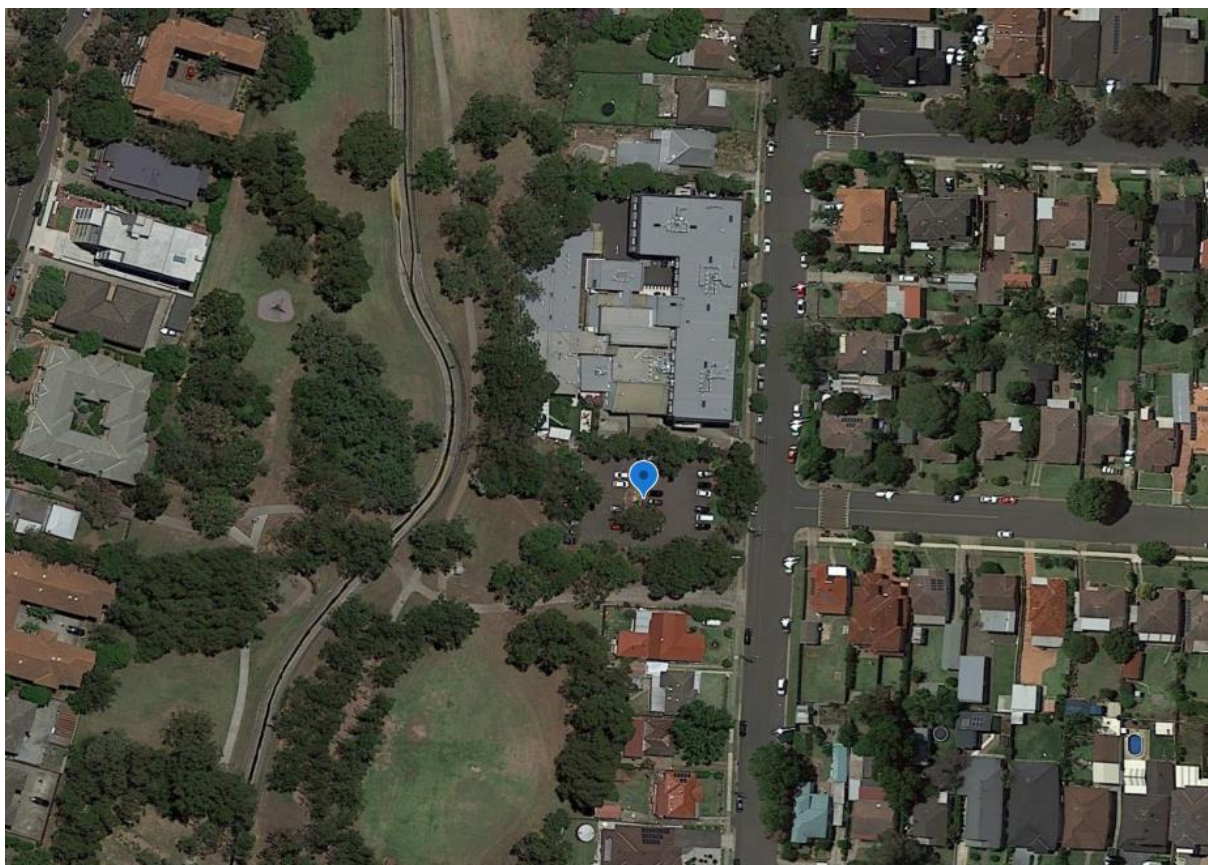


Figure 1 – Aerial photo of site

1.2 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

The SEARs for the development, issued on 13 May 2021, sets out the requirements for the preparation of the SSDA. This report acknowledges the SEARs prepared by the Secretary and notes the followings in Section 6 of the document:

6. Ecologically Sustainable Development (ESD)

- *Identify:*
 - *how ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation) would be incorporated in the design and ongoing operation phases of the development.*
 - *proposed measures to minimise consumption of resources, water (including water sensitive urban design) and energy.*
 - *how the future development would be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy.*
- *Provide:*
 - *an assessment against an accredited ESD rating system or an equivalent program of ESD performance. This should include a minimum rating scheme target level.*
 - *a statement regarding how the design of the development is responsive to the NARcliM projected impacts of climate change.*
 - *an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.*

Relevant policies and Guidelines:

- *NSW and ACT Government Regional Climate Modelling (NARcliM) climate change projections.*

In accordance with the above SEARS requirements, the development will implement a holistic and integrated approach to ESD, maximising passive opportunities with the selective application of modern technology where appropriate. The items listed above of the SEARS requirements are addressed in sections 2, 3, 4, 5, 6 and Appendices of this report.

2 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The principles as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 have been incorporated into the design and on-going operation phases of the development as follows:

2.1 THE PRECAUTIONARY PRINCIPLE

Namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

- (i) Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and;
- (ii) An assessment of the risk-weighted consequences of various options.

PROJECT RESPONSE:

This development is being designed in accordance with a wide range of ESD goals that pertain to the design, construction and operational stages. The development team will ensure that the building minimises the impact on the environment in the areas of energy, water and materials. The design will incorporate with external high performance glazing and shading devices, together with energy efficiency favoured passive design features to minimise severe or irreversible environmental damages.

Increasing resilience to natural hazards have been considered in the development. In regards to the NSW and ACT Government Regional Climate Modelling (NARClIM) climate change projections, details of this assessment is addressed in Section 6 of this report, Climate Response Statement.

2.2 INTER-GENERATIONAL EQUITY

Namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

PROJECT RESPONSE:

This development will not cause any significant impact on the health, diversity and productivity of the environment and will provide a community benefit in the form of increased access to health services and increased employment capacity. The project will contribute positively to the community environment and add architectural interest to the area.

Refer to in Section 6 of this report, Climate Response Statement, for the details of climate risks identified for this project and the relative responses, actions and responsibilities for high and extreme risks identified.

2.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

Namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.

PROJECT RESPONSE:

The assessment find that the current site is an existing health services facility. The proposed development will not impact significant, threatened or endangered species based on review of the Biodiversity Values Map.

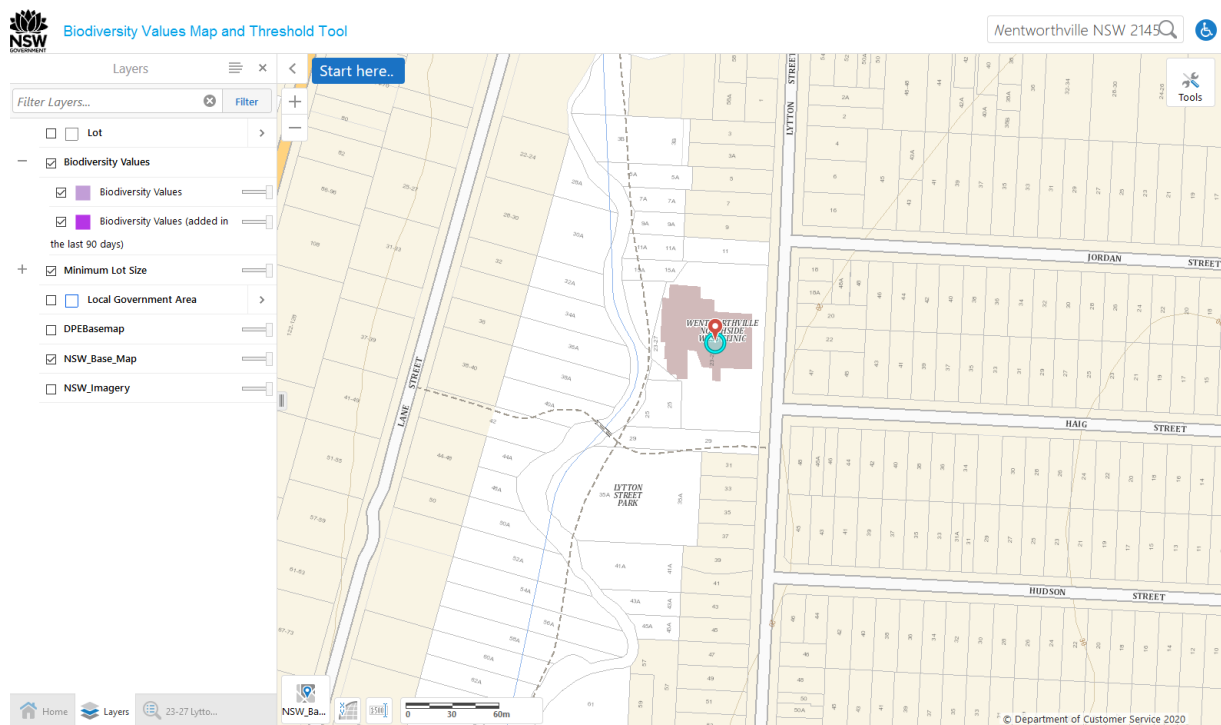


Figure 2 – Biodiversity Values Map of site

2.4 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

Namely, that environmental factors should be included in the valuation of assets and services, such as:

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

PROJECT RESPONSE:

The project team has self-assessed the project against the Green Star Design & As-Built v1.3 Rating System. Whole of Life considerations including running costs, long-term maintenance, quality, life-span, future improvement, value of money and sustainability, will be used to inform the design of the development. A Waste management plan will be implemented to cover the construction and demolition waste and operational waste.

3 SUSTAINABLE DESIGN FRAMEWORKS

The sustainable design framework for this development aims to incorporate the best practice ESD initiatives for new healthcare buildings to this development. The ESD initiatives and targets proposed for this project have been compiled based on the following regulatory instruments and design benchmarking tools:

- National Construction Code (NCC) Section J Energy Efficiency
- Green Star Design and As-Built tool v1.3

3.1 NCC 2019 SECTION J ENERGY EFFICIENCY

The objective of NCC Section J is to reduce greenhouse gas emissions in the built environment. The current version of construction code is NCC 2019, which became mandatory on 1 May 2020, is significantly more stringent than the previous version of NCC and as such will deliver more energy efficient buildings. Section J comprehensively covers all major factors that will impact a building energy usage, including building fabric, building sealing, air-conditioning & ventilations systems, artificial lighting & power, heated water supply & swimming pool plant and facilities for energy monitoring. For the proposed development, Section J is applicable to the Class 5 admin areas, Class 6 café & Class 9a patient care areas (treatment/ward).

3.2 GREEN STAR

Green Star is a voluntary, industry recognised and holistic sustainability rating tool for benchmarking developments against best practice in sustainable design. The most applicable version of Green Star for the proposed project is the Design & As-built tool (v1.3). The project team is committed to applying the Green Star framework to ensure a high level of sustainability has been embedded into the project. While formal Green Star certification is not being pursued, the proposed project is benchmarked to a 4 star Green Star rating, signifying industry best practice.

4 PROPOSED ESD INITIATIVES

4.1 ENERGY EFFICIENCY

4.1.1 BUILDING ENVELOPE

Intelligent design and material selection will help ensure that thermal comfort is not entirely achieved by mechanical means. Passive design initiatives such as performance glazing, shading devices and the use of insulation will reduce demand on the mechanical air conditioning systems resulting in a reduction of energy consumption and greenhouse gas emissions.

4.1.1.1 BUILDING FABRIC

The preliminary minimum performance requirements obtained under Section J Deem-to-Satisfy provision, coupled with allowance for Green Star compliance for the development (Class 9a) at the proposed location (Climate Zone 6) as per the NCC 2019 Section J – Energy Efficiency are:

Building Elements	Indicative NCC 2019 Requirements
Roof/Ceiling	Total R-Value of 3.7 (Downwards, Solar absorptance of the upper surface of a roof must be not more than 0.40)
External Envelope Walls	Total R-Value of 3.1 for Class 9a ward areas, Total R-Value of 1.6 for the rest of the building
Internal Envelope Walls	Total R-Value of 3.1 for Class 9a ward areas, Total R-Value of 1.6 for the rest of the building
Envelope Floors	Total R-Value of 2.2 (Downwards)

Note: The impact of thermal bridging must be considered within total R-value calculation under NCC2019.

This will necessitate the use of insulation in the walls, floor and roof for the building fabrics. Insulation reduces heat flow and consequent heat loss in winter and heat gain in summer. This minimises the heating and cooling load demand on the air conditioning systems. Light coloured roof material with a low solar absorptance (SA) is recommended to be used to isolate more sunlight and reduce summer heat gain. It also has an effect of reducing elevated localised temperatures (the heat island effect) and potentially can improve the efficiency of solar PV panels (if any) as they perform more efficiently in reduced temperatures.

4.1.1.2 GLAZING

Glazing is a major source of unwanted heat gain in the summer and can cause significant heat loss in the winter due to its low insulation performance. It is thus recommended that windows will be high performance glazing systems. Performance glazing substantially reduces heat transmission. This particularly reduces heat loss in winter; therefore, internal heat gain from equipment, lighting and people are better contained. Also, performance glazing absorbs the infrared portion of sunlight and reduces the amount of heat transferred into the conditioned space. This will correspond to a reduction of both heating and cooling loads.

The building will comply with NCC 2019 Section J Energy Efficiency. The detailed assessment will be carried out in the detailed design stage and a Section J statement of compliance will be provided for Construction Certificate. The indicative values below are based on previous similar scale projects within the same climate zone.

Building Elements	Window Assembly (Glass & Frame)		Description
	Total U-value	Total SHGC	
Envelope Glazing	1.5-3.5	0.20-0.50	Double Glazed Performance Glazing (Subject to detailed design)

4.1.2 EXTERNAL SHADING AND DAYLIGHTING

Solar access can enhance indoor environmental quality through access to daylighting and reduce lighting energy consumption. However, excessive solar access and hence, direct solar radiation heat can increase HVAC energy demand and can also cause thermal discomfort. Passive solar heating principle which aims to prevent solar heat gain in the summer and harvest it in the winter for free source of heating, and Passive cooling principle which prevents heat from entering the building during the summer months, are strategies which can conveniently take advantage of the site specific solar access for optimised indoor environmental quality and reduction of HVAC energy demand through use of tailored shadings.

The proposed buildings is to make the best use of the sun by using external shading devices where appropriate to reduce summer solar gains whilst allowing the winter sun to enter the building for passive heating.

These passive design features allow for enriched daylighting and greater access to external views for occupants. Additional daylighting reduces the reliance on artificial light and benefits alertness, mood and productivity. External views provide a connection to nature and the building and also help to create an environment encouraging constructive experience.

4.1.3 HEATING, COOLING AND VENTILATION SYSTEMS

The air-conditioning and ventilation systems shall be designed to comply or exceed the minimum requirements of NCC 2019 Section J5 as well as driven by Green Star requirement. High efficiency equipment for the HVAC system will be selected to assist with energy conservation of the building. The control of air conditioning system shall be designed to minimise energy consumption with features such as an after hour push button and/or motion detector controls.

All bathroom, storage, and general exhaust are to be naturally ventilated where possible, with mechanical ventilation required where necessary and provided with time controls (time switches or run-on timers as appropriate).

Ductwork systems will be designed to reduce system pressure losses to reduce fan motor power. This includes the selection of equipment for reduced coil and fittings drops and being generous with ductwork sizes to reduce friction losses.

A Building Management System is recommended to monitor and control all mechanical services in the building. The system will allow for programming of AC systems (for example time scheduling, and temperature settings), notification on maintenance requirements and system diagnostics.

These initiatives will provide significant savings in energy use.

4.1.4 LIGHTING

Lighting will be designed to comply with or exceed the minimum requirements of NCC 2019 Section J6 as well as driven by Green Star requirement.

The proposed development shall be illuminated predominantly by energy efficient LED fittings and be controlled via automatic control system with timer controls, PIR occupancy sensors and microwave occupancy sensors.

Daylight sensor is recommended to reduce light output or turn off lights when sufficient daylight is provided within the space. For large spaces, perimeter lightings is recommended to be designated on a separate zone to make maximum use of the daylight.

4.1.5 ELECTRICITY METERING

Electricity metering and sub-metering shall be specified in accordance with the Section J and Green Star requirement to monitor and manage electricity consumption in the building.

4.1.6 PHOTOVOLTAICS

Onsite generation of renewable electricity via solar photovoltaic (PV) panels on suitable roof space is highly recommended and feasibility of installing a PV system will be investigated during detail design.

4.2 WATER CONSERVATION

The following initiatives are proposed to ensure that significant water saving is achieved.

4.2.1 FITTINGS AND FIXTURES

Water consumption shall be reduced by incorporating water efficient fixtures and fittings in accordance with the Australian Government's Water Efficiency Labelling Scheme (WELS). The fixtures and fittings for the proposed development are to have the following minimum WELS Rating. In addition, flow restrictors or taps with timed flows can be used to minimise water usage.

Water Fittings / fixtures	Minimum WELS Rating Proposed for Development	Highest Available Rating
Showerheads rating	3 (6.0 but ≤ 7.5)	4
Toilets rating	4	6
Urinals rating	5	6
Taps rating	6	6
Dishwashers (if any) rating	5	6
Washing machines (if any) rating	4.5	6

4.2.2 WATER SENSITIVE URBAN DESIGN (WSUD)

External area design will implement best practices of water sensitive urban design to increase stormwater retention, decrease total suspended solids in runoffs and help mitigate the urban heat island effect. The use of soft landscaping, including indigenous low water usage plants, as part of overall Water Sensitive Urban Design strategy is highly recommended. The carbon sequestration ability of the plants will also combat climate change contributions. Detailed Integrated Water Management (IWM) Plan / Water Sensitive Urban Design (WSUD) study will be completed by Civil/Stormwater consultant.

4.3 OTHER ESD INITIATIVES

4.3.1 INDOOR AIR QUALITY (IAQ)

The quality of indoor air has a significant impact on our health and environment. Poor indoor air quality resulting in adverse health effect such as allergy, asthma, etc. It is recommended the outdoor air ventilation system is sized so that CO₂ concentrations can be maintained below 800ppm for mechanically ventilated spaces. The ventilation system shall be designed to minimise the entry of outdoor pollutant as per ASHRAE Standard 62.1:2013.

4.3.2 SUSTAINABLE MATERIALS

4.3.2.1 LOW VOC / LOW FORMALDEHYDE MATERIALS

Adhesives, sealants, flooring and paint products will be selected to contain low or no Volatile Organic Compounds (VOCs) and all engineered timber products used in exposed or concealed applications are specified to contain low or no formaldehyde to avoid harmful emissions that can cause illness and discomfort for occupants.

4.3.2.2 SUSTAINABLE PRODUCTS

A proportion of all materials used in the project will meet the transparency and sustainability requirements under one of the following initiatives:

- Reused Product;
- Recycled Content Products;
- Environmental Product Declarations;
- Third Party Certifications; or
- Stewardship Programs.

4.3.3 WASTE

Waste collection and disposal plays an important role in the protection of the environment and the health of the population in the modern world. A waste management plan will be prepared to assess and monitor the waste management process during construction and demolition, as well as waste produced during occupation within the development. The waste management plan shall incorporate how to minimise the amount of waste generated, maximise the reuse, recycling and reprocessing construction waste materials and minimise the volume of materials disposed to landfill.

5 SUSTAINABILITY (GREEN STAR) BENCHMARKING

While this project is not pursuing formal Green Star certification by the Green Building Council Australia (GBCA), the project has benchmarked itself to a 4 Star equivalency using the Green Star Design & As-built v1.3 rating tool.

Green Star is a voluntary, industry recognised and holistic sustainability rating tool for benchmarking the level of sustainable design in buildings. A rating is determined by comparing the percentage of available points achieved out of the total available points as per the rating tool. For a 4 star rating, signifying Australian Best Practice, a development will need to achieve a minimum of 45% of the available points.

A Green Star Scorecard has been prepared (attached as *Appendix A*), which lists the sustainability initiatives applicable for the project. Below table summarises the outcomes of self-assessed sustainability benchmarking based on the Green Star Design & As-built v1.3 rating tool.

Category	Points Available	Points Applicable
Management	14	9
Indoor Environment Quality	17	12
Energy	22	5
Transport	10	3
Water	12	4
Materials	13	5
Land Use & Ecology	6	3
Emissions	5	4
Total Score	99	45
		(equivalent to 4 star Australian Best Practice)

6 CLIMATE RESPONSE STATEMENT

The following climate response statement has been prepared for the proposed development based on the projected climate scenarios provided by NSW and ACT Regional Climate Modelling (NARCLIM) climate change projections. An assessment of potential risks on the proposed development as a result of the projected impacts of Climate Change has been undertaken to ensure the design allows for suitable provisions to mitigate these risks.

6.1 PROJECTED CHANGES TO CLIMATE

The climate change projections in the table below are from the NSW and ACT Regional Climate Modelling (NARCLIM) project. The table provides descriptions of climate change projections for two future 20-year time periods: 2020–2039 and 2060–2079.

The climate projections for 2020–2039 are described as NEAR FUTURE, or as 2030, the latter representing the average for the 20-year period. The climate projections for 2060–2079 are described as FAR FUTURE, or as 2070, the latter representing the average of the 20-year period.

Climate Variable	Projected changes	
	Near Future	Far Future
Temperature	Max temperatures to increase by 0.3–1.0°C Min temperatures to increase by 0.4–0.8°C The number of hot days will increase	Max temperatures to increase by 1.6–2.5°C Min temperatures to increase by 1.4–2.5°C The number of cold nights will decrease
Rainfall	Rainfall is projected to decrease in spring and winter Rainfall is projected to increase in summer and autumn	
Forest Fire Danger Index (FFDI)		Average fire weather is projected to increase in spring by 2070 Severe fire weather days are projected to increase in summer and spring by 2070

Source: Metropolitan Sydney Climate change snapshot, Office of Environment and Heritage, November 2014

The following table details projected changes to climate and the frequency and intensity of natural hazards in the Sydney/Central Coast region out to 2050:

Natural Hazards	Projected changes
Fire	The frequency of very high or extreme fire-risk days is projected to increase in the Sydney/Central Coast region. With a broadening of the fire season, a 10–50% increase in the frequency of very high to extreme fire danger days is projected. The conditions conducive to large and intense fires, such as prolonged drought, days of high temperature, high wind speed, and low humidity, are anticipated to increase. Projected changes in temperature and evaporation are likely to create drier conditions in winter and spring, leading to both the forward extension (into late winter), and lengthening (into late summer) of the fire season. Intensification of fire danger levels within the existing season is projected.

Heatwave	Heatwaves are projected to become more severe because of higher temperatures as a result of climate change. They are also likely to become more frequent.
Flooding	Incidence of flooding may increase. This is variable depending on location, but the risk is expected to increase with changing community profiles in urban areas, and in some cases, due to rising sea levels because of climate change.
Wind	Changes to incidence high wind events are uncertain.
Hail	Changes to frequency of hail days are uncertain.
Lightning	Changes to lightning frequency are uncertain.

Source: Impacts of Climate Change on Natural hazards Profile – Sydney/Central Coast Region, State of NSW and Department of Environment, Climate Change and Water, December 2010

6.2 PAST EXTREME EVENTS

Extreme events that have impacted a site in the past are indicative of possible extreme events that will impact the site in the future. The identification of past extreme events will help highlight the climate risks that should be the prioritized during the design of the development. Past climatic events that have impacted and potential hazards that may affect the site are summarised below:

- Bushfire – The parcel of land selected is not identified as bush fire prone however it could still be affected by a bush fire. [Source: NSW RFS Bushfire Prone Land].

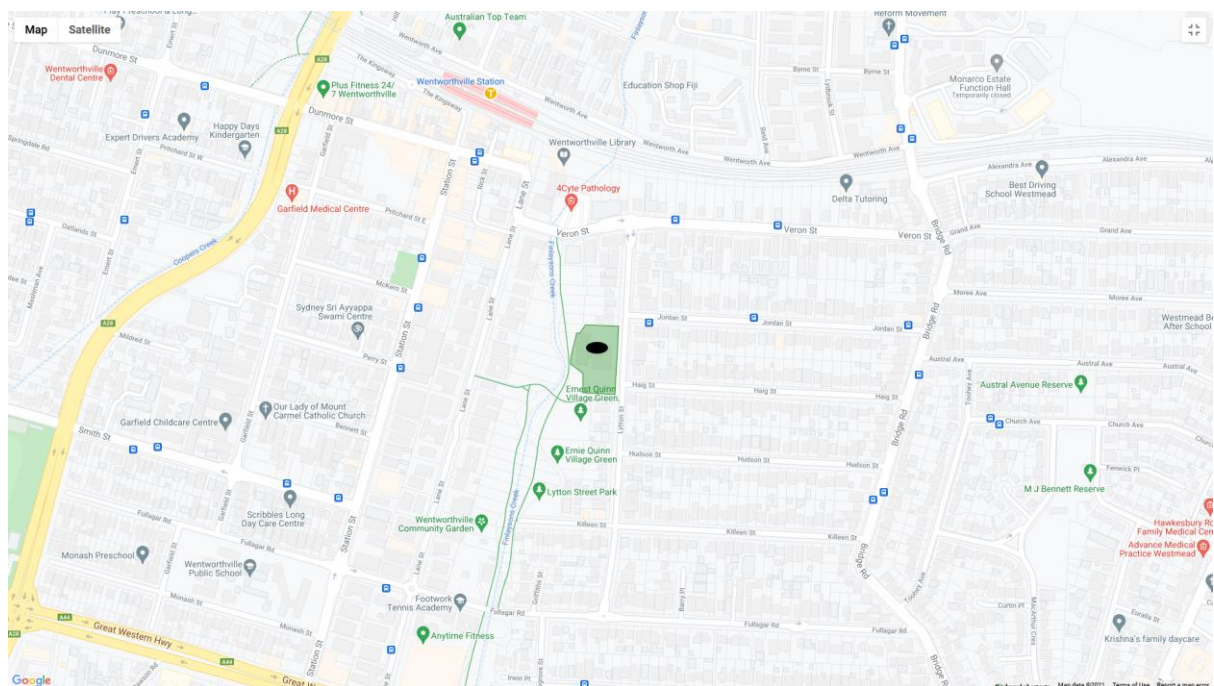


Figure 3 – Map of Bush Fire Prone Land

- Heat waves – Over the period 1911–2013, heatwaves in parts of NSW have become longer, hotter and occur more often. People with health issues are considered one of the groups most at risks to impact of heat related illness. [Source: AdaptNSW Heatwaves Climate Change Impact Snapshot]
- Flood – The site has been identified and categorised within the area of the “Preliminary Finlaysons Creek Overland Flood Study – 2012” (prepared by Lyall & Associates) as being subject to flood related development controls within

a defined flood risk precinct. [Source: Acor Consultants' Local Flood Impact Assessment Report No. SY150080-150310]

- Storm – Severe storm events in Sydney are not uncommon and include hailstorms and wind storms from rain caused either by East coast lows (during autumn-winter periods) or tropical cyclone remnants (during summer periods).

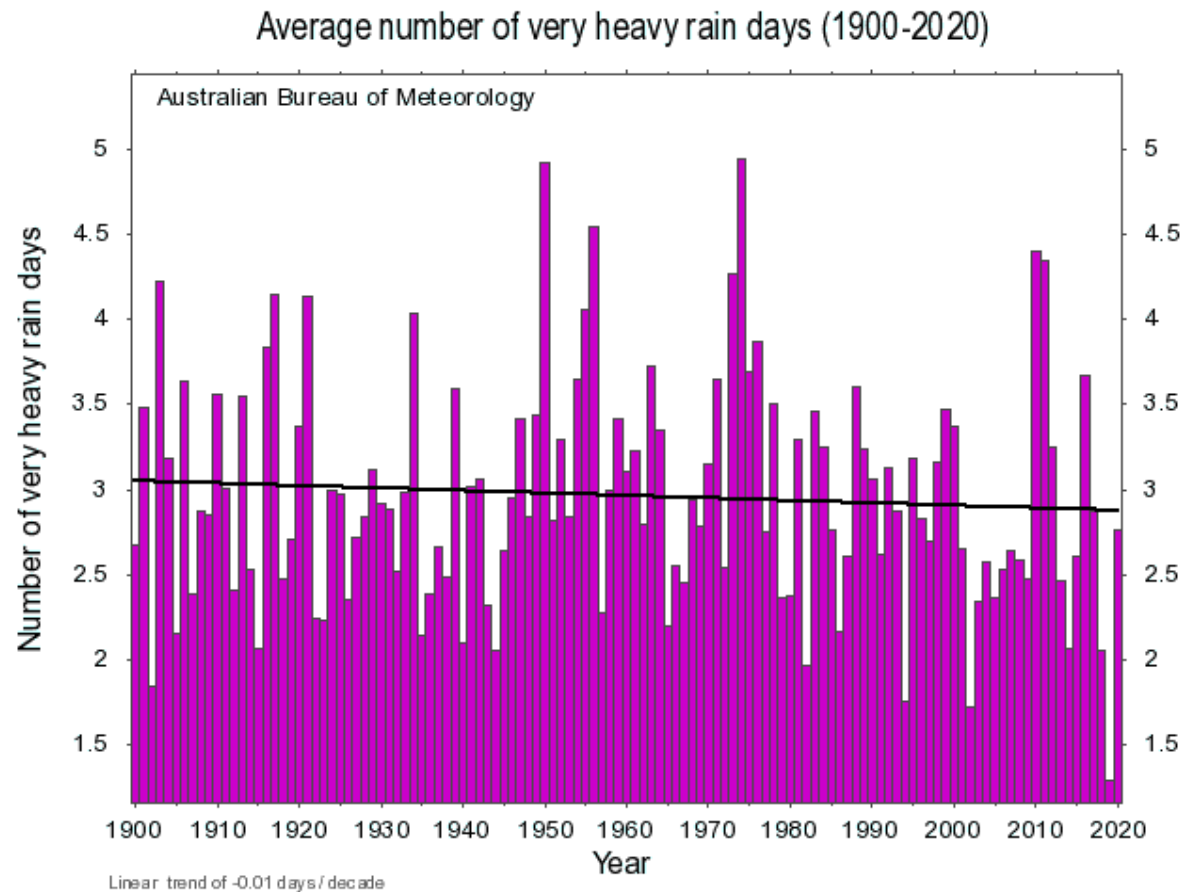


Figure 4 – Annual Very Heavy Rain Days Trend [Source: BOM]

6.3 PROJECT'S RESPONSE

Based on the above, the climate change projections indicate the risks of heat wave and flooding may be increased in future as a result of warmer temperatures and more intense rainfall, particularly in summer.

In response to the higher risks of heat waves, the project will include passive thermal features to help the building manage solar heat gains in summer, including thermal insulation and high thermal performance glazing. Air-conditioning should be considered throughout. However, overreliance on air-conditioning should be avoided, especially during extreme temperature and heatwave events; air-conditioning should be accompanied by appropriate occupant behaviours and responses to ensure fitting and efficient use of the system. As the climate becomes warmer, energy consumption associated with cooling will increase. This additional electricity demand and associated greenhouse gas emission could be offset with additional photovoltaics panels to provide renewable electricity.

In response to the higher risks of flooding, specialist consultant should be engaged to undertake an assessment of the flood impacts of and upon the proposed development and to prepare a concept flood management strategy for the development. It is recommended that this assessment should take into account the risks of more intense rainfall in future.

APPENDIX A: GREEN STAR SCORECARD

Green Star - Design & As Built Scorecard

Project:	Northside West Stage 2	Round:	1	Core Points Available	Total Score Targeted
Targeted Rating:	4 Star - Best Practice			99	45

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Management				14	
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.1	Accredited Professional	1	1
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-	Complies
		2.1	Services and Maintainability Review	1	1
		2.2	Building Commissioning	1	1
		2.3	Building Systems Tuning	1	1
		2.4	Independent Commissioning Agent	1	
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan	2	
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.1	Building Information	1	1
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1	1
		5.2	End of Life Waste Performance	A. Contractual Agreements	1
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Complies
		6.1	Monitoring Systems	1	1
Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Complies
		7.1	Environmental Management System	1	1
		7.2	High Quality Staff Support	1	
Operational Waste	A. Performance Pathway	8A	Performance Pathway: Specialist Plan	1	1
		8B	Prescriptive Pathway: Facilities	0	
Total				14	9

Indoor Environment Quality					17	
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1	
		9.2	Provision of Outdoor Air	<div><input type="checkbox"/> A. Comparison to Industry Standards</div> <div><input type="checkbox"/> B. Performance Based Approach</div> <div><input type="checkbox"/> C. Natural Ventilation</div>	2	1
		9.3	Exhaust or Elimination of Pollutants	<div><input type="checkbox"/> A. Removing the Source of Pollutants</div> <div><input type="checkbox"/> B. Exhausting the Pollutants Directly to the Outside</div>	1	1
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1	1	
		10.2	Reverberation	1	1	
		10.3	Acoustic Separation	A. Sound Reduction	1	
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Complies	
		11.1 General Illuminance and Glare Reduction	11.1.1 General Illuminance	<div><input type="checkbox"/> A. Non Residential Spaces</div> <div><input type="checkbox"/> B. Residential Spaces</div>	1	1
			11.1.2 Glare Reduction	<div><input type="checkbox"/> A. Prescriptive Method 1</div> <div><input type="checkbox"/> B. Prescriptive Method 2</div> <div><input type="checkbox"/> C. Performance Method</div>		
		11.2	Surface Illuminance	<div><input type="checkbox"/> A. Prescriptive Method</div> <div><input type="checkbox"/> B. Performance Method</div> <div><input type="checkbox"/> C. Residential Spaces (Prescriptive Method)</div>	1	
		11.3	Localised Lighting Control		1	1
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	<div><input type="checkbox"/> A. Fixed Shading Devices</div> <div><input type="checkbox"/> B. Blinds or Screens</div> <div><input type="checkbox"/> C. Daylight Glare Model</div>	-	Complies
		12.1	Daylight	<div><input type="checkbox"/> A. Prescriptive Methodology</div> <div><input type="checkbox"/> B. Compliance Using Daylight Factor</div> <div><input type="checkbox"/> C. Compliance Using Daylight Autonomy</div>	2	1
		12.2	Views		1	1
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1 Paints, Adhesives, Sealants and Carpets	13.1.1 Paints, Adhesives and Sealants	<div><input type="checkbox"/> A. Product Certification</div> <div><input type="checkbox"/> B. Laboratory Testing</div> <div><input type="checkbox"/> C. No Paints, Adhesives or Sealants</div>	1	1
			13.1.2 Carpets	<div><input type="checkbox"/> A. Product Certification</div> <div><input type="checkbox"/> B. Laboratory Testing</div> <div><input type="checkbox"/> C. No Carpets</div>		

Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	13.2	Engineered Wood Products	<input type="checkbox"/> A. Product Certification	1	1
				<input type="checkbox"/> B. Laboratory Testing		
		14.1	Thermal Comfort	<input type="checkbox"/> A. Naturally Ventilated Spaces	1	1
				<input type="checkbox"/> B. Mechanically Ventilated Spaces		
				<input type="checkbox"/> C. Residential Spaces		
		14.2	Advanced Thermal Comfort	<input type="checkbox"/> A. Naturally Ventilated Spaces	1	
				<input type="checkbox"/> B. Mechanically Ventilated Spaces		
				<input type="checkbox"/> C. Residential Spaces		
Total					17	12

Energy					22	
Greenhouse Gas Emissions	A. Prescriptive Pathway	15A.0	Conditional Requirement: Prescriptive Pathway		-	Complies
		15A.1	Building Envelope		1	1
		15A.2	Wall-Glazing Construction and Retail Display Glazing		1	1
		15A.3	Lighting		1	1
		15A.4	Ventilation and Air Conditioning		1	1
		15A.5	Domestic Hot Water		1	
		15A.6	Transition Plan		1	
		15A.7	Fuel Switching		1	
		15A.8	On-Site Storage		1	
		15A.9	Vertical Transportation		1	1
		15A.10	Off-Site Renewables		5	
		15B.0	Conditional Requirement: NatHERS Pathway		-	
		15B.1	Thermal and Energy Performance		6	
		15B.2 Building Services and Appliances	15B.2.1 Lighting		1	
			15B.2.2 Ventilation and Air Conditioning	<input type="checkbox"/> Mechanically Conditioned Spaces <input type="checkbox"/> Spaces With Mechanical Heating Only <input type="checkbox"/> Naturally Ventilated Spaces	2	
			15B.2.3 Domestic Hot Water		2	
			15B.2.4 Appliances & Equipment		1	
			15B.2.5 Fuel Switching		1	
			15B.2.6 On-Site Storage		1	
			15B.2.7 Vertical Transportation		1	
			15B.2.8 Passive Laundry Facilities		1	
			15B.2.9 Unoccupied Areas		1	
			15B.2.10 Off-Site Renewables		5	
		15C.0	Conditional Requirement: BASIX Pathway		-	
		15C.1	BASIX Greenhouse Gas Reductions		0	
		15C.2	Off-Site Renewables		0	
		15D.0	Conditional Requirement: NABERS Pathway		-	
		15D.1	NABERS Energy Greenhouse Gas Emissions Reduction		0	
		15D.2	Off-Site Renewables		0	
		15D.3 Additional Prescriptive Measures	15D.3.1 Transition Plan		0	
			15D.3.2 Fuel Switching		0	
			15D.3.3 On-Site Storage		0	
		15E.0	Conditional Requirement: Reference Building Pathway		-	
		15E.1	GHG Emissions Reduction: Building Fabric		0	
		15E.2	GHG Emissions Reduction		0	
		15E.3	Off-Site Renewables		0	
		15E.4	District Services		0	

		15E.5 Additional Prescriptive Measures	15E.5.1 Transition Plan	0	
			15E.5.2 Fuel Switching	0	
			15E.5.3 On-Site Storage	0	
Peak Electricity Demand Reduction	A. Prescriptive Pathway	16A	Prescriptive Pathway: On-Site Energy Generation	1	
		16B	Modelled Performance Pathway: Reference Building	0	
Total				11	5

Transport					10	
Sustainable Transport	B. Prescriptive Pathway	17A	Performance Pathway		0	
		17B.1	Access by Public Transport		3	1
		17B.2	Reduced Car Parking Provision		1	
		17B.3	Low Emission Vehicle Infrastructure	A. Parking for Fuel-Efficient Vehicles	1	1
		17B.4	Active Transport Facilities		1	
		17B.5	Walkable Neighbourhoods	A. Proximity to Amenities	1	1
		Total				

Water				12	
Potable Water	B. Prescriptive Pathway	18A	Potable Water - Performance Pathway	0	
		18B.1	Sanitary Fixture Efficiency	1	1
		18B.2	Rainwater Reuse	1	
		18B.3	Heat Rejection	2	2
		18B.4	Landscape Irrigation	1	1
		18B.5	Fire Protection System Test Water	1	
Total				6	4

Materials					13	
Life Cycle Impacts	B. Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment		0	
		19A.2	Additional Reporting	<input type="checkbox"/> Additional Life Cycle Impact Reporting	0	
				<input type="checkbox"/> Material Selection Improvement		
				<input type="checkbox"/> Construction Process Improvement		
				<input type="checkbox"/> LCA Design Review		
		19B.1 Concrete	19B.1.1 Portland Cement Reduction		2	1
			19B.1.2 Water Reduction		0.5	0.5
			19B.1.3 Aggregates Reduction	A. Course Aggregate Reduction	0.5	0.5
		19B.2 Steel	A. Reduced Mass of Steel Framing	A. High Strength Steel	1	
		19B.3	Building Reuse	19B.3.1 Façade Reuse	2	
				19B.3.2 Structure Reuse	2	
		19B.4	Structural Timber	19B.4.0 Responsible Sourcing	-	
				19B.4.1 Reduced Embodied Impacts	3	
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	20.1.0 Responsible Steel Maker	-	Complies
				A. Responsible Steel Fabricator	1	1
		20.2	Timber	<input type="checkbox"/> Certified Timber	0	
				<input type="checkbox"/> Reused Timber		
Sustainable Products	To encourage sustainability and transparency in product specification.	20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	B. Best Practice Guidelines for PVC	1	1
				<input type="checkbox"/> A. Reused Products	3	
		<input type="checkbox"/> B. Recycled Content Products				
		<input type="checkbox"/> C. Environmental Product Declarations (EPDs)				
		<input type="checkbox"/> D. Third Party Certification				
		<input type="checkbox"/> E. Stewardship Programs				
		22.0	Reporting Accuracy	A. Compliance Verification Summary	-	Complies

Construction and Demolition Waste	B. Percentage Benchmark	22A Fixed Benchmark	0	
		22B Percentage Benchmark	1	1
Total			12	5

Land Use & Ecology					6		
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	A. EPBC	-	Complies	
		23.1	Ecological Value			3	1
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement			-	Complies
		24.1	Reuse of Land	A. Previously Developed Land	1	1	
		24.2	Contamination and Hazardous Materials	<input type="checkbox"/> A. Site Contamination <input type="checkbox"/> B. Hazardous Materials	1		
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.1	Heat Island Effect Reduction			1	1
Total					6	3	

Emissions					5		
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge		1	1	
		26.2	Stormwater Pollution Targets		1	1	
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies			-	Complies
		27.1	Light Pollution to Night Sky	A. Control of Upward Light Output Ratio (ULOR)		1	1
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28	Legionella Impacts from Cooling Systems	B. Waterless Heat Rejection Systems		1	1
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.1	Refrigerants Impacts	A. Calculating TSDEI		1	
Total					5	4	

Innovation				10
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	10
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation	
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks	
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge	
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star	30E	Global Sustainability	
Total				100

TOTALS	AVAILABLE	TARGETED
CORE POINTS	99	45.0
CATEGORY PERCENTAGE SCORE		45.5
INNOVATION POINTS	10	0.0
TOTAL SCORE TARGETED		45.5