Westlink Stage 2 - Lot 2 ESD Report

Abbotts Road, Kemps Creek, NSW 2178

Project No.	P00286
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E-LAB Consulting

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DOCUMENT QA AND REVISIONS

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Authorised by:

Engineering Lab NSW Pty Ltd

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Sustainability

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1 INTRODUCTION

1.1 EXECUTIVE SUMMARY

E-LAB Consulting have been engaged by ESR to provide sustainability services inputs for the development at Abbotts Road, Kemps Creek. The intent of this report is to establish Ecologically Sustainable Design (ESD) measures that will be implemented and is intended to form part of the Environmental Impact Statement (EIS) for the State Significant Development Application (SSDA).

This report presents a summary of the ESD strategies proposed and commitments made for the development. The developer is aiming to deliver an affordable, sustainable outcome for the project by demonstrating a strong commitment to sustainability in its design, construction, and operation.

The proposed sustainability elements include:

- Targeting 5 **Star Green Star Design & As Built v1.3 Certification** for the development;
- No gas on site to reduce fossil fuel consumption;
- Significant on-site energy generation through a major solar PV array on the roof to reduce operational energy and GHG emissions associated with the site;
- Water Sensitive Urban Design Principals being upheld;
- Water recycling through rainwater storage;
- A minimum 90% diversion of waste from landfill target during demolition and construction;
- Creating and following a Green Travel Plan;
- Providing parking capacity for electric vehicles to prepare for a decarbonised future;
- Urban heat island effect mitigation strategies; and
- Following a range of sustainability initiatives across the site spanning energy efficiency, thermal performance, indoor environment quality, waste management, and comfort.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability in line with the Penrith's development guidelines and are to be further developed during subsequent stages of the project.

1.2 PROJECT OVERVIEW

ESR's Westlink Industrial Estate comprises of two stages. The first stage has been approved by the Department of Planning and Environment on 21 April 2023 and comprises of 81,317m2 of total gross floor area over Lot 1 and Lot 4, landscaping, construction of estate roads, and external road upgrades. The second stage seeks to complete the remaining bulk earthworks in the estate, completion of estate roads and services and seeks to deliver a 37,540m2 warehouse.

The estate comprises of the following lots:

- Lot 11 DP 253503
- Lot 12 DP 253503
- Lot 13 DP 253503
- Lot 3 DP 250002
- Lot 4 DP 250002

Figure 1 below shows the location of the Stage 2 proposal. The site is in Sydney's west, approximately 39 km west of the Sydney CBD. It is part of the Greater Western Sydney region and is in the local government area of the City of Penrith. The development is seeking use for warehouse and distribution centre with ancillary office.

Figure 1. Site overview. (Source: Nettleton Tribe)

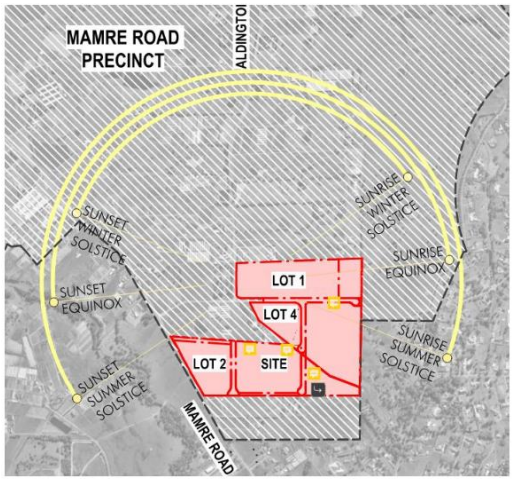

Figure 2. Site Location. (Source: Nettleton Tribe)

1.3 RESPONSE TO THE SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

This report outlines how the development will address the SEARs as part of the Environmental Impact Statement. These are:

REQUIREMENT	RESPONSE
Identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development	This report outlines how ESD Principles (as defined in clause 7(4) of Schedule 2 of the EPA) are incorporated in the design and ongoing operations of the development.
Demonstrate how the development minimises greenhouse gas emissions reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water and material resources.	Section 3.2 of this report outlines the substantial energy efficiency measures to minimise the development's greenhouse gas emissions including carbon emissions.
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Sections 3.2, 3.3 and 3.4 of this report outline how the development minimises its environmental impact through sustainable design and operation.

2 SUSTAINABILITY FRAMEWORKS

The proposed development's sustainability outcomes are influenced by the following key frameworks:

- State Environmental Planning Policy (Industry and Employment) 2021
- Mamre Road Development Control Plan (DCP) 2021
- Green Star Design & As Built v1.3
- Performance Standards for Net Zero Ready Energy Buildings
- Sustainability Buildings SEPP 2023

2.1 STATE ENVIRONMENTAL PLANNING POLICY (INDUSTRY AND EMPLOYMENT) 2021

The site is included in the Industry and Employment SEPP, as Precinct 12 (Mamre Road). Under this policy, the site is zoned in IN1 General Industrial zone. In accordance with the aims of the Industry and Employment under the Clause 2.1, the Augusta development must endeavour to protect and enhance the land, as well as:

- Provide for the co-ordinated planning and development of land in the Western Sydney Employment Area;
- Ensure that development occurs in a logical, environmentally sensitive and cost-effective manner and only after a development control plan (including specific development controls) has been prepared for the land concerned;
- Conserve and rehabilitate areas that have a high biodiversity or heritage or cultural value, in particular areas of remnant vegetation.
- Maximise rainwater harvesting; and
- Follow ESD principles, including minimising consumption of potable water and greenhouse gas emissions.

2.2 MAMRE ROAD DEVELOPMENT CONTROL PLAN (DCP) 2021

The Mamre Road DCP 2021 outlines the sustainable development objectives new developments within the Western Sydney Employment Area must consider. In particular, new developments must:

- Ensure that development in the Precinct occurs in an orderly manner;9
- To ensure coordinated and orderly planning and delivery of infrastructure, land uses, supporting facilities and protection of the environment;
- To ensure that infrastructure, services and amenities are sufficient to support growth and development in the Precinct;
- To protect environmental, heritage, amenity, and existing critical infrastructure; and
- To facilitate waste management in accordance with ESD principles.

2.3 GREEN STAR DESIGN & AS BUILT V1.3

The development also aims to meet and exceed industry best practice sustainability requirements within its design as part of the sustainability commitments associated with construction and operation. The development will be targeting 5 Star Green Star Design & As Built v1.3 for both buildings, by achieving ESD in the nine categories identified in the Green Building Council of Australia's benchmarking tool:

- **Management** – Assesses the policies, procedures, targets, and strategies put in place to ensure buildings operate to their fullest sustainable potential.
- **Indoor Environmental Quality** – Creation of high quality indoor environments to increase productivity and occupant satisfaction.
- **Energy** – Implementation of strategies and actions to measure and reduce a building's operational energy use, reliance on grid energy supply, and the greenhouse gas emissions associated with grid energy consumption.
- **Transport** – Discouragement of single-occupant vehicle use and encouragement of the use of sustainable transportation modes such as public transport, walking, or cycling.
- **Water** – Reductions in potable water use through the efficient design of building services, water reuse and substitution with non-potable water sources such as rainwater or greywater.
- **Materials** – Consideration of issues such as sustainable procurement and purchasing (materials in) and the management of waste (materials out).
- **Land Use and Ecology** – Address the ongoing impact of building operations on local ecosystems by discouraging degradation and encouraging the restoration of natural environments whenever possible. Improvement of biodiversity through policies and management practices.
- **Emissions** – Minimise point source pollution from buildings and building services to the atmosphere and local waterways. Manage and minimise emissions from stormwater, light pollution, and refrigeration.
- **Innovation** – Use creativity and the pioneering application of new ideas and approaches in order to facilitate the progression of the facilities management sector towards more sustainable outcomes.

2.4 PERFORMANCE STANDARDS FOR NET ZERO READY ENERGY BUILDINGS

In alignment with best practice, the development's commitment to sustainability, the project proposes to be ready for net zero carbon emissions. This includes the following strategies:

- Reducing energy loads and usage;
- Diverting a minimum of 90% construction waste from landfill;
- On-site renewable energy through a large photovoltaic array; and
- Eliminating gas to remove fossil fuel consumption and prepare for a decarbonised grid.

3 PROJECT DESIGN RESPONSE

3.1 EPA PRINCIPLES

The proposed development will follow the golden standard in sustainability principals throughout the development. This includes the design, construction, and operational elements of the project. The key overarching principals are aligned with the definition of Ecologically Sustainable Development as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. These include:

The Precautionary Principle:

Philosophy: Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Project Response: The project is committed to incorporating elements to minimise impacts on the environment, as outlined below in this section of this report. A commitment to improvement on minimum benchmarks demonstrates the development's commitment to sustainability.

The Principle of Inter-generational Equity:

Philosophy: The present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.

Project Response: The project is committed to incorporating careful selections into the project design. The design team will address key elements such as energy, potable water, and material consumption to do what is within the project's control to allow each following generation to have an opportunity for ecological equality.

The Principle of the conservation of biological diversity and ecological integrity:

Philosophy: Conservation of biological diversity and ecological integrity should be a fundamental consideration

Project Response: The project is committed to planting native vegetation and using integrated landscaping to enhance the overall ecological and biodiversity of the site. Rainwater and stormwater will be carefully managed and controlled to minimise impacts on surroundings.

Principles relating to improved valuation, pricing, and incentive mechanisms:

Philosophy: Environmental factors should be included in the valuation of assets and services. The users of goods and services should pay prices based on the full life cycle costs of providing goods and service.

Project Response: The project will target a construction waste diversion target of 90%, as well as developed specific project waste management strategies. These combine to ensure the project pays for the waste and damage it creates. Further, it is designed to be low-energy and low-water consumption, which provides an incentive for residents through lower utility bills.

The Principle of Waste Minimisation:

Philosophy: All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

Project Response: The project will target a construction waste diversion target of 90%, as well as developed specific project waste management strategies. Construction materials are chosen to be low impact in their manufacture, including best practice PVC and FSC/PeFC timber throughout where possible. This impacts waste both created by the site, as well as upstream and downstream waste categories.

The above principles are addressed by 5 key themes, being **Sea, Land, Water, Air and People**. These 5 key themes are centred around reducing harm as far as practicable across the practice of buildings and infrastructure, both in their construction and operation.

3.2 ENERGY

The only path to a low carbon economy and achieving a "2°C world", where the average global temperature is kept to less than 2°C above pre-industrial levels, is through comprehensive and complete consideration of how the development consumes resources, including energy, water, and material efficiency.

The energy efficiency strategy generally follows the energy efficiency pyramid of design in Figure 3. In the first instance demand for greenhouse gases should be reduced. Consideration should be to remove the need for energy to be consumed where possible. Beyond this, energy can be more efficient, through efficient lighting, mechanical systems, and appropriate services.

Once the system has reduced all available energy-consuming elements and made the remaining systems as efficient as possible, renewable energy sources will be considered. If space allows on the roof, PV will be installed. Only after all the above steps have been completed should offsets be used to close the gap and achieve neutrality.

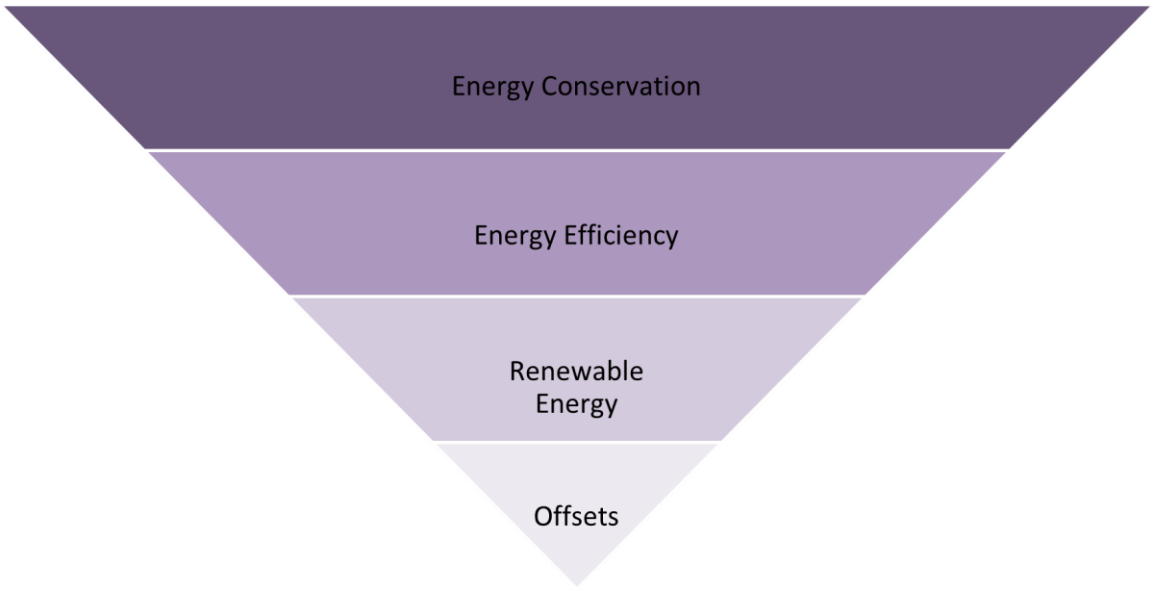

Figure 3. Energy efficiency pyramid: pathway to carbon neutrality.

To achieve the above, the following initiatives are proposed:

Electrification – No gas will be used on site, enabling the development to be 'net zero ready' and allow the benefits of decarbonisation of the grid to be realised. This is in keeping with the City of Penrith vision for the area.

Renewable Energy – The roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times.

Efficient Lighting Systems – High efficiency LED lighting throughout, including in common areas with efficiency controls to meet the requirements of NCC 2019 Amendment 1 Section J. Controls will include motion sensors, time clocks and zoned switching.

Controls, Energy Metering and Monitoring – Energy meters and monitoring systems will be provided to comply with NCC 2019 Amendment 1 Section J Part J8 requirements. Preference for natural ventilation and comfort through adaptive cooling and shading.

Hot Water – Hot water is likely to be provided by energy efficient heat pump systems. These systems are highly efficient and can be run off the solar PV system to reduce the operational carbon of the development.

Integration of Cool Roofing – roofing with a high albedo will reduce Urban Heat Island effect and reduce load on the HVAC system.

3.3 WATER CONSUMPTION & WSUD

To achieve responsible water consumption and water sensitive urban design, best practice water-saving initiatives will need to be implemented throughout the project. The following initiatives will be explored to achieve the potable water targets:

Sanitary Fixtures – By implementing low-flow water fixtures, the consumption will be significantly reduced. All sanitary fixtures are to be provided with the minimum WELS ratings identified below:

Taps – 6 Star WELS

Toilets – 4 Star WELS

Urinals – 6 Star WELS (0.8 L per flush)

Showers – 3 Star WELS (<9 L/min)

Landscape Irrigation – Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Native plants have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. They typically require less water and are more likely to survive the predicted increase in extreme drought conditions due to climate change. Native vegetation also stores a significant amount of carbon, helping to mitigate climate change.

Recycled water and rainwater – the development will supply most of the toilet flushing, irrigation, and washdown needs from a minimum 100kL on-site rainwater tank. Rainwater will be captured from the roof of the buildings to reduce potable water demand.

The development's design is deliberately working to reduce potable water consumption by in the first instance reducing water use, then offsetting it through rainwater tanks. The rainwater tanks are designed to meet as much of the site irrigation needs as possible.

3.4 MATERIALS

In line with the principals of sustainability outlined in the EPA, the project will have a significant focus on materiality. The scope of consideration includes the following action items within the project response:

- **Construction Waste** – A minimum 90% diversion from landfill target during demolition and construction. This diverts and ensure reuse or recycling of a high portion of site waste.
- **Low VOC and Low Formaldehyde Materials** – paints, adhesives, sealants, floor coverings, carpets and engineered wood will be selected appropriately to provide a healthier and low-impact environment. Such efforts provide a cleaner and better environment for all.
- **Best-Practice PVC** – cables, pipes, flooring, and blinds will be selected and specified to be Best Practice PVC. This ensures upstream performance will be met and has significant benefit for the overall environment during the construction process.
- **Best Practice Steel** – Where possible, steel will come from a sustainable steel manufacturer, who has an action plan.
- **FSC/PeFC Timber throughout** – where possible, timber, including virgin and engineered timber through construction and fitout elements under the builder's control will be specified as FSC/PeFC. This ensures the timber provided to site is of the highest standard and sourced from sustainable sources.
- **Waste Management Plan** – Development of an ongoing Waste Management Plan so waste can be sorted, separated, and recycled. This will assist ongoing diversion from landfill for the development.

3.5 COMFORT AND QUALITY

To ensure the best quality for users and visitors inside the space, the development will commit to the following key initiatives:

- **Visual Comfort** – Maximising high-quality light into the living spaces, with views to the sky and nature where possible.
- **Acoustic Excellence** – Designing the building layout to be protected from noise from external sources. Delicate material selection, acoustic attenuation, and designing the shape of the building and openings accordingly achieves the performance.
- **Thermal Comfort** – Appropriate mix of vernacular design, overhangs, adaptive comfort and high levels of insulation in the roof and facades. Adaptive cooling will be integrated into the design based on tenant needs and high-occupancy spaces.
- **Lighting Comfort** – Use of high colour rendering index (CRI > 80) LED lighting throughout the entire development. Low-glare lighting with baffles or louvres to limit UGR.
- **Generous Natural Planting –** Greenery through natural planting throughout the development assists in a connection to nature for users and passers-by. It also has a cooling effect, reducing the Urban Heat Island burden on the project.

The above combine to ensure the development is responsible, efficient, beautiful, and in the best interest of not just the developers, but the residents, community, and society as a whole.

3.6 URBAN HEAT ISLAND MITIGATION

The site is located in a position which experiences the urban heat island effect. Figure 4 shows the variation of temperature compared to a non-urban vegetated surface, such as a heavily wooded area. The **site experiences temperatures of 4˚C above baseline.**

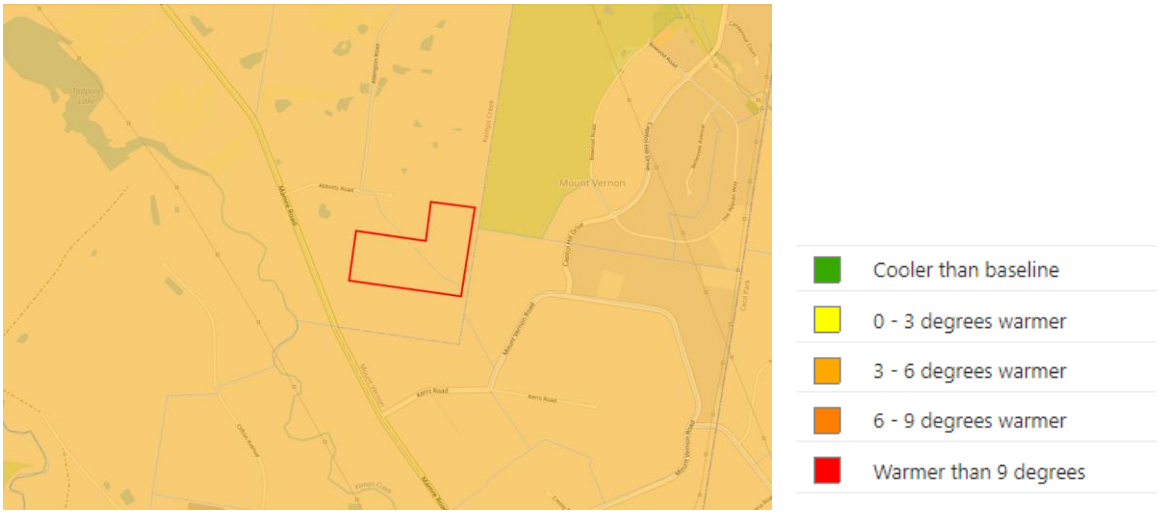

Figure 4. Urban heat island effect at the site. (Source: SEED Database)

To minimise the urban heat island effect and provide a more comfortable environment for occupants, the development can implement the following initiatives:

- Gardens with drought tolerant planting
- Light coloured external materials and roof
- Plant trees with wide tree canopies

3.7 SECTION J

The proposed development will be subject to compliance with Section J under the NCC 2019 Amendment 1 code. This code places strict environmental performance requirements on the building envelope and services within the building.

The project will demonstrate compliance via verification method JV3 – verification using a reference building (energy modelling). The design of the building fabric will need to demonstrate compliance with this clause through dynamic modelling of the building against a reference case.

The scope of the Section J compliance is limited to areas that meet both of the following criteria:

- Non-Residential areas
- Conditioned Spaces

As such, this includes majority of areas within the development.

3.8 SUSTAINABLE TRANSPORT

The development site has very low accessibility by public transport. This will decrease the need for staff to drive to the site. Bike parking will be provided to promote active transport methods including walking and cycling. A Green Travel Plan will be provided with practical solutions to minimise reliance on private vehicle use. This will include strategies to promote carshare services or carpooling.

The development also has the potential to support the shift away from fossil fuel transport by providing infrastructure for EV Charging in the carpark. While the demand is not anticipated to be high across the development, it is expected the future demand will continue to rise, so the infrastructure required to install and support this transition will be installed in day 1. This supports the development's commitment to transitioning to a carbon neutral economy.

4 CONCLUSION

This report provides an outline of the proposed development's Ecologically Sustainable Design initiatives and commitments. The ESD strategies proposed will assist the development in achieving high levels of sustainability and environmental performance. These strategies include:

- Committed to a 5 Star Green Star Design & As Built v1.3 for the Stage 5 Facility in this SSDA;
- No gas on site to reduce fossil fuel consumption;
- Significant on-site energy generation through a major solar PV array on the roof to reduce operational energy and GHG emissions associated with the site;
- Water Sensitive Urban Design Principals being upheld;
- Water recycling through minimum 100kL rainwater storage tank;
- A minimum 90% diversion of waste from landfill target during demolition and construction;
- Creating and following a Green Travel Plan;
- Providing parking capacity for electric vehicles to prepare for a decarbonised future;
- Urban heat island effect mitigation strategies; and
- Following a range of sustainability initiatives across the site spanning energy efficiency, thermal performance, indoor environment quality, waste management, and comfort.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability which meet and exceed expectations for the development. Further opportunities for optimisation of the building's performance will be developed during subsequent stages of the project.

Appendix A **Green Star Pathway**

Green Star - Design & As Built v1.3

		CORE POINTS AVAILABLE	5 Star
Project:	**Warehouse**		
Targeted Rating:	**5 Star**	**110**	**67**
Prepared by:	**AK | E-LAB Consulting**		
Date:	**23/09/2022**		

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	CORE POINTS AVAILABLE	5 Star
Management			**14**	
Green Star AP	1.0	Accredited Professional	1	1
Commissioning and Tuning	2.0	Environmental Performance Targets	-	Yes
	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	3.0	Implementation of a Climate Adaptation Plan	2	2
Building Information	4.1	Building Information	1	1
Commitment to Performance	5.1	Environmental Building Performance	1	1
	5.2	End of Life Waste Performance	1	1
Metering and Monitoring	6.0	Metering	-	Yes
	6.1	Monitoring Systems	1	1
Responsible Construction Practices	7.0	Environmental Management Plan	-	Yes
	7.1	Environmental Management System	1	1
	7.2	High Quality Staff Support	1	
Operational Waste	8A	Performance Pathway - Specialist Plan	1	1
Total			**14**	**14**

Indoor Environment Quality			17	
Indoor Air Quality	9.1	Ventilation System Attributes	1	1
	9.2	Provision of Outdoor Air	2	
	9.3	Exhaust or Elimination of Pollutants	1	1
Acoustic Comfort	10.1	Internal Noise Levels	1	1
	10.2	Reverberation	1	1
	10.3	Acoustic Separation	1	
Lighting Comfort	11.0	Minimum Lighting Comfort	-	Yes
	11.1	General Illuminance and Glare Reduction	1	1
	11.2	Surface Illuminance	1	
	11.3	Localised Lighting Control	1	
Visual Comfort	12.0	Glare Reduction	-	Yes
	12.1	Daylight	2	1
	12.2	Views	1	1
Indoor Pollutants	13.1	Paints, Adhesives, Sealants and Carpets	1	1
	13.2	Engineered Wood Products	1	1
Thermal Comfort	14.1	Thermal Comfort	1	1
	14.2	Advanced Thermal Comfort	1	
Total			17	10

Energy			**22**	
Greenhouse Gas Emissions	**15E**	**Reference Building Pathway**	20	10
	15H.0	Conditional Requirement	-	Yes
	15H.1	Building Envelope	1	
	15H.4	Ventilation and Air Conditioning	1	
	15H.5	Domestic Hot Water	1	
	15H.6	Transition Plan	1	
	15H.7	Fuel Switching	1	1
	15H.8	On-site Storage	2	
	15H.9	Provision of structure for PV	1	
	15H.10	Off-site Renewables (GreenPower)	5	
Peak Electricity Demand Reduction	16B	Performance Pathway - On-site Energy Generation	2	2
Total			**41**	**13**

Transport			**7**	
Sustainable Transport	17A.1	Performance Pathway		
	17C.1	Access by Public Transport	1	
	17C.2	Reduced Car Parking Provision	1	
	17C.3A	15% of parking is dedicated to fuel efficient vehicles	1	1
	17C.3B	5% of parking is dedicated to electric vehicles and charging infrastructure	1	1
	17C.3C	Parking for Car Share Vehicles	1	1
	17C.3D	No parking spaces have been provided	1	
	17C.3E	Low Emission facility transport	1	
	17C.4	Active Transport Facilities	2	2
	17C.5	Proximity to Amenities	2	
Total			**11**	**5**

Water			**12**	
Potable Water	18A.1	Potable Water - Performance Pathway	12	6
	18B.1	Sanitary Fixture Efficiency	1	
	18B.2	Rainwater Reuse	1	
	18B.3	Heat Rejection	2	
	18B.4	Landscape Irrigation	1	
	18B.5	Fire System Test Water	1	
Total			**6**	**6**
Materials			**14**	
Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment	6	3
	19A.2	Additional Life Cycle Impact Reporting	4	2
	19B.2	Steel	2	
	19B.3	Building Reuse	4	
	19B.4	Structural Timber	3	
Responsible Building Materials	20.1	Structural and Reinforcing Steel	1	1
	20.2	Timber Products	1	
	20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1
Sustainable Products	21.0	Product Transparency and Sustainability	3	3
Construction and Demolition Waste	22.0	Reporting Accuracy	-	Yes
	22A	Fixed Benchmark		1
Total			**14**	**11**

Land Use & Ecology			**6**	
Ecological Value	23.0	Endangered, Threatened or Vulnerable Species	-	Yes
	23.1	Ecological Value	3	
Sustainable Sites	24.0	Conditional Requirement	-	Yes
	24.1	Reuse of Land	1	
	24.2	Contamination and Hazardous Materials	1	
Heat Island Effect	25.0	Heat Island Effect Reduction	1	1
Total			**6**	**1**
Emissions			**5**	
Stormwater	26.1	Stormwater Peak Discharge	1	1
	26.2	Stormwater Pollution Targets	1	1
Light Pollution	27.0	Light Pollution to Neighbouring Bodies	-	Yes
	27.1	Light Pollution to Night Sky	1	1
Microbial Control	28.0	Legionella Impacts from Cooling Systems	1	1
Refrigerant Impacts	29.0	Refrigerants Impacts	1	
Total			**5**	**4**
Innovation			**10**	
Innovative Technology or Process	30A	Innovative Technology or Process	10	3
Market Transformation	30B	Market Transformation		
Improving on Green Star Benchmarks	30C	Improving on Green Star Benchmarks		
Innovation Challenge	30D	Innovation Challenge		
Global Sustainability	30E	Global Sustainability		
Total			**10**	**3**

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