Review of Environmental Factors Report

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220577 WENTWORTH HEALTH SERVICES REDEVELOPMENT

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1 Executive Summary

This report has been prepared by LCI Consultants for the Wentworth Health Services Redevelopment (WHSR) project, with input from the Health Infrastructure (HI) NSW, Mostyn Copper (MC) and the project design team. This Review of Environmental Factors (REF) Report has been prepared at the completion of Schematic Design Phase (Part 3).

The purpose of this report is to demonstrate how the design initiatives for the project respond to the sustainability requirements for the project. The drivers for the project are:

- The Principles of Ecologically Sustainable Development
 - the precautionary principle,
 - o inter-generational equity,
 - o conservation of biological diversity and ecological integrity,
 - o improved valuation, pricing, and incentive mechanisms.
- Health Infrastructure NSW Design Guide Note 58
 - HI ESD Evaluation Tool (minimum 45 points + 5 buffer points)
- NSW Government Resource Efficiency Policy 2019
- Health Infrastructure Engineering Services Guidelines 2021 and Australian Health Facility Guidelines
- NSW Net Zero Carbon Targets

These are elaborated upon in Section 3 of this report.

The ESD strategies proposed to date are based on input from key stakeholders during meetings and workshops with the Executive User Group (EUG), Expert Reference Group (ERG), Aboriginal Persons and Hospital Staff, as well as ongoing co-ordination with the wider project design team. The relevant stakeholders and design team members have performed as a collective and have approached the process in a supportive and open manner.

Key ESD initiatives incorporated in the project include:

- Full electrification of the site in line with Health Infrastructure's long-term electrification strategy and to
 reduce carbon footprint. The site currently uses LPG gas, and transitioning to 100% electrification will
 enable a future of carbon neutral operations and cheaper running costs.
- Consultation and Incorporation of Indigenous Design Elements
- Onsite Renewable Energy via Rooftop Solar Photovoltaics (PV) cells
- Outdoor green spaces and access to nature
- Enhancement of ecological values through green infrastructure and planting selection.
- Reduce building energy use and associated carbon emissions through passive design strategies and energy efficiency considerations
- Promote the use of low carbon transport model through the provision of services for EV charging
- Ongoing development of a Climate Change Risk Assessment (CCRA) and adaptation plan
- Views to external planting for connection to nature, natural daylighting and glare control
- Design for Lighting comfort, Acoustic comfort and Thermal comfort
- Reduction of embodied energy in construction materials



- Minimising demolition and construction waste
- Increasing the use of sustainable materials and recycled content
- Use of materials with low off-gassing (low VOC's and Formaldehyde)
- Operational waste reduction and recycling
- Sustainable drainage system considered such as biofiltration and swales.

Please note that the quality of patient care remains the priority throughout with sustainable design strategies supporting the patient care and without detriment. The strategies will be considered within the project constraints such as budget, programme, site, infection control etc to ensure appropriate and sensible outcomes.



2 Introduction

2.1 Sustainable Design in Hospitals

Hospital building design is vital in providing healthy environments for patients, staff, and visitors. Good design is the key to maximising the sustainability of a building. Within the health sector, sustainability shifts to work in conjunction with the function of the building, optimising healing. Healthcare facilities and hospitals should strive to create environments that promote healing and occupant wellbeing through design, social inclusion and resilience to the changes in climate and resource scarcity.

Hospitals and healthcare facilities are typically quite resource intensive, and this is due to the nature of their use, 24-hour functionality of the services they provide to the community. Making a Hospital and Healthcare facility will provide three key benefits ^{[1][2]}:

- The positive societal and environmental influence of the health sector fulfilling its obligation to "do no harm". To achieve climate-friendly hospitals, the WHO suggests seven focus areas: energy efficiency, green building design, alternative energy production, transportation, food sustainability, waste reduction and water conservation.
- Health benefits will accrue from reducing carbon emissions and other pollutants created by waste disposal.
- Reducing energy usage and waste will reap economic benefits.

Impacts	
Direct Health Impacts	 The emitting of carbon into the atmosphere through waste generation and the consuming of natural resources. Health impacts of climate change i.e., heat-related injuries and deaths, mortality from increasingly severe natural disasters, rising numbers of vector-borne diseases. Ambient air pollution linked to chronic diseases.
Waste Generation	 Single-use clinical equipment, disposable linen, excessive packaging, materials contaminated by patient fluids. General waste includes food waste, paper, cardboard and plastic, and similar waste to that typically generated from households.
Energy Use	 Direct emissions from the production of gas and electricity, in lighting, heating, and cooling, hot water, steam, ventilation, equipment, and the running of cooking and cleaning appliances.
Water Use	Water use for sanitary, domestic uses, and building systems

Healthcare and Hospital Buildings have further specific and direct impacts on the environment that we can minimise and reduce. These impacts include:

In developing the WHSR, sustainable design principles are supportive, integral and bring enhancements to the project and operations. A balanced approach is thus needed, where sustainable solutions are evaluated via the design team from a financial and performance viewpoint.

[1] The World Health Organization (WHO)

[2] The Medical Journal of Australia



2.2 How WHSR will achieve Sustainable Design

This section outlines the process undertaken in incorporating the proposed ESD strategies for the WHSR project to date. The WHSR's approach to Sustainable design relies on an understanding of the project requirements/brief, building function, climate, and client's (Health Infrastructure and FWLHD) sustainability aspirations (design principles). Key to the Sustainable design approach has been to target the Sustainability Strategies that offer value to the WHSR project and determined through a 'Value Based Assessment' (Figure 1). Strategies that align to the Design Principles of the project (Figure 2), and provide a social, environmental, anticipated operational benefit and cost effective have been targeted.



Figure 2: WHSR Design Principles (by HI NSW)



The ESD approach ensures that the needs and aspirations/priorities are considered early in the design stages. The Sustainability strategies considered to date have been based on input from stakeholders during workshops and meetings and ongoing co-ordination with the project design team.

The key workshops, meetings and actions during concept design were as follows:

- EUG (Executive User Groups)
- ERG (Expert Reference Groups)
- FWLHD Engineering
- Comms (Walk on Country, Information Session, Council Briefing, Aboriginal Focus Groups, Coomealla Health Aboriginal Corporation)
- Design team meetings and workshops (Sustainability and Climate Resilience)

The ESD principles and outcomes, which have been summarised in the main body of this report (Section 5 Sustainable Design Initiatives), are intended to form the ESD brief for further review and consideration during the future stages of design.



3 Sustainability Requirements

The purpose of this report is to demonstrate how the design initiatives for the project respond to the sustainability drivers of the project. The drivers for the project are below and their adherence is demonstrated in the following sub-headings.

- Section 3.1 Expansion and response to Principles of Ecologically Sustainable Development
- Section 3.2 Health Infrastructure NSW Design Guide Note 58 Ecological Sustainable Design
 - Section 3.2.1 HI ESD Evaluation Tool
- Section 3.3 NSW Government Resource Efficiency Policy
- Section 3.4 NSW Health Infrastructure Engineering Services Guidelines
- Section 3.5 NSW Net Zero Carbon Targets

3.1 Principles of Ecologically Sustainable Development

The principles of Ecologically Sustainable Development are the following -

- the precautionary principle,
- inter-generational equity,
- conservation of biological diversity and ecological integrity,
- improved valuation, pricing, and incentive mechanisms.

3.1.1 The Precautionary Principle

The precautionary principle is 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 applying the precautionary principle, public and private decisions should be guided by-

(a) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and (b) an assessment of the risk-weighted consequences of various options.

Project response:

The proposed project will be constructed on previously developed land. During the design and construction phases, the main contractor will implement an independently certified Environmental Management System (EMS), which demonstrates formalised systematic and methodical approach to planning, implementing, and auditing. Throughout the building's operation, adherence to procedures that account for environmental risk and mitigation measures will be met.



3.1.2 Inter-generational Equity

The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

Project Response:

To uphold inter-generational equity, the proposed development minimises the consumption of energy and water resources whilst reducing embodied carbon and waste. The ESD principles incorporated into the proposed development facilitates the conservation of energy and water resources through energy and water efficiency measures.

Energy consumption will be designed to achieve a minimum 10% improvement above National Construction Code requirements (NCC BCA 2022) and is targeting even higher levels of efficiency. The building is designed to be fully electric creating a pathway for a future net-zero carbon emissions building when the procured electrical energy comes from a renewable source. Onsite renewable energy from solar PV panels will reduce grid demand. Provision of services for EV charging has been included.

The reduction in water use will be established through high WELS rated water fixtures and fittings and a rainwater capture and reuse for irrigation of the landscape.

Waste generated during the construction and operational phases will be diverted from landfill to be recycled. An Environmental Management System (EMS) will be established and adhered to throughout construction. Operational waste streams will be separated to maximise recycled waste once the building is complete and occupied.

3.1.3 Conservation of Biological Diversity and Ecological Integrity

The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

Project Response:

This redevelopment project sits on a developed block surrounded by neighbouring river. The land has previously been built up to protect the buildings from erosion. Therefore, nothing within the project's boundary could be considered undeveloped. This will not have an adverse environmental impact and therefore alleviates concern of serious or irreversible environmental damage. These trees will help prevent erosion, create habitat for fauna, assist in reducing the temperature in the localised area during hot days and increase building occupants' connection to nature. The future designed garden space celebrates the natural environment with input from indigenous consultants.

The project's ESD principles to reduce energy, water and waste consumption have an indirect impact to conserve biodiversity and ecological integrity to the surrounding area. By minimising demand on energy and water resources, the need for land-clearing and the pollution generated from new utility infrastructure to support the surrounding area will be minimised.

3.1.4 Improved valuation, pricing, and incentive mechanisms.

The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services.

Project Response:



The valuation of the project's assets and services consider environmental factors through the implementation of various ESD initiatives. An Environmental Management System will be in place throughout the construction to ensure that excessive pollution and waste are minimised, and to establish recycling and avoid landfill waste streams during construction and operational phases. This creates a system where pollution is managed and controlled and creates an incentive to reduce pollution and waste.

In operation, the pursuit of resource efficiency for energy and water will reduce running costs and increases the value of the development to HI NSW, the FWLHD and patients and employees alike.

3.2 Health Infrastructure NSW Design Guide Note 58 Ecological Sustainable Design

The HI DGN 058 has been developed by HINSW and outlines the requirements for Ecological Sustainable Design, including the roles and responsibilities of the Independent HI ESD consultant/Reviewer and the Contractors ESD Consultant. The roles and responsibilities and timing of submissions and reviews shall be co-ordinated with the HI Independent ESD reviewer.

LCI Consultants have been engaged by Health Infrastructure for Part 2 Concept Design Stage and Part 3 Schematic Design Stage as the HI ESD Consultant/Reviewer.

3.2.1 HI ESD Evaluation Tool

The HI ESD Evaluation tool has been developed by Health Infrastructure. The tool is based primarily on the Green Star rating scheme and allows projects to target and award sustainability initiatives that offer value to the project. The HI ESD Evaluation tool primarily focuses on sustainability initiatives from the Green Building Council of Australia's Design and As-built tools, as this tool has been specifically developed for the Australian Construction Industry. The HI ESD Evaluation tool utilises the same scoring system and initiatives to align with the best practice sustainable design.

Refer to Section 5.1 for a summary of point targeted for the WHSR project.

The HI ESD Evaluation tool indicates credits that are considered standard practice, high priority, and lower priority. The purpose of this identification is to focus the team on firstly targeting sustainability initiatives that are valuable to healthcare facilities, and deliver on key sustainability issues, such as occupant and staff wellness, energy and water reduction and waste minimisation. The following sections provide more detail about the Green Star rating system.

3.2.1.1 Green Star Design and As built

Green Star is a voluntary scheme administered by the national, not-for-profit organisation, Green Building Council of Australia (GBCA). The Green Star suite of tools provides an environmental sustainability rating of a building's performance. The tools are performance based and assess the environmental attributes of new and refurbished buildings in every state across Australia. The Green Star rating system is scaled to a star level from 0 to 6 stars. The Green Star total weighted point threshold for each star rating is illustrated in Figure 3.

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Figure 3: Green Star Rating Scale

The HI DGN 58 and ESD Evaluation tool utilises the same scoring and requires a minimum of 45 points for a 4 Star rating + 5 Buffer Points by the completion of Tender Design.

Appendix A reflects the schematic design pathway for compliance with DGN 058. As design moves transitions to detailed design and up through to the end of construction, some of the targeted credits may drop off while others may be picked up. This document is current but not certain.

It is important to note that the basis of the HI ESD Evaluation Tool is based on the Green Star Design and as built v1.3 rating tool which has been superseded by the Green Star Buildings v1 rating tool (mandated from December 2021).

There are several differences between the Design and as built v1.3 and Buildings v1 rating tool, including the following. As an overview:

- There are new categories that are broader reaching than before which could mean more collaboration needed with HI regarding broader operational policies and guidelines.
- There are 15 minimum credits that must be achieved. Many are straight forward but some that are related to Net Zero Carbon operation such as the exclusion of natural gas use, even for cooktops. There is also additional modelling work/effort in achieving fabric energy reductions of 10% beyond NCC code and modelling key structural items in LCA software.
- Credit benchmarks have reduced significantly for 4 Star rated buildings, perhaps as a way of involving more parties that may have been reluctant to rate before. This may allow hospitals to achieve ratings in the future more easily/cost effectively. The 6 Star benchmark has not reduced significantly.
- The scoring system has also changed with more initiatives rewarded by multiple points with no part-scaling. This means points are now easier to lose if thresholds are not met or multiple requirements are not ALL achieved. This means tracking targeted outcomes through design and delivery is even more crucial and having an experienced ESD consultant throughout is essential.



3.3 NSW Government Resource Efficiency Policy 2019

Below are the four categories of the GREP with each relevant target listed beneath them with an individual response to how the building is adhering to the requirements. The following table demonstrates how the project responds to the relative GREP requirements.

Category	Requirement	Response	Section in Report
Energy	E1: Target to save energy across all government sites	Minimum of 10% reduction in energy against NCC	4.3
	E3: Minimum standards for new electrical appliances and equipment	These will be captured during procurement	4.3
	E4: Minimum standards for new buildings and fit-outs	4 Star Design & As Built Green Star Rating (certification not mandatory)	5.1
	E5: Whole-of-government color target	Solar DV system surrently included in	12
	ES. Whole-or-government solar target	the design	4.5
	E6: Minimum fuel efficiency standards for new light vehicles	Provision of services for EV charging	4.3
	E7: Purchase 6% GreenPower	Far West Local Health District is to adhere to this	4.3
Water	W1: Report on water use	This is captured in targeting Credit 5.1 – Commitment to Performance – Environmental Building Performance	4.6
	W3: Minimum standards for new water- using appliances	These WELS ratings will be implemented in the procurement stage	4.6
Waste	P1: Report on top three waste streams	Project to report on their top three waste streams	4.1
Clean air	A1: Air emission standards for mobile non- road diesel plant and equipment	Requirement to pass on to head contractor	4.2
	A2: Low-VOC materials	This has been targeted in Credit 13 – Indoor Pollutants	4.2



3.4 NSW Health Infrastructure Engineering Services Guidelines

The Engineering Services Guidelines (NSW HI ESG) provide a performance-based guide for the development of design and specification documentation for healthcare facilities.

The guidance document states that integrated, built environment sustainability must be considered, including appropriate designs for energy and water, and the use of appropriate materials. In addition, the indoor environment must consider air quality, ventilation, daylight, and other factors that influence thermal, visual, acoustic, and psychological comfort.

The requirements of the NSW HI ESG requirements will in many cases assist with achieve ESD strategies and have been specifically designed for Healthcare Buildings to ensure spaces function as required. In some instances, the ESD strategies may not be appropriate to certain spaces and will be identified and defined by the project team.

3.5 Alignment with NSW Net Zero Carbon Targets

NSW Government plans for all buildings to be Net Zero Carbon in operations by 2050. This would require no Scope 1 or Scope 2 emissions. This would require no fossil fuels burnt on-site and refrigerants to be offset with carbon offsets for their Scope 1 emissions and procuring 100% Green Power to eliminate Scope 2 emissions if the energy grid has not completely decarbonised.

Since this building is fully electric, it aligns with the requirements for NSW to reach its target in 2050. It will be up to the Far West Local Health District to procure 100% Green Power and purchase offsets for refrigerant to reach Net Zero Carbon for this project.



4 Sustainable Design Initiatives

The following Sustainable Design Initiatives have been incorporated into the WHSR project. The strategies are organised in 9 categories as per the Health Infrastructure DGN 58 ESD Evaluation tool. The categories are:

- Management
- Indoor Environmental Quality
- Energy & GHG Emissions
- Materials
- Transport
- Water
- Land use and Ecology
- Emissions
- Innovation

The strategies will be benchmarked against the HI ESD Evaluation Tool to achieve a minimum 4 Star Rating as per the HI DGN 58 Ecological Sustainable Design.



4.1 Management

The following sustainable building design and construction management practices have been proposed for the WSHR project. These strategies seek to implement process and practices to maximise sustainable design opportunities from project design through to construction and operation.

The management category aligns with the following project design principles.



Sustainability Category	Key Principles / Strategies	Status
Management	 Development of a Climate Adaptation and resilience plan through the workshops designers to identify risks and resilience measures in addressing climate risks such as: more hot days and fewer cold nights. an increase the number of heatwave events. more hot days above 35°C; particularly in Spring and Summer. Rainfall is projected to remain similar, projected to increase across the region during autumn a change in rainfall patterns that will affect drought and flooding events 	A climate adapation and risk workshop has been undertaken. Current control measures and mitigation and management strategies have been identified by the team. Ongoing development of the measures will be incorporated during the next phase.
	• Building services review, commissioning, and tuning building process as part of the construction and handover	A services and maintainabiliy review is required during the next phase of the design.
	Handover of Building operations manuals to the FWLHD/Facility Management	To be included in builders contract/specifications
	Implementation of Environmental Construction Management Plans	To be included in builders contract/specifications
	Contractor sustainability, mental health, drug, and alcohol abuse education	To be included in builders contract/specifications
	 Building energy and water metering and monitoring design for ongoing review of energy and water consumption. 	Energy and water metering has been included in the design.
	Operational Waste Management	Waste storage area has been included in the design.
		The FWLHD to review the exisitng operational waste management plan to identify any further operational waste mangement opportunities.

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Design for the

consumer



4.2 Indoor Environment Quality

The following Indoor Environment quality strategies have been proposed to improve occupant comfort and wellbeing. The strategies seek to address visual comfort, thermal comfort, indoor air quality and acoustic comfort.

The indoor environment quality category aligns with the following project design principles.



Design for wellbeing

Sustainability Category	Key Principles / Strategies	Status
Indoor Environment Quality	Design mechanical services systems to reduce source pollution between outdoor air intakes and exhausts	Incorporated in the design. Outdoor air intakes and exhausts include seperation distances in accordance with the credit requirements of 9.1.
	 Provided dedicated exhausts for pollutant emitting sources within the building 	Included in the design. The FWLHD has also been provided with advice regarding low emission printers/photocopiers required to achieve this measure.
	 Incorporate cleaning measures and plans to HVAC during construction (protect against dust) 	To be included in builders contract/specifications
	• Utilise passive design strategies to reduce energy consumption such as solar shading, high levels of insulation and thermally efficient glazing (double glazing with low U-values and low Solar Heat Gain Coefficients with appropriate visible light transmittance).	Incorporated in the design (solar shading, window units with low U-values and SHGC).
	• Optimise window locations and size to promote thermal efficiency whilst still achieving good access to views and natural daylight	Incorporated in the design. NBRS, Steensen Varming and LCI have reviewed the design. NBRS have iterated on the façade design to optimise the window location and size.
	• Promotion of views, natural daylighting, and glare control	Incorporated in the design.
	• Utilise LED lighting with good colour rending index and flicker free, appropriate illumination levels, glare reduction from bare light sources and lighting controls	Incorporated in the design.
	Use materials with low VOC and Formaldehyde off- gassing	To be included in builders contract/specifications



Sustainability Category	Ke	y Principles / Strategies	Status
	•	Maintained illuminance meets the recommended levels of AS1680.2.1, and lighting glare is eliminated.	Incorporated in the design.
	•	Design for access and maintenance to ventilation systems	Incorporated in the design.
	•	Thermal Comfort modelling	Incorporated in the design. Thermal comfort has been assessed at the completion of Schematic Design phase.



4.3 Energy & GHG Emissions

The WHSR has adopted the energy hierarchy approach in reducing energy use. The energy hierarchy approach seeks to systematically targeting building energy use through passive means first, then supported by efficient active systems and renewable energy. The energy conservation strategies considered for the WSHR are included below.

The energy and GHG emissions category aligns with the following project design principles.





Design for efficient & flexible delivery of care

Sustainability Category	Key Principles / Strategies	Status
Energy & GHG Emissions	• Building electrification (no fossil fuels burned on site) to support NSW Government Net Zero by 2050 goals)	Incorporated in the project. Electrification of building systems include: - Kitchen - Domestic hot water - HVAC
	• Achieve a minimum 10% GHG Emissions reduction compared to the NCC 2019 Section J requirements. This is to be demonstrated through thermal modelling (computer simulation).	Incorporated in the project. The building has been modelled at the completion of Schematic Design phase and demonstrates a minimum of 10% Reduction in GHG emissions have been achieved.
	• Façade design to incorporate passive design elements such as solar shading, improved construction R-values and moderate to high performance window systems with lower U-values and SHGC	Incorporated in the design (solar shading, window units with low U-values and SHGC).
	• Support building demands through energy (high) efficient systems for Building HVAC, Fans, Pumps, Artificial lighting, External Lighting, etc	Incorporated in the project.
	Onsite Roof top Solar Photovoltaic array	A Solar Photovoltaic rooftop array has been incorporated in the project.
	Assess peak electricity Demand reductions	Peak electricity demand reduction has been assessed at the completion of Schematic Design phase. The target of 20% reduction in peak electricity demand has been demonstrated in the energy model.



4.4 Materials

The following materials and construction waste strategies have been proposed for the WHSR to increase the uptake of environmentally preferable materials with a focus on reuse and recycle content, reduced embodied energy, greater transparency, and reduction of waste to landfill.

The materials category aligns with the following project design principles.



Design for sustainabiliity

Sustainability Category	Ke	y Principles / Strategies	Status
	•	Reduce use of PVC products (use alternatives) or use Best Environmental Practice certified PVC products	To be included in builders contract/specifications
	•	Utilise products with a recycled content, third party certifications, EPD's, stewardship programs	To be included in builders contract/specifications
Materialo	•	Reduce demolition and construction waste by 90%	To be included in builders contract/specifications
	•	Use of prefabricated staff accommodation buildings	Incorporated in the project.

4.5 Transport

The WHSR has limited opportunities to provide low carbon transport initiatives as it is located within the region. The hospital can be accessed driving.

The transport category aligns with the following project design principles.





4.6 Water

The WHSR has adopted the water hierarchy approach in reducing potable water use. The water hierarchy is similar to the energy hierarchy, and seeks to reduce potable water demand, then supported by efficient distribution systems and recycled water / non-potable water sources. The water conservation strategies proposed for the WHSR are included below.

The water category aligns with the following project design principles.



Design for sustainabiliity

Sustainability Category	Ke	y Principles / Strategies	Status
	•	WELS rated low water efficient fixtures and fittings	NBRS to confirm selections during the next phase and to be included in builders contract/specifications.
Water	•	Rainwater tank for landscape irrigation (not potable water)	Incorporated in the project.
	•	Capture of fire systems test water for reuse on site i.e., landscape irrigation	Incorporated in the project.
	•	No water-based heat rejection systems in HVAC plant	Incorporated in the project.
	•	Low water demand irrigation systems i.e., drip irrigation	Proposed for the project, subject to FWLHD approval.
	•	Low water demand landscaping	Incorporated in the project.
	•	Fire system test water to be captured in the fire test tank for reuse.	Incorporated in the project.



4.7 Sustainable Sites: Landuse and Ecology, and Emissions

The following sustainable site strategies have been proposed to:

- Reduce the negative impacts on sites as a result of construction and development and enhancing the local ecology.
- Reduce the negative impacts associated with buildings, such as refrigerant leaks, storm water peak discharge and pollution and light pollution.

The Landuse and Ecology, and Emissions category aligns with the following project design principles.



Sustainability	Key Principles / Strategies	Status
Category		
Landuse and	Landscaping design to include endemic and climate appropriate species	Incorporated in the project.
	 Improve the ecological value (biodiversity) of the site through plant species 	To be included in builders contract/specifications
Ecology	Contamination and Hazmat studies undertaken	Incorporated in the project and to be included in builders contract/specifications
	Reduce urban heat island effect using landscaping, tree canopy cover, light colour roofs etc	Incorporated in the project. Light colour roof (Evening Haze) and extensive landscaping has been prooposed.
	 Design landscaping appropriate to climate, climate change, region, and culture (Indigenous planting/landscaping) 	Incorporated in the project.
	• Incorporate Water Sensitive Urban Design features, such as Bio Swales and site surface treatments to maximise infiltration and passive Irrigation.	Incorporated in the project.
Emissions	• Stormwater system to be designed with passive irrigation, infiltration and reduce peak stormwater run-off when compared to the current site	Incorporated in the project.
	Reduction in stormwater pollution leaving the site	Incorporated in the project.
	 External lighting to reduce light pollution and eliminate upward lighting to the sky 	Incorporated in the project.



Sustainability Category	Key Principles / Strategies	Status
	• Legionella reduction in HVAC heat rejection through use of air base heat rejection systems	Incorporated in the project. VRF systems proposed.

4.8 Innovation

The following strategies are considered innovations as they seek to exceed above good practice sustainable design targets.

The innovation category aligns with the following project design principles.



Sustainability Category	Ke	y Principles / Strategies	Status
\frown	•	Use of Ultra low VOC paints	To be included in builders contract/specifications.
Innovation	•	Thoughtful design of Universal Access, that goes beyond DDA requirements	Proposed for the project. Further development including workshops and design elements to be detailed during the next design stage.
	•	Incorporation of Indigenous Design elements through consultation with Aboriginal Communities	Incorporated in the project. Aboriginal consultation has been undertaken, with positive feedback provided from the consultation process.
	•	Implement HINSW Reconciliation Action Plan	Propsoed for the project. Further development including HI NSW targets to be detailed during the next design stage, including any builders contract/specifications requirements.
	•	High Performance Site office for contracting staff (focus on energy, water, and comfort)	To be included in builders contract/specifications.



5 Sustainability Benchmarking

As discussed in Section 3.2 HI ESD Evaluation Tool, this section provides the status of points targeted to in achieving a 4 Star rating against the HI ESD Evaluation Tool.

5.1 HI ESD Evaluation Tool - Points Summary

The number of points available in each category and the points targeted in the respective categories as well as the total weighted points available and targeted is summarised in Table 1.

The WHSR project is targeting a 4 Star rating; indicating a minimum of 45 points + 5 buffer points to be achieved. LCI is also recommending targeting several points of safety margin above the 4 Star threshold to act as a buffer due to potential loss of points during the construction stage.

Table 1 summarises the percentage breakdown of available credit points for each category, totalling to 100 points and the score targeted in the 4 Star self-certified pathway.

Environmental Category	4 Star Target (Project Target)	Points Available
Management	11	14
Indoor Environmental Quality (IEQ)	10	17
Energy	5	22
Transport	1	10
Water	5	12
Materials	4	14
Land Use and Ecology	4	6
Emissions	4	5
Total Points	44	100
Sub-Total Percentage Score	44	100
Innovation	9	10
Grand Total Percentage Score	53	110

Table 1: HI ESD Evaluation Tool Category and Points Summary

LCI have modified the standard issue excel spreadsheet provided by HI NSW to provide additional relevant information; *refer to Appendix A HI ESD Evaluation Tool*. The LCI spreadsheet displays information regarding a brief description of each credit, respective compliance requirements and the provide simple and easy to use documents.



Appendix A - HI ESD Evaluation Tool

The following HI ESD Evaluation Tool is a live document and currently in a work in progress status. The Tool will be continually updated throughout the design phase to capture commentary and design development.



					Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
	-			-		-
1.1	Accredited Professional	Contractual engagement of GSAP at all stages of the project from schematic design through to practical completion and certification	1	No Risk	1	HI / LHD / ESD
2.0	Environmental Performance Targets	Minimum Credit Requirement: Documented targets for the environmental performance of the project to be set through a design intent report or an owner's project requirements document.	Credit Minimum	No Risk	To Comply	Client / ESD / All input
2.1	Services & Maintainability Review	Comprehensive services and maintainability review of the project led by the head contractor or owner's representative (e.g. ICA) during the design stage and prior to construction	1	Low	1	PM / FM team / Building Services team / Head contractor
2.2	Building Commissioning	Comprehensive pre-commissioning and commissioning activities are performed for all building services according to AIRAH/CIBSE codes for all services or ASHRAE for mechanical services only. Air permeability test to be carried out in accordance with AS/NZS ISO 9972:2015.	1	No Risk	0	Building Services team / Head contractor
2.3	Building Systems Tuning	Tuning process in place requiring, as a minimum, quarterly adjustments and measurements for the first 12 months after occupancy and review of building system manufacturer warranties. Tuning process requires analysis of monitoring system data and assessment of occupant feedback on building conditions.	1	Low	1	Building Services team / Head contractor
2.4	Independent Commissioning Agent (ICA)	Engagement of an ICA to advise, monitor, and verify the commissioning and tuning of all building systems	1	No Risk	0	HI / ICA
3.1	Climate Adaption Plan	Implementation of a Climate Adaption Plan according to AS5334:2013 or ISO31000-2009 & AGO, Climate Change Risks and Impacts	2	High	2	PM / All / Climate Assessor

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
4.1	Building Operations & Maintenance Information	Produce comprehensive Building Operation and Maintenance information made available to Facilities Management team. Relevant and current building user information is developed and made avaialble to all relvant stakeholders.	1	No Risk	1	Head Contractor
5.1	Environmental Building Performance	Commitment to set performance targets for 80% of the Gross Floor Area (GFA) to measure, and report on at least two environmental building performance metrics such as GHG emissions, potable water usage, operational waste etc. OR achieve certified operational performance ratings in accordance with Green Star.	1	Low	1	LHD
5.2	End of Life Waste Performance	Commitment to reduce demolition waste at the end of life of an interior fit out or base building component for at least 80% of the GFA	1	Low	1	LHD / NBRS
6.0	Metering	Minimum Credit Requirement: Provide accessible metering to all energy and water consumption covering common and major uses and sources for distinct uses or floors (whichever is smaller). Energy items >100kVA must be individually metered. Meters are to be commissioned and validated as per NABERS protocol.	Credit Minimum	Low	Yes	Electrical / Mechanical / Hydraulics
6.1	Monitoring Systems	Implementation of a monitoring strategy in accordance with a recognised standard (e.g. CIBSE TM39 Building Energy Metering), capable of capturing and processing data from all energy and water meters, and accurately and clearly presenting data consumption trends.	1	Low	1	Mechanical

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7.0	Environmental Management Plan (EMP)	Minimum Credit Requirement: Engaged Contractor must implement a project specific EMP meeting requirements of the NSW Environmental Management System Guidelines.	Credit Minimum	No Risk	To Comply	Head Contractor
7.1	Formalised Environmental Management System	Engaged Contractor to have a Formalised Environmental Management System with evidence of independent auditing & system compliance to ISO 14001.	1	No Risk	1	Head Contractor
7.2	High Quality Staff Support	Promote positive mental and physical health outcomes of site activities and culture of site workers through programs and solution on-site. Enhance site workers' knopwledge on sustainable practices through on- site, off-site, online education programs	1	Medium	1	Head Contractor
84	Performance Pathway: Specialist Plan	Engagement of a qualified waste auditor/professional specialist to prepare and implement an Operational Waste Management Plan (OWMP) for the project in accordance with best practice approaches. Requirements of the OWMP must be reflected in the development waste facilities provided.				
8B	Prescriptive Pathway: Facilities	Provide occupant waste storage containers for separation of all applicable waste streams, have a dedicated waste storage area for collection of all waste sized to handle all waste streams that is provided to meet best practice access requirements.	1	High	1	Operational Waste Auditor / HI / LHD / PM / Architect
		Category Total	14		11	

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	65	70	75	80	85	90



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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
9.1	Ventilation System Attributes	Mechanical ventilation systems are to be: 1. designed in accordance with ASHRAE Standard 62.1:2013 regarding separation of outdoor air intakes & pollution sources to minimise entry of pollutants; 2. designed with provision of access for maintenance and cleaning to both sides of all moisture and debris-catching components; and 3. cleaned prior to occupation and use, covering all new and existing ductwork.	1	Medium	1	Mechanical
9.2	Provision of Outdoor Air	For mechanically ventilated or mix mode spaces, outdoor air is provided at a rate 50%(1 point) /100% (2 points) greater than the minimum required by AS1668.2-2012, or CO2 concentrations are maintained below 800ppm/700ppm through a CO2 monitoring & control system. For naturally ventilated spaces 2 points are awarded where the requirements if AS 1668.4-2012 are met.	2	No Risk	0	Mechanical
9.3	Exhaust OR Elimination of Pollutants	Provide exhaust systems in accordance with AS1668.2-2012 to remove pollutants from printing and photocopy equipment, cooking processes and equipment, and vehicle exhaust &/OR remove the source of these pollutants. (For photocopiers, equipment with listed certifications can be used in place of dedicated exhaust ventilation)	1	Low	1	Mechanical (building exhaust)/ LHD (printers and photocipiers)
10.1	Internal Noise Levels	Internal noise levels in the nominated area considering all internal & external noise sources are to be no more than 5dB(A) above the "satisfactory" sound levels listed in AS/NZS 2107:2016	1	No Risk	1	Acoustics
10.2	Reverberation	The reverberation time in the nominated area must be below the maximum stated in AS/NZS 2107:2016	1	No Risk	0	Acoustics
10.3	Acoustic Separation	The partition between the nominated enclosed (typically occupied) spaces should be constructed to achieve a weighted sound reduction index (Rw) of at least 45 OR the sound insulation between enclosed spaces complies with DW + LAeqT > 75	1	No Risk	0	Acoustics

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
11.0	Minimum Lighting Comfort	Minimum Credit Requirement: All lights in the nominated area are installed with ballasts (flicker free) and have a minimum Colour Rendering Index (CRI) of 80	Credit Minimum	No Risk	To Comply	Lighting
11.1	General Illuminance & Glare Reduction	Maintained illuminance meets the recommended levels of AS1680.2.1, and lighting glare is eliminated.	1	No Risk	1	Lighting
11.2	Surface Illuminance	A combination of lighting and surfaces in the nominated area improve uniformity of lighting to give visual interest. Over 95% of nominated area's ceiling to have an surface reflectance value >0.75 and a lighting system to provide an average surface illuminance of at least 30% of the lighting levels on the working plane.	1	No Risk	0	Lighting
11.3	Localised Lighting Control	Occupants have the ability to control the lighting in their immediate environment including on/off switching and adjusting lighting levels.	1	No Risk	1	Electrical / Lighting
12.0	Glare Reduction	Minimum Credit Requirement: Demonstrate that glare from sunlight through the viewing facades in the nominated area is reduced through a combination of blinds, screens, fixed devices, or other means. Where the functional requirements of an are require the exclusion of daylight and views, these areas may be excluded.	Credit Minimum	Low	Complies	Architect
12.1	Daylight	At least 40% or 60% of the nominated area must demonstrate a daylight factor (DF) of 2%.	2	High	1	Architect

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
12.2	Views	At least 60% of the nominated area has a clear line of sight to an external view or a high quality internal view. Floor area within 8m from a compliant window, atrium or view can be considered to meet the criteria.	1	Medium	1	Architect
13.1	Paints, Adhesives, Sealants & Carpets	At least 95% of all internally applied paints, adhesives, sealants and carpets meet the stipulated 'T-VOC limits'	1	Low	1	All / Head Contractor
13.2	Engineered Wood Products	Engineered Wood Products: At least 95% of all engineered wood products meet the stipulated formaldehyde limits	1	Low	1	All / Head Contractor
14.1/2	Thermal Comfort	For mechanically ventilated spaces,a Predicted Mean Vote (PMV) levels between -1 and +1 must be achieved (1 point) and PMV levels between - 0.5 and +0.5 much be achieved for advanced thermal comfort (2 points)	2	Low	1	Mechanical
	·	Category Total	17		10	

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					Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
15E.0	GHG Emissions Reduction	Project teams must demonstrate that the project is subject to a NABERS Energy Commitment Agreement for a minimum of 5 Stars.	Conditional	Low	To Comply	Arch / ESD / Mechanical / Electrical / Hydraulics / VT
15E.1	GHG Emissions Reduction	GHG Emissions reduction: Building Fabric Intermediate Building Relative to Benchmark Building: - Conditional Requirement: 2 points - 2%: 1.0 points - 4%: 2.0 points - 6%: 3.0 points - 8% (max): 4.0 points	4	Medium	TBC	Arch / ESD
15E.2	GHG Emissions Reduction	GHG Emissions reduction - Proposed Building Relative to Benchmark Building: - Conditional Requirement: 2 points - 10%: 3.4 points - 20%: 4.8 points - 30%: 6.2 points - 40%: 7.6 points - 60%: 10.4 points - 80%: 13.2 points - 100% (max): 16.0 points	16	Medium	2	Arch / ESD / Mechanical / Electrical / Hydraulics / VT
15E.3	Off-Site Renewables	Commit to procuring 100% off-site renewable electricity for a minimum period of ten years.	15E.2 Result X 1.5 Points	No Risk	0	LHD / HI / PM
15E.3	District Services		N/A	High		

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					Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
15E.5.1.1	Transition Plan	Project teams reduce their fossil fuel use and develop a transition plan to phase them out.	1	No Risk	0	HI/LHD / PM / Mechanical / Electrical / Hydraulics
15E.5.1.2	Fuel Switching	No fossil fuels are burned on site to generate electricity, heating or cooling.	2	Medium	2	HI/LHD / PM / Mechanical / Electrical / Hydraulics
15E.5.1.3	On-Site Storage	On-site procurement and use strategy demonstrating to match the requirements of the building. Stored energy will be used to reduce evening peak electricity demand. All renewable energy not used by the building will be stored for later use.	1	No Risk	0	HI/LHD / PM / Electrical
16A	Prescriptive Pathway: On-site Energy Generation	The use of on-site electricity generation systems reduces the total peak electricity demand by at least 15% (1 point)	0			
16B	Modelled Performance Pathway: Reference Building	Improvement in Proposed Building Peak Electricity Demand over Reference Building Peak Electricity Demand v1.3 - sliding scale 20 (1pt) -30 (2pt)%	1	Medium	1	Mechanical / Electrical / ESD
		Category Total	22		5	

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	65	70	75	80	85	90



					Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
17A	Performance Pathway	Up to 10 points are awarded where the proposed transport solutions on site decrease emissions from transport, decrease mental and social impacts of commuting, and encourage uptake of healthier active transport options based on comparison to a Reference Building.	10	No Risk	0	PM / Traffic
17B.1		B.1 Access by Public Transport (up to 3 points) - Points are awarded based on the accessibility of the site by public transport	3	No Risk	0	HI / PM
17B.2		B.2 Reduced Car Parking Provision (1 point) - Reduction of car parking spaces for the proposed building compared to maximum rates allowed	1	No Risk	0	HI / LHD
17B.3	Prescriptive Pathway	B.3 Low Emission Vehicle Infrastructure (1 point) - 15% of parking is for fuel efficient vehicles and a maximum of 5% for motorcycle parking OR dedicated car share spaces and vehicles are provided at the rate of 1 per 70 building occupants	1	Medium	1	HI / LHD / Electrical
17B.4		B.4 Active Transport Facilities (1 point) - Provision of bicycle parking (occupants and visitor) and associated facilities (showers & lockers)	1	No Risk	0	Architect
17B.5		B.5 Walkable Neighbourhoods (1 point) - At least 8 amenities are within 400m of the development; OR achieve a walk score of at least 80	1	No Risk	0	Architect

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
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18B.1	Prescriptive Pathway	B.1 Sanitary Fixture Efficiency (1 point) - WELS Ratings of 6 Star for Taps/Urinals, 5 Star for Toilets, 3 Star (≤6I/min) for Showers.	1	No Risk	1	Architect / Hydraulics
18B.2	Prescriptive Pathway	B.2 Rainwater Reuse (1 point) - Rainwater collection & on-site reuse system incorporating a tank sized to 10L/m2 GFA.	1	No Risk	0	Hydraulics
18B.3	Prescriptive Pathway	B.3 Heat Rejection (2 points) - No water consumption used for heat rejection equipment.	2	No Risk	2	Mechanical
18B.4	Prescriptive Pathway	B.4 Landscape Irrigation (1 point) - Drip irrigation system with moisture sensor override is used OR no potable water is used for irrigation.	1	Low	1	Hydraulcs / Landscapes
18B.5	Prescriptive Pathway	B.5 Fire System Test Water (1 point) - No water is expelled for system testing OR 80% of test water is captured & reused on-site	1	Low	1	Fire / Hydraulics
		Category Total	12		5	

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
19A.1	Comparative Life Cycle Assessment	Up to 6 points are awarded based on the extent of environmental impact reduction achieved under six environmental impacts categories compared against a Reference Building using a Life Cycle Assessment (LCA) (sliding scale 0 to 6 points for 30%-130% impact reduction)	6	No Risk	0	HI / PM / LCA assessor (specialist) / QS (BoQ) / Structural
19A.2	Additional Life Cycle Impact Reporting	An additional point is awarded where the LCA is used to inform building design process or as-built outcome	4	No Risk	0	LCA assessor
19B.1	Concrete	<i>Portland Cement Reduction -</i> Portland cement content is reduced by 30% OR 40% across all concrete used in the project against a reference case (1 OR 2 points)	2	No Risk	0	Structural / Civil
19B.2	Concrete	Water Reduction - Mix water for all concrete used contains at least 50% captured or reclaimed water (0.5 points)	0.5	No Risk	0.0	Structural / Civil
19B.2	Concrete	Aggregates Reduction - At least 40% of coarse aggregate in the concrete is crushed slag aggregate or another alternative material, OR at least 25% of fine aggregate sand in the concrete are manufactured sand or other alternative material (0.5 points)	0.5	No Risk	0.0	Structural / Civil

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
19B.2	Steel	Steel Framed Building - <i>Reduced Mass of Steel Framing</i> - Reduce the mass of steel framing used by one of the following options (1 point): - Using high strength steel that meet specific strength grades for usage type; OR - Reduce mass of steel by 5% when compared to a suitable reference building. Concrete Framed Building - <i>Reduced Use of Steel Reinforcement</i> - Reduce the mass of steel reinforcement used by at least 5% when compared to a standard practice building (1 point)	1	No Risk	0	Structural / Civil
19B.3	Building Reuse	Façade Reuse - At least 50% OR 80% of the building facade is retained (1 OR 2 points) Structure Reuse - At least 30% OR 60% of the existing major structure is retained (1 OR 2 points)	2			
19B.4	Structural Timber	Minimum Requirement: All structural timber are responsibly sourced. Points are awarded based on the % of structural timber used compared to the building's GFA - 30 / 70 / 90% = 1 / 2 / 3 points.	1	No Risk	0	Architect / Structural
20.1	Structural and Reinforcing Steel	 95% of the building steel is sourced from a Responsible Steel Maker; and For steel framed buildings: at least 60% of the fabricated structural steelwork is supplied by a steel fabricator accredited to the Australian Steel Institute; OR For concrete framed buildings : at least 60% of all reinforcing bar and mesh is produced using energy-reducing processes 	1	No Risk	0	Structural
20.2	Timber Products	At least 95% (by cost) of all timber used is certified by a forest certification scheme OR is from a reused source	1	Low	1	Architect / Landscape

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Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
20.3	Permanent Formwork, Pipes, Flooring, Blinds & Cables	At least 90% (by cost) of all permanent formwork, cables, pipes, flooring and blinds do not contain PVC and have an Environmental Product Declaration (EPD) OR meet Best Practice Guidelines for PVC	1	High	1	Architect / Structure / Electrical / Mechanical / Hydraulics / Civils / Landscapes
21.1	Product Transparency	Points are awarded via the Product Transparency & Sustainability Calculator where the Product Sustainability Value (PSV) achieves a percentage of the Product Contract Value (PCV) - 3 / 6 / 9% = 1 / 2 / 3 points. PSV is contributed to for products that; have reused content, have recycled content, are environmentally certified or have stewardship programs.	3	Low	1	Head Contractor / PM
22.1	Demolition and Construction Waste	Fixed Benchmark: Construction and demolition waste is less than 12.5Kg/m2 GFA OR 10Kg/m2 GFA. (0.5 OR 1 point) OR Percentage Benchmark: 90% of the waste generated during construction and demolition has been diverted from landfill (1 point)	1	Low	1	Head Contractor
		Category Total	14		4	

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					Green Star Design and As-Built v1 3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
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23.0	Endangered, Threatened or Vulnerable Species	Minimum Credit Requirement: Demonstrate no critically endangered, endangered, vulnerable species or ecological communities were present on the site at the time of purchase.	Credit Minimum	Low	Complies	HI / PM
23.1	Ecological Value	Points are awarded based on the relative improvement of ecological value by 20% / 40% / 60% (1 / 2 / 3 points)	3	Medium	1	Architect / Landscape
24.0	Conditional Requirement	The site did not include old growth forest or wetland of 'High National Importance', or did not impact on 'Matters of National Significance'	Conditional	Low	Complies	н
24.1	Reuse of Land	At least 75% of the site was previously developed land	1	High	1	Architect
24.2	Contamination and Hazardous Materials	Any significant site contamination is identified with remedial steps undertaken to decontaminate site prior to construction	1	Low	1	PM / Head Contractor
25.1	Heat Island effect	At least 75% of the whole site area to comprise of one of a combination of: - Vegetation; - Green roofs; - Roofing material with high solar reflectance index (initial SRI>82 or 3yr SRI>64); - Water bodies; and - Hard-scaping elements shaded by overhanging vegetation or roof - Unshaded hard-scape with high SRI (initial SRI>39 or 3yr SRI>34).	1	High	1	Architect / Landscape

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					Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
26.1	Peak Discharge	Demonstrate a reduction in peak stormwater discharge comparing pre- development to post-development discharge	1	No Risk	1	Civil
26.2	Stormwater Pollution Targets	Stormwater discharged from the site must meet the following Pollution Reduction Targets: - Total Suspended Solids (TSS) - 80% - Gross Pollutants - 85% - Total Nitrogen (TN) - 30% - Total Phosphorus (TP) - 30% - Total Petroleum Hydrocarbons - 60% - Free Oils - 90%	1	High	1	Civil
27.0	Light Pollution Neighbouring Properties	Minimum Credit Requirement: Light Pollution to Neighbouring Properties: All outdoor lighting must comply with AS4282:1997	Credit Minimum	No Risk	To Comply	Electrical / Lighting
27.1	Light Pollution Night Sky	Light Pollution to Night Sky: No external luminaire has a Upward Light Output Ratio (ULOR) that exceeds 5%; OR External luminaries produces a maximum initial point illuminance value of no greater than 0.5 Lux to the site boundary and 0.1Lux to 4.5m beyond the site into the night sky	1	No Risk	1	Electrical / Lighting
28.1	Microbial control	Demonstrate the building is: - naturally ventilated; or - has waterless heat rejection systems; or - has water-based heat rejection systems that includes measures for Legionella control and Risk Management (1 point)	1	No Risk	1	Mechanical
29.1	Refrigerants	 The combined Total System Direct Environmental Impact (TSDEI) of the refrigerant is less than 15; The combined TSDEI of the refrigerant is between 15 and 35, AND a leak detection system with automated recovery covering plant >50kWr; All refrigerants used have a zero Ozone Depletion Potential (ODP); 	1	No Risk	0	Mechanical
		Category Total BASE TOTAL POINTS	5 100		4 44.0	

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r	Responsibility			
	All / Head Contractor			
	Civil			
	HI / LHD / PM / Architect / Landscapes (potentially)			
	PM / ESD			
	PM / Head Contractor			



					Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
30D	Local Procurement	Local Products and Materials: 1 point is awarded where the project team demonstrates that a percentage of the products and materials used in the project were produced or manufactured in Australia. Local Services and Skilled Labour: 1 point is awarded where the project team demonstrates that a percentage of the services and skilled labour employed by the project come from the local area surrounding the site.		High	TBC	PM / Head Contractor
	Occupant Engagement	To increase the availability of information on the benefits and outcomes of sustainable design practices and sustainable operation practices across the industry.		Low	1	HI / LHD / PM
	Reconciliation Action Plan	To encourage organisations to take formalised steps to provide opportunities for Aboriginal and Torres Strait Islander peoples.		High	1	PM / HI / LHD / Head Contractor

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	Universal Design	Projects will only be rewarded for going beyond compliance with access standards and legislation. Project teams are required to understand the accessibility issues specific to their project ('needs analysis') prior to developing design solutions in order to address these ('accessibility plan'). To claim this Innovation Challenge the project team must: - Review the Design for Dignity Guidelines, or similar guidelines for inclusive design and dignified access. - Perform a 'needs analysis' identifying the project's accessibility issues. See the Guidance section for additional detail. - Develop an 'accessibility plan' (or similar) that provides strategies to address the needs determined and identifies actions for how the project will incorporate inclusive design. - Implement the 'accessibility plan' and demonstrate that accessibility initiatives have been carried out for the project.		Medium	1	PM / LHD / HI / Architect / DDA consultant
30E	LEED - Integrative Design Process	To support high-performance, cost-effective project outcomes through an early analysis of the interrelationships among systems		Medium	1	PM / Architect / Mechanical / Electrical / Hydraulics

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	I			I	Green Star Design and As-Built v1.3	
Credit Code	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star Design and Asbuilt v1.3 Submission Guidelines	Points Available	Risk	4 Star	Responsibility
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		Environmental Category	Points Available		4 Star	
		Management	14		11	
		Indoor Environment Quality	17		10	
		Energy	22		5	
		Transport	10		1	
		Water	12		5	
		Materials	14	_	4	
		Land Use & Ecology	6	_	4	
		Emissions	5		4	
		Innovation	10	_	9	
		TOTAL WEIGHTED SCORE (Including Innovation)	110		53.0	
		4 Star - 45 to 59.9 score 5 Star - 60 to 7	4.9 score 6 Star - 75+ score			

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