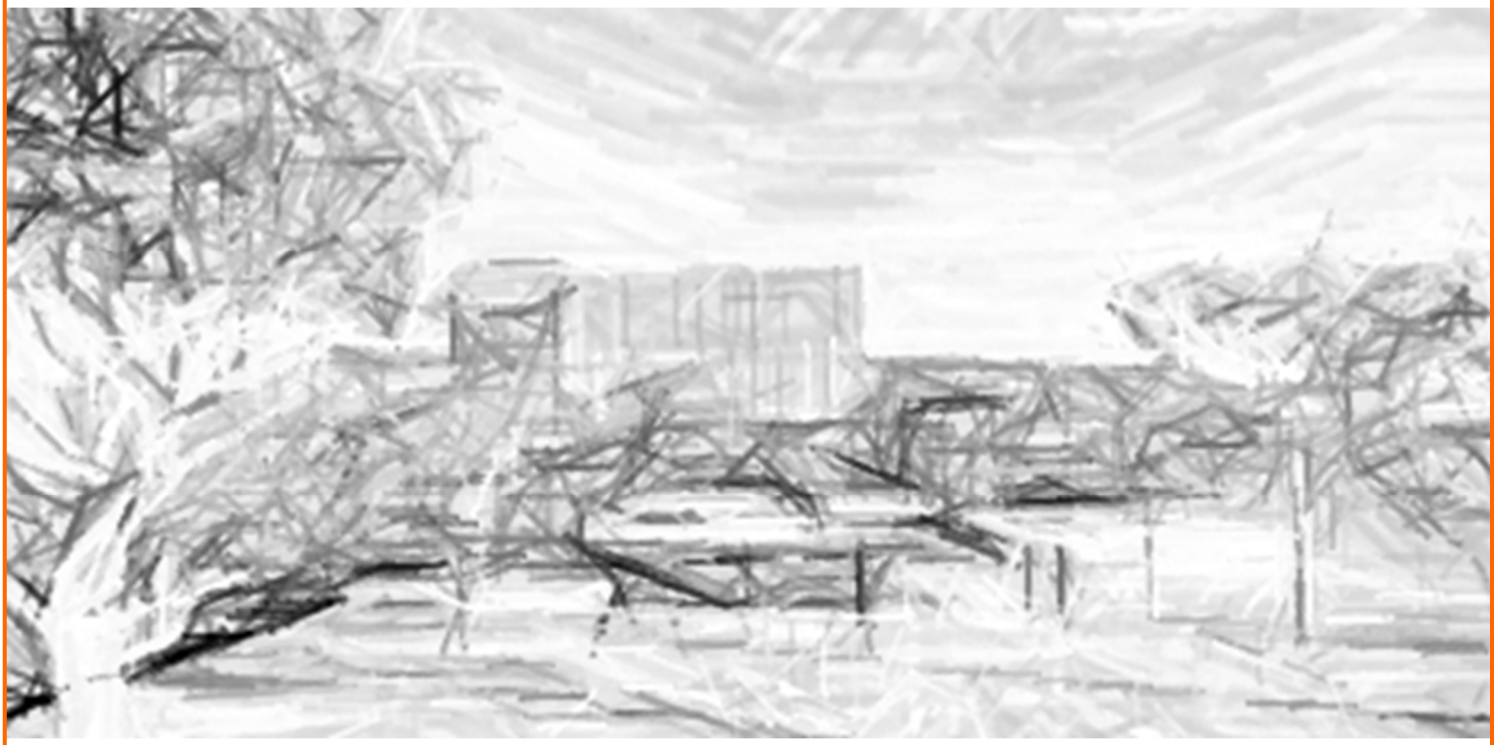
Albury Wodonga Regional Hospital Project – NE Building

Albury NSW 2640

DGN-058 ESD Evaluation Tool Specification For Tender

To Support the Albury Wodonga Regional Hospital Project – NE Building



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Report prepared for Health Infrastructure
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Report Summary

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Revision	**Description**		**Issue Date**
01	Issued for Tender Review		12/11/24
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Project Status:	Part 3 Concept Design (For Tender)		

Project	
Project Name:	Albury Wodonga Regional Hospital Project (AWRHP)
Building Owner	Health Infrastructure / Albury-Wodonga Health Service
Head Contractor:	TBC
Client	Health Infrastructure
Sustainability Certifications Required	
• HI NSW DGN 058: NCC 2019 Section J +10%, and • 60 points under ESD Framework (DGN 058 Appendix C). Rev C.	

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Contents

1. DGN-058 ESD Evaluation Tool (Appendix C) Requirements

1.1. Objectives

The objectives of this document are to outline the Contractor requirements that when met will allow the AWRHP Redevelopment project to demonstrate compliance with the following:

- Health Infrastructure NSW *DGN-058 ESD Evaluation Tool, Appendix C,* with goal to achieve 60 points.

The ESD Evaluation Tool requirements are described within this Specification and comprise two parts:

1) Performance or built outcomes; and
2) Documentary evidence required to demonstrate that compliance has been achieved.

The Contractor and all Sub-Contractors shall be aware of environmental benchmarks and be involved in the project construction to deliver the environmental targets set by the design team and the Principal's Authorised Person. The Contractor shall comply with all requirements listed in this document. In particular, Section 4 highlights relevant documentation that needs to be produced by the Contractor to enable compliance with the ESD Evaluation Tool to be verified.

1.2. Order of Precedence

This document is to be read in conjunction with all other contract documentation, in particular the specifications under each discipline. This document's focus is on the precise performance benchmarks and deliverables required for contractor-related compliance with the ESD Evaluation Tool. In the interests of completeness this Specification describes all contractor-related requirements under the ESD Evaluation Tool, with the Contractor's specific requirements identified within. Note that the ESD Evaluation Tool requires additional deliverables that fall outside the contractor's scope.

1) Where discrepancies arise between this document and the contract documentation with regard to design, materials or performance, the Contractor is required to bring the discrepancy to the Principal's Authorised Person's Authorised Person or Client's attention for resolution, noting that the requirements outlined in this Specification are required in order to meet DGN-058 minimum requirements.
2) Where discrepancies arise over ESD Evaluation Tool-related performance benchmarks between this document and others, the Contractor is required to bring the discrepancy to the Principal's Authorised Person's Authorised Person or Client's attention for resolution, noting that the requirements outlined in this Specification are required in order to meet DGN-058 minimum requirements.
3) Where discrepancies arise over documentation deliverables required under the ESD Evaluation Tool, this document takes precedence over the evaluation tool.

1.3. Definitions & Abbreviations

ASHRAE: The American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.
CIBSE: Chartered Institution of Building Services Engineers (UK).
FSC: Forest Stewardship Council.
GBCA: Green Building Council of Australia.
GWP: Global Warming Potential.
LHD: Local Health District (typically the hospital client / end user)
ODP: Ozone Depleting Potential.
PCBs: Polychlorinated Biphenyls.
PVC: Polyvinylchloride.
SRI: Solar Reflectance Index
TVOC: Total Volatile Organic Compounds.
VOC: Volatile Organic Compounds.

2. What Is The DGN-058 ESD Evaluation Tool?

2.1. Overview

The Evaluation Tool uses some of the key ESD initiatives included in the GBCA (Green Building Council of Australia) rating tools however does not produce a "Green Star" rating, instead prescribing a minimum number of points to be achieved. This document describes the assessment procedure required by Health Infrastructure (HI) on all of its projects and how to use the Evaluation Tool to evaluate the project's performance. HI has defined minimum targets for the AWRHP Redevelopment Project as follows:

- A **minimum of 60 points** to be achieved by the design in accordance with HI's ESD Evaluation Tool, as outlined in his Specification; and
- A **minimum 10% improvement** in energy efficiency compared to a baseline of National Construction Code (NCC) Section J compliance applicable to the development.

The ESD Evaluation Tool assesses attributes under the following sustainability categories:

- Management
- Indoor Environment Quality
- Energy & Carbon
- Climate Risk and Resilience
- Transport
- Water
- Materials & Waste
- Land Use & Ecology
- Discharge to Environment
- Innovation

Where the Contractor requires further detail relating to specific performance requirements outlined in this Specification, they are directed firstly to the *Green Star Design & As-Built v1.3 Submission Guideline.* The Contractor must obtain its own copy of this Guideline.

2.2. The Assessment Process

Upon completion of the works under contract, the Contractor is required to provide to the Principal's Authorised Person documentation that enables assessment of the project's compliance with the ESD Evaluation Tool (i.e., this specification). The assessment review is to be carried out by the Principal's Authorised Person's nominated ESD consultant. Hence, the completeness and accuracy of the As-Built documentation and various documents collected during the course of the Works are paramount.

The Contractor is encouraged to submit regular documentary evidence where possible and is encouraged to submit evidence as the relevant trade is completed. Required delivery timelines are described under each item in this Specification.

It is the Contractor's responsibility to actively request relevant documentation from the Sub-Contractors during the different stages of this process. The Contractor must collect and compile all necessary information as outlined in this document. The ESD Evaluation Tool requirements that affect the Contractor's responsibilities are listed in Section 4.

The Contractor must prepare and submit to the Principal's Authorised Person's Authorised Person the following;

1) All supporting ESD Evaluation Tool documents (copy of receipts, letters, reports, drawings etc.) organised according to the relevant ESD Evaluation Tool line item.
2) All letters must be formally signed and dated on company letter head nominating this specific project.
3) Reports must be appropriately formatted and equipped with a titlepage, job information and table of contents.
4) All supporting documents must be collected and filed in accordance with the line items nominated in this document, and if not specifically mentioning this job, must be referred to in a letter which states relevant job and Principal's Authorised Person information.
5) All documents shall clearly highlight requested information with highlighter or underlining.
6) All documents and as-built drawings shall be issued as PDF Adobe Acrobat files. All drawings must be legible when viewed on a standard computer monitor.
7) All for-construction drawings must be labelled as 'For Construction', individually dated, supported by evidence of transmittal.

8) All as-built drawings must be stamped as 'As-Built', and either individually signed and dated or supported with a written statement from the Contractor, testifying that the drawings and schedules stamped 'as built' are a true representation of the Works.

3. Contractor Requirements

3.1. Contractor Systems

The Contractor shall have the following accreditation, OR must be able to demonstrate equivalence with the following:

- ISO 14001 (or equivalent) accreditation applicable to the construction of this building. ISO 14001 is an International Standard covering environmental management intended to provide organizations with elements of an effective environmental management system which can be integrated with other management requirements, to assist achieving environmental and economic goals.

The Contractor shall submit the following documents prior to commencement of any building related works on site:

- A final and revised version of the Environmental Management Plan clearly demonstrating compliance with the requirements of the NSW Environmental Management System guideline and any local requirements.
- A final and revised version of the Construction Waste Management Plan clearly demonstrating compliance with the requirements of described in Section 4 and any local requirements.
- A copy of the Demolition or Construction contract stating recycling and/or recovering construction waste commitments.

3.2. Documentary Evidence

The Contractor is to ensure all documentation is complete and contains all correct information as stipulated within this document.

- Documentation is to be submitted no later than the dates indicated.
- The Contractor is expected to cover the cost of any additional revisions required due to missing or incorrect information supplied by the relevant sub-Contractor.
- It is assumed that the Contractor will not make changes to the design and that the documentation submitted will be based on the design developed by the consultants.
- The Contractor must seek the approval of the Project Manager/Principal's Authorised Person before making and proceeding with any changes to the design. Any changes proposed by the Contractor to the design may require additional computer modelling to verify compliance with Green Star requirements. The Contractor is responsible for covering the costs of any remodelling associated with changes of the proposed tenancy design developed by the consultants and the design team, unless otherwise agreed in writing by the Principal's Authorised Person.

3.3. Submission Dates

No later than Substantial Completion the Contractor shall have a co-ordinated document for each ESD Evaluation Tool line item (i.e., those described in this Specification) for which the Contractor is responsible, with complete information from all Sub-Contractors, in compliance with the deliverables noted in Section 4 of this document.

The contractor may submit tranches of such documentation earlier than Substantial Completion for line items that are complete, on the provision that subsequent tranches of documentation do not materially change the correctness of accuracy of the earlier issue.

Where 'For Construction' evidence is required this evidence is to be submitted no later than 2 weeks prior to commencement of construction.

3.4. Sub-Contractor Involvement

It is the Head Contractors responsibility for ensuring all Sub-Contractors' work is co-ordinated in terms of performance requirements and deliverables as described in Section 4 of this document. Sub-Contractors have the responsibility to satisfy the design intent and will need to comply with associated Contractor's management systems. Sub-Contractors must be specifically aware of the Contractor's targets in relation to the following:

The Contractor has an ISO 14001 accreditation applicable to the construction of this project. The Sub-Contractor is required to comply with the following documentation:

- The Contractor's Environmental Management System (EMS) which has an ISO 14001 Environmental Management System accreditation applicable to the construction of this project.
- The Contractor's project-specific Environmental Management Plan (EMP).

4. DGN-058 ESD Evaluation Tool Requirements

This section describes specific responsibilities and measures that shall be adopted in order to meet the requirements of the ESD Evaluation Tool. The requirements are described in two parts;

1) The *performance* benchmark, and
2) The *documentation* to prove that the benchmark has been physically achieved.

The Contractor shall submit to the Principal's Authorised Person the documentation as requested in each of the following sections.

4.1. (DGN-058 Code 1.0) Accredited Professional

Refer DGN-058 requirements

4.2. (DGN-058 Code 2.1) Services and Maintainability Review

Performance Requirements

A comprehensive services and maintainability review is to be conducted prior to construction.

This review must be carried out by a suitably qualified professional, e.g. a Facilities Manager, who is not directly involved in the contract of works.

The services and maintainability review is to facilitate input from the design team, the facilities manager and operations staff (if known), and any relevant suppliers and subcontractors (if engaged). The review must address the following aspects for all nominated building systems:

1) Commissionability.
2) Controllability.
3) Maintainability.
4) Operability, including 'Fitness for Purpose'; and
5) Safety.

Nominated Building Systems

The nominated building systems include, but are not limited to:

- Mechanical systems (such as HVAC and refrigeration systems; mechanically operable systems such as blinds and actuated shading devices).
- Building Management and Control System (BMCS).
- Lighting and associated controls.
- Electrical systems (such as electrical generation, electrical supply, distribution systems, security and access systems, and alarm systems).
- Hydraulic systems (such as gas and water supply distribution systems, sewage collection and distribution systems, stormwater collection and distribution systems; pumps).
- Fire detection systems, smoke alarm systems and emergency warning systems.
- Fire protection systems, including pumps and other equipment.
- Lifts and any other vertical transport devices.
- Any other system that have an impact on the energy or water consumption of the building as identified by building owner or building operator.
- Building envelope, such as facades, roofs and glazing systems.

Contractor Deliverable

(Due no later than 2 weeks prior to issue of For Construction documents)

The services and maintainability review and its outcomes must be summarised in a 'Service and Maintainability Report'. This report must be agreed and signed off by the involved parties. Action items resulting from this review shall be incorporated in the For Construction contract documents.

4.3. (DGN-058 Code 2.2) Building Commissioning

Contractor Deliverables

4.3.1. Commissioning Specification

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the commencement of the Works)

The contractual tender or construction documentation must list the commissioning requirements for each system. It is not sufficient to state that systems must be commissioned to the relevant standard. Instead, the documentation must:

- List the design parameters for each system;
- List the required commissioning activities;
- Define how each system is intended to operate; and
- List the acceptable tolerances during commissioning.

Contractual documentation must clearly indicate divisions of responsibilities, pre-commissioning procedures, commissioning requirements, witnessing requirements, phased completion requirements (if needed), post occupancy checks, and any training requirements for the operator.

4.3.2. Commissioning Plan

(to be provided to the Principal's Authorised Person no later than at the commencement of the Works)

In addition to commissioning scope outlined in the head contract, the commissioning plan shall include at least the following:

- Objectives, or basis, of the design;
- Scope of the commissioning plan;
- Commissioning team list, the individual responsibilities and interface matrix;
- General sequence of commissioning;
- Proposed commissioning procedures;
- Witnessing requirements;
- Commissioning program; and
- Requirements for subcontractor commissioning manuals.

4.3.3. Commissioning Report

(to be provided to the Principal's Authorised Person no later than Completion)

The Contractor must demonstrate that the commissioning took place in accordance with the requirements laid out in the contractual documentation and the commissioning plan. The commissioning report must certify that this is the case, and be signed by the designer, the head or main contractor, the commissioning manager (or ICA), and the project manager (or owner's representative).

The person responsible for the commissioning of the nominated services must have specific and demonstrable knowledge of the types of systems to be commissioned. As an example, a general sub-contractor is unlikely to be able to fill this role.

4.4. (DGN-058 Code 2.3) Building Systems Tuning

Performance Requirements

The Contractor must carry out quarterly building services tuning, adjustments, and measurement for the first 12 months after occupation and a review of building system manufacturer warranties.

The building tuning process will require the analysis of data from the monitoring systems and assessment of feedback from occupants on building conditions. During the tuning period, the nominated building systems are to be adjusted where necessary to account for all identified deficiencies.

All nominated building systems are to be tuned after Substantial Completion. These requirements may be included in the Commissioning Plan or provided as a separate document from the building owner. The tuning scope is to include at least the following:

- Operating and Maintenance Manuals have been developed in accordance with approved standards and guidelines;
- A building tuning manual, or a building tuning plan, has been developed in accordance with the approved standards and guidelines;
- A building tuning team has been created including the facilities manager, the owner's representative and the ICA (if applicable). The head contractor and the services design professionals are available to address specific tuning issues where required; and
- This scope includes requirements for:

- Verification that nominated systems are performing to their design potential at full and part load conditions.
- Reviews of environmental performance against the environmental targets.
- Collection of user feedback to match the system performance with the occupant's needs.
- Adjustment of all the systems to account for all deficiencies discovered; and
- Management, communication, and assignment of responsibilities for the tuning process within the team.

Contractor Deliverables

(Due no later than 2 weeks prior to issue of For Construction documents)

A Building Tuning Plan demonstrating how the performance requirements are to be met. This may be incorporated into the Commissioning Plan or prepared as a separate document.

4.5. (DGN-058 Code 2.4) Independent Commissioning Agent (ICA)

The Principal's Authorised Person will nominate an independent commissioning agent (ICA) to oversee and support the Contractor's commissioning and tuning processes. The ICA will advise, monitor, and verify the commissioning and tuning of the nominated building systems throughout the design, tender, construction, commissioning and tuning phases. The ICA may be nominated from within the Principal's Authorised Person's facilities management team.

4.6. (DGN-058 Code 3.1) Implementation of the Climate Adaptation Plan

A Climate Risk Assessment and Adaptation Plan has been prepared for this project.

Implement all contractor related adaptation measures for extreme/high climate risks from existing AWRHP Climate Adaptation Plan. *Specific* design responses are required for the following:

1. The contractor is to review all rainwater and stormwater management solutions to ensure that the system can cater for increased rain deluge. Potential risks include increased storm and hail damage to building structure, facade and/or landscaping, and increased storm and hail damage to utilities services and critical plant

   - This may rely on assured gutter overflow and overland flow, however evidence must be provided to demonstrate that possible increases in rainfall intensity have been addressed. Rain intensity increase figures as follows:

Annual 1-in-20year Rainfall (%)	Short term (Substantial Completion)	Longer term (towards end of service life)
	Minimum: Small Increase 10 to 30%	Large Increase >30.00

2. Manage increased risk to site workers during construction from heat (construction hours/offsite fabrication etc)
3. Manage potential heat stress for building occupants, and increased demand on buildings as a potential area of respite. Specific design conditions include:

   - Develop mechanical system capacity to allow for a dry bulb temperature uplift of +3°C DB and a reduction in RH of 5%.
   - Finalise building envelope to allow for the following criteria:

	Design for Substantial Completion	Design for / anticipate for 2090 / towards end of service life
Mean Temperature Change (˚C)	Hotter 1.50 to 3.00	Much Hotter >3.00
Additional Heat Days (single day over 35˚C)	*+0.85* additional days, primarily during Summer	*+3.79* additional days, primarily during Summer
Increase in Heatwave events per annum (3 consecutive days over 35˚C)	+1.0 to 1.5	+2.5 to 4.5
Annual Humidity %	Small decrease -10.00 to -1.00	Small decrease -10.00 to -1.00

Contractor Deliverables

(Prior to finalising services sub-contracts but as a minimum no later than 2 weeks before issuing of For Construction documentation)

Final performance specifications demonstrating solutions for the above criteria

(Due no later than Completion)

Drawings and specifications demonstrating design responses to the Climate Adaptation Plan. Commissioning report or other technical document demonstrating design responses to the Climate Adaptation Plan.

4.7. (DGN-058 Code 4.1) Building Information

Performance Requirements

4.7.1. Operations and Maintenance Information

Provide comprehensive operations and maintenance (O&M) information to the facilities management team. This information must define the requirements and procedures for the effective operation, maintenance and recommissioning of the building, and includes details of the building's construction, commissioning information, maintenance instructions for the operations and maintenance team, and guarantees and warranties.

In addition to O&M requirements under the head contract (and for completeness), the maintenance manual should include the following:

- A summary sheet of relevant building service contacts;
- System-level information for nominated building systems;
- Introduction and scope, including physical and functional descriptions;
- Operating parameters and procedures;
- Preventive maintenance requirements, including procedures and schedules;
- Corrective maintenance requirements, including repair requirements;
- Service contacts, and any warranties and certificates;
- Up-to-date drawings incorporating at least:
- Mechanical, electrical and hydraulic drawings and schematics covering all associated nominated building systems;
- Architectural, façade/building envelope drawings; and
- Architectural layout of the base building.

In addition, information aimed at assisting the facilities management team operate the building for optimal sustainability outcomes should be provided (for instance a Strategic Asset Management Guide). This information should include:

- Details on targets or operational benchmarks for energy use, greenhouse gas emissions, potable water, and indoor environment quality including air quality and thermal comfort indices. These should be SMART (specific, measurable, achievable, relevant and time- bound) goals aimed at assisting the facilities management team to optimize performance of the building;
- Details on the metering and sub-metering strategy employed by the building, including any

instructions for data collection and analysis; and
- Description and location of a sustainable procurement framework (if available).

Triggers for updating operations and maintenance information should also be detailed. This guidance should be aimed at assisting the operator's facilities management team to maintain relevant, up-to-date building information. Triggers for the update of operations and maintenance manuals and/or related operating information should include at least when the following events occur:

- Refurbishment of a base building space;
- Recommissioning, retro commissioning, or replacement of nominated building systems;
- Building owner targets or benchmarks change;
- A new operational process is introduced or an existing one is changed; or
- A new tenant fitout is finalised (if applicable).

4.7.2. Building Log Book

The project team must develop a building log book to present to the building owner before Substantial Completion of the project. The logbook is an information source that includes, and tracks updates to:

- Descriptions of building systems, including their use and performance;
- Activities for ongoing compliance;
- Re-commissioning procedures, and
- Building tuning protocols.

4.7.3. Building User Information

The following typical information is to be provided to building users. It is the project team's responsibility to define the specific information topics relevant to the building user:

- Description of initiatives designed to enhance energy efficiency and minimise greenhouse gas emissions, and measures that must be taken by users during day-to-day operation to maximise their effectiveness. This input may be coordinated with the operator's Net Zero program;
- Description of initiatives intended to enhance and minimise water use and the measures that must be taken by users during day-to-day operation to maximise their effectiveness;
- Description of basic function and operation of any nominated building systems that building users may come in direct contact with including any occupant-activated controls;
- List of relevant contacts for maintenance information, operational issues, complaints or other feedback (e.g. relevant facilities management team contact details and/or online request/feedback form);
- Description of alternative transport initiatives promoted within premises (such as bicycle facilities, end-of-trip facilities, carpooling or car-share), location of a transport plan (if available);
- Local public transport information, maps and timetables;
- Description of the operational waste requirements for the building users, including what waste streams can or cannot be collected for recycling at the premises;
- Information on how to maximise the efficiency potential offered by base building services and nominated building systems;
- Information on how to best maximise daylighting, sights and views; and
- Information on green make-good requirements for tenants at end-of-life (if available).

Contractor Deliverables

(Due no later than Completion or as per timing outlined in HI Knowledge Library / Project Toolkit, where relevant)

Compliance may be demonstrated with one document that includes operations and maintenance information, such as HI's PAIR guidelines and SPAIR requirements and asset register templates. This information must;

- Have appropriate content for all nominated building systems and must be readily available;
- Be accessible to the user group so that they can deliver best practice environmental outcomes; and
- Provide guidance to the facilities management team on keeping information up–to-date.

The project team must develop a building logbook to present to the building owner before Substantial Completion of the project. The building logbook must:

- Be developed to align with HI's SPAIR requirements/AFM Online and relevant elements from CIBSE TM31: Building Logbook Toolkit;
- Cover all nominated building systems; and
- Include links or references to all relevant operations and maintenance information.

Building Information must cover all building systems, including;

- Mechanical systems (such as HVAC and refrigeration systems; mechanically operable systems such as blinds and actuated shading devices).
- Building Management and Control System (BMCS).
- Lighting and associated controls.
- Electrical systems (such as electrical generation, electrical supply, distribution systems, security and access systems, and alarm systems).
- Hydraulic systems (such as gas and water supply distribution systems, sewage collection and distribution systems, stormwater collection and distribution systems; pumps).
- Fire detection systems, smoke alarm systems and emergency warning systems.
- Fire protection systems, including pumps and other equipment.
- Lifts and any other vertical transport devices.
- Any other system that have an impact on the energy or water consumption of the building as identified by building owner or building operator.
- Building envelope, such as facades, roofs and glazing systems.

4.8. (DGN-058 Code 6.0) Metering

Performance Requirements

Metering shall be provided to allow for monitoring of the relevant areas or functions of the project. Floor-by-floor metering will suffice if the entire floor has a single use. If a floor has multiple uses, the different uses shall be metered. Therefore, should a floor be composed of office space and a seminar room, both spaces shall be separately sub-metered. If a floor has multiple tenants or owners, each tenancy or property shall also be separately sub-metered.

Where an energy load for a single item exceeds 5% of the total energy use for the building, or 100kW, it must be independently metered. Supplementary equipment can also be installed on the same measured circuit as the major use item. However, the total combined energy use of any systems connected to the major use item must not contribute more than 10kVA to the overall energy use.

Where a common water use consumes 10% of the project's water use, these must be independently metered.

Examples of common water uses include, but are not limited to:

- Evaporative heat rejection systems;
- Irrigation systems;
- Wash down systems;
- Humidifiers;
- Kitchens; and
- Sanitary blocks (if refurbished as part of the tenancy works).

Utility meters must meet metering guidelines under the weights and measures legislation, as outlined under the current National Measurement Regulations. Project teams must verify if existing meters meet these requirements as well as any other utility meters being installed.

Non-utility meters (including sub-meters) must follow the same requirements to those described in the most current Validating Non-Utility Meters for NABERS ratings protocol, issued by the NSW Office of Environment and Heritage.

Meters must be located in an area that allows regular monitoring and maintenance by facilities managers and other facilities management personnel

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later 2 weeks prior to issue of For Construction documentation)

For Construction schematic/s showing the location of all energy and water meters in the project and the associated energy and water uses; showing how the system is easily accessible to the facility manager; and confirming the requirements for utility and non-utility meters.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

As-Built drawings or schematics demonstrating that the above has been successfully delivered.

4.9. (DGN-058 Code 6.1) Metering Monitoring Systems

Performance Requirements

A monitoring system is to be provided that is capable of capturing and processing the data produced by the installed energy and water meters. The monitoring system must accurately and clearly present the metered data and include reports on consumption trends, in accordance with the following requirements.

The monitoring strategy must be developed in accordance with a recognised Standard, such as CIBSE TM39 Building Energy Metering. Although this Standard has been created to be used for developing energy metering and monitoring strategies the same principles described in the Standard shall be used for developing water metering and monitoring strategies.

The monitoring strategy must include a metering schedule. This schedule shall address the estimated loads for energy and water and must list:

- The incoming input (electricity, gas, water, etc.);
- The end use (lighting, HVAC, fans);
- The estimated energy consumption for the end use;
- Which meter(s) provide the required information; and
- The individual estimated end consumption.

The monitoring schedule shall also address the location and the type of meter. The end uses shall be estimated and included in the strategy, though if not known at the initial stage, they can be established from the first full month of readings.

Automatic Monitoring System

The project team must provide automatic monitoring systems that record both consumption and demand of energy or water, and are capable of producing reports on hourly, daily, monthly, and annual energy use for all meters.

The installed meters must be capable of producing an output that can be transmitted to a central location (either onsite or offsite). This central location must provide data retrieval and reporting mechanisms.

As a minimum, the automatic monitoring system must be capable of:

- Collecting data from all meters;
- Alerting to missing data due to failures;
- Recording energy use and water consumption, and providing a reporting capability at user adjustable intervals;
- Raising an alarm when the energy or water use increase beyond certain parameters and automatically and instantly issue an alert the facilities manager. The process to assess, correct and validate alerts or faults must be detailed and contained in an accessible location;
- Providing a breakdown of the information by building system (mechanical, electrical, etc.), or by space (or by tenanted floor);
- Including the consumption water or energy, the load versus time (load profile), and the power factor (in the case of energy); and
- Producing, as a minimum, a quarterly report that is automatically emailed to the facilities manager responsible for the building.

For small buildings (<1,000m²), this criterion can be met by providing a simple automated metering system that provides an alert to the building manager or owner. Alternatively, offsite monitoring is also acceptable through a central reporting system.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Extracts from Commissioning Report where relevant, showing the automatic monitoring system is operating and has the ability to provide the information required under the Performance Requirements and demonstrating that all energy sub-meters have been validated in accordance with a recognised standard.

4.10. (DGN-058 Code 7.2) High Quality Staff Support

High quality staff support practices are in place that:

- Promote positive mental and physical health outcomes of site activities and culture of site workers, through programs and solutions on site; and
- Enhance site workers' knowledge on sustainable practices through on-site, off-site, or online education programs.

Health Impacts of Site Activities

To comply with this requirement, programs and policies in place must go beyond legal requirements for occupational health and safety (OHS) and extend into wellbeing promotion. The responsible party must implement policies and programs to promote health and wellbeing on-site. The programs must target both physical and mental health outcomes.

At least three distinct issues, with one of those specifically addressing mental health impacts, must be addressed. Issues that may be considered include:

1) Healthier eating and active living
2) Reduced harmful alcohol and drug and tobacco-free living
3) Increase social cohesion, community, and cultural participation
4) Understanding depression
5) Preventing violence and injury
6) Suicide prevention
7) Decrease psychological distress

The responsible party should carry a needs analysis of site workers and contractors to determine appropriate actions. The policies and programs must be relevant to all construction workers on site for the whole duration of construction. A mix of programs is acceptable throughout the duration of construction. A list of suggested programs or policies which could be implemented on the project can be found in the guidance section.

Knowledge of Sustainable Practices

The responsible party must provide training to site workers on project specific sustainable practices and initiatives. The training must include information on any sustainable systems or attributes included in the design; and the role site workers play in delivering a sustainable building.

The training must be provided to all contractors and subcontractors that were present for at least three days on site. Training can be provided through one, or a combination of:

- On-site training, such as by including the items above as part of site induction practices.
- Off-site training, such as by providing sustainability training to site workers via a TAFE or similar program within the last 3 years .
- Online training, such as by a third party service that can provide training on sustainability topics and track personnel who have taken the relevant materials within the last three years.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Description of the types of PPE available to construction workers, and evidence of purchase of appropriate PPE; and
- Extracts from relevant policies that address discriminating, racism and bullying.
- Extracts of evidence detailing the programs and policies implemented to promote health and wellbeing on site;

- Evaluation report of the effectiveness of the training;
- Evidence detailing the process to manage training, and track workers trained. Examples of evidence include extracts from the training policy, a report from a third-party provider, or similar; and
- Extracts of training such as screenshots, presentation, or similar, showing the information provided as part of training.

4.11. (DGN-058 Code 9.1) Ventilation System Attributes

This Item applies to all indoor habitable spaces unless specific clinical requirements override this Specification.

Performance Requirements

4.11.1. Entry of Outdoor Pollutants

The entry of outdoor air pollutants to the space must be minimised. The building ventilation systems must be designed to comply with ASHRAE Standard 62.1:2013 in regards to minimum separation distances between pollution sources and outdoor air intakes. Windows, doors, openings, vents, grilles, and skylights are all considered outdoor air intakes for purposes of this Item and must be modelled taking into account their free area.

Compliance is to be demonstrated in accordance with the distances specified in Table 5.5.1 of the Standard, however projects must also ensure compliance with any other requirement or guidance nominated within the Standard. Analytical solutions are also acceptable by following the example provided within Appendix F of ASHRAE Standard 62.1.

4.11.2. Design for Ease of Maintenance and Cleaning

Any new mechanical ventilation system within the building must be designed to provide adequate access for maintenance, to both sides of all moisture and debris-catching components, within the air distribution system. Moisture-producing and debris-catching components include items such as cooling coils, heating coils, fan coil units, humidifiers and filters in the air handling system.

4.11.3. Cleaning Prior to Use and Occupation

All new and existing ductwork that serves the building must have been cleaned in accordance with the recognised Standards. This includes all ductwork in the base building that serves the building from the air handling unit to the supply vents. If no ductwork exists, these requirements are deemed to be met.

Where construction management processes are in place to ensure that all new ductwork, or ductwork that has been recently cleaned, remains free of moisture and debris until occupation, this ductwork can be considered to be clean. All other ductwork (existing and new) including plenums, filters and fan chambers must be cleaned in accordance with a recognised Standard

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 Weeks prior to commencement of the Works)

- Extract from the ventilation system specification for each system, showing that the project's commissioning requirements are stated in accordance with the relevant codes/guideline. The relevant sections must be highlighted.
- Extracts from the Environmental Management Plan that specify ventilation cleaning

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- As-Built Mechanical drawings for each ventilated space.
- Written confirmation that cleaning has taken place in accordance with the performance requirements

4.12. (DGN-058 Code 9.2) Provision of Outdoor Air

This Item applies to all indoor habitable spaces unless specific clinical requirements override this Specification.

Performance Requirements

outdoor air is provided at a rate 50% greater than the minimum required by AS 1668.2:2012 as per 9.2A, or carbon dioxide (CO2) concentrations are maintained below 800ppm as per 9.2B

outdoor air must be provided to each space in the nominated area at a rate greater than the minimum required by AS 1668.2:2012, by the stipulated percentage increase (50% or 100%).

To demonstrate compliance, the HVAC system must be clearly sized to accommodate the increased outdoor air rates. The project must use the design occupancy, where known, rather than the default occupancy when calculating the required rates.

The design occupancy is to be determined by the project team – any assumptions made must be justified within the Submission Template. Where the occupant density is unknown, projects must utilise the occupancy rates prescribed within Table A1 Appendix A of AS 1668.2:2012.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later 2 weeks before issue of For Construction documentation)

- For Construction documentation showing specified outside air rates and CO_2 monitor locations .

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Extract from the Commissioning Report demonstrating that the HVAC and CO2 monitoring systems are operating as intended. For naturally ventilated areas, this is only relevant where automation systems and the like are included.

4.13. (DGN-058 Code 9.3) Exhaust or Elimination of Pollutants

Performance Requirements

Pollutants from printing and photocopying equipment, cooking processes and equipment, and vehicle exhaust, are limited from the nominated area by either:

A. Removing the source of pollutants.

sources of pollutants, such as printing or photocopy equipment, kitchen stoves or vehicles, must be compliant with minimum emissions standards or not be present within the habitable area.

Where printing and/or photocopying equipment is present within the building, these must be certified in accordance with one of the following test standards:

a. ECMA-328;
b. RAL-UZ 171;
c. GGPS.003.

or

B. Exhausting the pollutants directly to the outside, and/or physically separated from occupants.

Printing and Photocopying Equipment

All print and photocopy equipment must be located in an enclosed print/photocopy area that is exhausted directly to the outside, or to a dedicated exhaust riser. The exhaust system must not recycle air to other building enclosures, or to the return air duct of the ventilation system. In shell and core buildings (or similar), the provision of the exhaust facility without enclosure will suffice, provided that information to the tenant is developed to ensure appropriate installation. This information can be transmitted via the Building Users Guide or through a Soft Landings approach.

Each print/photocopy room must achieve a minimum exhaust ventilation flow rate in accordance with AS 1668.2-2012 (Table B1). The fans must be installed as part of the base building; provision of the fans for future installation (e.g. by a tenant) does not meet the requirements.

Cooking Processes and Equipment

All kitchens must be ventilated in accordance with AS 1668.2:2012. A separate exhaust system must be provided for the kitchen exhaust. The kitchen must be physically separated from the adjacent spaces or have an opening no larger than an area of 2.5m2.

A 'kitchen' is defined as a space that includes cooking equipment such as stove tops or ovens, please see the Definitions section. Residential kitchens are not required to be physically separated, but must utilise either:

A. A non-recirculating exhaust system, exhausting directly to outside; or

B. A recirculating system, with filtration media that has been proven to effectively remove kitchen pollutants.

Kitchenettes or tea points with basic tea/coffee making or simple reheat equipment are not included. Cooking equipment employed for the preparation of food which has a power input less than 0.5kW/m2 may be excluded.

A combination of methods can be used to demonstrate compliance

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later 2 weeks before issue of For Construction documentation)

- For Construction documentation showing required exhaust system.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Extract from the printing and photocopy specification outlining the product certification criteria for all printing or photocopy equipment located throughout the project.
- Certificates for printing equipment to ACMA 328, RAL-UZ 171 or GGPS.003 for all printing equipment which is included in the project

4.14. (DGN-058 Code 9.4) Paints, Adhesives, Sealants and Carpets

Performance Requirements

At least 95% of all internally applied paints, adhesives, sealants and carpets meet stipulated 'Total VOC Limits'.

4.14.1. Paints, Adhesives, and Sealants

This requirement is applicable to all internal applications of all types of paints, adhesives or sealants by volume applied on-site, including both exposed and concealed applications.

The following items are excluded from this requirement:

- Glazing film, tapes, and plumbing pipe cements;
- Products used in car parks;
- Paints, adhesives and sealants used off-site, for example applied to furniture items in a manufacturing site and later installed in the fitout; and
- Adhesives and mastics used for temporary formwork and other temporary installations.

Total VOC (TVOC) values must reflect the final ready to use product, inclusive of tints (in the case of paints) and made in grams of VOC per litre (g/L) of ready to use product.

Methods for demonstrating that a paint, adhesive or sealant complies with this requirement are as follows. A combination of methods may be used.

A. The product has a product certification under one of the following schemes;
   - Carpet Institute of Australia Limited - Environmental Certification Scheme
   - Ecospecifier - GreenTag GreenRate
   - Australasian Furnishing Research and Development Institute - Green Tick
   - Good Environmental Choice Australia (GECA)
   - The Institute for Market Transformation to Sustainability - Sustainable Materials Rating Technology
   - Environmental Choice New Zealand
B. Laboratory testing where the product meets the following criteria:

Table 1 Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75

Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- A summary schedule demonstrating how all materials relevant to this Item have meet the performance requirements. The schedule is to nominate the material, state the amount of product applied, state that amount as a percentage of overall product applied, and must conclude that at least 95% of all relevant materials have met the performance requirements. The schedule is to be signed, dated, and stamped 'as-installed' by the Contractor.
- Product Data Sheets for each nominated material

4.14.2. Carpets

All carpets (by area) meet the requirements nominated below. A combination of methods may be used.

A. The product has a product certification under one of the following schemes;

- Carpet Institute of Australia Limited - Environmental Certification Scheme
- Ecospecifier - GreenTag GreenRate
- Australasian Furnishing Research and Development Institute - Green Tick
- Good Environmental Choice Australia (GECA)
- The Institute for Market Transformation to Sustainability - Sustainable Materials Rating Technology
- Environmental Choice New Zealand

B. Laboratory testing where the product meets the following criteria:

Table 2 Carpet Testing Standards and TVOC Emissions Limits

Compliance option	Test protocol	Limit
ASTM D5116	ASTM D5116 - Total VOC limit*	0.5mg/m^2 per hour
ASTM D5116	ASTM D5116 - 4-PC (4-Phenylcyclohexene)*	0.05mg/m^2 per hour
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m^2 per hour
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m^2 per hour

*Both limits should be met when testing against ASTM D5116

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- A summary schedule demonstrating how all materials relevant to this Item have meet the performance requirements. The schedule is to nominate the material, state the amount of product applied, state that amount as a percentage of overall product applied, and must conclude that at least 95% of all relevant materials have met the performance requirements. The schedule is to be signed, dated, and stamped 'as-installed' by the Contractor.
- Product Data Sheets for each nominated material

4.15. (DGN-058 Code 9.5) Engineered Wood Products

Performance Requirements

At least 95% (by area) of all engineered wood products meet the formaldehyde emission limits specified below.

A combination of methods can be used to demonstrate compliance.

Engineered wood products include particleboard, plywood, Medium Density Fibreboard (MDF), Laminated Veneer Lumber (LVL), High-Pressure Laminate (HPL), Compact Laminate and decorative overlaid wood panels. Timber veneers are excluded. Where only part of a product is composed of an engineered wood product, the limits apply only to that portion of the product, not the entire item.

These requirements apply to any uses of engineered wood products used internally, including FF&E.

The following applications of engineered wood products are excluded from this credit:

- Formwork;
- Car park applications; and
- Non-engineered wood products such as milled timber

There are two methods for demonstrating than an engineered wood product complies:

A. The product has a product certification under one of the following schemes;
    - Carpet Institute of Australia Limited - Environmental Certification Scheme
    - Ecospecifier - GreenTag GreenRate
    - Australasian Furnishing Research and Development Institute - Green Tick
    - Good Environmental Choice Australia (GECA)
    - The Institute for Market Transformation to Sustainability - Sustainable Materials Rating Technology
    - Environmental Choice New Zealand
B. Laboratory testing where the product meets the following criteria:

Table 3 Formaldehyde Emission Limit Values for Engineered Wood Products

Test Protocol	Emission Limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m³**
ASTM E1333	≤0.12mg/m³***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m³
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m²hr

*mg/m²hr may also be represented as mg/m²/hr.

**The test report must confirm that the conditions of Table 3 comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

***The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ratio of 0.98.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- A summary schedule demonstrating how all materials relevant to this Item have meet the performance requirements. The schedule is to nominate the material, state the amount of product applied, state that amount as a percentage of overall product applied, and must conclude that at least 95% of all relevant materials have met the performance requirements. The schedule is to be signed, dated, and stamped 'as-installed' by the Contractor.
- Product Data Sheets for each nominated material

4.16. (DGN-058 Code 10.1) Internal Noise Levels

Performance Requirements

Internal ambient noise levels in the nominated area must be no more than 5dB(A) above the lower figure in the range recommended in Table 1 of AS/NZS2107:2016.

The noise measurement and documentation must be provided by a qualified acoustic consultant and in accordance with AS/NZS 2107:2016. Noise measurement must account for all internal and external noise including noise arising from building services equipment, noise emission from outdoor sources such as traffic, and (where known) noise from industrial process. Occupancy noise is excluded.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Provide a report by a qualified acoustic consultant demonstrating that measurements have been conducted in at least 10% of the spaces in the habitable area. The selection of representative spaces

must be justified and must consider how the spaces are considered to be the most conservative with respect to both internal, and external noise sources.

- The range of measurement locations shall be representative of all spaces available within the habitable areas. All relevant building systems must be in operation at the time of measurement.
- Provide as-built drawings detailing the acoustic design features relevant to this performance requirement

4.17. (DGN-058 Code 10.2) Reverberation

Performance Requirements

reverberation time in the nominated area is below the maximum stated in the 'Recommended Reverberation Time' provided in Table 1 of AS/NZ 2107:2016.

Reverberation refers to the persistent prolonged reflections of sound in a space. A technical definition is provided in AS/NZS 2107:2016. For residential projects, this criterion is 'Not Applicable'.

Where note 3 of Table 1 AS/NZ 2107:2016 applies and requires that reverberation times be minimised as far as practical, acoustic absorption should be installed in the noise sensitive space. Acoustic absorption should be applied in locations appropriate to the function of the space and located to maximise the acoustic performance of materials selected.

The resulting performance of the installed acoustic absorption, irrespective of quantity or location installed, must result in a reverberation time equivalent to or lower than the reverberation time predicted for treating at least 50% of the combined floor and ceiling area with a material having a noise reduction coefficient (NRC) of at least 0.5, or treat 50% of the combined floor and ceiling area with a material having a NRC of at least 0.5.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Provide a report by a qualified acoustic consultant demonstrating that measurements have been conducted in at least 10% of the spaces in the habitable area. The selection of representative spaces must be justified and must consider how the spaces are considered to be the most conservative with respect to both internal, and external noise sources
- Provide as-built drawings detailing the acoustic design features relevant to this performance requirement

4.18. (DGN-058 Code 11.0) Minimum Lighting Comfort

Performance Requirements

4.18.1. Flicker-Free Lighting

Flicker-free lighting refers to luminaires that have either:

- A minimum Class A1 & A2 ballast for all fluorescent lighting;
- Electronic ballasts for all High Intensity Discharge (HID) lighting;
- Electronic drivers that feature 12-bit or greater resolution for all Light-emitting Diode (LED) lighting; or
- High frequency ballasts for all other lighting types, including incandescent (incl Halogen, dichroic (e.g. low-voltage downlights), and High-Intensity Discharge (e.g. metal halide, low/high pressure sodium).

4.18.2. Colour Quality

To address the perception of colour, light sources must have a minimum Colour Rendering Index (CRI) of 80, unless the project team can demonstrate that, in a particular area, the activity is not impeded by a lower CRI. The project team shall support their justification by ensuring their selection complies with the guidance provided in Table 7.2 in AS 1680.1:2006.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

Evidence a compliant system has been installed. The following documents may be used to demonstrate compliance:

- As-installed Lighting Drawings and architectural Drawings
- Lighting Specifications/Schedules
- Product Data Sheets
- Isolux Plot Drawings

4.19. (DGN-058 Code 11.1) General Illuminance and Glare Reduction

Performance Requirements

For habitable areas, lighting levels must comply with best practice guidelines and glare is to be eliminated in accordance with the following requirements.

4.19.1. General Illuminance

Best practice lighting levels for each task within each space type is defined as lighting with a maintained illuminance that meets the levels recommended in the relevant Standard. Two options are provided for demonstrating compliance with this requirement, and a combination of methods can be used.

Compliance can be demonstrated through modelling or measuring of the whole habitable area or a representative floor or section. Assessment (either modelling or measuring) must be carried out in accordance with Appendix B of AS/NZS 1680.1:2006. Maintained Illuminance values must achieve a uniformity of no less than that specified in Table 3.2 of AS 1680.1:2006, with an assumed standard maintenance factor of 0.8. Where recommended maintained illuminance values for a particular space are not specified, the values to be used must relate to the closest type of task as defined in AS/NZS 1680.1:2006 Table 3.

Table 4 Standards for Best Practice General Illuminance

Type of Task/Activity	Guidance
Industrial tasks and processes	Table E1 of AS/NZS 1680.2.4
Circulation and other general areas	Table D1 of AS/NZS 1680.2.1
Healthcare spaces	Table F1 of AS/NZS 1680.2.5
Office spaces	Table E.1 of AS/NZS 1680.2.2
Workspaces and other activities	Table 3.1 of AS/NZS 1680.1

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

Evidence that a compliant system has been designed. Evidence may consist of specifications, For Construction drawings, lighting schedules and product data sheets. Evidence must be compiled such that it demonstrates compliance with the performance requirements.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

Evidence a compliant system has been installed. The following documents may be used to demonstrate compliance:

- As-installed Lighting Drawings and architectural Drawings
- Lighting Specifications/Schedules
- Product Data Sheets
- Isolux Plot Drawings

4.19.2. Glare Reduction (Lighting)

Glare from lamps must be limited within the nominated area. Three options are provided for demonstrating compliance with this requirement; a performance method, and two prescriptive methods. A combination of methods can be used to demonstrate compliance.

Either:

Bare light sources must be fitted with baffles, louvers, translucent diffusers, ceiling design, or other means that obscures the direct light source from all viewing angles of occupants, including occupants looking directly upwards.

and/or

The lighting system must comply with the Luminaire selection system as detailed in Clause 8.3.4 of AS/NZS 1680.1-2006.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

Evidence that compliant fittings have been nominated. Evidence may consist of specifications, For Construction drawings, lighting schedules and product data sheets. Evidence must be compiled such that it demonstrates compliance with the performance requirements.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

Evidence a compliant system has been installed. The following documents may be used to demonstrate compliance:

- As-installed Lighting Drawings and architectural Drawings
- Lighting Specifications/Schedules
- Product Data Sheets
- Isolux Plot Drawings

4.20. (DGN-058 Code 11.2) Surface Illuminance

Performance Requirements

Demonstrate that a combination of lighting and surfaces improve uniformity of lighting to give visual interest in the nominated area. There are two options provided for demonstrating compliance

Table 5 Surface Illuminance Calculation Methods

Option 11.2A – Prescriptive Method	For this option, 95% of the spaces in the nominated area must have: • An surface reflectance for ceilings of at least 0.75; and • A direct/indirect lighting system present such that the ceiling area has an average surface illuminance of at least 30% of the lighting levels on the working plane. The surface reflectance value of 0.75 corresponds to a matte flat white ceiling. The surface reflectance value for the final finish must be obtained from the manufacturer's data sheet.
Option 11.2B – Performance Method	For this option, the 95% of the spaces in the nominated area must be modelled to show that: • The average ceiling luminance (excluding light fixtures) does not exceed 0.5 kcd/m^2 and the maximum luminance at any point on the ceiling does not exceed 1.5 kcd/m^2; • The ceiling area has an average surface illuminance of at least 30% of the lighting levels on the working plane; and • In rooms less than 100m^2, or in rooms where more than 20% of workstations are located within 3m of walls, the wall area above the working plane has an average surface illuminance of at least 50% of the lighting levels on the working plane. The illuminance values for ceilings, walls, and floors must be calculated in accordance with Appendix B of AS/NZS 1680.1:2006. The material and reflectance values used must correspond to the installed items. Where these are not available, reflectance may be estimated from AS/NZS 1680.1 Table E1. Where the reflectance values are not included in the Standard, or through manufacturer's data, the closest conservative value must be used.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

Evidence that a compliant system has been designed. Evidence may consist of specifications, For Construction drawings, lighting schedules and product data sheets. Evidence must be compiled such that it demonstrates compliance with the performance requirements.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

Evidence that the required surface illuminance values have been achieved.

4.21. (DGN-058 Code 11.3) Localised Lighting Control

Performance Requirements

Demonstrate that for 95% of primary spaces (i.e., habitable spaces that are occupied for at least 2 hours per day), occupants have the ability to control the lighting in their immediate environment. This includes turning the lights on and off and adjusting their light levels.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

For Construction lighting schematics showing compliance with the performance requirements.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

Evidence a compliant system has been installed. The following documents may be used to demonstrate compliance:

- Lighting Drawings
- Architectural Drawings
- Lighting Specifications/Schedules
- Product Data Sheets
- Isolux Plot Drawings

4.22. (DGN-058 Code 12.0) Glare Reduction (Sunlight)

Performance Requirements

Sunlight through all viewing façades and skylights is reduced through a combination of blinds, screens, fixed devices, or other means.

Internal blinds or screens must be installed to all habitable areas and must meet the following criteria:

- The blinds must provide glare reduction to at least 95% of the area of viewing façade and skylights;
- Blinds must be controlled by all affected occupants within each individual space; and
- Blinds must have a visual light transmittance (VLT) of ≤ 10%. Manual or automated internal, in-glazing, or external blinds can be used.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

Evidence showing nominated internal blind specifications, demonstrating that the blinds meet required VLT.

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- As-installed drawings showing the location of all blinds / shutters, and/or any glare control devices.

4.23. (DGN-058 Code 14.1) Thermal Comfort

Performance Requirements

For 95% of the primary area and 98% of the year, a high degree of thermal comfort is provided. The space meets specified prescriptive criteria for Thermal Comfort or the Predicted Mean Vote (PMV) levels are between -1 and +1, inclusive.

Compliance can be demonstrated in one of two ways;

Prescriptive Thermal Comfort

HVAC system requirements:

- Dry bulb temperature must be between 20°C and 24°C.
- Relative humidity must be controlled between 40% and 60%.
- Air velocity must be no more than 0.2m/s with no supply air directed at occupants (unless they have direct control over air flow and/or direction).
- Systems must have modulation/turn down capability (i.e. the demonstrated ability to maintain both dry bulb temperature and relative humidity at low space loads).
- The system must have distinct internal zones (no more than 120 m2) and external perimeter zones (no more than 75m2) with independent temperature controls. Perimeter zones must have a maximum depth of 4m and cannot serve more than one orientation. Small deviations are allowed for zone sizes at the discretion of the mechanical engineer.

Building façade requirements:

- Solar Heat Gain Coefficient of façade glazing must be 0.3 or lower; OR, maximum solar heat gain through the glass must be calculated as no greater than 250W/m2 peak.
- Total glazing U-Value (inclusive of glass and frame) is 3.0W/m2.K or lower

Thermal Modelling

PMV levels must be calculated in accordance with either ISO 7730-2005 or ASHRAE Standard 55-2013. The specified PMV levels must be met for each zone, not as an average.

Modelling must be carried out in accordance with ASHRAE Standard 55-2013. All inputs into the modelling or calculations (e.g. building form, materials, air conditioning system(s), shading, internal loads, etc.) must be clearly justified and referenced consistently throughout the rest of the ESD Evaluation Tool compliance documentation (i.e. in related sections such as 'Greenhouse Gas Emissions' (15) or 'Indoor Air Quality' (9)). Values must be justified and sourced from either ASHRAE Standard 55-2013 or ISO 7730-2005. Alternative values may be accepted with proper justification and sourcing.

For equitable assessment the model must comply with the following requirements:

- Perimeter zones shall have a maximum depth of 4m;
- Zoning shall match the air conditioning zones (with the exception of perimeter zones which must be 4m in depth) with exceptions permitted for small enclosed spaces at the discretion of the mechanical engineer (e.g. a small perimeter office);
- Inter-zone partitions should be modelled;
- Each perimeter shall be reported independently (e.g. North, South, East and West);
- Perimeter air conditioning zones cannot exceed 75m2;
- Perimeter zones shall be reported independently of interior zones;
- Model shall be completed with all systems assessed simultaneously;
- Comfort predictions shall be measured at the midpoint of each zone (i.e. if the perimeter zone is 4m deep then the comfort prediction will be 2m from the perimeter), or taken as an average across the zone.
- Comfort predictions shall be measured at a height of between 0.8 and 1.5m above finished floor level (FFL) of each zone, or taken as an average across the zone.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

Documentation demonstrating the design's ability to meet the above thermal comfort requirements

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Confirmation from the relevant sub-contractors that all services have been installed and commissioned in line with the listed criteria.
- Drawings showing thermal properties of roof, windows, and façade.
- Extract(s) from the Commissioning Report demonstrating via commissioning results that the building has been commissioned and the installed systems operate as intended by the design.
- Mechanical drawings showing details of the HVAC system and zones.
- Modelling report showing the results of the mechanically-ventilated compliance method (Thermal Modelling option only).

4.24. (DGN-058 Code 15E.0 and 15E.1-2) Greenhouse Gas Emissions – Reference Building Pathway

Performance Requirements

Demonstrate that operational greenhouse gas (GHG) emissions from the Proposed Building are less than those of the equivalent Benchmark Building. The Benchmark Building represents a 10% improvement on the Reference Buildings GHG Emissions. The Reference Building is a building which achieves minimal compliance with the NCC Section J DTS provisions using a defined HVAC system type.

Then, demonstrate the following:

1. [15E.1] That the building's fabric is improved against the reference building such that GHG emissions of the building overall are reduced by at least 4%; and
2. [15E.2] That the building's modelled emissions against the reference building energy model are reduced by at least 17%

Contractor Deliverables

(to be provided to the Principal's Authorised Person prior to finalising sub-contracts and no later than 2 weeks before issuing of For Construction documentation relating to building fabric, and mechanical systems, and electrical systems)

- Energy modelling report in accordance with the *Green Star Design & As-Built v1.3 Energy Consumption and Greenhouse Gas Emissions Calculation Guide* following the structure of the guide and:
  - Clearly identifying all default values used (e.g. occupant density).
  - Clearly identifying all of the assumptions made, design-driven inputs and referencing drawings; whenever assumptions are used, they must be justified and conservative.
  - Clearly corresponding to the design.
  - Demonstrating compliance with NCC Section J
- Extract(s) from the Specification(s) demonstrating that all the inputs used in the energy simulation are reflected in the current design.

(to be provided to the Principal's Authorised Person at Substantial Completion)

- Extract(s) from the Commissioning Report demonstrating (through supporting evidence) that the building has been commissioned and operates as intended by the design (i.e. as described in the energy modelling report).
- As built drawings demonstrating that the facade details and materials are the same as described in the energy modelling report.

4.25. (DGN-058 Code 15E.6.1) Reduction in upfront carbon emissions

Performance Requirements

No later than Substantial Completion, complete the NABERS Embodied Emissions Materials form based on as-installed values

4.26. (DGN-058 Code 16A) Peak Electricity Demand Reduction – On-Site Energy Generation

Performance Requirements

Demonstrate that the use of on-site renewable energy or on-site generation sources reduces the peak electricity demand.

Demonstrate at least a 15% reduction as follows:

Peak electricity demand is the predicted annual peak calculated as the sum of all distribution boards (to include all miscellaneous loads) relevant to the building as shown in the as-installed electrical schematics.

Peak electricity demand must be calculated in line with the below requirements:

- In accordance with AS/NZS 3000:2007 (or as subsequently amended);
- As the absolute design capacity of the system, after the application of diversity factors, but prior to the application of contingency factors as required for utility agreements (the value is likely to be about 30% less than that for the utility agreement); and
- To include all building end-use loads, except process loads, in the peak demand assessment.

Contractor Deliverable

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- Extract(s) from the specification(s) where the proposed solution(s) are described.
- Calculation of the peak electricity demand referencing as-installed drawings and AS/NZS 3000, detailing (with supporting calculations) the design, operation and justifying the capacity of the intended system.
- Schematic electrical drawings clearly indicating the type, location and details of the proposed solution(s).

(Due no later than Substantial Completion)

- As-built drawings demonstrating PV system size and location
- Extracts from commissioning report demonstrating successful operation of the systems

4.27. (DGN-058 Code 18B.1) Sanitary Fixture Efficiency

Performance Requirements

All fixtures are within one star of the WELS rating stated below.

Table 6 Nominated fixture WELS Rating

Fixture / Equipment Type	WELS Rating
Taps	6 Star
Urinals	6 Star
Toilet	5 Star
Showers	4.5 Star (> 4.5 but <= 6.0)**
Clothes Washing Machines	5.5 Star
Dishwashers	6 Star

** The 3 star (>4.5 but <=6.0) requirement relates to Range F which is specified for both High Pressure and Low Pressure Showers as per Table 3.1 and Table 3.2 respectively of the AS NZS 6400-2016 Water Efficient Products standard. For showers, within one star of this Category F WELS rating means showers must be either 3 star (6.0 but <=7.5), 3 Star (> 4.5 but <= 6.0), 4 Star (>6.0 but <=7.5) or 4 Star (> 4.5 but <= 6.0).

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- A summary schedule listing all sanitary fixtures, stating the product name and WELS rating. The schedule is to For Construction

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- A summary schedule listing all sanitary fixtures, stating the product name and WELS rating. The schedule is to be signed, dated, and stamped 'as-installed' by the Contractor.
- WELS certificates for each nominated fixture

4.28. (DGN-058 Code 18B.2) Rainwater Reuse

Performance Requirements

Roof rainwater to be directed to on-site rainwater storage, location to be nominated by Principal's Authorised Person.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- For Construction schematics showing size and location of rainwater storage and re-use system

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- As-installed documentation indicating size and location of the rainwater system and the connections to the water end uses
- Extracts from the commissioning report demonstrating that the rainwater collection and reuse system is working as required

4.29. (DGN-058 Code 18B.4) Landscape Irrigation

Performance Requirements

For all landscape irrigation provide drip irrigation with moisture sensor override. The landscaping and associated systems must be designed to reduce the consumption of potable water required for irrigation through the installation of subsoil drip irrigation and moisture sensor controls.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- For Construction schematics showing landscape irrigation system, clearly identifying all system components as required under the performance requirements

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Landscape/Hydraulics drawings showing either the drip irrigation system

4.30. (DGN-058 Code 19B.1) Life Cycle Impacts - Concrete

Performance Requirements

1. Portland cement content in all concrete used in the project has been reduced by 30% compared to a reference case by replacing it with supplementary cementitious materials.
2. Water used in concrete mixes contains at least 50% captured or reclaimed water (measured across all concrete mixes).
3. At least 40% of coarse aggregate in the concrete is crushed slag aggregate or another alternative material (measured by mass across all concrete mixes in the project), provided that the use of such materials does not increase the use of Portland cement by over 5kg/m³ of concrete; OR
4. At least 25% of fine aggregate (sand) inputs in the concrete are manufactured sand or other alternative materials (measured by mass across all concrete mixes in the project), provided that the use of such materials does not increase the use of Portland cement by over 5kg/m³ of concrete

The reference case represents the amount of Portland cement (in kilograms) that would have been used in the project if no supplementary cementitious materials were used.

The reference case should be established through the following steps:

1. Establish the concrete mixes used in the project, their volume and strength grade.
2. Based on Table 19B.1.1 calculate the total amount of Portland cement in each mix, in kilograms, assuming no supplementary cementitious materials are used.
3. Add all totals of Portland cement in all mixes; this figure is the reference case for the project.

It is noted that not all concrete mixes may have the exact concrete strength grades shown in the table below. The project concrete designer or the supplier's concrete technologist will need to use the figures in the table below to calculate the amount of Portland cement in such mixes. This must be calculated as a linear interpolation of the two closest performing concrete mix reference cases.

Table 7 Portland Cement Content Concrete Strength Grades as Defined in AS 1379

Concrete Strength Grade (MPa)	Portland Cement Content to be used in Establishing the Reference Case (kg/m^3)
20	280
25	310
32	360
40	440
50	550
65	550
80	610
100	660

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- Concrete mix specifications for each concrete application

(to be provided to the Principal's Authorised Person no later than 4 Weeks following completion of the trade)

- As-Built structural drawings
- Structural Engineer's report, including:
    - Summary calculation of the Portland cement content in the project based on the reference case and the actual case as well as showing the percentage reduction of Portland cement.
    - Concrete supplier's submission detailing target mix designs for each product supplied to the project identifying strength grade of the concrete, any special properties associated with each product, quantities and types of Cement, supplementary cementitious materials, water, coarse aggregates and fine aggregates.

4.31. (DGN-058 Code 20.1) Responsible Building Materials: Structural & Reinforcing Steel

Performance Requirements

4.31.1. Responsible Steel Maker

95% (by mass) of the building's steel is sourced from a Responsible Steel Maker who complies with both of the following initiatives:

- The steel making facilities where the structural and/or reinforcing steel for the project is sourced have a currently valid and certified ISO 14001 Environmental Management System (EMS) in place. Valid ISO 14001 Environmental Management System (EMS) certificates must be provided from the steel making facilities where the structural and/or reinforcing steels in the project were produced; and
- The steel maker supplying the steel is a member of the World Steel Association's (WSA) Climate Action Programme (CAP). A current CAP certificate from the WSA, confirming that the steel maker is a member of the CAP, must be provided. Certificates are valid for a period of two years and must be current at the time that the Green Star documentation is submitted to achieve points for this criterion.

4.31.2. Responsible Steel Fabricator

At least 60% of the fabricated structural steelwork is supplied by a steel fabricator/steel contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI).

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- Evidence demonstrating that the proposed supplier is accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI).

(to be provided to the Principal's Authorised Person no later than 4 Weeks following completion of the trade)

- Bill of Quantities / Report from Quantity Surveyor / Cost Planner / Project Manager or other qualified professional
- As-Built structural drawings
- Steel Producer's ISO14001 certificate
- Details of Steel Fabricators membership of ASI Environmental Sustainability Charter
- Confirmation from the Supplier stating, where relevant based on the criteria claimed:
    - That they are a responsible steel maker and listing their compliance documentation.
    - The total quantities (by mass) of structural and/or reinforcing steel supplied to the building.

4.32. (DGN-058 Code 20.2) Responsible Building Materials: Timber Products

Performance Requirements

At least 95% (by cost) of all timber used in the building and construction works is either:

A. Certified by FSC International or PEFC-accredited forest certification schemes

or

B. Is from a reused source.

A combination of both initiatives may be used to achieve 95% compliance

This requirement applies to all timber applications within the building and construction works. No distinction is made between temperate, tropical, hardwood and softwood timbers and engineered wood products.

Typical timber uses include, but are not limited to:

- Formwork and other temporary installations of timber (e.g. hoardings);
- Structural and non-structural timber, including internal walls, floors and roof structures;
- External and internal cladding;
- Flooring, wall, and ceiling finishes;
- Internal and external joinery, windows, doors, and other specialist uses of timber, such as installed furnishings or balustrades; and
- Furniture items made from timber or including timber components.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- Evidence demonstrating that at least 95% of the proposed uses of timber meet the above requirements

(to be provided to the Principal's Authorised Person no later than 4 Weeks following completion of the trade)

- Bill of Quantities / Report from Quantity Surveyor / Cost Planner / Project Manager or other qualified professional
- Invoices confirming types of timber product and quoting chain of custody code.
- As-Built documentation demonstrating timber applications and referencing timber types as above

4.33. (DGN-058 Code 20.3) Responsible Building Materials: Permanent Formwork, Pipes, Flooring, Blinds and Cables

Performance Requirements

Demonstrate that at least 90% (by cost) of all permanent PVC formwork, pipes, flooring, blinds and cables – when used, meet the GBCA's *Best Practice Guidelines for PVC*.

This requirement applies only to new PVC materials installed in the project. Preference is still given to materials that avoid the use of PVC.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 4 Weeks following completion of the trade)

- A valid audit verification certificate for each of the PVC products used in the project. The certificate must clearly state the product name, compliance against the GBCA's *Best Practice Guidelines for PVC*, date of validity, auditor's name, and signature. The auditor must be JAS-ANZ accredited;

or

- A product accreditation certificate from a Green Building Council of Australia accredited scheme. The scheme must clearly reference the guidelines in their standard
- Bill of Quantities / Report from Quantity Surveyor / Cost Planner / Project Manager or other qualified professional
- Product data sheets and SDSs or EPD

4.34. (DGN-058 Code 21.1) Product Transparency and Sustainability

Demonstrate that at least 3% of eligible products meet one or more of the following initiatives:

a. Reused Products.
Reused products are items that are have been previously used and are incorporated in the project without significant changes to the structure or function of the item. Cleaning, making good, repairs, recovering and resurfacing are allowed.

b. Recycled Content Products
Recycled content items are items produced with recovered materials. The Sustainability Factor of a recycled content product represents the fraction of pre- and post-consumer recovered content included in the product by mass. For example, if a product has 75% recycled content, the Sustainability Factor is 0.75.

c. Environmental Product Declarations (EPDs)
The EPDs must consider a minimum cradle-to-gate scope and include independent verification. Published EPDs shall confirm compliance to listed standards and include the scope considered, and by whom the EPD was verified. For compliance with this Item, two EPD formats are recognised as follows:
Products with a product-specific, third-party verified EPD. For this format the following minimum requirements apply:
  - The EPD is issued in conformance with ISO 14025 or EN15804;
  - The EPD must be independently-audited; and
  - The EPD must be based on a cradle-to-gate scope as a minimum

Products with an industry-wide, third-party verified EPD. For this format the following minimum requirements apply:
  - The EPD is issued in conformance with ISO 14025 or EN15804;
  - The EPD must be independently-audited;
  - The EPD must be based on a cradle-to-gate scope as a minimum; and
  - The product manufacturer must be recognised as a participant in the EPD.

d. Third Party Certification
  - Carpet Institute of Australia Limited - Environmental Certification Scheme
  - Ecospecifier - GreenTag GreenRate
  - Australasian Furnishing Research and Development Institute - Green Tick
  - Good Environmental Choice Australia (GECA)
  - The Institute for Market Transformation to Sustainability - Sustainable Materials Rating Technology
  - Environmental Choice New Zealand

e. Stewardship Programs
Products stewardship programs must be demonstrated with a product stewardship contract. The two types of Product Stewardship Contracts, for a leased item and a purchased item, are defined below.
Product Stewardship Contract – Leased Item
For this arrangement the following minimum requirements apply:
  - The contract must be between a supplier and the building owner or tenant;
  - The supplier must agree to collect the item at the lease end for re-lease, re-use or recycling; and
  - The contract may not include exemptions which relate to timing, quality or quantity that will be accepted for collection.

Product Stewardship Contract – Purchased Item
For this arrangement the following minimum requirements apply:

- The contract must be between a supplier and the building owner or tenant;
- The supplier must agree to collect item at the end of use for re-lease, re-use or recycling; and
- The contract may not include exemptions which relate to timing, quality or quantity that will be accepted for collection.

Where at least 3% of the Works' contract value (works under contract) meet at least one of the above requirements, **1 point** can be contributed to the ESD Evaluation Tool

Where at least 6% of the Works' contract value (works under contract) meet at least one of the above requirements, **2 points** can be contributed to the ESD Evaluation Tool

Where at least 9% of the Works' contract value (works under contract) meet at least one of the above requirements, **3 points** can be contributed to the ESD Evaluation Tool.

Contractor Deliverables

In order to demonstrate that the Works are eligible to contribute 1 or more points to the ESD Evaluation Tool, submit sufficient documentation to verify the claims. Examples include

- Confirmation from supplier that products supplied are recycled, recycled content and cost
- Product Certification Certificate outlining the environmental credentials of the product
- Quantity Surveyors Report or other evidence of cost of certified products
- Environmental Product Declarations certificates
- Evidence of product cost
- Product Stewardship contracts

4.35. (DGN-058 Code 22.B) Construction & Demolition Waste: Percentage Benchmark

Performance Requirements

At least 90% of the waste generated during construction and demolition is to be diverted from landfill. Waste shall be reported in kilograms.

To calculate the amount of waste diverted from landfill, calculate the total amount of waste generated and the total amount of waste diverted from landfill, and report on the proportion diverted as a percentage

Special waste and excavation waste shall be excluded from consideration in this credit. However, soil generated from site clean-up works which incorporates soil leaving the site mixed with general construction and demolition waste, must be included in the waste-to-landfill calculations, as it forms part of the building site's general waste profile.

To determine the weight of particular waste material streams from visual inspections of a load's volume for the purpose of reporting the estimated weights of material types removed from site (e.g. timber, steel, plasterboard, concrete, carpet), the conversion factors below may be used to convert measurement of waste types from volume to weight.

Table 8 Waste Volume to Weight Conversion Factors

Material	Density (tonne/m³)	Material	Density (tonne/m³)
Aluminium cans - whole	0.026	Insulation	0.05
Aluminium cans - flattened	0.087	Litter trap	0.75
Aluminium cans - baled	0.154	Metals	0.9
Asphalt / Bitumen	0.8	Oil	0.8
Bricks	1.2	Other Textiles	0.15
Car Batteries	0.375	Others	0.3
Carpets	0.3	Paint	0.8
Cement Sheet	0.5	Paper / Cardboard	0.1
Ceramics	1	Plasterboard	0.2
Clean Soil	1.6	Plastic containers - whole	0.01
Cobbles / Boulders	1.4	Plastic containers - whole, some	0.013

Material	Density (tonne/m³)	Material	Density (tonne/m³)
		flattened	
Commingled containers (plastic, glass, steel and aluminium cans)	0.063	Plastic containers - baled	0.139
Concrete	1.5	Rubber	0.3
Garbage	0.15	Soil / Rubble<150mm	1.4
Garden / Vegetation	0.15	Steel cans - whole	0.052
Glass bottles - whole	0.174	Steel cans - flattened	0.13
Glass bottles - semi-crushed	0.347	Steel cans - baled	0.226
Hazardous Wastes	0.2	Wood / Timber	0.3

Source: Converting Volumes to Tonnes – Western Australia Waste Authority

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Demolition and As-Installed drawings indicating the structures on site at time of purchase, extent of demolition and retained structure and façade.
- Cumulative waste report generated from the monthly waste reports provided by the waste contractor over the entire duration of construction and demolition works.
- Submit monthly reports for waste disposal during the works

4.36. (DGN-058 Code 24.2) Contamination and Hazardous Materials

Performance Requirements

Carry out a comprehensive hazardous materials survey on impacted ground conditions on the project site, in accordance with the relevant Environmental and Occupational Health and Safety (OH&S) legislation. This includes enclosed or encapsulated materials, or materials that existed prior to the new construction works.

For the purposes of this requirement, hazardous materials are defined as follows:

Table 9 List of Relevant Legislation and Standards

Hazardous Materials	Relevant Standards or Legislation
Asbestos	Occupational Health and Safety (OH&S) legislation, Work Health and Safety (WH&S) legislation and relevant environmental legislation
Lead	AS4361 Guide to Lead Paint Management
Polychlorinated Biphenyls (PCBs)	ANZECC Polychlorinated Biphenyls Management Plan

If a Hazardous Materials Survey has been conducted (in accordance with relevant Environmental and Occupational Health (OH&S) legislation) after 1 January 2005, there is no need to conduct a new survey.

and

Where the survey identified asbestos, lead or PCBs in any existing impacted ground conditions; the materials have been stabilised, or removed and disposed of in accordance with best practice guidelines.

For stabilisation, a register and management plan must be developed for each type of hazardous material (as defined above) found within the existing ground conditions. The register and management plans must be developed and kept current, in accordance with the applicable codes of practice for each type of hazardous material. The results of the survey must include:

- Location of the hazardous material;
- Composition and type of material and the material friability;
- Risk to health based on the condition, potential disturbance and occupancy level; and
- Recommendations to control or further minimise risk to occupant health

or

The survey concluded that no hazardous materials were found in existing impacted ground conditions on the project site.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than completion of site excavation)

- Confirmation that a hazardous materials survey has taken place
- Hazardous Materials Survey
- Hazardous Materials Management plan (where hazardous materials have been found but not removed)
- Copy of the hazardous materials contract or commitment to stabilise and/or remove and dispose of the hazardous materials, describing the methods used
- Clearance Certificate confirming that hazardous materials have been stabilised and/or removed and disposed of.

4.37. (DGN-058 Code 25.0) Heat Island Effect Reduction

Performance Requirements

Demonstrate that at least 75% of the whole site area comprised or one or a combination of the following:

All new roofing materials, including shading structures, having the following characteristics:

- For roof pitched <15°– a three-year SRI of minimum 64; or
- For roof pitched >15°– a three-year SRI of minimum 34.

Only where the three-year Solar Reflectance Index (SRI) for products is not available, use the following:

- For roof pitched <15° – an initial SRI of minimum 82; or
- For roof pitched >15° – an initial SRI of minimum 39.

Unshaded hard-scaping elements – including car parking, are to have a three-year SRI of minimum 34 or an initial SRI of minimum 39.

The Solar Reflectance Index (SRI) is a composite measure of a material's reflectance and emittance. It is calculated in accordance with ASTM E1980-11. To calculate the SRI, the material or product's emittance values and total solar reflectance must be known. Material suppliers often provide the SRI data for products.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- For Construction materials schedule demonstrating compliance with the above values
- Calculation demonstrating that at least 75% of the whole site area meets the above values

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Material data sheet for compliant roofing and hardscape materials highlighting the three year or initial SRI for the product, as applicable.

4.38. (DGN-058 Code 26.1) Stormwater Peak Discharge

Performance Requirements

The post-development peak 5-year Average Recurrence Interval (ARI) event discharge from the site does not exceed the pre-development peak ARI event discharge.

The following considerations for rainfall simulation shall be adopted:

- Continuous simulation of a minimum of 10 years;
- A six (6) minute time step (intervals);
- Localised climatic sequences;
- Water balances; and
- Treatment train operation

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- Calculation/Modelling Report by a suitably qualified professional. The report should describe:
  - Software or calculation methods used.
  - Data sets and tables that were applied.
  - Sizing of all stormwater treatment systems installed.
  - Quantity of stormwater discharge to be addressed by each stormwater treatment system (annually).
  - Comparing the results of the pollutant export modelling/calculations with the Pollution Reduction Targets in the relevant column of Table 26.2 (where Stormwater Pollution Targets criterion is targeted).
  - If relevant, summarising how hydrocarbons and free oils have been addressed.
- Civil/Hydraulics As-built drawings showing the stormwater collection, storage and treatment facilities and detailing their functional elements
- As-Built Hydraulics drawings showing all the capture, storage, piping and discharge route.
- Site plans showing the total areas of uncovered areas where vehicles are likely to transit and/or park (e.g. roads, loading docks, refuelling bays, and car parking, etc), when relevant to the scope of the works.

4.39. (DGN-058 Code 26.2) Stormwater Pollution Reduction Targets

Performance Requirements

The stormwater system shall meet the 'Column A' pollution reduction targets outlined in the tale below, when compared to untreated runoff in accordance with the following requirements.

Appropriate calculations must be undertaken by suitably qualified professionals. Any calculations and assumptions must be outlined, easy to follow, and in accordance with common practice protocols.

Table 10 Stormwater Pollution Reduction Targets

	Reduction Target (% of the typical urban annual load)		
Pollutant	**A**	**B**	**C**
Total Suspended Solids (TSS)[1]	80%	80%	90%
Gross Pollutants	85%	90%	95%
Total Nitrogen (TN)[2]	30%	45%	60%
Total Phosphorus (TP)[2]	30%	60%	70%
Total Petroleum Hydrocarbons[3]	60%	90%	90%
Free Oils[3]	90%	90%	98%

1. Load based on the following particulate size distribution (by mass): 20% <20 µm; 20% 20-60 µm; 20% 60-150 µm; 20% 150-400 µm; 20% 400-2000 µm.
2. Load includes particulate and dissolved fraction.
3. This requirement is not applicable where the site contains less than a total of 200m2 of uncovered areas where vehicles are likely to transit and/or park e.g. roads, loading docks, refuelling bays, car parking etc.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than 2 weeks prior to the issue of For Construction documentation)

- Independently verified performance certification for each proposed stormwater treatment device, proving its ability to achieve the pollution reduction targets nominated in the table above.
- Stormwater treatment performance must be demonstrated by one of the following methods:

  Numerical modelling of pollutant export. The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) model (CRCCH, 2005) is widely adopted for this purpose. Modelling must be undertaken based on a continuous simulation of catchment hydrology using models, parameters and methodologies in accordance with the relevant local government requirements; or

  Manually calculated in accordance with methodologies outlined in procedural manuals such as WSUD Engineering Procedures – Stormwater (CSIRO, 2005

- For Construction drawings or schematics showing proposed stormwater treatment devices

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- As-Built drawings or schematics showing installed stormwater treatment devices

4.40. (DGN-058 Code 27.0) Light Pollution to Neighbouring Bodies

Performance Requirements

Meet the requirements of AS 4282:1997 Control of the obtrusive effects of outdoor lighting.

Conditions shall be applied to all boundaries, apart from boundaries with roads. The boundary shall be taken as the site boundary, with no setback and no consideration of the location of adjacent buildings (i.e. worst-case scenario).

The following values from Table 2.1 of AS 4282:1997 must be applied:

- For Class 2 buildings (residential), the values in Columns 5A and B; or
- For Class 3 to 9 buildings (non-residential), the values in Column 3.C. The system must comply with both pre- and post-curfew requirements

Signage related to emergency exits and external emergency lighting that only illuminates in the event of an emergency/power failure are excluded from these requirements. Lighting related to other safety requirements are also excluded, for example, the lighting of ATMs.

External emergency lighting that is integrated into the general external lighting scheme must comply with the requirements. For example, lights that act as general lighting but have a battery pack to ensure that they also stay on in the event of a power failure must comply.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- As Built drawings indicating the location of all external luminaires and showing the aiming point and mounting orientation of all external luminaires.
- Luminaire schedule for all external lighting, nominating the type, lighting distribution and quantity of each luminaire and including the relevant photometric data such as ULOR.
- Calculation Plots for all external lighting, showing that all grid points on the calculation plane return compliant Lux values.
- Excerpt from lighting control system, or similar, demonstrating automatic deactivation of lights, based on external lux levels, where deactivation is required to achieve compliance.

4.41. (DGN-058 Code 27.1) Light Pollution to Night Sky

Performance Requirements

One of the following specified reductions in light pollution shall be achieved.

A. Control of Upward Light Output Ratio (ULOR):

No external luminaire on the project has a ULOR that exceeds 5%, relative to its actual mounted orientation.

Demonstrate that the ULOR provided or calculated in the as-installed documentation is relevant to the as-installed orientation of the luminaire (as distinct from the manufacturer's specifications).

or

B. Control of Direct Illuminance:

Direct illuminance from external luminaries on the project produces a maximum initial point illuminance value no greater than:

- 0.5 Lux to the site boundary; and
- Lux to 4.5 metres beyond the site into the night sky, when modelled using a calculation plane set at the highest point of the building.

Calculations shall be in accordance with AS 4282:1997.

The calculation plane must cover the area between the site boundary and building façade or vertical service to be illuminated. The horizontal calculation plane shall be set at the top of the building fabric, excluding spires.

Calculation plane grid points shall have a 0.5m spacing. All illumination results shall be reported to within 2 decimal places.

This requirement covers all external lighting of a project. In addition to other types of external lighting, for the purposes of this requirement, luminaries inside glazed atria and those on the uppermost (uncovered) deck of an outdoor car park are considered to be external.

Contractor Deliverables

(to be provided to the Principal's Authorised Person no later than Substantial Completion)

- As Built drawings indicating the location of all external luminaires and showing the aiming point and mounting orientation of all external luminaires.
- Luminaire schedule for all external lighting, nominating the type, lighting distribution and quantity of each luminaire and including the relevant photometric data such as ULOR.

End of document.

Project Name:	Albury Hospital Redevelopment **NEB**		Update by:	Digby Hall	Points Currently Achieved	63	Total Points Available	101
HI Delivery Part:	3 / For Tender		Date Last Updated:	19/09/2024	Points TBC	3	Total - Minimum requirements	12
Revision F Notes:	1. Notes edited to suit Tender audience 2. For detailed performance, delivery and evidence criteria refer to DGN-058 ESD Evaluation Tool Specification (Rev 4 For Tender)						Total - Recommended	32

HI Environmentally Sustainable Development (ESD) Evaluation Tool

Category/Credit	Aim of the Credit / Selection	Code	Credit Criteria	Points available	Points Targeted	Points TBC	Type [per DGN-058]	Lead Input	Stakeholders In	Overlaps HI ESG, AusHFG, NCC, SSDA, Design Guide	CWD Notes
Management				**12**							
ESD Consultant (Accredited Professional)	To recognise the appointment and active involvement of an Accredited Professional in order to ensure that the ESD tool is applied effectively and as intended.	1.0	Accredited Professional	1	1		Minimum requirement	CONTR	HI / AWHS, ESD, Head Contractor		Head contractor to appoint ESD consultant for duration of Works
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-			Minimum requirement	HI	ESD		Operator to establish
		2.1	Services and Maintainability Review	1	1		Recommended	HI	AWHS FM Manager		By AWHS FM Manager, can also be internal HI specialist not directly involved in project design. HI to nominate reviewer. Assumed will be carried out prior to issue of Tender documentation,
		2.2	Building Commissioning	1	1		Recommended	CONTR			Include in head contract Included in ESD Specification
		2.3	Building Systems Tuning	1	1		Recommended	CONTR			Include in head contract Included in ESD Specification
		2.4	Independent Commissioning Agent	1	1		Optional	HI	HI / AWHS, Project Manager, ICA		By AWHS FM Manager. Included in ESD Specification
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance and sustainable outcomes.	4.1	Building Information	1	1		Recommended	CONTR	Façade, Mechanical, Electrical, V. Transport, Fire, Hydraulics, Landscape, Structrural, Head Contractor		Included in ESD Specification
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1	1		Recommended	AWHS	HI / AWHS		Met generally via GREP reporting Part 4 to establish specific targets relating to energy, water, waste, and IEQ
		5.2	End of Life Waste Performance	1	1		Recommended	AWHS	HI / AWHS		Requires commitment to reduce demolition waste at end of fitout life.

Category/Credit	Aim of the Credit / Selection	Code	Credit Criteria	Points available	Points Targeted	Points TBC	Type [per DGN-058]	Lead Input	Stakeholders In	Overlaps HI ESG, AusHFG, NCC, SSDA, Design Guide	CWD Notes
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6	Metering	-			Minimum requirement	MECH	Mechanical, Electrical, Hydraulics, Landscape		Included in ESD Specification
		6.1	Monitoring Systems	1	1		Minimum requirement	MECH	Mechanical, Electrical		Included in ESD Specification
Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction and support staff sustainability awareness and education.	7	Environmental Management Plan	-			Minimum requirement	CONTR	Head Contractor		Included in ESD Specification & HI head contract.
		7.1	Formalised Environmental Management System	1	1		Recommended	CONTR	Head Contractor		Included in ESD Specification & HI head contract.
		7.2	High Quality Staff Support	1	1		Recommended	CONTR	Head Contractor		Refer ESD Specification
Operational Waste	Performance Pathway To encourage project to apply waste hierarchy through the design	8A	Performance Pathway - Specialist Plan	1	1		Recommended	HI	HI / AWHS, Waste Consultant		Shared Amenity with main project: To be prepared by operator during Part 4.
		8A(i)	Operational Waste Management Plan	-			Minimum requirement	AWHS	HI / AWHS, Waste Consultant		To be prepared by operator during Part 4
		8B	Prescriptive Pathway - Facilities	0	0		Optional				NOTE: The project can target EITHER 8A or 8A(i) plus 8B. Architect to allocate sufficient area / room sizes
Total				**12**	**12**	**0**					
Indoor Environment				**17**							
Indoor Air Quality	To recognise projects that provide high air quality to occupants and safeguard occupant health through the reduction in internal air pollutant levels.	9.1	Ventilation System Attributes	1	1		Recommended	MECH	Mechanical		Included in ESD Specification
		9.2	Provision of Outdoor Air	2	1		Recommended	MECH	Mechanical	ESG requirements request 2.0 ACH to IPU spaces.	Refer ESD Specification
		9.3	Exhaust or Elimination of Pollutants	1	1		Recommended	MECH	ARCH, Mechanical		Refer ESD Specification. Met via dedicated print / photocopy room exhaust OR low emissions equipment
		9.4	Paints, Adhesives, Sealants and Carpets	1	1		Recommended	ARCH	ARCH, Façade, Mechanical, Electrical, V. Transport, Fire, Hydraulics, Acoustics, Head Contractor		Included in ESD Specification. Applies to all materials and FF&E inside building envelope
		9.5	Engineered Wood Products	1	1		Recommended	ARCH	ARCH, Structrural, Head Contractor		Included in ESD Specification. Applies to all materials and FF&E inside building envelope

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Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1	1		Recommended	ACOUS	ARCH, Façade, Mechanical, Acoustics		Included in ESD Specification
		10.2	Reverberation	1	1		Recommended	ACOUS	ARCH, Acoustics, Structrural		Included in ESD Specification
		10.3	Acoustic Separation	1		1	Optional	ACOUS	ARCH, Mechanical, Acoustics, Structrural		Not currently included in ESD Specification. To be reviewed during Part 4
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11	Minimum Lighting Comfort	-			Minimum requirement	ELEC	Electrical, Lighting	Artificial lighting initiatives can also utilise typical	Included in ESD Specification
		11.1	General Illuminance and Glare Reduction	1	1		Recommended	ELEC	Electrical, Lighting		Included in ESD Specification
		11.2	Surface Illuminance	1	1		Recommended	ARCH	ARCH, Electrical, Lighting		Included in ESD Specification
		11.3	Localised Lighting Control	1	1		Recommended	ELEC	Electrical, Lighting		Included in ESD Specification
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12	Glare Reduction	-			Minimum requirement	ARCH	ARCH, Façade		Included in ESD Specification
		12.1	Daylight	2	0		Recommended			Modelling of typical spaces for the daylighting initiative is acceptable, provided a sensible	Not targeted
		12.2	Views	1	0		Recommended			Views can also be assessed using typical spaces.	Not targeted
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1		Recommended	MECH	Mechanical	NCC 2022 JV3 requires a PMV assessment to be undertaken	Included in ESD Specification, including thermal comfort modelling requirements
		14.2	Advanced Thermal Comfort	1	0		Recommended				Not targeted
Total Line				**17**	**11**	**1**					
Energy & Carbon				**24**							
Greenhouse Gas Emissions	To encourage and recognise projects to reduce their carbon footprint through design and construction and to ensure projects are net zero	15E.0	Conditional Requirement: Reference Building Pathway	-			Minimum requirement	MECH	Façade, Mechanical, Electrical,		

Category/Credit	Aim of the Credit / Selection	Code	Credit Criteria	Points available	Points Targeted	Points TBC	Type [per DGN-058]	Lead Input	Stakeholders In	Overlaps HI ESG, AusHFG, NCC, SSDA, Design Guide	CWD Notes
		15E.0 (i)	10% energy performance beyond NCC requirement, or GREP	1	1		Minimum requirement	ELEC	Mechanical, Electrical		10% improvement on NCC Section J is a mandatory requirement
		15E.1	Comparison to a Reference Building Pathway: GHG Emissions Reduction: Building Fabric	4	2		Recommended	ARCH	Façade, Mechanical,		2 points assumed via building envelope improvements. Requirements included in ESD Specification
		15E.2	Comparison to a Reference Building Pathway: GHG Emissions Reduction	16	10		Minimum requirement	MECH	Façade, Mechanical,		Conservative 17.6% reduction in GHG emissions compared to reference building (via proposed fabric and services), which equates to 4pts. Adding 90kW PV improves to 57% GHG emissions reduction. Assume 99kW PV array and 60% overall GHG emissions reduction, equating to 10 points. To be modelled / verified in Part 4
		15E.3	Off-site Renewables	0	0		Optional				Not targeted
		15E.4	District Services	0	0		Optional				Not targeted
		15E.5.1	Conditional Requirement: Net zero plan ['Transition Plan']	-			Minimum requirement	ESD			Net Zero Ready statement by CWD
		15E.5.2	100% electric in operation ['Fuel Switching']	1	1		Minimum requirement	ELEC	Mechanical, Electrical	Aligns with Sustainable Buildings SEPP - A Net Zero Statement describes how a project will avoid dependence on fossil fuels and be capable of operating at net zero emissions by 2035.	Minimum compliance with DGN-058 (RevC)
		15E.6.0	Measurement of Embodied Carbon	1	1		Minimum requirement	ESD	ARCH, Structrural, Head Contractor, Façade	Aligns with Sustainable Buildings SEPP - use the Embodied Emissions Materials Form in line with the Embodied Emissions Technical Note	Embodied Emissions Materials Form (NABERS) requires completion.
		15E.6.1	Target reduction in upfront carbon emissions	1	1		Minimum requirement	ESD	Mechanical, Electrical		Complete NABERS Embodied Emissions Materials form
Peak Electricity Demand Reduction	To encourage projects to consider Peak electricity reduction through energy efficiency or on-site energy generation	16A(i)	Solar or Renewable energy assessment	-			Minimum requirement	ELEC	Mechanical, Electrical		Peak demand reduced by at least 15% via PV array

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		16A(ii)	Solar or Renewable energy generation	1	1		Recommended	ELEC	Mechanical, Electrical		Allocate 99kW of PV to 15E.2
		16B	Performance Pathway - Reference Building	0	0		Optional				
Total Line				**24**	**16**	**0**					
Climate risk and resilience				**2**							
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Climate risk assessment	1	1		Minimum requirement	ESD	ARCH, Façade, Mechanical, Electrical, Fire, Hydraulics, Civil, Landscape, Structrural,		Site specific risk assessment has been carried out.
		3.2	Implementation of a Climate Adaptation Plan	1	1		Recommended	ESD	ARCH, MECH, LA, CIVIL	SEARS condition: Credit can be used to demonstrate CSIRO project climate Impacts	Adaptation performance guidelines included in ESD Specification
Total Line				**2**	**2**	**0**					
Transport			**Points available**	**5**							
Sustainable Transport	To encourage projects to consider sustainable transport options through design	17A.1	Performance Pathway	9			Optional				
		17B.1	Access by Public Transport	1	1		Optional		ESD		NEB: same as main project
		17B.2	Reduced Car Parking Provision	1	0		Optional				Permanent car parking not within scope
		17B.3	Low Emission Vehicle Infrastructure	1	0		Minimum requirement		ARCH, Electrical	Consistent with DGN 46 and NSW Government Fleet Strategy	Not within NEB scope
		17B.4	Active Transport Facilities	1	1		Optional		ARCH		Shared amenity with main project
		17B.5	Walkable Neighbourhoods	1	0		Optional				Site does not achieve sufficient points in Walk Score.
Total Line				**5**	**2**	**0**					
Water				**6**							

Category/Credit	Aim of the Credit / Selection	Code	Credit Criteria	Points available	Points Targeted	Points TBC	Type [per DGN-058]	Lead Input	Stakeholders In	Overlaps HI ESG, AusHFG, NCC, SSDA, Design Guide	CWD Notes
Potable Water	Prescriptive Pathway	18A.1	Potable Water - Performance Pathway	0	*ser Input*		Optional				
		18B.1	Sanitary Fixture Efficiency	1	1		Recommended	ARCH	Architectural FF&E	AusHFG Requirements limit use of RW systems	Included in ESD Specification
		18B.2	Rainwater Reuse	1	1		Optional	HYDR	Hydraulics, Landscape	AusHFG Requirements limit use of RW systems	Rainwater harvest and re-yse included in ESD Specification. Part 4 to establish location and size of NEB-specific RW tank, for NEB landscape irrigation.
		18B.3	Heat Rejection	2	2		Optional	MECH			VRF system, non-water.
		18B.4	Landscape Irrigation	1	1		Recommended	LAND	Hydraulics, **Landscape**		Included in ESD Specification
		18B.5	Fire System Test Water	1	1		Recommended	FIRE	Fire		Included in ESD Specification. Test water to be diverted from stormwater / sewer via close loop testing or diversion to landscape or other uses
Total Line				**6**	**6**	**0**					
Materials & Waste				**14**							
Life Cycle Impacts	Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment	6			Optional				Life Cycle Assessor (additional consultant) required
		19A.2	Additional Life Cycle Impact Reporting	4			Optional				Life Cycle Assessor (additional consultant) required
		19B.1	Concrete	3	2		Optional	STRUC	Civil, Structrural		1 point for 30% Portland cement reduction, measured across all concrete mixes. 1 point added for water & aggregate per Enstruct advice. 30% PC replacement comes at 5-10% cost premium.
		19B.2	Steel	1	0		Optional				Not targeted

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		19B.3	Building Reuse	4	0		Optional				Not targeted
		19B.4	Structural Timber	4	0		Optional				Not targeted
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	1	1		Recommended	STRUC			Included in specification. [Responsible Steel Maker / Fabricator]
		20.2	Timber Products	1	1		Recommended	ARCH	Contractor, architect		Included in specification. [Responsible Timber Products]
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1		Recommended	HYDR MECH ELEC ARCH STRUC	Contractor, architect		Included in ESD Specification
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability	3	1	2	Optional	CONTR	Contractor, architect		Included in ESD Specification
Construction and Demolition Waste	Fixed Benchmark	22A	Fixed Benchmark	1	1		Optional	CONTR			90% C&D waste diversion
		22B	Percentage Benchmark	-			Recommended				
Total Line				**19**	**7**	**2**					
Land Use & Ecology				**6**							
Ecological Value	To reward projects that improve the ecological value of their site.	23	Endangered, Threatened or Vulnerable Species	-			Minimum requirement	ECO	Project Manager, ESD		
		23.1	Ecological Value	3	0						Not targeted
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24	Conditional Requirement	-			Minimum requirement	ESD			
		24.1	Reuse of Land	1	1			ESD			Requirments met
		24.2	Contamination and Hazardous Materials	1	1			CONTR	Project Manager, Head Contractor		Included in ESD Specification
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1	1		Recommended	ARCH	ARCH, Landscape		Included in ESD Specification
Total Line				**6**	**3**	**0**					
Discharge to Environment				**5**							
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	1		Recommended	CIVIL	Hydraulics, Civil, Landscape		Assumed met via existing stormwater management. Included in ESD Specification. Part 4 - explore options to use green infrastructure / landscape
		26.2	Stormwater Pollution Targets	1	1			CIVIL	Civil, Landscape		Assumed met via existing stormwater management. Included in ESD Specification. Part 4 - explore options to use green infrastructure / landscape
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-			Minimum requirement		Electrical, Lighting		Performance requirements included in ESD Specification
		27.1	Light Pollution to Night Sky	1	1		Recommended		Electrical, Lighting		
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	1		Recommended	MECH			VRF system without water. Compliance automatically met.

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Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1	0						Not targeted
Total Line				**5**	**4**	**0**					
Innovation				**10**							
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	10							HINSW confirm that Innovation points can be sought. Each proposed solution to be reviewed by HI ESD team prior to confirming point award.
	Thermal Comfort	30A.1	Individual Comfort Control	1			Optional				Provide individual comort control in all primary spaces
	Greenhouse Gas Emissions	30A.2	removed								included in 16A(ii) above
	Greenhouse Gas Emissions	30A.3	Building Integrated PV	1			Optional				When BIPV contribute to GHG reductions of at least 15% (can be awarded in addition to above). Unlikely to achieve 15% contribution unless extensive PV are installed.
	Potable Water	30A.4	Heat Rejection Systems in Equipment Requiring Process Cooling	1			Optional				Potable water use from heat rejection in process cooling is reduced, for new equipment purchases only.
	Potable Water	30A.5	Passive Design	1			Optional				Projects that use passive water treatment systems (e.g vegetation) to achieve at least 1 point in potable water calculator.
	Microbial Control	30A.6	Microbial control in Warm Water Systems	1			Optional				Warm water systems have been designed to manage the risk of microbial control
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation								
	Commissioning and Tuning	30B.1	Soft Landings	1			Optional				Designed, built, commissioned and tuned by adopting Soft Landings approach.
	Greenhouse Gas Emissions	30B.2	Passive Design	1			Optional				For projects that achieve more than 15 points through passive design / without energy generation / without offsets or Green Power in the GHG Emissions credit
	Life Cycle Impacts - Concrete	30B.3	Sustainable Sourcing of Concrete Aggregates	1			Optional				Concrete aggregates have chain of custody or come from responsible source/s
Improving on Benchmarks	The project has achieved full points in a credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Benchmarks								
	Commissioning and Tuning	30C.1	Supplementary or tenancy fitout systems review	1			Optional				Comprehensive services and maintainability review of supplementary or tenancy fitout systems
	Commissioning and Tuning	30C.2	Building Air Permeability Rates	1			Optional				Achieve rates from the 'normal' column
	Commissioning and Tuning	30C.3	Building Air Permeability Rates	1			Optional				Achieve rates from the 'best practice' column, or where it can be demonstrated that project has met requirements of JV4 Section J NCC 2019

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	Greenhouse Gas Emissions	30C.4	Reference Building Pathway - 15% Improvement	1			Optional				On-site renewable energy systems produce 5% more energy than what is required by the building. Energy must be exported or stored on site.
	Greenhouse Gas Emissions	30C.5	Reference Building Pathway - 30% Improvement	1			Optional				On-site renewable energy systems produce 5% more energy than what is required by the building. Energy must be exported or stored on site.
	Sustainable Transport	30C.6	No New Car Parks on Site	1			Optional				Includes all car parking regardless of ownership / operation
	Potable water	30C.7	Discharge to Sewer	1			Optional				90% or greater reduction in flow to sewer.
	Life Cycle Impacts	30C.8	Comparative Life Cyle Assessment +20%	1			Optional				Cumulative impact reduction is increased by 20% to 150% total.
	Life Cycle Impacts	30C.9	Comparative Life Cyle Assessment +40%	1			Optional				Cumulative impact reduction is increased by 40% to 170% total.
	Sustainable Products	30C.10	Product Transparency and Sustainability +3%	1			Optional				Percentage of compliant products is increased by 3% to 12%
	Sustainable Products	30C.11	Product Transparency and Sustainability +6%	1			Optional				Percentage of compliant products is increased by a further 3% to 15%
	Construction and Demolition Waste	30C.12	Reduction of Construction and Demolition Waste	1			Optional				Meets fixed benchmark of 5kg waste / sqm of GFA
	Stormwater	30C.13	Stormwater Pollution Targets	1			Optional				Meets Column B. Achievable via green infrastructure
	Stormwater	30C.14	Stormwater Pollution Targets	1			Optional				Meets Column C
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the above Credits.	30D	Innovation Challenge								
		30D.1	Community Benefits	1			Optional				Conduct community needs analysis, develop strategy for community neneits, implement plan
		30D.2	Culture, Heritage and Identity	1			Optional				Applies to buildings that are Burra Charter listed, retained, refurbished and celebrated through info / displays etc.
		30D.3	High Performance Site Offices	1			Optional				Where at least 75% of 'site office checklist' is achieved.
		30D.4	Integrating Healthy Environments	1			Optional				Conduct community health needs analysis, prioritise strategies to address needs, develop monitoring plan
		30D.5	Local Procurement - Products and Materials	1			Optional				Significant improvement in comparison to industry standard'.
		30D.6	Local Procurement - Services and Skilled Labour	1			Optional				Significant improvement in comparison to industry standard'
	Occupant Engagement	30D.7	Occupant Engagement - Occupant Survey	1			Optional				AWHS scope, not included in ESD Specification.
	Occupant Engagement	30D.8	Occupant Engagement - Connection to Nature	1			Optional				Provide ongoing feedback to Biophilic research by RMIT

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	Pathways to Carbon Positive	30D.9	Powered by Renewables	1			Optional				15% improvement on rating requirements & no fossil fuels on site, publicly commit to 100% renewable electricity
	Pathways to Carbon Positive	30D.10	Responsible Carbon Impacts	1			Optional				At least 3 points achieved under 19A and climate change impact category reduces by 10%, and Climate Active Carbon Neutral offsets purchased for remaining embodied carbon
		30D.11	Responsible Carbon Impacts	1			Optional				20% reduction in the climate change impact category and Climate Active offsets for residual as above
		30D.12	Responsible Carbon Impacts	1			Optional				Above, plus at least 5% of embodied carbon reduction in climate change category from carbon neutral certified products
	Pathways to Carbon Positive	30D.13	Carbon Positive - New Buildings	1			Optional				Requires whole-building Climate Active Carbon Neutral Standard registration, maintained for 6 years, plus 10% of embodied carbon in addition to 100% of operational carbon OR transport emissions are offset
	Reconciliation	30D.14	Reconciliation Action Plan	1			Optional	AWHS			AWHS develops a Reconciliation Action Plan.
		30D.15	Incorporation of Indigenous Design	1			Optional				From the Australian Indigenous Design Charter, follow 1) Indigenous Led, 2) Community Specific, 3) Impact of Design, and 4) Shared Knowledge
		30D.16	Social Return on Investment	1			Optional				Complete analysis of direct and indirect costs and benefits
		30D.17	Universal Design	1			Optional	ARCH			Review Design for Dignity Guidelines, perform needs analysis, develop accessibility plan, implement accessibility plan
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this rating tools.	30E	Global Sustainability								The Global Sustainability Credits shown are limited to relevant Credits from other Green Star tools only (Performance, Communities and Interiors). Credits from other international tools are also recognised, e.g. from BREEAM, DGNB, LEED, LBC, IWBI and Passive House.
	Indoor Air Quality [From Green Star Performance V1.2 **Credit 6.2**]	30E.1	Green Cleaning	1			Optional				Green Cleaning Policy is established and all areas are cleaned in Acordance with this policy.
	[From Green Star Buildings v1.3, **Credit 13**]	30E.2	Exposure to toxins	1		0	Optional	CONTR			Requires on-site tests verify the building has low Volatile Organic Compounds (VOC) and formaldehyde levels.
	[From Green Star Performance / Buildings v1.2, Credit 21]	30E.3	Procurement and Purchasing	1			Optional				Sustainable Procurement Framework is in place for ongoing purchasing of consumables, services, and materials post-completion

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	[From Green Star Performance / Buildings v1.2, Credit 25]	30E.4	Groundskeeping Practices	1			Optional				Best practice process put in place to maintain landscaped areas and hard surfaces to protect sensitive landscapes and improve ecological value.
	[From Green Star Interiors v1.3, **Credit 15.1**]	30E.5	Ergonomics Strategy	1			Optional				Ergonomics Strategy is developed, with all work settings addressing ergonomic needs of the user, with info provided to user.
	[From Green Star Interiors v1.3, **Credit 12.3**]	30E.6	Indoor Pollutants - Indoor Plants	1			Optional				Indoor plants are distributed across non-clinical floor areas. Include allowance for ongoing plant maintenance contract.
	[From Green Star Interiors v1.3, **Credit 13.1** INNOVATION]	30E.7	Indoor Pollutants - Mattresses	1		0	Optional	AWHS			All new mattresses installed emit a reduced amount of indoor pollutants (Greenguard emission criteria)
	[From Green Star Interiors v1.3, Credit 12 INNOVATION]	30E.8	Indoor Pollutants - Low VOC	1		0	Optional	ARCHI			50% of paints (by cost) have max VOC of 5g/L.
	[From Green Star Buildings v1.3, **Credit 14**]	30E.9	Amenity and Comfort	1			Optional				Building includes one or several rooms designed to promote either inclusivity, mindfulness or exercise for staff or occupants. i.e. Parent room, relaxation/ meditation / prayer room; Exercise room. Calculated at 1m² per every 10 occupants or staff.
	[From Green Star Buildings v1.3, **Credit 28**]	30E.10	Enjoyable Places	1			Optional				Deliver an Activation Strategy to facilitate initiation of placemaking activities.
	[From Green Star Buildings v1.3, **Credit 27**]	30E.11	Movement and Place, credit achievement (offers up to 3 points)	1			Optional				Develop a Sustainable Transport Plan that encourages walking and walkability, public transport use, and reduced reliance on car travel.
	Biodiversity Enhancement (Green Star Buildings)	30E.12	Biodiversity Enhancement	1			Optional				The landscaping includes a diversity of species and prioritises the use of climate resilient and indigenous plants;
	Biodiversity Enhancement (Green Star Buildings)	30E.13	ecologist / landscape:	1			Optional				The project team develops a site-specific Biodiversity Management Plan and provides it to the building owner or building owner representative
	Biodiversity Enhancement (Green Star Buildings)	30E.14	landscape:	1			Optional				The landscaping includes critically endangered and/or endangered plant species
	Impacts to Nature (Green Star Buildings)	30E.15	Impacts to Nature	1			Optional				The building's design and construction conserves existing natural soil, hydrological flows and vegetation elements; and If deemed necessary by an Ecologist, at least 50% of existing site with high biodiversity value is retained.
Total Line				**10**	**0**	**0**					

Project Score **63**