Green Star - Design & As Built v1.2

Project Name:	**Coffs Harbour Hospital - Clinical Services Building (CSB)**		
Targeted Rating:	4 Star - Best Practice	**Job Number**	190151
Points required	45	**Revision**	A
Points targeted	48	**Prepared**	ST
Safety Margin	3	**Date**	3/05/2021

HI ESD Framework								JHA/ CPB		
Category/Credit	**Aim of the credit/ Selection**	**Code**	**Credit Criteria**	**Points Available**	**Overlaps HI ESG AusHFG NCC 2019 SSDA Req**	**Standard Practice (1) Minimum requirement (C)**	**Healthcare relevant initiatives (1) Primarily for IPU type spaces.**	**Points Targeted**	**Description of Compliance requirements**	**Actual Evidence Proposed**
Management	**14**									
Accredited Professional	To recognise the appointment and active involvement of an Accredited Professional (under an Environmental Rating System) in order to ensure that the rating tool is applied effectively and as intended.	1.0	Accredited Professional	1		1		1	For all HI projects, an independent ESD consultant will be engaged by Health Infrastructure to review the project and provide advice on what mechanisms or design features are to be adopted to achieve the minimum 45 points required. The Head Contractor (HC) will also engage their own ESD Consultant to manage the design finalisation of the ESD Strategy on behalf of the contractor.	Meeting Agenda
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	-		C		C	This document must be prepared by the design team (and Independent commissioning agent (ICA) project team where applicable) at the design phase stage and outline at least the following items: ● Description of the basic functions, operations, and maintenance of the nominated building systems including: - A description of its intended operation and maintenance requirements; - A list of what the main components are (including controls), their operation and the importance of their efficient use. ● The targets for the project energy and water consumption and energy and water budgets for all nominated building systems. ● Description of how energy, water, and aspects of indoor environment quality are metered and monitored. This includes a meter diagram that illustrates how energy and water budgets are confirmed in operation.	1. HSW Heath Engineering services Guidelines 2. Resource Efficiency Strategy 2016 to 2023
		2.1	Services and Maintainability Review	1		1		1	Conduct review during design and prior to construction, led by head contractor or owner's representative. The review must address: - commissionability; - controllability, maintainability; - operability including 'fitness for purpose'; - safety. Outcomes to be summarised in report that is signed off by involved parties. Action items to be incorporated into design intent report or owner's project requirements.	Service and Maintainability Report
		2.2	Building Commissioning	1		1		-	A project team need to demonstrate that the pre-commissioning and commissioning activities have been performed based on the approved standards and guidelines. The following must be documented: ***Commissioning Specification -*** The contractual tender or construction documentation must list the commissioning requirements for each system. The documentation must: *List the design parameters for each system; List the required commissioning activities; Define how each system is intended to operate; 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. ***Commissioning plan -*** shall be developed and 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 .* The commissioning must have taken 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. ***Air Permeability Performance Testing -*** An air permeability test must be carried out by a suitably qualified practitioner (member of the Air Tightness Testing and Measurement Association (ATTMA) or a testing member of the Air Infiltration and Ventilation Association of Australia (AIVAA)), in accordance with an approved standard, over a minimum area of the building **(Section 2.2.3 of the GBCA Design and As Built Submission Guideline V1.2.)**. This applies to all building types irrespective of the conditioning strategy. Testing is equally relevant to mechanically ventilated (e.g. more efficient HVAC systems) and mixed-mode / naturally-ventilated buildings (e.g. control of airflow). The test may be carried out across a sample area, if not the whole building. For sample area testing, the test must be carried out on either 2,000m^2 or 10% of the building's total envelope area, whichever is greater and must not exceed the 'maximum' air permeability rates outlined in **Table 2.2.1 of the GBCA Design and As Built Submission Guideline V1.2.**	1. Signed Commissioning Report 2. Air tightness Testing Report 3. Signed Confirmation from the testing practitioner (ATTMA or AIVAA member) and main contractor that the results have been sighted.
		2.3	Building Systems Tuning	1		1		-	Following practical completion and prior to occupation, the owner/client has formally committed to a tuning process for all nominated building systems including: ● Quarterly adjustments and measurement for the first 12 months after occupation; ● Review of manufacture warranties; ● Occupants feedback on building conditions. The commitment can be included in the Commissioning Plan or provided as a separate document from the building owner and must include at least the following: ● Operating and Maintenance Manuals (as per approved standards and guidelines); ● A building tuning manual or plan (as per approved standards and guidelines); ● A building tuning team; ● Engagement of third parties to tune the nominated systems. This engagement 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 .*	Building Tuning Commitment or contract

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		2.4	Independent Commissioning Agent	1			Requires an additional consultant. HI undertake a similar role to ICA.	1	At least one of the credit requirements for 2.1, 2.2 or 2.3 has been achieved and an Independent ***Commissioning Agent (ICA***) has been appointed to advise, monitor, and verify the commissioning and tuning of the nominated building systems throughout the design, tender, construction, commissioning and tuning phases. A ***facilities manager*** employed by the client qualified in the commissioning of these systems also fulfils the roles of this criterion.	CV of the Independent Commissioning Agent
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.0	Implementation of a Climate Adaptation Plan (CAP)	2	SEARS condition: Credit can be used to demonstrate CSIRO project climate Impacts			2	1. Prepare a project-specific CAP and include the following: ● **Must contain** as a minimum the following information: - Summary of the project's characteristics (site, location, climatic characteristics); - Assessment and impacts on the project using at least two time scales (e.g. 2030, 2040, 2050 or 2070), - relevant to the projects anticipated lifespan, a summary of potential direct and indirect impacts (environmental, social and economic) on the project; - Identification of the potential risks (likelihood and consequence) for the project and the potential risks to people - A list of actions and responsibilities for all 'high' and 'extreme' risks identified; and - Details of stakeholder consultation and how the issues raised have been incorporated. ● The **scenarios** used by the project team must be sourced from the Intergovernmental Panel on Climate Change (IPCC) endorsed Global Circulation Models (GCMs) and may include: CSIRO projections; State or Federal climate projections; or Projections determined by a more detailed climate model. ● The **Risk Assessment** must address a minimum of two time scales for the **primary effects** of temperature, precipitation and sea-level rise. The plan must then consider the **secondary effects** of relative humidity, drought/flood, wind, cyclones and bushfire as a minimum. The 'Initial Assessment' as per the outlined in Sections 4-6 of the AGO Guide. 2. At least **two risk items** identified in the risk assessment component of the CAP are addressed by specific design responses and all risk items identified as 'high' or 'extreme' are also addressed by specific design responses.	Climate Adaptation Plan
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.0	Building Information	1		1		1	1. (electrical, mechanical, hydraulics, fire, VT): Provide operations and maintenance (O&M) info and log book to facilities management team and stakeholders ● O&M info provided must include: - appropriate content for all building systems is readily available; - appropriate user group has access to the info; - guidance on keeping info up to date is provided. ● Building user info is a live document that can be updated by facilities management. It must be demonstrated this info has been presented to relevant audience and tailored to their needs. ● Building log book must be developed in line with CIBSE TM31: Building Log Book Toolkit and include links or references to operations and maintenance info 2. Digital display required in high traffic public area showcasing the above info.	1. O&M information 2. Building log book 3. Confirmation that the building user information has been provided to the relevant parties
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		1	Set targets, measure and report on at least 2 of the following building performance metrics - greenhouse gas emissions, potable water usage, operational waste and indoor environment quality. LHD to show commitment via policy, guideline or environmental management plan. This formal commitment must address environmental targets that have been set and performance measurement procedures. The results of the performance monitoring shall be reported to relevant stakeholders on at least a quarterly basis.	1. Internal Policy or Guideline 2. Letter of Endorsement
		5.2	End of Life Waste Performance	1				1	Commitment to reduce demolition waste at end of life of fitout or base building component. ● LHD must commit to extending the life of interior fitout or finishes to at least 10 years. ● LHD can show commitment via the following: - furniture, fittings and equipment (FFE) quality standards policy - requirements for reuse of materials and setting targets for recycling - provisions for FFE to be donated to charity or sold on for reuse - provision of a building/equipment lifecycle and condition report that demonstrates a forecast of 10 years or greater on capital improvement costs towards new fit-out or refurbishment projects - strategic asset management plan incorporating whole-of-life management (disposal, reuse, condition standard, green procurement policy, material cost analysis, etc.)	1. Internal Policy or Guideline 2. Letter of Endorsement
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-		C		C	**This credit must be achieved to obtain point for the next credit.** - Accessible metering to be provided including all energy and water common uses, major uses and sources. - Different uses on each floor shall be metered. - Where an energy load for a single item exceeds 5% of the total energy use or 100kW and where common water use exceeds 10% of total water use, it must be independently metered. - Utility meters must meet metering guidelines under the weights and measures legislation as outlined under current National Measurement Regulations. - All meters must follow NABERS ratings protocol and produce alerts if any inaccuracies are found.	1. As built drawings 2. Compliance statement/ certificate

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		6.1	Monitoring Systems	1		1		1	Monitoring strategy developed in accordance with CIBSE TM39 Building Energy Metering ● Monitoring strategy must include metering schedule which lists: - incoming input (electricity, gas, water, etc.) - end use (lighting, HVAC, fans) - estimated energy consumption for end use - which meter(s) provide the required info - individual estimated end consumption - location and type of meter ● Automatic monitoring system must be capable of: - collecting data from all meters - alert to missing data due to failures - recording energy and water consumption - produce reports on hourly, daily, monthly and annual intervals - raise alarm when consumption increases beyond certain parameters - provide breakdown of info by building system or space - include load versus time (load profile) and power factor - produce as a minimum quarterly report that is automatically emailed to facilities manager.	TBC
Responsible Building Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-		1		1	**This credit must be achieved to obtain points for the rest of responsible building practices.** Prepare best practice EMP as outlined within NSW Environmental Management Systems Guidelines.	1. Environmental Management Plan (EMP) 2. Confirmation of subcontractor adherence to EMP
		7.1	Formalised Environmental Management System	1		1		1	Show formal environmental management system in place to implement EMP Independently certified by a party that is member of International Accreditation Forum to recognised standard such as AS/NZS ISO 14001.	Contractor ISO 14001 certificate
		7.2	High Quality Staff Support	1			Construction related credit for contractor to consider.	1	Promote positive mental and physical health outcomes of site activities and culture of site workers through programs and solutions on site. Enhance site workers' knowledge on sustainable practices through education programs. Programs and policies must go beyond legal requirements for OHS and extend into wellbeing promotion.	Extracts from the AIA vitality app
Operational Waste	Performance Pathway	8A	Performance Pathway - Specialist Plan	1		1		1	Qualified waste auditor prepares operational waste management plan which is then reflected in design of building facilities. As a minimum, the OWMP must: - Identify the site boundary, the waste streams relevant to the project, and the individual roles responsible for delivering and reviewing the OWMP; - Set diversion from landfill targets and/or targets for reducing total materials generation (general waste materials and recyclable/reusable materials), as well as monitoring and measurement procedures for waste and recycling streams by weight; - Outline methods for encouraging the separation of waste streams, such as bins, storage areas, or recycling facilities in public areas as required; - Identify storage areas for all waste streams and outline best practice safety and access requirements for their collection; - Identify safe methods for vehicle access and transfer of waste; and - Incorporate a review process to assess the success of the OWMP and make improvements, based on operational experience.	1. Operational Waste Management Plan (OWMP) 2. Clinical and Related Waste Management for Health Services 3. Email confirmation
		8B	Prescriptive Pathway - Facilities	-				-		
Indoor Environment Quality				**17**						
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1			1	-	Requires ***ventilation systems***: **1.** comply with *ASHRAE Standard 62.1:2013* for pollution source and outdoor air intakes minimum separation distances (specified in Table 5.5.1 or Appendix F of the standard). Windows, doors, openings, vents, grilles, and skylights are all considered outdoor air intakes for purposes of this credit and must be modelled taking into account their free area.	
		9.2	Provision of Outdoor Air	2	EFG requirements request 2.0 ACH to IPU spaces.		1	-		
		9.3	Exhaust or Elimination of Pollutants	1			1	1	Sources of pollutants (kitchen, photocopy or vehicles) compliant with minimum emissions standards such as AS 1668 or be exhausted directly to outside. Printers to meet one of the following test standards: - ECMA-328 - RAL-UZ 171 - GGPS.003	1. As-Built drawings (Mechanical) 2. Email confirmation
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1			1	1	Internal ambient noise levels in the nominated area are no more than 5dB(A) (10dB(A) if naturally ventilated) above the lower figure in the range recommended in Table 1 of AS/NZS 2107:2016: - measurements to be conducted in at least 10% of the spaces; - justify why the selection of the spaces is the most conservative; - account for all internal and external noise.	On site measurements and report at OC

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		10.2	Reverberation	1			1	1	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: - measurements to be conducted in at least 10% of the spaces; - justify why the selection of the spaces is the most conservative.	On site measurements and report at OC
		10.3	Acoustic Separation	1			1	-	***Enclosed space*** is defined as a space where it is expected that noise should not carry over from one space to the next. Compliance can be demonstrated by either: **A.** The partition between the spaces should be constructed to achieve a ***weighted sound reduction index (Rw)*** of: ● at least **45 -** all partitions which are fixed without a door and/or glazed partitions without a door; ● at least **35 -** all partition types that contain a door. *OR* **B.** The sound insulation complies with $D_w + LA_{eq}T > 75$. Dw = Weighted sound level difference measured between two spaces; and LAeqT = Indoor ambient noise level in the space adjacent to the enclosed space *Measurement* shall be conducted in at least 10% of the spaces in the nominated area. The selection of representative spaces must be justified within the Submission Template and considered to be the most conservative spaces with respect to both internal, and external noise sources. At the time of measurements: ● All relevant building systems must be in operation. Projects less than 500m^2 Gross Floor Area (GFA) must account for measurements conducted in at least 95% of spaces.	
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-			C	C	**This credit must be achieved to obtain points in the rest of lighting comfort.** Flicker free lights and min colour rendering index (CRI) of 80.	1. Lighting specification/ schedule 2. As-Built Drawings (electrical) 3. Compliance statement/ certificate
		11.1	General Illuminance and Glare Reduction	1			1	1	1. Lighting levels comply with AS/NZS 1680 and Table 3.2 AS 1680.1:2006 2. Glare is reduced via one option being the lighting system complying with Clause 8.3.4 of AS/NZS 1680.1-2006 or Unified Glare Rating (UGR) complying with Table 8.2 of AS/NZS 1680.1-2006 be calculated in accordance with the procedure outlined in Clause 8.3.3 of AS/NZS 1680.1-2006.	1. Product Data Sheets 2. Calculations demonstrating lighting levels and uniformity compliance 3.Compliance statement/ certificate
		11.2	Surface Illuminance	1			1	-		
		11.3	Localised Lighting Control	1			1	1	Occupants need to be able to control the lighting in their immediate environment including turning the lights on and off and adjusting their light levels. (in an open-plan office the immediate environment is the light shone on the workstation; in a residential unit it is the light hitting the work surface in the kitchen where food is prepared).	1. As-Built drawings - Lighting Control Zone Plan 2. Compliance statement/ certificate
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-			C	C	**This credit must be achieved to obtain points in the rest of visual comfort.** Glare from sunlight through all viewing façades and skylights is reduced through a combination of blinds, screens, fixed devices, or other means. Blinds must have: - visual light transmittance (VLT) of ≤ 10%; - provide glare reduction to at least 95% of the area of viewing façade and skylights; - controlled by all affected occupants within each individual space.	1. Product Data Sheets 2. As-Built Drawings (Architectural)
		12.1	Daylight	2			1	1	Specified proportion of the nominated area receives high levels of daylight.	Daylight modelling report
		12.2	Views	1			1	1	At least 60% of the nominated area has a clear line of sight to a high quality internal or external view.	Manual calculations
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1			1	1	95% (by volume) of all internal paints, adhesives, sealants and carpets meet total VOC limits specified in GBCA Design and As Built Submission Guideline V1.2.	1 Product VOC test certificates 2. certificates from recognised certification scheme or standard. 3. Safety data sheets 4. Order confirmation/ Invoices

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		13.2	Engineered Wood Products	1			1	1	95% (by area) of all engineered wood products meet formaldehyde emission limits specified in Design and As Built Submission Guideline V1.2.	1 Product VOC test certificates 2. certificates from recognised certification scheme or standard. 3. Order confirmation/ Invoices
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	NCC 2019 JV3 requires a PMV assessment to be undertaken		1	1	Mechanically ventilated spaces to achieve PMV between -1 and +1. Internal temperatures within 80% of Acceptability Limit 1 of ASHRAE Standard 55-2013 for naturally ventilated spaces.	PMV Modelling report
		14.2	Advanced Thermal Comfort	1			1	1	Mechanically ventilated spaces to achieve PMV between -0.5 and +0.5. Internal temperatures within 90% of Acceptability Limit 1 of ASHRAE Standard 55-2013 for naturally ventilated spaces.	PMV Modelling report
Energy				**22**						
Greenhouse Gas Emissions		15E.0	Conditional Requirement: Reference Building Pathway	-	Aligns with HI ESG 10% Improvement and NSW GREP. The NCC JV3 Energy Modelling approach should be used.	C		C	**This credit must be achieved to be eligible for a Green Star rating** Conditional requirement - proposed building must achieve improvement on benchmark building which is 10% improvement on NCC Section J reference building.	JV3 Report
		15E.1	Comparison to a Reference Building Pathway	20	Aligns with HI ESG 10% Improvement and NSW GREP. The NCC JV3 Energy Modelling approach should be used. 10% improvement equates to 1.6 points.	1	1	2	Reducing emissions against a GBCA Benchmark Building (10% Better than NCC Section J DTS Building): - 1.6 point for 10% - 3.2 point for 20% - 4.8 point for 30% etc.	JV3 Report
Peak Electricity Demand Reduction	Prescriptive Pathway	16A	Prescriptive Pathway - On-site Energy Generation	-				-		
		16B	Performance Pathway - Reference Building	2			1	-		
Transport				**10**						
Sustainable Transport		17A	Performance Pathway	10			Hospitals are usually well connected to public transport nodes. Large percentage of patients require access to hospitals via vehicles. Expansion of existing hospital also require additional carparking.	2	Travel or Transport plan to be developed by professional for a possible 10 points Points are awarded by completing the Sustainable Transport Calculator	1. Green Travel Plan 2. Sustainable Transport Calculator
		17B.1	Access by Public Transport	0				-		
		17B.2	Reduced Car Parking Provision	0				-		
		17B.3	Low Emission Vehicle Infrastructure	0				-		
		17B.4	Active Transport Facilities	0				-		
		17B.5	Walkable Neighbourhoods	0				-		
Water				**12**						

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Potable Water	Prescriptive Pathway	18A1	Potable Water - Performance Pathway	0	AusHFG Requirements limit use of RW systems (maintenance / Payback / health risks)		Hospitals require extensive use of potable water and typically lower use for recycled water. AusHFG requirements limit use of rainwater systems, limiting the use to primarily landscaping.	-		
		18B.1	Sanitary Fixture Efficiency	1		1		1	All fixtures to have the minimum WELS rating: - Taps - 5 Star - Urinals - 5 Star - Toilets - 4 Star - Clothes Washing Machines - 4 Star - Dishwashers - 5 Star - Showers -3 Star (cannot have greater flowrate than 7.5L/min)	1. FFE List/ Asset Register 2. Product data sheet 3. WELS certificates 4 GS Potable Water Calculator
		18B.2	Rainwater Reuse	1	AusHFG Requirements limit use of RW systems	-		-		
		18B.3	Heat Rejection	2				2	Requires project HVAC systems to not use water for heat rejection or be naturally ventilated in accordance with AS1668.4-2012.	1. Equipment schedule/ specification 2. As-Built drawings (Mechanical)
		18B.4	Landscape Irrigation	1		1		1	Council water is used irrigation or drip irrigation with moisture sensor override is installed.	1. Specification. 2. As-Built drawings (Landscape)
		18B.5	Fire System Test Water	1		1		1	No water is expelled for testing or temporary storage for 80% of the test water and maintenance drain-downs for reuse on-site or if sprinkler systems are installed, each floor is fitted with isolation valves or shut-off points for floor-by-floor testing.	As-Built drawings (Fire)
Materials				**14**						
Life Cycle Impacts	Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment	0			Life Cycle Assessor (additional consultant) required	-		
		19A.2	Additional Life Cycle Impact Reporting	4			Life Cycle Assessor (additional consultant) required	-		
		19B.1	Concrete	3		1		1	Portland cement content in all concrete used in the project satisfy at least one of the following: - Portland cement content is reduced by 30% measured by mass compared to reference case (1 point) - Mix water contains 50% reclaimed water (0.5 point) - 40% of coarse aggregate or 25% of fine aggregate is alternative materials (0.5 point) Concrete masonry including core-filled is excluded.	1. Concrete suppliers mix design certificate 2. Structural engineer's report including summary calculation of reference and actual case
		19B.2	Steel	1		1		-	**5 % r**eduction in mass or high strength steels. ***High strength steel -*** 95% of Category A products and 25% of Category B products meet the strength grades specified in **Table 19B.2A.1 and Table 19B.2A.2 of the GBCA Design and As Built Submission Guideline V1.2**. Reduction in Mass ***Steel framed building*** - the Submission Template must be completed by a qualified Structural Engineer (Chartered Engineer) and include the following: *Description of how the amount of steel has been reduced; Justification of a reference case; Calculations of the reduction in the total amount (by mass) of steel necessary for the design structure against the reference case; Confirmation that the reduction has been achieved without changing the load path to other structure elements that are not steel.* ***Concrete framed building*** - the Submission Template must be completed by a qualified Structural Engineer (Chartered Engineer) and include the following: *A description of how the amount of reinforcing steel has been reduced; Calculations of the reduction in the total amount (by mass) of reinforcement necessary for the design structure against a reference case; Standard reinforcement detailing shall be defined by an industry standard such as the Reinforcement Detailing Handbook – Concrete Institute of Australia; Justification of the reference case reinforcing rates; Confirm that the reduction has been achieved by without changing the load path to other structure elements that are not steel.* This credit is N/A if cost of structural and reinforcing steels is less than 1% of project contract value.	
		19B.3	Building Reuse	4				-		

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		19B.4	Structural Timber	4		1		-	***Responsible Sourcing*** - It is a minimum requirement for this criterion that all structural timber used in the building is FSC (Forest Stewardship Council) or PEFC (Programme for the Endorsement of Forest Certification) certified *AND* ***Reduced Embodied Impacts*** - at least **30%** of the building's gross floor area (GFA) is constructed and / or supported from structural timber. Any GFA where the vertical structure is not primarily structural timber shall not be included as compliant area. This may include concrete cores, lift shafts or hybrid material structure. Floor area calculations shall be taken from above the ground plane, inclusive of any on-grade or ground floor slab. Any floors located below ground should not be included in the area calculations. Additionally, calculations only apply to the new floor area constructed as part of the project's scope of works – existing floor area should be excluded. This credit cannot be targeted if the structural timber used represents less than 30% of the building's GFA.	
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		-	**95%** of steel (by mass) sourced from **Responsible Steel Maker**; and for a **Steel framed buildings** - at least **60%** of the fabricated structural steelwork is supplied by a steel fabricator/ contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI) ; or for a **Concrete framed buildings** - at least **60%** (by mass) of all reinforcing bar and mesh is produced using energy-reducing processed in its manufacture (measured by average mass by steel maker annually) ***Responsible Steel Maker -*** must show that comply 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. For **Steel framed** buildings - ***responsible Steel Fabricators*** must show that they are a current member of the ASI's Environmental Sustainability Charter Group. For **Concrete framed** buildings: ***Energy-Reducing Processes in Steel Reinforcement production*** must equate to at least 40 MJ/tonne, measured as a percentage of annual mass of reinforcing steel produced by the steel maker. A lifecycle assessment (LCA) must be made in accordance with the Protocol for Demonstrating Equivalency in Energy Reduction. The methodology can be summarised as follows: ● LCA generated in accordance with internationally applicable LCA techniques specified in ISO 14040:2006 and ISO 14044:2006; ● The function considered is the production of steel billet. Other functions relating to the generation of co-products from steel production to be allocated on the basis of procedures recommended in ISO 14044:2006; ● The functional unit is 1 tonne of steel billet; ● The standard measure for Energy in MJ; ● Boundary conditions are 'cradle to gate', meaning all production stages from raw materials mined (cradle) to finished steel billet ready to be converted to products (gate); ● Carbon Footprint calculated and reported in terms of scope 1, 2 and 3 emissions, as defined according to World Business Council for Sustainable Development / World Resources Institute Greenhouse Gas Protocol, Corporate Accounting and Reporting Standard (WBSCD/ WRI, 2004); and ● A single independent peer review conducted on the LCA according to ISO 14044:2006. Using a Polymer Injection Technology (PIT, as developed by the University of NSW) in manufacturing their reinforcing products is an acceptable method of demonstrating compliance with this criterion. This credit is N/A if cost of steel is less than 1% of project contract value or there are no new structural or reinforcing steels used in the project	
		20.2	Timber Products	1		1		-	**95%** (by cost) of all timber used in the building and construction works is certified by a forest certification or is from a reused source. The requirement applies to all timber applications within the building and construction works 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.* ***Certified Timber -*** must be sourced from forests that have been certified by forest certification schemes that are deemed to satisfy the minimum requirements of the GBCA's 'Essential Criteria' for forest certification. Products sourced from certified forests must be accompanied by a relevant **Chain of Custody (CoC)** in order to be recognised as certified timber. Currently in Australia, FSC (Forest Stewardship Council) and PEFC (Programme for the Endorsement of Forest Certification) accredited forest certification schemes both meet the GBCA's 'Essential' criteria. ***Reused Timber*** - Timber that is reused includes timber that is pre-existing in a building and timber that is procured from a second-hand source (100% post-consumer recycled timber without the incorporation of any virgin timber content). Third-party verification, in the form of a signed statement, is required and must be provided by an auditor registered by Exemplar Global (formerly RABQSA), or other equivalent national or international auditor accreditation system. This credit is N/A if cost of timber is less than 0.1% of project contract value	

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		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1		1		1	90% of all permanent formwork, pipes, flooring, blinds and cables do not contain PVC or meet GBCA best practice guidelines.	1. Safety data sheets/ environmental product declarations 2. Best practice guideline certificates 3. Order confirmation/ Invoices
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability	3				-	Requires calculating the Project Sustainability Value (PSV) and comparing it with the Project Contract Value (PCV) - material cost. Completion of the **Green Star – Design & As Built: Sustainable Products Calculator** is required. ● PSV = Product cost ($) x SF (Sustainability Factor in accordance with **Table 21.2 of the GBCA Design and As Built Submission Guideline V1.2**) ● PCV = Sum. of all products sustainability value At least **3%** of eligible products transparency and sustainability requirements under one of the following initiatives: ***Reused Products*** - items that are have been previously used and are incorporated in the project without significant changes to the structure or function of the item. ***Recycled Content Products*** - items produced with recovered materials. ***Environmental Product Declarations (EPD)*** recognised formats: ● *product-specific* - Third-Party Certification EDP issued in conformance with ISO 14025 or EN15804; must be independently-audited; and must be based on a cradle-to-gate scope as a minimum. ● *industry-wide* - Third-Party Certification EPD issued in conformance with ISO 14025 or EN15804; must be independently-audited; 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. ***Third-Party Certification*** - Third Party Certification levels A, B & C are defined in the GBCA's Framework for Product Certification Scheme. ***Stewardship Programs*** - must be demonstrated with a product stewardship contract: ● *Leased Item* - 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; The contract may not include exemptions which relate to timing, quality or quantity that will be accepted for collection. ● *Purchased Item* - 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; The contract may not include exemptions which relate to timing, quality or quantity that will be accepted for collection.	
Construction and Demolition Waste	Fixed Benchmark	22.A	Fixed Benchmark	1				-		
		22B	Percentage Benchmark	-		1		-	At least **90%** of construction and demolition waste generated (reported in kilograms) has been diverted from landfill. Required to report the total amount of waste generated and the total amount of waste diverted from landfill, and report on the proportion diverted as a percentage. The **Green Star Construction and Demolition Waste Reporting Criteria** is available at the GBCA website.	
Land Use & Ecology				**6**						
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-		C	Hospitals usually built on brown field sites	C	Project is not subject to approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) by referring to their Development Approval documents.	Request to waive requirement for Biodiversity Development Assessment Report (BDAR)
		23.1	Ecological Value	3			Hospital sites are usually mainly buildings with minimal landscape area.	-		
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-		C		C	**Conditional requirement** - site did not include old growth forest, prime agricultural land, wetland of high national importance or impact on matters of national significance.	Environmental Impact Statement
		24.1	Reuse of Land	1			Most hospital and healthcare projects are located within existing hospital sites. For most projects, this credit would be considered achieved.	1	75% of the site needs to be previously developed land.	Site Plan drawings
		24.2	Contamination and Hazardous Materials	1				-		

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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		-	Required for **75%** of the whole site area to comprise one or a combination of: ● Vegetation; ● Green roofs; ● Roofing materials, including shading structures, having the following: for roof pitched <15°– a three year **Solar Reflectance Index** (SRI) of minimum 64 or for roof pitched >15°– a three year SRI of minimum 34. ● Only where the three year 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 with a three year SRI of minimum 34 or an initial SRI of minimum 39; ● Hardscaping elements shaded by overhanging vegetation or roof structures, including solar hot water panels and photovoltaic panels; ● Water bodies and/or water courses; ● Areas directly to the south of vertical building elements, including green walls and areas shaded by these elements at the summer solstice.	
Emissions				**5**						
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1		1		1	Post-development peak average recurrence interval event discharge from site does not exceed pre-development using 1 year or 5 year ARI dependent on climate change risk.	Civil Design Report
		26.2	Stormwater Pollution Targets	1				1	Stormwater discharge to meet following pollution reduction targets: - total suspended solids - 80% - gross pollutants - 85% - total nitrogen - 30% - total phosphorus - 30% - total petroleum hydrocarbons - 60% - free oils - 90%	Civil Design Report
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-			Neighbouring buildings are usually the hospital buildings. Consider impacts to surrounding residential if any.	C	**This credit needs to be met for next credit to be eligible for a point** All outdoor lighting on the project to comply with AS 4282:1997 Control of the obtrusive effects of outdoor lighting. The following to be excluded: - All helipad lights providing safety landing and for safety purposes once the chopper landed. - Emergency signage and emergency way finding lights.	1. Luminaire schedule including relevant photometric data such as ULOR 2. As-Built drawings (Electrical)
		27.1	Light Pollution to Night Sky	1				1	No external luminaire has an upward light output ratio that exceeds 5% relative to actual mounted orientation or direct illuminance from external luminaries does not produce an initial point illuminance value greater than 0.5 lux to site boundary and 0.1 lux to 4.5m beyond site into night sky.	TBC
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		1	Waterless heat rejection system or water based heat rejection system includes measures for legionella control and risk management.	1. Equipment schedule/ specification 2. As-Built drawings (Mechanical)
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1				-		
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.	30.A		10				-		
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30.B	Soft Landings					-		
Improving on Benchmarks	The project has achieved full points in a credit and demonstrates a substantial improvement on the	30.C	Mattresses					1	95% of all mattresses that are to be supplied to the building meet the GreenGuard emission limit criteria for bedding listed below: - Formaldehyde - 0.0135ppm (0.0165mg/m3) - Total VOC - 0.22mg/m	1. Product data sheets 2. Order confirmation/ Invoices

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	benchmark required to achieve full points.	30. C	Ultra Low VOC Paints					1	For this credit, As per Credit 13.1.1 and 50% of paints to have max 5g/L VOC.	1 Product VOC test certificates 2. certificates from recognised certification scheme or standard. 3. Safety data sheets 4. Order confirmation/ Invoices
Improving Challenges	Where the project addresses an sustainability issue not included within any of the above Credits.	30.D	Local Products and Materials					1	Project team demonstrates that a percentage (significant in comparison to industry standard) of the products and materials used in the project were produced or manufactured in Australia.	1. Benchmark 2. Registered address records
		30.D	Local Services and Skilled Labour					1	Project team demonstrates that a percentage (significant in comparison to industry standard) of the services and skilled labour employed by the project come from the local area surrounding the site. As an example, this might be 80% of workers living within the 50km radius of the site based on research developed from similar projects in a similar location.	1. Benchmark 2. Registered postcode records
		30.D	Reconciliation Action Plan (RAP)					1	Demonstrate a relationship to, and a role in delivering, the action items within the organisational Reconciliation Action Plan (RAP).	1. RAP 2. Extract from contract 3. Training & Aboriginal Participation Report
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 too	30.E	Social awareness					1	Engagement of Aboriginal and Torres Strait Islander workers, including apprentices in the project delivery.	List of Aboriginal and Torres Strait Islander workers
		30.E	Green Cleaning Policy					1	Green cleaning policy, or equivalent mechanism, in accordance with Green Star - Performance V1.2 Clause 6.1 Green Cleaning Policy are in place.	1. NSW Health Environmental Cleaning Policy 2. Letter of Endorsement
		30.E	Digital Infrastructure					1	The free public WI-FI must meet the following requirements: meet the standard of 802.11n, must be accessible throughout 70% of the total area of CSB and a minimum of two general power outlets must be accessible from public seating, for every 250 square metre floor area zone.	Email Confirmation