ESD STRATEGIES REPORT

Stage 1A, No. 6 Australia Avenue

Sydney Olympic Park

Prepared by:

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Table of Contents

Executive Summary

The following report provides a summary of the ESD initiatives being developed for the proposed development at Sydney Olympic Park. As a summary, the building and services have been designed to achieve

- 5 Star Green Star Office V3 Design Rating prior to construction
- 5 Star Green Star Office V3 As-built rating during construction
- 5 Star NABERS Energy rating
- High performance in Energy, water, waste and indoor environmental quality

Green Planning Australia have been commissioned as an independent advisor by Capital Corporation to review the Green Star Office rating and NABERS Office rating of the building.

The following highlight the key ESD initiatives being developed:

Management

On-going operation of the development will be closely monitored through extensive pre and post commissioning with commitment to 12 months of building tuning and quarterly reviews to optimise the building performance. Waste, recycle and construction management plan is to be developed and applied during the construction to minimise pollution and impact to the environment quality.

Facade optimisation

A combination of high performance building fabric and effective shading devices on the facade is developed through the use of energy simulation program to maximise energy efficiency and occupant comfort.

Indoor Environment Quality

Provision of natural day light to the building occupants through the implementation of atrium.

Provision of carbon dioxide monitoring and control system to ensure delivery of optimum quantities of outside air.

Training of building operators and maintenance personnel

Training section is to be provided to the building management staff to ensure the building operators have all the information and understanding needed to operate and maintain the features and system in the building.

Efficient Air-conditioning System

Gas fired heat recovery VRF system is provided to reduce the carbon emission and to reduce the peak electrical demand from grid.

Recycled Water

Rain water recycle system will supply recycled water to the cooling tower and all other non potable requirements. High water efficient appliances and fittings are to be used throughout.

Lighting System

Use of efficient lighting and control systems with separated and sub-divided perimeter and internal zones to switch off lighting where not required. PE sensors are to be installed to all perimeter zones and interlocked to the corresponding lighting zone circuit.

Materials

Low VOC emission carpets and paints will be installed throughout. The use of PVC will be minimised. Timber is to be sourced from sustainable plantations, have low formaldehyde emissions without arsenic treatment.

The ESD strategies outlined will be developed further and will be delivered via the use of Environmental Management Plan.

Introduction

Green Planning Australia have been commissioned as an independent advisor by Capital Corporation to review the Green Star Office rating and NABERS Office rating of No 6 Australia Avenue Sydney Olympic Park. Green Planning Australia have been working with the design team to develop the sustainability strategies for the proposed building.

The proposed building demonstrates an integrated approach to sustainability. This document provides a summary of the proposed ESD strategies which comply with the requirements of the Sydney Olympic Park Masterplan 2030 and SOPA Environmental Guidelines.

The proposed development will achieve:

- 5 Star Green Star Office V3 Design Rating prior to construction
- 5 Star Green Star Office V3 As-built rating during construction
- 5 Star NABERS Energy rating
- High performance in Energy, water, waste and indoor environmental quality

ESD Initiatives

Overview

The project is committed to deliver a building to achieve 5 stars Green Star Design & As-built and NABERS Energy rating. The protocol from Green Star Office Rating and NABERS Office is incorporated into the design process. A design guideline and requirement with highlight items is also made available to all design team member to ensure each party delivers the design as intended. An Environmental Management and Waste Management Plan are to be generated during design phase to address all potential environmental impact during construction. The responsibilities, procedures and instructions for implementing, maintaining and monitoring each environmental requirement is clarified in the EMP and made available to each party. The management system will be implemented based on the EMP during construction. An environmental site supervisor will be assigned to monitor the process and report on implementation of EMP on a regular basic.

Upon building work completion, all building system will be commissioned and tuned to ensure operation as intended. All commissioning works will be carried out in accordance with CIBSE Commissioning Codes and ASHRAE Commissioning Guideline 1-1996. The building tuning process includes verification that systems are performing to the design potential during all variations in climate and occupancy; optimisation of time schedules to match occupant needs and system performance and alignment of the systems' operation to the attributes of the built space served. The system will be monitored via BMS with design criteria input. Alarms will be triggered and report generated by the building management system once the operation falls outside the design tolerance. Monthly review of the system operation will be reported to the building owner at quarterly duration. Re-commissioning will be undertaken twelve months after the building completion. Re-commissioning refers to the process of undertaking a review of all systems to the scope of the initial pre-occupancy commissioning. It is intended to incorporate any modifications identified as necessary or beneficial during the building tuning period and to improve the performance of building operation. Building management staff will be provided with training to ensure that building management have all the

information and understanding needed to operate and maintain the commissioned features and systems of the building. The training includes review of controls set up, programming, alarms and troubleshooting; O&M manuals; building operation; interactions between systems; measures that can be taken to optimise energy efficiency; OH&S issues; maintenance requirements and sourcing replacements.

The following section summarises the key ESD initiatives. These initiatives will be developed further and are subject to change depending on the final feasibility. Regardless of any changes the proposed development is to achieve a 5 star Green Star Design and As-built rating as per the 2030 SOPA Masterplan guidelines.

Management

The proposed development will achieve the following:

- Ongoing operation phases of the development will be monitored through extensive pre and post commissioning with a commitment to 12 months of building re-commissioning/tuning with quarterly reviews to ensure the performance of the building system is maintained.
- Training section is to be provided to the building management staff to ensure the building operators have all the information and understanding needed to operate and maintain the features and system in the building.
- An Environmental Management Plan in accordance with NSW Environmental Management System guidelines will be implemented during construction to minimise the impacts arise from site disturbance, pollution, construction waste and water and energy use.
- Disposal of construction waste will be minimised by recycling 80% of demolition and construction waste.

Indoor Environment Quality

The proposed development will enhance the wellbeing of the occupants by providing:

- Improvement of outside air rate by providing at a rate 50% greater than AS1668.2 requirement. Air-conditioning system will be installed with carbon dioxide monitoring and control to ensure sufficient outside is delivered to occupants.
- Optimisation of the air quality by achieving air change effectiveness to at least 0.95 over 95% of the occupancy space.
- Maximisation of natural lighting level to the building occupants through the implementation of atrium and well designed facade.
- Minimisation of the contribution and levels of Volatile Organic Compounds (VOCs) via the use of low VOC paints, adhesives and sealants, carpets and flooring. All engineered wood products to be used in the development will have low formaldehyde emission.
- High efficient lighting system with suitable luminance levels to avoid causing discomfort and strain for office occupants. All fluorescent luminaries are to be installed with high frequency ballasts to avoid discomfort caused by low frequency flicker.

- Internal noise level at an appropriate level, not greater than 40dB(A) to ensure the occupants' satisfaction and wellbeing.

Energy

The proposed development will target a 40% carbon footprint reduction over a benchmarked base case. The following strategies will be implemented:

- High efficiency air conditioning system with heat recovery to reclaim the "waste" energy in the system. A gas fuelled system will be installed to reduce the carbon emission and peak electricity demand when comparing to a conventional electrical driven system.
- Economy cycle on air conditioning
- Efficient zoning of air conditioning system to avoid reheat energy.
- Automated lighting system interfaced to BMCS. Lighting circuit on each floor/functional space will be divided into perimeter and internal zone and control separately. The perimeter zone system is to be installed with PE sensors to deactivate lighting when the natural light level has achieved a suitable level. Each lighting zone is sub-divided into no greater than 100m^2 to minimise energy consumption for performing a task in a specific area.
- Consideration of passive systems such as building integrated PV cells.
- Extensive BMCS linked sub-metering will provide the development with the ability to monitor and detect anomalies in energy consumption.

Transport

The proposed development encourages the use of more fuel efficient vehicles by providing adequate parking spaces at prime parking spot solely dedicated for use by small cars, car-pool participants or other alternative fuel vehicles.

Adequately sized and fully equipped secure cyclist facilities with change room and showers are to be provided to promote the use of cycling to work.

The development is located at a close proximity to the Sydney Olympic Park train and bus station. The number of services is relatively frequent with an average services interval between 15 – 30 mins during peak period. Building occupants are encouraged to use mass transport to travel to work.

Water

Reduction of potable water demand will be achieved through the use of water efficient appliances, fittings and the rain water reclamation system. The rain water recycle system will supply recycled water to the cooling towers, landscape irrigation and all other non potable requirements. Water efficient appliances and fittings are being used throughout.

All fire system test water will be capture and re-use on site.

Materials

The following initiatives will be provided:

- A dedicated with a clearly marked, sign-posted storage area is to be provided to facilitate the recycling of resources used within the building.

- Low VOC emission carpets and paints will be installed throughout. The use of PVC will be minimised. Timber is to be sourced from sustainable plantations, have low formaldehyde emissions without arsenic treatment.

- A percentage of the Portland cement mixed in concrete will be substituted with industrial waste or oversized aggregate to reduce the use of raw material.

Emissions

Building emissions will be minimised through the following practices:

- Zero Ozone Depletion Potential (ODP) refrigerants insulant

- Use of up light will be avoided to reduce light pollution.

- The development is designed to no increase peak stormwater flows for rainfall events of up to a 1 in 2 year storm. A filter system is considered to be installed to ensure the stormwater leaving the site at any time up to a 1 in 20 year storm event is treated in accordance with Urban Stormwater Best Practice Environmental Management Guidelines.

The ESD strategies outlined in this report will be developed further and will be delivered via the use of an Environmental Management Plan. The EMP will be developed for the construction and operational periods of the project.

Appendix

- SOPA 2030 Masterplan Guidelines
- Director General's Environmental Assessment Requirement – SSD 12_5676, 5677
- Environmental Planning and Assessment Regulation 2000 Schedule 2
- SOPA Environmental Guidelines
- No.6 Australia Avenue Green Star Summary Table RevC

Green Star - Office Design v3

Credit Summary for: **Axis Stage 1**

Category	Title	Credit No.	Points Available	Points Achieved	Points to be Confirmed
Management					
	Green Star Accredited Professional	Man-1	2	2	0
	Commissioning Clauses	Man-2	2	2	0
	Building Tuning	Man-3	2	2	0
	Independent Commissioning Agent	Man-4	1	1	0
	Building Users' Guide	Man-5	1	1	0
	Environmental Management	Man-6	2	2	0
	Waste Management	Man-7	2	2	0
		TOTAL	12	12	0
Indoor Environment Quality					
	Ventilation Rates	IEQ - 1	3	1	0
	Air Change Effectiveness	IEQ - 2	2	2	0
	Carbon Dioxide Monitoring and Control	IEQ - 3	1	1	0
	Daylight	IEQ - 4	3	1	1
	Daylight Glare Control	IEQ - 5	1	0	1
	High Frequency Ballasts	IEQ - 6	1	1	0
	Electric Lighting Levels	IEQ - 7	1	1	0
	External Views	IEQ - 8	2	1	0
	Thermal Comfort	IEQ - 9	2	1	1
	Individual Comfort Control	IEQ - 10	2	0	0
	Hazardous Materials	IEQ - 11	0	na	0
	Internal Noise Levels	IEQ - 12	2	2	0
	Volatile Organic Compounds	IEQ - 13	3	3	0
	Formaldehyde Minimisation	IEQ - 14	0	na	1
	Mould Prevention	IEQ - 15	1	0	0
	Tenant Exhaust Riser	IEQ - 16	1	1	0
		TOTAL	25	15	4
Energy					
	Conditional Requirement	Ene -	-	-	0
	Greenhouse Gas Emissions	Ene - 1	20	5	0
	Energy Sub-metering	Ene - 2	2	2	0
	Lighting Power Density	Ene - 3	3	3	0
	Lighting Zoning	Ene - 4	2	2	0
	Peak Energy Demand Reduction	Ene - 5	2	1	1
		TOTAL	29	13	1
Transport					
	Provision of Car Parking	Tra - 1	2	0	0
	Fuel-Efficient Transport	Tra - 2	1	0	1
	Cyclist Facilities	Tra - 3	3	3	0
	Commuting Mass Transport	Tra - 4	5	2	0
		TOTAL	11	5	1
Water					
	Occupant Amenity Water	Wat - 1	5	5	0
	Water Meters	Wat - 2	1	1	0
	Landscape Irrigation	Wat - 3	1	1	0
	Heat Rejection Water	Wat - 4	4	4	0
	Fire System Water Consumption	Wat - 5	1	1	0
		TOTAL	12	12	0
Materials					
	Recycling Waste Storage	Mat - 1	2	2	0
	Building Reuse	Mat - 2	0	na	0
	Reused Materials	Mat - 3	1	0	0
	Shell and Core or Integrated Fit-out	Mat - 4	2	0	1
	Concrete	Mat - 5	3	3	0
	Steel	Mat - 6	2	2	0
	PVC	Mat - 7	2	2	0
	Timber	Mat - 8	1	1	0
	Design for Disassembly	Mat - 9	1	0	0
	Dematerialisation	Mat - 10	1	1	0
		TOTAL	15	11	1
Land Use & Ecology					
	Conditional Requirement	Eco -	0	-	0
	Topsoil	Eco - 1	1	1	0

	Reuse of Land	Eco - 2	1	0		1
	Reclaimed Contaminated Land	Eco - 3	2	0		0
	Change of Ecological Value	Eco - 4	4	1		1
		TOTAL	8	2		2
Emissions						
	Refrigerant ODP	Emi - 1	1	1		0
	Refrigerant GWP	Emi - 2	2	0		0
	Refrigerant Leaks	Emi - 3	2	1		0
	Stormwater	Emi - 5	3	3		0
	Discharge to Sewer	Emi - 6	4	2		0
	Light Pollution	Emi - 7	1	1		0
	Legionella	Emi - 8	1	0		0
	Insulant ODP	Emi - 4	1	1		0
		TOTAL	15	9		0
	Sub-total weighted points:		**63**			**7**
Innovation						
	Innovative Strategies & Technologies	Inn-1	2	0		0
	Exceeding Green Star Benchmarks	Inn-2	2	0		0
	Environmental Design Initiatives	Inn-3	1	0		0
		TOTAL	1	0		0
	Total weighted points:		**63**			**7**

Once certified this would equate to a Five Star rating.

The GBCA does not endorse any self-assessed rating achieved by the use of Green Star - Office V3. The GBCA offers a formal certification process for ratings of Four Stars and above; this service provides for independent third party review of points claimed to ensure all points can be demonstrated to be achieved by the provision of the necessary documentary evidence. The use of Green Star - Office V3 without formal certification by the GBCA does not entitle the user or any other party to promote the Green Star rating achieved.

AXIS Stage 1 Green Star Summary - Office Design v3

Credit Criteria

MANAGEMENT

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Man-1	Green Star Accredited Professional	Two points are awarded where: A principal participant in the design team is a Green Star Accredited Professional and has been engaged by the building owner to provide sustainability advice from the schematic design phase through to construction completion.	**2**	**2**	**0**	Green Star Accredited Professional assigned from GPA	Green Star Consultant	
Man-2	Commissioning Clauses	Up to two points are awarded as follows: One point is awarded where it is demonstrated that: Comprehensive pre-commissioning, commissioning, and quality monitoring are contractually required to be performed for all building services (BMS, mechanical, electrical and hydraulic); and The works outlined above are done in exact accordance with CIBSE Commissioning Codes or ASHRAE Commissioning Guideline 1-1996 (for mechanical services only).	**1**	**1**	**0**	**All serviceses:** Stipulate in specification for tender - Commissioning complies to CIBSE for All services; ASHRAE for Mechanical; state that pre-commissioning, commissioning, and quality monitoring is to be performed in accordance with the relevant standards - Provide design details/scope on Energy and Environmental strategy, Monitoring and Targeting, System; description of the design intended operation and condition; a list of the main components (including controls) and the value and conditions of their efficient use; details on maintenance including recommended frequency and a list of likely tell-tale signs of system failure, system do and don'ts' and notes on inefficient operation - Specification shall list that contractor's requirements to provide: 1) as-built/as-installed drawings 2) the commissioning report 3) training as required to ensure the building management staff have all the information and understanding needed to operate and maintain the system **Builder/Contractors:** - Provide as-built/as-installed drawings, O&M, Commissioning report, traning to building management staffs - A drawing register listing the drawing name, number and issue of all as built drawings; - A copy of the transmittal showing that these documents were sent to the Cap Corp. The transmittal must be detailed, with the drawing number/name/revision number clearly listed for each drawing/document that was issued; and - Details of training provided to building management staff - Report outlining design intend **Cap Corp:** - Provide confimation letter stating that it is commited to incorporate the commissioning requirements into the project in accordance with the specification. Also specify the time related requirements of the pre-commissioning, commissioning, and quality monitoring.	All services to provide relevant reports and specification Contractors Builder Cap Corp	
		An additional point is awarded where it is demonstrated that: - The point above is achieved; and - The design team and contractor are required to transfer project knowledge to the building owner/manager through all of the following: o Documented design intent; o As-built drawings; o Operations and Maintenance Manual; o Commissioning Report; and o Training of building management staff.	**1**	**1**	**0**	NOTE: Training of building management staff must include: - Information provided in the design intent report (including energy/environmental features); - Review of controls set up, programming, alarms and troubleshooting; - Review of operations and maintenance manuals; - Review of building operation (start up, normal operation, unoccupied operation, seasonal changeover, shutdown); - Review of interactions between systems; - Review of measures that can be taken to optimise energy efficiency; - Review of Occupational Health and Safety (OHS) issues; - Review of maintenance requirements and sourcing replacements where/how replacements can be sourced; - Review of occupant satisfaction feedback		
Man-3	Building Tuning	Two points are awarded where: After handover, the building owner implements tuning of all building systems; A relevant member of the design team is involved in the tuning process; Monthly monitoring is undertaken and the outcomes are reported to the building owner quarterly; Full re-commissioning is undertaken 12 months after practical completion; and A Building Tuning Report on the outcomes of the tuning process will be provided to the building owner and made available to the design team.	**2**	**2**	**0**	All Services: Stipulate in specification for tender - Include requirement for a minimum 12-month period commissioning process which includes no less than monthly monitoring, quarterly reviews and reporting, and a full re-commissioning service carried out 12 months after practical completion in accordance with design intent documentation and a building tuning report generated for Cap Corp	All services designers	
Man-4	Independent Commissioning Agent	One point is awarded where an independent commissioning agent has been appointed to: Provide commissioning advice to the building owner and the design team; and Monitor and verify the commissioning of all building systems.	**1**	**1**	**0**	**Cap Corp:** - To appoint ICA - Provide statement stating that an Independent Commissioning Agent is employed. A letter of appointment is to be provided indicating that the commissioining agent is an objective advocate of Cap corp and including the responsibilities for the commissioning agent outlined in accordance to this credit requirement. - CV of the Independent Commissioning Agent **Independent Commissioning Agent (ICA):** - Provide a brief statement in the commisioning report stating the level of involvement in the project Responsibility - Contribute to the development and introduction of commissioning standards, strategies and process for the nominated system; - Review the basis of design and design intent, and recommend changes to preliminary working drawings; - Set or recommend requirements to ensure the commissioning standards and process; - Involved throughout the commissioning, testing and adjustment phases; - Observe, review and endorse results of all commissioning; - Prepare recommendations to Cap Corp on the performance of system; - Review/prepare the final commissioning report	Cap corp Independent Commissiong Agent	
Man-5	Building Users' Guide	One point is awarded where: A simple and easy-to-use Building Users' Guide, which includes information relevant for the building users, occupants and tenants' representatives, is developed and made available to the building owner.	**1**	**1**	**0**	**Cap Corp:** ~~- Provide statement/contract stipulate that the project team shall transfer the Building Users' Guide to the owner upon building handover.~~ [No longer required] **Contractors:** - Provide Building Users* Guide to facilitate the building performing to its designed potential. the buidling user guide has to include the following sections: - Building Users' Guide in draft version includes all the information outlined must be prepared for Green Star - Design Rating Submission Energy and Environmental Strategy Description of building initiatives intended to enhance energy efficiency and minimise greenhouse gas emissions Monitoring and Targeting Details on energy, water, indoor environment quality and waste targets and benchmarks for building; All Building Services System e.g. Ventilation, Electrical Systems; Transport Facilities Car parking requirements and provision of cyclist facilities, conditions of access and appropriate use; Materials and Wastes Policy Information on recycling, e.g. what can be recycled, where the recycling storage areas are; Expansion Include a list of environmental recommendations for consideration, e.g. environmentally friendly materials, re-use of other materials;	~~Cap Corp~~ Constractors	

Man-6	Environmental Management	Up to two points are awarded independently of each other and as follows: One point is awarded where it is demonstrated that: The contractor implements a comprehensive, project-specific Environmental Management Plan (EMP) for the works in accordance with Section 4 of the NSW Environmental Management System guidelines 1998 or 2007.	**1**	**1**	**0**	**Cap Corp:** Stipulate in specification for tender - Specify that a comprehensive, project specific EMP will be developed and implemented by the contractor; - The EMP must comply with the requirement of NSW Environmental Management System Guideline (2007) Section 3 OR Section 4 of the NSW Environmental Management Systems Guidelines 1998 - Specifying that the contractor must have a current and valid ISO14001 EMS in place prior and throughout construction works (where applicable); all subcontractor shall be adhere to applicable ISO14001 requirements **Cap Corp / Builder / Contractor:** - Provide report describing how the EMP was implemented, including a summary table describing all the reporting created through the use of the EMP confirming its thorough implementation in accordance with Section 3 of the NSW Environmental Management System guidelines 2007 - Provide compliance Matrix that includes the NSW Environmental Management System requirements and a statement of how these have been fulfilled - Provide EMP in accordance to NSW Environmental Management System Guideline (2007) Section 3 OR Section 4 of the NSW Environmental Management Systems Guidelines 1998 - (Additional Point) Contractor shall be ISO14001 certified NOTE: - Attached EMP Guideline 1998	Cap Corp Builder/Contractor	
		One point is awarded where it is demonstrated that: The Contractor has valid ISO14001 Environmental Management System (EMS) accreditation prior to and throughout the project.	**1**	**1**	**0**			
Man-7	Waste Management	Up to two points are awarded where: The contractor implements a Waste Management Plan (WMP), retains waste records and quarterly reports to the building owner; and A percentage (by mass) of all demolition and construction waste is reused or recycled as follows: One point for 60% of the waste; and Two points for 80% of waste.	**2**	**2**	**0**	**Cap Corp:** Stipulate in specification / contract - 60% (by mass) of the waste shall be re-used or recycled - list out the full criteria for reuse/recycling of the stated proportion of construction and demolition waste - Contractual document to show agreement of retaining waste record and to provide quarterly waste reports **All Services:** Stipulate in specification: - State the proportion of construction and demolition waste that the contractors and sub-contractors is obliged to achieve. - Min. 80% (by mass) of the waste shall be re-used or recycled - All statement shall be written in the main body in the specification instead of Appendix. **Builder/Contractors:** - Provide report to summarise the total amount of demolition and construction waste generated, how it was reused/recycled, and indicate the total percentage of the waste diverted from landfill. - Provide details of the recycling of the stated proportion of construction and demolition waste - Provide Waste Management Plan, describing how all generated waste is monitored, which types of waste will be collected for recycling or for reuse on site, how recycling will occur, and who is responsible for the various aspects of the plan - Provide quarterly waste reports for the entire duration of construction works issued to the building owner, referencing appended receipts and any other appropriate records, the total amount (by mass) of waste generated and the percentage reused and recycled shall be stated NOTE: Common Materials and Reuses Bricks and concrete used for clean-fill; Timber to be salvaged for new structural or material use; timber waste ground into mulch or garden compost; Crushed concrete used as road-base; Plasterboard crushed for soil conditioner or for use in the manufacture of new plasterboard; Steel, aluminium and other metals for reuse in the manufacture of new metal products; Foam insulation and packaging for new insulation or soft structural forms; Pallets for reuse; Clean plastic from packaging for new packaging materials; Carpet and ceiling tiles may be taken back for reconditioning/recycling by the manufacturer; Light fixtures for cleaning and reuse; Furniture for refurbishing and reuse; Crushed tiles for paving or landscape decoration	Cap Corp All Services Builder/Contractors	
		Total Points =	**12**	**12**	**0**			

IEQ

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
IEQ - 1	Ventilation Rates	Three points are available as follows: **Naturally Ventilated Spaces** Three points are awarded where it is demonstrated that 95% of the NLA is naturally ventilated in accordance with AS1668.2-2002. **Mechanically Air-conditioned and Mechanically Assisted Naturally Ventilated Spaces** Up to three points are awarded where for 95% of the NLA, outside air is provided at rates greater than the requirements of AS1668.2-1991, as follows: One point for 50% improvement; Two points for 100% improvement; and Three points for 150% improvement. **Mixed-Mode Ventilated Spaces** Both modes of operation must individually satisfy the relevant mechanical and natural ventilation criteria. The points awarded will be limited to the maximum points awarded under the mechanical ventilation criteria.	**3**	**1**	**0**	**Mechanical Designer / Contractor:** - Design air conditioning at**50%** improvement of ventilation rate over 95% of norminated area; - Provide min. 20% efficiency filter to AHU in accordance to AS1132.5 test dust No.1; - Outside air supply rate 11.25 l/s per person at normal operation; - Provide report indicating the AHUs/fans that serve each space, the minimum amount of O/A rates supplied by each AHU/fan as evident in the commissioning and compared with the minimum requirements of AS1668.2-1991, as well as confirming that the minimum requirements will be exceeded for at least 95% of the norminated area - Provide AHU/Fans schedule with outside air rate as evident in commissioning and compared with the minimum requirements of AS1668.2-1991 - Provide tender drawings - Stipulate in specification where design occupant density is specified and design outside air rates are nominated NOTE: "Nominated Area" is the occupied space excluding rooms for functional reasons, have specific temperature, humidity, air rate requirements	Mechanical designer Contractor	

IEQ - 2	Air Change Effectiveness	Two points are awarded where the Air Change Effectiveness (ACE) for at least 95% of the NLA meets the following criteria: **Naturally Ventilated Spaces** A distribution and laminar flow pattern for at least 90% of each space in the direction of air flow for not less than 95% of standard hours of occupancy is demonstrated. **Mechanically Air-conditioned and Mechanically Assisted Naturally Ventilated Spaces** The ventilation systems are designed to achieve an Air Change Effectiveness (ACE) of >0.95 for at least 95% of the NLA when measured in accordance with ASHRAE 129-1997: 'Measuring Air Change Effectiveness'; and ACE is measured in the breathing zone (nominally 1m from finished floor level). **Mixed-Mode Ventilated Spaces** The ventilation systems are designed to achieve an Air Change Effectiveness (ACE) of >0.95 when measured in accordance with ASHRAE 129-1997: 'Measuring Air Change Effectiveness'; ACE is measured in the breathing zone (nominally 1m from finished floor level); and A distribution and laminar flow pattern for at least 90% of the NLA of each space in the direction of air flow for 95% of hours of predicted natural ventilation operation is demonstrated.	**2**	**2**	**0**	**Mechanical Designer:** - Design the supply and exhaust point to achieve ACE min. 95% of norminated area, incorporate swirl diffusers in design - One FCU/AHU per room/zone - Incorporate 100% outside air cycle Provide: - Report describing proposed system; including summary table that identifiese all spaces in the building and the area, nominates compliant spaces, indicates the ventilation mode and how compliance is achieved as well as confirms that compliant spaces jointly account for at least the stipulated proportion of the NLA; -CFD report and modeling result Mechanical air-conditioned; Measured in the breathing zone (1m from finished floor level); CFD Modelling to demonstrate the Air Change Effectiveness of >0.95 over 95% of norminated area NOTE: Deemed to Satisfied system Displacement system; Evenly distributed; Covers at least 95% norminated area; Diffusers are installed at least every 20 sqm; High level exhaust is installed at least every 50 sqm Diffusion system to be selected to meet criteria, i.e. swirl type diffusers NOTE2: The workstation-based solution must be provided and paid for by the base developer (cost-share is appropriate if agreed to by both the tenant and the owner, if different); The workstation-based solution must be fully installed and operational (commissioned if recommended by the supplier or the design team) prior to occupancy; NOTE3: "Nominated Area" is the occupied space excluding rooms for functional reasons, have specific temperature, humidity, air rate requirements	Mechanical designer	
IEQ - 3	Carbon Dioxide Monitoring and Control	One point is awarded where: **Naturally ventilated spaces** 95% of the NLA is naturally ventilated in accordance with AS1668.2-2002; and Ventilation rates are directly controlled by occupants. **Mechanically Air-conditioned and Mechanically Assisted Naturally Ventilated Spaces** A carbon dioxide (CO2) monitoring and control system with a minimum of one CO2 sensor at all return points on each floor, is provided to facilitate continuous monitoring and adjustment of outside air ventilation rates to each level, to ensure independent control of ventilation rates to achieve outside air requirements; OR HVAC systems provide 100% outside air with no recirculated component. **Mixed-Mode Ventilated Spaces** Both modes of operation must satisfy the relevant mechanical and natural ventilation criteria. The points awarded will be limited to the maximum points awarded under the	**1**	**1**	**0**	**Mechanical designer / Contractor:** - Provide Carbon Dioxide monitoring and control system, interlock to BMS/Central controller and O/A damper; - Interlock O/A damper as a function of the Carbon Dioxide concentration in accordance to 600 PPM for 50% improved ventilation rate (IEQ-1); - Install CO_2 sensors at all return points - Carbon Dioxide shall be no greater than 600ppm - Provide tender drawings - Identify the proposed HVAC system in specification - Stipulate in specification to identify the proposed HVAC system and outline the requirements and operation. **Contractor:** - Install carbon dioxide sensor, interlock to central controller and outside air damper - Details the on-going operation and maintenance requirements of the CO_2 sensors in O&M **Commissioning Agent:** - Commission and provide report	Mechanical designer Contractor Commissiong Agent	
IEQ - 4	Daylight	Up to three points are available in his credit; there are two alternative credit criteria: The percentage of the NLA that has a measured Daylight Factor (DF) of not less than 2.0%, at desk-height level (720mm AFFL) under a uniform design sky; OR The percentage of the NLA that has a Daylight Illuminance (DI) of at least 250 Lux. In both cases are the points awarded based on percentage of NLA as per below. One point is awarded for 30% of NLA; Two points are awarded for 60% of NLA; and Three points are awarded for 90% of NLA.	**3**	**1**	**1**	**Cap corp:** Engage analysis Provide - Daylight calculation/modelling to confirm point - Report **Architect:** - Norminate all glazing properties and VLT - Provide reflectance values of of paint, carpet etc **Mech:** - input glazing requirement	Architect Capcorp Mech	
IEQ - 5	Daylight Glare Control	One point is awarded where it is demonstrated that glare from daylight is reduced through any combination of the below: Where, for each typical glazing configuration or atrium, fixed shading devices shade the working plane 1.5m in from the centre of the glazing of direct sun at desk height (720mm AFFL) for 80% of standard working hours; OR Where blinds or screens are fitted on all glazing and atriums as a base building provision and meet to following criteria; - Eliminate all direct sun penetration; - Are control with an automatic monitoring system; - Are equipped with a manual override function accessible by occupants; and - Have a visual light transmittance (VLT) of <10%.	**1**	**0**	**1**	**Architect:** To provide: - Fixed shading devices shade the working plane, 1.5m in from the centre of the glazing, from direct sun at desk height 720mm FFL for 80% (business hour 8am to 6pm) of standard working hours; - Internal blind is acceptable providing: A base building provision Eliminate all direct sun light Automatic control with manual override VLT less than 10% - Confirm operation hour - Where glare is reduced through fixed devices, including visual images of the modelled building from all four elevations and images showing sun penetration of the floor plate for the working hours on the equinox and solstices. Provide summary of the hours where the fixed shading devices do not shade the working plane The visual light transmittance (VLT) of blind has to be less than 10%; **Architect/Cost control** - Provid cost estimation **Architect:** - Nominate the daylight glare control system and how to achieve compliance - Provide floor drawings with shading effect for each hour from 8am - 6pm **Cap corp:** - Engage analysis	Architect Cap corp	
IEQ - 6	High Frequency Ballasts	One point is awarded where: High frequency ballasts are installed in fluorescent luminaries over a minimum of 95% of the Class 5 Commercial Office NLA.	**1**	**1**	**0**	**Electrical designer** - Design with high frequency ballast operate at over 32,000 Hz over a minimum of 95% of the class 5 NLA - Provide cost estimation - Stipulate in specification the use of high frequency ballasts for all the luminaries listed **Contractor** - Provide details on all luminaries with types of ballasts and quantities	Electrical designer Contractor	
IEQ - 7	Electric Lighting Levels	One point is awarded where: The office lighting design has a maintained illuminance level of no more than 400 Lux for 95% of the Class 5 Commercial Office NLA as measured at the working plane (720mm AFFL).	**1**	**1**	**0**	**Electrical designer** - Maintain the illuminance level of no more than 400 Lux for 95% of Class 5 NLA, measure at 720mm AFFL - Stipulate the maximum illuminance lighting level in specification - Provid isolux Plot Drawings marked up to show the location and size of all areas where maintained illuminance levels exceed 400 lux, and correlated with the short statement/report **Contractor** - Install as per specification and provide confirm in written form	Electrical designer Contractor	

IEQ - 8	External Views	Up to two points are awarded where: A significant portion of the Class 5 Commercial Office NLA has a direct line of sight to the outdoors or into an adequately sized and day-lit atrium is: - One point for 60% of the NLA; and - Two points for 80% of the NLA.	**2**	**1**	**0**	**Green star consultant/Architect** - Initial calculation shows compliance to 1 point 1F: approx. 76.8% as per DA1004[01] 2F: approx. 63.8% as per DA1005[01] 3-7F: approx. 60.3% as per DA1006[02] **Cap corp** - engage atrium daylight analysis	Architect Green Star consultant Capcorp	
IEQ - 9	Thermal Comfort	Up to two points are awarded where high level of thermal comfort is achieved for all of the Class 5 Commercial NLA through any combination of the below: **Naturally ventilated and mechanically assisted naturally ventilated spaces:** Where naturally ventilated buildings achieve credit criteria for IEQ-10 'Individual Comfort Control', up to two points are awarded for if Accessibility Limits of ASHRAE Standard 55-2004 are achieved during Standard Operating Hours of Occupancy for 98% of the year: - One point for internal temperatures within 80% Acceptability Limit 1; and - Two points for internal temperatures within 90% Acceptability Limit 1. **Mechanically Air-Conditioned Spaces:** Where Predicted Mean Vote (PMV) levels, calculated in accordance with ISO7730, are achieved during Standard Operating Hours of Occupancy for 98% of the year using standard clothing and metabolic rate value: - One point for PMV levels between -1 and +1, inclusive; and - Two points for PMV levels are between -0.5 and +0.5, inclusive. **Mixed-mode Ventilated Spaces:** For mixed-mode buildings, the above mechanical	**2**	**1**	**1**	**Contractor** - Provide calculation to confirm the Predicted Mean Vote (PMV) fall within +1 & -1 in accordance with ISO7730 in Occupied Space; - Provide thermal comfort report - Provide summary report - Summary of all the thermal properties of all materials that used **Architect:** - Provide details window schedule NOTE: Deem to Satisfy Criteria Dry bulb temperature within 20 degree C to 24 degree C; Mean radiant temperature of within 20 degree C to 27 degree C; RH within range of 40% to 60%; Air velocity not more than 0.2m/s with no supply directed at occupants (unless they have direct control of the air flor e.g. displacement grilles, task air nozzles); Double glazing is installed on 90% of all fenestration, and 100% of North, East and West orientations; HVAC system must have seperate internal and perimeter zones that each provide independent heating, cooling and air volumes; No individual perimeter zone can exceed 100 sqm; A perimeter zone can serve no more than one facade orientation; Each zone must have a thermostat located in that zone	Contractor Architect Mech	
IEQ - 10	Individual Comfort Control	Up to two points are awarded where it is demonstrated that the base building provides for individual user control of air supply rates, air temperature, or mean radiant temperature to each workspace, through any combination of the below: **Naturally Ventilated and Mechanically Assisted Naturally Ventilated Spaces** Individual user control over ventilation openings, no less than 0.75m2, is provided as follows: - One point where openings are provided every 30m2 of the NLA; and - Two points where openings are provided every 15m2 of the NLA. **Mechanically Air-Conditioned Spaces** The base building HVAC system allows for tenant installation of individual user control of thermal comfort to each workspace for each 15m2 or part thereof (including enclosed spaces), as follows: - One point for 60% of NLA; and - Two points for 90% of NLA. **Mixed-Mode Ventilated Spaces** For mixed-mode buildings, the above mechanical and natural ventilation thermal comfort criteria must be achieved.	**2**	**0**	**0**	Relatively high cost imposed, credit no claimed	Mechanical designer Architect Green star consultant	
IEQ - 11	Hazardous Materials	One point is awarded where: A comprehensive hazardous material survey has been carried out on the project site, as defined by the relevant Environmental and Occupational Health and Safety (OH&S) legislation; and Whenever asbestos, lead or Polychlorinated Biphenyls (PCBs) were found, they have been removed in accordance with the standards listed under Table IEQ-11.1. For new developments or developments in which none of the above hazardous materials were found, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Indoor Environment Quality category score. Type 'na' in the No. of points Achieved column	**0**	**na**	**0**	No existing building at Stage 1		
IEQ - 12	Internal Noise Levels	Up to two points are awarded where 95% of the project's NLA does not exceed the 'Satisfactory' ambient internal noise levels in accordance with AS/NZS 2107:2000, as follows: Building Services Design - One point is awarded where, within the entire base building general office space, noise from the building services does not exceed 40dBAeq. Overall Building - One point is awarded where within the base building office space, the sound level does not exceed 40dBAeq (assuming open plan offices).	**2**	**2**	**0**	**Acoustic:** - To confirm & approve design will not exceed sound levels requirement in Table 1 of AS/NZS2107:2000 for a minimum 95% of the project's nominated area - Provide assessment report. The data provided in the report should clearly justify the conclusion and account for all constant noise sources (hydraulic and mechanical systems that are both internal and external to the space, traffic, etc.). The report shall include a tabulated summary listing the noise levels in all relevant spaces and comparing them to the values prescribed in the standard to aid submission process **Contractors** - Building services design does not exceed 40dB(A) within the entire base building general office space - Overall building (within the base building office space) does not exceed 40dB(A) **Commissioning Agent:** - Test and provide report	Acoustic Consultant Commissioning Agent Contractors	
IEQ - 13	Volatile Organic Compounds	Up to three points are awarded where the various finishes used in the project meet the benchmarks outlined below as follows: **Paints** One point where at least 95% of all painted surfaces meet the TVOC Content Limits outlined in Table IEQ-13.1 (low-VOC) or where no paint is used in the project.	**1**	**1**	**0**	**Builder / Architect:** - Provide products with low VOC emission in accordance to following values - Confirm VOC emission meet requirement - Provide summary table to Green star consultant, listing and referencing all relevant products, and nominating those that meet the criteria Stipulate in specification: - Nominate the TVOC limits required for each product within the relevant category type - Stating that the contractor is required to obtain approval of the design team or client before substituting the finishes listed in the schedule; - Requiring that at the end of construction works, the contractor undertakes a final audit to ensure the correct products have been used; - Where the project has no products from a particular category, showing where it is stipulated that no such product is to be used in the project. **Contractors / Builder:** - All sealant to be used shall be complied to the following value. Submit product details to Architect / Green star consultant to confirm. - Undertake final audit ot ensure correct products have been used at teh end of construction - VOC Data sheets shall be submitted in the form of: 1) Baboratory test reports or test certificates issued by a NATA or ISO/IEC 17025 certified testing laboratory 2) Material Safety Data Sheets (MSDS) stating all VOC testing result in g/litre per product and the test method used to obtain the results. Refer to attached compliant experimental test methods. 3) Manufacturer prepared VOC data sheets that demonstrate all VOC value and calculation of the subtotal of all components. Provide a statement from manufacturer stating that the results have been obtained based on the subtotal of the known VOC values of the product's raw material components. NOTE: Theoretical VOC calculations, based on the subtotal of the known VOC values of the product's raw material components, for adhesive, sealants, or paints can be submitted as evidence for this credit. Project teams must submit a signed letter from the manufacturer listing the VOC results and stating that the calculations have been performed as above. This document substitutes the requirement for test reports or a manufacturer's data sheet. All other documentation stated in the Technical Manual is required. **Paints (Max TVOC content allowed, g/L of ready-to-use product)** Walls and ceilings - interior gloss 75 g/L; Walls and ceilings - interior semi gloss 16 g/l; Walls and ceilings - interior low sheen 16 g/l; Walls and ceilings - interior flat washable 16 g/l; Ceilings - interior flat 14 g/l; Trim - gloss, semi gloss, satin, varnishes and woodstains 75 g/l; Timber and binding primers 30 g/l; Latex primer for galvanized iron and zincalume 60 g/l;	Architect / Builder to provide product details and schedule Contractors	

						Interior latex undercoat 65 g/l; Interior sealer 65 g/l; One and two pack performance coatings for floors 140 g/l; Any solvent-based coatings whose purpose is not covered in table 200 g/l		
		Carpets and Flooring One point where all carpets meet the TVOC emissions limits outlined in Table IEQ-13.2 (low-VOC); OR Where no carpet has been installed in the project and projects wish to use low-VOC flooring, one point is awarded where all the flooring installed in the project meet the emissions limits outlined in Table IEQ-13.2. Where no carpet has been installed in the project, the carpet point is 'Not Applicable' and is removed from the total number of points available for the category; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**1**	**0**	**Carpets** - Total VOC limit 0.5 mg/sqm per hour; - 4-PC (4-Phenylcyclohexene) 0.05 mg/sqm per hour Floor covering products other than carpet (using ISO-16000 test protocol): - TVOC at three days 5 mg/sqm per hour - TVOC at 28 days 0.5 mg/sqm per hour The following international standards are to be referenced for low-VOC: • The Australian Environmental Labelling Association, Inc. Standard No: AELA 23-2005 'Australian Voluntary Environmental Labelling Standard Architectural and Protective Coatings'. • South Coast Air Quality Management District (California, U.S.) – Rule 1168 - for adhesives and sealants • Carpet and Rug Institute Green Label (U.S.) – for carpets Following manufactures and products can be referred to. Floor finishes: Ontera modular carpets - http://www.ontera.com.au/ Interface carpets - http://www.interfaceap.com Shaw carpets www.shawtile.com Paints: Berger BreatheEasy http://www.berger.com.au/Flash/breatheeasy.html Dulux Aquanamel http://www.dulux.com.au/html/planning/product_range_interior_walls.aspx		
		Adhesives and Sealants One point where 95% of all adhesives and sealants meet the TVOC Content Limits outlined in Table IEQ-13.3 (low-VOC) or where no adhesives or sealants are used.	**1**	**1**	**0**	**Adhesives & Sealants (Max TVOC content, g/litre of product)** Indoor carpet adhesive 50 g/l; Carpet pad adhesive 50 g/l; Wood flooring and laminate adhesive 100 g/l; Rubber flooring adhesive 60 g/l; Sub-floor adhesive 50 g/l; Ceramic tile adhesive 65 g/l; Cove base adhesive 50 g/l; Dry wall & panel adhesive 50 g/l; Multipurpose construction adhesive 70 g/l; Structural glazing adhesive 100 g/l; Architectural sealants 250 g/l		
IEQ - 14	Formaldehyde Minimisation	One point is awarded where all composite wood products (including exposed and concealed applications) either: Contain low-emission formaldehyde. OR Contain no formaldehyde. If no engineered wood products are used within the project, this credit is 'Not Applicable' and is removed from the total number of points available for the category; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**0**	**na**	**1**	**Architect:** - Stipulated in specification 95% of all engineered wood products must have low formaldehyde emissions (refer to attached document - IEQ-9 Formaldehyde emission limit values for different testing protocols) - List and referencing all engineered wood products used in the project, provide summary table - Clearly identify the products that meet criteria in the table attached IEQ 9 - Stat in specification the formaldehyde content or emissions standard for all engineered wood products used in the project - Stipulat in specification that contractor is required to obtain the approval of the design team or client before substituting the engineered wood products listed in the schedule NOTE: The following applications are excluded from this credit - any engineered wood products used in exterior application - formwork - internal car park applications - re-used engineered wood products - raw timber NOTE2: The emission levels must be established by a NATA or ISO/IEC17025 registered laboratory as per the testing methodologies provided in the attached table IEQ 9 NOTE3: - Engineered wood products, particle board, MDF, decorative overlaid wood panels, must confirm to formaldehyde testing outlined in AS4266.16-2004 and emission shall be no greater than the limit value provided in IEQ-9 Emission Limit table - Veneer and plywood must conform to formaldehyde testing outlined in AS/NZS2098.11-2005 and emission shall be no greater than the limit value provided in IEQ-9 Emission Limit table - Emission of formaldehyde from the final product shall not exceed 0.1 ppm after 28 days when tested and certified in accordance with EN717-1. Should any test is to be carried out in accordance with other accepted international standard, refer to IEQ-9 Emissions Limit table, result must be correlated to EN 717-1.	Architect Architect Contractor	
IEQ - 15	Mould Prevention	One point is awarded where it is demonstrated that: The mechanically air-conditioned ventilation system actively controls humidity to be no more than 60% relative humidity in the space and no more than 80% relative humidity in the supply ductwork; OR The building is fully naturally ventilated	**1**	**0**	**0**	Install humidity sensors in all ductwork and interlock to BMS to ensure the humidity control; (might require reheat element which involves energy & cost impact) Point not claimed	Mech Desinger Constractor	
IEQ - 16	Tenant Exhaust Riser	One point is awarded where the building includes a dedicated tenant's exhaust riser with the following characteristics: - Complies with section 5.7 of AS1668.2-2002; - Provides no less than 0.2 L/s/m² for 100% of the NLA; - Has a capacity of 0.35 L/s/ m² for 100% of NLA on any individual floor; and - The exhaust system is not recycled to other enclosures of different use.	**1**	**1**	**0**	**Mechanical designer:** -Outline the design criteria for the exhaust riser and demonstrate compliance with the credit in specification **Contractors:** Install tenant exhaust riser; Tenant exhaust riser must NOT serve the kitchenette or tearoom A grade building requirement	Mech Desinger Constractor	
		Total Points =	**25**	**15**	**4**			

ENERGY

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Ene - 1	Greenhouse Gas Emissions	Up to twenty points are awarded where it is demonstrated that the building's predicted greenhouse gas emissions have been further reduced below the Conditional Requirement. No evidence is required in addition to that submitted for Ene – Conditional Requirement.	**20**	**5**	**0**	**Mechanical designer/Green Star Consultant:** Provide energy modelling based on: - Gas fired VRF heat recovery system with economy cycle to office and; - Miscellaneous ventilation system - Tenant cooling tower - T5 high efficiency lighting system - Carpark supply and exhaust with CO monitory and VSD - 6 Lifts **Architect/Services designers/Contractors/Lift contractors/Cap Corp** - Glazing schedule and performance details - Lighting schedule and power consumption details - Design specification from all services - Pumps & all ancillary equipments details - Lift details - DHW **Green star consultant:** - Model based on benchmark building in accordance with Section J JV3 and DTS value - Finalize energy model and report	All services designers Contractor Green Star consultant Architect Cap Corp Lift contractor	

Ene - 2	Energy Sub-metering	Up to two points are awarded as follows: One point is awarded where: It is demonstrated that sub-metering is provided for substantive energy uses within the building (i.e. all energy uses of 100kVa or greater); and There is an effective mechanism for monitoring energy consumption data.	**1**	**1**	**0**	**Mech/Elect/Hydr Services:** - Provide/install meter to meet 2 points criteria - Electrical consumption shall be measured seperately for each primary functional space - Provide??? meters for electrical TBC, meter shall be provided to all energy uses of 100kVa or greater, meters shall measure the tenant and base building consumption seperative for future NABERS rating; sub meter shall be provided seperately to lighting, power on each floor/tenant - Provide??? meters for mechanical TBC, sub-meter shall be provided seperately record the consumption on each floor, carpark, tenant equipment - Describe in specification how the consumption data will be collected, recorded and monitored during the operation of the building - Provide summary table of all metered primary functional spaces - Describe in specification how electricity metering is provided separately for lighting and separately for power for each primary functional space, including how data is collected, recorded and monitored; - State in specification the installation requirements for each meter - All meters shall be connected to BMCS - Provide cost estimation	Elec Desinger Mech Designer Contractors	
		An additional point is awarded where: - The point above is achieved; - It is demonstrated that sub-metering is provided separately for lighting and separately for power for each floor or tenancy, whichever is smaller; and - There is an effective mechanism for monitoring energy consumption data.	**1**	**1**	**0**			
Ene - 3	Lighting Power Density	Up to three points are awarded where it is demonstrated that the lighting power densities for 95% of the NLA meets the following criteria at 720mm AFFL with the default maintenance factor of 0.8: One point for energy use of 2.5 W/m² per 100 Lux; Two points for energy use of 2.0 W/m² per 100 Lux; and Three points for energy use of 1.5 W/m² per 100 Lux.	**3**	**3**	**0**	**Electrical service** - Design lighting with 2.0 W/sqm per 100 Lux (average of NLA); - Details lighting design and requirements in specification **Contractor:** - Provide summary of the type and quantity of fittings supplied to the project, list of items shall come from the suppliers - Provide statement to confirm the location and type of fittings installed, clearly identify on drawings - Provide a summary short report detailing he lighting power density calculation, stating the working plane used in the calculation - Provide a summary table that lists all layouts and their area, demonstrating that compliant areas jointly account for at least 95% NLA - Conduct commissioning - Provide report detailing the measurement data, stating the working plane used for measurement and confirming compliance of each typical layout **Commissioning agent:** - commissioning - Provide report demonstrating the system have been commissioned and operate as intended	Elect Designer Contractor ICA	
Ene - 4	Lighting Zoning	Up to two points are awarded as follows: One point is awarded where it is demonstrated that: All individual or enclosed spaces are individually switched; The size of individually switched lighting zones does not exceed 100m² for 95% of the NLA; and Switching is clearly labelled and easily accessible by building occupants.	**1**	**1**	**0**	**Electrical designer:** - Design lighting zone to no greater than 100 sqm for 95% NLA; - Install individual switch with label; - Switches must be installed within the 100 sqm zone and at every entry; - In order to claim the second point, lighting fixture over 90% of NLA must be able to be readdressed/regrouped without rewiring (individually addressable), provide Dali control system with highlevel interface - Details the requirements for switching and zoning in specification - Provide a summary table that lists all separately switched zones and their area, demonstrating that compliant areas jointly account for the stipulated proportion of the NLA - Provide cost estimation **Contractor:** - Supply and install the propsed lighting system and wiring control - Provide statement to confirm the system has been installed and wired as designed - Provide as-installed drawing - Provide statement that lighting system has been commissioned and operates as intended by design. All commissioning data shall be presented in a clear and neat format ready for submission. **Commissioning agent:** - commissioning - Provide report demonstrating the system have been commissioned and operate as intended NOTE: Motion occupancy sensors are treated the same way as manual switching, they must be automated with a mnaual override and connected to BMS with time contro	Elect Designer Contractor ICA	
		An additional point is awarded where: - The point above is achieved; and - It is demonstrated that an individually addressable lighting system is provided for 90% of the NLA.	**1**	**1**	**0**			
Ene - 5	Peak Energy Demand Reduction	Up to two points are awarded where it is demonstrated that the building has reduced its peak electrical demand load on electricity infrastructure as follows: One point where: Peak electrical demand is actively reduced by 15%; OR The difference between the peak and average demand does not exceed 40%. Two points where: Peak electrical demand is actively reduced by 30%; OR The difference between the peak and average demand does not exceed 20%.	**2**	**1**	**1**	**Mech Contractor:** - Provide details and final selection on AC system, based on Gas fired VRV; Co-generation; Tri-generation; - Provide final equipment schedules **Electrical Contractor:** - Compliance TBC - Provide short report justifying, with supporting calculations, the building's peak demand value - Detailing, with supportin gcalculations, the design, operation, and sufficient capacity of teh intended system - Calculation as per AS3000 - Identify what active mechanism will ensure that the demand on the infrastructure will at no point exceed the stipulated percentage of the building's demand - Details the proposed system/solution in specification **Commissioning agent:** - commissioning - Provide report demonstrating the system have been commissioned and operate as intended, appending relevant test data, and referencing the O&M manual NOTE: Peak energy demand is teh predicted annual peak to be calculated as teh sum of all distribution bars relevant to the base building in electrical schematics. Calculation must be: - In accordance with AS3000; - 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 aggrements; mixed-mode ventilated buildings must be calculated as per the mechanically air-conditioned mode; - Tenant light and power is not to be included in assessment - Assuming the BCA DTS approach for building fabric Might consider: Photovoltaics with battery storage; Fuel cells; Energy & thermal storage system; Co/Tri-generation (relatively expensive); Micro turbine	Contractors Commissioning agent	
		Total Points =	**29**	**13**	**1**			

TRANSPORT

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost

Tra - 1	Provision of Car Parking	Up to two points are awarded as follows: One point is awarded where the number of car parking spaces is: - At least 25% less than the maximum local planning allowances applicable to the project. OR - Not to exceed the minimum planning allowance by more than 10% Two points are awarded where the number of car parking spaces is: - At least 50% less than the maximum local planning allowances applicable to the project. OR - No more than the minimum local planning allowances. Where car parking is not permitted in the local planning scheme, this credit is 'Not Applicable' and is excluded from the points available to calculate the Transport Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the	**2**	**0**	**0**	**Non compliance, point not claimed**	Cap Corp Architect	
Tra - 2	Fuel-Efficient Transport	One point is awarded where: - A minimum of 80% of all preferred parking spaces is dedicated solely for use by car-pool participants, small cars, hybrid or other alternative fuel vehicles; **and** Of the total parking spaces on the site: - A minimum of 10% or 10 parking spaces (whichever is the greater) are designed and labelled for small vehicles, in accordance with AS/NZS2890.1:2004; and - A minimum of 5% or 5 parking spaces (whichever is the greater) are designed and labelled for mopeds and/or motorbikes, in accordance with AS/NZS2890.1:2004. If no parking spaces are to be provided this credit is 'Not Applicable' and is excluded from the points available used to calculate the Transport Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**0**	**1**	**80% of the parking spaces (those closest to entrance and lift core) are to be provided as small car parking** NOTE: small car parking spaces, 2300 x 5000 W x L motorcycles parking spaces, 1200 x 2500 W x L	Architect Cap Corp Green star consultant	
Tra - 3	Cyclist Facilities	Up to three points are awarded as follows: One point is awarded where the following are provided: - Secure bicycle storage for 5% of building staff (based on one person per 15m2 of NLA); - Accessible showers (based on one per 10 bicycle spaces provided or part thereof); - Changing facilities adjacent to showers; and - One secure locker per bicycle space in the changing facilities. Two points are awarded where the following are provided: - Secure bicycle storage for 10% of building staff (based on one person per 15m2 of NLA); - Accessible showers (based on one per 10 bicycle spaces provided or part thereof); - Changing facilities adjacent to showers; and - One secure locker per bicycle space in the changing facilities.	**2**	**2**	**0**	**Architect:** - Provide bicycle path from building entrance to parking area Provide - 105 bike rack for building staffs, facility has to be secure in weather proofed enclosure close to main entrance (44 for Stage 1A, 110 for Stage 2) - 11 Accessible showers (based on one per 10 bicycle spaces provided or part thereof) shall be provided (5 for Stage 1A, 11 for Stage 2); - One secure locker per bicycle space in the changing facilities shall be provided - Change room must be located next to shower - 21 bicycle parking spaces for visitors (9 for Stage 1A, 22 for Stage 2). Visitor racks must be located near a major public entrance and not intended for sole or primary use by couriers. Racks shall comply with AS2890.3. Railings, lampposts and other non-purposeful bike parking facilities do not comply with Greenstar protocol - Rack/rails shall be covered and protected from the elements and designed to AS2890.3 with both wheel and the frame to be locked securely; Alternatively, a locked bicycle shed with access for staff only shall be provided. Sufficient space must be provided to store all bikes without having to move other bikes or rely on a bike's integral stand. Fixture to lock bikes in this case are not required. - Details the number of showers, lockers and storage/parking spaces provided in specification - Stipulate in specification that storage/parking spaces must comply with AS2890.3 and the requirement for compliance, i.e. racking, locking details, visitors' parking, shower & changing facilites accessibility	Architect Green Star consultant to provide summary Electrical designer Hydraulic designer Builder Contractor	Approximate $1400 per 5 bikes (Based on Street Furniture Australia) for visitor parking at public domain
		An additional point is awarded where: - The requirements for either one or two points have been met; and - Visitor bicycle parking is provided and meets the following criteria: One space per 750m2 NLA or part thereof; and Provided in an accessible location, signposted and close to, or adjacent to, a major public entrance to the building.	**1**	**1**	**0**	**Builder/Contractor (racks)** - Provide confirmation on the number of bicycle storage space provided from the supplier - Supply and install in accordance with AS2890, provide statement - Supply and install storage space for visitors in accordance with AS2890.3, confirm the number from suppliers and statement **Electrical Designer:** - Lighting/signage is designed in accorance with AS1158 - Provide tender drawings showing lighting and signage provided to the bicycle path **Hydraulic Designer:** - Provide 11 accessible showers **Green Star Consultant:** - Provide summary report NOTE: Secure lockers should not be significantly smaller than 80cm tall by 25cm wide or 180cm tall by 40cm wide;		
Tra - 4	Commuting Mass Transport	Up to five points are awarded for the quality of mass transport options available to building occupants. The points are determined using the Green Star Mass Transport Calculator based on: - The type of mass transport services available within 1000m of the site; - The number of routes served; and - The average interval between services during weekday peak hours. The points are determined using the Green Star Public Transport Calculator.	**5**	**2**	**0**	**TBC, at the moment 2 points**	Green star consultant	
			11	**5**	**1**			

WATER

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Wat - 1	Occupant Amenity Water	Up to five points are awarded where the predicted potable water consumption for sanitary use within the building has been reduced against a 'best practice' benchmark. The points are determined by the Green Star Potable Water Calculator.				**Pending confirmation from GBCA regarding the use of SOPA recycle water.** **Hydraulic designer / Landscape / Architect:** - ??? toilets, each WELS 5 stars, average 3 L/flush dual flush - ??? urinals, each WELS 5 stars, 2 L/min, with auto timer - ??? Indoor taps, WELS 5 stars basin taps (General), average 6 L/min - ??? Indoor taps, WELS 3 stars (cleaner room), average 9 L/min - ??? showers, WELS 5 stars, 9 L/mins - Confirm the consumption for irrigation, size of tank		

			5	**5**	**0**	- Confirm rainwater re-use, tank size, collect area, quantity - Confirm grey water re-cycle, tank size, percentage of re-use, tank size - ???% of toilets use rainwater - ???% of indoor taps use rainwater - ???% of shower taps use rainwater - ???% of irrigation will use rainwater - Rainwater used for other purposes ??? - Rainwater available for ALL uses ???kl per week Stipulate in specification: - State the minimum water consumption level of all fitting has been designed in accordance to above - Provide details for all hydraulic fixtures and fittings, any water reuse systems and teh water collection systems with a specific mention of the capacity of the system and the portion of each individual application consumption **Architect:** - Provide descriptions in specification of all the water-efficient features in the building - Provide a summary of all fixtures and fitting schedule and their flow rate - Stipulate in specification that the water consumption of all fitting must comply with the value listed above **Contractors/Commissioning Agent:** - Provide commissioning report demonstrating that the relevant systems have been installed and commissioned and operate as intended by the design. Report shall refer to the O&M manual to indicate that all the intended gydraulic fixtures and fittings and all water reuse, collection and storage systems have been installed - Provide as-install schedule of all fitting with their flow rate	Hydraulic designer Architect Contractor Commissiong Agent	
Wat - 2	Water Meters	One point is awarded where: - Water meters are installed for all major water uses in the project; and - There is an effective mechanism for monitoring water consumption data.	**1**	**1**	**0**	**Hydr Services:** Provide - water meters to all major water use, i.e.bathrooms/toilet to cover both hot & cold water (this meter shall also record kitchenette/sinks consumption), showers, irrigation, rainwater recycle supply system, wash-down system, cooling tower etc. Hydraulic to confirm - summary table of all metered spaces - schematic drawings Provide short report to - Identify major water uses - Describe how the consumption data will be collected, recorded and monitored during the operation of the building including the function of the alert and leak detection systems. Stipulate in specification - major water uses and stipulate the sub-metering requirements. - All meters shall be connected to BMCS for record and monitoring. BMS shall be provided with a leak detection system and include an alarm in the event of a new trend in water consumption. **Mech Services/Contractor:** - Incorporate the additional DDC point from water meter into BMS - Provide cost **Commissioning agent:** - Provide report showing that all the meters and the monitoring system have been commissioned and are operating as intended NOTE 1: Major water uses - Bathrooms; - Showers (if provided for at least 5% of staff); - Evaporative heat rejection systems; - Irrigation systems; - Wash down systems; - Rainwater supply; - Recycled water supply; - Humidifiers	Hydraulic designer Contractor Mechanical Commissiong agent	
Wat - 3	Landscape Irrigation	One point is awarded where: - Potable water consumption for landscape irrigation has been reduced by 90% OR - A xeriscape garden has been installed. If there is no landscaping, or landscaping represents less than 1% of the site area, this point is 'Not Applicable' and is excluded from the points available used to calculate the Water Category Score. Type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**1**	**0**	**Architect / Landscape Architect:** - Confirm Landscape area to be ??? sqm - Confirm irrigation water consumption ??? kL/week - Details in specification the proposed landscape irrigation system, its water sources and operation requirements - Provide landscape report to justify why the design can be classified as 'xeriscaping' -Total landscape area including roof, vertical and planter gardens has to be no less than 1% of site area, **Cap Corp:** - Provide short statement stating that the provision of irrigation systems for teh xeriscape garden will be removed within three months of landscaping installation and no water will be supplied to the landscape after completion. **Hydraulic designer:** - 100% rainwater for irrigation - Provide details of portable water consumption referencing the water efficiency regulation for comparison - Identify the proposed landscape irrigation system, water source and operation requirement in specification **Contractors:** - Install water tank for rainwater storage and irrigation - Provide commissioning report demonstrates the system has been installed, commissioned and operates as intended by the design **Commissioning agent:** - Provide commisioning and report demonstrating that the system has been commissioned and operates as intended by the design, and expressed in the hydraulics report	Hydraulic / Landscape designer Architect Contractor Cap Corp Commissiong agent	
Wat - 4	Heat Rejection Water	Up to four points are awarded as follows: Two points are awarded where: - Potable water consumption of water-based heat rejection systems is reduced by 50%; and Four points are awarded where: - Potable water consumption of water-based heat rejection systems is reduced by 90%; OR - No water-based heat rejection systems are provided.	**4**	**4**	**0**	**90% reduction of potable water consumption of tenant cooling towers** **Mechanical designer:** - Details in specification - Include side stream filtration system, eliminate chemical dosing **Hydraulic designer:** - Provision of water to cooling tower from rainwater tank, 100% reduction in portable wawter consumption, confirmation if capacity is ok - Details in specification of the proposed system **Contractors:** - Install water supply pipes - Provide commissioning report demonstrating that the installed system has been fuly commissioned and operates as intended - Provide summary report - Provide calculation to justify the portable water requirement for an average day in January, April, July and October **Commissioning agent:** - Commission system and provide report demonstrating that the installed system has been fully commissioned and operates as intended by the design	Mechanical designer Hydraulic designer Contractor Commissioning agent	

Wat - 5	Fire System Water Consumption	One point is awarded where: - There is sufficient temporary storage for a minimum of 80% of the routine fire protection system test water and maintenance drain-downs, for reuse on-site; and - Each floor fitted with a sprinkler system has isolation valves or shut-off points for floor-by-floor testing; OR - The fire protection system does not expel water for testing. If the building does not have a sprinkler system, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Water Category Score. Type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**1**	**0**	**Hydraulic designer/Fire Engineer/Contractor:** - Confirm tank size and system ??? - Design sprinkler system to not expel water during testing - Install storage tank for fire test water or for fire test water AND rainwater/recycled water. The size of storage of the latter case must be designed to avoid overflow of collected water into the sewerage system or the watercourse; - Details in specification regarding the fire protection system components and their properties - Details in specification regarding the fire protection system, its operation and testing requirements and how the water will be reused on site - Where no sprinkler system to be installed, justification shall be provided in Fire Engineering report and refer to relevant clauses **Commissioning agent:** - Provide commissioning and report demonstrating that teh fire protection system has been commissioned and operates as intended NOTE: Need water storage tank for fire testing water; Or increase the rainawter storage tank size, it must be designed to avoid overflow of collected test water into the sewerage system; Re-use water onsite for e.g. irrigation/put back to fire system NOTE2: The fire protection system is deemed to include: - Hydrants; - Firehose reel; - Storage and sprinkler-test tanks; - Sprinkler-test and drain-down points As sprinkler water may not be suitable for reuse, sprinklers and sprinkler pipe drain-down water can be excluded.	Hydraulic designer Fire engineer Contractor Commissioning agent	
		Total Points =	**12**	**12**	**0**			

MATERIALS

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Mat - 1	Recycling Waste Storage	Two points are awarded where a dedicated storage area for the separation and collection of office recyclables is provided and it: - Is adequately sized in accordance with 'Sizing the Waste Storage Area' table (Table Mat-1.1); - Meets the access requirements of 'Policy for Waste Minimisation in New Developments' (NSW, 2004): Section A, points A-12 through A-17, and Section C, points C6 and C7; and - Is located in the same level as the loading dock with clearly marked, sign-posted, convenient, guaranteed access route within one of the following walking distances: - 20m of the exit used for recycling pick-up; OR - 20m of the lift core serving all floors; OR - 3m of the shortest route connecting the lift core serving all floors and the exit used for recycling pick-up.	**2**	**2**	**0**	Gross Floor Area @ **Stage 1**: **17766** sqm Gross Floor Area @ **Stage 1a**: **6552** sqm Gross Floor Area @ **Stage 2**: **17817** sqm **Architect:** - To provide **0.172%** to GFA for Recycling Waste Storage, therefore **31** sqm for **Stage 1** - To provide **0.319%** to GFA for Recycling Waste Storage, therefore **21** sqm for **Stage 1a** - To provide **0.172%** to GFA for Recycling Waste Storage, therefore **31** sqm for **Stage 2** - Design to 'Policy for Waste Minimisation in New Developments' (NSW, 2004): Section A, points A-12 through A-17, and Section C, points C6 and C7 - Provide short report identify the compliance with the 'Policy for Waste Minimisation in New Developments' (NSW, 2004) **Green Star consultant:** - Provide summary report	Architect Green Star Consultant	
Mat - 2	Building Reuse	Six points are available as follows: Up to two points are awarded where a proportion of the total existing façade of the building, by vertical area, is reused: - One point for reuse of 60%; or - Two points for reuse of 90%. Up to four points are awarded where a proportion of the existing major structure, by gross building volume, is reused: - Two points for 30% reuse; - Three points for 60% reuse; or - Four points for 90%. Where the site contained no buildings at the time of purchase or the total GFA of the original building(s) is less than 20% of the GFA of the new building that replaces it, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**0**	**na**	**0**	**Cap Corp:** - Provide statement to confirm no existing building at Stage 1	Cap Corp	
Mat - 3	Reused Materials	One point is awarded where: At least 2% of the project's total contract value is represented by reused products/materials. This credit excludes materials specifically addressed by other credits (i.e. steel, concrete, PVC and timber); neither does it address the reuse of the original building(s) on the site (addressed in Mat-2 'Building Reuse').	**1**	**0**	**0**	**Cap Corp/Architect/Structural designer/All services designer:** - Confirm if possible to achieve, all reuse materials (exclude steel, concrete, PVC and timber) make up to a min. 2% of contract value **Architect/Structural/All services** - Stipulate all reused products and materials and the associated quantities in specification - Provide list of schedule and associated cost **Cost control:** - Estimate cost **Cap Corp:** - Provide statement stating the project's total value **Contractors:** - Supply and install all reuse products in accordance with relevant specifaction or to the Green star requirement should this credit is claimed - Provide statement that all reused items have been installed - Provide evidence of reuse of products, such as purchase receipts of items from a second-hand retailer etc	Cap Corp Architect Structural All services Contractors	
Mat - 4	Shell and Core or Integrated Fit-out	Two points are available as follows: Up to two points are awarded where a percentage of the (NLA) of the project is delivered as any combination of shell and core or integrated fitout. - One point for 60% of NLA; or - Two points for 90% of NLA.	**2**	**0**	**1**	Cap corp / Architect: - Confirm lease agreement, identify S&C and Integrated Fitout area	Cap corp Architect	
Mat - 5	Concrete	Portland cement Up to two points are available where the Portland cement content in all concrete used in the project has been reduced by replacing it with supplementary cementitious materials. - One point is awarded where the Portland cement content is reduced by 30%, measured by mass across all concrete used in the project compared to the reference case; or - Two points are awarded where the Portland cement content is reduced by 40%, measured by mass across all concrete used in the project compared to the reference case.	**2**	**2**	**0**	**Structural designer/Builder/Contractor:** - Design to reduce portland cement by 40%, replaced with flyash, ground granulated blast furnace slag etc. - Allow min. 50% captured or recycled water for the use of mix water for all concrete uses. Utilise SOPA recycle water for this claim. clearly document to Greenstar requirement. - Allow at least 40% of crushed slag aggregate or alternative materials coarse aggregate in the concrete; or allow at least 25% of manufactured fine aggregate inputs in the concrete - Provide a short report summarising the credit criteria that are claimed. - Provide report - include a summary calculation of the Portland cement content in the project based on the reference case and the actual case as well as the percentage reduction of Portland cement. - identify all water or coarse or fine aggregate uses in the project and demonstrating compliance. **Builder/Contractor (for as-built):** Provide:		

		Aggregate and Water One point is available where the mix water for all concrete used in the project contains at least 50% captured or reclaimed water (measured across all concrete mixes in the project), and one of the following criteria is met: - At least 40% of coarse aggregate in the concrete is crushed slag aggregate or another alternative materials (measured by mass across all concrete mixes in the project), provided that use of such materials does not increase the use of Portland cement by over five kilograms per cubic meter of concrete; - 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 use of such materials does not increase the use of Portland cement by over five kilograms per cubic meter of concrete. If the cost of placed concrete (all costs) represents less than 1% of the project's contract value this credit is "Not Applicable" and is excluded from the points available used to calculate the Materials Category Score.	**1**	**1**	**0**	- Summary report to outline the credit criteria that are claimed. - Concrete suppliers batching records for concrete delivered to site clearly highlighting type, quantities and strength of all concrete and detailing quantities and types of Portland cement, water, recycled, captured and reclaimed water, virgin aggregate and alternative aggregate (fine or coarse). Quantities must correlate with credit criteria being claimed. Provide report - include a summary calculation of the Portland cement content in the project based on the reference case and the actual case as well as the percentage reduction of Portland cement. - identify all water or coarse or fine aggregate uses in the project and demonstrating compliance. **Structural designer:** Stipulate in specification - the require Portland cement reductions across all concrete mixes in the project and requiring the supplier to establish the reduction of Portland cement use against the reference case - the requirement for substitution of a percentage of water and aggregate and requiring that the use of alternative aggregate does not increase the use of Portland cement by more than 5kg per cubic metre. REMARK 1: Where the credit is claimed as 'Not Applicable', projects may provide, in place of the Quantity Surveyor report, either a Report from a Structural Engineer, or a report from the Cost Planner, stating that the quantities of the total material value of the new concrete as a proportion of the project's total value represents less than 1% of the project's contract value. REMARK 2: Captured or reclaimed water is defined as rainwater captured on either the concrete supplier's manufacturing site, or another site, or recycled/recovered from a previous use such as blackwater or greywater from any locations.	Builder Structural designer	
Mat - 6	**Steel**	Up to two points are awarded where at least 95% of all steel used in the building's structure complies with the criteria set out below, and is sourced from a responsible steel maker. Points are awarded as follows: • Where structural steel comprises 60% or more of the total steel used in the structure, one point is awarded for each of the two initiatives met below: - At least 95% of all Category A products and at least 25% of Category B products (see Table 1) meet or exceed the nominated steel strength grades and are permanently marked with their strength grade; - 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. • Where reinforcing steel comprises 60% or more of the total steel used in the structure of the building, one point is awarded for each of the two initiatives met below: -At least 95% of all reinforcing bar and mesh meets or exceeds 500MPa strength grade, and at least 60% of all reinforcing steel is produced using energy-reducing processes in its manufacture (measured by average mass by steel maker annually); - At least 95% of all reinforcing steel meets or exceeds 500MPa strength grade, and at least 15% (by mass) of all reinforcing steel is assembled using off site optimal fabrication techniques detailed in Table 2. Where neither structural steel nor reinforcing steel comprises more than 60% of the total steel used in the structure, a combination of any of these criteria as set out above can be used to achieve the credit for a maximum of two points. See Additional Guidance for more information. If the material cost of structural and reinforcing steels represents less than 1% of the project's total contract value, or there are no new structural or reinforcing steels used in the project, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score.	**2**	**2**	**0**	**Builder/Structural designer/Quantity Surveyor:** - Estimates the total mass and material cost of the steel within the building structure - Confirm the ratio (by mass) of the structural steel to total steel and reinforcing stell to total steel - Install high strength grade structural steel, min. 95% of Category A and 25% of Category B (refer to below) - Source structural steelwork from manufacturer accredited to the Environmental Sustainability Charter of the Australian Steel Institute - Provide details/steel schedule stating the content of all steel used in the project. Provide schedule to indicate the total mass of the structural/reinforce steel as a portion of the total steel mass in the project - Calculate the overall percentage of structural/reinforced steel that meet criteria and point claim. Demonstrate via a summary table (and calculations wherever relevant). - Provide report to Identifying the total amount (by mass) and strength grade of steel used within the building structure; Identifying all of the applications of steel installed within the building structure; Identifying the product used for each type of application; Short description of the off-site optimal fabrication techniques used in the building's structure If steel was supplied for uses outside the building structure, these uses must be clearly identified and excluded from the calculations. OR Where the credit is claimed as 'Not Applicable', stating that the quantities of the total material value of the new steel as a proportion of the project's total value represents less than 1% of the project's contract value. **Structural designer:** Stipulate in specification - The revelant structural or reinforcing steel strength grades and the permanent steel marking requirements - As a minimum, the relevant percentage of structural steel be supplied by an ASI accredited steel fabricator or contractor - As a minimum, the relevant percentage of of reinforcing steel be supplied by a steel manufacturer that uses energy-reducing processes, include the benchmark for energy reducing processes - the optimal off-site fabrication techniques used for all reinforcing steel in concrete and percentage (by mass) of reinforcing steel specified for use **NOTE:** <u>Category A</u> Roof sheeting 550 MPa min. strength grade Wall sheeting 550 MPa min. strength grade Profiled-steel decking 550 MPa min. strength grade Purlins 450 MPa min. strength grade Girts 450 MPa min. strength grade Light steel framing systems 450 MPa min. strength grade (Light-steel framing systems refers to building framing systems made of lightweight cold-rolled galvanised steel sections <u>Category B</u> Hot-rolled structural steels (including plate) (e.g. universal beam and column sections, parallel flange channels, angles) 350 MPa min. strength grade Cold-formed sections (including hollow sections) (e.g. square and rectangular hollow sections, circular hollow sections, cold-formed channels and angles) 450 MPa min. strength grade Welded sections (e.g. welded beams and columns made from plate) 400 MPa min. strength grade <u>Table 2 - Off site Optimal Fabrication of Reinforcing Steel</u> 1) Engineered Reinforcing Bar Carpet - Reinforcing bars fabricated off site for rolling out on site 2) Engineered/Customised Mesh - Run-to-length meshes, tailored meshes, high ductility meshes, special size meshes, engineered meshes, variable diameter and spacing meshes 3) Prefabricated Reinforcing Cages - Prefabricated reinforcing cages for concrete elements such as slabs, walls, cores, columns and piles	Builder Structural designer Quantity Surveyor	
Mat - 7	**PVC**	Up to two points are awarded when a percentage of a project's PVC flooring, resilient wall coverings, cable insulation, pipe and conduit - which together account for the majority of PVC use in buildings and which are referred to as 'common uses of PVC' in this credit – meet the Best Practice Guidelines for PVC in the built environment. For further information on the Best Practice Guidelines see the Additional Guidance section of this credit. Points are awarded as follows: - One point where at least 60% of the common uses of PVC products in buildings (by cost) complies; and - Two points where at least 90% of the common uses of PVC products in buildings (by cost) complies. If the cost of PVC products in common uses of PVC represents less than 0.05% of the project's total contract value, or there are no PVC products present in the project for any of the common uses of PVC, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score.	**2**	**2**	**0**	**Architect/All services designers/Contractors:** - Stipulate in specification all PVC used in this project shall be sourced from manufacturers that meet the Best Practice Guidelines for PVC in the Built Environment. Specification shall specifically state the three methods of demonstrating compliance (refer to below - Stipulate in specification that any subsititute PVC product of a specified PVC product shall be compliant with the criteria - Design to meet two point requirement, 90% of total PVC (by cost) meets the Best Practice Guidelines for PVC in the built environment **Quantity surveyor** - Provide report to 1) identify all pipe, conduit and associated fittings, wire and cable insulation and flooring products and PVC content 2) state which PVC products in common uses of PVC are compliant (including total combined cost) 3) state which PVC products in common uses of PVC are NOT compliant (including total combined cost) 4) state the percentage (by cost) of the total PVC products in common uses of PVC that is compliant 5) reference to specification from services designer - Report shall include a comparison of all PVC cost to the total project value **Cap Corp:** - Provide contract/statement to show the total project value - Engage independent auditor to certify compliance to the Guidelines **Contractors:** - All products shall be sourced from manufacturers that meet the Best Practice Guidelines for PVC in the Built Environment. refer to specification from service designers. NOTE: Refer to attached PVC Best Practice Guide Re-used PVC is defined as PVC products pre-existing in a building or fitout, or PVC products procured from a second hand source. Re-used PVC product sources may include, but are not limited to second hand retailers, removalists, auction houses, and demolition works from previous sites. Re-used PVC products may be excluded from documentation in this credit Products containing recycled PVC content shall be documented in the credit and comply with teh Best Practice Guidelines as even PVC products with high recycled content require some virgin PVC in their production. Claims of recycled content in such products by suppliers or manufacturers must be independently verified. This requirement is incorporated in the Best Practice Guidelines for PVC in the Built Environment.	All services designers Quantity surveyor Contractors	

						All specified PVC (refer to relevant specification) is to be independently verified as compliant with the Best Practice Guidelines for PVC in the Built Environment. Documenting compliance of a PVC product to the Best Practice Guidelines shall be demonstrated using any of the following pathways: 1) Environmental Management System (EMS): Inclusion of the Best Practice Guidelines for PVC in the manufacturer or supplier's independently audited ISO 14001, Environmental Management Systems (EMS). Audits must be conducted by a JAS-ANZ (or equivalent) accredited certification body on a biannual basis. The compliance certificate issued by the auditor must provide written assurance of compliance to the guidelines and serves as the documentation needed to establish compliance with the credit via the EMS option; or 2) Product Declaration: Manufacturer or supplier product declaration that the producer-specific and product performance-specific criteria of the Best Practice Guidelines for PVC have been met for a specific product. The product declaration must be independently audited on a biannual basis by either an accredited auditor registered by RABQSA or another equivalent national or international auditor, or a JAS-ANZ (or equimalent) accredited certification body. A copy of the compliance certificate issued to the manufacturer/supplier by the auditor must be included in the Green Star submission along with a copy of the product declaration. These two items serve as the documenetation required to establish compliance with the credit via the Product Declaration option; or 3) Product Certification: Independent accreditation program(s) or product certification schemes that integrate the producer-specific and product perform,ance-specific criteria of the Guidelines into standare(s) or certification criteria (e.g. Type 5 ISO product certification, and eco labels). Independent accreditation programs and product certification schemes must compliance with Part I, Setion A – Governance and Transparency of the GBCA Assessment Framework for Product Certification Schemes. Evidence of independent accreditation of the product(s) (e.g. to an ISO Type 5 certification such as an Australian Standard or to a GBCA – recognised eco label) must be provided to Green Star project teams for inclusion in Green Star submissions and serves as the documentation needed to establish compliance with the credit via the Product Certification option.		
Mat - 8	**Timber**	Up to two points are awarded as follows: • One point where at least 95% (by cost) of all timber used in the building and construction works is certified by a forest certification scheme that meets the GBCA's 'Essential' criteria for forest certification (e.g. all schemes accredited by FSC International or PEFC); or is from a reused source; or is sourced from a combination of both.	**1**	**1**	**0**	**Structural designer/Architect:** - Design to meet 1 point requirement, 95% by cost of all timber is certified by a forest certification scheme - Stipulate in specification requiring that any certified timber used in the project is supplied in accordance with the Chain of Custody (CoC) rules of the respective forest certification scheme - Stipulate in specification requiring that contractor to obtain approval of the design team or client before substituting the timber listed in specification - Sourced from manufacturers with FSC certification - Provide description demonstrating how this requirement is met (for reuse of timber) and provide calculations (breakdown of all components by area, length and mass). Where the actual cost of the item is known then this cost must be reported. where the actual cost of re-used items is not known then the cost may be estimated on the basis of replacement cost (the cost of an equivalent new item). **Quantity surveyor:** - Provide summary report - Nominate all timber uses - Reference to specifications from Architect / Structural desinger for all timber uses in the project to demonstrate that at least 95% of all timber (by cost is either re-used or certified - Confirm total cost of timber in relation to the total project's contract value. The contract value is defined as teh dollar value required to complete the works for the entire project, including site works (landscaping, external paving, etc). Excludeing, Demolition works, consultants, design fees, project management fees, works outside the site area and buildings or areas within the site that are not being assessed for purposes of Green star. NOTE1: A current list of holders of the FSC chain-of-custody and management Certificate can be found on the following website: http://www.fsc-info.org/ NOTE2: The following applies to 95% of all formwork in a project for purposes of this credit: - New formwork must have Forest Stewardship Council certification. - Formwork that was new for this project that did not have Forest Stewardship Council certification, and was reused within this project cannot claim this credit. - Formwork that has been previously used in another project and has been used in this registered project can be deemed reused. NOTE3: For timber products to receive points within the Green Star 'Sustainable Timber' credit for the use of FSC certified timber, a full Chain of Custody (CoC) must exist through the supply chain to the project. That is, all FSC certified wood materials sourced by, and used on, the project must come from suppliers that have a valid FSC Chain of Custody certificate. For example, if a board manufacturer who has FSC certification sells the board to a contractor for installation on the building, full chain-of-custody exists to the project. However, if the board manufacturer provides product to the workstation manufacturer who doesn't have FSC certification, who then sells it to the project, then CoC is lost, and Green Star points can not be claimed. Entities that have been contracted/subcontracted to purchase, transform and/or install FSC certified wood specifically for the project do not need to be Chain on Custody holders themselves. Instead, these entities must prove (e.g. by providing invoices that include a current CoC code) that they have purchased the certified material directly from suppliers that have a valid Chain of Custody certificate.		
		• Two points* where at least 95% (by cost) of all timber used in the building and construction works is certified by a forest certification scheme that meets both the GBCA's 'Essential' and 'Significant' criteria for forest certification; or is from a reused source; or is sourced from a combination of both. * Only one point is currently available when claiming this credit. Further work is being undertaken on the 'Significant' criteria for forest management, against which forest certification schemes can be assessed to qualify certified timber for a second point in this credit. The second point will be N/A until the 'Significant Criteria' are implemented. A list of up-to-date GBCA recognised forest certification schemes can be found on the GBCA website at www.gbca.org.au. If the material cost of timber represents less than 0.1% of the project's total contract value then this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score.	**NA**	**NA**	**NA**		Architect Structural designer Quantity Surveyor	
Mat - 9	Design for Disassembly	One point is awarded where: - 50% (by area) of the structural framing, roofing, and façade cladding systems are designed for disassembly. OR - 95% of the total façade is designed for disassembly. If the material cost of the structural framing, roofing, and façade cladding systems represent less than 1% of the project's total contract value, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**0**	**0**	Point not claimed		
Mat - 10	Dematerialisation	One point is available where a substantial reduction in materials consumption occurs as follows: Where within projects where at least 50% of the GFA is framed in structural steel, and where it is demonstrated that the building's structural requirements and integrity have been achieved using 20% less steel (by mass) than in a structure with conventional steel framing, without changing the load path to other structural components. OR Where any two of the initiatives below are demonstrated: **Structure** Within projects where at least 50% of the GFA is framed in structural steel, and where it is demonstrated that the building's structural requirements and integrity have been achieved using 10% less steel (by mass) than in a structure with conventional steel framing, without changing the load path to other structural components. **Ductwork** The building is fully naturally ventilated; OR The requirement for ductwork has been reduced by 95%. **Building Efficiency** For new buildings, where it is demonstrated that Building Efficiency, defined as the ratio of the total NLA over the total GFA, is at least 85%. **Finishes** As-installed final design must require no finish. 95% of all base building floor material is exposed structure with no covering (e.g. exposed sealed concrete floor); OR 95% of all base building ceiling is exposed structure (and services, where relevant) with no cladding (e.g. exposed concrete ceiling). **Cladding** 25% of the roof cladding area has a dual function (e.g. roof garden substrate or photovoltaic shingles serve as cladding); OR 25% of the façade cladding area has a dual function (e.g. photovoltaic panels serve as cladding). **Piping** No piping is used for urinals (i.e. all urinals are waterfree); OR	**1**	**1**	**0**	**Aim for Building Efficiency & waterless urinal; Cap corp, Architect Hydraulic to advise** **Architect:** - At the moment achieve 85% NLA/GLA - Install water free urinals - Nominate in specification the relevant details for the point claim. **Hydraulic designer:** - Provide drain, irrigation to roof garden - Install water free urinals **Cost control:** - Estimate cost	Architect Cap Corp	**For Roof Garden:** Drainage $45/m2 Geotextile $20/m2 Soil 300mm $30/m2 Irrigation $15/m2 Plant material $40/m2 Mulch $8/m2 Softscape total $158/m2 (say $160/m2) Hardscape (decking or paving) approx. $250/m2 Trees and feature plants excluded Extra crane costs for delivery of materials to roof - allow 10%

		No piping is used for toilets (i.e. all toilets are waterfree); OR Mass of underground piping is reduced by 25% for the same functional requirement and material.							
			Total Points =	**15**	**11**	**1**			

LAND USE & ECOLOGY

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Eco -	Conditional Requirement	The Eco-Conditional Requirement is met where the project site is not: • On prime agricultural land; should the project site be on prime agricultural land then this project is not eligible for a Green Star certified rating; • On land containing old-growth forest; should the project site be on land containing old-growth forest then this project is not eligible for a Green Star certified rating; • Within 100 metres of a wetland listed as being of 'high ecological value'. Should the project site be within 100 metres of a wetland listed as being of 'high ecological value', then the project can only be deemed eligible for a Green Star certified rating if the project is defined as a 'refurbishment' and the Wetland Protection Measures (outlined below) have been completed; • Within 100 metres of a wetland NOT listed as being of high ecological value. Should the project site be within 100 metres of a wetland NOT listed as being of high ecological value, then the project can only be deemed eligible for a Green Star certified rating if the Wetland Protection Measures (outlined below) have been completed. Wetland Protection Measures • A site-specific Wetland Management Plan has been produced, exhibited and implemented; and • All points are achieved in Emi-5 'Watercourse Pollution' and in Emi-7 'Light Pollution'. The GBCA reserves the right to provide the final ruling on a project's compliance with this Conditional Requirement.						
Eco - 1	Topsoil	One point is awarded where: - All topsoil impacted by the construction works is separated and protected from degradation, erosion or mixing with fill or waste; - There is no net change in the volume of topsoil on the site; and - 95% of all topsoil (by volume) retains its productivity. Where no topsoil was impacted by the construction works, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Land Use & Ecology Category Score, type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**1**	**0**	**Architect / Cap Corp / Builder/Civil:** - Confirm existing topsoil quantity - Engage site surveyor - Provide topsoil storage on site, base on the outcome from survey; - Retain all topsoil - Provide report to descripte the scope and extent of the construction works, how they will affect existing topsoil, describe how the integrity of the site's topsoil will be protected throughout construction works - Provide description with calculation of the "before" and "after" conditions that account for all topsoil on the site, and clearly confirm that no more than 5% of the site's topsoil will be covered by hard surfaces as a consequence of the design, a minimum 95% of the topsoil will remain productive - Stipulate in contract the requirements of topsoil management that the contractor and sub-contractors must adhere to **Site surveyor:** - Quantify the amount of topsoil on site - Provide survey report, justify all assumptions **Cost control:** - Provide cost estimation **Builder/Contractor:** - Confirm no net change in volume of top soil - Provide top soil management to seperate and protect the top soil impacted by the construction works from degradation, erosion or mixing with fill or waste - Quantify the amount of topsoil covered by hard surfaces - Provide short report describing the process to retain the top soil during construction NOTE Topsoil is defined as the surface layer of soil containing partly decomprosed organic debris.	Architect Geotech Cap Corp Builder Surveyor Contractors	
Eco - 2	Reuse of Land	One point is awarded as follows: If the project is a refurbishment or a building extension; OR If at the time of the site purchase, 75% of the site had been previously built on.	**1**	**0**	**1**	**Greenstar classify stage 1 site is "Previously developed land"as carpark already exists;** **Potential to claim 1 point here. Required confirmation of the existing carpark/building area meet min. 75% of the overall site area.** **Arch** **- provide short report to describe the built area on the site at the time of purchase, and provide calculations of the proportion of the built area on the site**	Cap Corp Architect	
Eco - 3	Reclaimed Contaminated Land	Two points are awarded where: - The site was contaminated at the time of purchase; and - The developer has undertaken full remedial steps to decontaminate the site prior to construction. This credit is 'Not Applicable' for projects that are refurbishments or building extensions, and is excluded from the points available used to calculate the Land Use & Ecology Category Score; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.	**2**	**0**	**0**	Points not claimed		
Eco - 4	Change of Ecological Value	Up to four points are awarded where: - For Greenfield sites, the site has no threatened or vulnerable species and for reused sites (e.g. refurbishments), such species are adequately protected if present; - There is no net reduction of native vegetation; and - The ecological value of the site is either not diminished, or is enhanced beyond its previously existing state. The points are determined by the Green Star Change in Ecology Calculator on the basis of comparison between the 'before' and the 'after' ecological value of the site.	**4**	**1**	**1**	**Target minimum 2 points** **Cap Corp:** - Engage site surveyor to identify all land type on site **Site surveyor:** - Provide all existing green land type and building area on site - Fill in the attached Ecology Value Calculator and photograph site condition; **Architect / Landscape:** - Enhance green land (increase the number of plant, e.g. garden, grassland, lawn, etc) - Provide landscape plan clearly identify all proposed green land type, in accordance with the list in the Greenstar Ecology Value Calculator - Fill in the attached Ecology Value Calculator - Provide summary report to identify the conditions and time periods necessary for installed land types - Provide site report from the relevant authority identifying the site's bioregion and confirming or refuting the presence of endangered, threatened or vulnerable species on the site - Details any planting and any requirements necessary to ensure the landscape functions - if value species found on site, provide "Endangered species protection plan". Plan shall include: identifing the threatened or vulnerable species present on site, identifing the conditions necessary for the thriving of these species and outlines the plan for protecting the species **Green star consultant** - Points to be confirmed upon receiving details, potential to 1 or 2 points NOTE The existing state is defined as the state at the time of site purchase, please confirm if changes occurred throughout this period	Cap Corp Site surveyor Architect Landscape	**For Roof Garden:** Drainage $45/m2 Geotextile $20/m2 Soil 300mm $30/m2 Irrigation $15/m2 Plant material $40/m2 Mulch $8/m2 Softscape total $158/m2 (say $160/m2) Hardscape (decking or paving) approx. $250/m2 Trees and feature plants excluded Extra crane costs for delivery of materials to roof - allow 10%
			Total Points =	**8**	**2**	**2**			

EMISSIONS

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Emi - 1	Refrigerant ODP	One point is awarded where - All HVAC refrigerants have an Ozone Depletion Potential (ODP) of zero OR - No refrigerants are used.	**1**	**1**	**0**	**Mechanical designer:** - Use R134a or R410a refrigerant - Details in specification regarding HVAC system - Stipulate in specification to meet ODP requirement **Contractor:** - Confirming all equipments - Provide the mass and type of the refrigerant - Install AC units with zero ODP refrigerant - Provide report to describe the system - Provide full mechanical equipment details including VRV condensers	Mechanical designer Contractor	
Emi - 2	Refrigerant GWP	Up to two points are awarded as follows: - One point where 50% of the fluorocarbon refrigerant charge has been replaced with refrigerant(s) that have a Global Warming Potential (GWP) of 10 or less; and - Two points where all refrigerants have a GWP of 10 or less OR where no refrigerants are used at all.	**2**	**0**	**0**	**Comply only if design with absorption chiller with refrigerant ammonia, however on site generation plant will need to be installed, meaning co/tri-generation system** **Does not comply if use R410a/R134a refrigerant, Point to be confirmed**	Mechanical designer Contractor	
Emi - 3	Refrigerant Leaks	Up to two points are awarded as follows: One point is awarded where: - HVAC Systems containing refrigerants are contained in a moderately air tight enclosure; and - A refrigerant leak detection system is installed to cover high-risk parts of the plant.	**1**	**1**	**0**	**Mechanical designer:** - Install refrigerantion leakage detection system, interlock to BMS; - Details the refrigerant leak detection in specification **Contractors:** - Supply and install as required, interlock to BMS - Provide details explaining the correct operation of teh refrigerant leak detection and recovery system - Provide report to describe the system	Mechanical designer Contractor	
		An additional point is awarded where: - The point above is achieved; and - The project has installed a refrigerant recovery system that is: - Equipped with an automated pump-down system; and - Sized to effectively and safely capture, isolate, and store 95% (by weight) of the maximum refrigerant charge. Where the project is fully naturally ventilated or is fully mechanically assisted naturally ventilated OR if all points in Emi-1 'Refrigerant ODP' and Emi-2 'Refrigerant GWP' are achieved, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Emissions Category Score; type "NA" in the appropriate 'No. of Points Achieved' column of the rating tool.	**1**	**0**	**0**			
Emi - 4	Insulant ODP	One point is awarded where no ozone-depleting substances are associated with either the manufacture or the composition of all thermal insulants in the project.	**1**	**1**	**0**	**All services desingers / Architect:** - Use zero ODP insulant, insulation shall not contain Ozone Depleting substances or involve the use of such substances during its manufacture - Nominate all the insulation uses, provide summary table - Stipulate in specification that only the insulant with zero ODP emission shall be used - Provide short statement stating that there are no thermal or acoustic insulant in the building emit zero ODP **Contractors / Builder** - Insulation shall not contain Ozone Depleting substances or involve the use of such substances during its manufacture NOTE: Insulants included (but not limited to) - Chilled/Hot water pipework - Refrigerant pipework - Ductwork - Hot and cold water pipes - Water tanks - AHU - Building fabric insulation, e.g. wall, roof, floor, window frames, doors spandrel panels etc - Acoustic insulation	All services designer Architect Contractors	
Emi - 5	**Stormwater**	Up to three points are available. Points are awarded where the post-development peak 1.5 year Average Recurrence Interval (ARI) event discharge from the site does not exceed the pre-development peak 1.5 year ARI event discharge; AND • For one point, all stormwater discharged from site meets the Pollution Reduction Targets in Column A of Table Emi-5.1; • For two points, all stormwater discharged from site meets the Pollution Reduction Targets in Column B of Table Emi-5.1; • For three points, all stormwater discharged from site meets the Pollution Reduction Targets in Column C of Table Emi-5.1.	**3**	**3**	**0**	**Civil / Hydr to confirm eligibility and advise** e.g. Install oil and sediment arrester; Install sand filters, grassed swales; Install permeable paving materials, e.g. porous asphalt/concrete; Rainwater harvesting for toilet flushing/irrigation; Roof garden to retain water, however negative effect on structure; Vegetated filter strips to help remove pollutants from stormwater; TBC with Hydraulic designer NOTE: Install rainwater storage tank for harvesting, tank size and location to be confirmed by Hydraulic designer	Civil consultant Hydraulic consultant	
Emi - 6	Discharge to Sewer	Up to five points are available as follows: Up to four points are awarded where the building outflows to the sewerage system due to building occupants' usage have been reduced against an average-practice benchmark as follows: - One point for a 30% reduction; - Two points for a 50% reduction; - Three points for a 70% reduction; and - Four points for a 90% reduction.	**4**	**2**	**0**	**Aim at min. 2 points (benchmark 0.8 L/day/sqm discharge to sewer)** **Hydraulic designer/Architect:** - Confirm the number of toilet/showers/urinal etc, flush rate - Provide rainwater recycle; - Complete potable water & sewerage calculator - Details any water treatment plant/storage in specification; how it works and its treatment capacity compared with typical demand annually **Commissioning agent:** - Provide commissioning and report demonstrating system have been commissioned and operate as intended NOTE: Rainwater storage size and location to be confirmed by Hydraulic designer, might required earth removal	Hydraulic Contractor	
		An additional point is awarded where: - At least one point above was achieved; - There is a Blackwater Treatment Maintenance Plan; and - There is a maintenance contract for a minimum of five year to ensure that the blackwater treatment system operates as intended by the design. Where no blackwater treatment system is installed, the additional point is 'Not Applicable' and is excluded from the points available used to calculate the Emissions Category Score: type "NA" in the appropriate 'No. of Points Achieved' column of the rating tool.	**0**	**NA**	**0**			

Emi - 7	Light Pollution	One point is awarded where: - No light beam, generated from within the building or outside of the building boundary, is directed at any point in the sky hemisphere without falling directly onto a non-transparent surface; - The lighting design complies with AS4282 “Control of the Obtrusive Effects of Outdoor Lighting”; and - 95% of outdoor spaces do not exceed the minimum requirements of AS1158 for illuminance levels.	**1**	**1**	**0**	**Electrical designer:** - Design in accordance with AS4282 - Provide lighting/luminaire schedule nominating the type, location and quantity - Provide calculation plot for all external lighting, showing all grid points on the calculation plane return a direct illuminance reading of zero lux - Design to eliminate all direct light source to the sky; - Design in accordance to AS4282 - Provide report detailing the lighting system and how criteria is met; referencing photometric data and illumination diagrams for all external luminaires; demonstrating the external lighting has been designed in accordance with AS4282 - Details all relevant lighting and its requirements in specification **Contractor:** - Supply and install as intend - Provide statement to confirm all light fittings are installed at each corresponding area and operate as intended	Electrical designer Contractor	
Emi - 8	Legionella	One point is awarded where: • There are no water based heat rejection system(s) serving the building; OR • Water-based heat rejection system(s) meet all of the following: -Do not contain water that is kept at a temperature between 20ºC and 50ºC; -Do not release an aerosol spray during operation; -Are designed and built to maintain constant movement of the water in the system, when in operation, to prevent stagnation; -Are designed and built for routine and periodic flushing to remove bio-film buildup and stagnant water from the system(s) whenever it is not in operation; and -Are designed, located and built in accordance with AS/NZS 3666.1:2002; AND • A Legionella Risk Management plan has been prepared in accordance with AS/NZS 3666.2:2002 or AS/NZS 3666.3:2000 and has been included in the O&M manual provided to the building owner. This credit is applicable to all projects registered after December 18th, 2008. All projects registered prior to this date can choose to use this new credit in its entirety or	**1**	**0**	**0**	**Cooling tower on site, unlikely to claim point**	Mechanical designer Contractor	
		Total Points =	**15**	**9**	**0**			

INNOVATION

Ref No.	Title	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Action	Responsible	Cost
Inn-1	Innovative Strategies & Technologies	Up to two points can be awarded for an innovation initiative where: - The initiative is a technology or process that is considered a ‘first’ in Australia or in the World; OR - The project substantially contributes to the broader market transformation towards sustainable development in Australia or in the World. Points for this credit are allocated as: - One point is awarded when either of the above is true for the Australian market; and - Two points are awarded when either of the above is true for the Global market No individual initiative can achieve more than two points in this credit. Qualifying initiatives may achieve additional points in other Innovation credits, for the maximum of the five points available in total within the Innovation Category.	2	**0**		TBC		
Inn-2	Exceeding Green Star Benchmarks	Up to two points can be awarded for an innovation initiative where there has been a substantial improvement on an existing Green Star credit, as follows: - One point for a solution that results in the elimination of the specific negative environmental impact of the project targeted by an existing credit; and - Two points for a solution that results in a substantial (e.g. 5% or greater above ‘neutral’) restorative environmental impact targeted by an existing credit. No individual initiative can achieve more than two points in this credit. Qualifying initiatives may achieve additional points in other Innovation credits, for the maximum of the five points available in total within the Innovation Category.	2	**0**		TBC		
Inn-3	Environmental Design Initiatives	One point can be awarded where: - An initiative in the project viably addresses a valid environmental concern outside of the current scope of this Green Star tool. No individual initiative can achieve more than one point in this credit. Qualifying initiatives may achieve additional points in other Innovation credits, for the maximum of the five points available in total within the Innovation Category.	1	**0**		TBC		
		Total Points =	**5**	**0**	**0**			

Total weighted points:	**63**	**7**

Once certified this would equate to a Four Star rating.