COFFEY PROJECTS

PART 3A - ESD REPORT

CENTRAL COAST REGIONAL CANCER CENTRE

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1 EXECUTIVE SUMMARY

This report has been prepared by Steensen Varming, for the Part 3A Project Application submission, for the proposed Central Coast Regional Cancer Centre (CCRCC) at Gosford, located on the Central Coast of New South Wales.

This report presents a concise summary of the design decisions which have been made so far. This includes key ESD opportunities and initiatives that are likely to be implemented on the project. The proposed design will also address the ESD requirements noted in the Gosford City Council's Local Environmental Plan (LEP) and in the Director General's Requirements.

The project team is committed to achieve a minimum 4 star Green Star rating, using the Green Star Healthcare (version-1) Tool.

This report focuses on opportunities and strategies that are likely to be implemented in the building design that will result in:

- Reduced carbon emissions and environmental impact
- Improved Indoor Environmental Quality
- Reduced operating costs
- Reduced consumption of potable water
- Cost effectiveness over life cycles
- Efficient material usage

The project team is committed to achieve a sustainable high-performance building in order to minimise the environmental impact and achieve the optimal outcome for the community in Gosford. The primary design intent for the CCRCC is to achieve a building that contributes less to global warming, consumes fewer natural resources, and ensures the health, comfort and safety of its occupants.

At a minimum, the proposed cancer care centre's energy and water conservation standards would meet the requirements of NSW Health Technical Guidelines (TS-11 – Version 2: Engineering services & sustainable development guidelines) and would also meet the energy-efficiency provisions of Section-J of the Building Code of Australia (BCA) 2010.

As per TS-11, all NSW government projects with a budget greater than $10 million; shall undergo the Green Star rating process, using the Green Star Healthcare tool, so as to achieve a minimum 4 star rating. Hence, a key objective of the CCRCC is to design towards attaining a 4 star Green Star rating, as per the Green Star Healthcare Version-1 tool prepared by the Green Building Council of Australia (GBCA).

This report includes key strategies that are being targeted to drive the project towards attaining the target of 4 star Green Star rating.

2 INTRODUCTION

The greatest challenge for hospitals is to reduce their energy consumption, while maintaining their specific functional needs. Cancer care centres, by their nature are complex building types, as they consist of a wide range of functional and services requirements that place a high demand on energy and water.

To reduce the high energy and water demands, suitable and appropriate sustainable design initiatives have been considered and incorporated in the design of the CCRCC facility in order to achieve an environmentally sensitive and energy efficient building.

Proposed design includes sustainable design strategies such as day lighting, energy and water conservation techniques, use of non-toxic and environmentally sound materials and finishes.

Apart from Green Star, guidance has also been obtained from other international rating tools like BREEAM (UK), LEED (US) and Green Guide for Health Care (US). Suitable initiatives from these tools are currently being investigated and for including in the design.

Fundamental ESD aspects that have been considered in the proposed design include:

- Energy – Conservation and on-site generation
- Materials – Reuse, Recycle and possess low embodied energy
- Indoor environmental quality – Ventilation, day lighting and reduction of volatile organic compounds.
- Water – Saving and recycling
- Waste – Reduction of landfill

The details of the above aspects would be developed by the design team, in the next stages of design.

3 RELEVANT GOVERNMENT REGULATIONS & POLICIES

The NSW Government is committed to sustainable development and to advancing sustainable practices in the design, construction and operation of healthcare buildings.

Within New South Wales (NSW), the design of health care facilities is governed by many regulations and technical requirements. The proposed CCRCC project is required to respond to the following key regulations:

- Director General's Requirements (DGR's)
- Gosford Local environmental plan (LEP)
- NSW Health requirements (TS-11 – Version 2: Engineering services & sustainable development guidelines).
- Environmental Performance Guide for buildings (EPGB)
- NSW Government Sustainability Policy
- BCA Section-J

The requirements of each regulatory policy are stated in this section:

3.1 DIRECTOR GENERAL'S REQUIREMENTS (DGR)

The Director General Requirements (DGR's) for CCRCC, issued on 05.11.2010, (with reference to application no. MP 10_0173) will be addressed in the proposed design. The DG requirements include the following:

- Incorporation of ESD principles in the design, construction and ongoing operational phases of the development;
- Include measures that would minimise consumption of resources, water and energy, including details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design; and
- Achieving a minimum 4 Green Star rating.

3.2 GOSFORD LEP

The proposed CCRCC project also complies with the requirements of the Gosford City Centre Local Environmental Plan (LEP). The LEP states the following:

"Before granting consent for development, the consent authority must have regard to the principles of ecologically sustainable development as they relate to the proposed development based on a "whole of building" approach by considering each of the following:

- greenhouse gas reduction,
- embodied energy in materials and building processes,
- building design and orientation,
- passive solar design and day lighting,
- natural ventilation,
- energy efficiency and energy conservation,
- water conservation and water reuse,
- waste minimisation and recycling,
- reduction of car dependence,
- potential for adaptive reuse."

3.3 TS-11

NSW Health requires the incorporation of sustainable development principles and strategies to all health facilities. The main idea is to reduce the environmental impact of healthcare facilities, by reducing their dependency on non-renewable sources such as energy and water, and reducing pollutants and green house gas emissions.

The NSW Government and NSW Health developed the Engineering Services and Sustainable Development Guidelines Technical Series TS11. These Guidelines are intended as a handbook to be used during the project's briefing and design process.

We have identified the following issues and requirements from within TS-11, and have been considered as part of the proposed design for CCRCC:

- All projects greater than $10 million; the project shall undergo the Green Star rating process, using the Green Star Healthcare tool, so as to achieve a minimum 4 star rating.
- For all projects greater than $10 million, an independent commissioning agent shall be engaged to ensure minimum energy use by all services.
- Building design should improve upon the requirement of Section J of the Building Code of Australia. (at least 10% improvement)
- Design should incorporate passive design considerations to minimise energy use.
- The building form shall be optimised to minimise solar heat gain, maximise natural daylight benefits and optimum access to diffuse natural light and provide optimum HVAC outcomes.
- Water conservation and water cycle management are to be included in the design (rain water reuse, stormwater management, water recycling)
- Use of environmentally sound materials (with minimal impact on the environment, minimised impact on indoor air quality and high recycled/ recyclable content) are to be used wherever possible.
- The applicable environmental principles, performance areas, strategies and objectives described in the Environmental performance guide for buildings (EPGB) should be adopted. Environmental outcomes and performance reporting should be submitted by the consultants at the end of each design stage.

3.4 ENVIRONMENTAL PERFORMANCE REPORT

It is our understanding that the CCRCC needs to be assessed against the Environmental Performance Guide for Government Buildings (EPGB). As suggested in TS-11, this is a mandatory requirement for all NSW Government buildings, and the outcome of the assessment needs to be reported at each stage.

The Environmental Performance Guide for Buildings (EPGB) is a high environmental performance guide for NSW Government Buildings developed by the Policy Services Division of the NSW Department of Public Works and Services. It is structured through a framework of environmental performance categories, suggested strategies, and references to external guides.

It is mandatory regulatory requirement for all government buildings to provide an Environmental performance report (EPR) at the end of each design stage, in the form of an electronic Excel file, as stipulated in TS-11 reporting guidelines. This shall be undertaken using the template on the NSW Department of Public Services Web Site http://www.asset.gov.com.au ..

The purpose of the EPR is to demonstrate how the building and services would be designed in order to achieve the required environmental outcomes.

The EPR reporting consists of the following five categories:

- Resource consumption
- Environmental loadings
- Quality of indoor environment
- Functionality
- Wider planning issues

The environmental performance categories are all not of equal significance. The environmental weightings of each category are as noted below:

Resource Consumption	- 25%
Environmental Loadings	- 25%
Quality of Indoor Environment	- 20%
Functionality	- 10%
Wider Planning Issues	- 20%

Following criteria help in establishing the score for each of the credit points:

Points	Criteria
3	Strategies thoroughly considered and actions substantially incorporated in project - 75-100% EPGB strategies successfully included (min 3 out of 4)
2	Strategies considered and actions partly incorporated in project - 36-74% EPGB strategies successfully included
1	Strategies considered but unable to be incorporated in project - 0-35% EPGB strategies successfully included (max 1 out of 3)

3.5 NSW GOVERNMENT SUSTAINABILITY POLICY

The NSW Government Sustainability Policy outlines strategies and targets for the NSW Government to lead by example in sustainable water and energy use, reducing greenhouse gas emissions, waste and fleet management and sustainable purchasing. The Policy is an important step for the NSW Government to meet its commitment of becoming carbon neutral by 2020.

The NSW Government sustainability policy has established targets for the following categories:

- Greenhouse emissions from building energy use
- Water
- Environmental performance of buildings
- Cleaner government fleet
- Waste, recycling and purchasing

3.6 BCA SECTION-J

Section J of the Building Code of Australia (BCA) 2010 relates to energy efficiency of buildings. The objective of Section-J is to 'reduce greenhouse gas emissions by efficiently using energy'.

Minimum performance requirements have been developed in regards to building fabric gain, external glazing, building sealing, air movement, HVAC systems, lighting and power, hot water supply, access for maintenance and energy monitoring.

Section J is a minimum performance target for standard buildings. The CCRCC aims to be a high-performance sustainable building and will consider exceeding the deemed-to-satisfy requirements of Section-J.

4 SITE CHARACTERISTICS

The subject site is located on the western edge of the Gosford CBD, which is approximately 76km north of Sydney. We understand that the site contains existing hospital buildings, as well as a vehicle parking area. Therefore, consideration will be given to any external impacts (in terms of both acoustic and airborne emissions).

Fig 1: Location of proposed project

5 LOCAL CLIMATE

Climate-responsive design strategies have been adopted in the building design so as to suit the climate of Gosford. If we consider climate, there would be a significant impact on the energy use and occupant comfort levels.

The project team believe that if the building does not achieve comfortable conditions in a low-energy fashion, a significant fraction of building occupants will resort to measures such as local cooling or ventilating to create comfort despite the high energy use. The proposed design for CCRCC will target to avoid this situation of energy wastage, by incorporating climate-responsive design strategies.

To develop a climate-responsive design strategy, the long term climate averages for Gosford have been obtained from www.bom.gov.au

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Max. Temp	27.6	27.1	26.0	23.6	20.4	17.9	17.6	19.0	21.3	23.7	26.1	26.9
Mean Min. Temp	16.8	17.2	16.3	11.9	8.4	6.5	4.7	5.3	7.7	10.7	13.1	15.3
Mean Rainfall	133.1	153.7	148.6	136.8	118.4	128.5	79.0	72.9	67.6	84.9	91.7	102.8
Mean 9am RH	73	80	84	77	80	82	80	70	65	62	67	69
Mean 3pm RH	59	63	62	61	61	62	55	48	51	54	59	59
Mean 9am wind speed	7.7	6.6	6.1	6.3	6.2	6.7	6.6	8.2	9.5	10.0	9.2	8.2
Mean 3pm wind speed	12.3	11.1	10.5	8.8	7.1	6.7	7.6	9.6	11.5	11.0	11.9	12.4

6 KEY ESD OPPORTUNITIES

The design team has considered incorporating the following suitable ESD strategies into the integrated design process for the project. This development, while part of a larger health care facility, will be primarily a Radiation therapy unit.

In a cancer care centre, due to the nature of some of the spaces (eg: radiation bunkers, etc) and their associated functional requirements, opportunities for incorporation of passive strategies are limited to only certain functional areas. These will be implemented to the maximum possible extent.

Where feasible, the following strategies will be incorporated:

1. Design the building to maximise access to diffuse natural light and minimise solar heat gain.
2. Strategies to provide natural light to the core areas of the building will be investigated.
3. Incorporate passive design strategies (i.e. effective sun-shading and high-performance glazing) to improve the thermal performance of the building envelope, & minimise energy use.
4. Improve thermal insulation of the building envelope.
5. Material selection to focus on improving indoor air quality. (Materials with low VOC and low formaldehyde emissions will be preferred).
6. Environmentally sound materials would be used wherever possible.
7. Include water conservation strategies in the design.
8. Reduce water consumption by specifying low-flow fittings and fixtures.
9. Specification of efficient dual-flush valves for WC's.
10. Reduce potable water consumption for landscape irrigation.
11. Monitor and manage water consumption by installing sub-meters for major water uses in the project & also monitor leak detection.
12. Implement rain water capture and re-use.
13. Provide temporary storage for fire system test water.
14. Incorporate a central solar hot water system.
15. Incorporate photovoltaics as an opportunity to generate renewable-energy.
16. Incorporate electrical, gas and water sub-metering for monitoring usage.
17. Specification of efficient lamps and luminaires.
18. Incorporate efficient energy-saving medical equipment.
19. Provision of cyclist facilities. (Bike racks, showers and lockers), if considered appropriate
20. Provision of dedicated storage space for recycling waste, so as to reduce landfill. (need to confirm if there is any existing facility).
21. Specify refrigerants and insulants with zero ozone depleting potential (ODP).
22. Consider to implement commissioning of all systems to ensure efficient performance and minimum energy use.
23. Implement a comprehensive commissioning process in line with the CIBSE or ASHRAE commissioning requirements.
24. Obtain client's commitment to quarterly tuning of HVAC and lighting systems for the first 12 months of operation to ensure adequate and efficient operation. This will also include a final recommission after 12 months.
25. Engagement of an independent commissioning agent to manage commissioning process.
26. Provide a simple building user's guide.

7 SERVICES DESIGN PROPOSALS

7.1.1 Overview

Energy efficiency has been an integral part of all services design. In addition to the credits identified as part of the Green Star pre-assessment (noted in Appendix-A) the following additional initiatives are being targeted.

7.1.2 MECHANICAL SERVICES

Following mechanical services initiatives are being considered for this project:

- Energy efficiency will be an integral part of all mechanical services design.
- Provide advice to improve thermal performance of building envelope through effective sun shading, high performance glass and innovative construction details.
- High efficiency, low loss chillers, selected to give the optimum coefficient of performance.
- The proposed air handling system which will incorporate a Central Air Handling unit plant with localised Fan Coil Unit's (FCU's) for zone control.
- The use of variable speed drives on all appropriate fan and pump systems, coupled with high efficiency motors.
- Fan coil units shall be used to serve large intermittently occupied rooms such as meeting rooms such that they can be switched off when not in use.
- The use of high efficiency equipment such as chillers with environmentally friendly refrigerants such as R134a and R407c and high coefficients of performance.
- Outside air economy cycles on all appropriate air handling systems.
- A fully automated Building Monitoring and Control system to schedule and optimise plant to maximise efficiency.
- Carbon dioxide and VOC monitoring will be provided to ensure optimum quantity of outside air.
- Refrigerant leak detection system shall be provided, to identify refrigerant leaks that would cause environmental damage.

ELECTRICAL SERVICES:

Electrical services design, proposed by Steensen Varming will include the following:

- All sub-mains servicing distribution boards, mechanical boards and other major control cabinets shall be metered and be linked to the building management system (BMS) for energy auditing, energy monitoring and troubleshooting.
  Energy sub-metering will be in accordance with the requirements of BCA Section J-8, as well as Green Star requirements.
- Cross-Linked Polyethylene (XLPE) and Low Smoke Zero Halogen (LSZH) cables shall be used in the electrical distribution systems in place of traditional PVC type cabling.
- Motion sensors, timers and daylight sensors shall be used where appropriate to control the internal artificial lighting in the development to reduce energy usage. Lighting circuits shall be designed to provide high flexibility and not control large/multiple areas with one switch.
- The BMS will have the ability to control lighting circuits within the major corridors of the extension building to allow the hospital to switch off lighting that is not specifically required at any point in time.

- Efficient external lighting to meet or exceed the minimum requirements of AS 1158 for illuminance levels.
- The use of luminaries with high efficiency lamps and electronic control gear and high frequency ballasts
- The lighting system shall incorporate energy efficient lamps, use of luminaires with high light output ratios, and be coupled with lighting controls in selected common spaces to reduce energy consumption.
- External artificial lighting shall be designed to minimise light spillage and shall incorporate day light sensors.
- Emergency lighting within the hospital will make use of long life LED fittings.
- The lighting design would comply with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting', to minimise light pollution into the night sky.

HYDRAULIC SERVICES

Hydraulic services initiatives, included in the proposed design by hydraulics consultant SPP Group, include the following:

- Rainwater harvesting and Reuse - Rainwater will be collected from roof areas of the proposed building and collected into a rainwater tank. The rainwater will be treated and reuse for irrigation and toilet flushing purposes.
  Rainwater will be provided for 90% of landscape irrigation water requirements.
- Solar Hot Water - The proposed development will incorporate solar hot water plant with gas boost. Current design philosophies aim for a 50% contribution to hot water generation from the solar system.
- Water Efficient Fixtures and Tapware - All fixtures and tapware installed in the proposed building will confirm to the Water Efficiency Labelling Scheme (WELS), and will be within 1 star of the best available WELS rating.
- Metering – Meters will be provided for all major water uses. This includes: whole building, LINACS, Mechanical plant, hot water plant and other zones required to be sub-metered by the client.
- Reuse of fire-system test water – Discharge test water from Fire Hydrant and Fire sprinkler tests would be collected in the rain water tank.
- PVC minimisation – All drainage pipework would be installed in HDPE.

ARCHITECTURAL

- Maximise daylight availability in both perimeter and core areas. Rooflights will be incorporated, particularly along the bunker and waiting area. And internal glazed windows will be incorporated to maximise availability of borrowed light to core areas.
- The internal planning locates primary patient and open work spaces to the perimeter to maximise opportunities for natural light. Enclosed spaces have been located in the centre of the plan.
- Daylight glare control treatments have been incorporated. This includes use of external louvres.
- Incorporate efficient facade treatments which will provide shading and improve thermal performance.

- Provision of energy efficient glazing to improve thermal transmittance as required.
- The proposed design maximises access to external views, towards the east and south from the consulting rooms and waiting areas.
- There will be minimal removal of top soil.
- Landscape planting will be appropriate to site and climatic conditions.
- Environmentally preferrable materials will be utilised. This includes low VOC, low formaldehdye products and FSC certified timber products.

STRUCTURAL

The main ESD initiatives relevant to structural design, include the following:

Concrete

- Replacement of Ordinary Portland Cement (OPC) with supplementary cementitious materials & use of at least 20% slag aggregates will be incorporated.

Steel

- Use of high strength steel grades will be maximised.
- 60% or greater of the fabricated steelwork to be supplied by a steel fabricator accredited to the Environmental Sustainability Charter of the Australian Steel Institute. Speciifcations will include the requirement for the steel suppliers to be a member of the World steel Action Programme and to have an ISO14001 environmental management system.
- Preference will be given to steel produced using energy reducing processes in its manufacturer such as Polymer Injection Technology (Currently reinforcing steel is produced only by OneSteel & Bluescope).

8 GREEN STAR

8.1 OVERVIEW

Green Star is an environmental rating tool developed by the Green Building Council of Australia (GBCA) that has a holistic approach over a wide range of issues that address sustainability, from water to energy, materials to indoor environmental quality and also considers management practices. It is recommended that the tool be used right from the concept design stage in order to achieve the best possible outcome.

One of the clauses stated in NSW Health TS-11 (Ver 2.2) is for all project greater than $10m, the project shall undergo the Green Star rating process, using the Green Star PILOT Healthcare Tool and achieve a minimum 4 star rating. The GBCA has released the Healthcare Tool Version 1, in June, 2009. We have undertaken a pre-assessment using the version-1 tool, to identify the initiatives which need to be incorporated in order to achieve a rating of 4 Star.

The total environmental performance of the building is benchmarked by giving it a star rating from 1-6. Ratings below 3 Star are not officially recognised by GBCA. Only ratings of 4 Star and above are formally recognised and certified by the GBCA, since they represent better than average environmental credentials.

The rating tool consists of 9 categories, namely:

- Management
- IEQ
- Energy
- Transport
- Water
- Materials
- Land use & ecology
- Emissions and
- Innovation

The categories are weighted according to the importance of environmental issues and geographical location within Australia. For instance, potable water has a greater significance in South Australia than the Northern Territory, and therefore the Water category has a higher weighting in South Australia. The ninth category is Innovation and up to 5 points are set aside to reward projects that utilise 'innovative' technology or practices. The weighted points are added together to give an overall score which corresponds to the final Green Star rating, as follows:

Rating	*Total Weighted Points*
1 Star	10 - 19 pts
2 Star	20 - 29 pts
3 Star	30 - 44 pts
4 Star	**45 - 59 pts Best Practice**
5 Star	**60 - 74 pts Australian Excellence**
6 Star	**75+ pts World Leader**

8.2 GREEN STAR CREDIT CATEGORIES

As mentioned previously, the Green Star rating tools consist of nine categories and are defined in more detail in this section.

8.2.1 Management

The Management category promotes improving building services performance and associated environmental impact throughout its lifecycle. Points awarded relate to improved services performance and energy efficiency through commissioning and hand-over to the building maintenance personnel. Points are also awarded for documentation which will also assist in the optimum performance in the operation of the building.

8.2.2 Indoor environment quality

The IEQ credits address how the HVAC system, lighting and other building attributes contribute to a healthy indoor environment. Poor IEQ is the principal cause of sick building syndrome and according to scientific research can cost millions of dollars each year in lost productivity and health sector costs.

8.2.3 Energy

The aim of this section is to target overall reduction in energy consumption within the development with a view to reducing greenhouse gas emissions. The credits in this category have the potential to bring about substantial environmental savings through energy efficiency measures.
The design team should aim at greater efficiency of energy use, energy demand reduction methods and generation of energy from alternative sources in order to address the credit criteria under this category.

8.2.4 Transport

Private cars and motor vehicles directly affect global warming due to the high amounts of embodied energy as well as greenhouse emissions associated with their exhaust fumes. The credits under the transport category maximise alternative transport options in order to reduce environmental impact due to vehicles.

8.2.5 Water

The water category targets reduction of potable water consumption through the use of efficient fixtures and fittings. Since fresh water supply is scarce in Australia relevant measures should be adopted to ease the pressure on the water sources and also contribute to more efficient operation of building.

8.2.6 Materials

The environmental impact of materials is reduced by limiting the quantities of virgin building materials used in projects and choosing the least harmful when using virgin materials. The focus of this category is on the lifespan, lifecycle and approach towards use of materials.

8.2.7 Land use and ecology

This category aims at reducing environmental impact of the development and enhances the quality of local ecosystems.

8.2.8 Emissions

The credits under this category target emissions relating to watercourse pollution, light pollution, ozone depletion, global warming, legionella and sewage. Management approaches which effectively reduce building emissions and their impacts are rewarded under this category.

8.2.9 Innovation

This is an area to achieve additional points for ‘innovative’ design, strategies and technologies, exceeding Green Star Benchmarks and Environmental design Initiatives. The project should target at a minimum one key initiatives that it can “market” and be recognised for.

8.3 ELIGIBILITY CRITERIA

As a pre-requisite, for the CCRCC project to be eligible for Green Star assessment, projects must meet all four provisions of the Green Star Eligibility Criteria detailed below:
1. Space Use
2. Spatial Differentiation
3. Conditional Requirements
4. Timing of Certification

From a preliminary review, it is likely that the project will comply with the Green Star eligibility criteria.

ELIGIBILITY CRITERION 1: SPACE USE
Buildings primarily used for healthcare purposes are eligible for Green Star Healthcare, provided they have the following mix of GFA (measured to exclude internal car parks):

- A minimum of 80% of BCA Class 9a, 9c, 8 and 5 (BCA Classes 5 and 8 must be ancillary to the healthcare facility)
- A minimum of 50% of BCA Class 9a or 9c.

ELIGIBILITY CRITERION 2: SPATIAL DIFFERENTIATION
To meet the Spatial Differentiation criterion, the project must be clearly distinct. A Green Star rating must provide a meaningful result, and send a clear message to the marketplace, about a distinct project. Only distinct projects are eligible for assessment; project components are not eligible.

For assessment of building extensions, there are two options available:

- The building extension and the initial building are rated as one building under the relevant Green Star tool. OR
- The building extension is rated separately and will receive a Green Star "Building extension" rating if successful. (The rating will not relate to the primary building).

A project can qualify for assessment as a building extension if it meets all of the following criteria:

- The extension has full functional independence from the initial building;
- The extension has a distinct address or name, e.g. 'West Wing';
- The initial building's main function is not to service the extension;
- If the project scope includes work to the initial building, it only includes refurbishment or modification to the initial building's spaces/structures that support the extension. If the modifications affect primary spaces/structures in the initial building, the entire development will be deemed one building.

ELIGIBILITY CRITERION 3: CONDITIONAL REQUIREMENTS
Green Star Healthcare rating tool has two Conditional Requirements (maximum greenhouse gas emissions and protection of land with high ecological value). A project will not be eligible for a Green Star Certified Rating unless both the Conditional Requirements have been met.

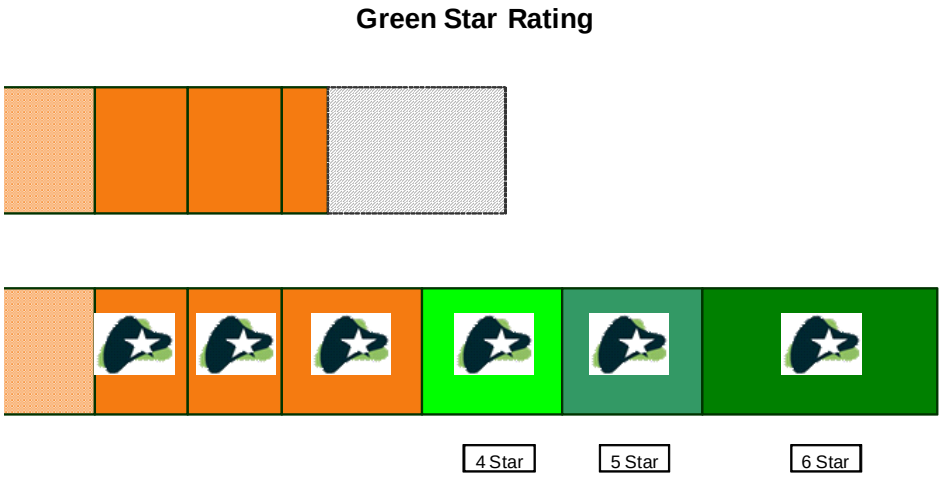
ELIGIBILITY CRITERION 4: TIMING OF CERTIFICATION
Green Star certification must be achieved within the applicable timeframe.

We understand that the CCRCC would target a 'design rating'. Submissions for a 'Design' Certified Rating will be lodged as soon as the required evidence is available. Submission will be made no later than 24 months after practical completion.

8.4 GREEN STAR PRE-ASSESSMENT SUMMARY

Preliminary assessment has been undertaken, for the proposed CCRCC project, using the Green Star Healthcare Version-1 tool.

A Green Star score of 35 points has been confirmed based on initiatives agreed to date. Another 19 points are noted as 'to be confirmed'. It is highly likely that these initiatives will be incorporated. Hence, the project has the potential to achieve a 4 star Green Star rating, provided all the initiatives get confirmed.



The above figure represents a graphical summary of the Green Star score as per credits that are so far confirmed. The grey bar represents the possibility to achieve a higher score of 4 Star Green Star, based on the adoption of all the credits which are yet to be confirmed, but are considered highly viable in the context of this project. Therefore it is evident that the project is definitely targeting a 4 Star Green Star rating.

Note: A green-star credit summary is included as Appendix-A of this report.

Green Star - Healthcare v1
Credit Summary
Central Coast Regional Cancer Centre

Green Star - Healthcare v1

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	1	1	0
	Independent Commissioning Agent	Man-4	1	1	0
	Building Guides	Man-5	1	1	0
	Environmental Management	Man-6	2	0	1
	Waste Management	Man-7	2	1	0
	Building Management Systems	Man-9	1	1	0
	Maintainability	Man-11	1	1	0
	Construction Indoor Air Quality Plan	Man-12	3	3	0
	Sustainable Procurement Guide	Man-13	1	1	0
		TOTAL	17	14	1
Indoor Environment Quality					
	Ventilation Rates	IEQ-1	4	0	0
	Air Change Effectiveness	IEQ-2	2	0	0
	CO2 Monitoring & Control and VOC Monitoring	IEQ-3	1	1	0
	Daylight	IEQ-4	3	2	0
	Thermal Comfort	IEQ-5	2	1	0
	Hazardous Materials	IEQ-6	1	0	1
	Internal Noise Levels	IEQ-7	1	1	0
	Volatile Organic Compounds	IEQ-8	5	5	0
	Formaldehyde Minimisation	IEQ-9	1	1	0
	Mould Prevention	IEQ-10	1	0	0
	Daylight Glare Control	IEQ-11	1	1	0
	High Frequency Ballasts	IEQ-12	1	1	0
	Electric Lighting Levels	IEQ-13	1	1	0
	External Views	IEQ-14	2	1	0
	Individual Thermal Comfort Control	IEQ-15	2	0	0
	Exhaust Riser	IEQ-16	1	0	1
	Air Distribution System	IEQ-17	1	1	0
	Outdoor Pollutant Control	IEQ-18	1	1	0
	Places of Respite	IEQ-19	1	0	1
		TOTAL	32	17	3
Energy					
	Conditional Requirement	Ene-Con	Conditional Requirement	Yes	/
	Greenhouse Gas Emissions	Ene-1	20	0	6
	Energy Sub-metering	Ene-2	1	1	0
	Peak Energy Demand Reduction	Ene-3	2	0	0
	Lighting Zoning	Ene-4	2	2	0
	Car Park Ventilation	Ene-6	0	na	0
	Efficient External Lighting	Ene-9	1	1	0
		TOTAL	26	4	6

Category	Title	Credit No.	Points Available	Points Achieved	Points to be Confirmed
Transport					
	Provision of Car Parking	Tra-1	2	0	2
	Fuel-Efficient Transport	Tra-2	1	0	1
	Cyclist Facilities	Tra-3	3	3	0
	Commuting Mass-Transport	Tra-4	5	0	2
	Transport Design and Planning	Tra-6	1	0	1
		TOTAL	12	3	6
Water					
	Occupant Amenity Water	Wat-1	5	0	4
	Water Meters	Wat-2	1	1	0
	Landscape Irrigation	Wat-3	2	2	0
	Heat Rejection Water	Wat-4	4	0	0
	Fire System Water	Wat-5	1	0	0
	Potable Water Use for Equipment	Wat-6	1	0	0
		TOTAL	14	3	4
Materials					
	Recycling Waste Storage	Mat-1	1	0	1
	Building Re-use	Mat-2	6	2	0
	Recycled Content & Re-used Products & Materials	Mat-3	2	0	0
	Concrete	Mat-4	3	1	0
	Steel	Mat-5	2	1	0
	PVC	Mat-6	2	2	0
	Timber	Mat-7	1	1	0
	Design for Disassembly	Mat-8	1	1	0
	Dematerialisation	Mat-9	1	0	1
	Flooring	Mat-11	3	0	2
	Joinery	Mat-12	1	0	1
	Loose Furniture	Mat-13	4	0	0
	Ceilings, Walls and Partitions	Mat-14	2	0	2
		TOTAL	29	8	7
Land Use & Ecology					
	Conditional Requirement	Eco-Con	Conditional Requirement	Yes	/
	Topsoil	Eco-1	1	1	0
	Re-use of Land	Eco-2	1	1	0
	Reclaimed Contaminated Land	Eco-3	0	na	0
	Change of Ecological Value	Eco-4	4	0	0
		TOTAL	6	2	0
Emissions					
	Refrigerant ODP	Emi-1	1	1	0
	Refrigerant GWP	Emi-2	2	0	0
	Refrigerant Leaks	Emi-3	2	2	0
	Insulant ODP	Emi-4	1	1	0
	Watercourse Pollution	Emi-5	2	#VALUE!	0
	Discharge to Sewer	Emi-6	5	0	1
	Light Pollution	Emi-7	1	1	0
	Legionella	Emi-8	1	0	0
	Trade Waste Pollution	Emi-9	1	0	0
		TOTAL	16	7	1
	Sub-total weighted points:			**35**	**19**
Innovation					
	Innovative Strategies and Technologies	Inn-1	2	0	0
	Exceeding Green Star Benchmarks	Inn-2	2	0	0
	Environmental Design Initiatives	Inn-3	1	0	0
		TOTAL	5	0	0
	Total weighted points:			**35**	**19**

9 APPENDIX-A

Following pre-assessment summary identifies the responsibilities within the project team to drive the relevant Green Star initiatives. Feedback received from the project team to date has been noted. The credits which they would capture have been indicated.

The risk associated with delivering the credit criteria has been noted (as low, medium or high). This is to indicate the complexity in achieving credit compliance.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Man-1	Green Star Accredited Professional	To encourage and recognise the engagement of professionals who can assist the project team with the integration of Green Star aims and processes throughout design and construction phases.	Two points are awarded where: • A principal participant in the design team is a Green Star Accredited Professional engaged to provide sustainability advice from the schematic design phase through to construction completion.	2	**2**			**Responsibility: Steensen Varming** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Steensen Varming are engaged to provide ESD advice for the project. & are Green Star accredited. However, the current scope of work does not include a formal certification process. **Benefit / Recommendation:** Green Star accredited professional would guide all members of the project team, and would co-ordinate the submission process. This would help achieve the desired rating.
Man-2	Commissioning Clauses	To encourage and recognise commissioning and handover initiatives that ensure that all building services can operate to optimal design potential.	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) and CIBSE Commissioning Codes for the other Services. • 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.	2	**2**			**Responsibility: Steensen Varming (Electrical / Mechanical) & Hydraulic consultants** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Credit requirements will be included in the services specifications. (Electrical, Mechanical and Hydraulic services). **Benefit/ Recommendation:** Commissioning is vital as it ensures that the services are commissioned as per the designer's intent.
Man-3	Building Tuning	To encourage and recognise commissioning initiatives that ensure optimum occupant comfort and energy efficient services performance throughout the year.	One point is awarded where it is demonstrated that: • 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 is provided to the building owner and made available to the design team.	1	**1**			**Responsibility: HI / Coffey** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Implementing 12 month building tuning, has bee nconfirmed by Coffey Projects. Credit requirements would be addressed by all services.(Electrical Mechanical and Hydraulic services). **Benefit/ Recommendation:** Tuning would verify whether or not systems are performing at their optimum efficiency. Thereby systems can be tuned to improve performance if necessary.
Man-4	Independent Commissioning Agent	To encourage and recognise the appointment of an Independent Commissioning Agent from project design through to handover.	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**			**Responsibility: HI / Coffey** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 As per TS-11, for all healthcare projects with a budget of more than $ 10Million, it is mandatory to appoint an independent commissioning agent. This has been confirmed by the project managers - Coffey.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Man-5	Building Guides	To encourage and recognise information management that enables building users to optimise the building's environmental performance.	One point is awarded where: • A simple and easy-to-use Building Users' Guide, which includes information relevant for the building users, patients and staff, is developed and made available to the building owner; and • A Building Maintenance Guide is developed, which provides detailed guidance on accessing and maintaining both the building's services and external building fabric. The guide is to be developed by the design team and made available to the Building Owner(s) or Manager.	1	**1**			**Responsibility: All** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 The project team recognises that it is beneficial to provide a "Building User Guide", in order to inform the staff about the environmental attributes of the building, in a simple easy-to-understand manner. Especially useful in hospitals, where there would be new staff joining in periodically. All design disciplines will contribute relevant information towards the Building Guide. **Benefit/ Recommendation:** A tenant guide would enable the users to maintain the building's environmental performance as per the initial design intent. This is highly beneficial for healthcare buildings, since there would be new staff joining periodically.
Man-6	Environmental Management	To encourage and recognise the adoption of a formal Environmental Management System or an Environmental Management Plan in line with established guidelines during construction.	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 3 of the NSW Environmental Management System guidelines 2007. • One point is awarded where it is demonstrated that: - The Contractor has valid ISO 14001 Environmental Management System (EMS) accreditation prior to and throughout the project.	2		**1**		**Responsibility: HI / Coffey** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 ISO Accreditation & implementing an Environmental Management Plan, have nowadays become more of a standard industry practice. If the client wishes to pursue this credit, the credit requirements will be addressed in the Tender Preliminaries. Yet to be confirmed at this stage. **Benefit/ Recommendation:** This credit would help minimise the adverse environmental impacts arising from construction activity such as pollution, construction waste, and water & energy usage. This would result in both economic and environmental benefit.
Man-7	Waste Management	To encourage and recognise management practices that minimise the amount of construction waste going to disposal.	Up to two points are awarded where: • The contractor implements a Waste Management Plan (WMP), retains waste records and submits quarterly reports to the building owner; and • A percentage (by mass) of all demolition and construction waste is re used or recycled as follows: - One point for 60% of the waste; and - Two points for 80% of waste.	2	**1**			**Responsibility: HI / COffey** **Delivery Risk: LOW** **Comments:** **Date:** Recycling or reuse of construction waste has become a standard practice nowadays. This credit would be pursued, as it reduces the amount of waste going to landfill. HI / Coffey twould target a minimum of 60%. **Benefit/ Recommendation:** Waste management will reduce amount of waste diverted to landfill. This is highly essentially for safeguarding the environment.
Man-8	Not applicable to this tool							
Man-9	Building Management Systems	To encourage and recognise the incorporation of Building Management Systems to actively control and maximise the effectiveness of building services.	One point is awarded where it is demonstrated that: • An electronic Building Management System (BMS) is integrated with the building to: - Monitor and report on energy and water consumption; and - Monitor and control building services systems.	1	**1**			**Responsibility: Steensen Varming** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 BMCS will be provided. **Benefit / Recommendation:** BMCS will provide an efficient means to monitor and control the services/ systems.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Man-10	Not applicable to this tool							
Man-11	Maintainability	To encourage and recognise building design that facilitates ongoing maintenance, and minimises the need for ongoing building maintenance throughout a building's lifecycle.	One point is awarded where it is demonstrated that: • The person responsible for maintenance, or a suitably qualified maintenance staff member, or a qualified facilities manager, has performed and submitted a design review at both the preliminary and final design stages. This review must consider the design with respect to access, ongoing maintenance and ongoing cleaning of the following: - Building services; and - External building features.	1	**1**			**Responsibility:** **HI** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 HI to review design at every stage.
Man-12	Construction Indoor Air Quality Plan	To encourage and recognise the reduction in indoor air quality problems arising from construction works, for the comfort and well being of construction workers and building occupants.	Up to three points are awarded as follows: • Two points are awarded where a Construction Indoor Air Quality (IAQ) Plan has been implemented during construction and pre-occupancy phases of a building. The IAQ plan must: - Meet or exceed the recommended control measures of the SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2008, Chapters 3 and 4 (Note: the following exception applies. Where the HVAC system is present during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8, or F4/G4, must be used at each return air grille); - Include infection control practices as found in the Australasian Health Facility Guidelines, Part D: Infection Prevention and Control, Section 900; - Protect HVAC systems to prevent contamination; - Reduce the capacity of building materials to absorb the emissions from significant sources of contaminants; - Include a requirement to replace all filtration media with F6/F7 (MERV 13) filters prior to occupancy: • An additional point is awarded where the IAQ plan includes a requirement for all ductwork to be clean in accordance with the NADCA ACR 2006 Standard prior to occupancy. If the building is naturally ventilated, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Management Category Score.	3	**3**			**Responsibility:** **Contractor** **Delivery Risk:** **MEDIUM** **Comments:** **Date: 21.10.2010** Contractor to prepare and implement plan. Steensen Varming will provide relevant advise, where necessary.
Man-13	Sustainable Procurement Guide	To encourage and recognise sustainable procurement strategies, which require energy and water efficiency to be considered, when selecting equipment.	One point is awarded where: • A Sustainable Procurement Guide has been developed for the healthcare facility, which provides guidance for the procurement of equipment; • The Guide is developed in accordance with the Australian Procurement and Construction Council's (2007a) 'Australian and New Zealand Government Framework for Sustainable Procurement'; • The building owner/user(s) is committed to the use of the Sustainable Procurement Guide for the initial and future procurement of equipment; • The Guide includes procurement guidelines for, at a minimum: - Electrical medical equipment; - Electrical laboratory equipment; - Clothes washers; and - Dishwashers. • The Guide identifies energy and water efficiency as key considerations in the selection of equipment.	1	**1**			**Responsibility:** **Delivery Risk:** **Comments:** **Date: 21.10.2010** Having a Sustainable Procurement Guide would enable the project team to procure the most energy-efficient equipment.
			Total Points =	**17**	**14**	**1**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-1	Ventilation Rates	To encourage and recognise designs that provide ample amounts of outside air to counteract build up of indoor pollutants.	Four points are available as follows: **Naturally Ventilated Spaces** Four points are awarded where it is demonstrated that 95% of the nominated area is naturally ventilated in accordance with AS1668.2-2002. **Mechanically Air-conditioned and Mechanically Assisted Naturally Ventilated Spaces** Up to four points are awarded where for 95% of the nominated area, outside air is provided at rates greater than the requirements of AS1668.2-1991, as follows: • Two points for 50% improvement; • Three points for 100% improvement; and • Four 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. For the purposes of this credit 'nominated area' is OFA.	4				**Responsibility:** **Steensen Varming** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010 Increased ventilation rates, would require increased mechanical loads. Will be investigated in later stages of design. **Benefit/ Recommendation:** Improvement in ventilation-rates should be targeted if feasible, since this would provide better access to fresh air which is particularly beneficial to healthcare facilities.
IEQ-2	Air Change Effectiveness	To encourage and recognise systems that effectively deliver optimum air quality to any occupant throughout the occupied area.	Two points are awarded where it is demonstrated that the Air Change Effectiveness (ACE) for at least 95% of the nominated area meets the following criteria: **Naturally Ventilated Spaces** • A distribution and laminar flow pattern for at least 95% of the nominated area 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 nominated area when measured in accordance with ASHRAE 129-1997: 'Measuring Air Change Effectiveness'; and • ACE is measured in the breathing zone.	2				**Responsibility:** **Steensen Varming** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010
			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; and • A distribution and laminar flow pattern for at least 95% of the nominated area of each space in the direction of air flow for 95% of hours of predicted natural ventilation operation is demonstrated. For the purposes of this credit 'nominated area' is OFA.					

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-3	CO_2 Monitoring & Control and VOC Monitoring	To encourage and recognise the provision of response monitoring of carbon dioxide and Volatile Organic Compound (VOC) levels to ensure delivery of optimum quantities of outside air and monitoring of VOC pollutants.	One point is awarded where it is demonstrated that: • A VOC monitoring system is provided that: - Is linked to the Building Management System; - Has a minimum of one sensor per return duct; - Facilitates continuous monitoring of VOC pollutants; and - Can detect and provide an alarm when VOC pollutants reach 0.5 mg/m^3 level. AND **Naturally Ventilated Spaces** • The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'; and • Ventilation rates are directly controlled by occupants. **Mechanically Air-Conditioned and Mechanically Assisted Naturally Ventilated Spaces** • 95 % of the nominated area has a carbon dioxide (CO2) monitoring and control system with a minimum of one CO2 sensor at all return points on each floor. The CO2 Monitoring & Control system is provided to facilitate continuous monitoring and adjustment of outside air ventilation rates to each level and to ensure independent control of ventilation rates to achieve outside air requirements; OR **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 mechanical ventilation criteria. For the purposes of this credit 'nominated area' is OFA.	1	**1**			**Responsibility: Steensen Varming** **Delivery Risk: MEDIUM** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance. **Benefit/ Recommendation:** CO2 levels indicate whether the ventilation is adequate or not. Since CO2 levels effect the quality of breathable air within the occupied space, this credit should be targeted inorder to ensure wellbeing of the patients and staff by monitoring and adjusting ventilation quality.
IEQ-4	Daylight	To encourage and recognise designs that provide good levels of daylight for building users.	Up to three points are awarded based on the percentage of nominated area that meets the daylight requirements as follows: • One point is awarded where 30% of the bedded patient areas achieve a measured Daylight Factor (DF) of 3% (or a Daylight Illuminance (DI) of at least 300 lux) AND, 30% of all other areas achieve a measured Daylight Factor (DF) of 2.5% (or a Daylight Illuminance (DI) of at least 250 lux); • Two points are awarded where 60% of the bedded patient areas achieve a measured Daylight Factor (DF) of 3% (or a Daylight Illuminance (DI) of at least 300 lux) AND, 60% of all other areas achieve a measured Daylight Factor (DF) of 2.5% (or a Daylight Illuminance (DI) of at least 250 lux); • Three points are awarded where 90% of the bedded patient areas achieve a measured Daylight Factor (DF) of 3% (or a Daylight Illuminance (DI) of at least 300 lux) AND, 90% of all other areas achieve a measured Daylight Factor (DF) of 2.5% (or a Daylight Illuminance (DI) of at least 250 lux); Measured Daylight Factors (DF) must be at finished floor level under a uniform design sky. For the purposes of this credit 'nominated area' is OFA (excluding rooms that, for functional reasons, require the exclusion of daylight).	3	**2**			**Responsibility: STH** **Delivery Risk: MEDIUM** **Comments:** **Date:** 21.10.2010 Generally, it is possible to achieve 30%. Higher % would be achieved via innovative daylighting techniques, to provide daylight to the core areas. **Benefit/ Recommendation:** Compliance with this credit should be targeted since daylight results in psychological, physiological and also environmental benefits.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-5	Thermal Comfort	To encourage and recognise buildings that achieve a high level of thermal comfort.	Up to two points are awarded where a high level of thermal comfort is achieved for all of the nominated area through any combination of the following: **Naturally Ventilated Spaces** Where naturally ventilated spaces achieve the Credit Criteria for IEQ-14 'Individual Comfort Control'; AND Where the Acceptability 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% of Acceptability Limit 1; • Two points for internal temperatures within 90% of Acceptability Limit 1. **Mechanically Air-Conditioned Spaces and Mixed Mode 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 values: • One point for PMV levels between -1 and +1, inclusive; and • Two points for PMV levels are between -0.5 and +0.5, inclusive.	2	**1**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Assume possible to achieve compliance.
			Mechanically Assisted Naturally Ventilated Spaces Where the mechanically assisted natural ventilation is provided with unconditioned air, but where the opening and closing of windows is the primary means of regulating thermal conditions, the project must show compliance with the Naturally Ventilated Spaces criteria for this credit. Where no operable windows exist in the space, the project must comply with the Mechanically Air-Conditioned Spaces criteria for this credit. For the purposes of this credit 'nominated area' is OFA. For the purposes of this credit, where the Green Star thermal comfort requirements conflict with health services regulations/codes, the health services regulations/codes shall take precedence.					
IEQ-6	Hazardous Materials	To encourage and recognise actions taken to reduce health risks to occupants from the presence of hazardous materials.	One point is awarded where: • A comprehensive hazardous materials 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-6.1. 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).	1		**1**		**Responsibility:** **HI / Coffey** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Assume it is possible to achieve compliance. A request has been put to obtain a Hazardous materials survey.
IEQ-7	Internal Noise Levels	To encourage and recognise buildings that are designed to maintain internal noise levels at an appropriate level.	One point is awarded where it is demonstrated that: • The internal noise levels from building services meets the recommended design sound levels provided in Table 1 of AS/NZS2107:2000 for 95% of the project's nominated area. For the purposes of this credit 'nominated area' is OFA.	1	**1**			**Responsibility:** **Acoustic Consultant** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Assume it is possible to achieve compliance. **Benefit/ Recommendation:** Achieving compliance for this credit criteria would help control noise from air-conditioning systems or plants.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-8	Volatile Organic Compounds	To encourage and recognise the use of interior finishes and products that minimise the levels of Volatile Organic Compounds present in buildings.	Up to five points are awarded as follows: **Paints** • One point where at least 95% of all internal painted surfaces meet the Total Volatile Organic Compound (TVOC) Content Limits outlined in Table IEQ-8.1 or where no paint is used in the project.	1	**1**			**Responsibility:** **STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Low VOC environment helps improve the indoor environmental quality. STH architects have confirmed that low VOC products will be specified. Nowadays, there are many low VOC products available, with no additional cost (as compared to standard products).
			Adhesives and sealants • One point where 95% of all adhesives and sealants meet the TVOC Content Limits outlined in Table IEQ-8.2 or where no adhesives or sealants are used.	1	**1**			
			Flooring • One point where 95% of all floor coverings meet the TVOC emissions limits outlined in Table IEQ 8.3 Where no floor coverings have been installed in the project, the flooring point is 'Not Applicable' and is excluded from the points available used to calculate the IEQ Category Score (type "na" in the 'No. of Points Achieved' column).	1	**1**			
			Wall and ceiling coverings • One point where at least 95% of all internal wall and ceiling coverings meet the TVOC Content Limits outlined in Table IEQ 8.4 or where no wall and ceiling coverings are used.	1	**1**			
			Mattresses • One point where 95% of all mattresses meet the GreenGuard emission criteria for bedding – GGPS.EC.003.RI. outlined in table IEQ-8.5 If there are no in-patient accommodation areas the mattresses point is 'Not Applicable' and is excluded from the points available used to calculate the IEQ Category Score (type "na" in the 'No. of Points Achieved' column).	1	**1**			
IEQ-9	Formaldehyde Minimisation	To encourage and recognise the specification of products with low formaldehyde emission levels.	One point is awarded where all engineered wood products (including exposed and concealed applications) either: • Have low formaldehyde emissions, see table IEQ-9.1; OR • Contain no formaldehyde. If no engineered wood products are used within the project, this credit is 'Not Applicable' and excluded from the total number of points available to calculate the IEQ Category Score (type "na" in the 'No. of Points Achieved' column).	1	**1**			**Responsibility:** **STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Credit requirements will be included in the relevant architectural specifications.
IEQ-10	Mould Prevention	To encourage and recognise the design of services that eliminate the risk of mould growth and its associated detrimental impact on occupant health.	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 Mechanically Assisted Naturally Ventilated (MANV); OR • The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'.	1				**Responsibility:** **Steensen Varming** **Delivery Risk:** **MEDIUM** **Comments:** **Date:** 21.10.2010 Compliance can be confirmed after the mechanical services design is developed.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-11	Daylight Glare Control	To encourage and recognise buildings that are designed to reduce the discomfort of glare from natural light.	One point is awarded where it is demonstrated that glare from daylight is reduced across the nominated area through any combination of the below: • Where, for each typical glazing configuration on each façade, fixed shading devices shade the nominated plane, 1.5m in from the centre of the glazing, from direct sun for 80% of nominated occupancy hours; OR • Where blinds or screens are fitted on all glazing and atriums as a base building provision and meet the following criteria: - Eliminate 95% of all direct sun penetration; - Can be controlled by all affected occupants within each floor or area; and - Have a visual light transmittance (VLT) of ≤10%. For the purposes of this credit 'nominated area' is OFA.	1	**1**			**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 External Shading devices / louvres will be provided to control daylight glare. **Benefit/ Recommendation:** Inclusion of glare control is essential for maintaining visual comfort of the users.
IEQ-12	High Frequency Ballasts	To encourage and recognise the increase in workplace amenity by avoiding low frequency flicker that may be associated with fluorescent lighting.	One point is awarded where: • High frequency ballasts are installed in fluorescent luminaires over a minimum of 95% of the nominated area. For the purposes of this credit 'nominated area' is OFA.	1	**1**			**Responsibility: Steensen Varming** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Steensen Varming's standard specifications complies with the Green Star criteria. **Benefit/ Recommendation:** For the building occupants, problems like eyestrain and headaches would arise due to flicker of fluorescent lighting. High frequency ballasts make this flicker totally indetectable, thereby eliminating health risk.
IEQ-13	Electric Lighting Levels	To encourage and recognise lighting that is not over-designed.	One point is awarded where it is demonstrated that: • The facility lighting design provides a maintenance illuminance of not greater than 25% above the minimum maintained illuminance levels recommended in Table F1 of AS 1680.2.5 for 95% of the nominated area as measured at the working plane (or as required by AS 1680.2.5). For the purposes of this credit 'nominated area' is OFA.	1	**1**			**Responsibility: Steensen Varming** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Steensen Varming's standard specifications complies with the Green Star criteria. **Benefit/ Recommendation:** Visual comfort is highly essential. Poor lighting would result in occupant discomfort and strain. This could be avoided by appropriate indoor electric lighting levels. Over specifying the lighting-levels will result in increased energy costs. Hence, this should be avoided.
IEQ-14	External Views	To encourage and recognise designs that provide occupants with a visual connection to the external environment.	Up to two points are awarded where it is demonstrated that a significant portion of the nominated area has a direct line of sight to the outdoors, or into an adequately sized and day lit atrium, as follows: • One point for 50% of the nominated area; and • Two points for 80% of the nominated area. For the purposes of this credit 'nominated area' is OFA (excluding corridors, transitional spaces and rooms that, for functional reasons, require the exclusion of sunlight).	2	**1**			**Responsibility: STH** **Delivery Risk: MEDIUM** **Comments:** **Date:** 21.10.2010 Views are maximised in the proposed design, towards east and south, from the consulting and waiting rooms. **Benefit/ Recommendation:** Visual problems can be significantly reduced if the occupants can periodically focus on a distant object. This would also provide a link to the outside environment, which would be beneficial to patients, and would enhance the rate of recovery.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-15	Individual Thermal Comfort Control	To encourage and recognise designs that facilitate individual control of thermal comfort.	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 of the occupied areas (workspace or bed), through any combination of the following: **Naturally Ventilated and Mechanically Assisted Naturally Ventilated (MANV) Spaces** Where the project is naturally ventilated as per IEQ-1 'Ventilation Rates' or mechanically assisted naturally ventilated and provides individual user control over ventilation openings, no less than 0.75m^2, for: • One point where openings are provided for every 30m^2 of the nominated area; and • Two points where openings are provided for every 15m^2 of the nominated area. **Mechanically Air-Conditioned Spaces** The base building HVAC system allows for individual user control of air supply rates, air temperature or radiant temperature within in patient accommodation rooms and to each workspace or individual office in administration areas as follows: • One point for 50% of in patient accommodation and administration areas; and • Two points for 80% of in patient accommodation and administration areas.	2				**Responsibility:** **Steensen Varming** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010
			Mixed-Mode Ventilated Spaces For mixed mode buildings, the above mechanical and natural ventilation thermal comfort criteria must be achieved. For the purposes of this credit 'nominated area' is OFA.					
IEQ-16	Exhaust Riser	To encourage and recognise buildings that safeguard occupant health, by reducing the levels of internal air pollutants from printing and photocopy equipment.	One point is awarded where all print/photocopy area(s) are exhausted to a dedicated exhaust riser with the following characteristics: • Complies with Section 5.7 of AS1668.2-2002; • Provides no less than 0.2L/s/m² for 100% of the nominated area; • Has a capacity of 0.35L/s/m² for 100% of the nominated area on any individual floor; and • The exhaust system is not recycled to other enclosures of different use. If there is no dedicated print/photocopy area(s) then this credit is 'Not Applicable' and is excluded from the points available used to calculate the IEQ Category Score (type "na" in the 'No. of Points Achieved' column). For the purposes of this credit, 'nominated area' is the print/photocopy area(s).	1		**1**		**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Can be provided to the centralised photocopying areas.
IEQ-17	Air Distribution System	To encourage and recognise the design and maintenance of air distribution systems that minimise the risk of particulate and microbial contamination to the internal air supply.	One point is awarded where it is demonstrated that: • All new and existing ductwork has adequate maintenance access provided to both sides of all moisture and debris generating components including cooling coils, heating coils, humidifiers and filters (see Figure IEQ-17.1); and • All new and existing ductwork is clean, or has been cleaned in accordance with the National Air Duct Cleaners Association ACR 2006 Standard; OR • The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'.	1	**1**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
IEQ-18	Outdoor Pollutant Control	To encourage and recognise designs that minimise the entry of outdoor air pollution into regularly occupied spaces to reduce the exposure of building occupants to outdoor air pollutants.	One point is awarded where it is demonstrated that the entry of outdoor pollutants through the ventilation system is minimised as follows: • Outdoor air intakes (including doors and windows used for natural ventilation) are located such that the shortest distance from the intake to any specific potential outdoor contaminant source is in accordance with ASHRAE Standard 62.1-2007, Section 5, Table 5 1; and • Outdoor air intakes are designed in accordance with ASHRAE Standard 62.1-2007, Section 5.6 (including all sub clauses).	1	**1**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance.
IEQ-19	Places of Respite	To encourage and recognise the provision of places of respite that allow for a physical connection to the natural environment.	One point is awarded where it is demonstrated that at least two designated places of respite with direct physical connection to the natural environment are provided in accordance with all of the following: • The combined area of all places of respite is equivalent to no less than 5% of the nominated area, with a minimum of 25m2 for each one; • Each place of respite is designed to be a universally accessible, well lit, well ventilated, non-smoking space and is located to avoid noise, odour and air pollution; • All staff have access to at least one place of respite which is designated as a 'staff only' area; • At least 75% of patients and all visitors have access to at least one place of respite; • A minimum of 30% of the area of the place of respite is soft landscaping; • Seating areas for both ambulatory and wheelchair users are provided, with a minimum of one seating space per 7.5m2 and one wheelchair space for every five seating spaces. • Where the place of respite is outdoors it must be shown that, in addition, the space: Is classified as having a noise exposure category of "A" or "B" as defined in the Draft Interim Sound and Vibration Design Guidelines for Hospital and Healthcare Facilities Table 1.3-1; Has shading to at least 50% of its area; and Is screened from prevailing winds that have a frequency equal to or greater than 10% annually • Where the place of respite is indoors it must be shown that, in addition, the space: Has a Daylight Factor (DF) of at least 3.5 or Daylight Illuminance (DI) of 350 lux; Is naturally ventilated (in accordance with IEQ-1 'Ventilation Rates'); or Is mechanically ventilated and outside air is provided at rates that are at least 50% greater than the requirements of AS1668.2-1991 for 95% of its area. For the purposes of this credit 'nominated area' is OFA.	1		**1**		**Responsibility:** **STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 To be further investigated.
			Total Points =	**32**	**17**	**3**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Ene-Con	Energy Conditional Requirement	To encourage and recognise designs that minimise the greenhouse gas emissions associated with operational energy consumption, and maximise potential operational energy efficiency of the building.	To meet the conditional requirement: The project's predicted greenhouse gas emissions must be equal to, or show an improvement over, the predicted greenhouse gas emissions of the 'benchmark building' as determined by the Green Star – Healthcare v1 Greenhouse Gas Emissions Calculator.		Yes			**Responsibility:** Steensen Varming **Delivery Risk:** HIGH **Comments:** **Date:** 21.10.2010 Energy modelling must be undertaken to confirm compliance. To achieve compliance, the building should achieve 10% reduction in energy consumption, as compared to a reference building. (Reference building is modelled as per BCA deemed-to-satisfy requirements). Achieving a 10% improvement in energy performance, over BCA requirements, is a mandatory requirement as per TS-11. Hence, this shall be targetted.
Ene-1	Greenhouse Gas Emissions	To encourage and recognise designs that minimise greenhouse gas emissions associated with operational energy consumption.	Up to twenty points are awarded where it is demonstrated that the building's predicted greenhouse gas emissions (GGE) have been further reduced below that of the 'benchmark building'. The number of points achieved is determined as follows: For every 5% reduction in predicted GHG Emissions, one point is awarded. Zero net operating emissions = 20 points. The predicted greenhouse gas emissions of the 'proposed building' and the 'benchmark building' must be calculated in accordance with the Green Star – Healthcare v1 Greenhouse Gas Emissions Calculator Guide.	20	0	**6**		**Responsibility:** Steensen Varming **Delivery Risk:** MEDIUM **Comments:** **Date:** 21.10.2010 Energy modelling must be undertaken to confirm compliance and to determine the score. Currently, the project is targetting 6 points. **Benefit/ Recommendation:** Compliance with this credit would ensure reduction in operational energy and associated green house emissions. This would result in both enironmental and economic benefits
Ene-2	Energy Sub-metering	To encourage and recognise the installation of energy sub metering to facilitate ongoing management of energy consumption.	One point is awarded where: • Sub-metering is provided to separately monitor lighting and general power consumption for primary functional areas (per floor) as defined in the Technical Manual, these areas include: - in-patient accommodation and operation theatres; - office/administration space; and - laboratories. Where a functional area is less than 200m2, they may be grouped with an adjacent functional area providing the total area being metered does not exceed 1000m2. The sub-meters must be connected to a Building Management System (BMS) or dedicated electronic energy monitoring and reporting system and continually demonstrate actual performance against energy benchmarks.	1	**1**			**Responsibility:** Steensen Varming **Delivery Risk:** LOW **Comments:** **Date:** 21.10.2010 Standard requirement as per BCA 2010. **Benefit/ Recommendation:** sub-metering of lighting and power would indicate their associated energy uses. This would help monitor excessive energy consumption.
Ene-3	Peak Energy Demand Reduction	To encourage and recognise designs that reduce peak demand on energy supply infrastructure.	Up to two points are awarded where it is demonstrated that the building has reduced its peak energy demand load on electricity infrastructure as follows: • One point where: - Peak energy demand is actively reduced by 15%; OR - A flatter demand curve is achieved, i.e. the difference between the peak and average demand does not exceed 40%; and • Two points where: - Peak energy demand is actively reduced by 30%; OR - A flatter demand curve is achieved, i.e. the difference between the peak and average demand does not exceed 20%.	2				**Responsibility:** Steensen Varming **Delivery Risk:** HIGH **Comments:** **Date:** 21.10.2010 Requires further investigation, once the design proceeds.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Ene-4	Lighting Zoning	To encourage and recognise lighting design practices that offer greater flexibility for light switching, making it easier to light only occupied areas.	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 nominated area; and - Switching is clearly labelled and easily accessible by building occupants. • An additional point is awarded where: - The point above is achieved; and - Automated lighting control system(s), such as occupant detection and daylight adjustment is (are) provided to 95% of the nominated area. The nominated area for the purposes of this credit is described in the Compliance Requirements.	2	**2**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance. **Benefit/ Recommendation:** Lighting zones equipped with controls for each zone, would help in reducing energy use and the costs associated. This would ensure user control and avoid energy wastage when unoccupied.
Ene-5	Not applicable to this tool							
Ene-6	Car Park Ventilation	To encourage and recognise designs that facilitate the reduction of energy consumption by car park ventilation.	Up to three points are awarded as follows: • One point is awarded where it is demonstrated that: - 25% of the total enclosed/semi-enclosed car park by area is naturally ventilated; OR - 50% of the total enclosed/semi-enclosed car park has either passive supply or passive exhaust. • Two points are awarded where it is demonstrated that: - 50% of the total enclosed/semi-enclosed car park by area is naturally ventilated; OR - 100% of the total enclosed/semi-enclosed car park has either passive supply or passive exhaust. • An additional point is awarded where it is demonstrated that: - The first two points have been awarded; and - The car park mechanical ventilation fans include variable speed drives controlled by carbon monoxide monitoring. OR • Three points are awarded where it is demonstrated that: - 100% of the total enclosed/semi-enclosed car park is entirely naturally ventilated. Where all of the car parking is single storey open-air, or where no car parking is provided, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Energy Category Score. (type "na" in the 'No. of Points Achieved' column).	0	**na**			**Responsibility:** **Steensen Varming / STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Where all parking is open-air parking, then the credit is not-applicable. Since the existing parking on-site is mostly open to air, it is assumed that it would be similar for the proposed development.
Ene-7	Not applicable to this tool							
Ene-8	Not applicable to this tool							
Ene-9	Efficient External Lighting	To encourage and recognise designs that facilitate the reduction in energy consumption by external lighting.	One point is awarded where all externally-lit spaces over the entire site meet the following criteria: • All external lighting has a light source efficacy of at least 65 lumens/watt; • 95% of outdoor spaces meet or exceed the minimum requirements of AS1158 for illuminance levels; and • 95% of all external lights are connected to daylight sensors (daylight sensors can be combined with a time switch). Emergency lighting required for BCA compliance is excluded from this credit.	1	**1**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance. Can be confirmed once the design proceeds.
			Total Points =	**26**	**4**	**6**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Tra-1	Provision of Car Parking	To encourage and recognise developments that limit the facilities provided for cars.	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 exceeding 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 'No. of Points Achieved' column).	2		**2**		**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 To be explored in more detail, by the architects in conjunction with the hospital management. **Benefit/ Recommendation:** Providing car parking less than the local planning allowances would encourage reliance on alternative modes of transport. This might even encourage staff to participate in car-pooling.
Tra-2	Fuel-Efficient Transport	To encourage and recognise developments that facilitate the use of fuel efficient vehicles.	One point is awarded where: • A minimum of 25% of the total parking spaces on the site are designed and labelled for small cars in accordance with AS/NZS 2890.1:2004 (i.e. maximum 2.3m wide x 5.0m long) and/or mopeds/motorbikes and/or car sharing programs, hybrid or other alternative fuel vehicles; • A minimum of 10% of the total parking spaces (rounded up) must be for small cars; and • A minimum of 80% of all spaces designated for use by car-pool participants, small cars, hybrid or other alternative fuel vehicles are preferred parking spaces (i.e. located near the entrance). 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 'No. of Points Achieved' column).	1		**1**		**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 To be explored in more detail, by the architects in consultation with the hospital management.
Tra-3	Cyclist Facilities	To encourage and recognise building design that promotes the use of bicycles by ensuring adequate cyclist facilities are provided.	Up to three points are awarded as follows: • One point is awarded where cyclist facilities are provided for 5% of building staff; • Two points are awarded where cyclist facilities are provided for 10% of building staff; • An additional point is awarded where: - The requirements for either one or two points have been met; and - Visitor/patient bicycle storage is in an accessible location that is within 50 metres of a major public entrance, and meets the following criteria: o facilities' with in patient accommodation: one space per 30 beds; o facilities' without in patient accommodation: one space per four practitioners; or o aged care facilities (Class 9c): one space per 60 beds. In every instance, a minimum of five bicycle parking spaces must be provided for visitors/patients.	3	**3**			**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Architects have noted that these can be provided at the hospital main-entry, or at the in-patient drop-off area. To be further explored by the architects, in consultation with the hospital management. **Benefit / Recommendation:** Cycling is an efficient alternative mode of transport. Provision of cyclist facilities would encourage staff to reduce their reliance on cars.
Tra-4	Commuting Mass-Transport	To encourage and recognise developments that facilitate the use of mass transport.	Up to five points are awarded for the quality of mass transport options available to building users. 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.	5	0	**2**		**Responsibility:** **Delivery Risk: MEDIUM** **Comments:** **Date:** 21.10.2010 Credit is related to the site location & the available public transport network. Likely to achieve 2 points.
Tra-5	Not applicable to this tool							
Tra-6	Transport Design and Planning	To encourage and recognise site design and planning that promote transport modes of low environmental impact.	One point is awarded where it is demonstrated that: • At least one dedicated pedestrian route is provided on and off the site; AND • A Travel Plan has been developed, that includes: - A site specific transport assessment; and - A report on sustainable transport initiatives.	1		**1**		**Responsibility: HI** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 A traffic study has been commissioned currently. Liekly to comply with the credit requirements. Otherwise necessary requirements would be addressed.
			Total Points =	**12**	**3**	**6**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Wat-1	Occupant Amenity Water	To encourage and recognise designs that reduce potable water consumption by building occupants.	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.	5	**0**	**4**		**Responsibility:** Hydraulic Services Consultant **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Efficient fixtures and fittings would be specified. (possibly within 1 star of the best available rating). & Rain water harvesting and re-use will also be implemented.
Wat-2	Water Meters	To encourage and recognise the design of systems that both monitor and manage water consumption.	One point is awarded where: • Water meters are installed for all major water uses in the project; and • There is an effective mechanism in place for monitoring water consumption data.	1	**1**			**Responsibility:** Hydraulic Services Consultant **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Sub-meters will be provided for all major uses. **Benefit / Recommendations:** Provision of water meters will enable monitoring of excessive water consumption & also detects any major leaks.
Wat-3	Landscape Irrigation	To encourage and recognise the design of systems that aim to reduce the consumption of potable water for landscape irrigation.	Two points are 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 'No. of Points Achieved' cell).	2	**2**			**Responsibility:** Hydraulic Services Consultant & Landscape Architects **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Rainwater harvesting will be incorporated. The water will be re-used to serve 90% of the landscaping requirements.
Wat-4	Heat Rejection Water	To encourage and recognise design that reduces potable water consumption from heat rejection systems.	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%. • 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. OR - The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'; OR - The building is Mechanically Assisted Naturally Ventilated (MANV).	4				**Responsibility: Steensen Varming** **Delivery Risk: MEDIUM** **Comments:** **Date:** 21.10.2010 To be confirmed once the mechanical services design proceeds. (A decision is yet to be made, on whether air-cooled or water-cooled equipment will be used).

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Wat-5	Fire System Water	To encourage and recognise building design which reduces consumption of potable water for the building's fire protection and essential water storage systems.	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 re-use on site; and • Each floor fitted with a sprinkler system has isolation valves or shut off points for floor by floor testing; OR One point is awarded where: • 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 'No. of Points Achieved' cell).	1				**Responsibility:** **Hydraulics Consultants** **Delivery Risk:** **MEDIUM** **Comments:** **Date:** 21.10.2010 Not possible to target this credit. Because the existing Fire Service pumps will not discharge into the new rainwater reuse tank. **Benefit / Recommendation:** There would be significant savings in potable water consumption, by recycling the fire-test water.
Wat-6	Potable Water Use for Equipment	To encourage and recognise designs that reduce demand on potable water consumption from medical and laboratory equipment cooling.	One point is awarded where it is demonstrated that: • 95% of the water requirement for once through cooling of medical and laboratory equipment is sourced from non-potable water; OR • 95% (measured by water use) of all water cooled medical and laboratory equipment uses cooling systems other than once through cooling systems. Where it can be demonstrated that there are no designated medical and laboratory areas, or no equipment requiring water based cooling present, the credit is deemed to be 'Not Applicable' and is excluded from the points available used to calculate the Water Category Score (type "na" in the 'No. of Points Achieved' cell).	1				**Responsibility:** **HI** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010 To be confirmed by HI, whether it is possible to achieve compliance.
			Total Points =	**14**	**3**	**4**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Mat-1	Recycling Waste Storage	To encourage and recognise the inclusion of storage space that facilitates the recycling of resources used within buildings to reduce waste going to landfill.	One point is awarded where a dedicated storage area for the separation and collection of recyclable waste is provided and it: • Is adequately sized to handle the recyclable waste streams specified in the Compliance Requirements; • Meets the access requirements of 'Policy for Waste Minimisation in New Developments' (Council of the City of Sydney, 2005): - Section A, points A-12 through A-17. • Is separate from, but adjacent to, general waste facilities; • Is located in the same level as the loading dock with a clearly marked, sign posted, convenient and guaranteed access route which allows: - Level access from tenancies (or goods lifts are provided); and - Avoids the need for manual handling of the waste; OR Is within one of the following walking distances: - 20m of the exit used for recycling pick-up; - 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.	1		**1**		**Responsibility:** **STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Architects have noted that it is possible to achieve compliance. However, this needs to be discussed and co-ordinated with the hospital management. **Benefit / Recommendation:** Encouraging recycling, will reduce the amount of operational waste going to landfill.
Mat-2	Building Re-use	To encourage and recognise developments that reuse existing buildings to minimise materials consumption.	Six points are available as follows: • Two points are awarded where it is demonstrated that at least 50% of the total façade of the building by area comprises re used building façade. • Up to four points are awarded where a proportion of the existing major structure, by gross building volume, is re used: - Two points for 30% re use; - Three points for 60% re use; - Four points for 90% re use. Where all buildings on the site were legally required to be demolished or 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 nominated area 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. The nominated area for the purpose of this credit is GFA.	6	**2**			**Responsibility:** **STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 STH have noted that the % reuse is likely to be around 40%.
Mat-3	Recycled Content & Re-used Products & Materials	To encourage and recognise designs that prolong the useful life of existing products and materials and encourage uptake of products with recycled content.	Up to two points are awarded where it is demonstrated that materials selected for base building construction or integrated fitout works have a post consumer recycled content of at least 50% as follows: • One point where recycled materials represent at least 1% of the project's total contract value; and • Two points where recycled materials represent at least 2% of the project's total contract value. This credit excludes materials specifically addressed by other credits (i.e. steel, concrete, PVC, timber, flooring, joinery, loose furniture, ceilings, walls and partitions) and does not address the re-use of the original building(s) on the site (addressed in Mat-2 'Building Re-use'). Post-industrial recycled content is also excluded.	2				**Responsibility:** **STH** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010 Architects to review credit criteria and confirm whether it is possible to achieve compliance. Yet to be confirmed.

Mat-4	Concrete	To encourage and recognise the reduction of embodied energy and resource depletion occurring through use of concrete.	Three points are available as follows: • Up to two points are available where the project has reduced the absolute quantity of Portland cement, as an average across all concrete mixes, by substituting it with industrial waste product(s) or oversized aggregate as follows: - For one point, 30% for in situ concrete, 20% for pre-cast concrete and 15% for stressed concrete; - For two points, 60% for in situ concrete, 40% for pre-cast concrete and 30% for stressed concrete. • An additional point is awarded where: - At least one of the above points is achieved; - 20% of all aggregate used for structural purposes is recycled (Class 1 RCA in accordance with HB155 2002) or slag aggregate; and - No natural aggregates are used in non-structural uses (e.g. building base course, sub-grade to any car parks and footpaths, backfilling to service trenches, kerb and gutter). If the material cost of new concrete 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 (type "na" in the 'No. of Points Achieved' column).	3	**1**			**Responsibility:** **Structural Consultant** **Delivery Risk:** **MEDIUM** **Comments:** **Date:** 21.10.2010 Structural consultant has confirmed that it is possible to achieve 1 point. The structural consultants intend to use cement replacement for much of the concrete.
Mat-5	Steel	To encourage environmentally responsible production, design and fabrication methods that result in efficient use of steel as a building material.	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.	2	**1**			**Responsibility:** **Structural Consultant** **Delivery Risk:** **MEDIUM** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance. (Currently targetting 1 point out of 2).
Mat-6	PVC	To reduce the environmental and health impacts of Polyvinyl Chloride (PVC) by encouraging the use of PVC material which adheres to best practice guidelines.	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**			**Responsibility:** **ALL** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance. Credit requirements will be addressed in the relevant specifications.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Mat-7	Timber	To recognise the use of reused timber, legally sourced timber, and timber sourced from forests whose conservation values are not degraded.	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**			**Responsibility:** **STH** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 All timber to be used will be FSC certified or equivalent. Credit requirements will be addressed in the relevant architectural specifications.
			• 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**		
Mat-8	Design for Disassembly	To encourage and recognise designs that minimise the embodied energy and resources associated with demolition.	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 'No. of Points Achieved' column).	1	**1**			**Responsibility:** **STH** **Delivery Risk:** **MEDIUM** **Comments:** **Date:** 21.10.2010 Structural steel framing and general light weight construction woul be used.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Mat-9	Dematerialisation	To encourage and recognise designs that require less material than conventional designs.	One point is available where a substantial reduction in materials consumption occurs as follows: • Where within projects at least 50% of the nominated area 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 nominated area 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%.	1				**Responsibility: STH** **Delivery Risk: MEDIUM** **Comments:** **Date:** 21.10.2010 To be confirmed.
			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). **Piping** - No water supply piping is used for flushing in urinals (i.e. all urinals are waterfree); OR - No water supply piping is used for flushing of toilets (i.e. all toilets are waterfree); OR - Mass of underground piping is reduced by 25% for the same functional requirement and material. **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). The nominated area for the purposes of this credit is GFA.			**1**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Mat-10	Not applicable to this tool							
Mat-11	Flooring	To encourage and recognise the selection of flooring that has a reduced environmental impact relative to available alternatives.	Up to three points are awarded where it is demonstrated that: • The flooring used in the project has a reduced environmental impact as determined by the following Assessment Categories in the Green Star Flooring Calculator: - Type of Flooring; - Eco Preferred Content; - Durability; - Environmental Management System (EMS); - Product Stewardship; - Modularity; and - Design for Disassembly.	3	**0**	**2**		**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 To be confirmed.
Mat-12	Joinery	To encourage and recognise the selection of joinery that has a reduced impact on the environment relative to available alternatives.	One point is awarded where it is demonstrated that: • The joinery used in the project has a reduced environmental impact as determined by the following Assessment Categories in the Green Star Joinery Calculator: - Type of Joinery; - Eco Preferred Content; - Modularity; and - Design for Disassembly.	1	**0**	**1**		**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 To be confirmed.
Mat-13	Loose Furniture	To encourage and recognise the selection of loose furniture that has a reduced environmental impact relative to available alternatives.	Up to four points are awarded where it is demonstrated that: • The loose furniture (defined as chairs, tables and storage only) used in the project have a reduced environmental impact as determined by the assessment categories in the Loose Furniture Calculator: - Type of Loose Furniture; - Eco Preferred Content; - Durability; - Environmental Management System (EMS); - Product Stewardship; and - Design for Disassembly.	4	**0**			**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 To be confirmed.
Mat-14	Ceilings, Walls and Partitions	To encourage and recognise the selection of ceilings, walls and partitions that have a reduced environmental impact.	Up to two points are awarded where it is demonstrated that: • The ceilings, walls and partitions used in the fitout have a reduced environmental impact as determined by the following assessment categories in the Green Star Ceilings, Walls and Partitions Calculator: - Type of Flooring; - Eco Preferred Content; - Durability; - Environmental Management System (EMS); - Product Stewardship; - Modularity; and - Design for Disassembly.	2	**0**	**2**		**Responsibility: STH** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 To be confirmed by architect.
			Total Points =	**29**	**8**	**7**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Eco-Con	Conditional Requirement	To encourage and recognise development on land that has limited ecological value and to discourage development on ecologically valuable sites.	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 100metres of a wetland listed as being of 'high ecological value'. Should the project site be within 100metres 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 (as outlined below) have been completed; • Within 100metres of a wetland NOT listed as being of high ecological value. Should the project site be within 100metres 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 (as 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.	Conditional Requirement	Yes			**Responsibility:** **HI** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010
Eco-1	Topsoil	To encourage and recognise construction practices that conserve the ecological integrity of 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. This credit is 'Not Applicable' and is excluded from the points available used to calculate the Land Use and Ecology Category Score where: • No topsoil was impacted by the construction works; • The project is a refurbishment; or • The topsoil on site is inherently non productive. (If Not Applicable, type "na" in the 'No. of Points Achieved' column.)	1	**1**			**Responsibility:** **STH** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010 Minimal soil to be removed. Hence, compliance will be achieved.
Eco-2	Re-use of Land	To encourage and recognise the re use of land that has previously been developed.	One point is awarded as follows: • If the project is a refurbishment; OR • A building extension, where the extension boundaries are within a site that was previously occupied by buildings; OR • If at the time of the site purchase, buildings have occupied a minimum of 75% of the site.	1	**1**			**Responsibility:** **HI** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Compliance is achieved, because the proposed development is within the existing hospital site.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Eco-3	Reclaimed Contaminated Land	To encourage and recognise developments that reclaim contaminated land that otherwise would not have been developed.	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 and Ecology Category Score (type "na" in the 'No. of Points Achieved' column).	0	**na**			**Responsibility:** **HI** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Credit does not apply to building extensions.
Eco-4	Change of Ecological Value	To encourage and recognise developments that maintain or enhance the ecological value of their sites.	Up to four points are awarded where: • For greenfield sites, the site has no threatened or vulnerable species and for re-used sites (e.g. refurbishments), such species are protected if present; • There is no net reduction of native vegetation cover; 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 'after' ecological value of the site.	4	**0**			**Responsibility:** **STH** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010
			Total Points =	**6**	**2**	**0**		

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Emi-1	Refrigerant ODP	To encourage and recognise the selection of refrigerants that do not contribute to long-term damage to the Earth's stratospheric ozone layer.	One point is awarded where: • All HVAC refrigerants have an Ozone Depleting Potential (ODP) of zero; OR • No refrigerants are used. OR • The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'; OR • The building is Mechanically Assisted Naturally Ventilated (MANV).	1	**1**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Credit criteria are included in Steensen Varming's Standard specifications. Possible to achieve compliance.
Emi-2	Refrigerant GWP	To encourage and recognise the selection of refrigerants that reduce the potential for increased global warming from the emission of refrigerants to the atmosphere.	Up to two points are awarded as follows: • One point where 50% of all HVAC refrigerant have a Global Warming Potential 100 (GWP100) of 10 or less; • Two points where: All refrigerants have a GWP100 of 10 or less; OR No refrigerants are used; OR - The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'; OR - The building is Mechanically Assisted Naturally Ventilated (MANV).	2				**Responsibility:** **Steensen Varming** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010 Generally, it is difficult to obtain suitable low GWP refrigerants, due to limited number.
Emi-3	Refrigerant Leaks	To encourage and recognise building systems design that minimises environmental damage from refrigerant leaks.	Up to two points are awarded as follows: • One point is awarded where: - HVAC Systems containing refrigerants are contained in a moderately airtight enclosure; and - A refrigerant leak detection system is installed to cover high risk parts of the plant. • An additional point is awarded where: - The point above is achieved; and - The project has installed a refrigerant recovery system that is: o equipped with an automated pump down system; and o sized to effectively and safely capture, isolate, and store 95% (by weight) of the maximum refrigerant charge. Where the project is naturally ventilated as per IEQ-1 'Ventilation Rates' OR 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 'No. of Points Achieved' column).	2	**2**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Emi-4	Insulant ODP	To encourage and recognise the selection of insulants that do not contribute to long term damage to the Earth's stratospheric ozone layer.	One point is awarded where all thermal insulants in the project avoid the use of ozone depleting substances in both its manufacture and composition.	1	**1**			**Responsibility: Steensen Varming / STH / Hydraulic Services consultant** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Credit criteria will be included in the relevant specifications.
Emi-5	Watercourse Pollution	To encourage and recognise developments that minimise stormwater run off to, and the pollution of, natural watercourses.	Up to three points are awarded as follows: • Two points are awarded where: - The development does not increase peak stormwater flows for rainfall events of up to a one in-two year storm; and - All stormwater leaving the site, at any time up to a one in twenty year storm event, is treated or filtered in accordance with either: o Urban Stormwater Best Practice Environmental Management Guidelines (CSIRO 1999); or o Australian and New Zealand Environment Conservation Council (ANZECC)'s Guidelines for Urban Stormwater Management. • An additional point is awarded where: - The points above are achieved; and - A Riparian Buffer Zone (RBZ) that has three separate zones of pollution buffering is installed within nine metres of a waterway or natural watercourse and the development.	2	**2**			**Responsibility: CIVIL engineer** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010
			Where the project site does not contain or is not immediately adjacent to a waterway, the additional point is 'Not Applicable' and is excluded from the points available used to calculate the Emissions Category Score (type "na" in the 'No. of Points Achieved' column).	0	**na**			
Emi-6	Discharge to Sewer	To encourage and recognise developments that minimise discharge to the municipal sewerage system.	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	**0**	**1**		**Responsibility: Hydraulic Services consultant** **Delivery Risk: LOW** **Comments:** **Date:** 21.10.2010 Hydraulic services consultants need to confirm whether compliance could be achieved.
			• An additional point is awarded where at least one point above was achieved through the use of a blackwater treatment facility; and At least one point above was achieved; and There is a Blackwater Treatment Maintenance Plan; and There is a maintenance contract for a minimum of five years 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.	1				

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Probable Order of Cost	Comments
Emi-7	Light Pollution	To encourage and recognise developments that minimise light pollution into the night sky.	One point is awarded where: • No external luminaire has an upward light output ratio that exceeds 5%; and • The lighting design complies with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting'.	1	**1**			**Responsibility:** **Steensen Varming** **Delivery Risk:** **LOW** **Comments:** **Date:** 21.10.2010 Possible to achieve compliance.
Emi-8	Legionella	To encourage and recognise building systems design that eliminates the risk of Legionnaires' disease (legionellosis).	One point is awarded where: • There is no water-based heat rejection system(s) serving the building; • Water-based heat rejection system(s) meets 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 build-up 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 Operations and Maintenance (O&M) manual provided to the building owner. OR • The building is 'Naturally Ventilated' as per IEQ-1 'Ventilation Rates'; OR • The building is Mechanically Assisted Naturally Ventilated (MANV).	1				**Responsibility:** **Steensen Varming** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010
Emi-9	Trade Waste Pollution	To encourage and recognise trade waste management systems that facilitate the downstream recycling of water.	One point is awarded where it is demonstrated that: • Effluent pre-treatment equipment is installed on-site; and • The installed pre-treatment equipment treats all effluent leaving the site to a standard which meets the acceptance criteria specified in Sections 2.1, 2.2 and 2.3 (excluding 2.2(d) and 2.2(h)) of the ACTEW Corporation's 'Trade Waste Acceptance Note TW1: General Acceptance Criteria for Liquid Waste' dated July, 2005.	1				**Responsibility:** **Hydraulic Services Consultant** **Delivery Risk:** **HIGH** **Comments:** **Date:** 21.10.2010 Not being targeted.
			Total Points =	**16**	**7**	**1**		