

AURORA PROJECTS

PART 3A ESD REPORT

GRAYTHWAITE REHABILITATION CENTRE

 **STEENSEN VARMING**

AUSTRALIA

DENMARK

IRELAND

UK

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TABLE OF CONTENTS

1	EXECUTIVE SUMMARY	4
2	INTRODUCTION	5
3	BRIEF REQUIREMENTS	6
3.1	GRAYTHWAITE REHABILITATION CENTRE PDP (FINAL VERSION-3)	6
3.2	DIRECTOR GENERAL'S REQUIREMENTS	7
4	REGULATORY REQUIREMENTS	7
4.1	TS-11	7
4.2	BCA SECTION-J	8
4.3	NSW GOVERNMENT SUSTAINABILITY POLICY	8
4.4	EPGB	8
5	ESD – DURING DIFFERENT PHASES OF PROJECT	10
5.1	DESIGN	10
5.2	CONSTRUCTION	11
5.3	OPERATION	12
6	SUSTAINABILITY CONTROL GROUP	12
7	VOLUNTARY ENVIRONMENTAL BENCHMARKING	13
7.1	GREEN STAR	13
7.2	ELIGIBILITY CRITERIA	15
7.3	EXTRA COSTS FOR 4 / 5 / 6 STAR	16
8	APPENDIX- A (GREEN STAR PRE-ASSESSMENT)	17

1 EXECUTIVE SUMMARY

This document has been prepared by Steensen Varming, for the proposed Graythwaite Rehabilitation Centre, at the Ryde Hospital, Sydney.

This report presents a concise summary of the environmentally sustainable design (ESD) decisions which have been made so far. This includes key ESD opportunities and initiatives that are likely to be implemented on the project.

The project team is committed to achieve the ESD targets noted in the Director General's Requirements (Date: 1.12.2010; Application No: MP10_0179) and a response to these DGR's is contained in this report, as part of the Part-3A submission.

The ESD approach for the proposed project 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 proposed design also addresses the sustainability targets noted in the Graythwaite Rehabilitation Centre – Project Definition Plan – Final Version-3 (Date:18.03.2010), prepared by Aurora Projects.

At a minimum, the proposed Graythwaite Rehabilitation Centre's energy and water conservation measures 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 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).

A preliminary Green Star assessment has been undertaken, and a Green Star score of 45 points has been confirmed based on initiatives agreed to date, provided the agreed initiatives are incorporated in the proposed design. Currently, the project is targeting 8 additional points that need to be confirmed. Together with these 8 points, the score comes to a total of 53 points. (this includes 8 buffer points, in addition to the 45 points required for 4 Star).

(Detailed assessment summary has been included as Appendix-A of this report).

2 INTRODUCTION

The proposed Graythwaite Rehabilitation centre is a specialised type of healthcare facility. We recognise that public buildings of this nature, generally have a significant impact on the environment. Hence, the project team would make every effort to create an environmentally sensitive and energy efficient building.

The greatest challenge for hospitals is to reduce their energy consumption, while maintaining their specific functional needs to enhance patient comfort. Healthcare facilities, 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 proposed Graythwaite rehabilitation centre.

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 minimisation – For reduction of landfill

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.

3 BRIEF REQUIREMENTS

Key brief requirements have been identified from the following documents.

3.1 GRAYTHWAITE REHABILITATION CENTRE PDP (FINAL VERSION-3)

The Graythwaite PDP suggests maximising natural light into the Centre and an outlook from patient bedrooms and therapy areas.

In addition, the PDP states that the project must be designed to meet the requirements of TS-11 and BCA Section-J.

The following requirements have been identified from TS-11, and have been considered as part of the proposed design:

- In conjunction with the functional requirements, the building form will incorporate passive design considerations to minimise the capacities and operation of engineering services, and to minimise energy use;
- The building's passive design and engineering services will complement each other, through an integrated design process involving all disciplines right from the beginning, to achieve the sustainable design outcomes for the whole building;
- The required sustainable design outcomes include thermal comfort, visual comfort and acoustic comfort for the building's users, as well as ensuring good indoor air quality;

4 REGULATORY REQUIREMENTS

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 healthcare facilities is governed by many regulations and technical requirements. The proposed Graythwaite Rehabilitation Centre is required to respond to the following key regulations:

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

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

4.1 DIRECTOR GENERAL'S REQUIREMENTS

The Director General's Requirements (MP10_0179) for the proposed project include the following:

- Detail how the development will incorporate ESD principles in the design, construction and ongoing operation phases of the development;
- Include a description of the measures that would be implemented to minimise consumption of resources, water and energy, including an Integrated Water Management Plan which details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design; and
- Demonstrate that the development can achieve a minimum 4 Green Star rating, or any other suitably accredited rating scheme.

4.2 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 the Graythwaite project:

- 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.

4.3 BCA SECTION-J

Section J of the Building Code of Australia (BCA) 2011 relates to “Energy-efficiency” of buildings. The objective of Section-J is to ‘reduce greenhouse gas emissions by efficiently using energy’.

The BCA stipulates minimum performance requirements for the thermal performance of the building fabric, external glazing, building sealing, air movement, HVAC systems, lighting and power, hot water supply, access for maintenance and energy monitoring.

Section J is a mandatory minimum-performance target for standard buildings. Since the proposed facility aims to be a high-performance sustainable building, we recommend that the project must consider exceeding the deemed-to-satisfy requirements of Section-J.

4.4 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

For hospital buildings, the NSW government sustainability policy suggests TS-11 requirements to be taken as a benchmark.

4.5 EPGB

It is our understanding that the proposed Graythwaite facility must 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)

5 ESD – DURING DIFFERENT PHASES OF PROJECT

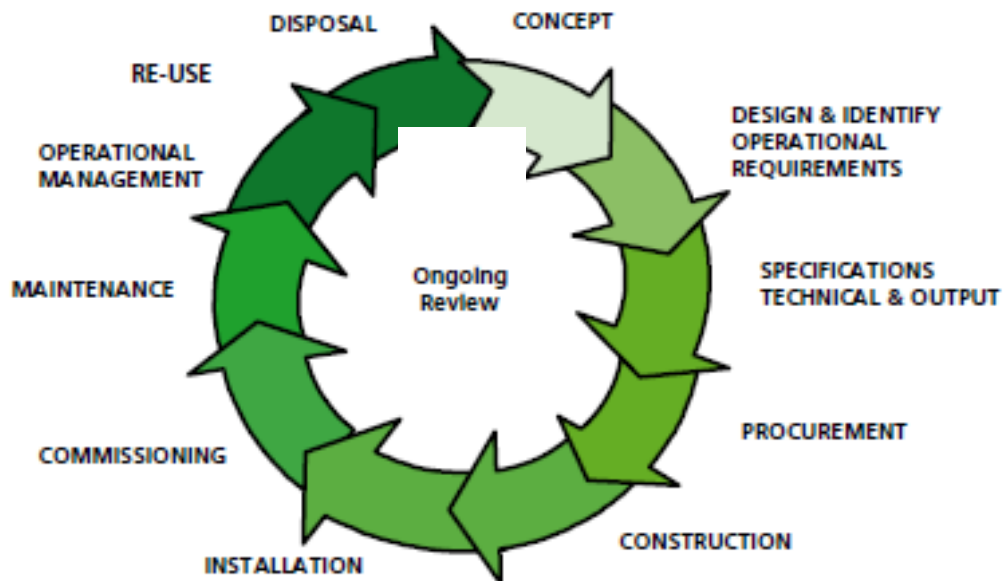


Fig: Healthcare Building Lifecycle

5.1 DESIGN

In New South Wales (NSW), the design of healthcare facilities is strongly impacted by building codes, and planning requirements, making it more challenging to justify energy efficiency goals.

Strategies implemented for the Design Phase of Graythwaite Centre include the following:

- Engage an ESD consultant to provide advice on sustainable design initiatives.
- Design for the provision of optimum air quality to occupants, and to counteract build-up of indoor pollutants.
- Provide monitoring systems to control CO₂ concentrations and Volatile Organic Compounds (VOC) in the air.
- Design for good daylighting, and provide access to external views.
- Provide external shading devices to control solar access and minimise issues of glare.
- Design artificial lighting to appropriate levels, and avoid over-lighting of spaces.
- Design for high level of thermal comfort.
- Designing with materials and internal finishes that minimise the levels of VOC and formaldehyde emissions within the spaces.
- Design building services systems that are not easily susceptible to mould growth that can harm occupant health.

- Design to minimise issues of noise, to reduce patient discomfort.
- Reduce contaminants in the air by providing dedicated exhausts for certain spaces (such as for photocopying areas).
- Design to reduce outdoor air pollutants to occupant spaces.
- Design places of respite for occupants to connect to the external environment.
- Design for a reduction in operational energy by;
 - Energy Sub-metering
 - Light Zoning
 - Naturally ventilating Carparks
 - Efficient external lighting
- Design for and encourage transport with low environmental impact.
- Implement water conservation strategies by installing water meters, reducing potable water consumption for landscaping, equipment cooling, and recycling of fire system test water.
- Reduce the Environmental Impact of new building materials by considering where possible; the re-use of building materials, specifying recycled concrete and steel, source timber from FSC or other certified suppliers, and minimise PVC use.
- Design to reduce the environmental impact associated with stormwater run-off and sewerage discharge.
- Design to minimise the risk of legionella from mechanical services systems.
- Design building systems to minimise refrigerant leaks, and select refrigerants that have low environmental impact.

5.2 CONSTRUCTION

During construction phase, the contractor is expected to ensure that the construction is executed in accordance with the design and specifications that have been documented by the design team.

For the construction phase, it is beneficial to implement the following:

- Reduce construction waste by implementing a Waste Management Plan (WMP).
- Encourage reuse or recycling of construction waste. (This requirement will be specified within the Tender preliminaries).
- Implement a site – specific Environmental Management Plan. Appoint a Contractor who holds a valid ISO 14001 accreditation prior to and throughout the construction.
- Maintain and conserve the ecological integrity of site by implementing good construction practices.

5.3 OPERATION

- Benchmarks / targets must be set for future monitoring and benchmarking.
- Implement ongoing monitoring to allow for optimization of building energy consumption.
- Purchase green power from an energy supplier.
- Provide area dedicated for the separation, storage and collection of recyclables (paper, plastics, mercury containing products & devices).
- Provide periodic staff training and provide information to occupants regarding the buildings environmental attributes and performance.
- Utilise a Building Management System (BMS) to maximise the effectiveness of building services.
- Encourage the use of non-potable water (ex: rainwater harvesting) whenever possible.

Key areas of concern during operation

The Graythwaite Rehabilitation centre should, at a minimum, focus on the following key areas:

- Ongoing monitoring of building performance (energy / water consumption and building out-flows, maintenance requirements)
- Waste Management (different streams of wastes – general waste, medical waste, chemical waste, electronic waste)
- Procurement (Electronic equipment, medical equipment, office stationery, cleaning chemicals)
- Training of occupants (updating the building user guide)
- Provision of a Learning Resource (To provide an interface to inform the occupants and visitors).

6 SUSTAINABILITY CONTROL GROUP

We recommend the hospital management / clients to have a Sustainability Control Group (SCG) or Green Team, within the organisation. This group should consist of director-level representatives, or other high-level staff members who have a decision-taking capacity.

The members of the SCG should identify relevant benchmarks. (This could either be in comparison with a previous project / past experience or from another industry example).

We recommend that staff-members of the following departments should serve on the green team:

- Environmental services (including key waste handlers and supervisors)
- Facilities managers
- Nursing and medical staff
- Infection control
- Purchasing/materials management
- Staff from key clinical departments
- Ad-hoc members, as needed.

7 VOLUNTARY ENVIRONMENTAL BENCHMARKING

7.1 GREEN STAR

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.

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:

<i>Rating</i>	<i>Total Weighted Points</i>
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

7.1.1 Green Star categories

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

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.

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.

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.

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.

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.

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.

Land use and ecology

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

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.

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.

7.2 ELIGIBILITY CRITERIA

As a pre-requisite, for the Graythwaite project to be eligible for Green Star assessment, the project 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

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.

The above criteria should be confirmed by the architects and the BCA consultant.

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.

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 Graythwaite project would initially target an equivalent rating, and not a certified rating.

7.2.1 Green star Environmental weightings – NSW

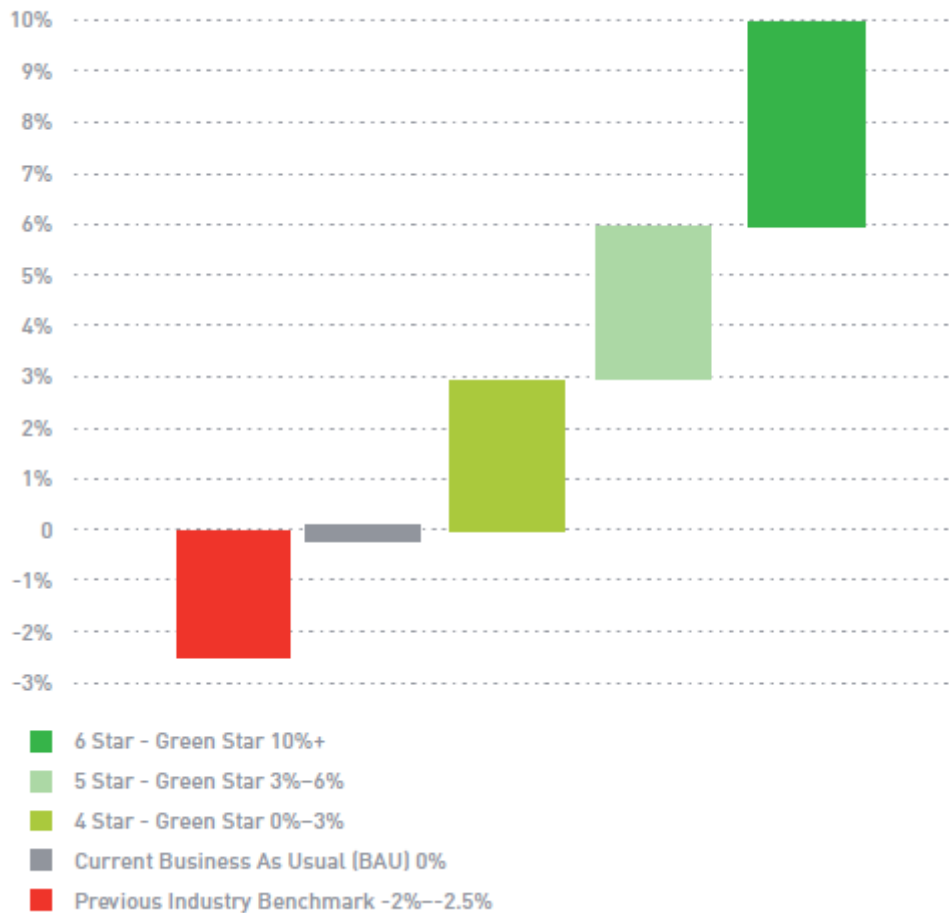
Category	No. of Points	NSW (%)
Management	17	9
Indoor Environmental Quality	32	20
Energy	28	24
Transport	12	7
Water	14	12
Materials	29	17
Ecology	8	8
Emissions	17	3
TOTAL	157	100 %

In addition to the above categories, points can be attained for “Innovation”.

7.3 EXTRA COSTS FOR 4 / 5 / 6 STAR

In order to achieve the Green Star targets, typically all projects would involve an additional over cost, which is above the normal budget. For Graythwaite project, a separate ESD allowance must be made within the project budget, to meet the Green Star requirements.

Capital Cost Impacts (%)



Reference – Davis Langdon Research

8 APPENDIX- A (GREEN STAR PRE-ASSESSMENT)

For the Graythwaite Rehabilitation Centre, one of the key Director General's Requirement is to attain a minimum of 4 Star Green Star rating. As a response to the DGR's, the design team would need to commit towards attaining a 4 Star Green Star rating.

It is also a mandatory requirement of TS-11, to achieve a minimum of 4 Star Green Star rating, for all hospital projects with a project cost of \$10 Million or above. Hence, the Graythwaite centre should attain a nominal Green Star rating of at least 4 Star (with a minimum score of 45).

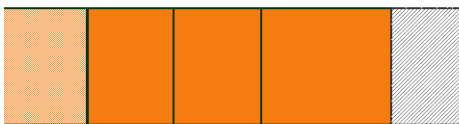
In this context, we have undertaken a pre-assessment of the proposed project, against the latest version of the Green Star Healthcare Tool - Version 1, released by the Green Building Council of Australia (GBCA).

Feedback has been received from the project team, and the credits which they would capture have been indicated. A Green Star score of 45 points has been confirmed based on initiatives agreed to date, provided the agreed initiatives are incorporated in the proposed design. Currently, the project is targeting 8 additional points that need to be confirmed. Together with these 8 points, the score comes to a total of 53 points. (this includes 8 buffer points, in addition to the 45 points required for 4 Star).

The pre-assessment summary is presented in the following format. It contains a credit summary that presents the compliance criteria associated with each of the Green Star initiatives, and identifies the responsibilities within the project team to drive these initiatives. The feedback received from each discipline is noted against the relevant credits.

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

Ref No.	Title	Aim of Credit	Credit Criteria	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	Comments
							HIGH / MEDIUM / LOW			Responsibility: Date: (Date of design response / comments).



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 predicted score, based on the credits that are yet to be confirmed.

GREEN STAR PRE-ASSESSMENT
GRAYTHWAITE REHABILITATION CENTRE – RYDE HOSPITAL

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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		Low	Yes	Nil	Responsibility: Steensen Varming Date: 16.05.2011 Steensen Varming: 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. SKM: Team members from SKM also possess Green Star accreditation.
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		Low	Yes	\$	Responsibility: SKM/ Steensen Varming / SPP Group Date: 16.05.2011 Steensen Varming: Credit requirements should be addressed in all the services specifications. (Electrical, Mechanical and Hydraulic services). Date: 18.05.2011 SKM: Not currently included in the Mechanical cost estimates. Date: 18.05.2011 Steensen Varming: Requirements will be addressed in the Electrical specifications.
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		Low	Yes	\$	Responsibility: Health Infrastructure / Aurora / SKM/ Steensen Varming / SPP Group Date: 16.05.2011 Steensen Varming: Implementing 12 month building tuning, should be confirmed by Health Infrastructure / Aurora Projects. If the credit is pursued, then the Credit requirements are required to be addressed in all services specifications.(Electrical Mechanical and Hydraulic services). Date: 18.05.2011 SKM: Not currently included in the Mechanical cost estimates. Date: 18.05.2011 Steensen Varming: Requirements will be addressed in the Electrical specifications.
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		Low	Yes		Responsibility: Aurora Projects / Health Infrastructure Date: 16.05.2011 Steensen Varming: As per TS-11, for all healthcare projects with a budget of more than \$ 10Million, it is mandatory to appoint an independent commissioning agent. Aurora / HI to confirm compliance. Date: 07.06.2011 Aurora Projects: 1 point agreed, Previous experience is that HI do not support the engagement of an ICA. However, as this is a requirements of TS - 11, it should remain in until instruction is received from HI that it is not proceeding.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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		Low	Yes		Responsibility: ALL Date: 16.05.2011 Steensen Varming: It is beneficial to provide a "Building User Guide", in order to inform the staff about the environmental attributes of the proposed hospital building, in a simple easy-to-understand manner. Steensen Varming can prepare a Template for the Building User Guide. And all team members are expected to contribute information relevant to their design discipline, towards the Building Guide. Date: 18.05.2011 SKM: Agree to contribute towards the Building User Guide.
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	2		Low	Yes		Responsibility: Aurora Projects / Health Infrastructure Date: 16.05.2011 Steensen Varming: ISO Accreditation and Environmental Management Plans, are nowadays a common industry practice. If the client wishes to pursue this credit, the credit requirements will need to be addressed in the Tender Preliminaries. Date: 07.05.2011 Aurora Projects: 2 points agreed, majority of T1/T2 Contractors are ISO 14001 certified.
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	2		Low	Yes		Responsibility: Aurora Projects / Health Infrastructure Date: 16.05.2011 Steensen Varming: HI / Aurora to set the target for waste recycling / construction waste management. Credit requirements will need to be addressed in the Tender Preliminaries. Date: 07.06.2011 Aurora Projects: 2 points should be targeted in lieu of 1, 80% + recycling of waste is common practice.
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		Low	Yes		Responsibility: SKM/ Steensen Varming / SPP Group Date: 16.05.2011 Steensen Varming: BMCS will provide an efficient means to monitor and control the services/ systems. Date: 18.05.2011 SKM: Compliance will be achieved.
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		Low	Yes		Responsibility: Aurora Projects / Health Infrastructure Date: 16.05.2011 Steensen Varming: HI should confirm whether a suitably qualified staff member from HI would review the design at every stage. Date: 07.06.2011 Aurora Projects: point agreed, design reviews to be facilitated by Nettleton Tribe. We have previously completed Maintainability reviews and can provide an agenda.

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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		Low	Yes		Responsibility: SKM / Mechanical Contractor Date: 16.05.2011 Steensen Varming: Contractor to prepare and implement plan. SKM will provide relevant advise, where necessary. Date: 18.05.2011 SKM: The requirements will be provided in the Mechanical Specification. Not currently allowed in the mechanical cost estimate.
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	0		Low	Yes		Responsibility: Aurora Projects / Health Infrastructure Date: 16.05.2011 Steensen Varming: Having a Sustainable Procurement Guide would enable the project team to procure the most energy-efficient and water-efficient equipment. Aurora / HI to confirm whether this credit would be pursued. Date: 07.06.2011 Aurora Projects: 0 points in lieu of 1 point.
Total Points =				17	16					

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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	0		High	N		Responsibility: SKM Date: 16.05.2011 Steensen Varming: 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. SKM to confirm whether it is feasible or not. Date: 18.05.2011 SKM: Currently all ventilation rates are based on AS 1668. There is an energy penalty for targeting higher flow rates.
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. 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.	2	0		High	N		Responsibility: SKM Date: 18.05.2011 SKM: Credit cannot be targeted.

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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/m³ 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 - HVAC systems provide 100% outside air with no recirculated component. Mixed-Mode Ventilated Spaces Both modes of operation must satisfy the relevant mechanical and natural ventilation criteria. The points awarded will be limited to the maximum points awarded under the mechanical ventilation criteria. For the purposes of this credit 'nominated area' is OFA.	1		1	Medium	N	\$	Responsibility: SKM Date: 16.05.2011 Steensen Varming: 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. Date: 18.05.2011 SKM: CO₂ monitoring can be easily achieved, but it is not currently included. There will be a cost uplift to provide this.
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	1		Medium	Yes		Responsibility: Nettleton Tribe / Steensen Varming Date: 16.05.2011 Compliance with this credit should be targeted since daylight results in psychological, physiological and also environmental benefits. Based on a review of the current architectural drawings, the project is expected to achieve required daylight levels for at least 30% of the bedded patient areas.

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. 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.	2		1	Medium	TBC		Responsibility: SKM Date: 16.05.2011 Steensen Varming: SKM to confirm whether it is possible to achieve compliance. Date:18.05.2011 SKM: The preferred scheme is to provide VAV cooling to all spaces, without individual control. PMV can be calculated by hand. However, to determine accurately, CFD modelling may be required. Steensen Varming to advise evidence requirements, as modelling and calculations are not included in our current scope of works.
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		Low			Responsibility: Aurora Projects / Health Infrastructure Date: 16.05.2011 Steensen Varming: Possible to achieve compliance. HI to confirm whether a Hazardous Materials Survey would be undertaken for the proposed site.
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		Low			Responsibility: Acoustic Consultant Date: 16.05.2011 Steensen Varming: Achieving compliance with these credit criteria, would assist in controlling noise from air-conditioning systems or plants.

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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		Low			Responsibility: Nettleton Tribe / SKM / SPP / Steensen Varming Date: 16.05.2011 Steensen Varming: Low VOC environment helps improve the indoor environmental quality. Low VOC products must be specified in all architectural and services specifications. 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		Low			Date: 20.05.2011 Nettleton Tribe: Low VOC products will be specified for the project.
			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		Low			
			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		Low			
			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		Low			Responsibility: Health Infrastructure / Aurora Projects Date: Credit requirements should be addressed in the FF&E schedules and specifications. Date: 07.06.2011 Aurora Projects: Mattresses: 1 point agreed, we will confirm with Medicaft Hill Rom if this product is available.
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		Low			Responsibility: Nettleton Tribe Date: 20.05.2011 Nettleton Tribe: Low formaldehyde products will be specified in the 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	1		Low	Y		Responsibility: SKM Date: 18.05.2011 SKM: Credit compliance will be achieved.

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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		Low			Responsibility: Nettleton Tribe Date: 20.05.2011 Nettleton Tribe: Project employs external vertical blade sun louvers to west L1 & L2 between Grids A - D; Glazing along west between Grids D - G shaded by existing landscaping (mature trees near boundary refer plans). Internal blinds or curtains throughout project also to be employed.
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		Low			Responsibility: Steensen Varming Date: 18.05.2011 Steensen Varming's standard Electrical specifications complies with the Green Star criteria.
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		Low			Responsibility: Steensen Varming Date: 18.05.2011 Steensen Varming's standard Electrical specifications complies with the Green Star criteria.
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		Medium			Responsibility: Nettleton Tribe Date: 16.05.2011 Steensen Varming: The proposed design provides adequate external views via the North and South terraces. Date: 20.05.2011 Steensen Varming: From a review of the architectural drawings, it is identified that the project is likely to achieve 1 point.

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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 0.75m², for: - One point where openings are provided for every 30m² of the nominated area; and - Two points where openings are provided for every 15m² 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. 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.	2	0		High			Responsibility: SKM Date: 16.05.2011 SKM: Credit is not targeted.
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	High	N		Responsibility: SKM Date: 16.05.2011 Steensen Varming: Architects to confirm if there would be any dedicated photocopying area. SKM to confirm whether this area can be served by a dedicated exhaust riser. Date: 18.05.2011 SKM: Not currently included, but could be incorporated with additional riser space and fan. Spatial provision does not currently include a dedicated riser.

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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		Low	Yes		Responsibility: SKM Date: 18.05.2011 SKM: Compliance will be achieved.
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		Low	Yes		Responsibility: SKM Date: 18.05.2011 SKM: Compliance will be achieved. However, SKM will not be providing ASHRAE 62.1 calculations as evidence.
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 25m ² 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 7.5m ² 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; • 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		Low			Responsibility: Nettleton Tribe Date: 16.05.2011 Steensen Varming: The North and South terraces can be considered as Places of respite, provided these areas satisfy all the credit requirements. Date: 20.05.2011 Nettleton Tribe: Two areas are provided to serve as places of respite. North terrace Level 1 = 362.5m ² Terrace Level 2 = 235.2m ²
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	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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		Medium			Responsibility: ALL Date: 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 targeted. Date: 18.05.2011 SKM: Currently no special provisions have been made for energy efficiency, other than TS-11 compliance. We have been advised by HI that a standard cost-effective solution should be adopted. Also, energy modelling is not included in the mechanical engineer's (SKM's) scope, but would be required to target this credit.
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	2	Medium	N		Responsibility: SKM Date: Energy modelling must be undertaken to confirm compliance and to determine the score. For the current pre-assessment, we have assumed 3 points. Date: 18.05.2011 SKM: Currently no special provisions have been made for energy efficiency, other than TS-11 compliance. We have been advised by HI that a standard cost-effective solution should be adopted. Also, energy modelling is not included in the mechanical engineer's (SKM's) scope, but would be required to target this credit.
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		Low			Responsibility: Steensen Varming Date: 16.05.2011 Steensen Varming: Energy sub-metering is now a mandatory requirement as per BCA Section-J. Hence compliance would be achieved. Date: 07.06.2011 Aurora Projects: General comment, Steensen Varming are to ensure metering is allowed for in accordance with the Green Star requirements.

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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			High			Responsibility: Steensen Varming Date: 16.05.2011 Steensen Varming: Compliance cannot be achieved. Requires further investigation.
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		Low			Responsibility: Steensen Varming Date: 16.05.2011 Steensen Varming: Compliance will be achieved. Lighting zones equipped with controls for each zone, would help in reducing energy use and the costs associated. This would 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.	3	0					Responsibility: SKM / Nettleton Tribe Date: 16.05.2011 Steensen Varming: Current design contains an underground basement car-parking. SKM to confirm whether the ventilation strategy would comply with the credit requirements. Date: 18.05.2011 SKM: The current schme, as drawn, will not achieve any points. This credit should be an SKM / NT joint action.
Ene-7	Not applicable to this tool									
Ene-8	Not applicable to this tool									

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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		Low			Responsibility: Steensen Varming Date: 16.05.2011 Steensen Varming: Will achieve compliance.
Total Points =				29	4	2				

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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			High			Responsibility: Nettleton Tribe / Halcrow Date: 20.05.2011 Nettleton Tribe: Current parking provision exceeds the Local Planning allowances. So compliance cannot be achieved.
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	High			Responsibility: Nettleton Tribe / Halcrow Date: 18.05.2011 Halcrow: We note that this is a choice for the client. We are aware of other sites which have actually used road marking to turn a traditional space into a small car space. Small car spaces can be provided. But are not currently included.
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		1	High			Responsibility: Nettleton Tribe / Halcrow Date: 18.05.2011 Halcrow: Cycle parking can be provided. It is unlikely to have 10% use at a hospital. Instead, provision of 5% would appear a more reasonable aim. Date: 20.05.2011 Nettleton Tribe: Not anticipated at this point in design.

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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	3	Low			Responsibility: Date: Credit is related to the site location & the available public transport network. Likely to achieve 3 points. However, more detailed assessment would have to be undertaken.
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	0		Low			Responsibility: Health Infrastructure / Aurora Projects/ Halcrow Date: HI / Aurora to confirm whether a site-specific Travel Plan would be developed. Date: 18.05.2011 Halcrow: The draft Traffic report prepared by Halcrow describes the pedestrian routes, but a Travel Plan has not been developed yet. HI / Aurora to advise whether a Travel Plan is proposed to be developed. Halcrow have vast experience and expertise to prepare Travel Plans (Ken has been involved in implementing the first hospital travel plan in the UK). Date: 07.06.2011 Aurora Projects: 0 points. NT design should facilitate and allow for ease of access to public transportation i.e footpaths, lighting, respite areas, signage etc. However, at this stage we envisage that a travel plan will not be prepared.
Total Points =				12	0	5				

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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	5		Low			Responsibility: SPP Group Date: 18.05.2011 SPP Group: Efficient fixtures and fittings should be specified. (possibly within 1 star of the best available rating). & Rain water harvesting and re-use should also be targeted. Date: 18.05.2011 SPP Group: * 4 Star WELS rated water closets, having an average volume per flush of 3.5 litres. * 5 Star WELS rated urinals, having an average volume per flush of 1 litres. * 5 Star WELS rated tapware, having a flow rate of 6 litres per minute. * 3 Star WELS rated showers, having a flow rate of 9.0 litres per minute. * No significant gym or cycling facilities. The water efficiency indoor water demand with these parameters has been estimated at 5.797kL/day throughout the development.
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		Low			Responsibility: SPP Group Date: 18.05.2011 SPP Group: Water meters will be provided to 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		Low			Responsibility: SPP Group Date: Rainwater harvesting will be implemented, and would serve the entire landscape irrigation needs.
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	0		High	N		Responsibility: SPP Group / SKM Date: To be confirmed by SKM, once the mechanical services design proceeds. Date: 18.05.2011 SKM: Compliance cannot be achieved. Normal traditional cooling towers are provided.

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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	1		Low			Responsibility: SPP Group Date: 18.05.2011 SPP: Credit compliance will be achieved.
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).	na	na	na	na			Responsibility: Health Infrastructure / Aurora Projects Date: 16.05.2011 Steensen Varming: To be confirmed by HI, whether it is possible to achieve compliance. Date: 18.05.2011 SPP Group: Compliance would be achieved. Date: 07.06.2011 Aurora Projects: We would suggest that this credit is N/A as there is no equipment requiring water based cooling. If there was equipment requiring water based cooling it would be unlikely that non - potable water would be used for cooling.
Total Points =				13	9	0				

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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			Low			Responsibility: Nettleton Tribe Date: A dedicated recycling storage area should be provided on every floor. Preferably closer to the lift core.
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.	na	na		na			Responsibility: HI Date:
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	2		Medium			Responsibility: Nettleton Tribe Date: Architects to review credit criteria and determine whether it is feasible to achieve compliance.

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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		Low			Responsibility: TTW Date: 17.05.2011 TTW: It is possible to achieve 1 point for Concrete.
Mat-5	Steel	To encourage and recognise the reduction in embodied energy and resource depletion associated with reduced use of virgin steel.	Up to two points are awarded as follows: • One point is awarded where: – 60% of all steel, by mass, in the project either has a post consumer recycled content greater than 50%, or is re-used. • Two points are awarded where: – 90% of all steel, by mass, in the project either has a post consumer recycled content greater than 50%, or is re-used. If the material cost of steel represents 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.	2	2		Low			Responsibility: TTW Date: 17.05.2011 TTW: It is possible to achieve 2 points.
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		Low	Y		Responsibility: ALL Date: 16.05.2011 Steensen Varming: Credit requirements should be addressed in all relevant specifications. Date: 18.05.2011 SKM: Compliance will be achieved.

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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		Low			Responsibility: Nettleton Tribe
			• 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	0		High			Responsibility: TTW Date: 17.05.2011 TTW: Unlikely to achieve any points, because façade is not designed for disassembly.

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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%. 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			High				Responsibility: ALL Date: 17.05.2011 TTW: It is not possible to quantify reduction. Date: 18.05.2011 SKM: The ductowrk initiative cannot be achieved.

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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	3		Low			Responsibility: Nettleton Tribe Date: 20.05.2011 Nettleton Tribe: Requirements will be addressed in the architectural specifications.
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	High			Responsibility: Nettleton Tribe Date: 20.05.2011 Nettleton Tribe: Requirements will be addressed in the architectural specifications. Date: 07.06.2011 Aurora Projects: Can be difficult to achieve, will need to be reviewed in line with the proposed FFE procurement strategy.
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	2	0	Low			Responsibility: Nettleton Tribe Date: 20.05.2011 Nettleton Tribe: Requirements will be addressed in the architectural specifications.
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	1	0	Low			Responsibility: Nettleton Tribe Date: 20.05.2011 Nettleton Tribe: Requirements will be addressed in the architectural specifications.
Total Points =				23	14	1				

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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		Low			Responsibility: Date:
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	0		High			Responsibility: TTW Date: 17.05.2011 It is not possible to achieve any points.
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		Low			Responsibility: HI Date: 16.05.2011 Steensen Varming: Since the proposed project is located within the existing Ryde Hospital site, it would achieve compliance.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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).	na	na		na			Responsibility: HI / Aurora Projects Date: Date: 07.06.2011 Aurora Projects: N/A the site is not contaminated.
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		Medium			Responsibility: Nettleton Tribe Date:
Total Points =				6	1	0				

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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		Low			Responsibility: SKM Date:
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	0		High			Responsibility: SKM Date:
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		Medium	Y		Responsibility: SKM Date: 18.05.2011 SKM: Can be done, but not included in the current cost estimate.

Ref No.	Title	Aim of Credit	Credit Criteria Summary	No. of Points Available	No. of Points Achieved	Points to be Confirmed	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	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		Low	Y		Responsibility: ALL Date: 16.05.2011 Steensen Varming: Zero ODP thermal insulation must be specified in all relevant specifications. (Architectural and services specifications). Date: 18.05.2011 SKM: Credit requirements will be addressed in the mechanical specifications.
Emi-5	Stormwater	To encourage and recognise the minimisation of peak stormwater flows and the protection of receiving waters from pollutants.	Up to three points are available. Points are awarded where the post-development peak 1.5 year Average Recurrence Interval (ARI) event discharge from the site does not exceed the pre-development peak 1.5 year ARI event discharge; AND • For one point, all stormwater discharged from site meets the Pollution Reduction Targets in Column A of Table Emi-5.1; • For two points, all stormwater discharged from site meets the Pollution Reduction Targets in Column B of Table Emi-5.1; • For three points, all stormwater discharged from site meets the Pollution Reduction Targets in Column C of Table Emi-5.1.	3	2		Medium			Responsibility: SPP Group / TTW Date: 18.05.2011 SPP Group: Compliance will be achieved.
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	2				Responsibility: SPP Group Date:
			• 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	0					
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 Date: 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	Delivery Risk (H/M/L)	Status (Y/N)	Cost Impact (\$)	Comments
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 20°C and 50°C; - 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	1			Y		Responsibility: SKM Date: 18.05.2011 SKM: Credit compliance will be achieved.
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	1					Responsibility: TTW Date:
Total Points =				17	9	2				