

Appendix 6.9

ESD Strategies Report

Prepared by AECOM

ESD Strategies Report

Dr Chau Chak Wing Building



ESD Strategies Report

Dr Chau Chak Wing Building

Prepared for

University of Technology, Sydney

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4 February 2011

60163668

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Quality Information

Document ESD Strategies Report

Ref 60163668

Date 4 February 2011

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Reviewed by Lester Partridge

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
01	27-Oct-2010	DA Submission Issue	Lester Partridge Technical Director	
02	10-Nov-2010	Revised DA Submission Issue	Lester Partridge Technical Director	
03	16-Dec-2010	Revised DA Submission Issue	Lester Partridge Technical Director	
04	14-Jan-2011	Updated DA Submission Issue	Lester Partridge Technical Director	
05	04-Feb-2011	Updated DA Submission Issue	Lester Partridge Technical Director	

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1.0 Introduction

The following report has been undertaken to identify the ecologically sustainable development strategies and environmental initiatives that will be considered and targeted within the design, construction and ongoing operation of the proposed Dr Chau Chak Wing Building on Ultimo Road at the University of Technology, Sydney.

The University of Technology, Sydney (UTS) is committed to achieving demonstrable environmentally sustainable outcomes across both its existing buildings and new buildings. This is illustrated by the work the University has undertaken in developing policy, design guidelines, a masterplan and initiatives focussed on sustainability.

The Dr Chau Chak Wing Building will be benchmarked against the Green Star – Education v1 environmental rating system, targeting a rating of 5 Stars.

1.1 Environmental Sustainability Policy

“This policy provides a framework for environmentally sustainable and responsible practices, activities, and operations at UTS. Through this policy, the University aims to demonstrate leadership in sustainable development in the university sector, and work towards developing environmentally sustainable campuses that will foster sustainability values and principles to students and employees.”¹

The principles which form the foundation of the UTS Environmental Sustainability Policy are:

- Incorporating sustainability principles into all University activities and decision making at all levels
- Identifying alternative and sustainable courses of action to minimise the University's environmental impact
- Creating and promoting an environmentally sustainable and responsible culture across the University community
- Setting rolling, sustainable and feasible targets to reduce the University's environmental impact and use of resources
- Utilising the University's education, knowledge and research in sustainability development to build best practice in campus sustainability amongst universities, both nationally and internationally
- Committing to continuous improvement of environmental performance at UTS

1.2 Sustainability Design Guidelines

*Philosophy The university's built environment should enhance the UTS image, be imaginative, and embrace the philosophy of **LONG LIFE / LOW ENERGY / LOW MAINTENANCE / LOOSE FIT**. Buildings and fit-outs should not be extravagant and each project should represent value for money. For new buildings the aspirational target is 6 star Green Star.”²*

The University has developed the UTS Design Guidelines (P-PO.01.08) to assist in the design and documentation of projects, enabling the translation of the University's requirements into design solutions.

The Environmental Sustainability Guidelines (Section 25) were developed to implement the UTS Environmental Sustainable Policy into the University's built environment.

¹ Page 1 – Environmental Sustainability Policy – UTS Facilities Management

² Page III – Design Guidelines P-PO.01.08 – UTS Facilities Management

1.3 ESD Masterplan

In conjunction with Arup consulting engineers, UTS undertook consultation with its various stakeholders and identified seven key principles that guided the development of the UTS City Campus ESD Masterplan 2020. These principles are:

- water
- daylight
- transport
- energy
- flexibility/adaptability
- work environment
- education product

The UTS City Campus ESD Masterplan addressed ESD strategies for the UTS City Campus site as a whole, individual existing buildings and future building development through the application of the key principles identified.

For new and refurbished building construction, the UTS City Campus ESD Masterplan identified a forward strategy for developments to target a high Green Star rating. This forward strategy has been put in action for the Dr Chau Chak Wing Building. The following outlines a sample of identified strategies within the ESD Masterplan to be investigated in targeting a high star rating for a development:

- **Facade treatment** – Optimise solar gain through summer minimisation and winter utilisation through considered selection of high performance materials including specialised glazing products, shading devices and structural thermal mass
- **Energy-efficient ventilation systems** – Considered ventilation selection for minimised energy consumption and maximised occupant thermal comfort through initiatives such as:
 - efficient mechanical ventilation systems that incorporate mixed-mode ventilation in offices
 - natural ventilation in circulation and core spaces
 - classroom ventilation options based on Variable Air Volume systems or underfloor displacement ventilation systems
- **Efficient use and re-use of natural resources** – Utilisation of water recycling/treatment technologies and rainwater capture to minimise potable water consumption
- **Construction materials** – Selection of materials and products for reduced environmental impact such as:
 - hard-wearing and low-maintenance finishes and products
 - construction concrete and steel with high percentage post-consumer recycled content
 - post-consumer recycled or Forest Stewardship Council certified timber
- **Transport provisions** – Incorporation of bicycle parking facilities and car parking areas to encourage low to zero impact forms of transport

Future buildings as identified in the UTS Masterplan will incorporate environmental initiatives and technologies tailored to the building form and function. Consideration will be given to initiatives such as above, emerging technologies and innovative strategies to minimise the environmental impact of new development work.

1.4 Environmental Sustainability Initiative

The Environmental Sustainability Initiative (ESI) supports UTS's operational sustainability initiatives, targeting:

- Energy
- Planning & Design
- Procurement
- Transport
- Waste
- Water

UTS is a member of the Australian Technology Network (ATN), along with RMIT University (Victoria), the University of South Australia, Curtin University (WA), and Queensland University of Technology. The ATN has set a target to reduce greenhouse gas emissions by 25 percent below 2007 levels by 2020-21. In the alignment with the University's commitment to Energy Management, UTS has committed to a 30 percent reduction in emissions by 2020-21 within the ATN agreement.

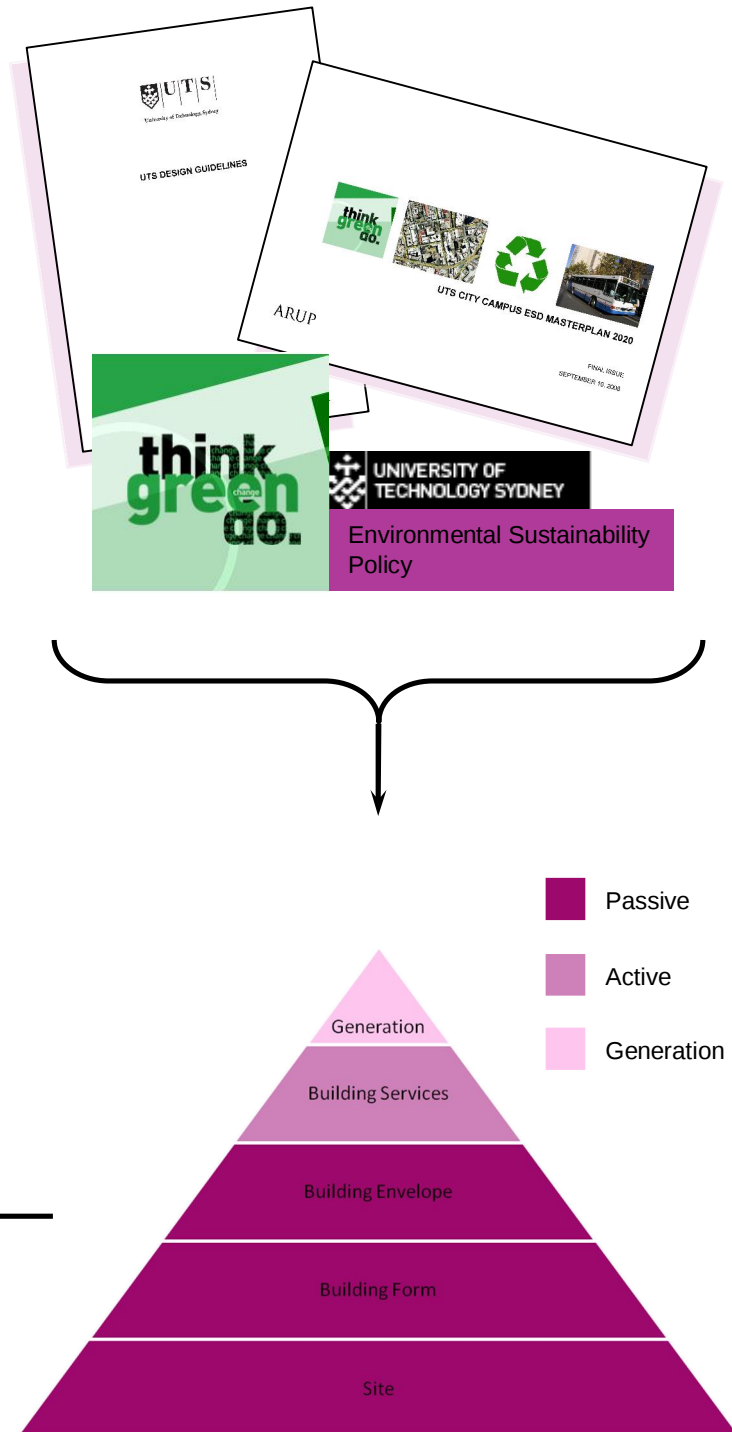


2.0 Sustainability Strategy

The Dr Chau Chak Wing Building is to be a healthy, energy efficient, water wise building embodying the principles set out in UTS's sustainability policies, design guidelines, masterplan and initiatives.

In developing an environmentally responsible solution which enhances education outcomes, the sustainability strategy incorporates the University's requirements and builds on the fundamentals of sustainable design. The prime objective is to establish and achieve the fundamental passive solar design concepts before integrating technology to reduce consumption.

Consideration is given firstly to the site, the orientation of the building and the building envelope. Next, active initiatives in the form of efficient building services are embedded into the building with the integration of generation technologies.



3.0 Environmental Benchmarking

The University has set environmental performance targets for all new buildings in the form of Green Star ratings. In particular, the Dr Chau Chak Wing Building is to target a 5 Star Green Star Education v1 design rating, representing Australian Excellence.

Green Star is a voluntary scheme administered by the national, not-for-profit organisation Green Building Council of Australia (GBCA). The Green Star suite of tools provides a common language and standard to enable the measurement of the environmental attributes of buildings in various sectors. The tools are performance based and assess the environmental attributes of new and refurbished buildings in every state across Australia. They are the GBCA's vehicle to encourage the development of a sustainable property industry in Australia and drive the adoption of green building practices through market-based solutions.

The Green Star rating system is scaled to a star level from 0 to 6 stars, where ratings of 4 stars or higher are able to be submitted for certification.

The Green Star rating tools that have been developed by the GBCA to date are:

- Green Star - Education v1
- Green Star - Healthcare v1
- Green Star - Multi Unit Residential v1
- Green Star - Office v3
- Green Star - Office Interiors v1.1
- Green Star - Retail Centre v1
- Green Star - Industrial v1

4 star rating

Best Practice
(45 – 59)

5 star rating

Australian Excellence
(60 – 74)

6 star rating

World Leadership
(75+)

The Green Star Education v1 rating tool utilises the Green Star framework, common to all Green Star tools, to assess a project's performance against eight environmental categories. The categories are:

- management
- indoor environment quality
- energy
- transport
- water
- materials
- land use & ecology
- emissions

In addition to these eight categories, there is a ninth category of Innovation which rewards innovations implemented in a project which can be demonstrated to have environmental benefits.



The Green Star Education v1 design tool assesses the potential opportunities for a proposed education facility development to have a reduced environmental impact. It is important to note that not all points are equal in Green Star. Each category is weighted to adjust for the environmental impacts of educational building developments. Table 1 shows each category included in the Education v1 design tool along with the given weighting for that category, and the weighted value of each point.

Category	Available Points	Weighting (NSW)	Weighted value of each point (NSW)
Management	14	10%	0.71
Indoor Environment Quality	26	20%	0.77
Energy	29	25%	0.86
Transport	13	10%	0.77
Water	16	15%	0.94
Materials	26	10%	0.38
Land Use and Ecology	8	5%	0.63
Emissions	14	5%	0.36
Total	146	100%	

Table 1 Green Star Education v1 weightings for each environmental category

4.0 ESD Concept Approach

The approach to the ecologically sustainable design concept is to minimise the carbon footprint and water consumption of the facility and deliver a building worthy of 5 Stars Green Star.

The ESD input has been integral to developing the environmental performance strategy for the facility, in both active and passive elements to the building. This included addressing Code compliance issues such as the BCA Section J and minimising greenhouse gas emissions through operational efficiency.

The approach was based on developing, in conjunction with the design architect, a passive low energy facility within the constraints of the site form and orientation. The façade was developed through numerous analysis iterations to provide high thermal and day lighting performance. The building services strategy has been co-ordinated to provide the most energy efficient system for the type of facility with individual air conditioning units serving academic offices. The individual air conditioning systems shutdown when offices are not occupied and outdoor air is matched to meet the transient building population.

Carbon emissions are reduced further by the incorporation of a micro tri-generation system to simultaneously generate clean electricity and produce chilled water and heating water to condition the building.

Figure 1 below provides a graphical representation of the sustainable design strategies incorporated within the building design. In summary the facility has been designed with the following strategies:

- Designed to achieve 5 Star Green Star Educational rating
- Low carbon emissions through a combination of high performing façade, low energy air conditioning and lighting design and on-site tri-generation
- The air conditioning system has been designed to turn off when occupants leave their offices for an extended period of time.
- Modulation of outdoor air in response to occupancy through the monitoring of CO₂ within the space.
- Lighting has been designed to modulate in response to daylight penetration and turn off if occupants are not present in their respective offices.
- Tri-generation will consist of three natural gas fired micro-turbines generating electricity and heat on site. The heat generated by the gas turbines will be used to provide space heating for the facility in winter and cooling through the application of an absorption chiller in summer.
- High levels of daylight serve the facility. This is achieved through the inherent small floor plate design, window arrangement and glazing visible light transmission
- Low water consumption through the use of high efficiency tap ware

-
- The diagram illustrates a smart building's integrated energy management system. It shows a central building with various energy flows represented by colored lines: blue for chilled water, red for hot water, yellow for steam, and green for waste water. Key components include a high-efficiency chiller, a micro turbine generator, a high-efficiency boiler, and a high-efficiency power plant. The building is equipped with smart lighting (daylight dimming), smart ventilation (CO2 control), and smart heating (radiant floor heating). A central control unit manages all these systems, with a callout box showing a network of sensors and actuators. The diagram also shows the building's connection to the grid and its own energy storage system.

5.0 Green Star Rating Strategy

To achieve the target Green Star Education v1 design rating of 5 Star, design elements and initiatives will be incorporated within the Dr Chau Chak Wing Building design according to the environmental assessment categories of the Green Star tool. The following breakdown outlines the current design strategies being targeted as appropriate within each tool category to achieve the 5 star goal.

5.1 Management

Points Available	Points Targeted	Points To Be Confirmed
14	14	0

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- Detailed services commissioning in accordance with international standards CIBSE and ASHRAE, managed by an Independent Commissioning Agent including a commitment to a 12 month building tuning process post construction
- Production of a Building Users' Guide and Building Maintenance Guide to facilitate data exchange from the design team to occupants/management staff and maximise environmental strategy awareness & implementation
- Selection of a head contractor with environmental awareness being ISO 14001 accredited, engaged to develop a project specific environmental management plan and implement a waste management plan recycling 80% of waste
- Incorporation of learning resources to display measurable benefits of the building's environmental initiatives
- Involvement of UTS maintenance staff within design process to maximise future maintainability of serviceable features

5.2 Indoor Environment Quality

Points Available	Points Targeted	Points To Be Confirmed
25	15	3

Indoor environment quality for the building users will be maximised through the following targeted initiatives and points achievement of this environmental category.

- 100% increase over Australian Standard ventilation rates for improved occupant amenity coupled with variable fresh air volume control in response to space carbon dioxide concentration including a space volatile organic compound concentration monitoring and alarm system
- Building layout designed to maximise day lighting potential reducing artificial lighting levels and energy consumption combined with internal blinds for occupant control of glare
- Optimised HVAC system design and control to maximise occupant thermal comfort to a simulated level of less than 10% of occupants dissatisfied according to international standard measurement methods
- Services plant selections to minimise internal noise levels for improved occupant interaction
- Careful selection of paints, adhesives, sealants, carpets, flooring and fitout items to minimise volatile organic compound off gassing and engineered wood products to minimise formaldehyde emissions that can both lead to reduced productivity and potential detrimental health issues
- Light fittings selected for flicker free operation and effective light distribution providing a more comfortable environment

5.3 Energy

Points Available	Points Targeted	Points To Be Confirmed
29	8	4

The following initiatives are targeted for design incorporation to maximise energy efficiency and minimise greenhouse gases produced from building operation.

- Considered building passive design in combination with an efficient lighting and HVAC system incorporating tri-generation (combined cooling, heating and power generation) leads to a reduction of almost half the building greenhouse gas emissions over a standard benchmark for a building of this type. Waste heat from gas fired power generation is utilised to produce chilled water, heating water and potable hot water.
- Provision of separate sub-metering to lighting and power linked to the building management system for monitoring and report generation
- Lighting system zoned to a maximum of 100m² enabling greater control and operation according to occupancy levels
- HVAC system designed to have at least 60% of the served building area able to be automatically shut down when unoccupied through the use of occupancy sensors linked to unit and zone controllers

- High efficiency external lighting selections to maximise light output for energy consumption linked to daylight level sensors for automatic control according to ambient lighting levels

5.4 Transport

Points Available	Points Targeted	Points To Be Confirmed
13	11	2

The following items within the transport category are targeted for incorporation within the design for a maximum point achievement.

- Available car parking spaces limited to less than 50% of maximum allowances to encourage more environmentally responsible forms of transport such as public transport
- Car parking spaces sized and made available only to more efficient forms of personal transport such as small cars, mopeds/motorbikes, hybrid vehicles, alternate fuel vehicles and car pool participants
- Cyclist facilities provided for 10% of staff and students including bike racks, showers, lockers and changing areas to encourage zero environmental impact travel and improved occupant health
- Development of pedestrian routes and a transport plan to enable improved and informed access to the array of nearby public transportation types

5.5 Water

Points Available	Points Targeted	Points To Be Confirmed
14	8	0

Point achievements in this environmental category are targeted through the incorporation of the following water sensitive initiatives.

- Water efficient fittings and fixtures selected throughout
- Non-potable water tank incorporated for collection of rainwater and fire system testing water to be used for toilet flushing, landscape irrigation and cooling system evaporative heat rejection make-up
- Provision of sub-meters to all major water uses within the building linked to the building management system for monitoring and report generation

5.6 Materials

Points Available	Points Targeted	Points To Be Confirmed
20	12	1

Reduced environmental impact of construction and fitout materials will be achieved through the following initiatives.

- Incorporation of an adequately sized and easily located recycling waste storage and handling area
- Concrete mixes developed to substitute Portland cement, that has high greenhouse gas emissions in production, with industrial waste products and oversized aggregate
- Selection of over 60% of building PVC product uses that are sourced from certified environmentally conscious suppliers and 95% of building timber uses sourced from certified sustainable forests
- Incorporation of roof mounted garden breakout areas to reduce the amount of materials used in construction
- Selection of flooring, joinery and loose furniture products that have reduced environmental impact through a combination of re-used & certified environmentally innovative products and products that have optimised resource utilisation, manufacturers with environmental management and the ability to be re-used

5.7 Land Use & Ecology

Points Available	Points Targeted	Points To Be Confirmed
7	4	0

Point achievements in this environmental category are targeted through the incorporation of the following site land sensitive initiatives.

- Site selection that will re-use land previously built on and not take land that may support agriculture, wildlife and vegetation minimising urban sprawl
- Appropriate use of the site so as to not reduce the ecological value
- Reclaiming a contaminated site through appropriate decontamination methods

5.8 Emissions

Points Available	Points Targeted	Points To Be Confirmed
12	7	0

The following initiatives are being targeted within the design in order to minimise the environmental impact of the building emissions.

- Air conditioning equipment selected to utilise zero ozone depletion potential refrigerants and coupled with a leak detection and pump down system to minimise refrigerant emissions should a leak occur
- Selection of thermal insulation which avoids the use of ozone-depleting substances in both its manufacture and composition
- Incorporation of sufficiently sized rainwater tank to capture 1 in 2 year storm events reducing stormwater flows and provision of treatment and filtration of water from a 1 in 20 year storm event to reduce watercourse pollution
- Selection of water efficient fittings and fixtures that reducing the discharge volume to sewer
- Appropriate design and selection of external light fittings to minimise light pollution from the site

5.9 Points Summary

Total Weighted Points Available	Weighted Points Targeted	Weighted Points To Be Confirmed
100	58	8
TOTAL	66	

Within Appendix A the targeted Green Star Points Summary has been shown.

The graph in Figure 2 illustrates the weighted points distribution within each environmental category of the Green Star tool demonstrating the distribution to achieve the 5 Star Education v1 rating.

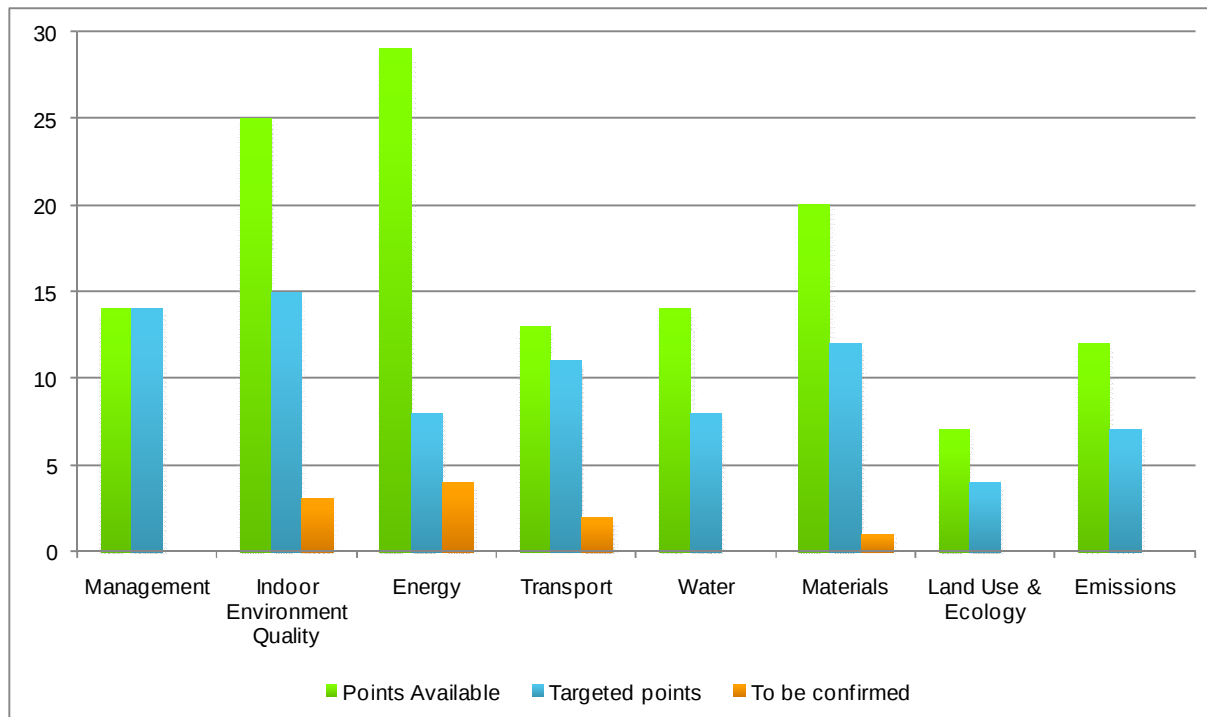


Figure 2 Weighted Green Star points distribution

5.10 Project Submission

Design documentation developed for tendering purposes or later issues will be collated for submission to the GBCA for certification. There are two rounds of assessment available, where the second round is only required should the desired rating/points achievement not be obtained in Round 1. Following the Round 1 submission the GBCA assessors' comments and initial points score are provided to the design team. The Round 2 submission provides the opportunity to adjust the documentation/design as necessary in response to the assessors' comments in order to achieve the desired certified rating.

For the Dr Chau Chak Wing Building, submission to the GBCA will be collated from tender and construction documentation developed during the detailed design and construction documents phases. Following appointment of the Managing Contractor the Round 1 submission will be finalised and issued to the GBCA for assessment. This is expected to occur shortly after construction commencement. Pending the outcome of the Round 1 submission, certification will either be achieved or a Round 2 submission will be undertaken incorporating the GBCA assessors' comments as necessary.

6.0 Operational Performance Maximisation

Building on the UTS Environmental Sustainability Policy, the post construction operational performance of the Dr Chau Chak Wing Building will be monitored and tuned to maximise environmental performance in alignment with the commitment from UTS to continuous improvement of environmental performance.

As per the requirements of the Green Star Education tool, several features are targeted for incorporation into the building in order to aid operational environmental performance management.

- A commitment to a 12 month building tuning process post construction is targeted including monthly system monitoring, quarterly adjustments and a full building re-tune at the end of the period.

- Sub-metering for energy and water uses are targeted for incorporation within the building to be connected to the building management system for monitoring and tracking of performance with sufficient metering to cover the major resource uses.
- Space for storage of recycling waste and sorting is targeted for inclusion to maximise waste recycling and minimise operational waste going to land fill.

7.0 Conclusion

Based on the above, the proposed design strategies and environmental initiatives of this report are aimed at improving the environmental and energy performance of the Dr Chau Chak Wing Building.

This assessment has been carried out based on benchmarking the building against the Green Star – Education v1 rating tool targeting a rating of 5 Stars. Through the targeted initiatives an overall weighted score of 66 points will be achieved exceeding the 60 point requirement of a 5 star rating.

Building design features and initiatives are incorporated to assist ongoing operational performance benchmarking and management maximising operational environmental performance.

Appendix A

Green Star Credit Point Summary

Appendix A Green Star Credit Point Summary

Credit No.	Title	Points Available		Targeted points		To be confirmed	
MANAGEMENT							
Man-1	Green Star Accredited Professional	2	1.4	2	1.4		0.0
Man-2	Commissioning Clauses	2	1.4	2	1.4		0.0
Man-3	Building Tuning	1	0.7	1	0.7		0.0
Man-4	Independent Commissioning Agent	1	0.7	1	0.7		0.0
Man-5	Building Guides	2	1.4	2	1.4		0.0
Man-6	Environmental Management	2	1.4	2	1.4		0.0
Man-7	Waste Management	2	1.4	2	1.4		0.0
Man-10	Learning Resources	1	0.7	1	0.7		0.0
Man-11	Maintainability	1	0.7	1	0.7		0.0
TOTAL		14	10.0	14	10.0	0	0.0
INDOOR ENVIRONMENT QUALITY							
IEQ-1	Ventilation Rates	3	2.4	2	1.6		0.0
IEQ-2	Air Change Effectiveness	2	1.6	0	0.0		0.0
IEQ-3	CO2 Monitoring & Control and VOC Monitoring	1	0.8	1	0.8		0.0
IEQ-4	Daylight	3	2.4	1	0.8	1	0.8
IEQ-5	Thermal Comfort	3	2.4	1	0.8	1	0.8
IEQ-6	Hazardous Materials	1	0.8	1	0.8		0.0
IEQ-7	Internal Noise Levels	2	1.6	1	0.8		0.0
IEQ-8	Volatile Organic Compounds	4	3.2	4	3.2		0.0
IEQ-9	Formaldehyde Minimisation	1	0.8	1	0.8		0.0
IEQ-10	Mould Prevention	1	0.8	0	0.0		0.0
IEQ-11	Daylight Glare Control	1	0.8	1	0.8		0.0
IEQ-12	High Frequency Ballasts	1	0.8	1	0.8		0.0
IEQ-13	Electric Lighting Levels	1	0.8	1	0.8		0.0
IEQ-14	External Views	1	0.8	0	0.0	1	0.8
TOTAL		25	20.0	15	12.0	3	2.4
ENERGY							
Ene-Con	Conditional Requirement	Conditional		-	-	-	-
Ene-1	Greenhouse Gas Emissions	20	17.2	4	3.4	3	2.6
Ene-2	Energy Sub-metering	1	0.9	1	0.9		0.0
Ene-3	Peak Energy Demand Reduction	2	1.7	0	0.0		0.0
Ene-4	Lighting Zoning	1	0.9	1	0.9		0.0
Ene-7	Unoccupied Areas	2	1.7	1	0.9		0.0
Ene-8	Stairs	1	0.9	0	0.0	1	0.9
Ene-9	Efficient External Lighting	1	0.9	1	0.9		0.0
Ene-10	Shared Energy Systems	1	0.9	0	0.0		0.0
TOTAL		29	25.0	8	6.9	4	3.4
TRANSPORT							
Tra-1	Provision of Car Parking	2	1.5	2	1.5		0.0
Tra-2	Fuel-Efficient Transport	1	0.8	1	0.8		0.0
Tra-3	Cyclist Facilities	4	3.1	2	1.5	2	1.5
Tra-4	Commuting Mass-Transport	5	3.8	5	3.8		0.0
Tra-6	Transport Design and Planning	1	0.8	1	0.8		0.0
TOTAL		13	10.0	11	8.5	2	1.5

WATER							
Wat-1	Occupant Amenity Water	5	5.4	3	3.2		0.0
Wat-2	Water Meters	1	1.1	1	1.1		0.0
Wat-3	Landscape Irrigation	3	3.2	3	3.2		0.0
Wat-4	Heat Rejection Water	4	4.3	0	0.0		0.0
Wat-5	Fire System Water	1	1.1	1	1.1		0.0
Wat-6	Potable Water Use in Laboratories	na	na	na	na		na
TOTAL		14	15.0	8	8.6	0	0.0
MATERIALS							
Mat-1	Recycling Waste Storage	2	1.0	2	1.0		0.0
Mat-2	Building Re-use	na	na	na	na	na	na
Mat-3	Recycled Content & Re-used Products & Materials	1	0.5	0	0.0		0.0
Mat-4	Concrete	3	1.5	1	0.5		0.0
Mat-5	Steel	2	1.0	0	0.0	1	0.5
Mat-6	PVC	2	1.0	1	0.5		0.0
Mat-7	Timber	1	0.5	1	0.5		0.0
Mat-8	Design for Disassembly	1	0.5	0	0.0		0.0
Mat-9	Dematerialisation	1	0.5	0	0.0		0.0
Mat-11	Flooring	3	1.5	3	1.5		0.0
Mat-12	Joinery	1	0.5	1	0.5		0.0
Mat-13	Loose Furniture	3	1.5	3	1.5		0.0
TOTAL		20	10.0	12	6.0	1	0.5
LAND USE & ECOLOGY							
Eco-Con	Conditional Requirement	Conditional		-	-	-	-
Eco-1	Topsoil	na	na	na	na	na	na
Eco-2	Re-use of Land	1	0.7	1	0.7		0.0
Eco-3	Reclaimed Contaminated Land	2	1.4	2	1.4		0.0
Eco-4	Change of Ecological Value	4	2.9	1	0.7		0.0
TOTAL		7	5.0	4	2.9	0	0.0
EMISSIONS							
Emi-1	Refrigerant ODP	1	0.4	1	0.4		0.0
Emi-2	Refrigerant GWP	2	0.8	0	0.0		0.0
Emi-3	Refrigerant Leaks	2	0.8	1	0.4		0.0
Emi-4	Insulant ODP	1	0.4	1	0.4		0.0
Emi-5	Watercourse Pollution	2	0.8	2	0.8		0.0
Emi-6	Discharge to Sewer	2	0.8	1	0.4		0.0
Emi-7	Light Pollution	1	0.4	1	0.4		0.0
Emi-8	Legionella	1	0.4	0	0.0		0.0
TOTAL		12	5.0	7	2.9	0	0.0
TOTAL POINTS		134	100	79	57.7	10	7.9
INNOVATION							
Inn-1	Innovative Strategies and Technologies	2	2.0	0			
Inn-2	Exceeding Green Star Benchmarks	2	2.0	0			
Inn-3	Environmental Design Initiatives	1	1.0	0			
TOTAL		5	5.0	0		0	
TOTAL WEIGHTED POINTS		58			8		
OVERALL TOTAL WEIGHTED POINTS		66 (5 Green Star)					