



sustainable built environments

**SBE Melbourne**

Level 10, 459 Lt Collins St  
Melbourne, VIC, 3000

T +61 3 9670 9820

F +61 3 9670 9890

**SBE Sydney**

Level 6, 61 Market St  
Sydney, NSW, 2000

T +61 2 8289 5720

F +61 2 9286 3745

E [info@sbe.com.au](mailto:info@sbe.com.au)

W [www.sbe.com.au](http://www.sbe.com.au)

**ESD STATEMENT**

**For the Part 3A  
Environmental  
Assessment**

OF

**Day Surgery Hornsby  
Redevelopment**

AT

**1A Northcote Road, Hornsby**

FOR

**Sydney Adventist Hospital  
Hornsby**

**07100081**

13 July 2010

SUBMITTED TO

Cameron Martin

Morris Bray Architects



## Quality Assurance

Document: 07100081 Day Surgery Hornsby Redevelopment

Date: 13 / 07 / 2010

Prepared by: Danielle McCartney

Reviewed by:

Revision	Revision Date	Details	Authorised	Signature
DRAFT	02-07-10		D. McCartney	
FINAL	13-07-10	Amended as per feedback from project team	D. McCartney	

© Sustainable Built Environments Pty Ltd

The information contained in this document is produced by Sustainable Built Environments solely for the use of the Client. Sustainable Built Environments undertakes no duty to or accepts any responsibility to any third party who may rely on this document.

All rights reserved. No section or element of this document may be removed, reproduced, electronically stored or transmitted in any form without the written permission of Sustainable Built Environments.

# CONTENTS

1	INTRODUCTION	4
2	ENERGY	6
3	WATER	8
4	INDOOR ENVIRONMENT QUALITY	10
5	TRANSPORT	11
6	MATERIALS, WASTE AND RESOURCES	12
7	SOCIAL ISSUES, HEALTH AND WELLBEING	14
8	CONCLUSION	15
APPENDIX A	GREEN STAR HEALTHCAREv1 SPREADSHEET	16

# 1. INTRODUCTION

---

## 1.1 Introduction

This Ecologically Sustainable Development (ESD) Statement has been prepared by Sustainable Built Environments Pty Ltd (SBE) for Morris Bray Architects on behalf of the client (Sydney Adventist Hospital Hornsby) to accompany the Part 3A Environmental Assessment of the proposed Day Surgery Hornsby Redevelopment.

## 1.2 The proposed development

The proposed redevelopment consists of 2 Stages and includes:

- Demolition of all of the existing buildings and structures on the site. The existing Day Surgery building will be retained and continue to operate until Stage 2 of the redevelopment, when it will be demolished ;
- Car parking with entrances from Balmoral Street and Northcote Road. The Car parking consists of two levels (Basement and Lower Ground Floor) and will be constructed over 2 Stages ;
- Ambulance Bay and support services located on the Lower Ground Floor ;
- Lobby, administration services and café located on the Ground Floor ;
- Wards located on the Ground Floor and Level 1 ;
- Operating theatres and recovery rooms located on Level 2 ; and
- Plant room, Doctors' lounge and terrace located on Level 3.

## 1.3 Documents

This ESD Statement is based on meetings with Morris Bray and the project team and the Project Application drawings prepared by Morris Bray dated the 28<sup>th</sup> June 2010 as follows :

- 09009-A/EA-101 A – Stage 1 Basement ;
- 09009-A/EA-102 A – Stage 1 Lower Ground Floor ;
- 09009-A/EA-103 A – Stage 1 Ground Floor ;
- 09009-A/EA-104 A – Stage 1 Level 1 ;
- 09009-A/EA-105 A – Stage 1 Level 2 ;
- 09009-A/EA-106 A – Stage 1 Level 3 ;
- 09009-A/EA-107 A – Stage 1 Sections ;
- 09009-A/EA-108 A – Stage 1 North & East Elevations ;
- 09009-A/EA-109 A – Stage 1 South & West Elevations ;
- 09009-A/EA-201 A – Stage 2 Basement ;
- 09009-A/EA-202 A – Stage 2 Lower Ground Floor ;
- 09009-A/EA-203 A – Stage 2 Ground Floor ;
- 09009-A/EA-204 A – Stage 2 Level 1 ;
- 09009-A/EA-205 A – Stage 2 Level 2 ;
- 09009-A/EA-206 A – Stage 2 Level 3 ;
- 09009-A/EA-207 A – Stage 2 Sections ;
- 09009-A/EA-208 A – Stage 2 North & East Elevations ;
- 09009-A/EA-209 A – Stage 2 South & West Elevations ; and
- Survey prepared by Whelans Insites dated May 2009.

## 1.4 ESD context

The major strategic issues that inform the consideration of ESD in this project include:

### ***Director General's Requirements***

The Director General's Requirements (issued on the 22<sup>nd</sup> April 2010) for the Part 3A Environmental Assessment of the proposed development are as follows :

## **5. Ecologically Sustainable Development (ESD)**

The EA shall:

- 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; and
- demonstrate that the development can achieve a minimum 4 Green Star rating, or any other suitably qualified rating scheme.

### ***Building Code of Australia (BCA)***

BCA Section J “Energy Efficiency Measures for Class 5-9 Buildings” was introduced in June 2006. The Section J regulations provide minimum energy performance requirements for: building fabric, glazing performance, building sealing, air movement, efficiency of air-conditioning and ventilation systems, efficiency of artificial light and power (internal and external/security) and efficiency of hot water supply. Maintenance provisions are also included to ensure that services and equipment are able to be accessed and that they operate in an efficient manner. A Section J compliance assessment of the development will be undertaken during the detailed documentation stage.

### **1.5 Report Format**

The aim of this report is to provide the NSW Department of Planning with a clear understanding of the ESD initiatives that will be incorporated into the development.

The methodology of the report is based on a checklist of items SBE has developed to inform our consultancy work. The checklist covers the ESD aspects listed below.

- Energy
- Water
- Indoor Environment Quality (IEQ)
- Transport
- Materials, Waste and Resources
- Social Issues, Health and Wellbeing

### **1.6 ESD Opportunities**

The ultimate environmental design aim for our built environment is to create buildings that use no energy, no water, produce no waste in operation or construction and are made from materials that derive totally from sustainable sources. This will not be achieved, but the aim acts as a theoretical lighthouse for the opportunities that should be considered in any project.

## **2. ENERGY**



### **2.1 Context**

Energy remains one of the key environmental initiatives in building developments and is the area in which life cycle cost considerations are likely to be favourable. Australians are the world's largest generators of greenhouse gas per capita, and the built environment contributes to over 40% of these emissions.

### **2.2 Demand management strategy**

An energy demand management strategy will be developed during the design process and implemented for the proposed redevelopment. Firstly, the need for energy consumption will be minimised, then technological solutions provided that deliver or convert energy in the most efficient and economically feasible way. Finally, renewable energy systems will be installed where technically and economically feasible.

### **2.3 Building orientation, form and layout**

The layout of the development is somewhat dictated by the shape of the existing rectangular site. For optimal solar orientation, the proposed building is elongated along the East-West axis, with the longer facades facing North and South. The East and West facades, typically more difficult to shade due to the early morning and late afternoon sun angles, are shorter. The building form is rectangular with its mass sloping back from Balmoral Street in order to reduce the visual impact of the building from the residential area. The proposed layout maximises the use of the site whilst providing good amenity for staff, patients and visitors. All patient wards and recovery rooms are located on the perimeter of the building, maximising daylighting. The majority of these patient wards and recovery rooms face North, maximising solar access. The North-East facing café and North-facing Doctors' lounge and outdoor terrace will be sunny locations for most of the day. The building layout is efficient with circulation spaces minimised and core and service areas grouped together along the central East-West spine of the building, thereby increasing efficiencies.

### **2.4 Building envelope – glazing and shading**

The design of the building with wards and recovery rooms, café and public areas on the perimeter and service areas central located in the building's interior is conducive to allowing maximum daylight penetration into the building, resulting in energy savings due to the reduced need for artificial lighting during the day. There will be some openable windows in the building, such as in the Ground Floor café and Doctor's lounge opening out on to the roof terrace. Glazing will be specified to comply with Section J of the Building Code of Australia (BCA) or better, which will further improve the efficiency of the mechanical heating and cooling systems. Solar calculated window shading will ensure that direct short-wave solar access is excluded over the cooling period (to reduce cooling loads) and allowed over the heating period (to reduce heating loads). External fixed shading will be provided to the North, East and West facing orientations. This Passive Solar Design strategy of maximising daylighting, installing improved glazing and shading appropriate to façade orientation will significantly reduce the energy requirements of the building through passive means.

### **2.5 Building envelope – insulation and infiltration**

Roof, ceiling, wall, floor and building services insulation will be specified to comply with Section J of the BCA or better, and the building appropriately sealed to reduce air leakage, which will reduce the heating and cooling load of the mechanical systems, thereby improving energy efficiency.

### **2.6 Choice of fuel**

Gas will be used to supply as many of the energy demands on site as possible as it produces less than 30% of the greenhouse gas outputs of mains electricity derived from coal-fired power stations.

### **2.7 Low carbon technology**

Installing a cogeneration plant provides both power and heat to a site. Cogeneration involves the generation of electricity for use on the site from natural gas and the utilisation of the generated waste heat for heating, manufacturing processes etc. Cogeneration is efficient as it lowers fuel consumption (and associated greenhouse gas emissions) by generating heat and power rather than supplying those needs separately. Cogeneration also reduces greenhouse gas emissions by replacing grid electricity with natural gas fired generation (which produces one-third of the greenhouse gas emissions of electricity generated from coal-fired power stations) and by

replacing some of the site's heat requirements with waste heat from the generation process. However, cogeneration is also more expensive than grid electricity as the cost of natural gas is higher. The installation of a cogeneration plant for the proposed redevelopment will be explored for feasibility in the subsequent design stage.

## **2.8 Heating, cooling and ventilation**

The heating and cooling energy demand for the building will be reduced by firstly eliminating, or minimising, the need for heating and cooling, and secondly by installing a heating and cooling system that requires the minimum energy input for the given heating or cooling demand. The mechanical ventilation system will be designed to maintain a comfort band of 22 degrees Celsius plus or minus 1.5 degrees in the internal environment. All building services ducts and pipes containing hot or cold air or fluids will be appropriately insulated to reduce thermal losses. An efficient HVAC system will be designed in the subsequent stage of design. It could include high efficiency chillers and motors, variable speed drives for pumps and air handling units, heat recovery etc. It is anticipated that the car park will be principally naturally ventilated as the Lower Ground Floor car park is open on three sides and the Basement car park is open on one side. However, if mechanical ventilation is required, variable speed drive fans and carbon monoxide sensors linked to the mechanical ventilation is recommended. The Passive Solar Design features of the building (e.g. shading, improved insulation levels) reduce the amount of energy required for heating and cooling and the installation of an efficient HVAC system will supply the heating and cooling demand in an efficient manner, thereby reducing the volume of greenhouse gas emissions.

## **2.9 Lighting**

The penetration of natural daylighting into the patient recovery areas and public spaces of the building has been prioritised with the location of these spaces adjacent to the building perimeter, resulting in energy savings due to the reduced need for artificial lighting during the day.

For general lighting, T5 fluorescent fittings will be most likely be installed to all wards, recovery areas, theatres service areas and general circulation spaces. T5 lamps fitted with high frequency electronic ballasts use approximately 25% less energy than the standard T8 lamps, thereby producing 25% lower greenhouse gas emissions. Lower background lighting levels, dimmers, and task lighting will be used where appropriate. Time switches and motion and daylight sensors will be installed to selected light fittings where appropriate (e.g. external lighting, store rooms) to ensure that these lights are only operating when required. The lighting layout will incorporate zoning to allow switching control over spaces, thereby improving energy efficiency.

Lighting is responsible for around 33% of a building's greenhouse gas emissions. By reducing the requirement for artificial lighting in the building (by maximising use of natural daylighting), then supplying the lighting demand with energy efficient fittings and controlling their operation as required, energy consumption (and associated greenhouse gas emissions) will be significantly reduced in the proposed development.

## **2.10 Hot water heating**

The feasibility of the installation of a solar hot water heating system (with gas back-up) will be determined in the detailed design stage. The system would supply the hot water requirement for the proposed redevelopment. The system would be mounted on the roof of the building as it provides unobstructed solar access from the North. Solar hot water heating systems significantly reduce energy consumption and greenhouse gas emissions by using renewable energy from the sun to heat water. Gas back-up is preferable to electric back-up as it produces one-third of the greenhouse gas emissions of electricity generated from coal-fired power stations.

## **2.11 Renewable energy generation**

A grid connected photovoltaic (PV) array could be easily mounted on the roof of the building, as it is optimal for providing unobstructed solar access from the North. PVs provide electricity from renewable sources (i.e. the sun) with no operational CO<sub>2</sub> emissions. The installation of a PV array is a reasonable capital investment, so feasibility in terms of electricity output and cost-effectiveness will need to be thoroughly explored in the subsequent design stage.



### **3. WATER**

---

#### **3.1 Context**

Australia is the second driest continent on the planet, and Australians are the world's largest consumers of water per capita. Guaranteeing the supply and quality of mains water to cities has huge ramifications in terms of availability of catchment resources and cost of delivery infrastructure.

#### **3.2 Demand management strategy**

A water demand management strategy will be developed during the design process and implemented for the proposed redevelopment. Firstly, the demand for potable water in the development will be reduced, then technological solutions provided that collect, store and re-use water in the most efficient and economically feasible way. Significant reductions in potable water use will be made through the selection of water efficient tapware, toilet cisterns, low water use urinals, showerheads and water-using appliances (e.g. washing machines, dishwashers). These fittings and appliances will be one star less than the best available under Australia's Water Efficiency Labelling Scheme (WELS) or better. The reduction of potable water use through demand management represents minimal capital cost outlay for significant water (and cost) savings during the development's operational life.

#### **3.3 Stormwater retention strategy**

Controlling peak flows of stormwater during major rainfall events is a major issue for Sydney's aging stormwater infrastructure. Initiatives to harvest rainwater and stormwater assist in detaining peak flows of stormwater into the drainage system thereby reducing the likelihood of neighbourhood flooding.

A Water Sensitive Urban Design (WSUD) strategy will be developed during the design process and implemented on the site which aims to reduce surface water run-off and peak stormwater flows during storm events, preventing this water from being carried off site directly into river and harbour systems. WSUD initiatives are likely to include minimising impervious surfaces and the planting of drought tolerant native species.

#### **3.4 Rainwater collection**

The collection of rainwater from the roof of the building will reduce potable water use and reduce peak stormwater flows. Two rainwater/detention tanks will be installed in the car park; one in the North-West corner of the Basement and the other one in the North-East corner of the Lower Ground Floor. The collected rainwater will be stored and re-used for non-potable applications such as landscape irrigation, and for flushing toilets and urinals.

#### **3.5 Greywater collection**

For this site and building uses, greywater collection, treatment and re-use is not considered as economically viable or practical as rainwater collection.

#### **3.6 Sewer mining / blackwater re-use**

For this site, which is connected to the existing sewer network, sewer mining / blackwater collection, treatment and re-use is not considered as economically viable or practical as rainwater collection.

#### **3.7 Drought resistant native species**

Where possible, the existing mature street trees will be retained. As part of the landscape plan, drought-resistant native species will be planted around the building's perimeter. Plant species will be zoned based on water needs to optimise water efficiency (i.e. native plants, exotic plants or lawn areas).

#### **3.8 Landscape irrigation**

Where appropriate, efficient landscape watering systems, such as sub surface irrigation with timers and/or rainwater or soil moisture sensors, will be installed. Water for landscape irrigation will be supplied from a non-potable source i.e. re-used rainwater.

### **3.9 Water metering and monitoring**

Individual water meters will be installed for any large water uses on the site and linked to the development's Building Management System (BMS). A water consumption monitoring plan will be developed to monitor water use and promote continual improvement.



## **4. INDOOR ENVIRONMENT QUALITY**

### **4.1 Context**

A number of factors contribute to the wellbeing of building occupants. Buildings must meet the needs of users in terms of thermal comfort, visual comfort and acoustic comfort and be healthy places to work. Creating spaces with high indoor environmental quality improves occupant comfort, can increase staff productivity and can improve patient recovery times.

### **4.2 Daylighting**

Natural daylighting has been prioritised in the layout of spaces in the building. All of the wards on Ground Level and Level 1, as well as the recovery rooms on Level 2 have direct access to natural daylighting. Service areas, that do not benefit significantly from the provision of natural light, are located along the interior spine of the building. The Doctors' lounge and adjacent outdoor terrace are North-facing, thereby optimising solar access and daylighting. Public areas, such as the lobby and café, are located on the perimeter of the building to facilitate the entry of daylighting. As well as providing a visual connection to the exterior and a better, more natural visual environment for staff, patients and visitors, the energy required for artificial lighting is reduced.

### **4.3 Glare control**

Where appropriate, glare-control devices, such as external louvres or internal blinds, will be installed to reduce any visual discomfort to staff or patients that may be caused by reflected light.

### **4.4 Views out**

All of the wards and recovery rooms are located on the building perimeter to facilitate access to views out for patients. This creates a direct visual link to the outside which is important for patient recovery as well as visual comfort.

### **4.5 Occupant environmental control**

Where possible, staff and patients will be given individual control over heating, cooling, ventilation (HVAC) and lighting systems which allows them to optimise their thermal and visual comfort.

### **4.6 Lighting levels**

Artificial light fittings, lighting layout and lighting levels will be designed and specified to comply with Section J Energy Efficiency provisions of the Building Code of Australia (BCA) or better, which will improve energy efficiency as well as optimise the occupants' visual comfort.

### **4.7 Noise**

The design of the development and building services will incorporate good practice sound attenuation levels in accordance with (or better than) AS2107-2000 Acoustics.

### **4.8 Building layout efficiency**

The building layout aims to minimise circulation and utility spaces whilst maximising useable space in order to conserve non-renewable resources and materials.

### **4.9 Volatile Organic Compounds (VOCs)**

In selecting sustainable construction materials, furnishings, furniture, paints, carpets, finishes, sealants and adhesives etc., preference will be given to resources that minimise contractors' and building users' exposure to VOCs.

### **4.10 Formaldehyde minimisation**

In selecting particleboards and composite wood products, preference will be given to zero or low-formaldehyde products.



## **5. TRANSPORT**

### **5.1 Context**

There are many negative environmental impacts associated with transport to and from development sites, including the consumption of fuel energy and the resultant greenhouse gas emissions, air pollution and traffic congestion.

### **5.2 Public transport**

The redevelopment site in Hornsby is reasonably well-located in terms of connection to public transport links, thus reducing staff, patient and visitor reliance on the private car, which in turn reduces transport energy use (and its resultant air pollution and greenhouse gas emissions) and the impact of the site on traffic congestion. The site is located within walking distance (1000m) of Hornsby railway station. Shorelink Bus service number 575, which travels from Hornsby Railway Station to Macquarie University (via Wahroonga, Turramurra, West Pymble and Macquarie Centre), sets down at the front entrance of Hornsby Ku-ring-gai Hospital, in Palmerston Road.

### **5.3 Bicycle facilities**

The proposed redevelopment will have weather-protected, secure parking for a number of bicycles for staff located on the Basement level of the car parking area adjacent to the lifts. Bicycle facilities (including staff change rooms with toilets, shower facilities and lockers) will be provided on the same level. Bicycle locking points will be installed adjacent to the entry of the building on Palmerston Road for visitors. The provision of these facilities is designed to encourage staff and visitors to cycle to the site, thereby reducing reliance on the private car.

### **5.4 Car parking**

Total car parking provision (after Stage 2 has been completed) will consist of 139 car parking spaces. There are car parking areas at the Basement and Lower Ground Floor levels. Cars will enter and exit the site from Balmoral Street, and ambulance and service vehicles will access the site from Northcote Road. The parking provision consists of 106 car spaces, 6 disabled spaces, 27 dedicated spaces for small fuel-efficient cars and courier parking. The provision of dedicated spaces for small cars (including hybrid and electric cars, motorbikes, mopeds, scooters) aims to encourage more efficient use of private transport.



## **6. MATERIALS, WASTE & RESOURCES**

### **6.1 Context**

The environmental impacts of material usage in buildings and developments are numerous and include the depletion of natural resources, the degradation and pollution of the environment in their extraction, production and use, and health impacts associated with off-gassing of pollutants in production and use. Waste created by the building industry accounts for more than 40% of waste going to landfill. One of the major imperatives of sustainable design is to reduce, reuse and recycle. The environmental opportunities pertaining to waste management include the reduction of demolition and construction waste streams, as well as those resulting from ongoing operational waste during the life cycle of the building.

### **6.2 Low embodied energy materials**

In selecting structural building materials or second-fix elements (e.g. work stations, kitchen cupboards), preference will be given to resources which:

- Are locally sourced;
- Are renewable;
- Are from demonstrably sustainable sources;
- Do not contribute to poor air quality or harm the ozone layer;
- Are natural or involve limited processing;
- Have been previously used;
- Have a high content of recycled material;
- Can be recycled at the end of their life; and/or
- Are shown to have a reduced impact on the environment over their full lifecycle (i.e. low embodied energy).

### **6.3 Construction waste management**

Where possible, materials from the demolition of the existing buildings and structures on the site and waste from the construction stage of the new development will be collected by the builders, stored and recycled or re-used (either on site or off site). This could include the collection of masonry (bricks, concrete etc.), wood, steel and miscellaneous metals, and paper and cardboard. These waste materials would need to be separated and stored in separate skips on the site. A Construction Waste Management Plan will be prepared in a subsequent development stage.

It is recommended that a minimum construction waste target of a 60% reduction be set (this is a target set under the NSW government 'Waste Challenge' initiative). Best practice waste targets are 95% reduction in waste to landfill and 90% reuse of demolition material.

### **6.4 Operational waste management**

Dedicated spaces will be provided in the administration and service areas of the development for the collection, separation and temporary storage of recyclable waste. To facilitate its removal off site, dedicated space for this collected garbage and recyclable waste will be located near the loading dock on the Lower Ground Floor of the development for pick-up by service vehicles. An Operational Waste Management Plan has been prepared as part of the Part 3A Environmental Assessment.

### **6.5 PVC minimisation**

Where feasible, Morris Bray Architects will specify alternatives to materials that contain PVC. These could include PVC-free stormwater and sewage pipes, electrical cabling, telephone and data cables, cable conduits, floor coverings, blinds, finishes etc.

## **6.6 Ozone Depleting Potential (ODP) and Global Warming Potential (GWP)**

Where possible, Morris Bray Architects will specify insulation (to walls, roofs, ceilings, floors, ductwork etc.) with zero ODP both in manufacture and composition, as well as specifying fire extinguishers and refrigerants with zero ODP and low GWP.

## **6.7 Provision for future change**

The building has been designed with the flexibility to accommodate future alterations, changes in use and expansion of activities.



## **7. SOCIAL ISSUES, HEALTH & WELLBEING**

### **7.1 Context**

One of the three cornerstones of sustainability is enhancement of social issues. Creating an environment that promotes social interaction and a safe and healthy physical environment that meets the needs of staff, patients and visitors enhances their wellbeing.

### **7.2 Social interaction**

The building and surrounding site provide opportunities for staff, patients and visitors to relax, socialise and eat or drink, which can lead to increases in work productivity and workplace satisfaction for staff and better recovery time for patients. These spaces include a North-facing outdoor terrace for patients on the Ground Floor, a North and East facing outdoor terrace for visitors adjoining the café and lobby on the Ground floor, an outdoor terrace for Doctors on Level 3, as well as the landscaped public spaces surrounding the building.

### **7.3 Building User's Guide**

It is recommended that a Building User's Guide be provided to the Sydney Adventist Hospital Hornsby and staff. The Guide would contain information on the building's architectural design and engineering systems and how they are operated to optimise sustainability performance during the operational phase of the development.



## 8. **CONCLUSION**

A number of ESD initiatives will be implemented into the design, construction and operational phases of the proposed Day Surgery Hornsby redevelopment in order to minimise the consumption of resources, energy and water and to optimise the sustainability performance of the development in operation. These represent good practice ESD measures and include :

- An energy demand management strategy ;
- Passive Solar Design (i.e. building form and layout, glazing, shading, daylighting, insulation) ;
- Solar hot water heating with gas back-up (subject to a feasibility study) ;
- A water demand management strategy ;
- Stormwater retention strategy ;
- Initiatives to promote indoor environment quality ;
- Dedicated parking spaces for small fuel-efficient vehicles ;
- Provision of bicycle facilities ;
- Selection of low embodied energy materials ; and
- A construction and operational waste management strategy.

The proposed Day Surgery Hornsby redevelopment has the potential to achieve a minimum 4 star Green Star rating (under the Green Building Council of Australia's Green Star Healthcarev1 Design tool) as required by the DGRs. This is demonstrated in Appendix A, which contains a spreadsheet outlining how the development would achieve this 4 star rating.

**APPENDIX A GREEN STAR HEALTHCAREV1 SPREADSHEET**

---

# GREEN STAR MINUTES

Project Name: **Hornsby Day Surgery (Sydney Adventist Hospital)**  
 Site Location: **NSW**

Green Star tool used: **Green Star Healthcare v1**  
 Green Star phase: choose from list **Preliminary Review**

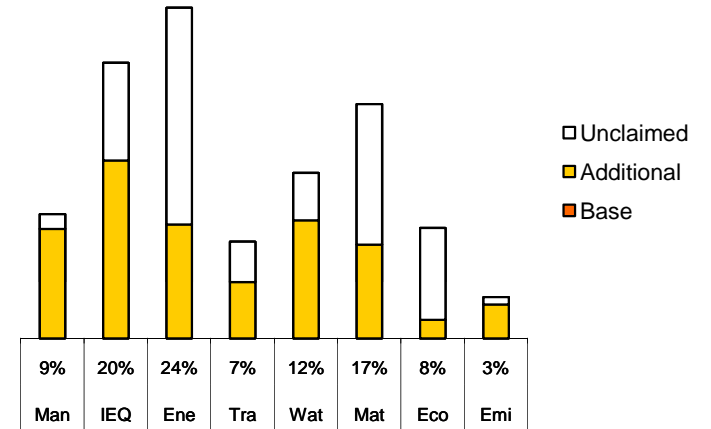


Green Star Meeting / Review No. **1**  
 Meeting / Review held on: **19/05/2010**  
 Meeting / Review location:  
 Next Meeting / Review date:  
 Next Meeting / Review location:

Summary of Results	Zero & Low Cost	Medium Cost	High Cost
Cost	\$19,500	\$70,000	\$600,000
Total Weighted Credits	50	1	1
Cumulative Weighted Credits	50	52	52
Predicted GreenStar Rating	4	4	4

Present

Name	Company	Phone	Email
Danielle McCartney	SBE	8289 5721	<a href="mailto:danielle.mccartney@sbe.com.au">danielle.mccartney@sbe.com.au</a>



Apologies

Distribution

General	Comments	Action By
1 Project Registration	<p>Eligibility Criteria:</p> <p>1) Space Use</p> <ul style="list-style-type: none"> <li>- A minimum of 80% of BCA Class 91, 9c, 8 &amp; 5 (Class 8 &amp; 5 must be ancillary to healthcare facility) &amp;</li> <li>- A minimum of 50% of BCA Class 9a &amp; 9c</li> </ul> <p>2) Spatial Differentiation</p> <ul style="list-style-type: none"> <li>- The project must be clearly distinct, or have a building extension that is clear and distinct</li> </ul> <p>3) Conditional Requirements</p> <ul style="list-style-type: none"> <li>- ENE-Conditional Requirement must be met - must not exceed the benchmarked electricity consumption.</li> <li>- ECO-Conditional Requirement must be met - project must not be within 100m of a wetland of high ecological value, on an old growth forest, or prime agricultural land</li> </ul> <p>4) Timing of Certification</p> <ul style="list-style-type: none"> <li>- Submissions for a 'Design' Certified Rating can be achieved prior to practical completion, but no later than 24 months after practical completion.</li> <li>- Submissions for an 'As Built' Certified Rating can be achieved prior to practical completion, but no later than 24 months after practical completion.</li> </ul>	
2 Costing	To determine which credit points are viable with respect to cost and practicality - project team to provide input on costs / practicality of credit points through project workshops and as requested	

No	Total Credit Available	Base Credit Claimed	Additional Credit Sought	Comments	Action By	
<b>Management</b>						
Man-1	Green Star Accredited Professional	2	0	2	To engage SBE as Green Star professional. GSAP to participate in at least 50% all project design meetings and 75% of all building services meetings. Register project with GBCA.	SBE
Man-2	Commissioning Clauses	2	0	2	Details of commissioning for HVAC, BMS, hydraulic, electrical, and fire-protection will need to be included in respective specifications	Mechanical Engineer
Man-3	Building tuning	1	0	0	Commitment to a full re-commissioning undertaken after practical completion and 12 months after.	Mechanical Engineer
Man-4	Independent Commissioning Agent	1	0	0	Appoint independent agent for commissioning.	Mechanical Engineer / SAH
Man-5	Building Guides	1	0	1	Engage architect or BMS contractor.	Mechanical Engineer / Morris Bray
Man-6	Environmental Management	2	0	2	Contractor to have EMP & ISO 14001 - include requirements in contract documentation	Morris Bray / SAH
Man-7	Waste Management	2	0	2	1 point for 60% of waste by weight being reused or recycled. Another 1 point if 80% is achieved.	Morris Bray / SAH
Man-8	Not applicable to this tool					
Man-9	Building Management System	1	0	1	1 pt for 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.	Mechanical Engineer
Man-10	Not applicable to this tool					
Man-11	Maintainability	1	0	1	1 pt if the person responsible for maintenance has performed and submitted a design review at both the preliminary and final design stages. Building services and External building features.	SAH
Man-12	Construction Indoor Air Quality Plan	3	0	3	2 pts where a Construction Indoor Air Quality (IAQ) Plan has been implemented during construction and pre-occupancy phases of a building. Add 1 pt if it meets NADCA ACR 2006 Standard prior to occupancy. N/A if building is naturally ventilated.	Mechanical Engineer
Man-13	Sustainable Procurement Guide	1	0	1	1 pt if a Sustainable Procurement Guide has been developed for the healthcare facility that includes at a minimum: electrical medical equipment, electrical laboratory equipment, clothes washers and dishwashers.	Morris Bray / SAH
<b>TOTAL</b>		<b>17</b>	<b>0</b>	<b>15</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>88</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>7.94</b>		

No		Total Credit Available	Base Credit Claimed	Additional Credit Sought	Comments	Action By
<b>Indoor Environment Quality</b>						
IEQ-1	Ventilation Rates	4	0	2	2 pts for 50% improvement on AS1668.2-2002 - requires additional capacity to be added to air handlers. 4pts for 150% or 95% naturally ventilated.	Mechanical Engineer
IEQ-2	Air Change Effectiveness	2	0	0	Requires either sophisticated CFD modelling or underfloor distribution.	Mechanical Engineer
IEQ-3	Carbon Dioxide Monitoring & Control and VOC Monitoring	1	0	0	1 pt if VOC monitoring is included in BMS and minimum of 1 sensor for return duct. TBC by client.	Mechanical Engineer
IEQ-4	Daylight	3	0	3	1 pt for 30% of bed areas with DF of 3% and 30% of other areas with 2.5%. 2 pts for 60% and 3 pts for 90%. All beds around perimeter, so likely to achieve 3 points.	SBE
IEQ-5	Thermal Comfort	2	0	0	Modelling required to show PMV +/-1 if all mechanically ventilated. 2 pts for +/-0.5.	SBE
IEQ-6	Hazardous Materials	0	0	0	1 pt if comprehensive hazardous materials survey has been carried out on the project site. Whenever asbestos, lead or polychlorinated biphenyls (PCBs) were found, they have been removed in accordance with the standards listed under Table IEQ-6.1. N/A if none found. Hazardous Materials Survey / Contamination Report underway. Likely to be NA.	Mackenzie Group / Morris Bray
IEQ-7	Internal noise levels	1	0	1	1 pt if 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.	Heggies
IEQ-8	Volatile Organic Compounds	5	0	4	Specify low VOC paints, flooring, adhesive, wall and ceiling linings & mattresses.	Morris Bray
IEQ-9	Formaldehyde Minimisation	1	0	1	Specify E0 board. N/A if no engineered wood products are used.	Morris Bray
IEQ-10	Mould Prevention	1	0	0	1 point if HVAC maintains 60% RH in spaces or 80% RH in ductwork	Mechanical Engineer
IEQ-11	Daylight Glare Control	1	0	1	Award if glare is reduced by fix shading devices OR automated blinds/screens with a VLT of <10%	Morris Bray / SBE
IEQ-12	High Frequency Ballasts	1	0	1	Achievable. Specify T5 luminaries	Electrical Engineer
IEQ-13	Electric Lighting Levels	1	0	1	One point is awarded where it is demonstrated that the facility lighting design has a maintained illuminance level of no more than the lighting levels in Table F1 of AS/NZS 1680.2.5 for 95% of the OFA as measured at the working plane stipulated in table F1	Electrical Engineer
IEQ-14	External Views	2	0	2	1 point if 50% of OFA has a direct line of sight through window to external or atrium, 2 for 80%. Likely to achieve 2 points.	Morris Bray
IEQ-15	Individual Thermal Comfort Control	2	0	0	1 pt if HVAC systems allows for individual user control of air supply rates & temperature for 50% of in patient accommodation and administration areas. 2 pts for 80%.	Mechanical Engineer
IEQ-16	Exhaust Riser	1	0	1	1 point if all print/photocopy rooms are enclosed and have a dedicated & separate exhaust facility	Morris Bray
IEQ-17	Air Distribution System	1	0	1	All new & existing ductwork have adequate access and must be cleaned in accordance with the National Air Duct Cleaners Association 2006 Standard	Mechanical Engineer
IEQ-18	Outdoor Pollutant Source Control	1	0	1	Location of HVAC intakes meet or exceed the recommended distance from pollution sources	Mechanical Engineer / Morris Bray
IEQ-19	Places of Respite	1	0	1	One point is awarded where it is demonstrated that at least two designated and programmed places of respite with direct physical connection to the natural environment are provided. At least one place of respite must be easily identifiable and accessible to patients and visitors, and at least one place of respite must be dedicated to staff. Places of respite can be indoor or outdoor, and their combined area must be equivalent to no less than 5% of the OFA. Each place of respite must have a minimum size of 25m2 and contain an area of vegetation of no less than 30%. Outdoor areas automatically qualify and atriums may qualify provided they are naturally ventilated and have a Daylight Factor of at least 3.5. All places of respite must be 100% non-smoking areas and be clearly signposted as such.	Morris Bray
<b>TOTAL</b>		<b>31</b>	<b>0</b>	<b>20</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>65</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>12.90</b>		

<b>Energy</b>						
Ene-0	Conditional Requirement	Conditional	Yes			
Ene-1	Greenhouse Gas Emissions	20	0	4	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. Requires evaluation of overall energy use and emissions. Features like passive solar design and glazing will be considered in terms of energy savings. 4 points estimated.	SBE
Ene-2	Energy Sub-metering	1	0	1	Monitor energy consumption data (eg: BMS) with sub-metering to the following areas, in-patient accommodation and operation theatres, office/administration space, and laboratories.	Mechanical Engineer
Ene-3	Peak Energy Demand Reduction	2	0	0	1 pt if peak energy demand is actively reduced by 15% or if average demand does not exceed 40%. 2pts for 30% / 20%. Unlikely to achieve these points.	Mechanical Engineer
Ene-4	Lighting Zoning	2	0	2	1 pt if all individual or enclosed spaces are individually switched. 2 pts if automated lighting control system in place.	Electrical Engineer
Ene-5	Not applicable to this tool					
Ene-6	Car Park Ventilation	3	0	2	1 point if 50% of car park has either passive supply or exhaust, 2 for 100% + 1 point if car park mechanical ventilation fans include variable-speed drives controlled by CO2 monitoring. NA if no carparking or single open carpark. Potentially 3 points.	Mechanical Engineer
Ene-7	Not applicable to this tool					
Ene-8	Not applicable to this tool					
Ene-9	Efficient External Lighting	1	0	1	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.	Electrical Engineer
<b>TOTAL</b>		<b>29</b>	<b>0</b>	<b>10</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>34</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>8.28</b>		

<b>Transport</b>						
Tra-1	Provision of car parking	2	0	0	1 pt if 25% under council minimum. 2pts for 50%. Unlikely to achieve this.	Arup / Morris Bray
Tra-2	Fuel Efficient Transport	1	0	1	Min. 25% of total car parking spaces designated and labelled for small cars and/or mopeds/motorbikes and/or hybrid or other alternative fuel vehicles + Min. 10% of total parking spaces must be for small cars + Min. 80% of all spaces designated for use by small cars are preferred parking spaces.	Morris Bray
Tra-3	Cyclist Facilities	3	0	3	Secure space for 5% of building staff (1 per 15m2 NLA) with 1 shower per 10 spaces to be adjacent to shower with 1 secure locker per bike space = 1 point, 2 points if space for 10%. 1 additional point for visitor parking with 1 space per 750m2 NLA	Morris Bray
Tra-4	Commuting Mass-Transport	5	0	2	Location in relation to public transport. 2 points estimated.	Arup / SBE
Tra-5	Not applicable to this tool					
Tra-6	Transport Design and Planning	1	0	1	At least one dedicated pedestrian route is provided on and off the site and a Travel Plan has been developed.	Arup / Morris Bray
<b>TOTAL</b>		<b>12</b>	<b>0</b>	<b>7</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>58</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>4.08</b>		

No		Total Credit Available	Base Credit Claimed	Additional Credit Sought	Comments	Action By
<b>Water</b>						
Wat-1	Occupant amenity Water	5	0	5	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.	Warren Smith
Wat-2	Water Meters	1	0	1	Install for all major water uses in conjunction with system to monitor water consumption.	Warren Smith
Wat-3	Landscape Irrigation	2	0	2	2 pts if potable water consumption for landscape irrigation has been reduced by 90% OR a xeriscape garden has been installed. NA if no landscaping or less than 1% of site.	Warren Smith / Site Image
Wat-4	Heat Rejection Water	4	0	0	2/4 points if 50%/90% of water for cooling system is non-potable + >6 cycles / evaporative / no cooling towers Unlikely to achieve if cooling are installed (TBC)	Mechanical Engineer
Wat-5	Fire System Water	1	0	1	Storage for 80% of testing water OR channelled to be used elsewhere OR no water expelled in testing	Warren Smith
Wat-6	Potable Water Use for Equipment	1	0	1	1 pt if 95% of the water requirement for once through cooling of medical and laboratory equipment is sourced from non-potable water OR 95% of all water cooled medical and laboratory equipment uses cooling systems other than once through cooling systems. TBC by client.	Warren Smith / SAH
<b>TOTAL</b>		<b>14</b>	<b>0</b>	<b>10</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>71</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>8.57</b>		

<b>Materials</b>						
Mat-1	Recycling waste storage	1	0	1	A dedicated storage area is provided for the separation, collection and recycling of office consumables with good access for all building occupants and for collection by recycling companies. The storage area shall have adequate signage and be adequately sized to allow for recycling of, as a minimum, paper, glass, plastics, metals & organic materials. Bins for collecting recyclables are provided in all public and common areas, including cafeterias but excluding amenity areas. Will aim to achieve this.	Morris Bray
Mat-2	Building Reuse	6	0	0	What elements of building are to be reused - façade / major structure - need % retained. 2 pts of 50% of façade is reused, 2 pts for 30% reused of existing, 3 for 60%, 4 for 90%. 0 points as we are not re-using any elements.	Morris Bray
Mat-3	Recycled-Content & Re-used Products & Materials	2	0	0	1 pt if reused products is 1% of total contract value, 2 for 2%. Unlikely to achieve this one.	Morris Bray / WT Partnership
Mat-4	Concrete	3	0	1	Depends on the amount of recycled aggregate specified into concrete. Enstruct have advised that 1 point possible to achieve.	Enstruct
Mat-5	Steel	2	0	1	Aim to reduce use of virgin steel - 1 point where 60% of all steel by mass has post consumer content > 50%. 2 for 90%. Enstruct have advised that 1 point possible to achieve.	Enstruct
Mat-6	PVC Minimisation	2	0	1	1 pt if 30% of total cost of PVC content reduced by replacement with alternative materials. 2 for 60% TBC in detailed design stage.	Morris Bray / WT Partnership
Mat-7	Sustainable Timber	2	0	1	2 pts if 95% sourced from re-used timber or FSC certified. NA if less than 0.1% of total contract value.	Morris Bray
Mat-8	Design for Disassembly	1	0	0	1 pt if 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.	Enstruct
Mat-9	Dematerialisation	1	0	0	Using less materials than conventional design.	Morris Bray
Mat-10	Not applicable to this look					
Mat-11	Flooring	3	0	2	Points depend on the choice of materials, it considers eco-content, durability, certification, waste minimisation, & reusability	Morris Bray
Mat-12	Joinery	1	0	1	Calculators to determine result.	Morris Bray
Mat-13	Loose Furniture	4	0	2	if products are AELA certified or reused full points are awarded.	Morris Bray
Mat-14	Ceilings, Walls & Partitions	2	0	2	Calculators to determine result.	Morris Bray
<b>TOTAL</b>		<b>30</b>	<b>0</b>	<b>12</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>40</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>6.80</b>		

<b>Land Use &amp; Ecology</b>						
Eco-0	Conditional Requirement	Conditional	Yes		Not on ecologically valuable site.	Conacher / SBE
Eco-1	Topsoil	1	0	0	No net change in volume of topsoil on site. This will not be achieved.	Morris Bray
Eco-2	Reuse of Land	1	0	1	1 pt if project is a refurbishment / extension OR buildings have occupied at least 75% of the site. TBC. May achieve this credit if buildings occupied at least 75% of site.	Morris Bray
Eco-3	Reclaimed Contaminated Land	0	0	0	2 pts if full remedial steps to decontaminate the site prior to construction. NA if site is not contaminated. Contamination assessment underway. Most likely not contaminated so NA.	Mackenzie Group / Morris Bray
Eco-4	Change of Ecological Value	4	0	0	Determined by ecology calculator. Needs to be an increase compared to existing conditions. Will most likely not achieve points here.	Conacher / Site Image
<b>TOTAL</b>		<b>6</b>	<b>0</b>	<b>1</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>17</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>1.33</b>		

No		Total Credit Available	Base Credit Claimed	Additional Credit Sought	Comments	Action By
<b>Emissions</b>						
Emi-1	Refrigerant ODP	1	0	1	Zero ODP refrigerants	Mechanical Engineer
Emi-2	Refrigerant GWP	2	0	0	Refrigerant GWP below 10. 1 pt for 50% 2 for 100%. Unlikely to achieve this one.	Mechanical Engineer
Emi-3	Refrigerant Leaks	2	0	2	Requires HVAC system in moderately air tight enclosure with refrigerant leak detection system. Additional point for above and refrigerant recovery system.	Mechanical Engineer
Emi-4	Insulant ODP	1	0	1	insulants to building services and building fabric be free of ozone depleting substances in manufacture and composition - include in specification. Verify that this is for new equipment and that all xtg insulants are not required to be changed.	Morris Bray
Emi-5	Watercourse Pollution	2	0	2	2 pts if the development does not increase peak stormwater flows for rainfall events of up to a one in-two year storm. Additional 1 pt for Riparian Buffer Zone (RBZ). 1 pt NA if not near watercourse. Will achieve 2 points + NA.	Warren Smith
Emi-6	Discharge to Sewer	0	0	0	Total of 5 points. Determined by Sewage Calculator. 1 pt to 30% reduction, 2 for 50%, 3 for 70% and 4 for 90%. 1 more pt for Black water treatment plan for 5 years. NA if no blackwater treatment system. NA as there will be no BWT system.	Warren Smith
Emi-7	Light pollution	1	0	1	External lighting schedule - comply with AS4282 <i>Control of obtrusive effects of Outdoor Lighting</i>	Electrical Engineer
Emi-7	Legionella	1	0	1	Requires no water based heat rejection system - low volume cooling towers	Mechanical Engineer
Emi-8	Trade Waste Pollution	1	0	1	1 pt if effluent pre-treatment equipment is installed on-site. TBC by client.	Warren Smith / SAH
<b>TOTAL</b>		<b>11</b>	<b>0</b>	<b>9</b>		
<b>CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>82</b>		
<b>WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0.00</b>	<b>2.45</b>		
<b>TOTAL CREDITS</b>		<b>150</b>	<b>0</b>	<b>84</b>		
<b>TOTAL WEIGHTED CATEGORY SCORE</b>		<b>na</b>	<b>0</b>	<b>52</b>	Note overall weighted scores shown here are whole numbers rounded up and down	

<b>Innovation</b>						
Inn-1	Innovative Strategies and Technologies	2			To be determined.	Team
Inn-2	Exceeding Green Star Benchmarks	2			To be determined.	Team
Inn-3	Environmental Design Initiatives	1			To be determined.	Team
<b>TOTAL</b>		<b>5</b>	<b>0</b>	<b>0</b>		

	Total Available	Base Claimed	Total Additional	Base + Additional Total Score
<b>OVERALL WEIGHTED SCORE:</b>	<b>100</b>	<b>0</b>	<b>52</b>	<b>52</b>

	Base	Base + Additional
<b>OVERALL GREENSTAR RATING:</b>	<b>0</b>	<b>4</b>