

Savills

**Royal Prince Alfred Hospital
Missenden Mental Health Unit**

ESD Statement

REP/EW/002

Rev A | 11 July 2012

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 219913

Arup
Arup Pty Ltd ABN 18 000 966 165



Arup
Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia
www.arup.com

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1 Introduction

This report is provided as a statement of intent regarding the Ecologically Sustainable Design (ESD) principles for the new Royal Prince Alfred Hospital Missenden Mental Health Unit.

1.1 Project Description

NSW Health Infrastructure is developing the new Royal Prince Alfred Hospital Missenden Mental Health Unit. The proposed development is a 14,500m² healthcare facility comprising mental health and ambulatory care departments.

The facility will include a mental health emergency/assessment unit, mental health in-patient units, a renal dialysis unit and various community health units.

1.2 Sustainable Design Drivers

NSW Health Infrastructure is committed to sustainable design of their healthcare facilities. There are several sustainability drivers that will be referenced in the design of this facility.

1.2.1 TS-11 Sustainability Requirements

NSW Health Infrastructure mandates that healthcare facilities be designed in accordance with document TS-11: Engineering Services and Sustainable Development Guidelines.

This document provides guidance on sustainable design for healthcare facilities and will be used in developing the building system concepts.

1.2.2 Building Code of Australia (BCA)

Section J of the BCA lists minimum requirements for energy efficiency of the building envelope and HVAC systems on a deemed-to-satisfy (DTS) basis.

Where practical, the design of the facility will exceed the DTS requirements.

1.2.3 Director-General's Requirements (DGRs)

The DGRs indicate that the design must demonstrate that the facility can achieve a minimum 4 Green Star rating, or any other suitably accredited rating scheme. It is noted that special attention should be paid to minimising energy and water consumption.

2 Key ESD Principles

2.1 Passive Design Features

The thermal performance of the building facade will aim to exceed the DTS requirements within BCA Section J. Consideration will be given to optimising the balance between minimising energy transfer and allowing adequate daylight. The result of this will be a facade which minimises solar gains and heat loss.

2.2 Reduced Energy Use

The energy efficiency of the HVAC and lighting systems will aim to exceed the DTS requirements within BCA Section J. The design will incorporate high-efficiency central plant and seek to reduce fan energy. Commissioning of building systems will ensure that they are performing at optimum levels.

2.3 Reduced Water Use

The building hydraulic systems will aim to exceed minimum water efficiency targets. A combination of water efficient fixtures and water harvesting/recycling will be explored to limit building potable water consumption.

2.4 Environmental Quality for Occupants

Indoor environmental quality (IEQ) is very important for the health and productivity of building occupants. Some of the key factors to be targeted in the design include fresh air, access to daylight and views, use of healthy building materials, acoustic performance and local controls.

3 Green Star Rating

The benchmarking tool for this project will be Green Star for Healthcare v1. A summary of the Green Star rating tool sections and the initiatives targets is listed below, culminating with an early stage assessment scorecard.

3.1 Management

The Management section focuses on environmentally sensitive construction practices and commissioning the building systems prior to handover.

Effective commissioning of building systems can result in a building that which uses less energy and is more comfortable for the occupants. Some key initiatives that the design team will explore include:

- Comprehensive third-party commission of the building services including seasonal re-commissioning for optimum performance.
- A high level of environmental management during the construction phase.
- A high level of waste management during the construction phase with a focus on recycling waste materials.

3.2 Indoor Environmental Quality (IEQ)

The IEQ section focuses on providing a safe and comfortable environment for the building occupants.

A comfortable environment helps to keep occupants healthy and increases productivity. Giving people control over their own environment also increases user satisfaction.

Mental health facilities have unique consideration that must be further explored with the building users to inform the design. Some key initiatives that the design team will explore include:

- Provision of adequate ventilation.
- Monitoring CO₂ and volatile organic compound (VOC) levels within the facility.
- Provision of appropriate glazing to provide daylight and external views.
- Reducing or eliminating hazardous materials within the building construction and operation; including VOCs, formaldehyde and mould.
- Providing local controls for occupant comfort where appropriate (e.g. window blinds, lighting controls, thermal controls).
- Providing a well designed acoustic environment.

3.3 Energy

The Energy section focuses on reducing facility energy consumption and carbon emissions.

Energy supply and climate change are becoming increasingly important to society. Buildings are a significant source of greenhouse gases and there is great potential to reduce their environmental impact. The design will aim to maximise the energy-efficiency of the facility where possible. Some key initiatives that the design team will explore include:

- Provide a high performance facade to reduce heating and cooling loads.
- Provide energy-efficient HVAC systems.
- Provide high-efficiency lighting.
- Renewable energy sources (solar thermal domestic hot water).
- Sub-meter building systems to track energy use.

3.4 Transport

The Transport section focuses on promoting alternative forms of transportation.

Providing alternate forms of transportation such as public transport and cycling can help to ease road congestion and reduce the secondary environmental impact of the building. As this is a healthcare facility, we must consider the special access requirements of the people who will use the building and strike an

appropriate balance. Some key initiatives that the design team will explore include:

- Limit carparking spaces and provide preferred parking for fuel efficient vehicles.
- Provision of cyclist facilities.

3.5 Water

The Water section focuses on reducing mains potable water consumption and reusing/recycling water within the facility.

Adequate supply of clean water is becoming increasingly important to society. The design will aim to minimise the water use of the facility where possible. Some key initiatives that the design team will explore include:

- Use of the highest efficiency fixtures and fittings available.
- Collecting and treating rainwater for use within the facility for sanitary flushing.
- Recycling of the waste reverse-osmosis water (greywater) within the facility for sanitary flushing.
- Recycling of fire sprinkler and hydrant test water for reuse within the facility for sanitary flushing.
- Use of efficient irrigations systems or landscaping which does not require any irrigation (xeriscape).
- Where possible, the principles of water sensitive urban design will be integrated (noting the limited site footprint makes many external options difficult to integrate).
- Metering of all major water uses within the facility, including BMCS monitoring for leak detection.

3.6 Materials

The Materials section focuses on the use of sustainable and recycled materials to minimise the environmental impact of the facility. Some key initiatives that the design team will explore include:

- Specifying products and materials for flooring, joinery, ceilings, walls, partitions and loose furniture that are Good Environmental Choice Australia (GECA) certified.
- Reduce cement content in the structural concrete.
- Use recycled steel for the building structural elements.
- Use timber that has been certified as sustainably grown and sourced.
- Reduce the use of PVC in the building.

3.7 Land Use and Ecology

The Land Use and Ecology section focuses on minimising the impact of the building on the surround environment.

As the proposed facility is located on an existing built-up site, it will be very difficult to obtain credits in this section. Some key initiatives that the design team will explore include:

- Maintain or increase the ecological value of the site.

3.8 Emissions

The Emissions section focuses on reducing a wide variety of environmental emissions that are harmful or disruptive. Some key initiatives that the design team will explore include:

- Select refrigerants that have an ozone depletion potential (ODP) of zero and monitor refrigeration equipment for atmospheric leaks.
- Minimise discharge to the sewer system by reducing potable water use and recycling water within the building.
- Minimise external light pollution.

3.9 Preliminary Scoring Matrix

Arup has completed an early-stage Green Star pre-assessment which identifies how the facility could be designed in order to achieve an equivalent 4-star Green Star rating. Based on this strategy, the development is scoring 48 points, which meets the 4-star Green Star target rating.

Note: Arup cannot award a Green Star rating, as this is administered by the Green Building Council of Australia. The intent of this process is to validate that the as-designed building could achieve a 4-star Green Star rating if certification is pursued in the future.

Project:	Royal Prince Alfred Hospital - Missenden Mental Health Unit
Rating Tool:	Greenstar Healthcare v1

Title	Credit No.	Points Available	Points Achieved	Points to be Confirmed
Management				
Green Star Accredited Professional	Man-1	2	0	0
Commissioning Clauses	Man-2	2	2	0
Building Tuning	Man-3	1	1	0
Independent Commissioning Agent	Man-4	1	1	0
Building Guides	Man-5	1	1	0
Environmental Management	Man-6	2	2	0

Waste Management	Man-7	2	2	0
Building Management Systems	Man-9	1	1	0
Maintainability	Man-11	1	1	0
Construction Indoor Air Quality Plan	Man-12	3	3	0
Sustainable Procurement Guide	Man-13	1	0	1
	TOTAL	17	16	1
Indoor Environment Quality				
Ventilation Rates	IEQ-1	4	2	2
Air Change Effectiveness	IEQ-2	2	0	2
CO2 Monitoring & Control and VOC Monitoring	IEQ-3	1	1	0
Daylight	IEQ-4	3	0	1
Thermal Comfort	IEQ-5	2	0	1
Hazardous Materials	IEQ-6	1	1	0
Internal Noise Levels	IEQ-7	1	1	0
Volatile Organic Compounds	IEQ-8	5	5	0
Formaldehyde Minimisation	IEQ-9	1	1	0
Mould Prevention	IEQ-10	1	0	0
Daylight Glare Control	IEQ-11	1	1	0
High Frequency Ballasts	IEQ-12	1	1	0
Electric Lighting Levels	IEQ-13	1	1	0
External Views	IEQ-14	2	0	1
Individual Thermal Comfort Control	IEQ-15	2	0	1
Exhaust Riser	IEQ-16	1	1	0
Air Distribution System	IEQ-17	1	1	0
Outdoor Pollutant Control	IEQ-18	1	1	0
Places of Respite	IEQ-19	1	0	1
	TOTAL	32	17	9
Energy				
Conditional Requirement	Ene-Con	Conditional Requirement	Yes	-
Greenhouse Gas Emissions	Ene-1	20	2	4
Energy Sub-metering	Ene-2	1	1	0
Peak Energy Demand Reduction	Ene-3	2	0	1
Lighting Zoning	Ene-4	2	2	0
Car Park Ventilation	Ene-6	3	1	1
Efficient External Lighting	Ene-9	1	1	0
	TOTAL	29	7	6
Transport				
Provision of Car Parking	Tra-1	2	0	2
Fuel-Efficient Transport	Tra-2	1	1	0
Cyclist Facilities	Tra-3	3	1	1
Commuting Mass-Transport	Tra-4	5	5	0
Transport Design and Planning	Tra-6	1	1	0
	TOTAL	12	8	3

Water				
Occupant Amenity Water	Wat-1	5	3	1
Water Meters	Wat-2	1	1	0
Landscape Irrigation	Wat-3	2	2	0
Heat Rejection Water	Wat-4	4	0	0
Fire System Water	Wat-5	1	1	0
Potable Water Use for Equipment	Wat-6	N/A	-	-
	TOTAL	13	7	1
Materials				
Recycling Waste Storage	Mat-1	1	1	0
Building Re-use	Mat-2	6	0	0
Recycled Content & Re-used Products & Materials	Mat-3	2	0	2
Concrete	Mat-4	3	3	0
Steel	Mat-5	2	2	0
PVC	Mat-6	2	2	0
Timber	Mat-7	1	0	1
Design for Disassembly	Mat-8	1	0	1
Dematerialisation	Mat-9	1	0	0
Flooring	Mat-11	3	3	0
Joinery	Mat-12	1	1	0
Loose Furniture	Mat-13	4	4	0
Ceilings, Walls and Partitions	Mat-14	2	1	1
	TOTAL	29	17	5
Land Use & Ecology				
Conditional Requirement	Eco-Con	Conditional Requirement	Yes	-
Topsoil	Eco-1	N/A	-	-
Re-use of Land	Eco-2	1	0	0
Reclaimed Contaminated Land	Eco-3	N/A	-	-
Change of Ecological Value	Eco-4	4	1	0
	TOTAL	5	1	0
Emissions				
Refrigerant ODP	Emi-1	1	1	0
Refrigerant GWP	Emi-2	2	0	0
Refrigerant Leaks	Emi-3	2	1	0
Insulant ODP	Emi-4	1	1	0
Stormwater	Emi-5	3	0	3
Discharge to Sewer	Emi-6	4	1	1
Light Pollution	Emi-7	1	1	0
Legionella	Emi-8	1	0	0
Trade Waste Pollution	Emi-9	1	0	0
	TOTAL	16	5	4
Innovation				

Innovative Strategies and Technologies	Inn-1	2	0	0
Exceeding Green Star Benchmarks	Inn-2	2	0	0
Environmental Design Initiatives	Inn-3	1	0	0
	TOTAL	5	0	0

Total weighted points:	48	18
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4 Future Actions

You will note the matrix contains many possible credits, which is normal for a project at this early stage of the design. As the design is developed, certain credits will be dropped and others may be added. Arup will continue to update the Green Star matrix as the design progresses.

To assist with the design documentation, Arup will issue a responsibility matrix to the design team which will identify the nominated credits that each Consultant is responsible for.

4.1 Design Stage Credits

For the design stage credits, the Consultants will be responsible for integrating the credit requirements into their design packages. Consultants will “self-certify” the design by issuing letters to the Project Manager.

4.2 Construction Stage Credits

For construction stage credits, the Consultants will be responsible for integrating the credit requirements into the performance specifications for completion by the Contractor. The Contractor will be responsible for fulfilling the credit requirements and certifying the design by issuing a letter to the Project Manager.

5 Conclusion

The early stage pre-assessment indicates the facility is capable of achieving an equivalent 4-star Green Star rating.

The design team will continue to evaluate the Green Star requirements as the design of the facility is developed.