ESD REPORT

WOLLONGONG

PRIVATE HOSPITAL

Prepared for:

AA CROWN HOLDINGS

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DOCUMENT CONTROL SHEET

Title	ESD REPORT
Project	WOLLONGONG PRIVATE HOSPITAL
Description	ESD PERFORMANCE BRIEF FOR GREENSTAR AND NABERS
Key Contact	MARTIN THOMPSON AND CHRIS CUSACK
Client	AA CROWN HOLDINGS
Document Description	ESD, Green Star, NABERS Strategies
Project Number	212078

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Revision History

Issued To	Revision and Date								
DCWC	Rev 0	15/5/2013							
DCWC	Rev 0a	14/6/2013							
DCWC	Rev 0b	19/6/2013							
DCWC	Rev 0c	21/6/2013							

Client Status

Client Representative	MARTIN THOMPSON AND CHRIS CUSACK
Date	
Signature	
Approved	☐
Amended as Noted	☐

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INTRODUCTION

This document presents Ecologically Sustainable Development (ESD) measures proposed for the new healthcare development located at 360-364 Crown Street, Wollongong, NSW.

The proposed development is known as “Wollongong Private Hospital” and is to be reviewed under the Environmental Planning and Assessment Act 1979. The Project Application Number is MP 07_0070.

The Department of Planning has issued Director-General’s Requirements under Section 75F of the above act which requests demonstration of ESD measures to be applied in the project.

The current conceptual stage of the architectural design does not incorporate any construction details as yet, however the site configuration and development controls incorporate appropriate flexibility to allow for design development to proceed in accordance with ESD principles whilst meeting regulatory requirements.

This report describes the key features of the ESD strategy for the purposes of the Project Application submission.

DESCRIPTION

Project Description

The building is an 11 Level development including 3 underground car parking levels having a gross floor area of 18,080 square metres excluding plant areas. The layout drawings indicate the following:

Architectural:

- WGPH-P-S-75W ISSUE 2 – Site Plan
- WGPH-P-B3-75W ISSUE 4 – Basement 3 Plan
- WGPH-P-B2-75W ISSUE 4 – Basement 2 Plan
- WGPH-P-B1-75W ISSUE 4 – Basement 1 Plan
- WGPH-P-G-75W ISSUE 5 – Ground Floor Plan
- WGPH-P-1-75W ISSUE 3 – 1F Plan
- WGPH-P-2-75W ISSUE 2 – 2F Plan
- WGPH-P-3-75W ISSUE 1 – 3F Plan
- WGPH-P-4-75W ISSUE 1 – 4F Plan
- WGPH-P-5-75W ISSUE 2 – 5F Plan
- WGPH-P-6-75W ISSUE 2 – 6F Plan
- WGPH-P-7-75W ISSUE 2 – 7F Plan
- WGPH-P-8-75W ISSUE 1 – 8F Plan
- WGPH-E-1-75W ISSUE 3 – Elevation Plan
- WGPH-E-2-75W ISSUE 2 – Elevation Plan

A full indication of area function and size is shown on the Health Planning International’s drawings.

Site and Climatic Conditions

Wollongong is in Climate Zone 5 in accordance with BCA Table A1.1, Climate Zones for Thermal Design. This zoning reflects the coastal climatic conditions of the area.

SUSTAINABILITY BACKGROUND

General

The development has been considered in this report as providing for appropriate level of ESD outcomes for the building covering social, environmental and economic aspects.

The base criteria for ESD for the project is meeting the general requirements, expectations and recommendations of BCA 2013 Section J deem to satisfy

This document specifically adopts sustainable development objectives as follows:

- Comfortable and suitable indoor environment.
- Minimisation of non-renewable resource consumption and environmental impacts.
- Cost effectiveness over its whole life cycle.

As part of the design process all of the above aspects will be considered together with those that provide appropriate returns for a commercial enterprise which may be assessed on both a return on investment and an overall building quality and therefore investment value and status in the industry and the community.

Benchmarking

Section J, Energy Efficiency, of the BCA sets out minimum performance requirements that the building must achieve in relation to fabric and energy usage. The projects objectives would be to better this requirement

Key Design Issues

The following are considered key design issues for the complex:

- Passive features to minimise installed equipment size and extent of services.
- Façade treatment including glazing types and solar control.
- Facilities that minimise consumption of energy and allow for the reuse of site collected water.
- Services installations that allow for waste heat reclaim and otherwise energy efficient operation in line with best practice with commercially available equipment.
- Maintainability of building fabric and serviceability of equipment.
- Provision of safe operating environments.
- Provision of occupant comfort and satisfaction with the occupied spaces.
- Recovery of water from sterilization and rain water for reuse in the cooling towers

BUILDING FABRIC

Orientation of Building

The building is sited on the land to maximise functionality in line with providing efficient pedestrian and vehicular access and good access to natural light, prevailing winds and area views.

Solar Access & Glazing

All levels have potential direct access to daylight from glazing from all façade orientations. The north façade areas on Levels Ground and level 2 have generally been allocated to spaces which do not require substantial glazing for function, such as corridors, services areas and storage, and reduce building cooling loads on this basis.

High performance glazing is proposed generally to suit façade exposures, using low emittance glazing panels. Glazing systems will meet or exceed the requirements of BCA Section J.

Internal shading will also be provided to eliminate any occupant discomfort from glare or direct solar effects.

Building Form & Construction

The building façade will be of light weight construction with FC panels.

The roof will be of concrete with insulation proposed to be applied above the slab to maximise the insulating effect.

The main internal division walls in Ward and Procedures areas are proposed as light weight. Lightweight construction will be used in other areas for partitions with appropriate mass and insulation treatment for thermal, fire, smoke and acoustic separation.

WATER SENSITIVE URBAN DESIGN MEASURES

General

A design goal for the development is to minimise usage of water generally so that the site discharges are reduced, and to collect and reuse roof rain water to minimise mains water usage.

Metering

All separate sections of the building and high usage plant and equipment will have individual water meters installed to allow for a usage monitoring and reporting regime to be put in place. This will provide performance parameters on usage and allow for attention when excessive usage becomes apparent and alarms on system or equipment malfunction.

Fixtures and Fittings

Fixtures and fittings will be selected to provide the best Water Efficiency Labelling and

Standards (WELS) rating commensurate with the function of the area.

- WC's will have a 3 Star Rating
- Basin taps generally will have a 5 Star Rating (Some areas associated with procedures will have higher flow fittings)
- Shower heads will have a 3 Star Rating (Maximum available)
- Food preparation/serving areas will have a 3 Star Rating

Efficient Water Use Equipment

Specific equipment using water directly will have water usage considered as part of the selection criteria, including any medical equipment.

Cooling towers, being large water consumers, as such it is proposed to collect rainwater sterilizer water and condensate from the air conditioning system in a storage tank within the basement for reuse in the cooling towers.

Recycling

Collection of roof stormwater, air-conditioning condensate and sterilizer discharge is proposed with this water stored, treated and reused for toilet flushing, landscape irrigation and in mechanical heat rejection equipment serving main cooling plant.

Preliminary appraisal of likely system sizing to suit the development indicate that a tank in the order of 120,000 litres would be appropriate, subject to detailed design.

ENERGY EFFICIENCY

General

The building with its systems is intended to be built and to operate using minimal energy and therefore with minimum impact on the environment.

All installations in the development are to be considered on the basis of this premise.

Mechanical Services

Cooling and Heating Systems

At this stage of the design development, it is considered that a chilled water cooling system provides the best facility for control of temperatures within the various spaces and also provides the basis for appropriate control of space humidity in critical areas.

- Water cooled High efficiency chiller sets are proposed.

- Heat rejection for the building is proposed utilising a water based system designed to utilise reclaimed water and filtrations systems to minimise water consumption.
- A heating hot water system utilising high efficiency gas fired heaters.

All piping reticulation and equipment will be correctly insulated to minimise system losses to a minimum level as prescribed in BCA Section J.

Air Handling & Distribution

Air handling equipment will be dedicated to individual thermal zones and will incorporate variable speed drives for variable air volume systems wherever appropriate and outside air economy cycles on larger units.

For areas such as operating suites, where 50% outside air is required, heat reclaim systems will be considered, to minimise energy consumption. Outside air cycles will also be provided.

Ventilation

Provision to allow for opening windows in specific areas will be considered. At this stage Consulting corridor will be considered for natural ventilation.

Specific service areas will be exhaust ventilated to meet their functional requirements.

Cooking areas will be provided with high efficiency collection hoods to minimise exhaust airflows and consequential make up requirements. Make up air facilities local to the hood extraction points is proposed to minimise any conditioning requirements in the general kitchen area.

Controls

Full Direct Digital Controls for all Mechanical Services will be installed connected to a Building Monitoring System.

Apart from control of day to day mechanical functions to meet building design parameters the system will provide energy efficiency functions such as outside air control, night set back, night purge and area usage monitoring for both energy and water.

Corridors & common spaces will be operated at high temperatures commensurate to the comfort envelope.

Electrical Services

Power

An authorities substation will provide power to the site in line with normal practice

Power factor correction will be provided on the main supply system to improve efficiency.

Minimisation of energy usage from general equipment will form part of the selection process at procurement and subsequent management regimes.

Lighting

All lighting will be selected to minimise consumption and associated heat loads on air conditioning systems.

Extensive use of LED light fittings is proposed and where larger fluorescent fittings are required these will be of the T5 lamp with electronic ballast type.

An automatic control system will provide switching on motion detectors and level sensors at building perimeters to minimise energy usage.

Domestic Hot Water

It is considered that the gas hot water plant will provide the bulk of the hot water requirements for the complex, on the basis of 24 hour operation of that equipment and inclusion of appropriate water storage.

RECYCLING AND WASTE DISPOSAL

General

Wastes are inevitably generated from large scale public buildings such as hospitals. These waste streams can, however, be managed to good effect through adherence to best practice.

State and Commonwealth legislation dictates that management of these waste streams must be carried out in accordance with the Waste Hierarchy. The Waste Hierarchy lists the most to least desirable outcomes for waste management with actual disposal as the least favourable option. See

Fig. 1 below. One of the major imperatives of sustainable design is to use the waste hierarchy of avoid, reduce, reuse and recycle

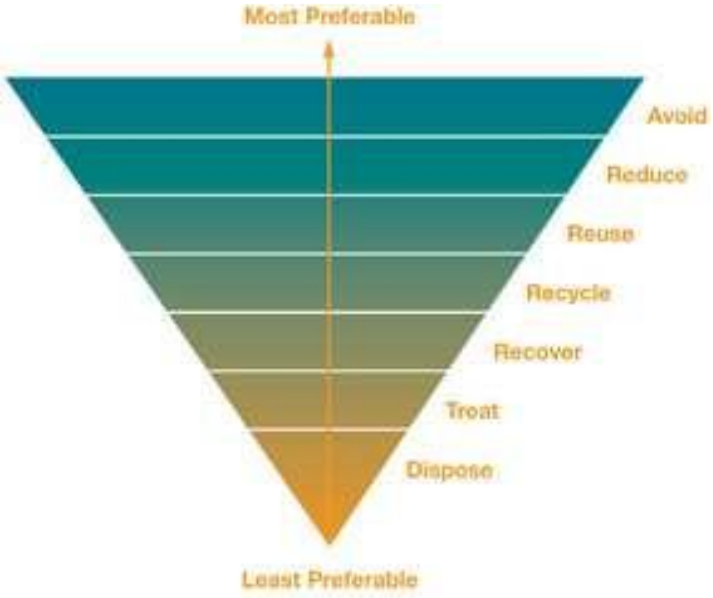

Figure 1 – Waste Hierarchy based on Resource NSW data.

As well as compliance with government legislation such as the NSW Government's Waste Reduction and Purchasing Policy (WRAPP) and local government policy, there are other drivers and incentives for good waste management.

These include working in alliance with local council waste collection services, and the requirements of private contractors. The project will have a comprehensive waste and recycling management plan for a reduction in the amount of a facilities overall operational waste and demonstrating that up to 80% of construction waste by weight is re-used or recycled.

Design and Construction Phase

Waste management is not limited to the operational phase of a buildings life. Waste management of a building is applied across both the operational and Construction/Demolition phases of a buildings life. According to the Australian Government, Department of Environment and Water Resources -*ESD Design – Office and Public Buildings, 3rd Edition May 2007,* Waste is a major environmental issue in the built environment with more than 40% of landfill resulting from building-related waste. Construction and demolition waste alone makes up 33% of the landfill space in Australia. This can be reduced in many cases by 80-90% through better waste management procedures.

During the planning phase building materials with a high level of recycled content, low water and energy production costs will be selected. These materials will also have low toxic emissions to maintain internal environments for the health of all occupants.

Many of the wastes generated during the construction and demolition phase of the buildings life will be recyclable materials such as steel, glass, paper, cardboard, concrete and brick. When properly

managed and appropriately separated and distributed to the correct facility nearly all materials are completely recyclable.

Methods proposed for waste reduction include:

- Waste management awareness,
- Sorting of materials,
- Organised collection and recycling,
- Implementation of purchasing policies to minimise waste generation,
- Use of standard sizes and prefabricated components for construction and
- Maintaining records and conducting audits of wastes in order to meet set target levels.

The *ESD Design – Office and Public Buildings, 3rd Edition May 2007* advises to Encourage contractors to have a plan of what waste they expect to be generated by the project, how they will divert it from landfill, and where it will be sent for reuse or recycling.

Ensuring that the contractor has an ISO 14001 certification is one way of ensuring that the contractor has at least a basic understanding of waste minimisation requirements. This certification is for all environmental impacts, not just waste. It provides assurance that the contractor understands how to carry out an environmental plan and its associated waste management plan.

Operational Phase

Waste minimisation during the operation of the hospital will rely upon building management and a waste management plan specific to the building and its services will be provided. Opportunities for waste minimisation will be determined at the start of the life of the building by implementing a waste and recycling reporting, auditing and management programme as part of the everyday management of the building. Waste management awareness and occupational education will be specifically targeted.

Provision of waste sorting and segregation facilities as well as the setting and adherence to waste reduction targets is crucial. The behaviour of staff, patients and contractors can be influenced for the better by ensuring easy access to recycling facilities, describing what happens to the recycling and waste streams from the building and including reports to all involved on performance.

It is also particularly important that the management program measures the actual waste leaving the building and where it is taken – recycling, landfill, composting as this allows for active management of the waste streams.

Provision of Sorting Facilities

Appropriate waste sorting and segregation facilities will be included based on the type and amount of

waste to be generated. These facilities will also address all applicable legislative requirements and take into account the collection services available.

For the design, construction and operation of waste storage and process areas a number of factors will be considered. As follow:

- Waste and recycling streams should be segregated within the building,
- Facilities for separated waste should be indicated on all plans,
- Signage,
- Easy and amenable access should be provided to waste material collection and storage areas,
- Storage areas should be of sufficient capacity to accommodate expected waste quantities and frequency of collection and easily accessible by removal vehicles, and provided with appropriate environmental controls.
- All prescribed monitoring and reporting requirements should be undertaken.

Recycling Schemes

As mentioned above and outlined in Fig. 1 the most desirable means for managing waste is avoidance, followed by reduction and reuse. Management schemes, awareness and education plans to this end are the most preferred option for this project for dealing with wastes before their creation. Inevitably though, some waste material will be produced from any large scale building.

The following table outlines potential waste streams generated from the operational phase of a large building such as this hospital and the possible recycling options for these streams.

WASTE STREAM AND MANAGEMENT

Table 1 – Hospital waste stream & Management Option

Hospital Facility	Waste Description	Waste Stream	Waste Management Option
Administration and Kitchen	Paper, Cardboard	Solid Inert	Recycle through council provided kerbside collection
	Plastic, cans, glass		Recycle plastic containers 1-7, glasses, cans in council provided kerbside collection glass recycling bins
	Copier and printer cartridges		Recycle used cartridges by collection or drop off at facility
	Polystyrene from packaging boxes		Recycled through a polystyrene collector
	Commercial Garbage wastes Food wastes-vegetable kitchen wastes	Putrescible	Place in council provided kerbside garbage bins or, Compost on site
	Garden clippings, grass cuttings		Place in council provided kerbside garbage bins or, Compost on site
	Grease trap effluent	Prescribed Industrial Waste	Discharge to licensed trade waste and/or contractor collection
	Vegetable, fruit, food processing effluent		Discharge to licensed trade waste
	Animal and vegetable oils		Collected through licensed oil collector
	Animal effluent and residues from poultry, meat and fish processing		Discharge to licensed trade waste
General Maintenance Waste	Vehicle, machinery and industrial wash waters with or without detergents		Discharge to licensed trade waste and/or contractor collection
	Inks, dyes, pigments, paints, lacquers and varnish		Recycle through participating collection centres or transfer stations
	Pesticides, herbicides		Dispose through appropriate chemical collector
	Batteries, scrap metal and electrical equipment		Recycle through collection service or dispose of at transfer station
	Fluorescent lamps including high efficiency		Recycle through local council or appropriate DECCW scheme
	LPG cylinders, gas Cylinders and fire extinguishers		To be collected by cylinder distributor or appropriate hazardous waste/dangerous goods collector
Medical and Clinical Related Waste	Sharps (eg. Needles, scalpel blades)		Stored in Australian Standard Sharps container and removed by licensed waste collector or licensed medical waste collection scheme
	Biomedical wastes (body tissues, fluids), Clinical waste		Stored in appropriate containers for infectious waste and cytotoxic waste and to be removed by licensed waste collector or medical waste collection scheme
	Pharmaceuticals and chemical substances		Removed by licensed waste collector or medical waste collection scheme
	Low level solid radioactive waste		To be contained in appropriate bags and disposed of to landfill through licensed waste collector