



Arup

Woollooware Town Centre

Stage 1 DA ESD Report

Report

Final | 7 February 2013



Document Verification

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		Signature				

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

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1 Executive Summary

This report identifies the key sustainability strategies that have been integrated into the design of the Stage 1 work for the Neighbourhood retail, medical and leisure centre on the eastern car park site and the redevelopment of the Cronulla Sutherland Leagues Club facility.

The report has been structured to respond to the two requirements in the Concept Plan approval:

Concept Plan Approval	Item reference	Item Description
Schedule 3	11	Ecologically Sustainable Development- Future applications shall demonstrate incorporation of ESD principles in the design, construction and ongoing operation phases, including the selection of fabric and materials, water conservation and management initiatives, energy efficiency and renewable energy initiatives
Schedule 5	7	Environmentally Sustainable Development- Future applications shall address the environmental performance targets outlined in the Executive Summary to Cronulla Sharks Redevelopment ESD DA Report prepared by Cundall (Appendix R of Environmental Assessment Report)

2 Introduction

2.1 Stage 1 Description of Work

The concept plan has been approved for the following three stages of work:

- **Stage 1:** Neighbourhood retail, medical and leisure centre on the eastern car park site and the redevelopment of the Cronulla Sutherland Leagues Club facility.
- **Stage 2:** Residential master plan on the western side of the club.
- **Stage 3:** Conceptual improvement to the playing faculties and grandstand extensions.

This report summarises the sustainability strategies that have been integrated into the Stage 1 works. Consideration has also been given to a number of precinct wide strategies supplying all stages of the work such as central water and energy plant.

2.2 Key ESD requirements

This report summaries the key sustainability strategies that have been integrated into the design of the stage 1 work.

The report has been structured to respond to the two requirements in the Concept Plan approval:

Concept Plan Approval	Item reference	Item Description
Schedule 3	11	Ecologically Sustainable Development- Future applications shall demonstrate incorporation of ESD principles in the design, construction and ongoing operation phases, including the selection of fabric and materials, water conservation and management initiatives, energy efficiency and renewable energy initiatives
Schedule 5	7	Environmentally Sustainable Development- Future applications shall address the environmental performance targets outlined in the Executive Summary to Cronulla Sharks Redevelopment ESD DA Report prepared by Cundall (Appendix R of Environmental Assessment Report)

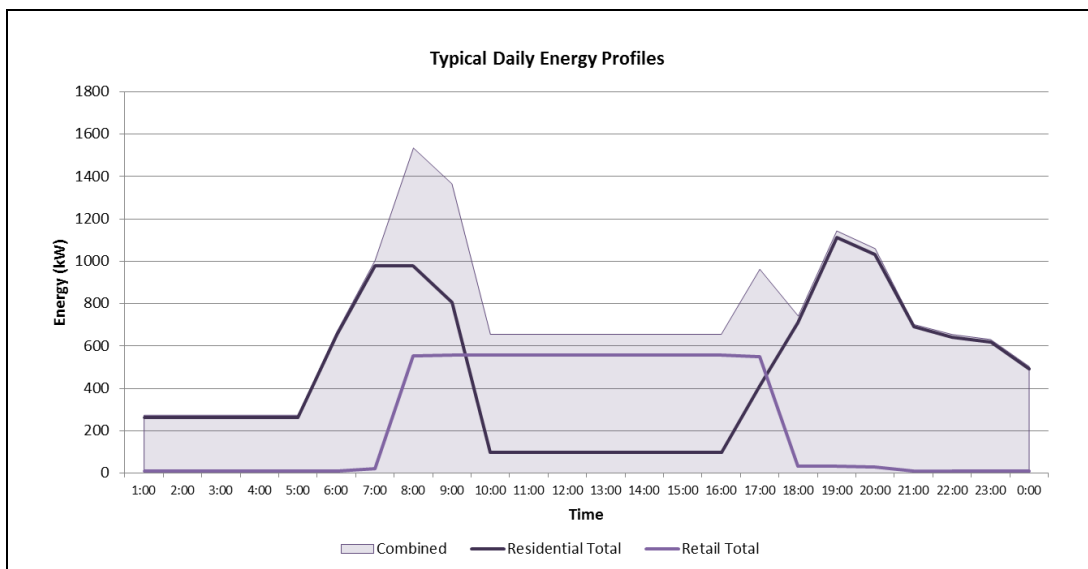
We believe that the requirements in Schedule 3, item 11 are fully summarised in the Appendix R so we have used the headings from appendix R for the structure of this report.

2.3 How we have developed the sustainability strategies

The developer will be a long term operator of the retail component of work so has a long term interest in ongoing life cycle costs. Life cycle analyse has therefore been used to balance the capital costs against the ongoing operational costs of the systems.

The approach by the development team has been to firstly consider the site as a precinct overall in order assesses the opportunities to share infrastructure between the residential and retail components of work.

For example the graph below illustrates the energy profiles across the precinct indicating that the residential is the predominant load. This energy profiling was used to assess the option of central energy plant to supply Stage 1 and Stage 2.



2.4 Framework and assessment methodology

As per the ESD DA report the sustainability initiatives have been evaluated against the following principles:

1. Future-proofing and adaptability
2. Operational certainty
3. Design Quality
4. Visible / communicable strategies
5. Cost-benefit assessment
6. Community Contribution

3 ESD compliance table

The table below summarises key sustainability benchmarks, minimum requirements and project targets that outlined in the Executive Summary to Cronulla Sharks Redevelopment ESD DA Report prepared by Cundall (Appendix R of Environmental Assessment Report).

Category from Concept Plan Appendix R	Minimum requirement	Project Target	Summary of proposed strategy
Passive design	Section J BCA	Section J BCA	- An initial section J BCA assessment has been carried out to determine the glass and insulation performance requirements. The DA submission complies with this requirement. See section 4. - It is intended during the next stage is to use a BCA JV3 verification methodology to provide a final assessment of the total energy systems.
Water	NA	Minimise water consumption in fittings/ fixtures, cooling towers and irrigation.	The following water conservation strategy is being proposed with the target to aim to achieve a minimum 25% saving in potable water consumption: - Water efficient appliances are used throughout for WC flushing, WHB's and showers. - Rainwater tanks will be installed to recycle rainwater. The recycled rainwater will be used for WC flushing, irrigation and partial supply of water to the cooling towers. - The remaining water for the cooling towers will be topped up by the recycled water main adjacent to the site. This water will require some final treatment prior to supplying the cooling towers.

Category from Concept Plan Appendix R	Minimum requirement	Project Target	Summary of proposed strategy
CHG Emissions	Section J BCA	Exceed BCA section J requirements.	The following energy efficiencies initiatives are being developed: - Central chilled water system with cooling towers to supply the base building systems and the tenants. The chilled water will also be metered and provided to the club. - Natural daylight and mixed mode ventilation opportunities will be provided to the common areas of the retail centre. - Efficient LED and fluorescent lighting to 80% of all light fittings. Lighting controls to respond to daylight levels and occupancy. I
Indoor environmental quality		Improve indoor air quality, including daylight, acoustics, thermal comfort, views, glare control and air quality.	- The retail centre has introduced a number of light wells into the common areas of the centre to improve daylight quality and reduce the energy consumed by lighting. - A mixed mode ventilation strategy for the common areas of the retail centre is being investigated to introduce natural ventilation into the building when the conditions outside are acceptable. - Consideration of the life cycle benefit of a 100% fresh air system to the club will be carried out. - Dining areas facing north towards views of the bay and views west to the Cronulla Sharks Stadium. However retractable canopies will be used to protect from solar gains and create comfortable adaptive spaces. - Use of low VOC materials for paints, sealants and carpets where applicable.
Materials		Reduce embodied energy in construction materials by careful selection	The materials strategy is to list the top ten materials used on the project via weight and then assess the embodied carbon associated with these materials and consider alternatives that have a lower embodied content. The materials already considered include: - The floor finishes for the retail centre. - Cement reduction within the concrete. - Recycled content of the steel.

Category from Concept Plan Appendix R	Minimum requirement	Project Target	Summary of proposed strategy
			4. Recycled timber components.
Waste		Aim to achieve at least 80% diversion rate of waste from land fill.	The developer will work with the waste contractor to aim to achieve an operational waste reduction of 80% going to land fill. This will be achieved by: - The two loading docks will share waste recycling facilities which will house garbage and cardboard compactors and also separate bins for mixed containers and hard waste. - Establishment of periodic waste audits, keeping records, and monitoring of the quantity of recyclables found in landfill-bound bins and sharing results with users/staff. - A training program for tenants will be established to promote waste recycling as far along the custody chain as possible. Actual operational waste performance information will be shared with the tenants.
Management		Implement best management practice in design, construction and operation.	The sustainability targets and strategies to achieve these targets will be summarised in a Sustainability Management Plan (SMP) during the design development, construction and operational stages of the project. Clear, defined and measurable KPI's will be established within the SMP for each of the sustainability categories in this table. The SMP will be a live document that is updated with the progress of the development of the sustainability strategies.
Ecology		Preserve the sites high ecological value	Reefer to report by Eco Logical Australia
Transport		Target minimum 5% of trips by bicycle, walking or public transport	The development will promote sustainable forms of transport across the precinct. This has included sufficient cycle spaces with dedicated cycle lanes, preferential car spaces for small cars with a number of electric car spaces. The proponent will operate a shuttle bus service to Woollooware Station until the commencement of a public bus service operating via the club/retail centre.

4 Section J Building Fabric Requirements

An initial assessment has been carried out to highlight the likely minimum requirements for section J of the BCA in relationship to the building envelope. The design and the section J compliance will be developed through the next stages of the project, most likely using a JV3 methodology.

Glass properties will aim to have high VLT whilst still maintaining thermal performance through low-e coatings if required. Appropriate insulation levels within wall constructions will allow good thermal performance and reduce cooling and heating loads.

4.1 Roof and ceiling construction

A Minimum requirement of a R-value of 3.2 under DTS.

4.2 Roof lights

For those used for natural ventilation; to have an area not greater than 7.5% of the floor area and have a combined performance of 0.26 SHGC, 2.9 total *U*-value. Roof lights not required for ventilation have different requirements based on the area of the floor area they represent.

4.3 Opaque Wall areas

Achieve a minimum R-value of 2.8, unless shaded, of heavy construction or south facing then a minimum R-value of 2.2 is acceptable.

4.4 Floors

The following insulation properties apply:

- Slab on ground have no requirement R-value unless an in-slab heating or cooling system is installed.
- Suspended floors to mechanically ventilated spaces (up to 1.5ac/hr) require an R-value 1-1.25 depending on in slab systems.
- Suspended floors over the car park or other naturally ventilated spaces have a requirement to achieve an R-value 2.

4.5 Glass

See example calculation using the NCC Glazing calculator below.

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2012) HELP

Building name/description: **Woollooware Town Centre** Application: **shop display** Climate zone: **5**

Storey: **Level 2**

Facade areas:

	N	NE	E	SE	S	SW	W	NW	Internal
Option A	494.6m ²								
Option B									n/a

Glazing area (A): **211m²**

Number of rows preferred in table below: **10** (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES OK (if inputs are valid)								
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size		Outcomes	
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total U-Value (AFRC)	SHGC (AFRC)	P (m)	H (m)	PIH	G (m)	Heating (S _c)	Cooling (S _c)	Area used (m ²)	Element share of % of allowance used		
1	North Façade Glazing	N		4.00		211.00	6.0	0.51	5.000	5.800	0.00	1.80	1.00	1.00	211.00	100% of 99%		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR
The Glazing Calculator has been developed by the ABCB to assist in developing a better understanding of glazing energy efficiency parameters. While the ABCB believes that the Glazing Calculator, if used correctly, will produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all. Your use of the Glazing Calculator is entirely at your own risk and the ABCB accepts no liability of any kind.

if inputs are valid 

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Figure 1 Example Glazing DTS calculation for North Façade

This could result in single glazing unit with a thermally broken or timber frame or a higher performing laminate with a non-thermally broken frame.