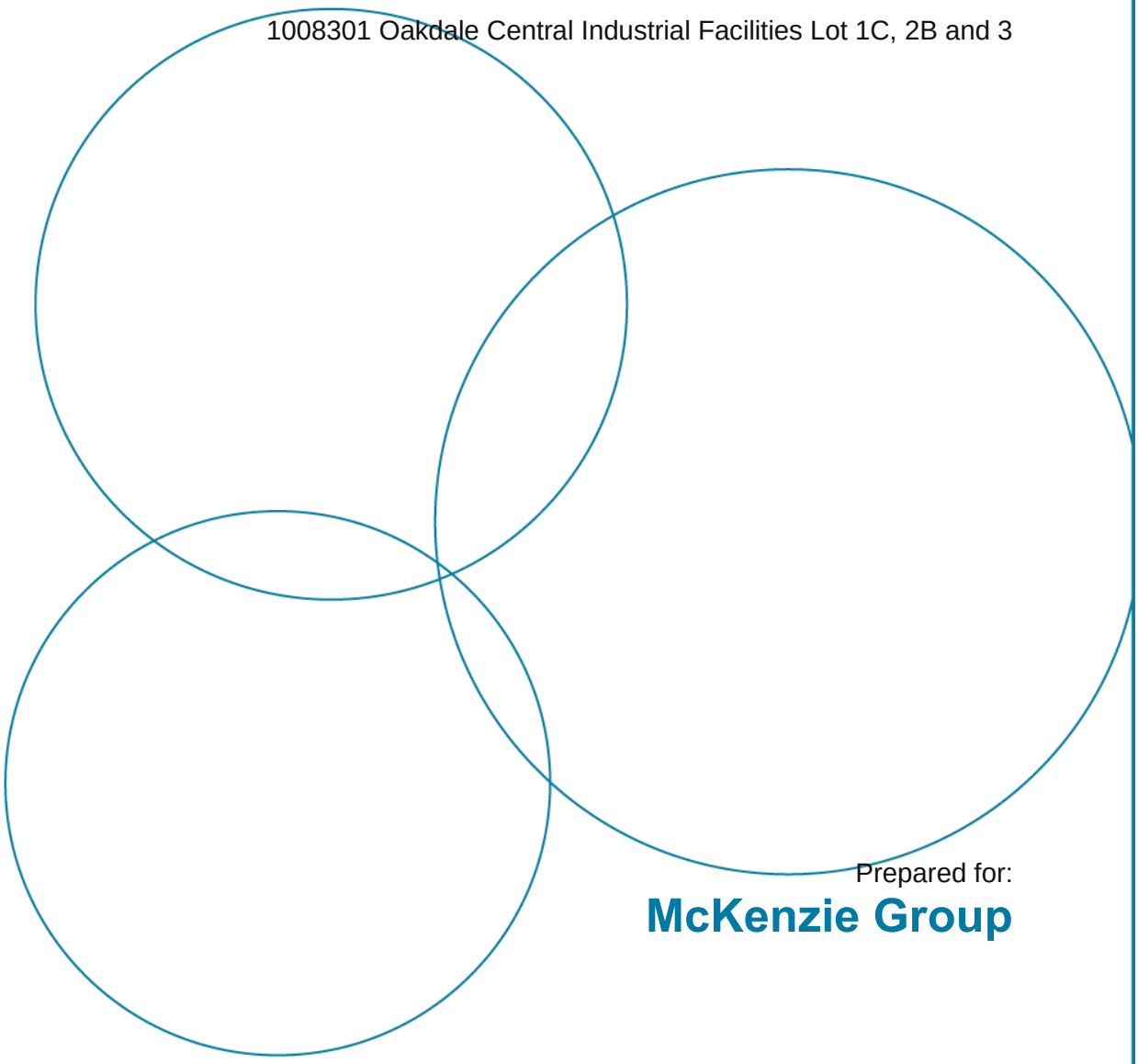
CUNDALL

23-Oct-2013

Sustainability Report for DA

1008301 Oakdale Central Industrial Facilities Lot 1C, 2B and 3



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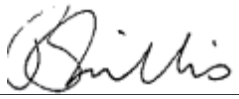
Author:	Rochelle Phillis & David Collins	
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Revision	**Description**	**Date**
A	Draft Issue	01/10/2013
B	Issue for DA	11/10/2013
C	Revised plans and areas	23/10/2013

The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.

Contents

Executive Summary

This report provides a summary of the Environmentally Sustainable Design (ESD) initiatives proposed for Lot 1C, 2B and 3 of the Oakdale Central Industrial Facilities at Old Wallgrove Road, Horsley Park.

Each lot comprises warehouse space with ancillary spaces such as offices and other facilities required for operations. The space types within each lot are identified below;

Lot 1C

- Site Area 46,417m^2
- Industrial Warehouse 26,700m^2
- Office Space 790m^2
- Car park and hardstand 13,665m^2

Lot 2B

- Site area 60,010m^2
- Industrial Warehouse 29,480m^2
- Office Space 1,480m^2
- Car park and hardstand 23,716m^2

Lot 3

- Site Area 155,900m^2
- Industrial Warehouse 87,105m^2
- Office Space 2,000m^2
- Car park and hardstand 54,822m^2

Major sustainability initiatives considered in the design phase include:

- High efficiency lighting and HVAC
- High level of Indoor Environmental Quality (IEQ) with good access to daylight, fresh air and reduced emissions from installed finishes
- Rainwater harvesting for toilet flushing, irrigation and truck wash down
- Solar hot water use and consideration of future PV connection to reduce reliance on grid energy
- Reduced concrete and steel through use of a jointless fibre reinforced slab and precast concrete panels in places
- Addressing minimum compliance in the form of BCA Section J
- Further initiatives are identified in Section 2 of this report.

1 Introduction

Sustainability has been considered during design of the project and it is intended that the facility will employ best practice design for sustainable industrial facilities.

As well as reducing energy and carbon emissions, the project identifies a number of ESD initiatives that are proposed to be addressed in the design. These include Indoor Environmental Quality (IEQ), materials, waste, water, transport, ecology and social sustainability.

These initiatives allow the environmental impact of the development to be reduced, as well as improved occupant amenity, reduced indirect impacts through materials extraction, manufacture and transport.

Through the proposed ESD initiatives the project will achieve the sustainability objectives. Additionally, measures are to be considered and implemented to reduce resources, energy and water consumption.

This report identifies ways in which the proposed three industrial lots address ecologically sustainable design. The report also addresses the Director Generals environmental assessment requirements for Greenhouse Gas and Energy Efficiency and the Fairfield City Councils water reuse and potential energy generation comments.

1.1 Project Background

The proposed Industrial Facilities at Oakdale Central Lots 1C, 2B and 3, Old Wallgrove Road, Horsley Park are large industrial sites providing warehouse distribution facilities and forming part of a larger masterplan which includes a completed warehouse along with two previously approved warehouse buildings.

The development is located within close proximity to both the M7 and M4 motorways, enabling excellent access to transport hubs reducing traffic congestion, and associated local air pollution on local roads.

The development includes three industrial lots as described below:

Lot 1C

- Site Area 46,417m^2
- Industrial Warehouse 26,700m^2
- Office Space 790m^2
- Car park and hardstand 13,665m^2

Lot 2B

- Site area 60,010m^2
- Industrial Warehouse 29,480m^2
- Office Space 1,480m^2
- Car park and hardstand 23,716m^2

Lot 3

- Site Area 155,900m^2
- Industrial Warehouse 87,105m^2
- Office Space 2,000m^2
- Car park and hardstand 54,822m^2

The Estate Masterplan identifying each lot and the individual lot site plans are provided below;

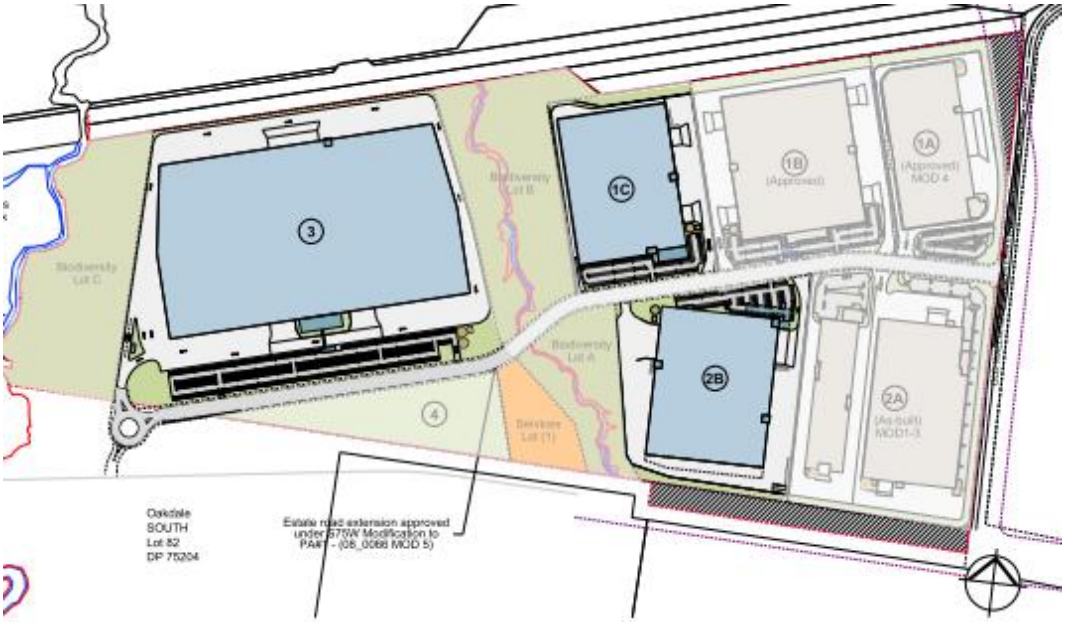


Figure 1: Oakdale Central Estate Masterplan

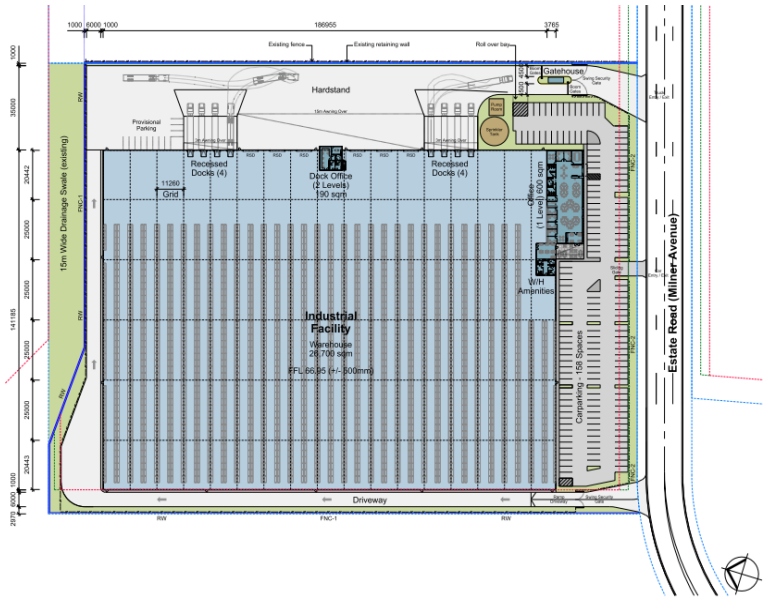


Figure 2: Site Plan – Lot 1C

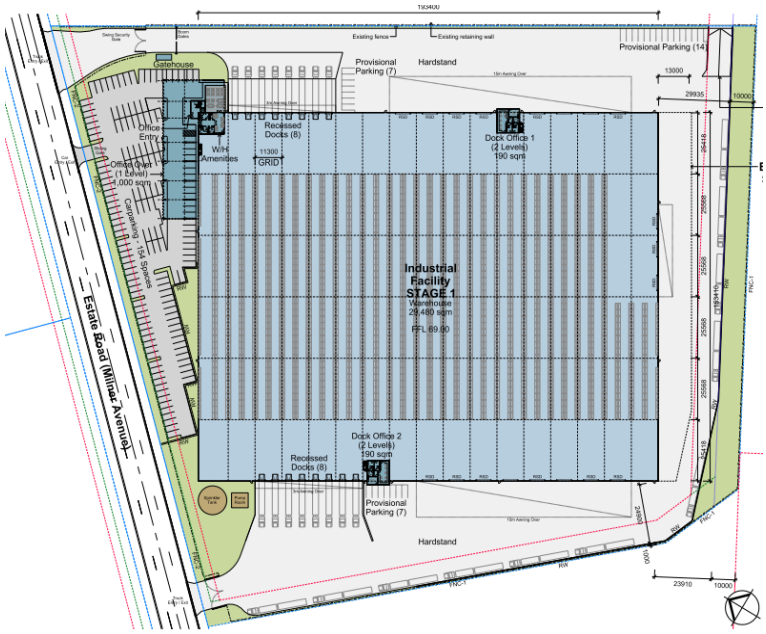


Figure 3: Site Plan – Lot 2B

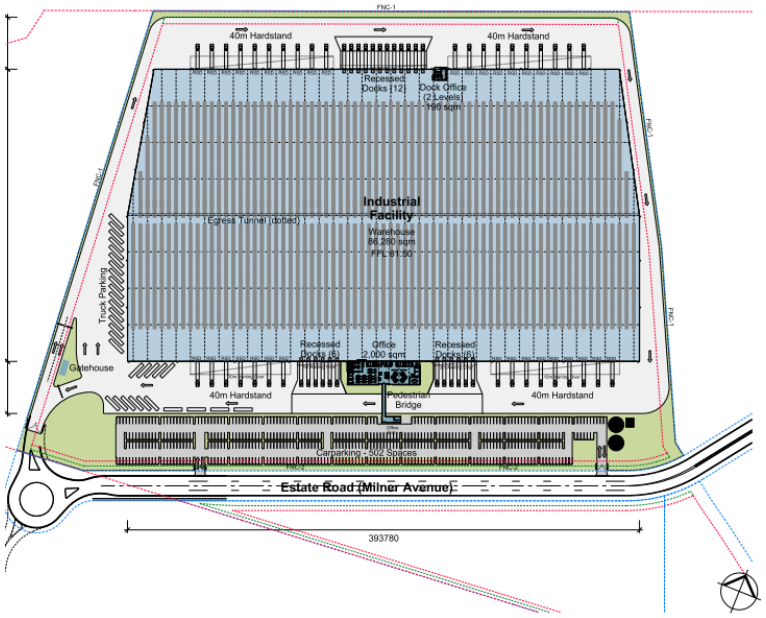


Figure 4: Site Plan – Lot 3

2 ESD Initiatives and Strategies

The following section identifies ESD objectives, proposed targets related to the objective and strategies that are being considered or being implemented in order to meet these targets:

Objective	Proposed Target	Proposed Strategy
Design and management • Documentation of design intent and expected outcomes • Appropriate commissioning	• Communicate sustainability initiatives and operation to building users • Commissioning and building tuning required by contractors and reviewed for 12 months after completion	• Provision of a building Users Guide • Investigate costs and viability of commissioning and building tuning requirements and appointing an independent commissioning agent • Independent consultant to perform quarterly tuning of Fire, mechanical, electrical, hydraulic services
Facade Performance • Optimised facade performance	• Achieve minimum performance requirements under NCC Section J1 and J2 • Reduce heat gain through the warehouse facade	• Meet or exceed NCC Section J1 and J2 facade performance for conditioned spaces • Light coloured roofing with high reflectivity and appropriate insulation to reduce solar heat gain into the warehouse • Performance glazing in office spaces appropriate to the window size and orientation
Social sustainability • Consider design with due regard to occupant satisfaction in accessibility, usability, Indoor air quality and public space utility	• High level of occupant satisfaction • Provide external as well as internal comfort	• High level of Indoor Environmental Quality (see following section) • Flexibility of space for potential future configurations • Consider occupant surveys to track user satisfaction • Provide shading to the outdoor courtyard areas • Lot 2B and Lot 3 - Consider using dense planting to screen the outdoor areas from the docks to increase visual and acoustic amenity. • Lot 3 – For the pedestrian bridge consider extensive shading and adequate natural ventilation openings to reduce heat build-up and discomfort. • Consider occupant user control eg A/C systems, glare reducing strategies, lighting etc

Objective	Proposed Target	Proposed Strategy
Minimising Transport Impact • Consider location with links to public transport and employee services • Consider location to reduce operational transport • Consider the impact of industrial trucks on local traffic	• Reward drivers of fuel efficient vehicles by providing spaces for small cars and or motorbikes • Provide alternatives to single-occupancy vehicles • Reduce operational fuel consumption through close proximity to major arterial roads. • Reduce the impact of operational traffic on local communities	• Consider providing 10% of total parking spaces for small cars and 5% for motorbikes situated near the office entrance • Lot 1C & 2B - Cars 16, motorcycles 8 • Lot 3 – Cars 51, motorcycles 26 • Transport management plan based on staff surveys; implement car pooling, car-share etc • Due to the location of the site, it is considered that staff bicycle riding will be unlikely, although if staff surveys indicate a preference for cycling, consider appropriate amenities • The site is located within close proximity (<5km) to both the M7 and M4 motorways • The roads linking the site to the motorways are predominantly used for industrial traffic, as such the traffic is unlikely to impact on local areas
Optimising IEQ • Optimise natural light to work environment • Optimise fresh air ventilation • Consider Thermal Comfort of occupants • Consideration of noise transference in space planning • Minimise use of materials that emit volatile organic compounds • Create a pleasant working environment	• Daylight: Daylight Factor (DF) of at least 2% at finished floor level under a uniform sky for at least 60% of the GLA. • Thermal comfort: 95% of office areas have PMV levels between -1 and +1 for 98% of the year; Warehouse spaces include passive thermal comfort strategies • Finishes: 95% of all paints, adhesives & sealants and all carpet and flooring to be low-VOC finishes; use low-formaldehyde wood products • Electric lighting levels: 95% of GLA has a lighting system that is flicker free and has a maintained illuminance of no more than 25% above those recommended in AS1680.2.4, 2.1 and 0.1 • Reduce visual glare	• Daylight: rationalised glazing to offices; high performance glass • Daylight: evenly spaced translucent roof sheeting to warehouses areas • Thermal comfort: Office envelope and HVAC system designed to meet thermal comfort requirements; warehouse consider whirly birds and fans for heat reduction • Provide R1.5 roof insulation to the warehouse and consider insulation to the inside face of the warehouse walls • Finishes: Specify and track correct finishes and wood products • Provide pleasant indoor and outdoor breakout spaces with sufficient daylight and plants • Lighting: Good light fixtures and well designed layout • Ventilation: Consider increased fan and duct sizing Additionally: • Install eco-certified workstations (eg GECA or Ecospecifier) • Provide sufficient shading and blinds with rationalised glazing for visual and thermal comfort

Objective	Proposed Target	Proposed Strategy
Minimising Energy Use • Consider passive design to minimise energy use such as orientation, ventilation, shading and floor plate design. • Appropriate sizing of plant and equipment in heating and cooling, lighting, control systems, • Building management systems and renewable energy sources • Reduce reliance on connection to grid electricity and gas	• Target a 20% reduction in Greenhouse gas emissions • Energy sub-metering for all major uses greater than 100kVa; linked to monitoring system • High efficiency warehouse lighting and controls • Reduce energy for water heating • Integrated building management • Consider renewable energy generation for a portion of energy consumption and/or consider future-proofing the building for future installation • Reduce urban heat island effect and heat load through the roof by providing a highly reflective roof • Reduce office equipment load from 20W/m² to 15W/m² • Optimise insulation for energy and thermal comfort	• Lot 1C and Lot 3 - Predominantly south, south easterly office space, consider insulated spandrel panels to reduce the glazing area and associated heat loss in winter • Lot 2B - Predominantly north facing office, consider additional shading or solar controlled glazing to reduce heat transfer into the office space • Allow high-level ventilation openings to warehouse spaces. Consider alternative passive exhaust options such as wind or solar assisted whirly birds to improve thermal comfort • Consider operable windows with reed switches to allow offices to operate with mixed-mode air conditioning • Consider office air conditioning temperature set-points for an increased comfort band • Provide energy efficient T5 lighting, with zoning and automatic controls where reasonable • Consider LED lighting strategies and advanced controls • Consider a solar hot water system with gas boost • Consider solar photovoltaic panels or allow upgraded roof structure for potential future installation • Sub-metering: install appropriate metering; develop metering and tracking strategy to allow for self-assessment, problem solving and ongoing improvements during operations • BMS linked to metering, operations and ongoing tracking • Investigate feasibility of installing PV panels and/or requirements for future installation of PV system • Use roofing material that has a high Solar Reflective Index • Work with office purchasing department to specify low-energy office and kitchen equipment • Investigate current insulation design and determine proposed options

Objective	Proposed Target	Proposed Strategy
Choosing Materials • With consideration to energy inputs in manufacture • Toxicity • Consequential impacts – rain forest timbers • Regional or local manufacturer employment support	• Reduce steel and cement in internal slab (10% reduction in embodied energy) • Reduce embodied energy in concrete and plasterboard elements • Consider 95% of timber to be AFS or FSC certified • Reduce emissions associated with insulation and refrigerant • Reduce environmental impact of materials for tiling, awning, cladding, roller shutters etc	• Jointless fibre reinforced slab • Use pre-cast concrete panels with recycled content • Use plasterboard with recycled content or eco-certification • Joinery to be FSC certified timber • Use only insulation with zero ODP (Ozone Depleting Potential) associated with manufacture and composition; use only refrigerants with zero ODP • Use products with recycled content and/or eco certified (eg Almaxco, Wintec)
Minimising Waste • By clever design • Contracted to builder as a requirement on site for construction waste • During the life of the building • And in dealing with building end of life options	• Reduce construction waste going to landfill by 90% • Reduce operational waste going to landfill • Consider a design that can be disassembled at the end of the building's life	• Contractor is to develop and implement a Waste Management Plan and track all waste going offsite to show that 90% of all construction waste is re-used or recycled • Waste storage and recycling facilities to be provided for different operational recycling streams such as paper, glass, plastics, metals, food waste etc. Consider operational waste plans and training for staff to provide incentive to reduce waste • Specify mechanical joining mechanisms and components that can be demounted; document procedure for disassembly
Water Conservation and Reuse • Monitoring of meters to track use • Timely maintenance of fixtures and fittings • Water sensitive landscape design • Source potable water alternatives such as rain water harvesting, grey and black water treatment.	• Reduce potable water in internal fixtures • Reduce potable water for irrigation • Water efficient operation of appliances • Utilise rainwater and/or recycled water	• Water efficient sanitary taps and toilets • Water efficient and drought tolerant landscaping • Water and energy efficient dishwasher • Rainwater collection for toilets, irrigation and truck wash down

Objective	Proposed Target	Proposed Strategy
Land Use and Ecology Impact • Consider local biodiversity impacts of flora and fauna • Look to specialist advice on land impact in development.	• Encourage biodiversity • Reduce light pollution from the site • Consider reducing impact of stormwater flows off the site into the natural watercourses including Ropes Creek adjacent to the site	• Install indigenous planting appropriate to the area and the adjacent biodiversity lots. • Design external lighting to avoid emitting light into the night sky or beyond the site boundary • Consider integrated stormwater management to minimise the impact on receiving waters of flow volumes and pollution content. Eg. bioswales, bio retention, OSD tanks and treatment. • Consider permeable concrete /paving for staff car parking areas and footpaths etc.

3 Director General's Requirements

The Director General's environmental assessment requirements (DGRs) identified below are addressed in this section of the report:

1. A quantitative assessment of the potential Scope 1 and 2 greenhouse gas emissions of the development, and a qualitative assessment of the potential impacts of these emissions on the environment; and
2. A detailed description of the measures that would be implemented on site to ensure that the energy efficiency measures are consistent with the commitments made for the broader Oakdale site.

Furthermore the below comments from the Fairfield City Council are addressed in Section 2 of this report;

1. Water Reuse

   Consideration should be given to incorporate rainwater harvesting, recycling and reuse of sewerage to deliver potable water both within Oakdale Central, subject to approval of Sydney water, to supplement Sydney Water Supply.

2. Potential Energy Generation

   Consideration should be given to reduce reliance on connection to standard electricity and gas supplies for the future operation of the facility. In this regard, it is considered that the potential to provide further offsets against climate impacts (including carbon emission) that may be associate with the proposal should be fully considered.

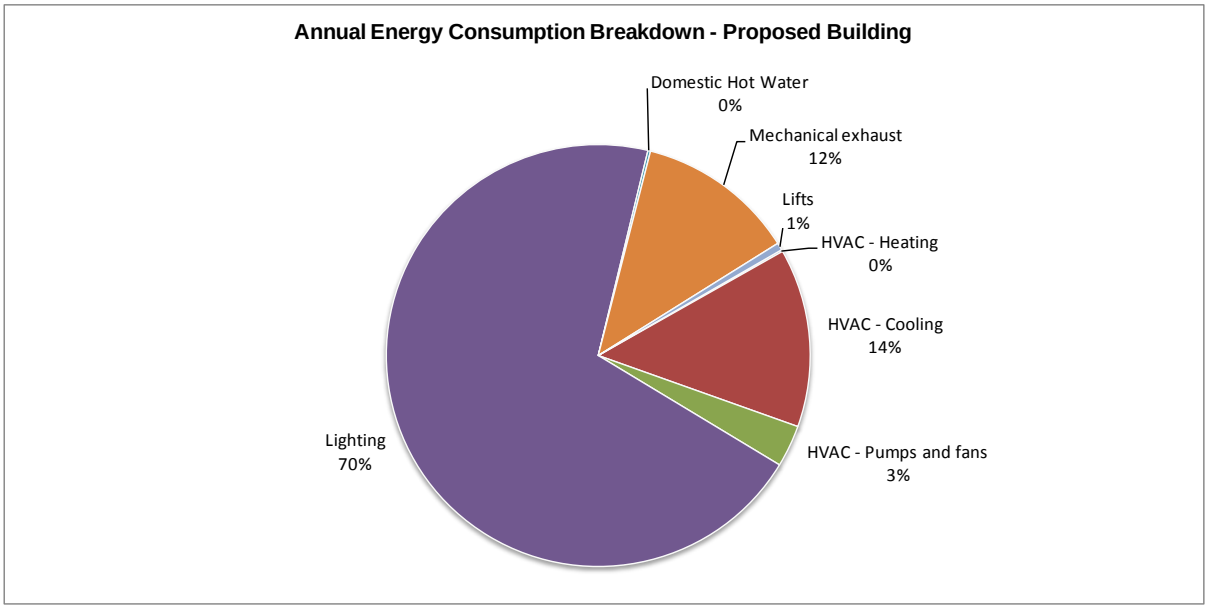
   Given the large roof area of the warehouses, measures should be incorporated into the proposal to take advantage of the significant roof area associated with the proposal for the purposes of rainwater harvesting. Similarly, Council considers that further consideration should be given in both the current and future stages of the development for the inclusion of solar power and how green power can be returned to the state electricity grid.

3.1 GHG Quantification and Qualification

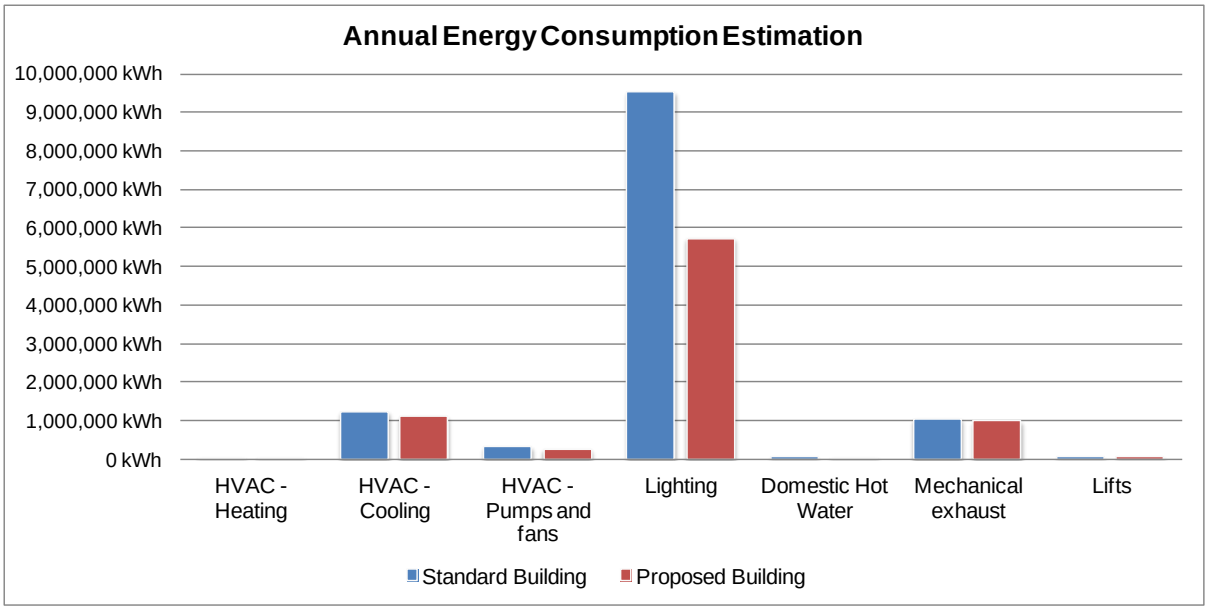
Based on the DA documentation a high level analysis of the energy related greenhouse gas emissions has been conducted. This analysis has been developed for a base case development and also a proposed development.

The base case analysis utilised the Building Codes of Australia Section J minimum compliance requirements. The proposed development utilised the design data where known or assumed improvements.

A breakdown of the energy consumption is shown below. It is noted that a large portion of the energy is related to lighting of the warehouse.



A comparison of the base case energy and the proposed building energy is shown on the following page. A significant improvement in the lighting efficiency through the design optimisation, energy efficiency and daylight linking has achieved a 40% energy saving.



A summary of the total electricity, gas and greenhouse gas emissions is shown below.

Scenario	Electricity	Gas	GHG Emissions
Total - Base Case	12,189,167 kWh	53,460.0 MJ	13,046,030 kg CO2
Total - Proposed	8,174,013 kWh	0.0 MJ	8,746,194 kg CO2
Saving	4,015,154 kWh	53,460.0 MJ	4,299,835 kWh
Change	32.9%	100.0%	33.0%

This analysis indicates that a greenhouse gas saving of 33% is achievable in comparison to a base case development.

3.2 Energy Efficiency Measures

The energy efficiency measures in the table below are being considered for Lot 1C, 2B and 3 and are consistent with the commitments made for the broader Oakdale site.

Objective	Proposed Target	Proposed Strategy
Minimising Energy Use • Consider passive design to minimise energy use such as orientation, ventilation, shading and floor plate design. • Appropriate sizing of plant and equipment in heating and cooling, lighting, control systems, • Building management systems and renewable energy sources • Reduce reliance on connection to grid electricity and gas	• Target a 20% reduction in Greenhouse gas emissions • Energy sub-metering for all major uses greater than 100kVa; linked to monitoring system • High efficiency warehouse lighting and controls • Reduce energy for water heating • Integrated building management • Consider renewable energy generation for a portion of energy consumption and/or consider future-proofing the building for future installation • Reduce urban heat island effect and heat load through the roof by providing a highly reflective roof • Reduce office equipment load from 20W/m² to 15W/m² • Optimise insulation for energy and thermal comfort	• Lot 1C and Lot 3 - Predominantly south, south easterly office space, consider insulated spandrel panels to reduce the glazing area and associated heat loss in winter • Lot 2B - Predominantly north facing office, consider additional shading or solar controlled glazing to reduce heat transfer into the office space • Allow high-level ventilation openings to warehouse spaces. Consider alternative passive exhaust options such as wind or solar assisted whirly birds to improve thermal comfort • Consider operable windows with reed switches to allow offices to operate with mixed-mode air conditioning • Consider office air conditioning temperature set-points for an increased comfort band • Provide energy efficient T5 lighting, with zoning and automatic controls where reasonable • Consider LED lighting strategies and advanced controls • Consider a solar water system with gas boost • Consider solar photovoltaic panels or allow upgraded roof structure for potential future installation • Sub-metering: install appropriate metering; develop metering and tracking strategy to allow for self-assessment, problem solving and ongoing improvements during operations • BMS linked to metering, operations and ongoing tracking • Investigate feasibility of installing PV panels and/or requirements for future installation of PV system • Use roofing material that has a high Solar Reflective Index • Work with office purchasing department to specify low-energy office and kitchen equipment • Investigate current insulation design and determine proposed options

4 BCA Section J Compliance

The development is required to comply with Section J (Energy Efficiency) of the BCA, 2013. Based on the DA Design, Section J Assessment has been carried out to determine the compliance of the design.

The building site is located in BCA Climate Zone 6 and the study below assumes that the warehouse spaces are un-conditioned spaces and the office spaces are each conditioned.

Detailed strategies to comply with sections J1 and J2 are outlined in the following sections.

4.1 Part J1 – Building Fabric

In relation to part J1 Building Fabric, the Deemed-to-Satisfy (DTS) requirements specify minimum insulation levels required for all air-conditioned habitable spaces. Conditioned spaces are to meet the insulation requirements outlined below. The figures quoted are for whole constructions.

Part	Minimum R-Value
Roof and Ceiling	R3.2 Note: A roof that has metal sheet roofing fixed to metal purlins, rafters or battens and does not have a ceiling lining (or has ceiling lining fixed to the purlins, rafters or battens) must have a thermal break installed between the sheet roofing and purlins, rafters or battens with thermal resistance of no less than R0.2.
External Walls	R2.8 (eg external office walls)
Internal Walls	R1.0 for internal walls forming the building envelope separating conditioned space from non-conditioned space. Providing the non-conditioned space is enclosed, with mechanical ventilation of not more than 1.5 air changes per hour of outside air. (Eg walls between office and warehouse) R1.8 for all other internal walls separating conditioned space from non-conditioned space.
Floors	No additional insulation required for slab on ground R1.0 for a suspended floor above a mechanically ventilated (<1.5 ac/h) non-conditioned space R2.0 for all other floors separating conditioned space from non-conditioned space
Roof lights	Roof lights serving conditioned spaces must not have area greater than **5%** of the area they serve, and must have the following properties: U value of 3.4 W/m²K and SHGC of 0.34.

Table 1: BCA DTS Building Fabric Insulation Requirements

4.2 Section J2 – Glazing

BCA Glazing Assessment has been carried out for the conditioned office spaces. At this stage the assessment has been carried out to determine the glazing performance required for the current design to meet the Deemed-to-Satisfy (DTS) requirements.

The properties quoted in this report are shown to demonstrate that the design is compliant with BCA Section J. This report does not act as a specification for glazing to be used in the final design.

It is likely that JV3 alternate verification modelling will be undertaken for the office areas. During the detailed design phase of the project where specific glazing types are preferred, whole building modelling may be carried out in accordance with Section J, Verification Method 3 (JV3). JV3 modelling involves comparing the annual energy consumption of the 'reference building' – i.e. the proposed building geometry with BCA Deemed-to-Satisfy (DTS) building fabric, glazing and services – to the proposed building, with the proposed fabric, glazing and services. The design is verified compliant if the annual energy consumption of the proposed building is lower than the annual energy consumption of the reference building. This exercise may be required to be undertaken during detailed design to ensure that the design is complaint with the preferred glazing types.

The following pages present the DTS glazing properties required for each section of the buildings where conditioned spaces have been noted.

Glazing properties quoted are whole system values, inclusive of both frame and glazing.

Lot 1C

Glazing to the office has been assumed as 2.7m high with a 900mm spandrel at high level. Total slab to ceiling height assumed as 3.6m.

Glazing to the Dock Office is assumed to be 1.8m high with a total slab to slab height of 2.7m.

The following pages present the glazing properties required for DTS compliance. Glazing properties quoted are whole system values, inclusive of both frame and glazing.

A summary of the glazing requirements is shown below:

Location	Level	Facade	U-value	SHGC	Example Window Type
Office	Ground	S	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Ground	E	2.5	0.14	Double glazed tinted low-e with thermally broken aluminium frame
	Ground	W	2.5	0.14	Double glazed tinted low-e with thermally broken aluminium frame
Dock Office	Ground	S	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Ground & Level 1	E	2.6	0.23	Double glazed tinted low-e with thermally broken aluminium frame
	Ground & Level 1	N	2.6	0.44	Double glazed low-e with thermally broken aluminium frame
	Ground	Internal	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Level 1	S	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame
	Level 1	Internal	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame

Lot 2B

Glazing to the office has been assumed as 2.7m high with a 900mm spandrel at high level. Total slab to ceiling height assumed as 3.6m.

Glazing to the Dock Office is assumed to be 1.8m high with a total slab to slab height of 2.7m.

The following pages present the glazing properties required for DTS compliance. Glazing properties quoted are whole system values, inclusive of both frame and glazing.

A summary of the glazing requirements is shown below:

Location	Level	Facade	U-value	SHGC	Example Window Type
Office	Ground	N	6.5	0.40	Single glazed tinted with aluminium frame
	Level 1	N	2.6	0.19	Double glazed tinted low-e with thermally broken aluminium frame
	Level 1	E	2.6	0.19	Double glazed tinted low-e with thermally broken aluminium frame
	Level 1	W	1.9	0.16	Double glazed tinted low-e with PVC frame
Dock Office 1	Ground	S	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Ground & level 1	E	2.6	0.23	Double glazed tinted low-e with thermally broken aluminium frame
	Ground & level 1	N	2.6	0.44	Double glazed low-e with thermally broken aluminium frame
	Ground	Internal	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Level 1	S	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame
	Level 1	Internal	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame
Dock Office 2	Ground	S	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Ground & level 1	N	2.6	0.44	Double glazed low-e with thermally broken aluminium frame
	Ground	Internal	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Ground & level 1	W	1.8	0.12	Double glazed tinted low-e with PVC frame
	Level 1	S	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame
	Level 1	Internal	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame

Lot 3

Glazing to the office has been assumed as 2.7m high with a 900mm spandrel at high level. Total slab to slab height assumed as 4.2m.

Glazing to the Dock Office is assumed to be 1.8m high with a total slab to slab height of 2.7m.

The following pages present the glazing properties required for DTS compliance. Glazing properties quoted are whole system values, inclusive of both frame and glazing.

A summary of the glazing requirements is shown below:

Location	Level	Facade	U-value	SHGC	Example Window Type
Office	Ground	E	2.4	0.18	Double glazed tinted low-e with thermally broken aluminium frame
	Ground	S	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Ground	W	1.8	0.18	Double glazed tinted low-e with PVC frame
	Level 1	N	2.6	0.37	Double glazed tinted low-e with thermally broken aluminium frame
	Level 1	E	2.6	0.37	Double glazed tinted low-e with thermally broken aluminium frame
	Level 1	S	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Level 1	W	3.3	0.67	Clear double glazing with thermally broken aluminium frame
Dock Office	Ground & Level1	N	3.3	0.16	Double glazed tinted with thermally broken aluminium frame
	Ground & Level1	E	1.8	0.16	Double glazed tinted low-e with PVC frame
	Ground & Level1	W	1.8	0.16	Double glazed tinted low-e with PVC frame
	Ground	Internal	3.3	0.67	Clear double glazing with thermally broken aluminium frame
	Level 1	Internal	2.4	0.64	Clear double glazed low-e with thermally broken aluminium frame

5 Appendices

Appendix A : BCA Glazing Calculator Outputs

Lot 1C Office

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A			53.5m²		161m²		40.3m²		
Option B									n/a
Glazing area (A)			30.8m²		85.1m²		22.1m²		

Number of rows preferred in table below: 4 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	South	S		2.70	27.00		3.3	0.67	0.400	3.600	0.11	0.90	0.99	0.99	72.90	85% of 77%
2	East	E		2.70	11.40		2.5	0.14				0.00	1.00	1.00	30.78	100% of 93%
3	West	W		2.70	8.20		2.5	0.14	4.500	3.600	1.25	0.90	0.73	0.66	22.14	100% of 100%
4	South Entrance	S		2.70	4.50		3.3	0.67	2.000	3.600	0.56	0.90	0.95	0.91	12.15	15% of 77%

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if inputs are valid

Figure 5: BCA Glazing Calculator – Lot 1C Office Ground Floor

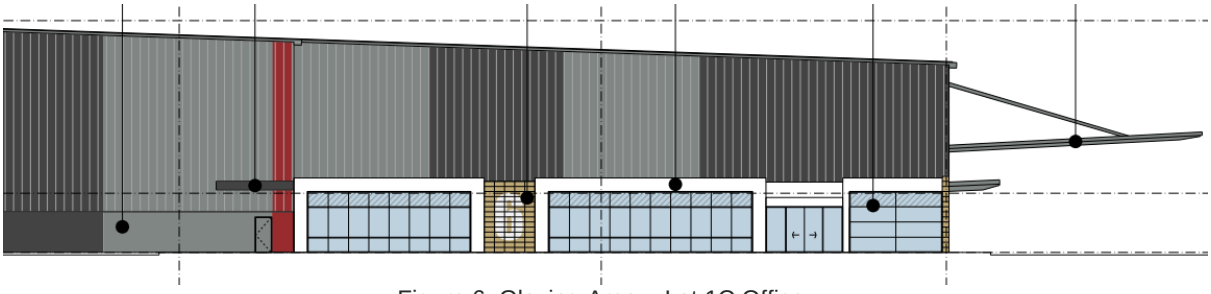

Figure 6: Glazing Area – Lot 1C Office

Lot 1C Dock Office

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	3.92m²		25.1m²		3.92m²				69m²
Option B									n/a
Glazing area (A)	2.52m²		17.1m²		2.52m²				18m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	South	S		1.80	1.40		3.3	0.67				0.00	1.00	1.00	2.52	100% of 93%
2	East	E		1.80	8.00		2.6	0.23	device		2.00	0.00	0.01	0.29	14.40	84% of 100%
3	North	N		1.80	1.40		2.6	0.44	device		2.00	0.00	0.00	0.30	2.52	100% of 98%
4	Internal	internal		1.80	10.20		3.3	0.67			2.00	0.00	0.55	0.55	18.36	100% of 72%
5	East Entrance	E		2.70	1.00		2.6	0.23	device		2.00	0.00	0.01	0.29	2.70	16% of 100%

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if inputs are valid

Figure 7: BCA Glazing Calculator – Lot 1C Dock Office Ground Floor

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Level 1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	3.92m²		25.1m²		3.92m²				69m²
Option B									n/a
Glazing area (A)	2.52m²		16.7m²		2.52m²				38m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	South	S		1.80	1.40		2.4	0.64	13.600	1.900	7.16	0.10	0.55	0.55	2.52	100% of 100%
2	East	E		1.80	9.30		2.6	0.23	13.600	1.900	7.16	0.10	0.01	0.29	16.74	100% of 98%
3	North	N		1.80	1.40		2.6	0.44	13.600	1.900	7.16	0.10	0.00	0.30	2.52	100% of 98%
4	Internal	internal		1.80	21.00		2.4	0.64			2.00	0.00	0.55	0.55	37.80	100% of 89%
5																

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if inputs are valid

Figure 8: BCA Glazing Calculator – Lot 1C Dock Office Level 1

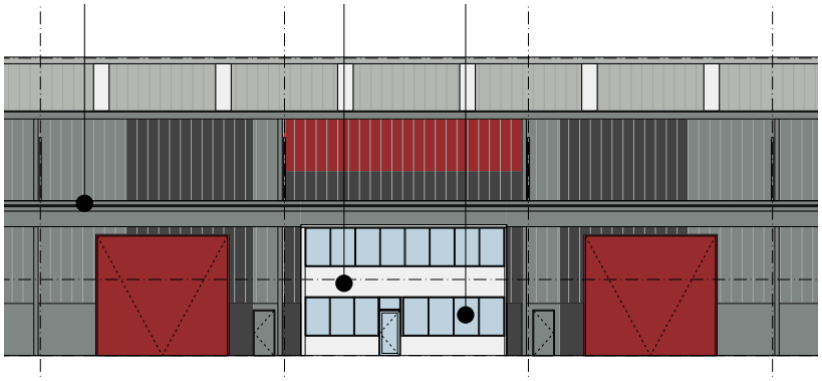

Figure 9: Glazing Area – Lot 1C Dock Office

Lot 2B Office

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	24.4m²								
Option B									n/a

Glazing area (A) 19.7m²

Number of rows preferred in table below: 2 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	North	N		2.70	2.10		6.5	0.40	1.300	2.700	0.48	0.00	0.73	0.57	5.67	36% of 100%
2	North	N		2.70	5.20		6.5	0.40	3.400	2.700	1.26	0.00	0.00	0.32	14.04	64% of 100%

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if inputs are valid

Figure 10: BCA Glazing Calculator – Lot 2B Office Ground Floor

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Office | Application: other | Climate zone: 6

Storey: Level 1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	212m²		82.8m²				53.6m²		
Option B									n/a

Glazing area (A) 125m² ..... 41m² 34m²

Number of rows preferred in table below: 6 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	North	N		2.70	46.20		2.6	0.19	0.300	3.600	0.08	0.90	1.00	0.99	######	100% of 97%
2	West	W		2.70	4.80		1.9	0.16	0.300	3.600	0.08	0.90	1.00	0.99	12.96	39% of 100%
3	East	E		2.70	15.20		2.6	0.19	1.700	3.600	0.47	0.90	0.96	0.92	41.04	100% of 92%
4	West	W		0.90	7.80		1.9	0.16	0.300	0.900	0.33	0.00	0.82	0.77	7.02	19% of 100%
5	West	W		0.90	7.80		1.9	0.16	0.300	0.900	0.33	0.00	0.82	0.77	7.02	19% of 100%
6	West	W		0.90	7.80		1.9	0.16	0.300	0.090	3.33	-0.81	0.05	0.31	7.02	22% of 100%

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if inputs are valid

Figure 11: BCA Glazing Calculator – Lot 2B Office Level 1

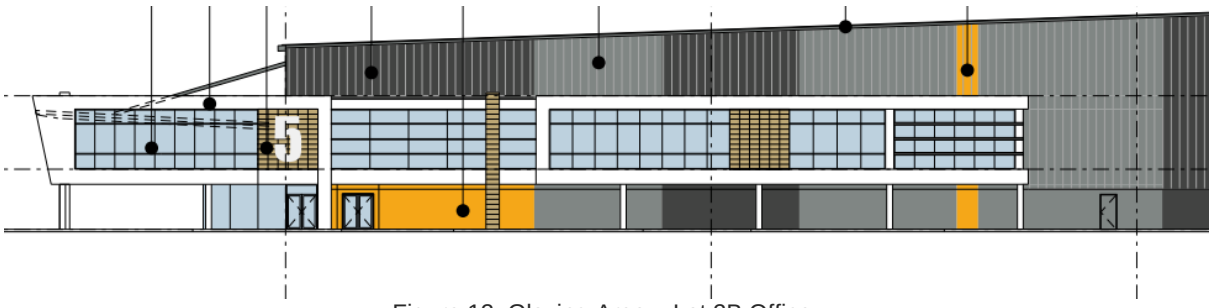

Figure 12: Glazing Area – Lot 2B Office

Lot 2B Dock Office 1

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	3.92m²		25.1m²		3.92m²				69m²
Option B									n/a
Glazing area (A)	2.52m²		17.1m²		2.52m²				18m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	South	S		1.80	1.40		3.3	0.67				0.00	1.00	1.00	2.52	100% of 93%
2	East	E		1.80	8.00		2.6	0.23	device		2.00	0.00	0.01	0.29	14.40	84% of 100%
3	North	N		1.80	1.40		2.6	0.44	device		2.00	0.00	0.00	0.30	2.52	100% of 98%
4	Internal	internal		1.80	10.20		3.3	0.67			2.00	0.00	0.55	0.55	18.36	100% of 72%
5	East Entrance	E		2.70	1.00		2.6	0.23	device		2.00	0.00	0.01	0.29	2.70	16% of 100%

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if inputs are valid

Figure 13: BCA Glazing Calculator – Lot 2B Dock Office 1 Ground Floor

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Level 1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	3.92m²		25.1m²		3.92m²				69m²
Option B									n/a
Glazing area (A)	2.52m²		16.7m²		2.52m²				38m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	South	S		1.80	1.40		2.4	0.64	13.600	1.900	7.16	0.10	0.55	0.55	2.52	100% of 100%
2	East	E		1.80	9.30		2.6	0.23	13.600	1.900	7.16	0.10	0.01	0.29	16.74	100% of 98%
3	North	N		1.80	1.40		2.6	0.44	13.600	1.900	7.16	0.10	0.00	0.30	2.52	100% of 98%
4	Internal	internal		1.80	21.00		2.4	0.64			2.00	0.00	0.55	0.55	37.80	100% of 89%
5																

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if inputs are valid

Figure 14: BCA Glazing Calculator – Lot 2B Dock Office 1 Level 1

Lot 2B Dock Office 2

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	3.92m²				3.92m²		25.1m²		69m²
Option B									n/a
Glazing area (A)	2.52m²				2.52m²		17.1m²		18m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)		P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	South	S		1.80	1.40		3.3	0.67					0.00	1.00	1.00	2.52	100% of 93%
2	East	W		1.80	8.00		1.8	0.12					0.00	1.00	1.00	14.40	84% of 99%
3	North	N		1.80	1.40		2.6	0.44		device		2.00	0.00	0.00	0.30	2.52	100% of 98%
4	Internal	internal		1.80	10.20		3.3	0.67				2.00	0.00	0.55	0.55	18.36	100% of 72%
5	East Entrance	W		2.70	1.00		1.8	0.12					0.00	1.00	1.00	2.70	16% of 99%

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if inputs are valid ✓

Figure 15: BCA Glazing Calculator – Lot 2B Dock Office 2 Ground Floor

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Level 1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	3.92m²				3.92m²		25.1m²		69m²
Option B									n/a
Glazing area (A)	2.52m²				2.52m²		16.7m²		38m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)		P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	South	S		1.80	1.40		2.4	0.64					0.00	1.00	1.00	2.52	100% of 26%
2	East	W		1.80	9.30		1.8	0.12					0.00	1.00	1.00	16.74	100% of 98%
3	North	N		1.80	1.40		2.6	0.44		device		2.00	0.00	0.00	0.30	2.52	100% of 98%
4	Internal	internal		1.80	21.00		2.4	0.64				2.00	0.00	0.55	0.55	37.80	100% of 89%
5																	

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if inputs are valid ✓

Figure 16: BCA Glazing Calculator – Lot 2B Dock Office 2 Level 1

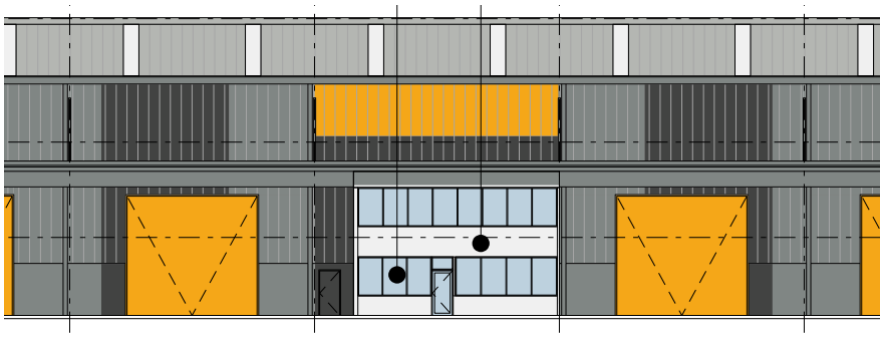

Figure 17: Glazing Area – Lot 2B Dock Office

Lot 3 Office

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A			68.6m²		216m²		68.6m²		
Option B									n/a
Glazing area (A)			37m²		136m²		43.2m²		

Number of rows preferred in table below: 3 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)		P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	East	E		2.70	13.70		2.4	0.18		0.400	3.600	0.11	0.90	0.99	0.99	36.99	100% of 100%
2	South	S		2.70	50.50		3.3	0.67		0.400	3.600	0.11	0.90	0.99	0.99	######	100% of 91%
3	West	W		2.70	16.00		1.8	0.18		0.200	3.600	0.06	0.90	1.00	0.99	43.20	100% of 100%

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if inputs are valid

Figure 18: BCA Glazing Calculator – Lot 3 Office Ground Floor

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Level 1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	60.5m²		183m²		260m²		184m²		
Option B									n/a
Glazing area (A)	17m²		55.5m²		150m²		53.4m²		

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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)		P (m)	H (m)	P/H	G (m)	Heating (S_w)	Cooling (S_c)	Area used (m²)	Element share of % of allowance used
1	South	S		2.70	6.80		3.3	0.67					0.00	1.00	1.00	18.36	12% of 83%
2	South	S		2.70	34.90		3.3	0.67		0.400	3.600	0.11	0.90	0.99	0.99	94.23	63% of 83%
3	West	W		2.70	7.80		3.3	0.67		device		2.00	0.00	0.05	0.31	21.06	46% of 99%
4	West	W		2.70	7.80		3.3	0.67		4.400	3.600	1.22	0.90	0.74	0.66	21.06	32% of 99%
5	West Bridge	W		0.78	14.40		3.3	0.67					0.00	1.00	1.00	11.23	22% of 99%
6	South Entrance	S		2.70	13.70		3.3	0.67					0.00	1.00	1.00	36.99	25% of 83%
7	East	E		2.70	13.70		2.6	0.37		0.400	3.600	0.11	0.90	0.99	0.99	36.99	66% of 98%
8	East	E		2.70	2.70		2.6	0.37					0.00	1.00	1.00	7.29	13% of 98%
9	East Bridge	E		0.78	14.40		2.6	0.37					0.00	1.00	1.00	11.23	20% of 98%
10	North Entrance	N		2.70	6.30		2.6	0.37					0.00	1.00	1.00	17.01	100% of 98%

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

Figure 19: BCA Glazing Calculator – Lot 3 Office Level 1

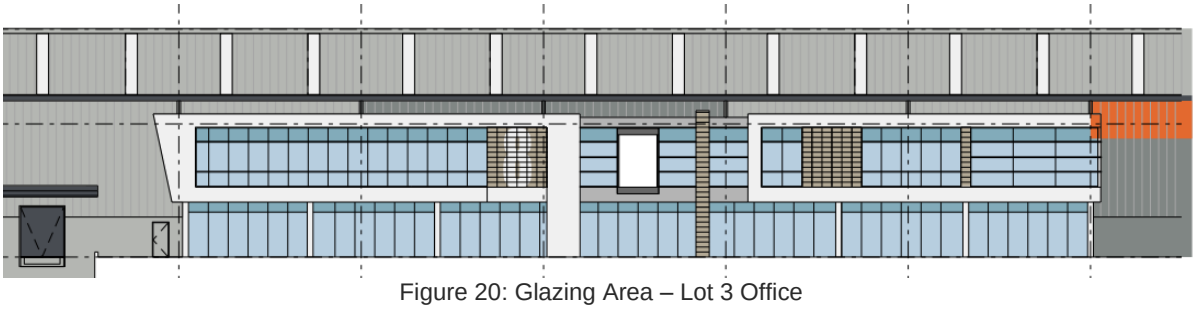

Figure 20: Glazing Area – Lot 3 Office

Lot 3 Dock Office

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Ground

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	25.1m²		3.92m²				3.92m²		69m²
Option B									n/a
Glazing area (A)	17.5m²		2.52m²				2.52m²		18m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)		P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	South	E		1.80	1.40		1.8	0.16					0.00	1.00	1.00	2.52	100% of 99%
2	East	N		1.80	8.20		3.3	0.16					0.00	1.00	1.00	14.76	85% of 92%
3	North	W		1.80	1.40		1.8	0.16					0.00	1.00	1.00	2.52	100% of 100%
4	Internal	internal		1.80	10.20		3.3	0.67				2.00	0.00	0.55	0.55	18.36	100% of 72%
5	East Entrance	N		2.70	1.00		3.3	0.16					0.00	1.00	1.00	2.70	15% of 92%

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if inputs are valid

Figure 21: BCA Glazing Calculator – Lot 3 Dock Office Ground Floor

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description: Oakdale Central - Dock Office | Application: other | Climate zone: 6

Storey: Level 1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	25.1m²		3.92m²				3.92m²		69m²
Option B									n/a
Glazing area (A)	16.6m²		2.52m²				2.52m²		38m²

Number of rows preferred in table below: 5 (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 (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)		P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	South	E		1.80	1.40		1.8	0.16					0.00	1.00	1.00	2.52	100% of 99%
2	East	N		1.80	9.20		3.3	0.16					0.00	1.00	1.00	16.56	100% of 87%
3	North	W		1.80	1.40		1.8	0.16					0.00	1.00	1.00	2.52	100% of 99%
4	Internal	internal		1.80	21.00		2.4	0.64				2.00	0.00	0.55	0.55	37.80	100% of 89%
5																	

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if inputs are valid

Figure 22: BCA Glazing Calculator – Lot 3 Dock Office Level 1

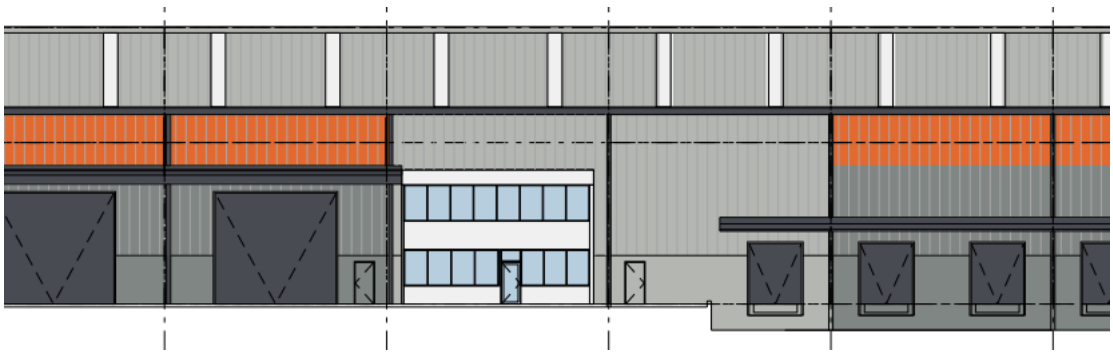

Figure 23: Glazing Area – Lot 3 Dock Office