

CUNDALL

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78-96 Arncliffe St, Wolli Creek ESD Report



Prepared for
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Contents

| | | |
|------|--|----|
| 1 | Executive Summary..... | 5 |
| 2 | Introduction..... | 9 |
| 3 | Director General Requirements | 10 |
| 3.1 | Relevant EPI's policies and Guidelines to be Addressed | 10 |
| 3.2 | Built Form | 10 |
| 3.3 | Urban Design..... | 10 |
| 3.4 | Environmental and Residential Amenity | 11 |
| 3.5 | Transport & Accessibility Impacts (Construction and Operational) | 11 |
| 3.6 | Ecologically Sustainable Development (ESD) | 11 |
| 3.7 | Contributions | 11 |
| 3.8 | Contamination | 11 |
| 3.9 | Consultation..... | 11 |
| 3.10 | Economic Impact Assessment..... | 11 |
| 3.11 | Public Domain | 12 |
| 3.12 | Drainage..... | 12 |
| 3.13 | Groundwater..... | 12 |
| 3.14 | Noise Assessment..... | 12 |
| 3.15 | Statement of Commitments | 12 |
| 4 | Rockdale DCP requirements | 12 |
| 5 | Rockdale LEP requirements..... | 14 |
| 5.1 | Objectives of the Mixed use Zone | 14 |
| 6 | BCA Section J1 and J2 requirements..... | 15 |
| 6.1 | Section J Review – General Parameters..... | 15 |
| | Climate Zone | 15 |
| | Building Classifications..... | 15 |
| | Information Used in Review..... | 15 |
| 6.2 | Section J1 – Building Fabric | 16 |
| J1.1 | – Application of Part..... | 16 |
| J1.2 | – Thermal Construction General..... | 16 |
| J1.3 | – Roof and Ceiling Construction | 16 |
| J1.4 | – Roof Lights | 16 |
| J1.5 | – Walls..... | 16 |
| J1.6 | – Floors..... | 16 |
| | Conclusions..... | 16 |
| 6.3 | Section J2 – External Glazing..... | 16 |
| J2.1 | – Application of Part..... | 16 |
| J2.2 | – Applicable Glazing Provisions..... | 17 |
| J2.4 | – Glazing - Method 2 | 17 |
| | Glazing Assessment..... | 17 |
| 7 | Additional ESD Initiatives | 18 |
| 7.1 | Building Form, Fabric & Orientation..... | 18 |
| | Orientation & Shading | 19 |
| | Structure & Insulation | 19 |
| | Glazing | 20 |

| | | |
|-----|--|----|
| 7.2 | Indoor Environmental Quality | 21 |
| | Daylight, Glare & External Views | 21 |
| | Thermal Comfort | 21 |
| 7.3 | Energy Savings | 22 |
| | Energy Efficiency Targets..... | 22 |
| | Passive Design..... | 23 |
| | Energy Efficiency..... | 23 |
| | Lighting | 23 |
| | Heating, Ventilation & Cooling (HVAC) | 24 |
| | Domestic Hot Water | 24 |
| | Retail Power | 24 |
| | Energy Management | 25 |
| 7.4 | Water Conservation..... | 26 |
| | Demand Reduction..... | 26 |
| | Rainwater & Stormwater Recycling | 27 |
| | Tracking and Monitoring..... | 27 |
| | Groundwater & Stormwater management | 28 |
| | Sustainable Building Materials | 29 |
| | Sustainable Timber..... | 30 |
| | Plasterboard | 30 |
| | MDF..... | 30 |
| | Paints and Adhesives | 30 |
| | Steel | 31 |
| | Concrete..... | 31 |
| | Tenancies..... | 31 |
| 8 | Appendices | 32 |

1 Executive Summary

78-96 Arncliffe St, Wolli Creek is located 230 metres south east of the Wolli Creek Railway Station. The site currently contains a range of industrial and commercial buildings used for car repair shops, storage and motor show rooms.

The \$260 million capital investment project would comprise a residential and serviced apartment component of around 45,000 m² with around 25,000 m² of retail GFA. This will be made up of a supermarket, a number mini major retail outlets and specialty retail.

This report highlights the ESD initiatives that are being carried out or will be investigated under the stage 1 development. The report also highlights environmental requirements to meet Rockdale DCP, LEP, Director General Requirements and BCA Section J1 fabric and J2 Glazing, under the Deemed to satisfy Methodology.

The main initiatives to be included or investigated in further detail are as below:

Director General Requirements (DGR)

Sustainable car parking measures

Sustainable public transport initiatives and secure bicycle parking facilities and associated signage

Incorporate ESD principles in the design, construction and ongoing operation phases of the development

Incorporate Water Sensitive Urban Design (WSUD) measures to ensure minimal impact on the ground water during construction and operation

Ensure noise from the development is mitigated for the surrounding residents

Rockdale Development Control Plan (DCP)

Correct management of contaminated land

Minimise waste generation through construction period

Ensure adequate flood control

Ensure adequate stormwater control

Minimise noise issue.

Reduce air pollution (dust during construction) including CO₂ emissions through construction and operation.

Rockdale Local Environment Plan (LEP)

Ensure the use of land will not adversely impact the surrounding area

Promote optimum development while minimising adverse environmental impacts by facilitating the efficient use of and access to the Wolli Creek railway station

To ensure that future development will meet environmental requirements relating to flood prone land, stormwater management, waste management, noise and vibration, air and water quality and energy efficiency as per the DCP.

BCA J1 & J2 Fabric and Glazing requirements

Walls to meet R1.8 and roof to meet R3.2

Glazing to meet the following standards:

| Required specifications | | Reference glazing to achieve required specifications |
|-------------------------|------|--|
| U-Value (W/m.K) | SHGC | |
| 6.5 | 0.7 | 1. Clear Laminate with aluminum frame or equivalent |
| 6.5 | 0.59 | 2. Grey Laminate with aluminum frame or equivalent |

Additional ESD initiatives

The consideration of orientation, shading, insulation glazing and structure has been included in the design.

The development will allow for daylight where appropriate whilst designing to minimise glare.

Thermal comfort of the occupants will be targeted whilst keeping in mind energy efficiency.

Energy consumption can be reduced through the efficient design of lighting, air-conditioning and ventilation systems, as well as water heating and other services

Focus should also be placed on lighting controls including consideration of:

- Daylight dimming or extinguishing of external and streetscape perimeter lighting, as well as internal lighting adjacent to the skylights;
- Motion detectors in infrequently used spaces such as plant rooms, along with timer switches where appropriate;
- Localised light switching, with lighting zones to be $\leq 250\text{m}^2$;
- Central automatic timed control of lighting throughout the centre

The following energy initiatives can help to reduce air-conditioning energy:

- Each A/C unit to be within the top 10% of energy efficiency, with a high Coefficient of Performance (COP), particularly at part load (and use a zero ODP refrigerant).
- Install high-efficiency chillers;
- Variable Air Volume (VAV) air conditioning systems may be considered and adopted if deemed suitable for retail centre use;
- Outside Air supply can be controlled by CO₂ sensors to reduce energy consumption at part occupancy;
- Be zoned so that only occupied areas are cooled and so that spaces with different occupancy patterns or drastically different cooling loads are zoned separately. To achieve this, motion sensors and timers should be used to automatically switch off when parts of the centre will be unoccupied (Absence off control).

- A/C should have a simple control and be linked to a timer to turn off. The control strategy is "Absence Off": manual on, manual off, auto off.
- A wider, internal temperature range will be considered. For example, when it is 36°C outside, an internal temperature of 24 - 26°C is considered quite comfortable by most people provided radiant temperature is reduced (e.g. no direct solar gain) and air movement is provided (e.g. natural ventilation or ceiling fans). This could use significantly less energy than trying to cool to a standard 22 - 24°C throughout the year.

Additionally, an energy monitoring system may include the following:

- The power loads of each separate area of the centre;
- The lighting loads of each separate area of the centre;
- Any piece of equipment using over 100kVA;
- Condenser water temperatures to enable monitoring of the chillers/cooling tower interface.

Water reduction strategies such as:

- Use of 3 / 4.5L dual flush toilets;
- Use of 0.8L low flush urinals or waterless urinals;
- Showers with a maximum flow rate of 7.5 L/min (e.g. *Ecoshower*);
- Wash hand basin faucets with a maximum flow rate of 4 L/min;
- Cleaners and kitchen taps with a maximum flow rate of 6L/min;
- Drought resistant (xeriscape) plants and grass for gardens and landscaping where appropriate;
- The following practices for all sprinkler, micro spray, sub-soil drip system or any other watering system:
 - On-site rainwater storage tank supply; and/or
 - Usage on alternate days between the hours of 10.00am and 5.00pm;
- Installing watering systems with either a rain sensor or soil moisture sensor as part of the control system;
- Cleaning of paved areas with an alternative to water unless cleaning is required as a result of an accident, fire, health or safety hazard, or other emergency;
- Consideration of flow shut-off device for all hoses;
- Consideration of water-efficient cooling towers that achieve 6 cycles of concentration or more.

Rain and stormwater strategies to be investigated

Sustainable building materials such as recycled or FSC timber, low formaldehyde composite wood products, low VOC paints and adhesives, recycled steel, recycled content in concrete, and recycled aggregate should be used

Pervious swales to be considered rather than the standard concrete drainage system

2 Introduction

78-96 Arncliffe St, Wolli Creek is located 230 metres south east of the Wolli Creek Railway Station. The site currently contains a range of industrial and commercial buildings used for car repair shops, storage and motor show rooms.

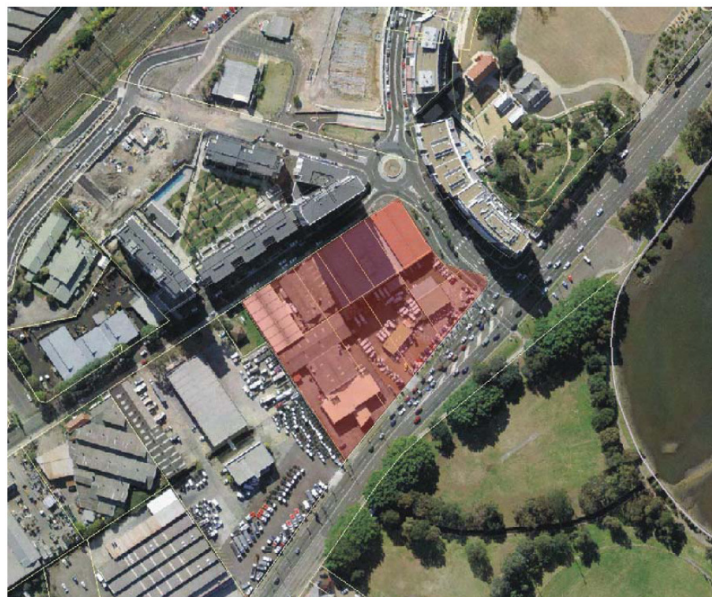
In addition to the CityRail network the site is in close proximity to Port Botany, Sydney Airport, the M5 Motorway, and the Sydney CBD, therefore making it highly accessible. The area forms part of a growing redevelopment zone extending along the Airport Rail Line linking Wolli Creek to Sydney Airport's international and domestic terminals, Mascot, Green Square, and the CBD.

Wolli Creek is identified as a "Village" in the NSW Department of Planning's Draft South Subregional Strategy which generally means there is one major retailer and other local retail outlets such as hairdressers and take-away food shops etc and contain between 2,100 to 5,500 dwellings. Wolli Creek also forms part of the "Global Economic Corridor" as identified in the NSW Department of Planning's Metropolitan Strategy, City of Cities – A Plan For Sydney's Future.

The \$260 million capital investment project would comprise a residential and serviced apartment component of around 45,000 m² with around 25,000 m² of retail GFA. This will be made up of a supermarket, a number mini major retail outlets and specialty retail.

The development will be split into various stages. Stage one, which this scope and fee addresses, will comprise a supermarket of 4,200m² and a retail outlet of 600m² only. At some time in the future the stage 1 development will make way for the stage 2 which may include the rest of the development in its entirety.

This report highlights the ESD initiatives that are being carried out or will be investigated under the stage 1 development. The report also highlights environmental requirements to meet Rockdale DCP, LEP, Director General Requirements and BCA Section J1 fabric and J2 Glazing, under the Deemed to satisfy Methodology.



Proposed development site

This report also reviews the proposed design of the development with respect to environmental performance in the following categories:

| | |
|--------------------------------|---------------------------------------|
| Building Form & Fabric | Energy Consumption & Renewable Energy |
| Indoor Environmental Quality | Environmental Site Management |
| Sustainable Building Materials | Groundwater & Stormwater Management |
| Water Consumption | Air & Noise Pollution |
| Waste Management | |

The scope and systems described herewith cater for the abovementioned performance requirements, and will be further developed through the detailed design stage. Please note that this report addresses the shopping centre extension & refurbishment, and does not attempt to address the existing component of the centre.

3 Director General Requirements

The Director general Requirements requests that the following key issues are addressed:

3.1 Relevant EPI's policies and Guidelines to be Addressed

Planning provisions applying to the site, including permissibility and the provisions of all plans and policies including, but not limited to:

- Objects of the EP&A Act 1979;
- NSW State Plan, Urban Transport Statement;
- Draft South Sub-regional Strategy;
- SEPP 55 Remediation of Land;
- SEPP (Infrastructure) 2007;
- Rockdale Local Environmental Plan 2000;

Relevant Rockdale Development Control Plans and policies, including, but not limited to, the Wolli Creek Streetscape Design Manual, and the Residential Amenity Improvements Scheme (RAIS); and Nature and extent of any non-compliance with relevant environmental planning instruments, plans and guidelines and justification for any non-compliance.

3.2 Built Form

The EA shall address the height, bulk and scale, within the context of the adjacent streetscapes and the general locality.

The EA shall clearly detail existing built form to be retained and to be demolished. A structural engineer's report, prepared by a suitably qualified engineer, shall be submitted demonstrating the structural integrity of any walls, floors and roofs to be retained.

3.3 Urban Design

The EA shall address the design quality with specific consideration of the façade treatment and design, massing, setbacks, building articulation, roof form design, use of appropriate colours, materials/finishes, landscaping, safety by design and public domain.

The EA shall consider the following:

The provision of active frontages to the Princes Highway, Broadie Sparks Drive and Arncliffe Street. The provision of a Signage Strategy for the temporary uses including details of illumination.

3.4 Environmental and Residential Amenity

The EA must address solar access, acoustic privacy, visual privacy, view loss and achieve a high level of environmental and residential amenity for surrounding residential occupiers.

3.5 Transport & Accessibility Impacts (Construction and Operational)

The EA shall address the following matters:

- Provide a Transport & Accessibility Impact Assessment prepared in accordance with the RTA's Guide to Traffic Generating Developments, considering the following issues:
 - Traffic generation including daily and peak traffic movements likely to be generated by the proposed development and the impact on nearby intersections
 - Access, loading dock(s) and service vehicle movements, including consideration of current restrictions on ingress from Broadie Spark Drive and egress onto Arncliffe Street;
 - Car parking arrangements;
 - Measures to promote sustainable means of transport including public transport usage and pedestrian and bicycle linkages in addition to addressing the potential for implementing a location specific sustainable travel plan;
 - Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets;
 - Identify measures to mitigate potential impacts for pedestrians and cyclists during and after the construction stage of the project (eg signposting);
 - Identify and resolve barriers to efficient and safe pedestrian and cycle access and identify all possible options for pedestrian and cycle connections through the subject site. Links to Wolli Creek and Arncliffe stations and the Princes Highway bus corridor from the subject site should also be specifically addressed with any necessary infrastructure upgrades identified;

3.6 Ecologically Sustainable Development (ESD)

The EA shall detail how the development will incorporate ESD principles in the design, construction and ongoing operation phases of the development..

3.7 Contributions

The EA shall address the provision of public benefit, services and infrastructure having regard to Council's Section 94 Contribution Plan for Wolli Creek, and provide details of any Voluntary Planning Agreement or other legally binding instrument proposed to facilitate this development.

3.8 Contamination

The EA is to demonstrate that the site is suitable for the proposed uses in accordance with SEPP 55.

3.9 Consultation

Undertake an appropriate and justified level of consultation in accordance with the Department's *Major Project Community Consultation Guidelines October 2007*.

3.10 Economic Impact Assessment

The EA shall address the economic impact of the proposal and include a detailed investigation into the impact upon the retail, commercial and residential industry within the locality (including current approvals) and having regard to the hierarchy of centres in the relevant regional strategy.

3.11 Public Domain

The EA shall provide details on the interface between the proposed uses and public domain, and the relationship to and impact upon the existing public domain.

The EA shall consider;

- Potential improvements to the existing public domain including local streets, footpaths and shared - zones and identify any proposed road closures, openings and re-alignments.
- Interface of proposed development and public domain;
- Relationship to and impact upon existing public domain;
- Provision of street lighting, underground power lines and CCTV;
- Public art strategy; and
- Provision of a public plaza on the corner of Broadie Spark Drive and Arncliffe Street.

3.12 Drainage

The EA shall address drainage/flooding issues associated with the development/site, including: stormwater, drainage infrastructure and incorporation of Water Sensitive Urban Design measures. The EA shall identify any potential hydraulic connection between the proposed development and groundwater sources and propose mitigation measures for any possible connection.

The EA shall provide an assessment of any flood risk on site in consideration of any relevant provisions of the NSW Floodplain Development Manual (2005) including the potential effects of climate change, sea level rise and an increase in rainfall intensity.

3.13 Groundwater

The EA shall address any impacts upon groundwater resources, and when impacts are identified, provide contingency measures to remediate, reduce or manage potential impacts.

3.14 Noise Assessment

The EA shall address the issue of noise from the development on surrounding residential occupiers and provide detail of how this will be managed and ameliorated through the design of the building, in compliance with relevant Australian Standards.

3.15 Statement of Commitments

The EA must include a draft Statement of Commitments detailing measures for environmental management, mitigation measures and monitoring for the project.

4 Rockdale DCP requirements

The area is covered by RockDale DCP62 for the Wolli Creek area. Part 8 of the DCP stipulates the requirements for Environmental manage.

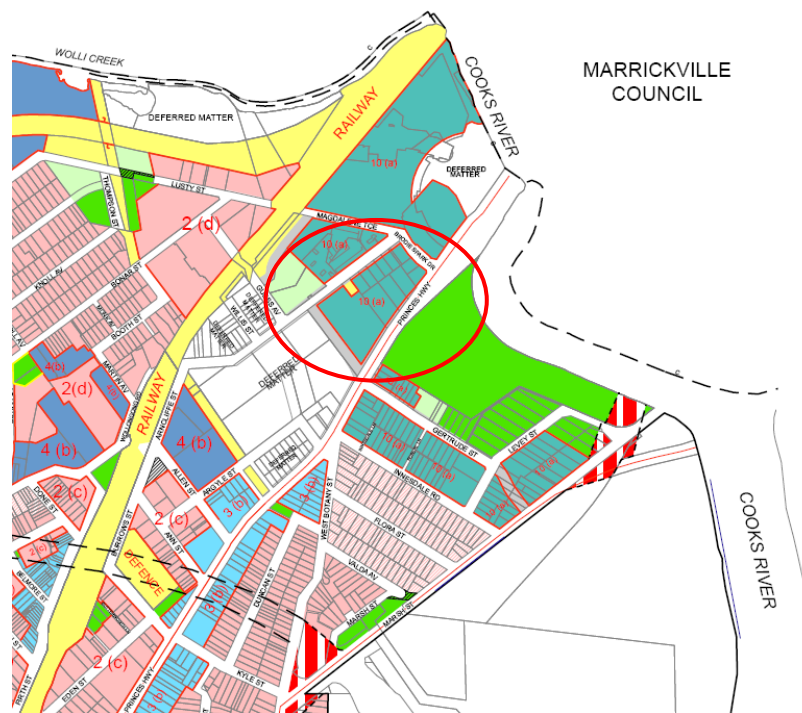
The main objectives of the DCP from an environmental standpoint are:

- Contaminated soil and acid sulphate soils:
 - To ensure the development of potentially contaminated land is undertaken in a responsible manner and disposal of contaminated material according to the Environment Protection Authority requirements.
 - To mitigate against the disturbance and impacts of acid sulphate soils.
- To ensure the construction and operation activities of proposed land uses to minimise the generation of waste in accordance with the Waste Avoidance and Resource Recovery Act 2001.
- Flood Control:

- To provide adequate flood protection to the area which is appropriate to the scale, value and intensity of the development that is likely to occur;
- To ensure that development will not exacerbate the impact of flooding on the area or on other areas;
- To ensure that structures and infrastructure are built to minimise flooding impact;
- To ensure improvements to the drainage system are undertaken as part of the redevelopment process;
- To protect public safety and minimise property damage in the event of a flood;
- To ensure that flood protection measures are designed so that they are integrated, functionally and architecturally, into the overall development of the area
- Water management:
 - To ensure integration into the hydrology of the natural system, reduce discharge of pollutants into the stormwater system and reduce erosion and sedimentation;
 - To provide an adequate stormwater drainage system within the area that is appropriate to the scale, value and intensity of the development that is likely to occur;
 - To preserve the banks of the Cooks River;
 - To minimise soil erosion and sedimentation, especially during construction.
- Noise and vibration:
 - To minimise the exposure to noise (be it industrial, rail, road, aircraft) through building siting, building orientation, building form, or suitable building materials such that an acceptable amenity is achieved.
 - To include the appropriate noise mitigations measures to achieve the minimum noise standards.
- Air quality:
 - To minimise the output of greenhouse gases through the reduction of trip demand and increase of pedestrian activity and public transport usage;
 - To manage the air quality of the area through emission control and dust management (esp. during construction).
- Rail Corridors:
 - To recognise the location of the development site and need for specific considerations required due to the proximity of the adjoining rail corridors;
 - To understand and plan for potential impacts from adjoining rail activities in terms of noise and vibration;
 - To meet Rail Infrastructure Corporation (RIC) and State Rail Authority (SRA) requirements in terms of direct relationship with the adjoining rail corridors;
 - To consider impacts on the operation of the rail corridors during construction;
 - To provide appropriate derailment protection.

5 Rockdale LEP requirements

The following outlines the requirements of the Rockdale LEP for the mixed use area 10a in Wolli Creek:



10a = mixed use zoning by Rockdale Council

5.1 Objectives of the Mixed use Zone

- (a) to take advantage of the construction of the new Wolli Creek railway station in the locality by requiring the land within the zone to be developed in an orderly and efficient manner to its optimum potential, and
- (b) to maximise the amount of permanent employment within the zone, and
- (c) to permit development for the purpose of bulky goods showrooms on the Princes Highway, but otherwise allow retail development only if it is intended to serve the Wolli Creek area, and
- (d) to allow new buildings only if they will achieve a high standard of urban design, and
- (e) to require residential development to include an area of useable open space within the land for the benefit of the occupants, and
- (f) to ensure that the use of land within the zone will not result in any significant adverse impacts from or on the uses of other land in the immediate vicinity, and
- (g) to ensure that development of land will not unreasonably restrict or inhibit the future development of adjoining land, and
- (h) to promote optimum development while minimising adverse environmental impacts by facilitating the efficient use of and access to the Wolli Creek railway station and transport interchange and by controlling the amount of car parking within any development, and
- (i) to provide for adequate vehicular and pedestrian circulation and access and to ensure streetscapes are of a high visual standard, and

(j) to ensure that future development will meet environmental requirements relating to flood prone land, stormwater management, waste management, noise and vibration, air and water quality and energy efficiency, and

(k) to ensure that development will have due regard to the heritage significance and setting of the heritage item known as the Tempe House precinct through appropriate building design and landscaping, and

(l) to ensure that new development on the corner of the Princes Highway and Gertrude Street opens up and addresses views to Cahill Park and the Cooks River and does not adversely impact on the function and character of Cahill Park, and

(m) to ensure that development in Gertrude Street and Innesdale Road does not adversely impact on existing residential development on the southern side of Innesdale Road, and

(n) to provide for the long term traffic access and circulation needs of the Wolli Creek area by limiting access and controlling development on land which will be required for new roads or the widening of existing roads.

The following are allowed with development consent:

Development for the purpose of airline terminals; backpackers' accommodation; boarding houses; bulk stores; bulky goods showrooms; bus stations; child care centres; clubs; commercial premises (other than public car parks within the meaning of the *Local Government Act 1993*); community facilities; drainage or flood mitigation works; dwellings; educational establishments; home industries; home occupations; hospitals; hotels; housing for older people or people with a disability; light industries; mixed use premises; motels; motor showrooms; open space; places of assembly; places of public worship; professional consulting rooms; public buildings; public transport facilities; recreation areas; residential flat buildings; restaurants; roads; service stations; shops (intended to serve the Wolli Creek area); telecommunications facilities; utility installations other than gas holders or generating works; warehouses.

6 BCA Section J1 and J2 requirements

The following section outlines the requirements for BCA compliance for fabric and glazing of the new development

6.1 Section J Review – General Parameters

Climate Zone

The site is located at 78-96 Arncliffe St Wolli Creek NSW. This address correlates to BCA Climate Zone 5.

Building Classifications

The attached plan (Appendix A) details the classifications of building area within the development. The development comprises of Class 6 – Retail.

Information Used in Review

The following drawings were used for the Section J Review as issued by Mecone via email and received on 11/09/2009:

| Drawings | Rev | Description |
|----------|-----|-----------------|
| DA 01 | 03 | Level 1 |
| DA 02 | 01 | Elevation North |

Table 1: Drawings summary.

6.2 Section J1 – Building Fabric

J1.1 – Application of Part.

The deemed-to-satisfy provisions apply to Class 6 buildings.

J1.2 – Thermal Construction General

It is assumed that the requirements of J1.2 – Thermal Construction General will be complied to.

J1.3 – Roof and Ceiling Construction

For a Class 6 building in Climate Zone 5 the roof and ceiling construction is to have a minimum total R-Value of:

- R3.20 (downwards) for a roof or ceiling generally.

Based on a typical construction, of metal roof, air space, Reflective foil sarking, Glasswool Anticon R2, air gap (unventilated) and plasterboard ceiling will achieve the R-Value requirement of R3.20 for roof.

Alternatively should there be an area where a concrete roof is provided the construction of concrete slab, air gap, Glasswool Anticon R2,, air gap and plasterboard ceiling could achieve a total R-Value of R3.20 (downwards) and thus meet the R-Value requirement for ceiling.

J1.4 – Roof Lights

Not applicable as it is assumed there are no roof lights in the design.

J1.5 – Walls

For Class 6 building in Climate Zone 5 the external walls is to achieve a minimum Total R-Value of

- R1.80 for all external wall elements.

Based on a typical construction of fibre cement cladding, air gap, Aircell Retrosshield insulation, air gap and precast concrete internally could achieve a Total R-Value of 1.80 and thus meet the R-Value requirement for external walls.

An alternative construction of fibre cement cladding, Glass Anticon R1.5 CSR Bradford, air gap and plasterboard internally will achieve the R-Value requirement of R1.80 for external walls.

J1.6 – Floors

For Class 6 building in Climate Zone 5 there are no requirements for floor insulation.

Conclusions

The building fabrics for this development, as outlined above, will comply with BCA Section J1 requirements.

6.3 Section J2 – External Glazing

J2.1 – Application of Part

The deemed-to-satisfy provisions apply to Class 6 buildings.

J2.2 – Applicable Glazing Provisions

Assessment process detailed in J2.4 is applicable for a Class 6 building.

J2.4 – Glazing - Method 2

The following assessments have been completed using deemed-to-satisfy assessment Method 2. Details of the assessment are attached as Appendix A & B.

Glazing Assessment

All U-values and SHGC values are based on NFRC100-2001 figures.

The glazing ID, dimensions and orientations are based of drawings DA 01.03 and DA 02.01. The calculations include all external shading devices as shown on drawings – See Appendix B for Window legend.

The calculations show that the following glazing specifications are required to achieve compliance with BCA Section J2:

| Glazing unit forming part of building fabric | Required specifications | |
|--|-------------------------|------|
| | U-Value (W/m.K) | SHGC |
| Supermarket | | |
| W01 | 5.5 | 0.70 |
| W02 | 6.5 | 0.59 |
| W03-W10 | 5.5 | 0.70 |
| Retail | | |
| W11-W12 | 6.5 | 0.70 |
| W13-W20 | 6.5 | 0.59 |

Table 2: Glazing specifications required.

Note the above U-value and SHGC includes glazing and frame.

Therefore, the assessment shows that two types of glazing are required. These are:

| Required specifications | | Reference glazing to achieve required specifications |
|-------------------------|------|--|
| U-Value (W/m.K) | SHGC | |
| 6.5 | 0.7 | 1. Clear Laminate with aluminum frame or equivalent |
| 6.5 | 0.59 | 2. Grey Laminate with aluminum frame or equivalent |

Reference glazing.

Note glazing subcontractor to confirm required U-Values and SHGCs are achieved with selected glazing.