Section J 'Deemed to Satisfy' Building Fabric Assessment Report

Block 8 Central Park
Retail Space

Frasers Property Australia Pty Ltd

Prepared for
Frasers Property Australia Pty Ltd

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Surface Design

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Contents

1. Executive Summary

This report has been prepared to demonstrate compliance with the Building Code of Australia (BCA) Energy Efficiency 2013 provisions for Central Pack Block 8 Chippendale: The analysis has been undertaken for the Retail (Class 6)components of the project. The document has been prepared on behalf of Frasers Property Australia Pty Limited for submission with the Preliminary Development Approval application.

An assessment has been undertaken for the building fabric in reference to Parts J1, J2 and J3 where appropriate to the proposed Retail areas only (Class 6).

This document is to be read in conjunction with Architectural detailed design drawings, details and sections prepared by Smart Design Studio, which confirm the location and extent of glazing and insulation to the relevant spaces.

Project Details

The development includes the establishment of new multi-residential tower with multi-level basement car park. The building is twelve storeys in height with the retail spaces located along the west elevation of ground level. The building is located within Chippendale, NSW, within Climate Zone 5, according to Building Code of Australia 2013 provisions.

Assessment Methodology

The building fabric has been assessed in accordance with the 'Deemed to Satisfy' provisions of Part J1 and J2 BCA 2013. Part J1 compliance has been demonstrated through the specification of appropriate insulation performance requirements to all external wall constructions, refer to Section 4 of this report. Part J2 compliance has been demonstrated by Method 2 Glazing calculator assessment, refer to Section 5 of this report for further details.

Results

The proposed glazing to the building is to be compliant with Building Code of Australia Energy Efficiency 2013 provisions, using Method 2 Glazing Assessment methodology; refer to Section 5 of this report. The final selection of glass and frame details to the building is to reflect the minimum performance specifications as detailed in this report. Nominal glazing types and frame details have been assessed in this report to demonstrate compliance with BCA provisions and the final selection is to meet or exceed these requirements.

Facade contractors are to confirm U value and SHGC performance requirements are met prior to the installations of any systems.

The following glazing system are proposed and are considered to be compliant with BCA 2013 Part J2 Method 2 glazing assessment:

Glass Type	Area	Glass Specifications	Expected Performance of System	
			U-value	SHGC
G1	Retail South, West and North	Shenzhen SDT1-70	3.50 (total)	0.29

The external building constructions to the building are to include insulation requirements that exceed the requirements of Part J1 and as noted in this report. The details, as noted in the report, should be read in conjunction with Smart Design Studio documentation for wall details and drawings. All external constructions are to exceed BCA thermal construction provisions; refer to Section 4 of this report.

2. Introduction

2.1 Purpose of Report

This report outlines the proposed construction and building fabric specifications to satisfy the provisions of the Building Code of Australia Section J Energy Efficiency for the proposed Block 8 Chippendale Retail (Class 6) components of the development. The document has been prepared on behalf of Frasers Property Australia Pty Ltd for submission with Preliminary Planning Application. The proposed building fabric for the development is to comply with the Building Code of Australia 'Deemed to Satisfy' provisions as defined in 2013 version for Parts J1, J2 and J3.

2.2 Project Description

The development includes the establishment of new multi-residential tower with multi-level basement car park. The building is twelve storeys in height with retail located along the west elevation of ground level. The building is located within Chippendale, NSW, within Climate Zone 5, according to Building Code of Australia 2013 provisions.

The building is located within Chippendale, NSW within Climate Zone 5 according to Building Code of Australia 2013 provisions.

2.3 Building Code of Australia Provisions

This assessment has been completed in accordance with the following provisions and assumptions relevant to Building Code of Australia 2013 version.

Building Fabric

Typical building materials have been assumed for:

- Walls
- Ceiling/Roof constructions
- Floor constructions

The building is to be designed to accommodate conditioned spaces within all areas of the building excluding Residential apartments (Class 2) as these do not form part of this assessment.

Site Location

The proposed site is located in Chippendale, New South Wales within climate zone 5.

Compliance Method

The building fabric is to comply with the 'Deemed to Satisfy' (DTS) building fabric provisions of Parts J1, J2 and J3 2013.

For the glazing assessment BCA DTS calculators have been adopted for the Retail areas, under option A assessment method.

Assumptions

It has been assumed that the Residential apartments will be conditioned and any energy efficiency provisions that apply to the Residential development have been undertaken by another party as required at Development Application stage. Subsequent details of BASIX and NatHERS assessments for the residential component are covered in other reports. It is expected that the Architectural drawings and details have incorporated any necessary measures where relevant to the energy efficiency provisions that apply to the Residential development.

2.4 Authority Items

It is our understanding that the Local Council, City of Sydney Council, has set reflectivity requirements that apply to the development where the maximum reflectivity of the glass is to be limited to 20%. Therefore it is our understanding that the application of films with high reflectivity is not appropriate for the project.

2.5 Reference Documents

This report and assessment has been undertaken in reference to the following documents:

Document	Description	Author	Revision
DA000	Legend	SDS	A
DA001	Context Plan	SDS	A
DA100 PLB3	Basement 3 Floor Plan	SDS	A
DA101 PLB2	Basement 2 Floor Plan	SDS	A
DA102 PLB1	Basement 1 Floor Plan	SDS	A
DA103 PL00	Ground Floor Plan	SDS	A
DA104 PL01	Level 1 Floor Plan	SDS	A
DA105 PL02	Level 2 Floor Plan	SDS	A
DA106 PL03-06	Level 3 – 6 Floor Plan (typical)	SDS	A
DA107 PL07	Level 7 Floor Plan	SDS	A
DA108 PL08	Level 8 Floor Plan	SDS	A
DA109 PL09	Level 9 Floor Plan	SDS	A
DA110 PL10	Level 10 Floor Plan	SDS	A
DA111 PL11	Level 11 Floor Plan	SDS	A
DA112 PL12	Level 12 Floor Plan	SDS	A
DA113 PLRO	Roof Plan	SDS	A
DA300 Elev N	North Elevation	SDS	A
DA301 Elev S	South Elevation	SDS	A
DA302 Elev E	East Elevation	SDS	A
DA303 Elev W	West Elevation	SDS	A
DA400 SECTION AA	SECTION AA	SDS	A
DA401 SECTION BB	SECTION BB	SDS	A
BCA 2013 Section J Part J1,J2 and J3	Requirements to the BCA for energy	BCA	2013

3. Building Fabric Description

3.1 General Facade description

The typical façade system consists of concrete walls, with external glazing predominately to all elevations. The proposed glazing systems are typical shopfront glazing systems with aluminium frames.

3.2 Architectural details

The following architectural constructions apply to the project, refer to Architectural design drawings by Smart Design Studio.

External Wall constructions

The external wall constructions for the building are as follows and compliance criteria nominated respectively is required:

- EW-01: Concrete column with Internal plasterboard lining
  - EW-01 to comply with BCA provisions (R2.80)
- EW-02: Glazed spandrel panel
  - EW-02 to comply with BCA provisions (R2.80)

Internal Wall Constructions

The internal wall constructions of the building, that separate conditioned and unconditioned spaces are not applicable to this assessment as they do not have any design provisions that apply under BCA 2013 provisions as the building is located within climate zone 5.

Floor Constructions

The floor constructions of the buildings are to comply with the 2013 provisions as the building is located within climate zone 5 and the Retail areas are located over unconditioned car park space.

- FC-01: Concrete slab with no finishes to Retail areas
  - FC-01 to comply with BCA provisions (R2.00)

Roof / Ceiling constructions

The ceiling constructions of the buildings are to comply with the 2013 provisions as the building is located within climate zone 5 and the Retail areas are located underneath unconditioned space.

- RC-01: Concrete slab with tile finish at loggia locations
  - RC-01 to comply with BCA provisions (R3.20)

4. Building Construction Assessment (Part J1)

4.1 Wall Constructions

The following tables detail the proposed construction makeup of the relevant wall construction types, refer to Section 3.2 for minimum values to be achieved. These constructions apply to all walls within retail component which forms an envelope. Envelope, for the purposes of Section J, means the parts of a building's fabric that separate a conditioned space or habitable room from –

A) the exterior of the building; or

B) a non-conditioned space including –

   a. the floor of a rooftop plant room, lift machine room or the like; and

   b. the floor above a carpark or warehouse; and

   c. the common wall with a carpark, warehouse or the like.

Table 1: External wall constructions for EW-01 – Concrete wall with internal plasterboard lining

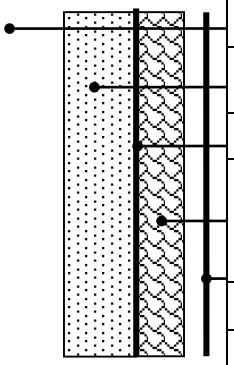
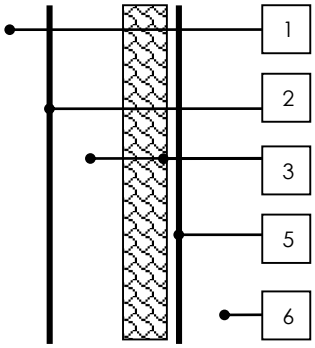
EW-01: Concrete wall with internal plasterboard lining	Item	Description	R-value
	1.	Outdoor air film (7m/s)	0.03
	2.	150mm concrete (high density 2400kg/m^3)	0.09
	3.	Moisture barrier film	0.00
	4.	**Insulation R3.0 or R3.0 insulation with reflective unventilated air gap (Low density 14kgm/m^3 75mm thk or similar)**	**3.00**
	5.	Plasterboard (13mm)	0.08
	6.	Indoor air film (still air)	0.12
	Total R-value		**3.32**

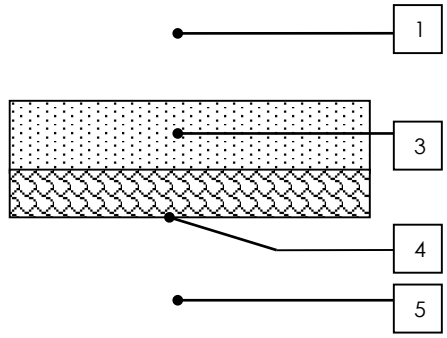
Table 2: External wall constructions for EW-02 – Glazed insulated spandrel panel

EW-02: Facade System with internal lining	Item	Description	R-value
	1.	Outdoor air film (7m/s)	0.03
	2.	Glazing (6.38mm float glass)	0.06
	3.	**Insulation R3.0 or R3.0 insulation with reflective unventilated air gap (Low density 14kgm/m^3 60mm thk or similar)**	**3.00**
	4.	13mm Plasterboard	0.08
	5.	Indoor air film (still air)	0.12
	Total R-value		**3.29**

4.2 Floor Constructions

The floor construction is deemed to be concrete slab over for the retail facilities generally. The constructions assumed for the slab has been provided below and final details are to be confirmed by Contractor. It is assumed that there is no ceiling to be installed as part of the finishes for the Retail facilities therefore ceiling void or ceiling structure has been taken for this system.

Table 3: Floor constructions for FC-01 Concrete roof constructions to Retail spaces above car park area

FC-01: Proposed Floor Slab Construction	Item	Description	R-Value (up)	R-Value (down)
	1.	Indoor air film (still air)	0.11	0.16
	2.	180mm reinforced concrete slab	0.11	0.11
	3.	**Insulation R2.00 (Styrofoam closed cell 50 thk or similar)**	**2.00**	**2.00**
	4.	Outdoor air film (still air)	0.04	0.04
	Total R-Value		**2.26**	**2.31**

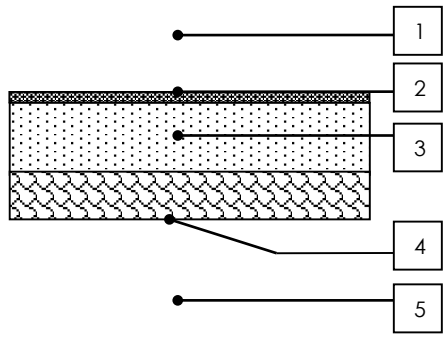
The floor above the retail spaces contains residential apartments. Where external terraces are located above the retail spaces insulation is to be provided that meets the above provisions. Where the ceiling of the retail is located below residential internal areas the above provisions are not expected to apply as both spaces are expected to be internal conditioned and are internal areas.

4.3 Roof / Ceiling Construction

The roof construction is deemed to be concrete slab with finishes over for residential areas. The constructions assumed for the slab has been provided below and final details are to be confirmed by Contractor. It is assumed that there is no ceiling to be installed as part of the finishes for the Retail facilities therefore ceiling void or ceiling structure has been taken for this system.

Where the ceiling above the retail spaces are located underneath external terraces, insulation is to be provided that meets the above provisions.

Table 4: Ceiling constructions for RC-01 Slab constructions to Retail spaces below external terraces

RC-02: Proposed Floor Slab Construction	Item	Description	R-Value (up)	R-Value (down)
	1.	Outdoor air film (7m/s)	0.04	0.04
	2.	External tile finish (10mm thk vitrified tile finish)	0.05	0.05
	3.	180mm reinforced concrete slab	0.11	0.11
	4.	**Insulation R3.00 (Styrofoam closed cell 75 thk or similar)**	**3.00**	**3.00**
	5.	Indo air film (still air)	0.11	0.16
	Total R-Value		**3.31**	**3.36**

4.4 Insulation Installation Requirements (Part J1.2)

All insulation is to comply with AS/NZS 4859.1 and be installed in accordance with the following:

- Insulation to abut or overlap adjoining insulation except at supporting members such as studs, noggings, joists, furring channel and the like where the insulation must butt against the member; and
- Forms a continuous layer barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
- Bulk insulation is to be installed such that it maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like;
- In a ceiling where there is no bulk insulation or reflective insulation to be located in the wall beneath, the insulation must overlap the wall by not less than 50mm; and
- Reflective insulation must be installed with the necessary airspace to achieve the required R-value between the reflective side of the reflective insulation and a building lining or cladding; and
- Reflective insulation must be installed closely fitted against any penetration, door or window opening;
- Reflective insulation must be adequately supported by framing members and each adjoining insulation sheet of roll membranes must be overlapped by not less than 50mm or taped together.
- Moisture barriers are to be installed in all wall and roof types, as per the requirements of the BCA and waterproofing design codes, in order to ensure that the integrity of the insulation system is maintained.

Insulation is not to affect the safe or effective operation of any services.

All materials for roof, wall and floor must meet the construction property criteria as noted in Section 4 of this report, else adjustments to the insulation requirements is to be made to ensure that the minimum total R-values are achieved for each system.

5. Glazing Assessment (Part J2)

Glazing calculations in accordance with BCA Section J methodology 2 have been undertaken for each of the elevations where glazing is proposed to the building. Glazing is proposed to the following elevations with relevant facade design features:

Elevation / Exposure	Space Use	Glazing System	Features
North elevation	Retail	Double glazed units	Shaded by structure over to Retail room 012 only
West elevation	Retail	Double glazed units	Shaded by structure overhead
	Gym	Double glazed units	Vertical shading
South elevation	Retail	Double glazed units	Shaded by structure overhead

5.1 Glass Performance Criteria

The following minimum glazing performance has been determined for the project based on the Section J Method 2 Glazing assessment:

Glazing System	Location	Total System U-value	Solar Heat Gain Coefficient (SHGC)
G1 – Shopfront and Doors Retail	West Elevation Grid A-R	3.50	0.29

The proposed glazing system to be installed within the building are as follows; subject to confirmation by the facade contractor(s):

Glass Type	Area	Glass Specifications	Expected Performance of System	
			U-value	SHGC
G1	West Elevation Grid A-R [Retail]	Shenzhen SDT1-70	3.50 (total)	0.29

The above Proposed Glazing systems comply with Section J energy efficiency requirements as demonstrated in the below calculators for the proposed extent of glazing as shown on Smart Design Studios Architects Elevations as referenced in this report.

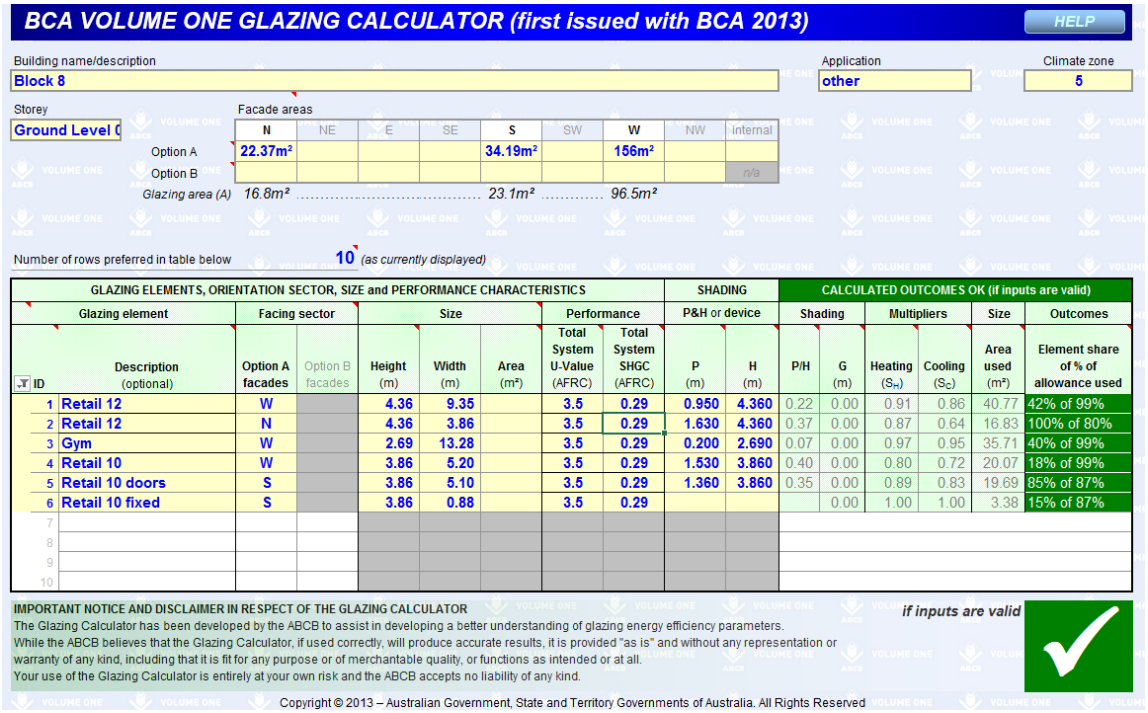
5.2 Extent of Glazing

The current extent of glazing detailed to the Retail elevations of the West meets the energy efficiency provisions of 2013 glazing calculator for standard double glazed units with having a 75/25 glazing to solid ratio with the presence of solid spandrel glazing and vision glass.

5.3 Glazing Calculator results

The following figures demonstrate compliance with Method 2 Building Code of Australia Glazing Calculator for the relevant building elevations and proposed glazing systems.

Figure 1: Ground glazing calculator results



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

Building name/description: Block 8 | Application: other | Climate zone: 5

Storey: Ground Level (

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	22.37m²				34.19m²		156m²		
Option B									n/a
Glazing area (A)	16.8m²				23.1m²		96.5m²		

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_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	Retail 12		W		4.36	9.35		3.5	0.29	0.950	4.360	0.22	0.00	0.91	0.86	40.77	42% of 99%
2	Retail 12		N		4.36	3.86		3.5	0.29	1.630	4.360	0.37	0.00	0.87	0.64	16.83	100% of 80%
3	Gym		W		2.69	13.28		3.5	0.29	0.200	2.690	0.07	0.00	0.97	0.95	35.71	40% of 99%
4	Retail 10		W		3.86	5.20		3.5	0.29	1.530	3.860	0.40	0.00	0.80	0.72	20.07	18% of 99%
5	Retail 10 doors		S		3.86	5.10		3.5	0.29	1.360	3.860	0.35	0.00	0.89	0.83	19.69	85% of 87%
6	Retail 10 fixed		S		3.86	0.88		3.5	0.29				0.00	1.00	1.00	3.38	15% of 87%
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

6. Building Sealing Requirements (Part J3)

The following provisions apply to the development for Part J3 building sealing requirements:

Windows and Doors

All doors and windows or the like are to be fitted with a seal that is to restrict air infiltration where they form part of the building envelope to a conditioned space. Seals may be in the form of rubber compressible strips, fibrous seal or the like.

These requirements do not apply to:

- Windows complying with AS 2047; or
- Louvre doors, louver windows or other such openings
- Fire doors or smoke doors
- Roller shutters or other security door or device installed only for out-of-hours security

Main entrances to the building if leading to conditioned spaces are to be fitted with self closing doors, airlock or similar devices, designed to avoid heat loss or gain through inadvertently leaving external doors open are to be included in the building design to minimise heat gains or losses are to be installed to all conditioned spaces that provide separation to exterior environment.

External Constructions

Roofs, ceilings, walls and floors are to be constructed in such a way as to minimise air leakage and infiltration. The construction should be enclosed by an internal lining system, which is close fitting at the junctions of walls, ceilings, floors and roofs.

7. Summary

This report has been prepared to demonstrate compliance with Building Code of Australia (BCA) Energy Efficiency Parts J1, J2 and J3 2013 provisions for the Central Park Block 8 Retail components of the development. The document has been prepared on behalf of Frasers Property Australia Pty Limited for submission with Preliminary Planning Application. The assessment completed in this document demonstrates compliance with parts J1 and J2 for retail (Class 6) areas only. Where appropriate, the provisions of part J3 have been highlighted for reference in regards to the installation of insulation to the building and overall building seal-up.

The provisions that relate to the Residential development have been documented in previous assessment under BASIX Building Sustainability Index for Multi-residential developments.

This document is to be read in conjunction with Architectural detailed design drawings and sections prepared by Smart Design Studios which confirm the location and extent of insulation to the relevant spaces.

The building constructions and glazing types to be installed to the building are to comply with 'Deemed to Satisfy' provisions of 2013 BCA energy efficiency of Parts J1 and J2 as noted in this report.