

# MEMORANDUM

To: Citify & BFC Pty Ltd

Attention: Mr J WILKINSON Reference: LCE14462-020

From: Matt Cuppleditch Date: 7 June 2019

Project: Mixed-Use Development – 248 Unley Road, Hyde Park SA 5061

Subject: NCC Glazing and Insulation Calculations -APT107

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This memo has been completed to provide analysis of the minimum glazing and insulation requirements for Apartment 107 to meet the 'Deemed to Satisfy' conditions of the 2016 National Construction Code (NCC) for the development at 248 Unley Road, Hyde Park SA 5061.

This dwelling was previously assessed as Class 2 and achieved 6.8 stars under NatHERS. This dwelling has now been repurposed as a carer's unit and as such, must be assessed as Class 3 by request of the certifier.

This assessment consolidates the compliance record in accordance with Section J for Building Rules Consent. The following parts of Section J are assessed within this report:-

## **Part J1 Building fabric**

## **Part J2 External glazing**

## **Part J3 Building sealing**

Calculations were completed based on the latest architectural plans provided by Gemma Lea Design Studio, dated 17 March 2019.

The proposed building is a residential mixed-use development. This memo pertains Apartment 107, located on the first floor. It has been assumed that all residential common corridors are unconditioned spaces.

No in-slab heating or cooling system is proposed as such, relevant clauses of Part J1.6 do not apply.

The site is located approximately 3km South of Adelaide CBD, and in accordance with 2016 NCC Part A1 considered Climate Zone 5.

## **J1 -BUILDING FABRIC**

We have reviewed Architectural documentation and provide required insulation performance and layout in accordance with NCC 2016. Refer attached Appendix A.

For wall constructions where lightweight external cladding is fixed directly to a metal frame and the internal wall lining is also fixed directly to the same metal frames (no furring channel or other additional framing member), a thermal break of minimum R0.2 is to be installed between the external cladding and the metal frame.

The minimum requirements of 2016 NCC Part J1 were assessed for the proposed building fabric. Appendix A identifies the proposed additional insulation to achieve that stipulated within Table 1.

**Table 1: 2016 NCC Part J1 Minimum requirements**

Building Fabric	2016 NCC Minimum Total System R-Value (construction + added insulation)
<b>Ceiling / Roof</b> (Balcony above Apartment)	R-Value = 3.7
<b>External Wall</b> (Hebel Wall, WT4)	R-Value = 2.8
<b>Internal Riser Lining</b>	R-Value = 1.8
<b>Corridor Wall</b> (WT7)	R-Value = 1.0

The following clauses are to be included within the Architectural Documentation to comply with Part J1 requirements:-

1. "A thermal break is to be installed:
  - between lightweight external cladding and a metal frame.
  - with minimum thermal performance of R0.2.
  - as a proprietary item."
2. "Insulation must comply with AS/NZS 4859.1."
3. "Insulation must be installed so that it:
  - abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation must be against the member; and
  - forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
  - does not affect the safe or effective operation of a service or fitting.
 Bulk insulation must be installed so that:
  - it maintains its position and thickness, other than where it is compressed between cladding and supporting members, water pipes, electrical cabling or the like; and
  - in a ceiling, where there is no bulk insulation or reflective insulation in the external wall beneath, it overlaps the external wall by not less than 50 mm.
 Reflective insulation must be installed with:
  - the necessary airspace between a reflective side of the reflective insulation and a building lining or cladding as specified with the architectural documentation; and
  - the reflective insulation closely fitted against any penetration, door or window opening; and
  - the reflective insulation adequately supported by framing members; and
  - each adjoining sheet of roll membrane being—
    - (A) overlapped not less than 50 mm; or
    - (B) taped together."

## J2 – EXTERNAL GLAZING

The required glazing was determined by using the NCC Volume One Glazing Calculator (NCC 2014), which assesses the required U-value and Solar Heat Gain Coefficient (SHGC) to determine whether the design meets 'Deemed to Satisfy' code requirements. Refer to Appendix B.

The minimum performance glazing for each façade of the Ground and First Floor is summarised in Table 2.

**Table 2: 2016 NCC Part J2 minimum external glazing performance requirements**

First Floor – <u>East Facade</u>	
Minimum Total System U Value (W/m <sup>2</sup> .°C)*	<b>4.8</b>
Minimum Total System Solar Heat Gain Coefficient (SHGC)*	<b>0.17</b>

*\*system performance values including glass and frame*

## J3 – BUILDING SEALING

The following clauses are to be included within Architectural documentation to comply with Part J3 requirements:-

*"A caulking compound (or similar approved) sealant is to be used to around window frames, doors, plumbing and electrical conduits to minimise air leakage from penetrations within the envelope constructions."*

*"A seal to restrict air infiltration must be fitted to each edge of an external door, openable window and other such opening when serving a habitable room and/or part of the envelope of a conditioned space."*

*"A seal required for the bottom edge of an external swing door, must be a draft protection device and for the other edges of an external swing door or the edges of an openable window or other such opening, may be a foam or rubber compressible strip, fibrous seal or the like."*

*"An entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, revolving door or the like."*

Should you have any queries regarding the above, please don't hesitate to contact the undersigned.

Regards

**LUCID CONSULTING ENGINEERS**



**MATT CUPPLEDITCH**  
Sustainability Engineer

Attachments: Appendix A – Specified Construction Total R-Value  
Appendix B - LCE144625\_Insulation Markup\_6.06.19  
Appendix C - NCC GLAZING CALCULATOR 2014

#### APPENDIX A – SPECIFIED CONSTRUCTION TOTAL R-VALUE

### WT4

Layer Type	Material Layer	Thermal Conductivity	Material Thickness (mm)	Bulk Insulation R-Value	R-Value
<b>Inside</b>					
Air	Air film - Still air - Wall				0.120
Materials	Gypsum Plasterboard	0.17	32		0.188
Insulation	90mm R2.5 Batt			2.5	2.500
Materials	Air Spaces Non-Refl. Unvent.	0.17	50		0.294
Materials	Autoclaved Aerated Concrete (High Density)	0.27	75		0.278
Air	Air Film - moving air - wind speed < 3m/s				0.040
<b>Outside</b>					
<b>Total System R-Value</b>					<b>3.42</b>
<b>Total System U-Value</b>					<b>0.29</b>

### WT7

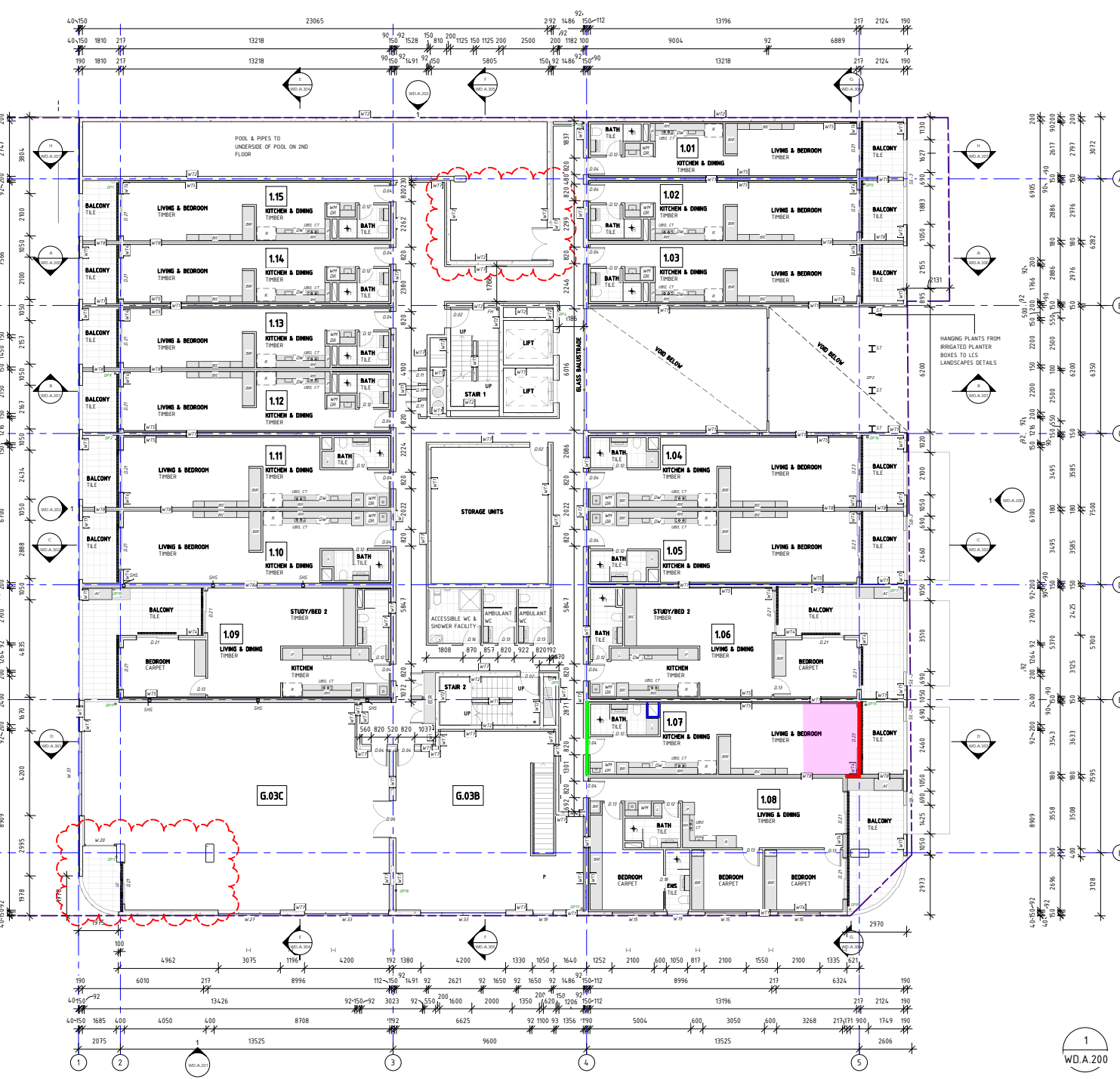
Layer Type	Material Layer	Thermal Conductivity	Material Thickness (mm)	Bulk Insulation R-Value	R-Value
<b>Inside</b>					
Air	Air film - Still air - Wall				0.120
Materials	Gypsum Plasterboard	0.17	16		0.094
Insulation	75mm R2.0 Batt			2	2.000
Materials	Solid Concrete Floor (2400kg/m <sup>3</sup> )	1.44	150		0.104
Air	Air Film - moving air - wind speed < 3m/s				0.040
<b>Outside</b>					
<b>Total System R-Value</b>					<b>2.36</b>
<b>Total System U-Value</b>					<b>0.42</b>

## **APPENDIX B – INSULATION MARKUP**

KEY	DESCRIPTION
AC	AIR CONDITIONING CONDENSER WHERE ON BALCONY CONCRETE IN FULL HEIGHT VENTILATION CUPBOARD WITH LOUVER DOORS
BR	BUILT IN ROBE
BL	BOLLARD
BW	BROWN FULL CUPBOARD
BW	STEEL FRAMED BALUSTRADE WALL - SHS COLUMNS AND BEAMS CLAD WITH PREPRESSED CYC SHEETING SB-2 FIXED ATOP BW
CH	TRIPLE WASTE CHUTE SYSTEM
CJ	CONSTRUCTION JOINT
COL	STRUCTURAL CONCRETE COLUMN TO END'S DTLS
CH	DOOR REFER DOOR TYPE SCHEDULE WD.A.601 FOR DTLS OF DOOR TYPES
CU200	90/90/90 FRL REFER END'S DTLS. REFER ACUSTIC ASSESSMENT BY VPAI FOR UNDERLAY AND INSULATION REQUIREMENTS
CU250	100/100/100 FRL REFER END'S DTLS. REFER ACUSTIC ASSESSMENT BY VPAI FOR UNDERLAY AND INSULATION REQUIREMENTS
DM	DOORMAT
DS	DRIVEWAY
DW	DRAINAGE COVER SPACE
ECR	ELECTRICAL & COMMUNICATIONS RISER CUPBOARD
FC	FEATURE ARCHITECTURAL COLUMN TO END'S DTLS
FI	FIRE HYDRANT RISER
FP	FIRE INDICATOR PANEL
FT	FLOOR TRAP
FR	FASALA TRUSS TO END'S DTLS
GA	IN-GROUND GREASE ARRESTOR
GL-0	GLASS FULLY FRAMED BALUSTRADE TO 1050mm AFL. HARKX VIEW SYSTEM OR SIMILAR
HR	50mm HANDRAIL IN STAIR FIXED TO CENTRAL PRECAST WALL HEIGHT TO ABOVE BALUSTRADE
HR-L	20mm HANDRAIL AND BALUSTRADE IN STAIR ON LANDING HEIGHT MIN 1000mm ABOVE PFL
L	LINEAR DRAIN
LVR	VERTICAL PRIVACY LOUVER AS PER DTLS ON WINDOW SCHEDULE WD.A.600
MSB	MAIN SWITCH BOARD
NNN	NON-VOLATILE CABINET
ONS	OVER BONNET SPACE UNIT - 1000mm CLEAR - 1000 x 2400v x R94 TOTAL HEIGHT 2300
OP	OVERFLOW DEVICE AS DETAIL IN BOX GUTTER TABLE
PC-B	PRECAST CONCRETE PIGMENTED TO DARK GREY COLOUR TO SELECTION
PC-N	PRECAST CONCRETE WITH NO PIGMENT - NATURAL
PC-W	PRECAST CONCRETE PIGMENTED TO OFF-WHITE COLOUR TO SELECTION
PJ	PANEL JOINT - REFER END'S DTLS FOR DTLS
PL	GRK PLANTER BOX
R	REFRIGERATOR SPACE
RC	NECESSED CEILING AT DOORS AND WINDOWS FOR CONCEALED CURTAIN TRACK OR BLIND PELMET
RH	RANGEHOOD WITH DUCTING TO OUTSIDE
RWT	RAINWATER TANK - REFER CUL PLANS FOR DTLS
SB-1	100mm WIDE HORIZONTAL FLAT STEEL BALUSTRADE TO INTERNAL WALKWAYS 1050mm AFL
SB-2	STEEL FRAMED BALUSTRADE ATOP "BW" TO WEST ELEVATION - SEE SECTION DETAIL "BALCONY EDGE - WEST" FOR DETAIL. 600 FOR A TOTAL BALUSTRADE HEIGHT OF 1600mm AFL
SB-3	100mm WIDE VERTICAL FLAT STEEL SCREEN TO EAST FACING FIRST FLOOR BALCONIES. 200 x 1000
SHS	SHS COLUMN TO END'S DTLS
ST	FEATURE STEEL COLUMNS TO END'S DTLS
UBO	UNDER BENCH OVEN
W#	WINDOW REFER WINDOW TYPE SCHEDULE WD.A.600 FOR DTLS OF WINDOW TYPES
WR	WALK IN ROBE
WT	WASHING MACHINE SPACE WITH FLOOR TRAP UNDER AND TAPS
WO	WALL OVEN
WS	WHEEL STOP TO CIVL DTLS

**LUCID**  
APT 107 INSULATION MARKUP  
LCE14462  
06.06.2019

REV	DESCRIPTION
01	ISSUED FOR PERMIT
02	ISSUED FOR PERMIT
03	ISSUED FOR PERMIT
04	ISSUED FOR PERMIT
05	ISSUED FOR PERMIT
06	ISSUED FOR PERMIT
07	ISSUED FOR PERMIT
08	ISSUED FOR PERMIT



TAG	CONSTRUCTION	FRL	INSULATION	ACUSTIC
WT1	100mm PRECAST CONCRETE PANEL - STANDARD GREY INTERNALLY. REFER ELEVATIONS FOR EXTERNAL CONCRETE COLOURS	05/05/05	REFER TO WTS OR WTS FOR WALL INSULATION WHERE APPLICABLE	Rw 50 + Rw + Cr 50 IF NO LING. REFER TO WTS OR WTS FOR SOU APPLICATIONS
WT2	200mm PRECAST CONCRETE PANEL - STANDARD GREY INTERNALLY. REFER ELEVATIONS FOR EXTERNAL CONCRETE COLOURS	05/05/05	REFER TO WTS OR WTS FOR WALL INSULATION WHERE APPLICABLE	Rw 50 + Rw + Cr 50 IF NO LING. REFER TO WTS OR WTS FOR SOU APPLICATIONS
WT3	100mm PRECAST CONCRETE PANEL - STANDARD GREY INTERNALLY. REFER ELEVATIONS FOR EXTERNAL CONCRETE COLOURS	05/05/05	REFER TO WTS OR WTS FOR WALL INSULATION WHERE APPLICABLE	NA
WT4	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	Rw 50 + Rw + Cr 50
WT5	40mm STEEL STUDS AT 600mm CTS. TO WTS OR WTS PARTY WALLS AND EXTERNAL WALLS. 25mm CAVITY DISCONTINUOUS CONSTRUCTION	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	WHEN COMBINING WTS OR WTS WITH WTS OR WTS 25mm CAVITY DISCONTINUOUS CONSTRUCTION
WT6	90mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA
WT7	90mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA
WT8	100mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA
WT9	100mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA
WT10	100mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA
WT11	100mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA
WT12	100mm STEEL STUDS AT 600mm CTS. USED FOR BATHROOM & LAUNDRY POSSES.	05/05/05	100mm R25 BRADFORD GW NON-COMBUSTIBLE INSULATION WITHIN 70mm STEEL STUD. 2 LAYERS 90mm PYROCHECK PLASTERBOARD FINISH INTERNALLY. FLOURED & PAINTED. RENDERED AND PAINTED TO 3 COAT SYSTEM	NA

LEGEND
External Wall: Total System R-Value of R2.8
Internal Wall: Total System R-Value of R1.5
Internal Wall: Total System R-Value of R1.0
External Ceiling: Total System R-Value of R3.7

1 1ST FLOOR PLAN  
WD.A.200  
1 : 100

PROJECT ADDRESS  
248 UNLEY ROAD HYDE PARK  
HYDE PARK PLACE

CLIENT  
HYDE PARK PLACE PTY LTD



SHEET  
1ST FLOOR PLAN  
WD.A.103

AUTHOR  
GB

PRELIMINARY - NOT FOR CONSTRUCTION



## **APPENDIX C – GLAZING CALCULATOR**

# NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

248 Unley Rd - APT 107

Application

Class 3

Climate zone

5

Storey

Level 1

Facade areas

N	NE	E	SE	S	SW	W	NW	internal
		9.8m <sup>2</sup>						
								n/a

Option A

Option B

Glazing area (A) ..... 7.56m<sup>2</sup>

Number of rows preferred in table below

8 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S <sub>H</sub> )	Cooling (S <sub>C</sub> )	Area used (m <sup>2</sup> )	Element share of % of allowance used
1	D.23	E		2.40	3.15		4.8	0.17	2.300	2.700	0.85	0.30	0.70	0.62	7.56	100% of 99%
2																
3																
4																
5																
6																
7																
8																

## IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR

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

if inputs are valid



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