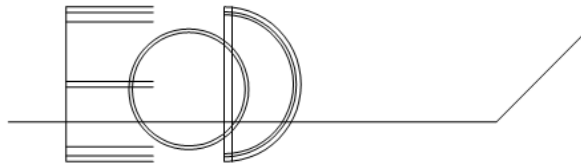


Energy and Outdoor Design



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ENERGY EFFICIENCY REPORT

BCA 2016 – Volume 2 Deemed to Comply

Client:	NIC Design
Owner:	Huida Unley Park No.1
Address:	392-394 Unley Road, Unley Park SA
Date:	31 May, 2019
Client project number:	19002
Climate zone:	5
Job number:	EOD-2638A dwelling 5
Assessor:	Stephen Cramond MRICS NatHERS Cert IV

ENERGY EFFICIENCY REPORT

BCA 2016 – Volume 2 Deemed to Comply

BCA Part 3.12 – <u>Building Fabric</u>

	<u>Required</u>		
Requirements	Yes	No	N/A
Building fabric thermal insulation must:-			
Meet AS/NZS 4859.1 requirements	√		
Form a continuous barrier including overlapping and maintains thickness / airspace as required (ceilings, walls etc)	√		
Must not affect safe operation of building services	√		
Is a thermal break required (only for lightweight cladding on steel framing with either no ceiling / wall lining or ceiling / wall lining fixed direct to metal frame). R0.2 insulation blanket required between lightweight cladding and metal framing	√	Only if metal framing is used	

BCA Part 3.12.1.2 – Roofs

Roof construction is: **Pitched colorbond clad roof**
 Insulation specified: **Not specified**

Requirements	R Value	Comments
Total R value of roof is required to be:	5.1	Base rating for roof with absorbance value of >0.6 (dark assumed where not specified as worst case)
Less Actual Roof materials R Value:	- 0.39	Pitched metal clad roof
Adjustment Factor for roof venting (0.5 R Value reduction for well vented roofs):	-	
Re-adjustment for loss of ceiling insulation due to downlights / exhaust fans: (see table 3.12.1.1b)	-	
Total minimum R Value of insulation to the roof required after adjustments:	R4.71	Required to all roof areas excluding garage roof. A minimum 50% required insulation to be located at ceiling level

BCA Part 3.12.1.3 – Roof Lights

Type of roof light nominated: **N/A**
 U Value: **N/A**
 SHGC Value: **N/A**

Requirements	<u>Compliance required</u>		
	Yes	No	N/A
Are the roof lights required for BCA Ventilation purposes (habitable rooms and conditioned spaces only)			√
If so, they must have an area not greater than 150% minimum area for BCA ventilation compliance and maximum U Value 2.9 and SHGC value 0.29			√
If not, must have max area of 3% of storey floor area and meet U & SHGC values for rooflights			√

BCA Part 3.12.1.4 – External Walls

External wall / internal envelope wall construction nominated is:

- Wall type 01 – CD01
- Wall type 02 – CD02
- Wall type 03 – CD03
- Wall type 04 – CD04
- Wall type 05 – CD05
- Wall type 06 – CD06
- Wall type 07 – internal wall
- Wall type 08 – CS012 (party wall) – to manufacturers specifications
- Wall type 09 – CD-09

Insulation specified:

Not nominated

Requirements		R Value	Comments
Total R value of walls is required to be:		2.80 2.40*	External wall construction Internal fully shaded envelope wall
Less	Actual wall materials R Value:	-	
		0.42	Wall types 01,03, 05 & 06
		0.48	Wall type 02
		0.91	Wall types 04 & 09
		0.45	Wall type 07
	Adjustment factor for shading:	-	*
	Adjustment factor if the wall exceeds 220kg/m2 density (some types of masonry):	-	-
Total minimum R Value of insulation to external walls required after adjustments:		R2.38	Required to wall types 01, 03, 05 & 06 excluding garage external walls if applicable
		R2.32	Required to wall type 02 excluding garage external walls if applicable
		R1.89	Required to wall types 04 & 09 excluding garage external walls if applicable
		R1.95	Required to wall type 07 between the dwelling and garage only

BCA Part 3.12.1.5 – <u>Floors</u>
--

Floor construction nominated is

Concrete slab on ground

Insulation specified:

Suspended timber floor to upper level

Not specified

Requirements

R Value

Comments

Total R value of floors is required to be:

1.00

Required to all upper level floor areas where either externally exposed or over a non-conditioned class 10a building (ie garage) below

No specific requirement for concrete slab on ground where not artificially heated or cooled

Less Actual floor materials R Value:

0.51

Suspended timber floor

Added insulation required to achieve compliance:

R0.49

Required to all upper level floor areas where externally exposed or over the garage below

Added insulation required (where floor is suspended, exposed or has in-slab heating / cooling).

N/A

Note: Where in-ground, insulation must be water resistant and to depth of 300mm or full depth of vertical edge of slab

N/A

BCA Part 3.12.1.6 – <u>Attached Class 10 buildings</u>

Requirements	<u>Required</u>			Comments
	Yes	No	N/A	
Have external construction with R Value equivalent or better than the dwelling			√	
Be separated from the dwelling with construction having R value as required for the dwelling external wall / roof	√			1. The garage must be thermally separated from the dwelling (refer parts 3.12.1.4 & 3.12.1.5 of this report)
Where in climate zone 5, is enclosed with masonry walls and separated from the dwelling with masonry wall(s) and has total R value of roof as required for the dwelling and does not have east / west facing garage door except where the glazing for the dwelling is compliant with clause 3.12.2.1 having 15% SHGC value reduction			√	

BCA Part 3.12.2.1 – <u>External Glazing</u>
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*The results of glazing compliance are covered within a copy of the glazing calculator **provided with this report***

Window manufacturer specified	U Value	SHGC Value
Manufacturer <u>(Not specified)</u> – Stegbar window data used to demonstrate compliance– see required U and SHGC values within the glazing calculator outputs for compliance	-	-

BCA Part 3.12.2.2 – <u>Shading</u>

The building has the following:	Yes	No	N/A
Permanent devices ie eaves, verandahs or the like	√		
Semi permanent ie adjustable blinds, adjustable hoods which restrict 80% summer solar radiation			√

BCA Part 3.12.3.1 – <u>Chimneys and Flues</u>
--

Requirements	<u>Required</u>		
	Yes	No	N/A
A chimney or flue associated with a solid fuel burning appliance must have a damper / flap to seal the flue			√

BCA Part 3.12.3.2 – <u>Roof Lights</u>

	<u>Required</u>		
Requirements	Yes	No	N/A

A roof light must be capable of being sealed by weatherproof seal / a shutter / imperforate ceiling diffuser **if serving a habitable room** (climate zones 4,5,6,7 & 8) or conditioned space

√

BCA Part 3.12.3.3 – <u>External Windows and Doors</u>
--

	<u>Required</u>		
Requirements	Yes	No	N/A

External doors and windows must be capable of being sealed from air leakage by a seal (draft seals required to external window and door edges) where serving a habitable room (climate zones 4,5,6,7 & 8) or conditioned space

√

BCA Part 3.12.3.4 – <u>Exhaust Fans</u>
--

	<u>Required if provided</u>		
Requirements	Yes	No	N/A

An exhaust fan (if provided) must be capable of being sealed with a self sealing device ie self closing damper if serving a habitable room (climate zones 4,5,6,7 & 8) or conditioned space

√

BCA Part 3.12.3.5 – <u>Construction of Roofs Walls and Floors</u>
--

	<u>Required</u>		
Requirements	Yes	No	N/A

Building external fabric items such as roofs, external walls and external floors and any openings ie window frames, door frames etc must be constructed to minimize air leakage if serving a habitable room (climate zones 4,5,6,7 & 8) or conditioned space

√

BCA Part 3.12.3.6 – Evaporative Coolers

Required

Requirements

Yes

No

N/A

Evaporative coolers must be fitted with a self closing damper or the like if serving a habitable room (climate zones 4,5,6,7 & 8) or heated space

√

BCA Part 3.12.4.1 – Air Movement

Achieved

Requirements

Yes

No

N/A

Air movement must be provided to **habitable rooms** at % opening to floor area (climate Zones 4 & 5):-

- Without ceiling fan – 7.5% (10% climate zone 4)
- With ceiling fan – 5%

√

√

As per BCA 3.8.5 – climate zones 6,7 & 8

√

BCA Part 3.12.4.2 – Ventilation Openings

Achieved

Requirements

Yes

No

N/A

Ventilation and breeze paths provided

√

BCA Part 3.12.4.3 – Ceiling Fans and Evaporative Coolers

Required

Requirements

Yes

No

N/A

Ceiling fans / evaporative coolers must be permanently installed and have a speed controller. Note ceiling fans with blade rotation diameter up to 900mm must not exceed 15m2 room and 25m2 for 1200mm blade rotation diameter

√

BCA Part 3.12.5.1 – Insulation of Services

Required if provided

Requirements

Yes

No

N/A

Thermal insulation for central heating water piping and heating and cooling ductwork must be protected against effects of weather and sunlight, temperatures within service duct / pipe and comply with AS4859.1

√

BCA Part 3.12.5.2 – Central Heating Water Piping

Required

Requirements

Yes

No

N/A

Central heating water piping not within a conditioned space must be thermally insulated (between R0.2 & R1.3 depending on climate zone)

√

BCA Part 3.12.5.3 – <u>Heating and Cooling Ductwork</u>
--

Required if provided

Requirements

Yes No N/A

Heating and cooling ductwork and fittings (apart from those within a conditioned space / insulated by the building envelope) must achieve required R value and be sealed against air loss :

- Climate zones 4,5 & 6 - R1.0 for heating or cooling only systems + evaporative systems
- Climate zone 4 & 6 - R1.5 for combined systems / Climate zone 5 – R1.0 combined systems

√
√

BCA Part 3.12.5.4 – <u>Electrical Resistance Space Heating</u>

Required

Requirements

Yes No N/A

Electric resistance space heating serving multiple rooms must have separate isolation switching for each room and separate temperature controller and time switch for each group of rooms with common heating needs and a power load not exceeding 110w/m2 – living areas and 150w/m2 for bathrooms

√

BCA Part 3.12.5.5 – Artificial Lighting

Requirements	<u>Required</u>		
	Yes	No	N/A
Lamp power density or illumination power density of artificial lighting must not exceed 5 W/m² for class 1 buildings, 4 W/m² for verandahs or balconies attached to class 1 buildings or 3 W/m² for class 10 buildings *modification factors may apply	√		
Halogen lamps separately switched from fluorescent lamps	√		
Artificial lighting to the perimeter of a building must be controlled by a daylight sensor or have average light source efficacy of not less than 40 lumens/W	√		
<i>A lighting plan has not been provided for the works</i>			
<i>Downlights have not been specified for the project. If downlights are provided, the clearance zones about each downlight and the ceiling exhaust fans to any roof areas must not exceed 0.5% of the ceiling area of the level or reassessment of the roof insulation requirements for the works will be required to ensure energy efficiency compliance is maintained.</i>			

BCA Part 3.12.5.6 – Water heater in a Hot Water Supply System

A water heater in a heated water supply system must be designed and installed in accordance with Part B2 of NCC Volume 3 – Plumbing Code of Australia

BCA Part 3.12.5.7 & 8 – Heating and pumping of a swimming pool or spa pool

Requirements	<u>Required if provided</u>		
	Yes	No	N/A
Swimming pool heating must be by Solar heating not boosted with electric resistance heating, heater using reclaimed energy, gas, heat pump or a combination of these			√
Spa pool heating where sharing water reticulation with swimming pool to be either solar, gas, heat pump or Combination. Where heating or part is by gas or heat pump, a cover to the pool / spa is required			√
Timed switch is required for all pools / spas greater than 680L			√

Report Summary

Total min. value of roof insulation required	R4.71 Required to all roof areas excluding garage roof area. A minimum 50% required insulation to be located at ceiling level
Total min. value of wall insulation required	R2.38 Required to wall types 01, 03, 05 & 06 (excluding garage external walls where applicable) R2.32 Required to wall type 02 (excluding garage external walls where applicable) R1.89 Required to wall types 04 & 09 (excluding garage external walls where applicable) R1.95 Required to wall type 07 to garage internal walls only. Wall type 08 – party wall is to be insulated in strict accordance with the manufacturers specifications
Total min. value of floor insulation required	R0.49 Required to all upper level floor areas where externally exposed and where over the garage only
Thermal Break requirements:	NOTE: R0.2 minimum rated thermal break is required between any metal framing and any metal cladding / fibre cement cladding / timber cladding (only if metal framing iss used)
Glazing U Value(s) & SHGC Value(s) required	Refer to Glazing Calculator outputs. Double glazing as specified to all windows and external glazed doors. Stegbar window data has been used to demonstrate compliance where a specific glazier has not been nominated.
Draft sealing	Required to new external doors and windows and the door between the dwelling and garage only. All new windows and doors to be fitted with seals and be tight fitting when closed
Skylights	N/A
Ventilation	Complies
Lighting maximum wattage / m2 allowed	5 W/m2 Internally 4 W/m2 Garage / porch
Compliance items not summarized above	Refer to the relevant parts of the energy report for all energy efficiency compliance requirements

Disclaimer

- 1) This energy efficiency compliance report is based entirely on the documentation stamped approved and attached to this report and as verified with the building designer. Any assumptions used outside of the plans have been verified with the design consultants. Where building services (ie air-conditioning, central heating etc) are not nominated, they have been noted not applicable under this assessment. Any alterations to the design or installation of new building services such as air-conditioning may alter the energy efficiency compliance of the building.
- 2) While all due care has been taken in the preparation of this report, Energy and Outdoor Design ABN 91505034369 does not assume liability for any damage or loss due to misrepresentation of this report and confirms that this report provides general compliance advice to the requirements. All comments and recommendations relate to energy efficiency requirements only. All products used to achieve required R ratings are to be to the manufacturers recommendations and verified by the builder as suitable.
- 3) This is not a structural report. All assumptions and recommendations made within this report are for energy efficiency purposes only and should be verified by a suitably qualified structural expert as required.

NCC VOLUME TWO GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

392-394 Unley Road, Unley Park Residence 5 GF glazing

Climate zone

5

	C_U	C_{SHGC}
CONSTANTS	13.464	0.134

Storey Floor Construction Area

Ground

Direct contact 48m²

Wall insulation option chosen for 3.12.1.4

Air Movement

high

Suspended

No wall insulation concession used

Area of storey 48m²Area of glazing 13.1m² (27% of area of storey)

	C_U (only)	$C_{SHGC} \times \text{Area}$
ALLOWANCES	13.5	6.4

Number of rows for table below

3 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS							SHADING		CALCULATION DATA			CALCULATED OUTCOMES - OK (if inputs are valid)				
Glazing element		Orientation		Size		Performance		P&H or device		Exposure		Size	Conductance - PASSED		Solar heat gain - PASSED	
ID	Description (optional)	Facing sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / winter access	Element share of % of allowance used	SHGC x Es x area	Element share of % of allowance used
1	W01	N	2.70	3.30		4.45	0.59				0.82	8.91	2.99	71% of 31%	4.3	71% of 95%
2	W02	N	2.70	1.10		3.65	0.35				0.82	2.97	0.82	19% of 31%	0.9	14% of 95%
3	W03	W	0.60	2.00		4.46	0.59	0.20	5.90	0.02	1.26	1.20	0.40	10% of 31%	0.9	15% of 95%

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR

If inputs (including air movement levels) are valid

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.



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NCC VOLUME TWO GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

392-394 Unley Road, Unley Park (Residence 5)

Climate zone

5

	C_U	C_{SHGC}
CONSTANTS	12.118	0.110

Storey Floor Construction Area

Upper

Direct contact

Wall insulation option chosen for 3.12.1.4

Air Movement

Suspended

71m²

No wall insulation concession used

standard

Area of storey

71m²Area of glazing 22.4m² (32% of area of storey)

	C_U (only)	$C_{SHGC} \times \text{Area}$
ALLOWANCES	12.1	7.8

Number of rows for table below

8 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS							SHADING		CALCULATION DATA			CALCULATED OUTCOMES - OK (if inputs are valid)				
Glazing element		Orientation		Size		Performance		P&H or device		Exposure		Size	Conductance - PASSED		Solar heat gain - PASSED	
ID	Description (optional)	Facing sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / winter access	Element share of % of allowance used	SHGC x Es x area	Element share of % of allowance used
1	W04C	S	1.90	1.25		4.35	0.58	1.20	3.40	0.18	0.49	2.38	1.00	11% of 73%	0.7	9% of 98%
2	W04B	S	1.90	3.20		4.35	0.58	1.20	3.40	0.18	0.49	6.08	2.56	29% of 73%	1.7	23% of 98%
3	W04A	S	1.90	1.05		4.35	0.58	1.20	3.40	0.18	0.49	2.00	0.84	10% of 73%	0.6	7% of 98%
4	W05	E	1.90	0.50		3.63	0.36	0.35	3.20	0.05	1.06	0.95	0.33	4% of 73%	0.4	5% of 98%
5	W06	E	1.90	1.00		4.46	0.59	0.35	3.00	0.06	1.06	1.90	0.82	9% of 73%	1.2	15% of 98%
6	W07	N	2.00	3.20		3.44	0.35				0.82	6.40	2.13	24% of 73%	1.8	24% of 98%
7	W08	N	1.50	0.90		4.35	0.58				0.82	1.35	0.57	6% of 73%	0.6	8% of 98%
8	W09	N	1.50	0.90		4.35	0.58				0.82	1.35	0.57	6% of 73%	0.6	8% of 98%

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