

Proposed Childcare Centre

110-112 Mount Vernon Road
MOUNT VERNON NSW

Compliance Report

National Construction Code Series
(Building Code of Australia)
Section J – Energy Efficiency

February 2019



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The reader's attention is drawn to the following important information:

Disclaimer

Scope Limitations: This report is to assess the proposed development (named above), with reference to the documents listed in the report, with respect to compliance with the Building Code of Australia (2016) Section J Energy Efficiency provisions and report the results of the assessment to the client

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Document Control


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Executive Summary

The development has been assessed against the Deemed to Satisfy provisions of Section J (Energy Efficiency) of the Building Code of Australia. The items outlined below are the requirements for this development to achieve compliance with Section J. These requirements have been determined based on the information provided to Application Solutions at the time of carrying out this assessment. Any design changes should be checked to ensure these requirements remain correct and accurate. Contact Application Solutions for assistance if reassessment is required.

Part J1 – Building Fabric

1. Construction Requirements – Installation of Insulation

Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it:

- (i) abuts or overlaps adjoining insulation other than at supporting members; and
- (ii) forms a continuous barrier...and
- (iii) does not affect the safe or effective operation of a service or fitting.

Reflective insulation must be installed with:

- (i) the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and
- (ii) the reflective insulation closely fitted against any penetration, door or window opening; and
- (iii) the reflective insulation adequately supported by framing members; and
- (iv) each adjoining sheet of roll membrane being overlapped not less than 50 mm or taped together.

Bulk insulation must be installed so that:

- (i) it maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like; and
- (ii) in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, it overlaps the wall by not less than 50 mm.

2. Construction Requirements – Roof and Ceiling Insulation

The minimum total R-Value for the roof/ceiling system which forms part of the envelope required by BCA Table J1.3a is R3.2.

The proposed roof/ceiling system achieves an R-Value of R0.47. Therefore to achieve compliance, insulation of at least R2.73 is required to be incorporated into the roof/ceiling system which forms part of the envelope.

3. Construction Requirements – Adjustment for Loss of Ceiling Insulation

Where the required insulation is located at ceiling level and the percentage of ceiling area uninsulated is more than 0.5% as a result of loss of ceiling insulation due to operational or safety reasons and where insulation of more than R1.0 is located at ceiling level, the loss of insulation must be compensated for by increasing the R-Value of the insulation in the remainder of the ceiling in accordance with BCA Table J1.3b.

Note: The percentage of ceiling area uninsulated must not exceed 5% of the total ceiling area forming part of the envelope.

4. Construction Requirements – Thermal Break

Where the ceiling lining is attached directly to the same metal frame as the metal roof, a thermal break of at least R0.2 must be installed between the metal sheet roofing and its supporting metal frame. This applies to areas of roof that form part of the envelope.

5. Construction Requirements – Wall Insulation (External Envelope)

Where external walls form part of the envelope, a total R-value of R2.8 is required to be achieved. The metal stud walls achieve an R-value of R0.22. Therefore, insulation with R-value of at least R2.58 is required to be incorporated into the metal stud wall system where walls form part of the external envelope.

See Appendix for walls forming part of the envelope.

6. Construction Requirements – Wall Insulation (Internal Envelope)

Where internal walls form part of the envelope, a total R-value of R1.8 is required to be achieved.

The stud walls achieve an R-value of R0.33. Therefore, insulation with R-value of at least R1.47 is required to be incorporated into the stud wall system where walls form part of the internal envelope.

See Appendix for walls forming part of the envelope.

7. Construction Requirements – Thermal Breaks

A thermal break with R-Value of not less than R0.2 must be installed between the external cladding and the metal frame of walls that have lightweight external cladding fixed to a metal frame and have a wall lining fixed directly to the same metal frame where walls form part of the envelope.

8. Construction Requirements – Floor Insulation

The total R-value required to be achieved by an on-ground concrete slab with no in-slab heating or cooling in climate zone 6 is: *NIL*

Part J2 – Glazing

9. Construction Requirements – Glazing

Glazing elements forming part of the envelope shall have the following thermal properties in terms of their orientations:

Ground Floor

Orientation	Items	Total U-Value	SHGC	Notes
South	New glazing	Equal or Lower than 5.4	Equal or Higher than 0.31	See graph in appendix for a more detailed result
East	New glazing	Equal or Lower than 8.0	Equal or Lower than 1.00	No glazing restriction
North	New glazing	Equal or Higher than 3.2	Equal or Lower than 0.54	See graph in appendix for a more detailed result
West	New glazing	Equal or Lower than 6.0	Equal or Lower than 0.99	Use this result

Refer to Appendix for full calculation of glazing requirements.

10. Construction Requirements – Shading

Shading has been provided as shown on architectural drawings by building elements and shading projections. For further details refer to the glazing calculations in Appendix (see P and H values). No alterations shall be made to shading design dimensions without first checking compliance with this Clause. Contact Application Solutions for assistance if required.

Part J3 – Building Sealing

11. Construction Requirements – Window and Door Sealing

A seal to restrict air infiltration must be fitted to each edge of a door, openable window or the like where forming part of the envelope. The seal may be a foam or rubber compression strip, fibrous seal or the like. For the bottom edge of an external swing door, a draft protection device must be installed. For exemptions to this clause see body of report.

12. Construction Requirements – Building Entrance Sealing

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

13. Construction Requirements – Exhaust Fan Sealing

A miscellaneous exhaust fan such as a bathroom or domestic kitchen exhaust fan, must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space.

14. Construction Requirements – Roof, Wall and Floor Sealing

Roofs, ceilings, walls, floors and any opening such as a window frame, door frame, or the like must be constructed to minimise air leakage when forming part of the envelope and must be enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions or sealed by caulking, skirting, architraves, cornices or the like.

Part J5 – Air-conditioning and Ventilation Systems

15. Construction Requirements – Deactivation Capability

An air-conditioning system must be capable of being deactivated when the building or part of the building served is not occupied.

16. Construction Requirements – Air-conditioning Zones

Different air-conditioning zones shall be separately thermostatically controlled and not have their temperature controlled by mixing actively heated air or actively cooled air. Reheating must be limited to not more than a 7.5K rise in temperature for a fixed supply air rate, or for a variable supply air rate, not more than 7.5K rise in temperature at the normal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased.

17. Construction Requirements – Economy Cycle

Where the air-conditioning system provides the required mechanical ventilation and exceeds 35 kW_r, it shall have an outdoor air economy cycle.

18. Construction Requirements – Air Dampers

Where the air-conditioning unit or system has motorised outside air and return dampers, close the dampers when the air-conditioning unit or system is deactivated.

19. Construction Requirements – Air-conditioning Fans

Fans of any air-conditioning systems serving the building must comply with BCA Specification J5.2a.

20. Construction Requirements - Ductwork Insulation

The ductwork of an air-conditioning system must be insulated and sealed in accordance with BCA Specification J5.2b.

21. Construction Requirements – Energy Efficiency Ratios

Any packaged air-conditioning equipment or refrigerant chillers (as part of an air-conditioning system) must have energy efficiency ratios in compliance with BCA Specification J5.2e.

22. Construction Requirements – Time Switch

A time switch in accordance with BCA Specification J6 must be provided to control all air-conditioning/heating systems of more than 10 kW.

23. Construction Requirements – Ventilation Operation

A mechanical ventilation system (including one which is part of an air-conditioning system) must be capable of being deactivated when the building or part of the building served is not occupied.

24. Construction Requirements – Mechanical Ventilation of Conditioned Space

The mechanical ventilation system shall not provide mechanical ventilation in excess of the minimum quantity required by BCA Part F4 by more than 20% other than in the conditions detailed in the body of the report.

25. Construction Requirements – Ventilation Fans

Any fans of a mechanical ventilation system installed must comply with BCA Specification J5.2a.

26. Construction Requirements – Ventilation Time Switch Control

Any mechanical ventilation system with an air flow rate of more than 1000 L/s must be controlled by a time switch in compliance with BCA Specification J6.
See BCA J5.3(c)(ii) for any appropriate exclusions to this requirement.

27. Construction Requirements – Miscellaneous Exhaust

An exhaust system which has an air flow rate of more than 1000 L/s and is associated with equipment having a variable demand must have the ability for the operator to stop the motor when the system is not in use and must also have a variable speed fan (or similar control system).

Part J6 – Artificial Lighting and Power

28. Construction Requirements – Maximum Interior Illumination Power Load

The total maximum allowed interior illumination power load for the development is 6,446 W.
The aggregate design illumination power load must not exceed this allowed wattage.
Note emergency lighting and signage lighting are exempted from this requirement.
See Appendix for detailed calculation of allowed interior illumination power load.

29. Construction Requirements – Lighting Control

Artificial lighting of a room or space must be individually operated by a switch or other control device.

30. Construction Requirements – Lighting Control (Switching)

Artificial lighting switches must be located in a visible position in the room or space being switched or in an adjacent room or space from where the lighting being switched is visible.
Switches must not operate lighting for an area of more than 250 m².

31. Construction Requirements – Time Switch or Occupant Sensing Device

95% of the lighting in the building must be controlled by a time switch in accordance with BCA Specification J6 or an occupant sensing device such as a security card reader that registers a person entering and leaving the building or a motion detector in accordance with BCA Specification J6.

32. Construction Requirements – Decorative or Display Lighting

Interior decorative and display lighting (such as for foyer mural art display), shall be controlled separately from other lighting by a manual switch for each area (where the operating times of the displays are the same in multiple areas, they may be combined).

Where the decorative/display lighting exceeds 1 kW, it must be controlled by a time switch in accordance with BCA Specification J6.

33. Construction Requirements – Window Display Lighting

Window display lighting must be controlled separately from other display lighting.

34. Construction Requirements – Perimeter Lighting

Artificial lighting around the perimeter of the building must be controlled by a daylight sensor or a time switch in accordance with BCA Specification J6.

When the total perimeter lighting load exceeds 100 W it shall have an average light source efficacy of not less than 60 Lumens/W or be controlled by a motion detector in accordance with BCA Specification J6.

35. Construction Requirements – Decorative Perimeter Lighting

Where external lighting for decorative or signage purposes is installed, it must be controlled by a time switch (separate from other external lighting) in accordance with BCA Specification J6.

36. Construction Requirements – Boiling/Chilled Water Storage Units

The power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with BCA Specification J6.

Part J7 – Heated Water Supply and Swimming Pool and Spa Pool Plant

37. Construction Requirements – Hot Water Heater

Any heated water service for food preparation or sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three - Plumbing Code of Australia.

Part J8 – Access for Maintenance and Facilities for Monitoring

38. Construction Requirements – Gas and Electricity Consumption

The building has a floor area of more than 500 m² and therefore must have the facility to record the consumption of gas and electricity.

Introduction

Application Solutions has been engaged to provide a compliance assessment of the proposed development with respect to the Building Code of Australia (2016) (BCA), Section J – Energy Efficiency. The BCA2016 is part of the National Construction Series.

The assessment is based on the Deemed-to-Satisfy (DTS) provisions of the BCA. The assessment references the National provisions of the BCA and the NSW Appendix to the BCA.

Throughout this report, reference is made to the **envelope** of a building. This is an important term in the application of Section J and is defined in the BCA as follows:

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-
 - (i) The floor of a rooftop plant room, lift-machine room or the like; and
 - (ii) The floor above a carpark or warehouse; and
 - (iii) The common wall with a carpark, warehouse or the like.

For complete understanding, the term **conditioned space** is also referred to and is defined in the BCA as follows:

Conditioned space means a space within a building, including a ceiling or under-floor supply air plenum or return air plenum, where the environment is likely, by the intended use of the space, to have its temperature controlled by air-conditioning, but does not include-

- (a) A non-habitable room of a Class 2 building or Class 4 part of a building in which a heater with a capacity of not more than 1.2 kW or 4.3 MJ/hour provides the air-conditioning; or
- (b) A space in a Class 6, 7, 8 or 9b building where the input energy to an air-conditioning system is not more than 15 W/m² or 15 J/s.m² (54 KJ/hour.m²); or
- (c) A lift shaft

References are also made to Specifications and additional information contained within the BCA. It is important to be aware of these details as relevant to Section J compliance. Copies of these are now available free of charge through the Australian Building Codes Board at www.abcb.gov.au

Contact Application Solutions if you need assistance in accessing the online version of the BCA.

Proposed Development

The proposed development comprises a new childcare centre.

The proposed development has been classified:

Childcare Centre Class 9b

The development is in the Local Government Area (LGA) of City of Penrith

and therefore the relevant climate zone is Climate Zone 6

The designer for the proposed development is:

Project Works Design
PO Box 5138
Chittaway Bay NSW 2261

Assessment Outline

This Assessment examines each Part of Section J in turn and provides an opinion on whether the Part applies in this case and if so whether the Deemed-to-Satisfy provisions have been met. In some cases further clarification is specified in the form of notes to be included on the plans and/or specifications.

A summary of items required to achieve Section J compliance is provided at the beginning of this report. These matters will need to be incorporated into the Construction Certificate documentation before a Construction Certificate is granted.

In the preparation of this assessment, reference was made to the following plans:

Proposed Site Plans	SK01 – B
Proposed Floor Plan	SK02 – B
Proposed Roof Plan	SK03 – B
Proposed Elevations	SK04 – B

Section J: On Completion of Construction

The section above provides the documentation of Section J requirements which apply to the proposed development. Attention is drawn to the need to provide documentation during construction that each requirement has been met.

This should include, where relevant;

- Certificates from specific suppliers and contractors
- Photographic record and
- Site inspections

It is important that the information in this report be forwarded to the person/s responsible on site to ensure all work is carried out in compliance and that each item is documented appropriately.

Part J1 – Building Fabric

J1.1 Application of Part

BCA extract	<i>The Deemed-to-Satisfy Provisions of this Part apply to building elements forming the envelope of a Class 2 to 9 building.</i>		
Application to Development	Childcare Centre	Class 9b	This Part applies

J1.2 Thermal construction – general

BCA extract	<p>J1.2 (a) <i>Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it-</i></p> <ul style="list-style-type: none"> (i) <i>abuts or overlaps adjoining insulation other than at supporting members such as studs, noggins, joists, furring channels and the like where the insulation must be against the member; and</i> (ii) <i>forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and</i> (iii) <i>does not affect the safe or effective operation of a service or fitting.</i> <p>(b) <i>Where required, reflective insulation must be installed with-</i></p> <ul style="list-style-type: none"> (i) <i>the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and</i> (ii) <i>the reflective insulation closely fitted against any penetration, door or window opening; and</i> (iii) <i>the reflective insulation adequately supported by framing members; and</i> (iv) <i>each adjoining sheet of roll membrane being-</i> <ul style="list-style-type: none"> (A) <i>overlapped not less than 50 mm; or</i> (B) <i>taped together.</i> <p>(c) <i>Where required, bulk insulation must be installed so that-</i></p> <ul style="list-style-type: none"> (i) <i>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</i> (ii) <i>in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, it overlaps the wall by not less than 50 mm.</i> <p>(d) <i>Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in BCA Specification J1.2.</i></p>
Application to Development	This clause applies where insulation is required in the proposed development.
1. Construction Requirements – Installation of Insulation	<p>Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it:</p> <ul style="list-style-type: none"> (i) abuts or overlaps adjoining insulation other than at supporting members; and (ii) forms a continuous barrier...and (iii) does not affect the safe or effective operation of a service or fitting. <p>Reflective insulation must be installed with:</p> <ul style="list-style-type: none"> (i) the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and (ii) the reflective insulation closely fitted against any penetration, door or window opening; and (iii) the reflective insulation adequately supported by framing members; and (iv) each adjoining sheet of roll membrane being overlapped not less than 50 mm or taped together. <p>Bulk insulation must be installed so that:</p> <ul style="list-style-type: none"> (i) it maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like; and (ii) in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, it overlaps the wall by not less than 50 mm.

J1.3 Roof and ceiling construction

BCA extract	<p>J1.3 (a) A roof or ceiling that is part of the envelope, other than of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, must achieve the Total R-Value specified in BCA Table J1.3a for the direction of heat flow.</p> <p>(b) For compliance with BCA Table J1.3a, roof and ceiling construction is deemed to have the thermal properties listed in BCA Specification J1.3.</p>																																
Application to Development	<p>This clause applies to the proposed development. The roof/ceiling system which forms part of the envelope shall have a minimum total R-Value as required by BCA Table J1.3a. The components of the proposed new roof/ceiling system and their respective R-Values are tabulated below:</p> <p>Metal Roof</p> <table border="1" data-bbox="464 625 1430 856"> <thead> <tr> <th>Item</th> <th>Description</th> <th>R-Value</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Outdoor air film</td> <td>0.04</td> <td>from specification J1.3</td> </tr> <tr> <td>2</td> <td>Metal cladding</td> <td>0.00</td> <td>from specification J1.3</td> </tr> <tr> <td>3</td> <td>Airgap</td> <td>0.21</td> <td>from specification J1.3</td> </tr> <tr> <td>4</td> <td>Insulation</td> <td></td> <td>to be specified</td> </tr> <tr> <td>5</td> <td>Plasterboard 10 mm</td> <td>0.06</td> <td>from specification J1.3</td> </tr> <tr> <td>6</td> <td>Indoor air film</td> <td>0.16</td> <td>from specification J1.3</td> </tr> <tr> <td colspan="2">TOTAL</td> <td>R0.47</td> <td></td> </tr> </tbody> </table> <p>To achieve compliance with the total R-Value requirement, insulation with R-Value of at least R2.73 is required to be incorporated into the roof/ceiling system.</p>	Item	Description	R-Value	Note	1	Outdoor air film	0.04	from specification J1.3	2	Metal cladding	0.00	from specification J1.3	3	Airgap	0.21	from specification J1.3	4	Insulation		to be specified	5	Plasterboard 10 mm	0.06	from specification J1.3	6	Indoor air film	0.16	from specification J1.3	TOTAL		R0.47	
Item	Description	R-Value	Note																														
1	Outdoor air film	0.04	from specification J1.3																														
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TOTAL		R0.47																															
2. Construction Requirements – Roof and Ceiling Insulation	<p>The minimum total R-Value for the roof/ceiling system which forms part of the envelope required by BCA Table J1.3a is R3.2.</p> <p>The proposed roof/ceiling system achieves an R-Value of R0.47. Therefore to achieve compliance, insulation of at least R2.73 is required to be incorporated into the roof/ceiling system which forms part of the envelope.</p>																																

Continues on next page...

<p>BCA extract</p>	<p>J1.3 (c) Where, for operational or safety reasons associated with exhaust fans, flues or recessed downlights, the area of required ceiling insulation is reduced, the loss of insulation must be compensated for by increasing the R-Value of the insulation in the remainder of the ceiling in accordance with BCA Table J1.3b.</p> <p>BCA Table J1.3b ADJUSTMENT OF MINIMUM R-VALUE FOR LOSS OF CEILING INSULATION</p> <table border="1"> <thead> <tr> <th rowspan="2">Percentage of ceiling area uninsulated</th> <th colspan="11">Minimum R-Value of ceiling insulation required to satisfy J1.3(a)</th> </tr> <tr> <th>1.0</th> <th>1.5</th> <th>2.0</th> <th>2.5</th> <th>3.0</th> <th>3.5</th> <th>4.0</th> <th>4.5</th> <th>5.0</th> <th>5.5</th> <th>6.0</th> </tr> </thead> <tbody> <tr> <td>0.5% to less than 1.0%</td> <td>1.0</td> <td>1.6</td> <td>2.2</td> <td>2.8</td> <td>3.4</td> <td>4.0</td> <td>4.7</td> <td>5.4</td> <td>6.2</td> <td>6.9</td> <td></td> </tr> <tr> <td>1.0% to less than 1.5%</td> <td>1.1</td> <td>1.7</td> <td>2.3</td> <td>2.9</td> <td>3.6</td> <td>4.4</td> <td>5.2</td> <td>6.1</td> <td>7.0</td> <td></td> <td></td> </tr> <tr> <td>1.5% to less than 2.0%</td> <td>1.1</td> <td>1.7</td> <td>2.4</td> <td>3.1</td> <td>3.9</td> <td>4.8</td> <td>5.8</td> <td>6.8</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.0% to less than 2.5%</td> <td>1.1</td> <td>1.8</td> <td>2.5</td> <td>3.3</td> <td>4.2</td> <td>5.3</td> <td>6.5</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.5% to less than 3.0%</td> <td>1.2</td> <td>1.9</td> <td>2.6</td> <td>3.6</td> <td>4.6</td> <td>5.9</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.0% to less than 4.0%</td> <td>1.2</td> <td>2.0</td> <td>3.0</td> <td>4.2</td> <td>5.7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Not Permitted</td> </tr> <tr> <td>4.0% to less than 5.0%</td> <td>1.3</td> <td>2.2</td> <td>3.4</td> <td>5.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5.0% or more</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Note: Where the minimum R-Value of ceiling insulation required to satisfy BCA J1.3(a) is between the values stated, interpolation may be used to determine the adjusted minimum R-Value.</p>	Percentage of ceiling area uninsulated	Minimum R-Value of ceiling insulation required to satisfy J1.3(a)											1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	0.5% to less than 1.0%	1.0	1.6	2.2	2.8	3.4	4.0	4.7	5.4	6.2	6.9		1.0% to less than 1.5%	1.1	1.7	2.3	2.9	3.6	4.4	5.2	6.1	7.0			1.5% to less than 2.0%	1.1	1.7	2.4	3.1	3.9	4.8	5.8	6.8				2.0% to less than 2.5%	1.1	1.8	2.5	3.3	4.2	5.3	6.5					2.5% to less than 3.0%	1.2	1.9	2.6	3.6	4.6	5.9						3.0% to less than 4.0%	1.2	2.0	3.0	4.2	5.7						Not Permitted	4.0% to less than 5.0%	1.3	2.2	3.4	5.0								5.0% or more											
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<p>Application to Development</p>	<p>This clause may apply to the development depending on selection of insulation and location of installation</p>																																																																																																																							
<p>3. Construction Requirements – Adjustment for Loss of Ceiling Insulation</p>	<p>Where the required insulation is located at ceiling level and the percentage of ceiling area uninsulated is more than 0.5% as a result of loss of ceiling insulation due to operational or safety reasons and where insulation of more than R1.0 is located at ceiling level, the loss of insulation must be compensated for by increasing the R-Value of the insulation in the remainder of the ceiling in accordance with BCA Table J1.3b.</p> <p>Note: The percentage of ceiling area uninsulated must not exceed 5% of the total ceiling area forming part of the envelope.</p>																																																																																																																							

BCA extract	<p><i>J1.3 (d) A roof that-</i></p> <ul style="list-style-type: none"> <i>(i) is required to achieve a minimum Total R-Value; and</i> <i>(ii) has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and</i> <i>(iii) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see BCA Specification J1.3 Figure 2(c) and Figure (f)),</i> <p><i>must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.</i></p>
Application to Development	<p>This clause applies to the proposed development where the ceiling lining is attached directly to the same metal frame as the metal roof.</p>
<p>4. Construction Requirements – Thermal Break</p>	<p>Where the ceiling lining is attached directly to the same metal frame as the metal roof, a thermal break of at least R0.2 must be installed between the metal sheet roofing and its supporting metal frame. This applies to areas of roof that form part of the envelope.</p>

J1.4 Roof lights

BCA extract	<p><i>Roof lights, including any associated shaft and diffuser, that form part of the envelope, other than of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, must-</i></p> <p><i>J1.4 (a) if the roof lights are not required for compliance with BCA Part F4, comply with BCA Table J1.4; or</i></p> <ul style="list-style-type: none"> <i>(b) if the roof lights are required for compliance with BCA Part F4-</i> <ul style="list-style-type: none"> <i>(i) have an area not more than 150% of the minimum area required by BCA F4.6; and</i> <i>(ii) have transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of not more than-</i> <ul style="list-style-type: none"> <i>(A) 0.29 SHGC; and</i> <i>(B) 2.9 Total U-Value.</i>
Application to Development	<p>This clause does not apply as there are no roof lights forming part of the envelope of the development.</p>

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J1.5 Walls

BCA extract	<p>J1.5 (a) Each part of an external wall that is part of the envelope, other than of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, must satisfy one of the options in BCA Table J1.5a except for-</p> <ul style="list-style-type: none"> (i) opaque non-glazed openings in external walls such as doors (including garage doors), vents, penetrations, shutters and the like; and (ii) glazing; and (iii) an earth retaining wall or earth-berm, in other than climate zone 8. 																												
Application to Development	<p>External walls forming part of the envelope (see Appendix) must satisfy one of the options in BCA Table J1.5a. The components of the proposed external wall system and their respective R-Values are tabulated below:</p> <p>Metal Stud wall</p> <table border="1" data-bbox="464 621 1430 827"> <thead> <tr> <th>Item</th> <th>Description</th> <th>R-Value</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Outdoor air film</td> <td>0.04</td> <td>from specification J1.5</td> </tr> <tr> <td>2</td> <td>Metal cladding</td> <td>0.00</td> <td>from specification J1.5</td> </tr> <tr> <td>3</td> <td>Insulation</td> <td></td> <td>to be specified</td> </tr> <tr> <td>4</td> <td>Plasterboard 10 mm</td> <td>0.06</td> <td>from specification J1.5</td> </tr> <tr> <td>5</td> <td>Indoor air film</td> <td>0.12</td> <td>from specification J1.5</td> </tr> <tr> <td colspan="2">TOTAL</td> <td>R0.22</td> <td></td> </tr> </tbody> </table> <p>To achieve compliance with the total R-Value requirement, insulation with R-Value of at least R2.58 is required to be incorporated into the external wall system where walls form part of the envelope.</p>	Item	Description	R-Value	Note	1	Outdoor air film	0.04	from specification J1.5	2	Metal cladding	0.00	from specification J1.5	3	Insulation		to be specified	4	Plasterboard 10 mm	0.06	from specification J1.5	5	Indoor air film	0.12	from specification J1.5	TOTAL		R0.22	
Item	Description	R-Value	Note																										
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2	Metal cladding	0.00	from specification J1.5																										
3	Insulation		to be specified																										
4	Plasterboard 10 mm	0.06	from specification J1.5																										
5	Indoor air film	0.12	from specification J1.5																										
TOTAL		R0.22																											
5. Construction Requirements – Wall Insulation (External Envelope)	<p>Where external walls form part of the envelope, a total R-value of R2.8 is required to be achieved. The metal stud walls achieve an R-value of R0.22. Therefore, insulation with R-value of at least R2.58 is required to be incorporated into the metal stud wall system where walls form part of the external envelope. See Appendix for walls forming part of the envelope.</p>																												

BCA extract	<p>J1.5 (b) Any wall, other than an external wall, that is part of the envelope must achieve the Total R-Value in BCA Table J1.5b.</p>																												
Application to Development	<p>Internal walls shown in Figure 1.5 to form part of the envelope (see Appendix) must achieve the Total R-value in BCA Table J1.5b. The components of the proposed internal wall system and their respective R-Values are tabulated below:</p> <p>Stud wall</p> <table border="1" data-bbox="464 1451 1430 1656"> <thead> <tr> <th>Item</th> <th>Description</th> <th>R-Value</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Indoor air film</td> <td>0.12</td> <td>from specification J1.5</td> </tr> <tr> <td>2</td> <td>Fibre-cement 6 mm</td> <td>0.03</td> <td>from specification J1.5</td> </tr> <tr> <td>3</td> <td>Insulation</td> <td></td> <td>to be specified</td> </tr> <tr> <td>4</td> <td>Plasterboard 10 mm</td> <td>0.06</td> <td>from specification J1.5</td> </tr> <tr> <td>5</td> <td>Indoor air film</td> <td>0.12</td> <td>from specification J1.5</td> </tr> <tr> <td colspan="2">TOTAL</td> <td>R0.33</td> <td></td> </tr> </tbody> </table> <p>To achieve compliance with the total R-Value requirement of R1.8, insulation with R-Value of at least R1.47 is required to be incorporated into the internal wall system where walls form part of the envelope.</p>	Item	Description	R-Value	Note	1	Indoor air film	0.12	from specification J1.5	2	Fibre-cement 6 mm	0.03	from specification J1.5	3	Insulation		to be specified	4	Plasterboard 10 mm	0.06	from specification J1.5	5	Indoor air film	0.12	from specification J1.5	TOTAL		R0.33	
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5	Indoor air film	0.12	from specification J1.5																										
TOTAL		R0.33																											
6. Construction Requirements – Wall Insulation (Internal Envelope)	<p>Where internal walls form part of the envelope, a total R-value of R1.8 is required to be achieved. The stud walls achieve an R-value of R0.33. Therefore, insulation with R-value of at least R1.47 is required to be incorporated into the stud wall system where walls form part of the internal envelope. See Appendix for walls forming part of the envelope.</p>																												

BCA extract	<p><i>J1.5 (c) A wall that-</i></p> <ul style="list-style-type: none"> <i>(i) is required to achieve a minimum Total R-Value; and</i> <i>(ii) has lightweight external cladding such as weatherboards, fibre cement or metal sheeting fixed to a metal frame; and</i> <i>(iii) does not have a wall lining or has a wall lining that is fixed directly to the same metal frame,</i> <p><i>must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed between the external cladding and the metal frame.</i></p>
Application to Development	<p>This clause applies to the metal stud walls forming part of the envelope where lightweight external cladding is fixed to a metal frame and the wall lining is fixed directly to the same metal frame.</p>
7. Construction Requirements – Thermal Breaks	<p>A thermal break with R-Value of not less than R0.2 must be installed between the external cladding and the metal frame of walls that have lightweight external cladding fixed to a metal frame and have a wall lining fixed directly to the same metal frame where walls form part of the envelope.</p>

BCA extract	<p><i>J1.5 (d) For compliance with BCA Table J1.5a and BCA Table J1.5b, wall construction is deemed to have the thermal properties listed in BCA Specification J1.5.</i></p>
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J1.6 Floors

BCA extract	<p><i>J1.6 (a) A floor that is part of the envelope of a building, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, including a floor above or below a carpark or a plant room-</i></p> <ul style="list-style-type: none"> <i>(i) must achieve the Total R-Value specified in BCA Table J1.6; and</i> <i>(ii) with an in-slab or in-screed heating or cooling system, must be insulated around the vertical edge of its perimeter with insulation having an R-Value of not less than 1.0</i> <p><i>(b) In climate zones 1 to 6, the minimum Total R-Value required in BCA J1.6 (a) may be reduced by R0.5 provided R0.75 is added to the Total R-Value required for the roof and ceiling construction.</i></p>
Application to Development	<p>Floors shown in Figure 1.6 to form part of the envelope must achieve the Total R-Value specified in BCA Table J1.6.</p> <p>The total R-value required to be achieved by an on-ground concrete slab with no in-slab heating or cooling in climate zone 6 is: <i>NIL</i></p>
8. Construction Requirements – Floor Insulation	<p>The total R-value required to be achieved by an on-ground concrete slab with no in-slab heating or cooling in climate zone 6 is: <i>NIL</i></p>

BCA extract	<p><i>J1.6 (c) A concrete slab-on-ground-</i></p> <ul style="list-style-type: none"> <i>(i) with an in-slab or in-screed heating or cooling system; or</i> <i>(ii) located in climate zone 8,</i> <p><i>must have insulation installed around the vertical edge of its perimeter.</i></p> <p><i>(d) Insulation required by BCA J1.6 (c) must-</i></p> <ul style="list-style-type: none"> <i>(i) have an R-Value of not less than 1.0; and</i> <i>(ii) be water resistant; and</i> <i>(iii) be continuous from the adjacent finished ground level-</i> <ul style="list-style-type: none"> <i>(A) to a depth of not less than 300 mm; or</i> <i>(B) for the full depth of the vertical edge of the concrete slab-on-ground.</i>
Application to Development	<p>This clause does not apply as there are no in-slab heating/cooling systems shown to be planned.</p>

BCA extract	<p><i>J1.6 (e) The requirements of BCA J1.6 (a)(ii) and BCA J1.6 (c)(ii) do not apply to an in-screed heating or cooling system used solely in a bathroom, amenity area or the like.</i></p>
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BCA extract	<p><i>J1.6 (f) Floor construction is deemed to have the thermal properties listed in BCA Specification J1.6.</i></p>
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Part J2 – Glazing

J2.1 Application of Part

BCA extract	<i>The Deemed-to-Satisfy Provisions of this Part apply to elements forming the envelope of a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building.</i>		
Application to Development			
	Childcare Centre	Class 9b	This Part applies

J2.2 Blank

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J2.3 Blank

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J2.4 Glazing

BCA extract	<p>J2.4 (a) <i>The glazing in each storey, including any mezzanine, of a building must be assessed separately in accordance with BCA J2.4 (b) and BCA J2.4 (c) for-</i></p> <ul style="list-style-type: none"> (i) <i>glazing in the external fabric facing each orientation; and</i> (ii) <i>glazing in the internal fabric</i> <p>(b) <i>The aggregate air-conditioning energy value attributable to the glazing must not exceed the allowance obtained by multiplying the façade area that is exposed to the conditioned space for the orientation by the energy index in BCA Table J2.4a.</i></p> <p>(c) <i>The aggregate air-conditioning energy value must be calculated by adding the air-conditioning energy value through each glazing element in accordance with the following formula:</i></p> $A1[SHGC1(CA \times SH1 + CB \times SC1) + CC \times U1] + A2[SHGC2(CA \times SH2 + CB \times SC2) + CC \times U2] + \dots$ <p>where-</p> <ul style="list-style-type: none"> A1, 2, etc = <i>the area of each glazing element; and</i> CA, B and C = <i>the energy constants A, B and C for the specific orientation from BCA Table J2.4b; and</i> SHGC1, 2, etc = <i>the SHGC of each glazing element; and</i> SH1, 2, etc = <i>the heating shading multiplier for each glazing element obtained from BCA Table J2.4c; and</i> SC1, 2, etc = <i>the cooling shading multiplier for each glazing element obtained from BCA Table J2.4d; and</i> U1, 2, etc = <i>the Total U-Value of each glazing element.</i> <p>(d) <i>For the purposes of BCA J2.4 (c) -</i></p> <ul style="list-style-type: none"> (i) <i>where the air-conditioning energy value of a glazing element is calculated to be negative, it must be taken to be zero; and</i> (ii) <i>where glazing is in the internal fabric, the aggregate air-conditioning energy value must be calculated using –</i> <ul style="list-style-type: none"> (A) <i>the energy constants A, B and C for the south orientation sector in BCA Table J2.4b; and</i> (B) <i>the shading multipliers in BCA Table J2.4e.</i>
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Application to Development	<p>The glazing forming part of the envelope must comply with this Part. The appropriate Energy Index (Option A) for this assessment of a childcare centre in Climate Zone 6 is 0.116. Glazing shall have the thermal parameters as set-out below. Refer to Appendix for full calculation of glazing requirements.</p> <p>Ground Floor</p> <table border="1"> <thead> <tr> <th>Orientation</th> <th>Items</th> <th>Total U-Value</th> <th>SHGC</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>South</td> <td>New glazing</td> <td>Equal or Lower than 5.4</td> <td>Equal or Higher than 0.31</td> <td>See graph in appendix for a more detailed result</td> </tr> <tr> <td>East</td> <td>New glazing</td> <td>Equal or Lower than 8.0</td> <td>Equal or Lower than 1.00</td> <td>No glazing restriction</td> </tr> <tr> <td>North</td> <td>New glazing</td> <td>Equal or Higher than 3.2</td> <td>Equal or Lower than 0.54</td> <td>See graph in appendix for a more detailed result</td> </tr> <tr> <td>West</td> <td>New glazing</td> <td>Equal or Lower than 6.0</td> <td>Equal or Lower than 0.99</td> <td>Use this result</td> </tr> </tbody> </table>	Orientation	Items	Total U-Value	SHGC	Notes	South	New glazing	Equal or Lower than 5.4	Equal or Higher than 0.31	See graph in appendix for a more detailed result	East	New glazing	Equal or Lower than 8.0	Equal or Lower than 1.00	No glazing restriction	North	New glazing	Equal or Higher than 3.2	Equal or Lower than 0.54	See graph in appendix for a more detailed result	West	New glazing	Equal or Lower than 6.0	Equal or Lower than 0.99	Use this result
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<p>9. Construction Requirements – Glazing</p>	<p>Glazing elements forming part of the envelope shall have the following thermal properties in terms of their orientations:</p> <p>Ground Floor</p> <table border="1"> <thead> <tr> <th>Orientation</th> <th>Items</th> <th>Total U-Value</th> <th>SHGC</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>South</td> <td>New glazing</td> <td>Equal or Lower than 5.4</td> <td>Equal or Higher than 0.31</td> <td>See graph in appendix for a more detailed result</td> </tr> <tr> <td>East</td> <td>New glazing</td> <td>Equal or Lower than 8.0</td> <td>Equal or Lower than 1.00</td> <td>No glazing restriction</td> </tr> <tr> <td>North</td> <td>New glazing</td> <td>Equal or Higher than 3.2</td> <td>Equal or Lower than 0.54</td> <td>See graph in appendix for a more detailed result</td> </tr> <tr> <td>West</td> <td>New glazing</td> <td>Equal or Lower than 6.0</td> <td>Equal or Lower than 0.99</td> <td>Use this result</td> </tr> </tbody> </table> <p>Refer to Appendix for full calculation of glazing requirements.</p>	Orientation	Items	Total U-Value	SHGC	Notes	South	New glazing	Equal or Lower than 5.4	Equal or Higher than 0.31	See graph in appendix for a more detailed result	East	New glazing	Equal or Lower than 8.0	Equal or Lower than 1.00	No glazing restriction	North	New glazing	Equal or Higher than 3.2	Equal or Lower than 0.54	See graph in appendix for a more detailed result	West	New glazing	Equal or Lower than 6.0	Equal or Lower than 0.99	Use this result
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West	New glazing	Equal or Lower than 6.0	Equal or Lower than 0.99	Use this result																						

J2.5 Shading

BCA extract	<p>Where shading is required to comply with BCA J2.4, it must-</p> <p>J2.5 (a) be provided by an external permanent projection, such as a verandah, balcony, fixed canopy, eaves or shading hood, which-</p> <p>(i) extends horizontally on both sides of the glazing for the same projection distance P in BCA Figure J2.4; or</p> <p>(ii) provides the equivalent shading to (i) with a reveal or the like; or</p> <p>(b) be provided by an external shading device, such as a shutter, blind, vertical or horizontal building screen with blades, battens or slats, which-</p> <p>(i) is capable of restricting at least 80% of summer solar radiation; and</p> <p>(ii) if adjustable, is operated automatically in response to the level of solar radiation.</p>
Application to Development	<p>This clause applies to the shading provided to the glazing of the development.</p>
<p>10. Construction Requirements – Shading</p>	<p>Shading has been provided as shown on architectural drawings by building elements and shading projections. For further details refer to the glazing calculations in Appendix (see P and H values). No alterations shall be made to shading design dimensions without first checking compliance with this Clause.</p> <p>Contact Application Solutions for assistance if required.</p>

Part J3 – Building Sealing

J3.1 Application of Part

BCA extract	<p>The Deemed-to-Satisfy Provisions of this Part apply to elements forming the envelope of a Class 2 to 9 building, other than-</p> <ul style="list-style-type: none"> (a) a building in climate zones 1, 2, 3 and 5 where the only means of air-conditioning is by using an evaporative cooler; or (b) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or (c) a building or space where the mechanical ventilation required by BCA Part F4 provides sufficient pressurisation to prevent infiltration; or (d) NSW BCA J3.1(d) parts of the building that cannot be fully enclosed. 		
Application to Development	Childcare Centre	Class 9b	This Part applies

J3.2 Chimneys and flues

BCA extract	<p>The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue.</p>
Application to Development	This clause does not apply as there is no chimney/flue shown in the development.

J3.3 Roof lights

BCA extract	<p>J3.3 (a) A roof light must be sealed, or capable of being sealed, when serving-</p> <ul style="list-style-type: none"> (i) a conditioned space; or (ii) a habitable room in climate zones 4, 5, 6, 7 and 8. <p>(b) A roof light required by BCA J3.3 (a) to be sealed, or capable of being sealed, must be constructed with-</p> <ul style="list-style-type: none"> (i) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or (ii) a weatherproof seal; or (iii) a shutter system readily operated either manually, mechanically or electronically by the occupant.
Application to Development	These clauses do not apply as there are no roof lights forming part of the envelope of the development.

J3.4 Windows and doors

BCA extract	<p>J3.4 (a) A seal to restrict air infiltration must be fitted to each edge of a door, openable window or the like forming part of-</p> <ul style="list-style-type: none"> (i) the envelope of a conditioned space; or (ii) the external fabric of a habitable room or public area in climate zones 4, 5, 6, 7 and 8. <p>(b) The requirements of BCA J3.4 (a) do not apply to-</p> <ul style="list-style-type: none"> (i) a window complying with AS 2047; or (ii) a fire door or smoke door; or (iii) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security. <p>(c) A seal required by BCA J3.4 (a) –</p> <ul style="list-style-type: none"> (i) for the bottom edge of an external swing door, must be a draft protection device; and (ii) for the other edges of an external door or the edges of an openable window or other such opening, may be a foam or rubber compression strip, fibrous seal or the like.
Application to Development	These clauses apply to the development.
11. Construction Requirements – Window and Door Sealing	<p>A seal to restrict air infiltration must be fitted to each edge of a door, openable window or the like where forming part of the envelope. The seal may be a foam or rubber compression strip, fibrous seal or the like.</p> <p>For the bottom edge of an external swing door, a draft protection device must be installed.</p> <p>For exemptions to this clause see body of report.</p>

BCA extract	<p>J3.4 (d) An entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, revolving door or the like, other than-</p> <ul style="list-style-type: none"> (i) where the conditioned space has a floor area of not more than 50 m²; or (ii) where a café, restaurant, open front shop or the like has- <ul style="list-style-type: none"> (A) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and (B) at all other entrances to the café, restaurant, open front shop or the like, self-closing doors.
Application to Development	This clause applies to the development.
12. Construction Requirements – Building Entrance Sealing	<p>An entrance to a building leading to a conditioned space must have an airlock, self-closing door, revolving door or the like.</p>

J3.5 Exhaust fans

BCA extract	<p>A miscellaneous exhaust fan, such as a bathroom or domestic kitchen exhaust fan, must be fitted with a sealing device such as a self-closing damper or the like when serving-</p> <p>J3.5 (a) a conditioned space; or</p> <p>(b) a habitable room in climate zones 4, 5, 6, 7 and 8.</p>
Application to Development	This clause applies to the development
13. Construction Requirements – Exhaust Fan Sealing	<p>A miscellaneous exhaust fan such as a bathroom or domestic kitchen exhaust fan, must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space.</p>

J3.6 Construction of roofs, walls and floors

BCA extract	<p>J3.6 (a) <i>Roofs, ceilings, walls, floors and any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage in accordance with BCA J3.6 (b) when forming part of-</i></p> <ul style="list-style-type: none"> <i>(i) the envelope; or</i> <i>(ii) the external fabric of a habitable room or a public area in climate zones 4, 5, 6, 7 and 8.</i> <p>(b) <i>Construction required by BCA J3.6 (a) must be-</i></p> <ul style="list-style-type: none"> <i>(i) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or</i> <i>(ii) sealed by caulking, skirting, architraves, cornices or the like.</i> <p>(c) <i>The requirements of BCA J3.6 (a) do not apply to openings, grilles or the like required for smoke hazard management.</i></p>
Application to Development	This clause applies to the development
14. Construction Requirements – Roof, Wall and Floor Sealing	Roofs, ceilings, walls, floors and any opening such as a window frame, door frame, or the like must be constructed to minimise air leakage when forming part of the envelope and must be enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions or sealed by caulking, skirting, architraves, cornices or the like.

J3.7 Evaporative coolers

BCA extract	<p><i>An evaporative cooler must be fitted with a self-closing damper or the like when serving-</i></p> <ul style="list-style-type: none"> <i>J3.7 (a) A heated space; or</i> <i>(b) A habitable room or a public area of a building in climate zones 4, 5, 6, 7 and 8.</i>
Application to Development	This clause does not apply as there is no evaporative cooler shown to be planned.

Part J4

This Part has deliberately been left blank due to its removal in BCA 2010.

Part J5 – Air-conditioning and Ventilation Systems

J5.1 Application of Part

BCA extract	<i>The Deemed-to-Satisfy Provisions of this Part do not apply to a Class 8 electricity network substation.</i>		
Application to Development	Childcare Centre	Class 9b	This Part applies

J5.2 Air-conditioning systems

BCA extract	<i>J5.2 (a) (i) An air-conditioning system- (A) must be capable of being deactivated when the building or part of a building served is not occupied; and</i>
Application to Development	This clause applies to the development
15. Construction Requirements – Deactivation Capability	An air-conditioning system must be capable of being deactivated when the building or part of the building served is not occupied.

BCA extract	<i>J5.2 (a) (i) (B) when serving more than one air-conditioning zone or area with different heating or cooling needs, must- (aa) thermostatically control the temperature of each zone or area; and (bb) not control the temperature by mixing actively heated air and actively cooled air; and (cc) limit reheating to not more than- (AA) for a fixed supply air rate, a 7.5 K rise in temperature; and (BB) for a variable supply air rate, a 7.5 K rise in temperature at the nominal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased; and</i>
Application to Development	This clause may apply to the development depending on air-conditioning system selection and setup
16. Construction Requirements – Air-conditioning Zones	Different air-conditioning zones shall be separately thermostatically controlled and not have their temperature controlled by mixing actively heated air or actively cooled air. Reheating must be limited to not more than a 7.5K rise in temperature for a fixed supply air rate, or for a variable supply air rate, not more than 7.5K rise in temperature at the normal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased.

BCA extract	J5.2 (a) (i) (C) which provides the required mechanical ventilation, other than in process-related applications where humidity control is needed, must have an outdoor air economy cycle- (aa) in climate zone 2 and 3, when the air-conditioning system capacity is more than 50 kW _r ; and (bb) in climate zones 4, 5, 6, 7 or 8, when the air-conditioning system capacity is more than 35 kW _r ; and
Application to Development	This clause may apply to the development depending on air-conditioning system selection and setup
17. Construction Requirements – Economy Cycle	Where the air-conditioning system provides the required mechanical ventilation and exceeds 35 kW_r, it shall have an outdoor air economy cycle.

BCA extract	J5.2 (a) (i) (D) which contains more than one water heater, chiller or coil, must be capable of stopping the flow of water to those not operating; and
Application to Development	The planned air-conditioning system is a packaged DX type – ie not water based. Therefore, this clause is not applicable.

BCA extract	J5.2 (a) (i) (E) except for a packaged air-conditioning system, must have a variable speed fan when its supply air quantity is varied; and
Application to Development	The planned air-conditioning system is a packaged DX type. Therefore, this clause is not applicable.

BCA extract	J5.2 (a) (i) (F) when serving a sole-occupancy unit in a Class 3 building, must not operate when any external door of the sole-occupancy unit that opens to a balcony or the like, is open for more than one minute.
Application to Development	This clause does not apply to the development as it is not a Class 3 building.

BCA extract	J5.2 (a) (ii) when an air-conditioning system is deactivated, any motorised outside air and return dampers must close.
Application to Development	This clause may apply to the development depending on air-conditioning system selection and setup
18. Construction Requirements – Air Dampers	Where the air-conditioning unit or system has motorised outside air and return dampers, close the dampers when the air-conditioning unit or system is deactivated.

BCA extract	J5.2 (a) (iii) Compliance with BCA Clause J5.2(a)(i) must not adversely affect- (A) smoke hazard management measures required by BCA Part E2 ; and (B) ventilation required by BCA Part E3 and BCA Part F4 .
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BCA extract	J5.2 (b) Fans of an air-conditioning system must comply with BCA Specification J5.2a.
Application to Development	This clause applies to the development
19. Construction Requirements – Air-conditioning Fans	Fans of any air-conditioning systems serving the building must comply with BCA Specification J5.2a.

BCA extract	<p>J5.2 (c) (i) An air-conditioning system, where water is circulated by pumping at more than 2 L/s, must be designed so that the maximum pump power to the pump complies with BCA Table J5.2.</p> <table border="1"> <thead> <tr> <th colspan="4">BCA Table J5.2 MAXIMUM PUMP POWER</th> </tr> <tr> <th rowspan="2">Cooling or heating load (W/m² of the floor area of the conditioned space)</th> <th colspan="3">Maximum pump power (W/m² of the floor area of the conditioned space)</th> </tr> <tr> <th>Chilled water</th> <th>Condenser Water</th> <th>Heating Water</th> </tr> </thead> <tbody> <tr> <td>Up to 100</td> <td>1.3</td> <td>0.9</td> <td>1.0</td> </tr> <tr> <td>101 to 150</td> <td>1.9</td> <td>1.2</td> <td>1.3</td> </tr> <tr> <td>151 to 200</td> <td>2.2</td> <td>2.2</td> <td>1.7</td> </tr> <tr> <td>201 to 300</td> <td>4.3</td> <td>3.0</td> <td>2.5</td> </tr> <tr> <td>301 to 400</td> <td>5.0</td> <td>3.6</td> <td>3.2</td> </tr> <tr> <td>More than 400</td> <td>5.6</td> <td>5.6</td> <td>3.6</td> </tr> </tbody> </table> <p>Note: Values do not include any motor losses.</p>	BCA Table J5.2 MAXIMUM PUMP POWER				Cooling or heating load (W/m ² of the floor area of the conditioned space)	Maximum pump power (W/m ² of the floor area of the conditioned space)			Chilled water	Condenser Water	Heating Water	Up to 100	1.3	0.9	1.0	101 to 150	1.9	1.2	1.3	151 to 200	2.2	2.2	1.7	201 to 300	4.3	3.0	2.5	301 to 400	5.0	3.6	3.2	More than 400	5.6	5.6	3.6
BCA Table J5.2 MAXIMUM PUMP POWER																																				
Cooling or heating load (W/m ² of the floor area of the conditioned space)	Maximum pump power (W/m ² of the floor area of the conditioned space)																																			
	Chilled water	Condenser Water	Heating Water																																	
Up to 100	1.3	0.9	1.0																																	
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201 to 300	4.3	3.0	2.5																																	
301 to 400	5.0	3.6	3.2																																	
More than 400	5.6	5.6	3.6																																	
Application to Development	The planned air-conditioning system is a packaged DX type – ie not water based. Therefore, this clause is not applicable.																																			

BCA extract	J5.2 (c) (ii) An air-conditioning system pump that is rated at more than 3 kW of pump power and circulates water at more than 2 L/s must be capable of varying its speed in response to varying load.
Application to Development	The planned air-conditioning system is a packaged DX type – ie not water based. Therefore, this clause is not applicable.

BCA extract	J5.2 (c) (iii) A spray water pump of an air-conditioning system's closed circuit cooler or evaporative condenser must not use more than 150 W of pump power for each L/s of spray water circulated.
Application to Development	The planned air-conditioning system is a packaged DX type – ie not water based. Therefore, this clause is not applicable.

BCA extract	J5.2 (d) (i) The ductwork of an air-conditioning system must be insulated and sealed in accordance with BCA Specification J5.2b.
Application to Development	This clause may apply to the development depending on air-conditioning system selection and setup

20. Construction Requirements - Ductwork Insulation	The ductwork of an air-conditioning system must be insulated and sealed in accordance with BCA Specification J5.2b.
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BCA extract	<i>J5.2 (d) (ii) Piping, vessels, heat exchangers and tanks containing heating or cooling fluid that are part of an air-conditioning system, other than those with insulation levels covered by MEPS, must be insulated in accordance with BCA Specification J5.2c.</i>
Application to Development	The planned air-conditioning system is a packaged DX type – ie does not include heat exchangers etc. Therefore, this clause is not applicable.

BCA extract	<i>J5.2 (e) A heater used for air-conditioning or as part of an air-conditioning system must comply with BCA Specification J5.2d.</i>
Application to Development	The planned air-conditioning system is a packaged DX type – ie does not include a heater. Therefore, this clause is not applicable.

BCA extract	<i>J5.2 (f) With respect to energy efficiency ratios; (i) refrigerant chillers used as part of an air-conditioning system; and (ii) packaged air-conditioning equipment, must comply with BCA Specification J5.2e.</i>
Application to Development	This clause applies to the development
21. Construction Requirements – Energy Efficiency Ratios	Any packaged air-conditioning equipment or refrigerant chillers (as part of an air-conditioning system) must have energy efficiency ratios in compliance with BCA Specification J5.2e.

BCA extract	<i>J5.2 (g) (i) A time switch complying with BCA Specification J6 must be provided to control- (A) an air-conditioning system of more than 10 kW_r; and (B) a heater of more than 10 kW_{heating} used for air-conditioning.</i>
Application to Development	This clause may apply to the development depending on air-conditioning system and/or heater selection
22. Construction Requirements – Time Switch	A time switch in accordance with BCA Specification J6 must be provided to control all air-conditioning/heating systems of more than 10 kW.

BCA extract	<p>J5.2 (g) (ii) The requirements of BCA Clause J5.2 (g) (i) do not apply to-</p> <p>(A) an air-conditioning system that serves-</p> <p>(aa) only one sole-occupancy unit in a Class 2 or 3 building; or</p> <p>(bb) a Class 4 part of a building; or</p> <p>(cc) only one sole-occupancy unit in a Class 9c building; or</p> <p>(B) a building where air-conditioning is needed for 24 hour occupancy.</p>
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J5.3 Mechanical Ventilation systems

BCA extract	<p>J5.3 (a) (i) A mechanical ventilation system, including one that is part of an air-conditioning system, except where the mechanical system serves only one sole-occupancy unit in a Class 2 building or serves only a Class 4 part of a building, must-</p> <p>(A) be capable of being deactivated when the building or part of the building served by that system is not occupied; and</p>
Application to Development	<p>This clause applies to the development where mechanical ventilation systems are installed</p>
23. Construction Requirements – Ventilation Operation	<p>A mechanical ventilation system (including one which is part of an air-conditioning system) must be capable of being deactivated when the building or part of the building served is not occupied.</p>

BCA extract	<p>J5.3 (a) (i) (B) when serving a conditioned space-</p> <p>(aa) not exceed the minimum outdoor air quantity required by BCA Part F4, where relevant, by more than 20%; and</p> <p>(bb) in other than climate zone 2, where the number of square metres per person is not more than 1 as specified in BCA D1.13 and the air flow rate is more than 1000 L/s, have-</p> <p>(AA) an energy reclaiming system that preconditions outside air; or</p> <p>(BB) the ability to automatically modulate the mechanical ventilation required by BCA Part F4 in proportion to the number of occupants.</p>
Application to Development	<p>Clause J5.3(a)(i)(B)(aa) applies where mechanical ventilation systems serve <u>conditioned space</u>.</p> <p>Clause J5.3(a)(i)(B)(bb) does not apply as the number of square metres per person according to the use of an early childhood centre in BCA Part D1.13 is 4 m² per person.</p>
24. Construction Requirements – Mechanical Ventilation of Conditioned Space	<p>The mechanical ventilation system shall not provide mechanical ventilation in excess of the minimum quantity required by BCA Part F4 by more than 20% other than in the conditions detailed in the body of the report.</p>

BCA extract	<p>J5.3 (a) (ii) The requirements of BCA J5.3(a)(i)(B)(aa) do not apply where-</p> <p>(A) additional unconditioned outside air is supplied for free cooling or to balance process exhaust;</p> <p>(B) additional exhaust ventilation is needed to balance the required mechanical ventilation; or</p> <p>(C) an energy reclaiming system preconditions all the outside air.</p>
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BCA extract	<p>J5.3 (a) (iii) Compliance with BCA J5.3(a)(i) must not adversely affect-</p> <p>(A) smoke hazard management measures required by BCA Part E2; and</p> <p>(B) ventilation required by BCA Part E3 and BCA Part F4.</p>
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BCA extract	<p>J5.3 (b) Fans of a mechanical ventilation system covered by BCA Clause J5.3(a) must comply with BCA Specification J5.2a.</p>
Application to Development	<p>This clause applies to the development where mechanical ventilation systems are installed</p>
25. Construction Requirements – Ventilation Fans	<p>Any fans of a mechanical ventilation system installed must comply with BCA Specification J5.2a.</p>

BCA extract	<p>J5.3 (c) (i) A time switch complying with BCA Specification J6 must be provided to control a mechanical ventilation system with an air flow rate of more than 1000 L/s.</p>
Application to Development	<p>This clause applies to the development where mechanical ventilation systems are installed</p>
26. Construction Requirements – Ventilation Time Switch Control	<p>Any mechanical ventilation system with an air flow rate of more than 1000 L/s must be controlled by a time switch in compliance with BCA Specification J6. See BCA J5.3(c)(ii) for any appropriate exclusions to this requirement.</p>

BCA extract	<p>J5.3 (c) (ii) The requirements of BCA Clause J5.3(c)(i) do not apply to-</p> <p>(A) a mechanical ventilation system that serves-</p> <p>(aa) only one sole-occupancy unit in a Class 2 or 3 building; or</p> <p>(bb) a Class 4 part of a building; or</p> <p>(cc) only one sole-occupancy unit in a Class 9c building; or</p> <p>(B) a building where mechanical ventilation is needed for 24 hour occupancy.</p>
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J5.4 Miscellaneous exhaust systems

BCA extract	<p><i>J5.4 (a) A miscellaneous exhaust system with an air flow rate of more than 1000 L/s, that is associated with equipment having a variable demand, must-</i></p> <ul style="list-style-type: none"> <i>(i) be capable of stopping the motor when the system is not needed; and</i> <i>(ii) have a variable speed fan or the like.</i>
Application to Development	This clause applies to the exhaust system serving the kitchen cooking area.
27. Construction Requirements – Miscellaneous Exhaust	An exhaust system which has an air flow rate of more than 1000 L/s and is associated with equipment having a variable demand must have the ability for the operator to stop the motor when the system is not in use and must also have a variable speed fan (or similar control system).

BCA extract	<p><i>J5.4 (b) The requirements of BCA J5.4(a) do not apply-</i></p> <ul style="list-style-type: none"> <i>(i) to a miscellaneous exhaust system in-</i> <ul style="list-style-type: none"> <i>(A) a sole-occupancy unit in a Class 2, 3 or 9c building; or</i> <i>(B) a Class 4 part of a building; or</i> <i>(ii) where additional exhaust ventilation is needed to balance the required outside air for ventilation.</i>
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Part J6 – Artificial Lighting and Power

J6.1 Application of Part

Application to Development	Childcare Centre		
	Class 9b	This Part applies	

J6.2 Artificial lighting

BCA extract	<p>J6.2 (a) In a sole-occupancy unit of a Class 2 building or a Class 4 part of a building-</p> <ul style="list-style-type: none"> (i) the lamp power density or illumination power density of artificial lighting must not exceed the allowance of - <ul style="list-style-type: none"> (A) 5 W/m² within a sole-occupancy unit; and (B) 4 W/m² on a verandah, balcony or the like attached to a sole occupancy unit; and (ii) the illumination power density in BCA J6.2 (a) (i) may be increased by dividing it by the illumination power density adjustment factor for a control device in BCA Table J6.2b as applicable; and (iii) when designing the lamp power density or illumination power density, the power of the proposed installation must be used rather than nominal allowances for exposed batten holders or luminaires; and (iv) halogen lamps must be separately switched from fluorescent lamps.
Application to Development	This clause does not apply to the development as it is not a Class 2 or Class 4 building.

BCA extract	<p>J6.2 (b) In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building-</p> <ul style="list-style-type: none"> (i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density in BCA Table J6.2a; and (ii) the aggregate design illumination power load for BCA J6.2 (b) (i) is the sum of the design illumination power loads in each of the spaces served; and
Application to Development	<p>This clause applies to the development. Refer to Appendix for calculation of maximum allowable lighting power.</p> <p>Note: That Table J6.2b allows the maximum power load to be adjusted by a factor provided in the table where lighting is controlled by movement detectors or dimmers. The adjustment would have the effect of increasing the maximum allowable illumination power. At this stage no adjustment has been made.</p>
28. Construction Requirements – Maximum Interior Illumination Power Load	<p>The total maximum allowed interior illumination power load for the development is 6,446 W.</p> <p>The aggregate design illumination power load must not exceed this allowed wattage. Note emergency lighting and signage lighting are exempted from this requirement.</p> <p>See Appendix for detailed calculation of allowed interior illumination power load.</p>

BCA extract	<p>J6.2 (c) <i>The requirements of BCA J6.2 (a) and BCA J6.2 (b) do not apply to the following:</i></p> <ul style="list-style-type: none"> (i) <i>emergency lighting in accordance with BCA Part E4.</i> (ii) <i>signage and display lighting within cabinets and display cases that are fixed in place.</i> (iii) <i>lighting for accommodation within the residential part of a detention centre.</i> (iv) <i>a heater where the heater also emits light, such as in bathrooms.</i> (v) <i>lighting of a specialist process nature such as in an operating theatre, fume cupboard or clean workstation.</i> (vi) <i>lighting of performances such as theatrical or sporting.</i> (vii) <i>lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.</i>
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J6.3 Interior artificial lighting and power control

BCA extract	J6.3 (a) <i>Artificial lighting of a room or space must be individually operated by a switch or other control device.</i>
Application to Development	This clause applies to the development
29. Construction Requirements – Lighting Control	Artificial lighting of a room or space must be individually operated by a switch or other control device.

BCA extract	J6.3 (b) <i>An occupant activated device, such as a room security device, a motion detector in accordance with BCA Specification J6, or the like, must be provided in the sole occupancy unit of a Class 3 building, other than where providing accommodation for people with a disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the sole-occupancy unit is unoccupied.</i>
Application to Development	This clause does not apply to the development as it is not a Class 3 building

BCA extract	<p>J6.3 (c) <i>An artificial lighting switch or other control device in BCA J6.2 (a) must-</i></p> <ul style="list-style-type: none"> (i) <i>if an artificial lighting switch, be located in a visible position-</i> <ul style="list-style-type: none"> (A) <i>in the room or space being switched; or</i> (B) <i>in an adjacent room or space from where the lighting being switched is visible; and</i> (ii) <i>for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse-</i> <ul style="list-style-type: none"> (A) <i>not operate lighting for an area of more than 250 m² if in a Class 5 building or a Class 8 laboratory; or</i> (B) <i>not operate lighting for an area of more than-</i> <ul style="list-style-type: none"> (aa) <i>250 m² for a space of not more than 2000 m²; or</i> (bb) <i>1000 m² for a space of more than 2000 m², if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building.</i>
Application to Development	This clause applies to the development
30. Construction Requirements – Lighting Control (Switching)	<p>Artificial lighting switches must be located in a visible position in the room or space being switched or in an adjacent room or space from where the lighting being switched is visible.</p> <p>Switches must not operate lighting for an area of more than 250 m².</p>

BCA extract	<p>J6.3 (d) 95% of the light fittings in a building or storey of a building, other than a Class 2 or 3 building or a Class 4 part, of more than 250 m² must be controlled by-</p> <ul style="list-style-type: none"> (i) a time switch in accordance with BCA Specification J6; or (ii) an occupant sensing device such as- <ul style="list-style-type: none"> (A) a security key card reader that registers a person entering and leaving the building; or (B) a motion detector in accordance with BCA Specification J6.
Application to Development	This clause applies to the development
31. Construction Requirements – Time Switch or Occupant Sensing Device	95% of the lighting in the building must be controlled by a time switch in accordance with BCA Specification J6 or an occupant sensing device such as a security card reader that registers a person entering and leaving the building or a motion detector in accordance with BCA Specification J6.

BCA extract	<p>J6.3 (e) In a Class 5, 6 or 8 building of more than 250 m², artificial lighting in a natural lighting zone adjacent to windows must be separately controlled from artificial lighting not in a natural lighting zone in the same storey except where-</p> <ul style="list-style-type: none"> (i) the room containing the natural lighting zone is less than 20 m²; or (ii) the room's natural lighting zone contains less than 4 luminaires; or (iii) 70% or more of the luminaires in the room are in the natural lighting zone.
Application to Development	This clause does not apply as the development is not a Class 5, 6 or 8 building

BCA extract	<p>J6.3 (f) The requirements of BCA J6.3 (a), (b), (c), (d) and (e) do not apply to the following:</p> <ul style="list-style-type: none"> (i) emergency lighting in accordance with BCA Part E4. (ii) where artificial lighting is needed for 24-hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a detention centre. (g) The requirements of (d) do not apply to the following: <ul style="list-style-type: none"> (i) artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as in a patient care area in a Class 9a building or in a Class 9c aged care building. (ii) a heater where the heater also emits light, such as in bathrooms.
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J6.4 Interior decorative and display lighting

BCA extract	<p>J6.4 (a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled-</p> <ul style="list-style-type: none"> (i) separately from other artificial lighting; and (ii) by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and (iii) by a time switch in accordance with BCA Specification J6 where the display lighting exceeds 1 kW.
Application to Development	This clause applies to the development if decorative or display lighting is planned
32. Construction Requirements – Decorative or Display Lighting	Interior decorative and display lighting (such as for foyer mural art display), shall be controlled separately from other lighting by a manual switch for each area (where the operating times of the displays are the same in multiple areas, they may be combined). Where the decorative/display lighting exceeds 1 kW, it must be controlled by a time switch in accordance with BCA Specification J6.

BCA extract	J6.4 (b) <i>Window display lighting must be controlled separately from other display lighting.</i>
Application to Development	This clause applies to the development if window display lighting is planned
33. Construction Requirements – Window Display Lighting	Window display lighting must be controlled separately from other display lighting.

J6.5 Artificial lighting around the perimeter of a building

BCA extract	J6.5 (a) <i>Artificial lighting around the perimeter of a building, must-</i> (i) <i>be controlled by-</i> (A) <i>a daylight sensor; or</i> (B) <i>a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and</i> (ii) <i>when the total perimeter lighting load exceeds 100 W-</i> (A) <i>have an average light source efficacy of not less than 60 Lumens/W or;</i> (B) <i>be controlled by a motion detector in accordance with BCA Specification J6; and</i>
Application to Development	This clause applies to the development if external lighting is planned
34. Construction Requirements – Perimeter Lighting	Artificial lighting around the perimeter of the building must be controlled by a daylight sensor or a time switch in accordance with BCA Specification J6. When the total perimeter lighting load exceeds 100 W it shall have an average light source efficacy of not less than 60 Lumens/W or be controlled by a motion detector in accordance with BCA Specification J6.

BCA extract	J6.5 (a) (iii) <i>when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with BCA Specification J6.</i>
Application to Development	This clause applies to the development if external lighting for decorative purposes is planned
35. Construction Requirements – Decorative Perimeter Lighting	Where external lighting for decorative or signage purposes is installed, it must be controlled by a time switch (separate from other external lighting) in accordance with BCA Specification J6.

BCA extract	J6.5 (b) <i>The requirements of BCA J6.5 (a)(ii) do not apply to the following:</i> (i) <i>emergency lighting in accordance with BCA Part E4.</i> (ii) <i>lighting around a detention centre</i>
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J6.6 Boiling water and chilled water storage units

BCA extract	<i>Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with BCA Specification J6.</i>
Application to Development	This clause applies to the development if boiling water or chilled water storage units are planned
36. Construction Requirements – Boiling/Chilled Water Storage Units	The power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with BCA Specification J6.

Part J7 – Heated Water Supply and Swimming Pool and Spa Pool Plant

J7.1 Blank

Application to Development			
	Childcare Centre	Class 9b	This Part applies

J7.2 Heated water supply

BCA extract	<i>A heated water supply system for food preparation and sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three – Plumbing Code of Australia.</i>
Application to Development	This clause applies to the development
37. Construction Requirements – Hot Water Heater	Any heated water service for food preparation or sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three - Plumbing Code of Australia.

J7.3 Swimming pool heating and pumping

BCA extract	<i>J7.3 (a) Heating for a swimming pool must be by-</i> <i>(i) a solar heater not boosted by electric resistance heating; or</i> <i>(ii) a heater using reclaimed energy; or</i> <i>(iii) a gas heater; or</i> <i>(iv) a heat pump; or</i> <i>(v) a combination of 2 or more of (i), (ii), (iii) and (iv).</i>
Application to Development	Clause J7.3 does not apply to the development as there is no swimming pool included in the works

J7.4 Spa pool heating and pumping

BCA extract	<i>J7.4 (a) Heating for a spa pool that shares a water recirculation system with a swimming pool must be by-</i> <i>(i) a solar heater; or</i> <i>(ii) a heater using reclaimed energy; or</i> <i>(iii) a gas heater; or</i> <i>(iv) a heat pump; or</i> <i>(v) a combination of 2 or more of (i), (ii), (iii) and (iv).</i>
Application to Development	Clause J7.4 does not apply to the development as there is no spa pool included in the works.

Part J8 – Access for Maintenance and Facilities for Monitoring

J8.1 Application of Part

BCA extract	<i>The Deemed-to-Satisfy Provisions of this Part do not apply-</i> (a) <i>within a sole-occupancy unit of a Class 2 building or a Class 4 part of a building; or</i> (b) <i>to a Class 8 electricity network substation.</i>		
Application to Development	Childcare Centre	Class 9b	This Part applies

J8.2 Blank

This clause has deliberately been left blank in BCA2016.

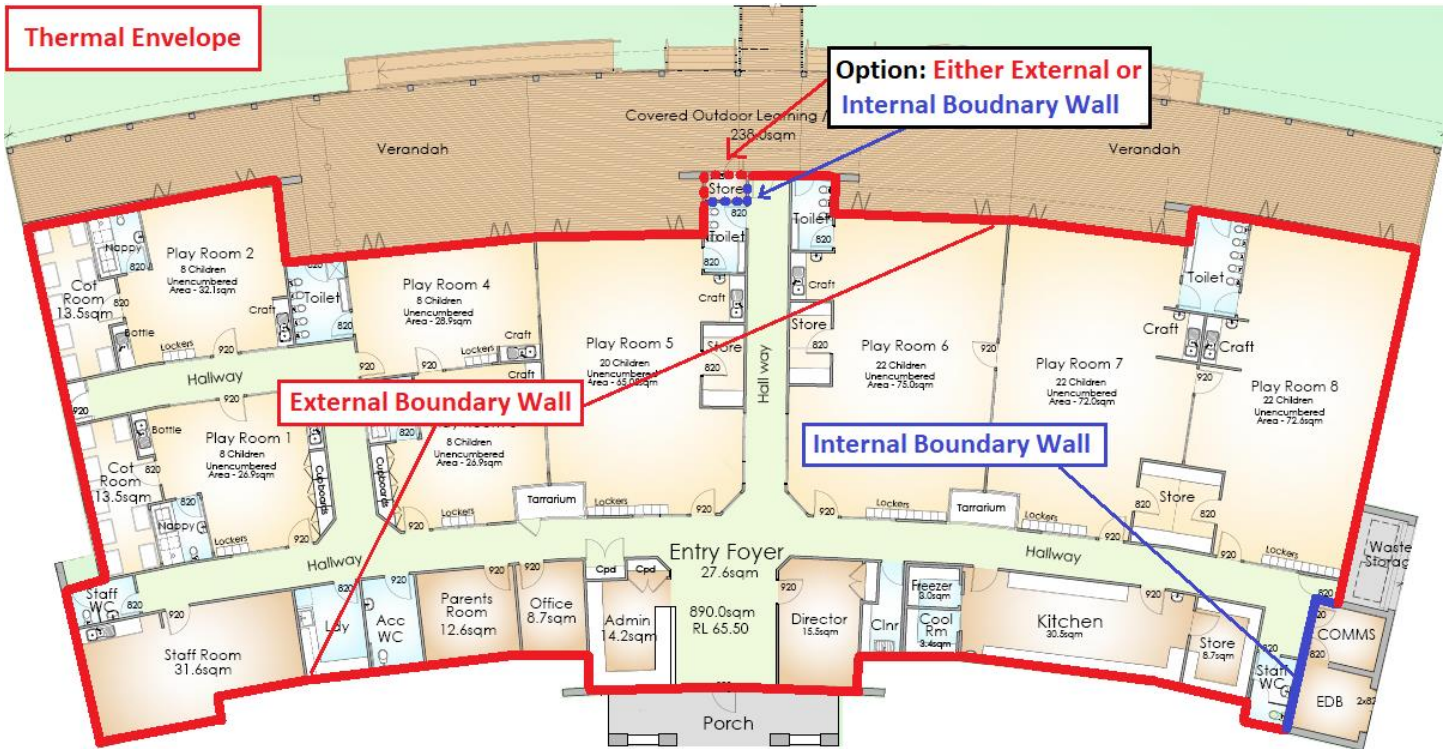
J8.3 Facilities for energy monitoring

BCA extract	<i>J8.3 (a) A building or sole-occupancy unit with a floor area of more than 500 m² must have the facility to record the consumption of gas and electricity.</i>
Application to Development	This clause applies to the development as the floor area of the development is greater than 500 m².
38. Construction Requirements – Gas and Electricity Consumption	The building has a floor area of more than 500 m² and therefore must have the facility to record the consumption of gas and electricity.

BCA extract	<i>J8.3 (b) A building with a floor area of more than 2,500 m² must have the facility to record individually the energy consumption of-</i> (i) <i>air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and</i> (ii) <i>artificial lighting; and</i> (iii) <i>appliance power; and</i> (iv) <i>central hot water supply; and</i> (v) <i>internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and</i> (vi) <i>other ancillary plant.</i>
Application to Development	This clause does not apply as the building floor area is less than 2,500 m².

BCA extract	<i>J8.3 (c) The provisions of BCA J8.3 (b) do not apply to a Class 2 building with a floor area of more than 2,500 m² where the total area of the common areas is less than 500 m².</i>
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Appendix 1 – Envelope Markup



Appendix 2 – Glazing Calculations

printed 27/02/2019

Report from PW Design - Mount Vernon - glazing_v2014_FR.xlsx

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

Building name/description: **Proposed Childcare Centre** Application: **other** Climate zone: **6**

Storey: **GF**

Facade areas							
	N	NE	E	SE	S	SW	W
Option A	153m ²		73.1m ²		240m ²		73.1m ²
Option B							
Glazing area (A)	81.2m ²		4.79m ²		41m ²		12.1m ²
Internal							n/a

Number of rows preferred in table below **48** (as currently displayed)

Glazing element	GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS				SHADING				CALCULATED OUTCOMES OK (if inputs are valid)										
	Description (optional)	Option A facades	Option B facades	Facing sector	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	PI/H (m)	G (m)	Heating (S _H)	Cooling (S _C)	Multipliers	Area used (m ²)	Size	Outcomes
1	Staff Room W1	S			0.60	3.00	5.4	5.4	0.31	0.000		0.00	0.00	1.00	1.00		1.80	1.80	4% of 100%
2	Staff Room W2	S			0.90	0.90	5.4	5.4	0.31	0.920	1.050	0.88	0.15	0.81	0.73		0.81	0.81	2% of 100%
3	Staff Room W3	S			0.90	0.90	5.4	5.4	0.31	0.920	1.050	0.88	0.15	0.81	0.73		0.81	0.81	2% of 100%
4	Laundry	S			0.90	0.90	5.4	5.4	0.31	0.920	1.050	0.88	0.15	0.81	0.73		0.81	0.81	2% of 100%
5	Acc WC	S			0.60	1.80	5.4	5.4	0.31	0.920	0.780	1.18	0.18	0.75	0.68		1.08	1.08	3% of 100%
6	Parents Room	S			1.23	1.80	5.4	5.4	0.31	0.920	1.380	0.67	0.15	0.86	0.79		2.21	2.21	5% of 100%
7	Office	S			1.23	1.80	5.4	5.4	0.31	1.030	1.380	0.75	0.15	0.84	0.77		2.21	2.21	5% of 100%
8	Admin	S			1.45	1.00	5.4	5.4	0.31	1.850	1.650	1.12	0.20	0.76	0.69		1.45	1.45	4% of 100%
9	Entry	S			2.45	2.39	5.4	5.4	0.31	2.350	2.740	0.86	0.29	0.82	0.74		5.86	5.86	14% of 100%
10	Director	S			1.45	1.00	5.4	5.4	0.31	1.850	1.650	1.12	0.20	0.76	0.69		1.45	1.45	4% of 100%
11	Kitchen W1	S			0.60	2.00	5.4	5.4	0.31	0.900	0.780	1.15	0.18	0.76	0.69		1.20	1.20	3% of 100%
12	Kitchen W2	S			0.60	2.00	5.4	5.4	0.31	0.900	0.780	1.15	0.18	0.76	0.69		1.20	1.20	3% of 100%
13	Kitchen Store	S			0.60	2.13	5.4	5.4	0.31	0.850	0.780	1.09	0.18	0.77	0.70		1.28	1.28	3% of 100%
14	Staff WC	S			0.60	1.40	5.4	5.4	0.31	0.000		0.00	0.00	1.00	1.00		0.84	0.84	2% of 100%
15	High W1	S			0.60	3.73	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		2.24	2.24	5% of 100%
16	High W2	S			0.60	1.48	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		2.89	2.89	2% of 100%
17	High W3	S			0.60	4.26	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		2.56	2.56	6% of 100%
18	High W4	S			0.60	4.87	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		2.92	2.92	7% of 100%
19	High W5	S			0.60	1.53	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		0.92	0.92	2% of 100%
20	High W6	S			0.60	4.89	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		2.93	2.93	7% of 100%
21	High W7	S			0.60	4.31	5.4	5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75		2.59	2.59	6% of 100%

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printed 27/02/2019

Report from PW Design - Mount Vernon - glazing_v2014 FR.xlsx

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS													CALCULATED OUTCOMES OK (if inputs are valid)				
ID	Glazing element Description (optional)	Facing sector		Size			Performance		SHADING			Shading		Multipliers		Size	Outcomes
		Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	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 (m ²)		
22	High W8	S		0.60	4.84		5.4	0.31	0.900	1.100	0.82	0.50	0.83	0.75	2.90	7% of 100%	
23	Director	E		2.20	1.23		8.0	1.00	1.231	2.740	0.45	0.54	0.96	0.93	2.71	60% of 52%	
24	Playroom 8	E		0.60	1.80		8.0	1.00	0.550	2.385	0.23	1.79	1.00	0.99	1.08	25% of 52%	
25	Toilet (Playroom 6)	E		1.12	0.90		8.0	1.00	device		2.00	0.00	0.01	0.29	1.01	15% of 52%	
26	Playroom 8	N		2.20	5.40		3.2	0.54	3.711	2.200	1.69	0.00	0.00	0.30	11.88	14% of 100%	
27	Toilet (Playroom 7/8)	N		2.20	0.90		3.2	0.54	4.830	2.200	2.20	0.00	0.00	0.30	1.98	2% of 100%	
28	Playroom 7	N		2.20	5.46		3.2	0.54	6.110	2.200	2.78	0.00	0.00	0.30	12.01	15% of 100%	
29	Playroom 6	N		2.20	5.46		3.2	0.54	6.090	2.200	2.77	0.00	0.00	0.30	12.01	15% of 100%	
30	Toilet (Playroom 6) Win	N		1.32	0.52		3.2	0.54	4.780	1.320	3.62	0.00	0.00	0.30	0.69	1% of 100%	
31	Toilet (Playroom 6) Door	N		2.20	0.77		3.2	0.54	4.780	2.200	2.17	0.00	0.00	0.30	1.69	2% of 100%	
32	Hallway Entry Window	N		1.32	0.51		3.2	0.54	4.760	1.320	3.61	0.00	0.00	0.30	0.67	1% of 100%	
33	Hallway Entry Door	N		2.20	0.85		3.2	0.54	4.760	2.200	2.16	0.00	0.00	0.30	1.87	2% of 100%	
34	Store Door	N		2.20	0.77		3.2	0.54	4.740	2.200	2.15	0.00	0.00	0.30	1.69	2% of 100%	
35	Store Window	N		1.32	0.50		3.2	0.54	4.740	1.320	3.59	0.00	0.00	0.30	0.66	1% of 100%	
36	Playroom 5	N		2.20	5.19		3.2	0.54	6.890	2.200	3.13	0.00	0.00	0.30	11.42	14% of 100%	
37	Playroom 4	N		2.20	5.90		3.2	0.54	6.900	2.200	3.14	0.00	0.00	0.30	12.98	16% of 100%	
38	Toilet (Playroom 4)	N		2.20	0.85		3.2	0.54	device		2.00	0.00	0.00	0.30	1.87	2% of 100%	
39	Playroom 2	N		2.20	4.20		3.2	0.54	3.530	2.200	1.60	0.00	0.00	0.30	9.24	11% of 100%	
40	Staff WC	N		0.60	0.90		3.2	0.54	1.000	2.180	0.46	1.58	0.99	0.93	0.54	2% of 100%	
41	Toilet (Playroom 7/8)	W		1.12	0.88		6.6	0.99	device		2.00	0.00	0.05	0.31	0.99	9% of 100%	
42	Toilet (Playroom 5)	W		1.12	0.90		6.6	0.99	device		2.00	0.00	0.05	0.31	1.01	10% of 100%	
43	Cot Room (PR2) W1	W		0.60	1.80		6.6	0.99	0.550	1.910	0.29	1.31	0.99	0.98	1.08	9% of 100%	
44	Cot Room (PR2) W2	W		0.60	1.80		6.6	0.99	0.550	2.440	0.00	1.84	1.00	1.00	1.08	10% of 100%	
45	Hallway Door/Window	W		2.75	1.53		6.6	0.99	1.450	2.750	0.53	0.00	0.69	0.65	4.21	32% of 100%	
46	Cot Room (PR1) W1	W		0.60	1.80		6.6	0.99	0.550	3.470	0.00	2.87	1.00	1.00	1.08	10% of 100%	
47	Cot Room (PR1) W2	W		0.60	1.80		6.6	0.99	0.550	2.270	0.24	1.67	0.99	0.99	1.08	9% of 100%	
48	Admin	W		1.23	1.26		6.6	0.99	1.000	1.380	0.72	0.15	0.75	0.68	1.55	11% of 100%	

if inputs are valid

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.

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Appendix 3 – Glazing Specification Tool

The graphs below are a more comprehensive glazing assessment compared to the tables. The information is generated using the tables in appendix 2, however, the graphs combine the results of multiple iterations, rather than just one, giving a full range of results.

To create these graphs, the full spectrum of values has been assessed and therefore if the specifications of a particular glass fits in the shaded area of the graph, it DOES comply.

U- and SHGC Values

U-Value relates to the overall heat transmissibility of a glass and is represented by numbers between 1 and 8.

SHGC relates to the solar heat gain and is represented by numbers between 0 and 1. The lower the SHGC of the glass, the less solar heat transmits.

U-Values and SHGC values work in combination with each other. Often when one goes up, the other goes down. The exact behavior of the results depends on the façade orientation.

One valid result may appear contradictory to another valid result because as one value has moved, it has given more or less room for the other value to move. How much one value can move compared to the other cannot be guessed and is difficult to explain in a table therefore we are presenting all the results in a graph.

If the selected glazing has U and SHGC values that appear in the shaded area, it is one of the acceptable combinations and DOES comply.

How to use the graphs

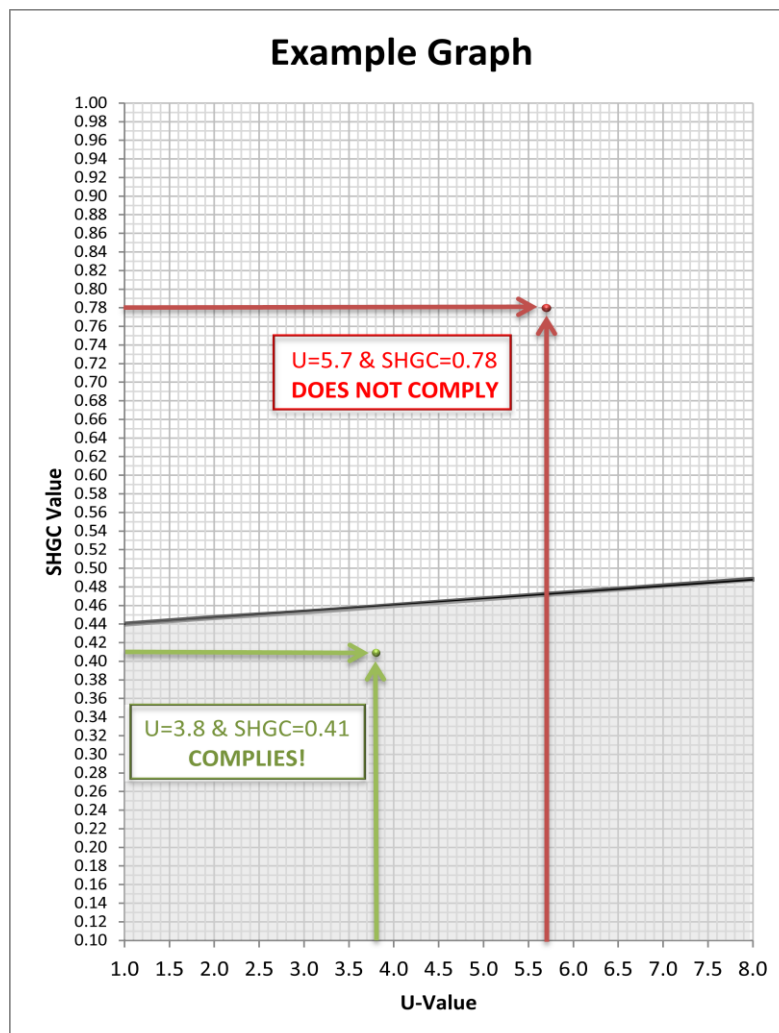
The U-Values are along the bottom and the SHGC values along the left side.

Find both the U-Value and the SHGC value you are interested in, and then find where they meet up at one point. That will be where that particular combination lies on that particular assessment.

Any of the combination of values that lie in the shaded area comply for that particular façade.

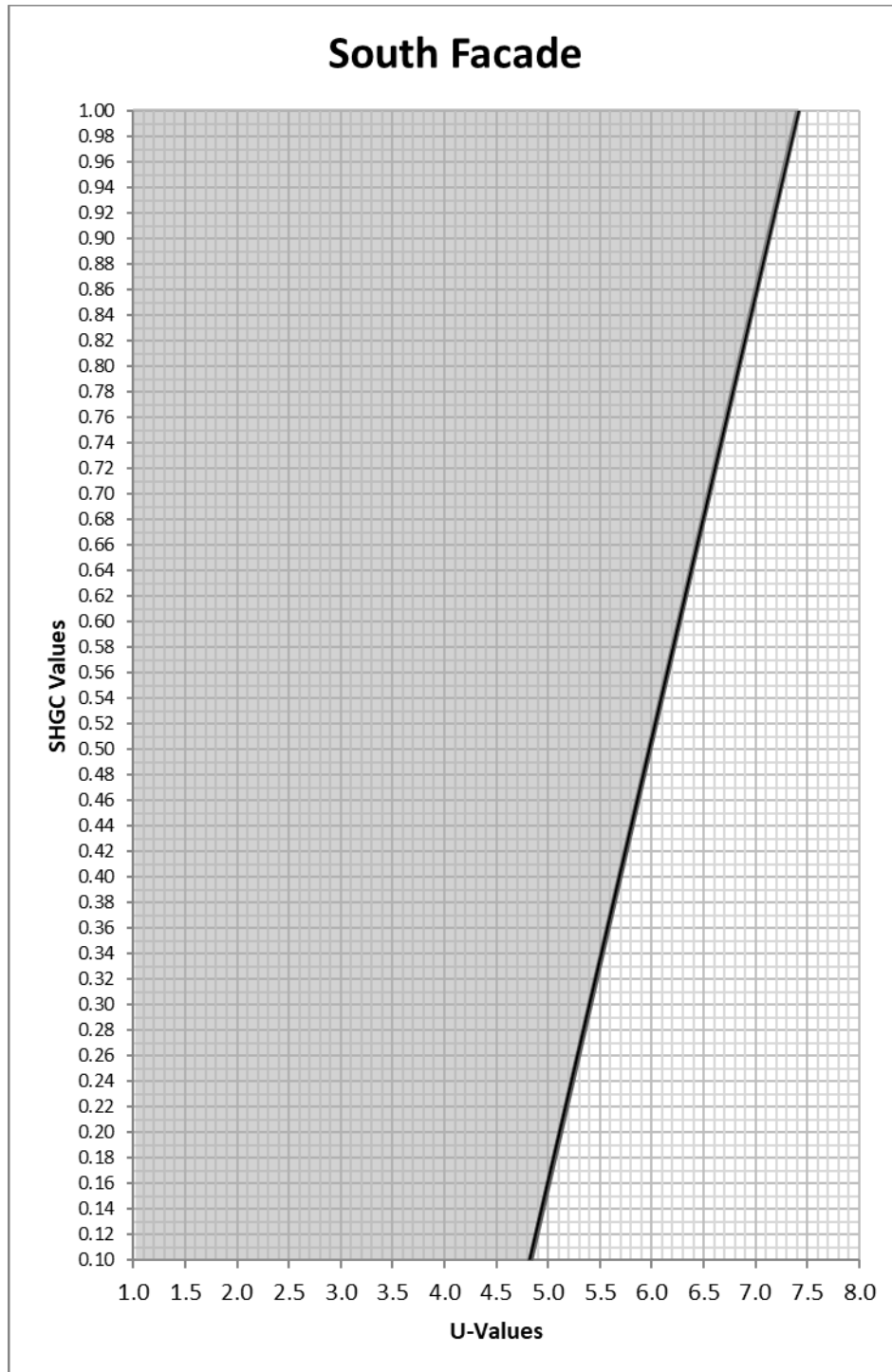
There are two examples on the graph. One falls in the shaded area and therefore complies. The other falls outside the shaded area and therefore does not comply.

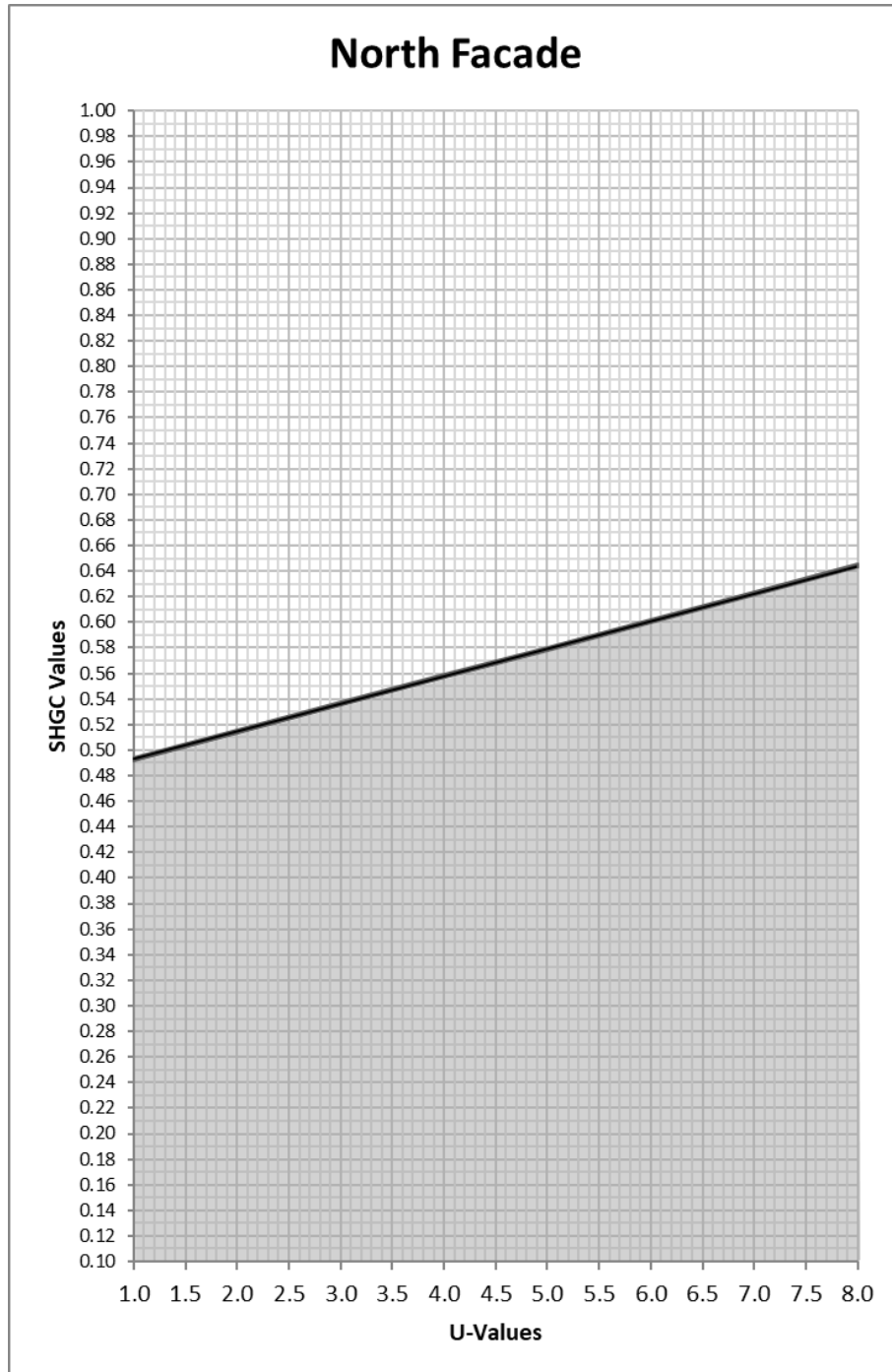
The closer to the line your glass option lies, the cheaper that glass is likely to be and/or the easier that glass is likely to be to source.



Please contact Application Solutions if you require assistance in interpreting these graphs.

Glazing assessment for Mount Vernon





Appendix 4 – Lighting Calculations

Proposed Childcare Centre - 110-112 Mount Vernon Rd, Mount Vernon NSW

Spaces	Space Categories	Area (m ²)	Power Density (W/m ²)	Maximum Power Load (W)
Comms	Control room, switch room, and the like	5.6	9	50
EDB	Control room, switch room, and the like	6.7	9	60
Staff WC	Toilet, locker room, staff room, rest room and the like	4.1	6	25
Kitchen Store	Storage with shelving higher than 75% of the height of the aisle lighting	8.7	10	87
Kitchen	Kitchen and food preparation area	30.5	8	244
Cool Room	Storage with shelving higher than 75% of the height of the aisle lighting	3.4	10	34
Freezer	Storage with shelving higher than 75% of the height of the aisle lighting	3.0	10	30
Cleaner	Service area, cleaner's room and the like	4.3	5	21
Director	Office - artificially lit to an ambient level of 200 lx or more	15.5	9	140
Foyer	Entry lobby from outside the building	17.4	15	261
Admin	Office - artificially lit to an ambient level of 200 lx or more	12.5	9	113
Office	Office - artificially lit to an ambient level of 200 lx or more	8.7	9	78
Parents Room	Toilet, locker room, staff room, rest room and the like	12.6	6	76
Acc WC	Toilet, locker room, staff room, rest room and the like	7.0	6	42
Laundry	Service area, cleaner's room and the like	8.5	5	42
Staff Room	Toilet, locker room, staff room, rest room and the like	31.6	6	190
Staff WC	Toilet, locker room, staff room, rest room and the like	3.7	6	22
Playroom 1	School - general purpose learning areas and tutorial rooms	30.3	8	243
Nappy (Playroom 1)	Toilet, locker room, staff room, rest room and the like	4.5	6	27
Cot Room (Playroom 1)	Toilet, locker room, staff room, rest room and the like	13.5	6	81
Playroom 2	School - general purpose learning areas and tutorial rooms	32.1	8	257
Nappy (Playroom 2)	Toilet, locker room, staff room, rest room and the like	4.5	6	27
Cot Room (Playroom 2)	Toilet, locker room, staff room, rest room and the like	13.5	6	81
Playroom 3	School - general purpose learning areas and tutorial rooms	29.4	8	235
Toilet (Playroom 3)	Toilet, locker room, staff room, rest room and the like	4.5	6	27
Playroom 4	School - general purpose learning areas and tutorial rooms	31.1	8	249
Toilet (Playroom 4)	Toilet, locker room, staff room, rest room and the like	6.6	6	40
Playroom 5	School - general purpose learning areas and tutorial rooms	69.2	8	553
Store (Playroom 5)	Storage with shelving higher than 75% of the height of the aisle lighting	4.9	10	49
Toilet (Playroom 5)	Toilet, locker room, staff room, rest room and the like	4.2	6	25
Store	Storage with shelving higher than 75% of the height of the aisle lighting	1.3	10	13
Playroom 6	School - general purpose learning areas and tutorial rooms	79.0	8	632
Store (Playroom 6)	Storage with shelving higher than 75% of the height of the aisle lighting	4.8	10	48
Toilet (Playroom 6)	Toilet, locker room, staff room, rest room and the like	4.2	6	25
Playroom 7	School - general purpose learning areas and tutorial rooms	75.8	8	606
Store (Playroom 7/8)	Storage with shelving higher than 75% of the height of the aisle lighting	9.5	10	95
Toilet (Playroom 7/8)	Toilet, locker room, staff room, rest room and the like	8.0	6	48
Playroom 8	School - general purpose learning areas and tutorial rooms	77.7	8	621
Hallways	Corridors	118.8	8	950
Total		811		6,446