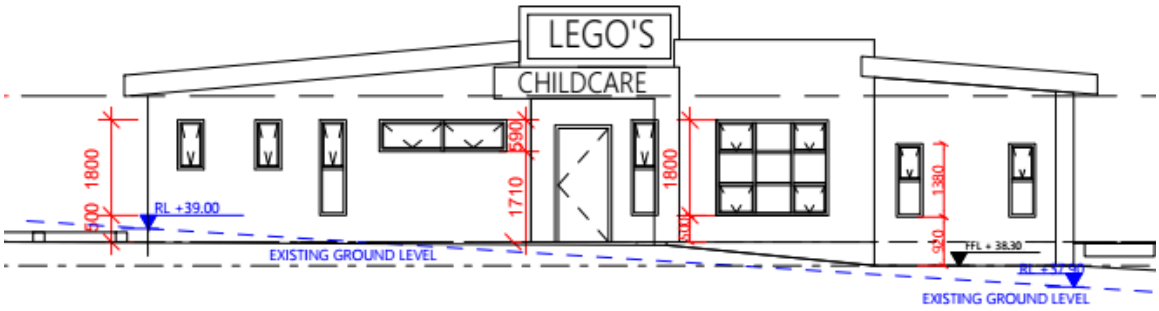
# Sustainability-Z

# Part J BCA Report

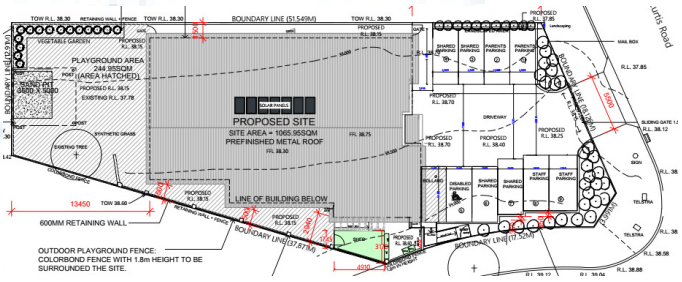
**October 2022**

Project name:

# PROPOSED CHILD CARE CENTRE
## 22 Curtis Road Chester Hill 2162
## Content





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Project name:

# PROPOSED CHILD CARE CENTRE
## 22 Curtis Road Chester Hill 2162
## Content

1. DESCRIPTION

The childcare centre, the subject of this report, is located at 22 Curtis Road Chester Hill 2162. It is a single level building with metal roof and a concrete slab.

2. PURPOSE OF THE ASSESSMENT

The purpose of this report is to assess the design proposal against the Deemed-to-Satisfy provisions of Section J of the BCA, and to clearly outline those areas where compliance has not been achieved. Deemed-to-Satisfy Solution as a Performance Solution is used to satisfy the Performance Requirements of the NCC-2016. (Transition period until 1 May 2020)
This Report addresses ONLY matters relevant to Section 'J' of Volume 1 of the BCA pertaining to the Class 9B portions of the building.

3. DEEMED-TO-SATISFY PROVISIONS (BCA)

This report is based on the Deemed-to-Satisfy Provisions of Section J of the National Construction Code (NCC) – 2016 Volume 1, incorporating the State variations where applicable. Please note that the version of the BCA applicable is the version applicable at the time of the Construction Certificate Application.
The intent of the report is to facilitate the efficient use of energy appropriate for Class 2 to 9 buildings (or part of the buildings) that are conditioned or likely to be conditioned.

4. PERFORMANCE REQUIREMENTS

Performance Requirements specify the minimum level of performance that all buildings must have. They must have, to the degree necessary, features that facilitate the efficient use of energy appropriate to the function and use of the building and its services, the internal environment, heating and cooling, and the building fabric. This also includes relevant materials, components, design factors, and construction methods.
Deemed-to-Satisfy Solution as a Performance Solution is used to satisfy the Performance Requirements in this report. The requirements JP1 and JP3 are satisfied by complying with: J0.1 to J0.3, J1.1 to J1.6, J2.1 to J2.5, J3.1 to J3.7, J5.1 to J5.4, J6.1 to J6.6, J7.1 to J7.4 and J8.1 to J8.3.

## 5. PROJECT LIMITATIONS

This report does not include nor imply any detailed assessment for design, compliance or upgrading for -
(a) Sections B, C, D, E, F, G, H, and I of the BCA;

(b) The structural adequacy or design of the building.

(c) The inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and

(d) The design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:
(a) The National Construction Code - Plumbing Code of Australia Volume 3

(b) The Disability Discrimination Act 1992, including the Disability (Access to Premises – Buildings) Standards 2010;

(c) Demolition Standards not referred to by the BCA;

(d) Occupational Health and Safety Act;

## 6. ASSESSMENT DATA

The following Architectural Plans for Proposed Child care centre are supplied for assessment according the Section J of the BCA:

- Site Plan
- Roof Plan
- Floor Plan
- Elevations
- Elevations and sections

## 7. ASSUMPTIONS

Assumptions made in the preparation of this report are listed below:

1. The North point marked as True North is taken from the Site plan
2. The major building classification is: Class 9B.
3. Because of the nature of the building and the necessity to control the temperature internally, the entire space is a conditioned space.

## 8. BUILDING CHARACTERISTICS

The proposed Childcare centre is a two-floor building, with brick veneer walls and a metal roof. The significant spaces in the proposed design have been classified in accordance with the requirements of Clause A3.2 of the BCA and are summarized in the table below. Floor areas have been calculated from the plan.

| | | |
|---|---|---|
| 23 Children room | 78.7 | m2 |
| Toilet | 12.9 | m2 |
| Storage 1 | 6.2 | m2 |
| Storage 1 | 3.9 | m2 |
| 22 Children room | 76.4 | m2 |
| Entry/Reception/Hwy | 42.5 | m2 |
| Office | 14.3 | m2 |
| Laundry | 9.87 | m2 |
| Staff Room | 24.53 | m2 |
| Disabled toilt | 6.95 | m2 |
| Kitchen | 13.3 | m2 |
| Storage (Kitchen) | 8.2 | m2 |
| Toilets (External) | 5.6 | m2 |
| Outdoor covered area | 70.1 | m2 |

## 9. BUILDING CLASSIFICATION

According BCA Part A3 (CLASSIFICATION OF BUILDINGS AND STRUCTURES), Proposed child care centre – "22 Curtis Road Chester Hill 2162" is classified as a Class 9B building.

***Class 9b buildings are typically buildings considered assembly buildings. These typically include public halls, theatres & churches; schools; Clubs, nightclubs, and sporting complexes; and transport buildings such as train stations, and airports***

## 10. CLIMATE ZONE

The proposed Building is located at 22 Curtis Road Chester Hill 2162. In accordance with Figure A1.1 and Table A1.1 of the BCA, the development is in the Climate Zone 6.

### Building Code of Australia

This report is based on the Deemed-to-Satisfy Solutions of Section J of the National Construction Code Series Volume 1 - Building Code of Australia, NCC 2016 incorporating the State variations where applicable. Deemed-to-Satisfy Solution as a Performance Solution is used to satisfy the Performance Requirements of the NCC 2016.
This Section of the report presents a clause-by-clause assessment of the proposed design against the DtS Solutions of NSW Subsection J of the BCA. The performance requirements JP1 and JP3 are satisfied by complying with: J0.1 to J0.3, J1.1 to J1.6, J2.1 to J2.5, J3.1 to J3.7, J5.1 to J5.4, J6.1 to J6.6, J7.1 to J7.4 and J8.1 to J8.3.

## PART J1 – BUILDING FABRIC

| Clause | Description | Status | Comments |
|---|---|---|---|
| J1.1 | **Application of Part**<br>The Deemed-to-Satisfy Provisions of this Part apply to building elements forming the envelope of a Class 2 to 9 building. | **Applicable** | The building is classified as Class 9B with conditioned space.<br>The intent of this part is to facilitate the efficient use of energy for the building (or part of the buildings) that are conditioned or likely to be conditioned |
| J1.2 | **J1.2 Thermal construction — general**<br><br>(a) Where *required*, insulation must comply with AS/NZS 4859.1 and be installed so that it—<br>(i) abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation must be against the member; and<br>(ii) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and<br>(iii) does not affect the safe or effective operation of a *service* or fitting.<br><br>(b) Where *required*, *reflective insulation* must be installed with—<br>(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<br>(ii) the *reflective insulation* closely fitted against any penetration, door or *window* opening; and<br>(iii) the *reflective insulation* adequately supported by framing members; and<br>(iv) each adjoining sheet of roll membrane being—<br>(A) overlapped not less than 50 mm; or<br>(B) taped together. | **Applicable**<br><br>**Applicable** | The insulation used to insulate the building fabric must comply with AS/NZS 4859.1.The products must be valid and tested in accordance with AS/NZS 4859.1<br>SubclauseJ1.2 (a) requires any mandatory insulation, when installed in a building, to form a consistent and continuous barrier other than at supporting members. Wall insulation should be closely fit within a wall frame to achieve the desired overall level.<br><br>When installing a reflective insulation an air space is needed. Because the presence of an airspace at the reflective surface is critical. Without this airspace, the reflection will not occur. |

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| | (c) Where *required*, bulk insulation must be installed so that—<br>(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<br>(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. | **Applicable** | The depth of the insulation is critical because of the need to retain the air pockets within the material. If the insulation is compressed, it will reduce its capacity to achieve the tested R-Value. |
| | (d) Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in **Specification J1.2**. | **Applicable** | The insulation used in the building must be of negligible fire hazard by complying with the non-combustibility, flammability, and spread of flame and smoke development requirements of this Clause. The performance of the insulation used should be validated by test reports and these reports should form part of the building approval documentation. The properties must be in accordance with the **Specification J1.2**. |
| **J1.3** | **Roof and ceiling construction**<br><br>(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 **Table J1.3a** for the direction of heat flow.<br>For compliance with **Table J1.3a**, roof and ceiling construction is deemed to have the thermal properties listed in **Specification J1.3**. | **Applicable** | A roof or ceiling that is part of the envelope (with any surface solar absorptance value), must achieve the Total R Value of R3.2<br>The construction diagrams are attached giving one possible option how to fulfill the requirements. |
| | (b) For compliance with **Table J1.3a**, roof and ceiling construction is deemed to have the thermal properties listed in **Specification J1.3**. | **Applicable** | Any reduction in the ceiling insulation must be compensated in accordance with the **Table J1.3b**. If IC rated downlights are used, then there is no reduction in the insulation |
| | (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 | **Applicable** | |

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| | increasing the *R-Value* of the insulation in the remainder of the ceiling in accordance with **Table J1.3b**.<br><br>(d) A roof that—<br>(i) is *required* to achieve a minimum *Total R-Value*; and<br>(ii) has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and<br><br>(iii) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see **Specification J1.3 Figure 2(c)** and **(f)**), 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. | **Applicable** /If there are any that type ceilings/ | A thermal break may be provided by materials such as 20 mm thick timber or 12 mm thick expanded polystyrene strips, plywood or bulk insulation. The material used as a thermal break must separate the metal purlins or metal battens from the metal sheet roofing and achieve an R-Value of not less than 0.2. Reflective insulation alone is not suitable for use as a thermal break because it requires an adjoining airspace to achieve the specified R-Value |
| **J1.4** | **Roof lights**<br><br>*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—<br>(a) if the *roof lights* are not *required* for compliance with **Part F4**, comply with **Table J1.4**; or<br>(b) if the *roof lights* are *required* for compliance with Part **F4**—<br>(i) have an area not more than 150% of the minimum area *required* by **F4.6**; and<br>(ii) have transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of not more than—<br>(A) 0.29 SHGC; and<br><br>(B)2.9 Total U-Value. | **Not Applicable**<br><br>**Not Applicable** | The plans don't show any roof lights<br><br>If there are any roof lights, they must have the following properties<br>(A) 0.29 SHGC; and<br>(B)2.9 Total U-Value. |
| **J1.5** | **Walls**<br><br>(a) Each part of an *external wall* that is part of the *envelope*, other than of | **Applicable** | For Climate zone 6 According the Table J1.5a the total R value of **R2.8** wall insulation is |

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| | a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must satisfy one of the options in **Table J1.5a** except for—<br>(i) opaque non-glazed openings in *external walls* such as doors (including garage doors), vents, penetrations, shutters and the like; and<br>(ii) *glazing*; and | | required. The total R value is reduced by 0.5 where the surface density exceeds 220 kg/m2.<br><br>(The construction details are attached for the additional insulation required) |
| | (b) Any wall, other than an *external wall*, that is part of the *envelope* must achieve the *Total R-Value* in **Table J1.5b**. | **Not Applicable** | According to the Table J1.5b AN ENVELOPE WALL OTHER THAN AN EXTERNAL WALL – MINIMUM TOTAL R-VALUE of **R1.8** is required<br>There are no such walls |
| | (c) A wall that—<br>(i)is required to achieve a minimum Total R-Value; and<br>(ii)has lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to a metal frame; and<br>(iii) does not have a wall lining or has a wall lining that is fixed directly to the same metal frame,<br>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.<br>(d) For compliance with Table J1.5a and Table J1.5b, wall construction is deemed to have the thermal properties listed in Specification J1.5. | **Not Applicable** | If there are such walls a thermal break of min R0.2 must be provided between the external cladding and the metal frame |
| **J1.6** | **Floors**<br><br>(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—<br>(i) must achieve the *Total R-Value* specified in **Table J1.6**; and<br>(ii) with an in-slab or in-screed heating or cooling system, must be | **Applicable**<br><br>**Applicable**<br>**Not Applicable** | This building is other than a sole-occupancy unit of a Class 2 building or a Class 4<br><br>The construction diagram is attached (As per the Table J1.6) |

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| | insulated around the vertical edge of its perimeter with insulation having an *R-Value* of not less than 1.0.<br><br>(b) In *climate zones* 1 to 6, the minimum *Total R-Value required* in **(a)** may be reduced by R0.5 provided R0.75 is added to the *Total R-Value required* for the roof and ceiling construction.<br><br>(c) A concrete slab-on-ground—<br>(i) with an in-slab or in-screed heating or cooling system; or<br>(ii) located in *climate zone* 8, must have insulation installed around the vertical edge of its perimeter.<br><br>(d) Insulation *required* by **(c)** must—<br>(i) have an *R-Value* of not less than 1.0; and<br>(ii) be water resistant; and<br>(iii) be continuous from the adjacent finished ground level—<br>(A) to a depth of not less than 300 mm; or<br>(B) for the full depth of the vertical edge of the concrete slab-on-ground.<br><br>(e) The requirements of **(a)(ii)** and **(c)(i)** do not apply to an in-screed heating or cooling system used solely in a bathroom, amenity area or the like.<br><br>(f) Floor construction is deemed to have the thermal properties listed in **Specification J1.6**. | **Applicable**<br><br>**Not Applicable**<br><br>**Not Applicable**<br><br>**Not Applicable**<br><br>**Applicable** | |
| PART J2<br><br>**J2.1** | GLAZING<br><br>**Application of Part**<br><br>**Application of Part**<br>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. | **Applicable** | The building is classified as Class 9B with conditioned space.<br>The intent of this part is to facilitate the efficient use of energy appropriate for the building or parts of the building that are conditioned or likely to be conditioned. This part aim to |

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| | | | reduce air-conditioning energy consumption attributable to glazing. |
| **J2.4** | **Glazing**<br><br>(a) The *glazing* in each *storey*, including any *mezzanine*, of a building must be assessed separately in accordance with **(b)** and **(c)** for—<br>(i) *glazing* in the external *fabric* facing each orientation; and<br>(ii) *glazing*in the internal *fabric*.<br>(b) The aggregate *air-conditioning* energy value attributable to the *glazing* must not exceed the allowance obtained by multiplying the facade area that is exposed to the *conditioned space* for the orientation by the energy index in **Table J2.4a**.<br><br>(c) 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:<br>A1[SHGC1(CAxSH1+CBxSC1)+CCx U1] +<br>A2[SHGC2(CAxSH2+CBxSC2)+CCx U2] + ...<br>where—<br>A1, 2, etc = the area of each *glazing* element; and<br>CA, B and C = the energy constants A, B and C for the specific orientation<br>from Table J2.4b; and SHGC1, 2, etc = the *Total System SHGC* of each *glazing* element; and<br>ding multiplier for each *glazing* element obtained from **Table J2.4c**; and SC1, 2, etc = the cooling shading multiplier for each *glazing* element obtained from **Table J2.4d**; and U1, 2, etc = the *Total System U-Value* of each *glazing* element.<br><br>(d) For the purposes of **(c)**—<br>(i) where the *air-conditioning* energy value of a *glazing* element is | | **Glazing Calculator**<br><br>The glazing design has been analyzed using the NCC 2014 Volume One Glazing Calculator (Published: 30 April 2014).<br>The window sizes and the façade areas are measured from the plan. The window numbers used are as per the plans. In the glazing design, are analyzed only the new or the altered windows |

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| | calculated to be negative, it must be taken to be zero; and<br>(ii) where *glazing* is in the internal *fabric*, the aggregate *air-conditioning* energy value must be calculated using—<br>(A) the energy constants A, B and C for the south orientation sector in **Table J2.4b**; and<br>(B) the shading multipliers in **Table J2.4e**. | | |
| **J2.5** | **Shading** Where shading is *required* to comply with **J2.4**, it must—<br>(a) be provided by an external permanent projection, such as a verandah, balcony, fixed canopy, eaves or shading hood, which—<br>(i) extends horizontally on both sides of the *glazing* for the same projection distance P in**Figure J2.4**; or<br>(ii) provides the equivalent shading to **(i)** with a reveal or the like; or<br>(b) be provided by an external shading device, such as a<br>(i) is capable of restricting at least 80% of summer solar radiation; and<br>(ii) if adjustable, is operated automatically in response to the level of solar radiation. | **Applicable** | Shading is calculated as it is given on the plans. Where necessary devices are used. |
| PART J3 | BUILDING SEALING | | |
| **J3.1** | **Application of Part**<br>The *Deemed-to-Satisfy Provisions* of this Part apply to elements forming the *envelope* of a Class 2 to 9 building, other than—<br>(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<br>(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<br>(c) a building or space where the mechanical ventilation *required* by | **Applicable**<br>**Not Applicable**<br>**Not Applicable**<br>**Not Applicable** | The building is classified as 9B with a conditioned space |

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| | **Part F4** provides sufficient pressurisation to prevent infiltration. | | |
| **J3.2** | **Chimneys and flues**<br><br>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. | **Not Applicable** | No Chimneys and flues of an open solid-fuel burning appliance |
| **J3.3** | **Roof lights**<br><br>(a) A *roof light* must be sealed, or capable of being sealed, when serving—<br>(i) a *conditioned space*; or<br>(ii) a*habitable room* in *climate zones* 4, 5, 6, 7 or 8.<br>(b) A *roof light required* by **(a)** to be sealed, or capable of being sealed, must be constructed with—<br>(i) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or<br>(ii) a weatherproof seal; or<br><br>(iii) a shutter system readily operated either manually, mechanically or electronically by the occupant. | **Not Applicable** | There are no roof lights shown on the plans in the conditioned area (the office) |
| **J3.4** | **Windows and doors**<br><br>(a) A seal to restrict air infiltration must be fitted to each edge of a door, openable *window* or the like forming part of—<br>(i) the *envelope* of a *conditioned space*; or<br>(ii) the external fabric of a *habitable room* or public area in *climate zones* 4, 5, 6, 7 or 8.<br>(b) The requirements of **(a)** do not apply to—<br>(i) a *window* complying with AS 2047; or<br><br>(ii) a fire door or smoke door; or | **Applicable**<br><br>**Applicable**<br><br>**Applicable**<br><br>**Applicable** | Weather seals to be installed on all doors and open able windows (other than aluminum, fire doors or security doors /used out of operating hours/), of the envelope of the conditioned space.<br><br>All windows that are aluminum windows complying with AS 2047 are exempt from this clause. (Requirements of (a) don't apply to these windows) This clause also doesn't apply to the fire doors |

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| | (iii) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security.<br><br>(c) A seal *required* by **(a)**—<br>(i) for the bottom edge of an external swing door, must be a draft protection device; and<br>(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.<br>(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—<br>(i) where the *conditioned space* has a *floor area* of not more than 50 $m^2$; or<br>(ii) where a café, restaurant, open front shop or the like has—<br><br>(A) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the *conditioned space*; and<br>(B) at all other entrances to the café, restaurant, open front shop or the like, *self-closing* doors. | **Not Applicable**<br><br>**Applicable**<br><br>**Applicable**<br><br>**Applicable**<br><br>**Not Applicable**<br><br>**Not Applicable**<br><br>**Not Applicable**<br><br>**Not applicable** | The roller shutter doors are exempt only if they are installed only for the purpose of security<br><br>Ext. Doors must have a draft protection device on the bottom edge<br><br>Other edges seals may be compression type<br><br>The entrance to the building is leading to a condition space; therefore, an airlock (self-closing device) is required |
| **J3.5** | **Exhaust fans**<br><br>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—<br>(a) a *conditioned space*; or<br>(b) a*habitable room* in *climate zones* 4, 5, 6, 7 or 8. | **Applicable** | If there are any miscellaneous exhaust fans serving a conditioned space must be fitted with self-closing dampers or the like |
| **J3.6** | **Construction of roofs, walls and floors**<br><br>(a) 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 **(b)**when forming part of—<br>(i) the *envelope*; or | **Applicable** | The fabric forming the envelope must be constructed to be capable of minimizing air leakage by using lining systems or caulking, skirting, architraves or the like, except for openings and grilles required for smoke hazard management. |

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| | (ii) the external *fabric* of a *habitable room* or a public area in *climate zones* 4, 5, 6, 7 or 8.<br>(b) Construction *required* by **(a)** must be—<br>(i) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or<br>(ii) sealed by caulking, skirting, architraves, cornices or the like.<br>(c) The requirements of **(a)** do not apply to openings, grilles or the like *required* for smoke hazard management. | | |
| **J3.7** | **Evaporative coolers**<br><br>An evaporative cooler must be fitted with a self-closing damper or the like when serving—<br>(a) a heated space; or<br>(b) a*habitable room* or a public area of a building in *climate zones* 4, 5, 6, 7 or 8. | **Not Applicable** | The plans don't show any evaporative coolers installed but if there will be any then the evaporative cooler must be fitted with a self-closing damper |
| PART J4 | ***** | | |
| PART J5 | AIR-CONDITIONING AND VENTILATION SYSTEMS | | **Because the A/C plans are not supplied in this section are assessed only the general provisions** |
| **J5.1** | **Application of Part**<br><br>The *Deemed-to-Satisfy Provisions* of this Part do not apply to a Class 8 *electricity network substation*. | **Applicable** | This clause sets minimum energy efficiency requirements for air-conditioning systems and its components. |
| **J5.2** | **Air-conditioning systems**<br><br>(a) Control —<br>(i) An *air-conditioning* system—<br>(A) must be capable of being deactivated when the building or part | **Applicable** | This Sub-clause requires controls to deactivate the air-conditioning unit when the area is not occupied. The operational |

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| | of a building served by that system is not occupied; and | | arrangements should be designed on logical building areas and segments. (Zones) Accordingly, each sole occupancy unit should be able to be deactivated without compromising the needs of air-conditioning in the adjacent spaces. When the zones have different heating or cooling needs then the temperature in each zone should be thermostatically controlled. A suitable location of the temperature control devices may be in the ductwork supplying the different spaces or the air volume dampers. |
| | (B) when serving more than one *air-conditioning* zone or area with different<br><br>heating or cooling needs, must—<br>(aa) thermostatically control the temperature of each zone or area; and | **Applicable** | |
| | (bb) not control the temperature by mixing actively heated air and actively<br>cooled air; and<br>(cc) limit reheating to not more than—<br>(AA) for a fixed supply air rate, a 7.5 K rise in temperature; and<br>(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 | **Applicable** | This Clause requires the temperature control of the air-conditioning system not to depend on mixing heated and cooled air streams that have been actively conditioned by the plant. This requirement allows the air-conditioning system to use no more energy than is necessary.<br>However, the reheating is limited to not more than , 7.5 K rise in temperature (for fixed supply air rate), and 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 (for a variable supply air rate) |
| | (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*— | **Applicable** | The outdoor air economy cycles to be provided where (*air-conditioning* system with capacity of more than 35 kWr ) it can cost-effectively provide free cooling, however an area needing |

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| | (aa) in *climate zones* 2 or 3, when the *air-conditioning* system capacity is more than 50 kWr; or<br>(bb) in *climate zones* 4, 5, 6, 7 or 8, when the *air-conditioning* system capacity is more than 35 kWr; and | | humidity control for process applications is exempt. |
| | (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 | **Applicable** | The water flow through major items such as boilers and chillers to be stopped when the item is not needed, usually by an automatic valve. This will reduce the amount of water being circulated and the pump energy needed, as well as thermal loss through the additional components like piping. This requirement is intended to reduce pump energy consumption to its minimum level. |
| | (E) except for a packaged *air-conditioning* system, must have a variable speed fan when its supply air quantity is capable of being varied; and | **Applicable** | A variable speed fan must be used when the supplied air quantity is capable of being varied. This is because a variable speed fan is a more energy efficient method of reducing energy consumption than throttling the air supply with dampers. A packaged air-conditioning system is exempt. |
| | (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. | **Applicable** | This is Class 9B building. Therefore, this Clause is not applicable |
| | (ii) When an *air-conditioning* system is deactivated, any motorised outside air and return dampers must close.<br>(iii) Compliance with **(i)** must not adversely affect—<br>(A) smoke hazard management measures *required* by **Part E2**; and<br>(B) Ventilation *required* by **Part E3** and **Part F4**. | **Applicable**<br><br>**Applicable** | This clause requires any motorised outside air or return dampers to close when the system is deactivated. It does not require that the dampers be motorised, only that they close if motorised dampers are installed. |
| | (b) **Fans** — Fans of an *air-conditioning* system must comply with **Specification J5.2a**. | **Applicable** | This is a linking clause that requires fans that are part of an air-conditioning system to comply with Specification J5.2a |

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| | (c) **Pumps** —<br>(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 **Table J5.2**. | **Applicable** | This aims to limit the overall energy consumption of the pumps used to circulate water at greater than 2 L/s in an air-conditioning system and the intention is for the pumps to circulate the required amount of water using no more energy than necessary. The maximum pump power values in the Table J5.2 are included to allow a cost-effective balance to be met.<br>. |
| | (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. | **Applicable** | This requires the pump speed, where the pump uses more than 3 kW of pump power, to be capable of being lowered to meet a change in duty. This will allow a lowering the pump's energy use. |
| | (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. | **Applicable** | This states the requirements for the spray water pumps of a closed-circuit cooler or evaporative condenser where part of an air-conditioning system. Any relevant standard can be used to determine the performance and may be part of the tests for closed circuit coolers and evaporative condensers. |
| | (d) **Insulation** —<br>(i) The ductwork of an *air-conditioning* system must be insulated and sealed in accordance with **Specification J5.2b**. | **Applicable** | This is a linking clause and specifies that the ductwork of an air-conditioning system must be sealed and insulated in accordance with **Specification J5.2b**.<br><br>*Table 3 DUCTWORK AND FITTINGS - MINIMUM MATERIAL R-VALUE*<br>*Location of ductwork and fittings* — *Climate zone* — *1, 2, 3, 4, 5, 6 and 7* |

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|---|---|---|---|
| | | | <table><tr><td>*Within a conditioned space*</td><td>*1.2*</td></tr><tr><td>*Where exposed to direct sunlight*</td><td>*3.0*</td></tr><tr><td>*All other locations*</td><td>*2.0*</td></tr></table><br>Or<br>R1.0, for flexible ductwork with a length to an outlet or from an inlet of not more than 3 m.<br>The Insulation must be protected against the effects of weather and sunlight; and<br>be installed so that it:<br>1)abuts adjoining insulation to form a continuous barrier; and<br>2)maintains its position and thickness, other than at flanges and supports; and<br>The ductwork insulation requirements do not apply to:<br>1)ductwork and fittings located within the only or last room served by the system.<br>2)fittings that form part of the interface with the *conditioned space*.<br>3)return air ductwork in, or passing through, a *conditioned space*.<br>4)ductwork for outside air and exhaust air associated with an *air-conditioning* system.<br>5)the floor of an in-situ air-handling unit; or packaged *air-conditioning* equipment complying with MEPS; or (vIi) flexible fan connections. |
| | (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 **Specification J5.2c**. | **Applicable** | This is a linking clause and requires piping, vessels, heat exchangers and tanks that contain heating and cooling fluids that are part of an air-conditioning system to be insulated to meet the quirements of Specification J5.2c |

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| | (e) **Space heating** — A heater used for *air-conditioning* or as part of an *air-conditioning* system must comply with **Specification J5.2d**. | **Applicable** | This is a linking clause that specifies standalone heaters used for air-conditioning or heaters, used as part of an air-conditioning system such as a boiler, that must comply with the requirements of Specification J5.2d |
| | (f) **Energy efficiency ratios** —<br>(i) refrigerant chillers used as part of an *air-conditioning* system; and<br>(ii) packaged*air-conditioning* equipment, must comply with **Specification J5.2e**. | **(If there are any refrigerant chillers)** | The plans don't show but if there are any refrigerant chillers as part of an air-conditioning system, as well as packaged air-conditioning equipment, must have an energy efficiency ratio in accordance with Specification J5.2e.. |
| | (g) **Time switches** —<br>(i) A time switch complying with **Specification J6** must be provided to control—<br>(A) an *air-conditioning* system of more than 10 kWr; and<br>(B) a heater of more than 10 $kW_{heating}$used for *air-conditioning*.<br>(ii) The requirements of **(i)** do not apply to— | **Applicable** | This clause specifies the requirements for time switch controlling of power supply to air-conditioning systems. The intent is to reduce unnecessary energy consumption attributable to the system when it is not being used. Air-conditioning systems and heaters greater than 10 kW must be provided with time switches in accordance with Specification J6 that can activate and de-activate the respective system. The automatic nature of the switch removes dependency on actions by occupants or plant operators to turn off equipment when they are not needed, thereby increasing energy savings |
| | (A) an *air-conditioning* system that serves— (aa) only one *sole-occupancy unit* in a Class 2 or 3 building; or (bb) a Class 4 part of a building; or<br>(cc) only one *sole-occupancy unit* in a Class 9c building; or<br>(B) a building where *air-conditioning* is needed for 24 hour occupancy. | **Not Applicable** | |

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| **J5.3** | **Mechanical ventilation systems**<br>(a) **Control —**<br>(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— | **Applicable** | BCA cannot mandate operational or administrative matters such as the pre-programmed times for time switches, nor would it be practical to do so. It can only require that time switches be installed. |
| | (A)be capable of being deactivated when the building or part of the building served by that system is not occupied; and<br>(B)when serving a conditioned space—<br>(aa) not exceed the minimum outdoor air quantity required by Part F4, where relevant, by more than 20%; and<br>(bb) in other than climate zone 2, where the number of square metres per person is not more than 1 as specified in D1.13 and the air flow rate is more than 1000 L/s, have—<br>(AA) an energy reclaiming system that preconditions outside air; or<br>(BB) the ability to automatically modulate the mechanical ventilation required by Part F4 in proportion to the number of occupants.<br>(ii) The requirements of (a)(i)(B)(aa) do not apply where—<br>(A)additional unconditioned outside air is supplied for free cooling or to balance process exhaust; or<br>(B)additional exhaust ventilation is needed to balance the required mechanical ventilation; or<br>(C)an energy reclaiming system preconditions all the outside air.<br>(iii) Compliance with (a)(i) must not adversely affect—<br>(A)smoke hazard management measures required by Part E2; and<br>(B)ventilation required by Part E3 and Part F4. | **Applicable** | This Sub-clause requires controls to deactivate the mechanical ventilation system when the area is not occupied. This requires the mechanical ventilation system where the building or space has a high density of people and consequently a high rate of outdoor air required by **Part F4**, to have facilities to either reclaim energy from the building's exhaust or reduce the outdoor air rate to minimum required by **Part F4**. This must be done in proportion to the number of people in the building. This requirement does not apply to mechanical ventilation systems in climate zone 2 as it would not be cost effective in a climate where the outside air is so temperate. |
| | (b) Fans — Fans of a mechanical ventilation system covered by (a) must comply with Specification J5.2a. | **Applicable** | This Clause is a linking clause that requires mechanical ventilation system fans covered by J5.3(a)to comply with Specification J5.2a |

If the air flow rate of the mechanical ventilation system is more than 1000 L/s, the system must have a fan motor power to air flow rate ratio in accordance with

| ***Air-conditioning* sensible heat load (W/m2 of the *floor area* of the *conditioned space*)** | **Maximum *fan motor power* (W/m2 of the *floor area* of the *conditioned space*)** | |
|---|---|---|
| | **For an *air-conditioning* system serving not more than 500 m2** | **For an *air-conditioning* system serving more than500 m2** |
| Up to 100 | 5.3 | 8.3 |
| 101 to 150 | 9.5 | 13.5 |
| 151 to 200 | 13.7 | 18.3 |
| 201 to 300 | 22.2 | 28.0 |
| 301 to 400 | 30.7 | 37.0 |
| More than 400 | See Note | |

**Note:** Where the *air-conditioning* sensible heat load is more than 400 W/m2, the maximum *fan motor power* must be determined— (a) in a building of not more than 500 m2 *floor area*, using 0.09 W of *fan motor power* for each Watt of *air-conditioning* sensible heat load; and (b) in a building of more than 500 m2 *floor area*, using 0.12 W of *fan motor power* for each Watt of *air-conditioning* sensible heat load.

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| | (c) Time switches —<br>(i)A time switch complying with Specification J6 must be provided to control a mechanical ventilation system with an air flow rate of more than 1000 L/s.<br>(ii)The requirements of (i) do not apply to— | **Applicable** | A time switch controlling of power supply to mechanical ventilation systems needs to be installed. The reason is to reduce the unnecessary energy consumption attributable to the system when it is not being used.<br>If the mechanical ventilation system is with an air flow rate of more than 1000 L/s, then needs to be provided with time switches in accordance with Specification J6 which can activate and de-activate the respective system. |
| | (A)a mechanical ventilation system that serves— (aa) only one sole-occupancy unit in a Class 2 or 3 building; or (bb) a Class 4 part of a building; or<br>(cc) only one sole-occupancy unit in a Class 9c building; or<br>(B)a building where mechanical ventilation is needed for 24 hour occupancy. | **Not Applicable**<br><br>**Not Applicable** | |
| **J5.4** | **Miscellaneous exhaust systems**<br><br>(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—<br>(i) be capable of stopping the motor when the system is not needed; and<br>(ii) have a variable speed fan or the like. | **Applicable (if there are any miscellaneous exhaust system)** | This clause sets the requirements for miscellaneous exhaust system.<br><br>This Sub-clause requires controls to stop the motor when the area is not occupied. |
| | (b) The requirements of **(a)** do not apply—<br>(i) to a miscellaneous exhaust system in—<br>(A) a *sole-occupancy unit* in a Class 2, 3 or 9c building; or<br>(B) a Class 4 part of a building; or<br>(ii) where additional exhaust ventilation is needed to balance the *required* outside air for ventilation. | **Applicable**<br><br>**Not Applicable** | This clause shows when clause (a) doesn't apply |

| PART J6 | ARTIFICIAL LIGHTING AND POWER | | |
|---|---|---|---|
| **J6.1** | **Application of Part J6.2, J6.3** and **J6.5(a)(ii)** do not apply to a Class 8 *electricity network substation*. | **Applicable** | This is Class 9B Building<br>The intent of this part is to set the minimum requirements for the level of interior artificial lighting and power. |
| **J6.2** | **Artificial lighting**<br>(a) Ina *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building—<br>(i) the *lamp power density* or *illumination power density* of artificial lighting must not exceed the allowance of—<br>(A) 5 W/m$^2$ within a *sole-occupancy unit*; and<br>(B) 4 W/m$^2$ on a verandah, balcony or the like attached to a *sole-occupancy unit*; and<br><br>(ii) the illumination power density allowance in (i) may be increased by dividing it by the illumination power density adjustment factor for a control device in Table J6.2b as applicable; and<br>(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<br>(iv) halogen lamps must be separately switched from fluorescent lamps.<br>(b) In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building—<br>(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 Table J6.2a; and<br>(ii) the aggregate design illumination power load in (i) is the sum of the design illumination power loads in each of the spaces served; and | **Not Applicable**<br><br>**Applicable** | This is not Class 2 or Class 4 Building<br><br>Lighting (BCA) Calculator Version 2_30_Excel2007-Published: 30 April 2014 is used for illumination power load allowance<br><br>(The calculation is attached to the report) |

| | | | |
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| | (iii) in determining the design illumination power load for (ii) the following must be used:<br>(A) Where there are multiple lighting systems serving the same space—<br>(aa) the total illumination power load of all systems; or (bb) for a control system that permits only one system to operate at a time,<br>the design illumination power load is—<br>(AA) based on the highest illumination power load; or<br>(BB) determined by the formula—<br>[H x T/2 + P x (100 -T/2)] / 100<br>Where: H = the highest illumination power load; and T = the time for which the maximum illumination power load will occur, expressed as a percentage; and P = the predominant illumination power load.<br>(B) Where there is adjustable position lighting such as trapeze lighting or track lighting other than trunking systems that accept fluorescent lamps—<br>(aa) the rating of the circuit breaker protecting the track; or (bb) of extra low voltage, 80% of the power rating of the transformer; or<br>(cc) of mains voltage, 100 W per metre of track.<br>(c) The requirements of (a) and (b) do not apply to the following:<br>(i) Emergency lighting in accordance with Part E4.<br>(ii) Signage and display lighting within cabinets and display cases that are fixed in place.<br>(iii) Lighting for accommodation within the residential part of a detention centre.<br>(iv) A heater where the heater also emits light, such as in bathrooms.<br>(v) Lighting of a specialist process nature such as in an operating theatre, fume cupboard or clean workstation.<br>(vi) Lighting of performances such as theatrical or sporting.<br>(vii) 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. | **Applicable** | All these cases described in (c) are exempted from the calculation (Emergency lighting, Signage and display lighting, A heater where the heater also emits light, such as in bathrooms, Lighting for the permanent display and preservation of works of art other than for retail sale, purchase or auction) |

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| **J6.3** | **Interior artificial lighting and power control** | | |
| | (a) Artificial lighting of a room or space must be individually operated by a switch or other control device. | **Applicable** | This subclause (a) requires the electrical design for lighting in each room or space within a building to be operated separately from other rooms or spaces. In simple terms, the lighting in each space must be switched by its own light switch or group of switches. The Clause prevents the use of a master light switch to operate all lights in a number of rooms or areas. |
| | (b) An occupant activated device, such as a room security device, a motion detector in accordance with **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. | **Not Applicable** | |
| | (c) An artificial lighting switch or other control device in **(a)** must—<br>(i) if an artificial lighting switch, be located in a visible position—<br>(A) in the room or space being switched; or<br>(B) in an adjacent room or space from where the lighting being switched is visible; and | **Applicable** | The Electrical design according to Subclause (c) should provide lighting switch be in a visible position in the room where the lighting is being switched or in an adjacent room that offers a view of the lighting being switched. (As per **Specification J6)** |
| | (ii) for other than a single functional space such as an auditorium, theatre, *swimming pool*, sporting stadium or warehouse—<br>(A) not operate lighting for an area of more than 250 $m^2$ if in a Class 5 building or a Class 8 laboratory; or<br>(B) not operate lighting for an area of more than— (aa) 250 $m^2$ for a space of not more than 2000 $m^2$; or (bb) 1000 $m^2$ for a space of more than | **Not Applicable**<br><br>**Not Applicable** | The space floor area is less than 1000 m2.<br>An artificial lighting switch or other control device must not operate lighting for an area of |

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| | 2000 $m^2$, if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building. | | more than 250 m2 for a space of not more than 2000 m2 |
| | (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 a building, of more than 250 $m^2$ must be controlled by—<br>(i) a time switch in accordance with **Specification J6**; or<br>(ii) an occupant sensing device such as—<br>(A) a security key card reader that registers a person entering and leaving the building; or<br>(B) a motion detector in accordance with **Specification J6**. | **Applicable** | Sub clause (d) requires that 95% of the lighting in a building or storey of Class 5 to 9 which is larger than 250 $m2^2$ be controlled by devices which can turn it off out-of-hours. The devices can include a time switch, security card reader or a motion detector complying with in Specification J6. |
| | (e) In a Class 5, 6 or 8 building of more than 250 $m^2$, 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—<br>(i) the room containing the natural lighting zone is less than 20 $m^2$; or<br>(ii) the room's natural lighting zone contains less than 4 luminaires; or<br>(iii) 70% or more of the luminaires in the room are in the natural lighting zone. | **Not Applicable** | This is Class 9B building |
| | (f) The requirements of **(a)**, **(b)**, **(c)**, **(d)** and **(e)** do not apply to the following:<br>(i) Emergency lighting in accordance with **Part E4**.<br>(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*. | **Applicable** | This clause sets out where the requirements of (a), (b), (c), (d) and (e) do not apply.<br>The emergency lighting and the 24 hour required lighting doesn't need to be operated as per Subclause (a) (See **Specification J6**.) |
| | (g) The requirements of **(d)** do not apply to the following:<br>(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 building. | **Not Applicable** | This is a Class 9B building. This clause is not applicable |
| | (ii) A heater where the heater also emits light, such as in bathrooms. | **Not Applicable** | |

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| **J6.4** | **Interior decorative and display lighting**<br><br>(a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled—<br>(i) separately from other artificial lighting; and<br>(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<br>(iii) by a time switch in accordance with **Specification J6** where the display lighting exceeds 1 kW.<br><br>(b) Window display lighting must be controlled separately from other display lighting. | **Applicable if there are any interior decorative and display lighting**<br><br>**Applicable** | The provisions of this Clause cover decorative and display lighting inside a building and window display lighting. The interior lighting, such as used for a foyer mural or art display, must be (i) be separately controlled from other artificial lighting, (ii) have separate manual switching for each area that operates during different periods, except where operating times coincide such as in a museum or art gallery, and (iii) have a separate time switch, in accordance with Specification J6, for display lighting uses more than 1 kW.<br><br>Sub-Clause (b) requires window display lighting, usually on the perimeter of the building, to be controlled separately from other display lighting. |
| **J6.5** | **Artificial lighting around the perimeter of a building**<br><br>(a) Artificial lighting around the perimeter of a building, must—<br>(i) be controlled by—<br>(A) a daylight sensor; or<br>(B) 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<br>(ii) when the total perimeter lighting load exceeds 100 W—<br>(A) have an average *light source efficacy* of not less than 60 Lumens/W; or<br>(B) be controlled by a motion detector in accordance with **Specification J6**; and<br>(iii) when used for decorative purposes, such as facade lighting or signage lighting, have a separate time switch in accordance with **Specification J6**. | **Applicable** | The provisions of this Clause cover external lighting around the perimeter of a building, which must (i) be controlled by a daylight sensor or programmable time switch control, (ii) use high efficacy lamps (min.60 Lumens/W) or a motion detector if the total load exceeds 100W and (iii) have a separate time switch, in accordance with Specification J6, when used for decorative purposes. |

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| | (b) The requirements of **(a)(ii)** do not apply to the following:<br>(i) Emergency lighting in accordance with **Part E4**.<br>(ii) Lighting around a *detention centre*. | | Sub clause J6.5(b) exempts emergency lighting required by Part E4 or around detention centre<br>(See **Specification J6**.)<br>LIGHTING AND POWER CONTROL<br>DEVICES (BCA ) |
| **J6.6** | **Boiling water and chilled water storage units**<br><br>Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with **Specification J6**. | **Applicable if there are any boiling water or chilled water storage unit** | The power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification J6. The requirement does not apply to instantaneous heating units without storage that do not operate or lose heat when not in use. |
| PART J7<br><br>**J7.2** | HEATED WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT<br><br>**Heated water supply**<br><br>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 | **Applicable** | All HWS must comply with NCC Volume Three B2.4 Water heater in a heated water supply system<br>If there are any New Hot Water Taps - Must have a minimum WELS rating of 3 stars (9L/min)<br>Compliance for a heated water supply system is verified when the annual greenhouse gas intensity of the water heater does not exceed 100 g CO2e/MJ of thermal energy load determined in accordance with AS/NZS 4234. |

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| PART J8 | FACILITIES FOR ENERGY MONITORING | | |
| **J8.1** | **Application of Part**<br>The Deemed-to-Satisfy Provisions of this Part do not apply—<br>(a) within a sole-occupancy unit of a Class 2 building or a Class 4 part of a building; or<br>(b) to a Class 8 electricity network substation | **Applicable** | This is a Class 9B building with a condition space. |
| **J8.3** | **Facilities for energy monitoring** | | |
| | (a) A building or *sole-occupancy unit* with a *floor area* of more than 500 $m^2$ must have the facility to record the consumption of gas and electricity. | **Applicable** | The building is with a total floor area of less than 500 m2. Therefore, the building doesn't need devices to record the consumption of the gas and the electricity. (Monitoring system that keeps track of electricity and gas consumption) |
| | (b) A building with a *floor area* of more than 2,500 m must have the facility to record individually the energy consumption of—<br>(i) *air-conditioning* plant including, where appropriate, heating plant, cooling plant and air handling fans; and<br>(ii) artificial lighting; and<br>(iii) appliance power; and<br>(iv) central hot water supply; and<br>(v) internal transport devices including lifts, escalators and travellators where there is more than one serving the building; and<br>(vi) Other ancillary plant.<br>(c) The provisions of **(b)** do not apply to a Class 2 building with a *floor area* of more than 2,500 $m^2$ where the total area of the common areas is less than 500 $m^2$. | **Not Applicable** | The building doesn't need to have devices to record individually the energy consumption of air-conditioning plant, artificial lighting, appliance power, central hot water supply, internal transport devices including lifts, escalators and travellators where there is more than one serving the building, and other ancillary plants |

## STATEMENT OF COMPLIANCE

The design documentation as referred to in this report has been assessed against the applicable provisions of Section J of the Building Code of Australia, (BCA) and it is considered that such documentation complies or is capable of complying (as outlined above) with that Code.

# Conclusions

## SUMMARY OF SOLUTIONS TO COMPLY WITH SECTION J PERFORMANCE REQUIREMETS

The following table is a summary of the requirements for compliance with the Section J.

| Part J1 - Building Fabric **Building Element**<br>**ROOF:** | Required | Additional Insulation |
|---|---|---|
| **Metal Roof**<br><br>**Ceiling Insulation Assumption**<br>***The reduced insulation must be compensated with additional insulation according the Table J1.3b**<br>***Fireproof covers can be use above the down-lights and there will be no loss of insulation (or alternatively the IC rated down lights to be used)** | R3.20 (downwards)<br>*for 0.4-0.6 surface solar absorptance value | R2.81 (downwards)<br><br>*For details/ see the construction diagrams* |
| **External WALLS**<br><br>Brick Veneer walls<br><br>**Note: Where the insulation goes in the air space and the R-value of the air space is lost the R value of the required insulation should be increased for the lost R-value* | R2.80 | R2.32<br><br>*For details/ see the construction diagrams* |
| **FLOOR**<br><br>**Concrete Slab on ground** | ------ | ------<br>*For details/ see the construction diagrams* |

| Part J2 -Glazing | U-value maximum | SHGC maximum |
|---|---|---|
| **Windows N** | **6.6** | **0.66** |
| **Windows E** | **5.2** | **0.44** |
| **Windows S** | **3.5** | **0.55** |
| **Windows W** | **5.2** | **0.44** |
| | | *For details/ see the glazing calculator* |

*For details: see the glazing calculator
** If the glazing calculator shows "Device", an exterior shading device to be installed on that window

| Part J3 - Building Sealing Building Element | Comment |
|---|---|
| **Doors and open-able windows or the like forming part of the envelope of a conditioned space** | Weather seals to be installed on all doors and open able windows (other than aluminium), of the envelope of the conditioned space. *(for exceptions see the detailed assessment).* |
| **All External doors leading to a condition space** | Main door leading to a condition space must have an airlock, /self-closing device/ *(for exceptions see the detailed assessment).* |
| **New Exhaust Fans** | Must have self-closing dampers. |
| **Roofs, Walls & Floor** | Minimise air leakage by enclosed or internal lining systems that is close fitted at the ceiling, the wall and the floor junctions. Also, to be sealed by caulking, skirting, architraves, cornices or the like. |

| Part J5 - Air Conditioning and Ventilation Systems Building Element | Comment |
|---|---|
| **New Air -Conditioning Certification and the air economy cycle** | Required if the size of the air-conditioner is greater than **35kWr.** |
| **New A/C System** | Must have the ability to be inactive when the area is not occupied. *(for exceptions see the detailed assessment)* |
| **Time Switch** | A time switch complying with **Specification J6** must be provided to control—<br>• an *air-conditioning* system of more than 10 kWr;<br>• a heater of more than 10 kW heating used for air-conditioning<br>• A time switch complying with Specification J6 must be provided to control a mechanical ventilation |

| | |
|---|---|
| | system with an air flow rate of more than 1000 L/s */for exclusions see detailed report/* |
| **New Ductwork** | Must be insulated to a minimum **R-value** of **R1.20** within a conditioned space, **R3.0** in direct sunlight, and **R2.0** in other locations or R1.0, for flexible ductwork |

| **Part J6 - Artificial Lighting and Power**<br>**Building Element** | Comment |
|---|---|
| **New Lighting** | Must not exceed the "maximum lighting wattage" in the lighting calculations table in **Lighting Calculator** |
| **Artificial Lighting Switch** | Must be located in a visible position in the room being switched or located in an adjacent room where the lighting being switched can be seen.<br>An artificial lighting switch or other control device must not operate lighting for an area of more than 250 $m^2$ |
| **Artificial Lighting** | A time switch or an occupant sensing device such as a security key card reader or a motion detector in accordance with Spec J6 must control 95% of artificial lighting in a building or storey of a building of more than 250m2 and which can turn it off out-of-hours *(for exceptions see the detailed assessment).* |
| **Interior Decorative & Display Lighting** | Controlled separately from other artificial lighting by a manual switch for each area. Controlled by a time switch where display lighting exceeds 1kW. *(for exceptions see the detailed assessment).* |
| **Window Display Lighting**<br><br>**Artificial Lighting in the natural lighting zone** | Must be controlled separately from other display lights. *(for exceptions see the detailed assessment).*<br><br>To be controlled separately, then the lighting, not in the natural lighting zone |

| | |
|---|---|
| **Artificial Lighting Perimeter** | Must be controlled by a daylight sensor or programmable time switch control, use high efficacy lamps (min.60 Lumens/W) or a motion detector if the total load exceeds 100W and have a separate time switch, in accordance with Specification J6, when used for decorative purposes (*for exceptions see the detailed assessment).* |
| **Decorative External Lighting** | Must have a separate time switch. *(for exceptions see the detailed assessment).* |
| **Boiling Water & Chilled Water Storage Units** | Must be controlled by a time switch. *(for exceptions see the detailed assessment).* |

| **Specification** | Comment |
|---|---|
| **Specification J6** | All time switches, motion detectors, occupant sensing devices & daylight sensors must meet **Specification J6** standards. |

| **Part J7 - Hot Water Supply Building Element** | Comment |
|---|---|
| **Heated water supply** | All HWS must comply with NCC Volume Three B2.4 Water heater in a heated water supply system<br>Compliance for a heated water supply system is verified when the annual greenhouse gas intensity of the water heater does not exceed 100 g CO2e/MJ of thermal energy load determined in accordance with AS/NZS 4234. |
| **New Hot Water Taps** | Must have a minimum WELS rating of 3 stars (9L/min) |

| **Part J8 - Access for Maintenance and Facilities for Monitoring Maintenance /Monitoring** | Comment |
|---|---|
| **Access** | Must be provided to all plant, equipment and components that require maintenance. |
| **Energy Monitoring** | The building is with a total floor area of less than 500 m2. Therefore, the building doesn't need devices to record the consumption of the gas and the electricity. (Monitoring system that keeps track of electricity and gas consumption) |

**EVIDENCE OF COMPLIANCE CHECK LIST**

The purpose of this checklist is to itemise the evidence that should be collected during the construction phase of the project that will demonstrate how the final building complies with the Energy Efficiency requirements of Section J of the BCA that were identified during the design phase.

Generally, evidence should take the form of delivery receipts, photographs, or signed and dated statements from installers.

**Assessor: Zoran Cvetkovski**
**Thermal Performance Assessor**
**Home Sustainability Assessor**
**BSc.(B.Eng.)**

NCC
Volume One

# Sustainability-Z

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## Construction Diagrams

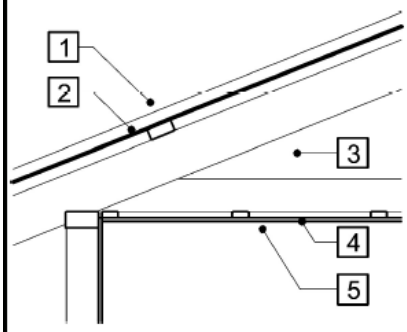
Project name:

## PROPOSED CHILD CARE CENTRE

## 22 Curtis Road Chester Hill 2162

**ROOF**

A) Metal Roof (Flat Ceiling)

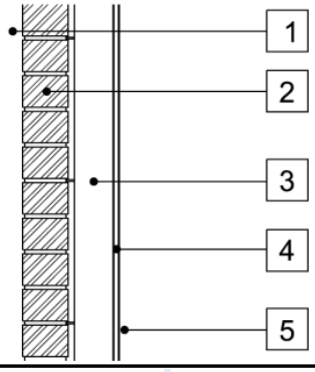
| Roof construction description | Item | Item description | *R-Value* Unventilated | | *R-Value* Ventilated | |
|---|---|---|---|---|---|---|
| | | | Up | Down | Up | Down |
| (a) Roof<br>– Horizontal ceiling<br>– Metal cladding<br>  | 1. | Outdoor air film (7 m/s) | 0.04 | 0.04 | 0.04 | 0.04 |
| | 2. | Metal cladding | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3. | Roof airspace (non-reflective) | 0.18 | 0.28 | 0.00 | 0.46 |
| | 4. | Plasterboard, gypsum (10 mm, 880 kg/m$^3$) | 0.06 | 0.06 | 0.06 | 0.06 |
| | 5. | Indoor air film (still air) | 0.11 | 0.16 | 0.11 | 0.16 |
| | | *Total R-Value* | 0.39 | 0.54 | 0.21 | 0.72 |

**Required R3.2-Additional insulation of R2.81**

NCC
Volume One

## I) EXTERNAL WALLS

A) Brick Veneer

| External wall construction description | Item | Item description | *R-Value* |
|---|---|---|---|
| (a) Masonry veneer – 25 mm to 50 mm cavity, 10 mm internal plaster on 90 mm stud frame   | 1. | Outdoor air film (7 m/s) | 0.04 |
| | 2. | Masonry (See Notes 3 and 4) | 0.09 |
| | 3. | Cavity and airspace (115 to 140 mm, made up of 90 mm stud + 25 mm to 50 mm airspace non-reflective and unventilated) | 0.17 |
| | 4. | Plasterboard, gypsum (10 mm, 880 kg/m$^3$) | 0.06 |
| | 5. | Indoor air film (still air) | 0.12 |
| | | *Total R-Value* | 0.48 |

**Required R2.8-Additional insulation of R2.32**

## II) FLOORS

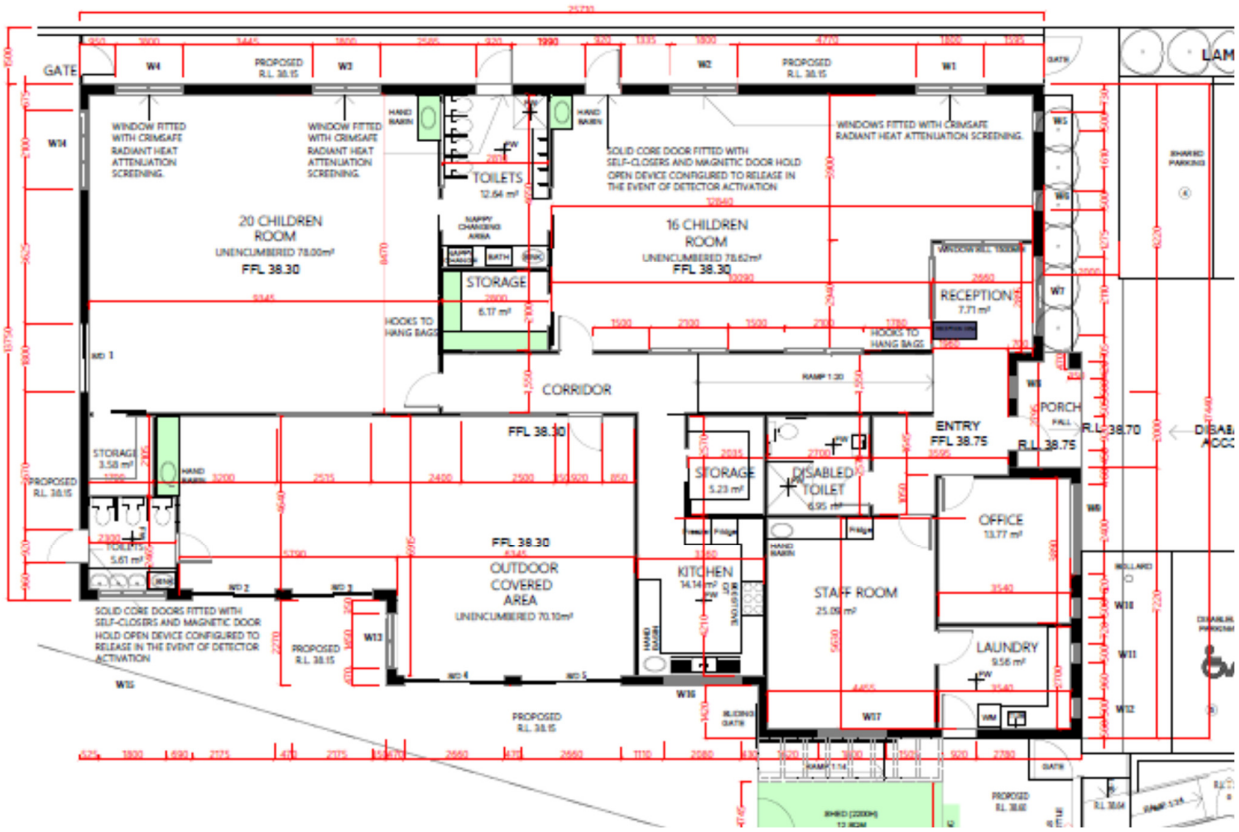
**A) Concrete slab on ground: No insulation requirements (**As per the Table J1.6)

***Note: The loss of ceiling insulation because of downlights, fans and other penetrations, requires compensation as per the Table J1.3(b)***

***Note: Where the insulation goes in the air space and the R-value of the air space is lost the R value of the required insulation should be increased for the lost R-value***

**Assessor: Zoran Cvetkovski**
Thermal Performance Assessor
Home Sustainability Assessor
BSc.(B.Eng.)

**Windows -**22 Curtis Road Chester Hill 2162



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

Building name/description: **Proposed child care centre: 22 Curtis Road Chester Hill 2162**

Application: **other**

Climate zone: **6**

Storey: **Ground**

Facade areas

| | N | NE | E | SE | S | SW | W | NW | internal |
|---|---|---|---|---|---|---|---|---|---|
| Option A | 72m² | | 46.4m² | | 66m² | | 46.4m² | | |
| Option B | | | | | | | | | n/a |
| *Glazing area (A)* | *5.76m²* | ..... | *9.29m²* | ..... | *28.7m²* | ..... | *8.76m²* | | |

Number of rows preferred in table below: **22** *(as currently displayed)*

| GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS | | | | | | | | | | | SHADING | | CALCULATED OUTCOMES OK (if inputs are valid) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Glazing element | | Facing sector | | Size | | | Performance | | | | P&H or device | | Shading | | Multipliers | | Size | Outcomes |
| ID | Description (optional) | Option A facades | Option B facades | Height (m) | Width (m) | Area (m²) | Total System U-Value (AFRC) | Total System SHGC (AFRC) | | | P (m) | H (m) | P/H | G (m) | Heating ($S_H$) | Cooling ($S_C$) | Area used (m²) | Element share of % of allowance used |
| 1 | W1 | N | | 0.80 | 1.80 | | 6.6 | 0.66 | | | 0.850 | 1.650 | 0.52 | 0.85 | 0.98 | 0.86 | 1.44 | 25% of 39% |
| 2 | W2 | N | | 0.80 | 1.80 | | 6.6 | 0.66 | | | 0.850 | 1.650 | 0.52 | 0.85 | 0.98 | 0.86 | 1.44 | 25% of 39% |
| 3 | W3 | N | | 0.80 | 1.80 | | 6.6 | 0.66 | | | 0.850 | 1.650 | 0.52 | 0.85 | 0.98 | 0.86 | 1.44 | 25% of 39% |
| 4 | W4 | N | | 0.80 | 1.80 | | 6.6 | 0.66 | | | 0.850 | 1.650 | 0.52 | 0.85 | 0.98 | 0.86 | 1.44 | 25% of 39% |
| 5 | W5 | E | | 1.38 | 0.50 | | 5.2 | 0.44 | | | 1.000 | 2.400 | 0.42 | 1.02 | 0.97 | 0.94 | 0.69 | 7% of 83% |
| 6 | W6 | E | | 1.38 | 0.50 | | 5.2 | 0.44 | | | 1.200 | 2.630 | 0.46 | 1.25 | 0.98 | 0.96 | 0.69 | 8% of 83% |
| 7 | W7 | E | | 1.80 | 2.11 | | 5.2 | 0.44 | | | 0.450 | 2.250 | 0.20 | 0.45 | 0.98 | 0.95 | 3.80 | 41% of 83% |
| 8 | W8 | E | | 1.80 | 0.50 | | 5.2 | 0.44 | | | 0.400 | 2.200 | 0.18 | 0.40 | 0.98 | 0.95 | 0.90 | 10% of 83% |
| 9 | W9 | E | | 0.59 | 2.40 | | 5.2 | 0.44 | | | 1.000 | 1.560 | 0.64 | 0.97 | 0.92 | 0.87 | 1.42 | 14% of 83% |
| 10 | W10 | E | | 1.80 | 0.50 | | 5.2 | 0.44 | | | 0.750 | 2.600 | 0.29 | 0.80 | 0.98 | 0.96 | 0.90 | 10% of 83% |
| 11 | W11 | E | | 0.90 | 0.50 | | 5.2 | 0.44 | | | 0.650 | 1.600 | 0.41 | 0.70 | 0.97 | 0.94 | 0.45 | 5% of 83% |
| 12 | W12 | E | | 0.90 | 0.50 | | 5.2 | 0.44 | | | 0.550 | 1.500 | 0.37 | 0.60 | 0.97 | 0.95 | 0.45 | 5% of 83% |
| 13 | W13 | W | | 1.30 | 1.45 | | 5.2 | 0.44 | | | 1.400 | 2.700 | 0.52 | 1.40 | 0.97 | 0.95 | 1.89 | 21% of 82% |
| 14 | SD1 | W | | 2.30 | 1.80 | | 5.2 | 0.44 | | | 1.700 | 4.000 | 0.43 | 1.70 | 0.98 | 0.97 | 4.14 | 48% of 82% |
| 15 | W14 | W | | 1.30 | 2.10 | | 5.2 | 0.44 | | | 1.250 | 2.550 | 0.49 | 1.25 | 0.97 | 0.95 | 2.73 | 31% of 82% |
| 16 | W15 | S | | 0.80 | 1.80 | | 3.5 | 0.55 | | | 1.650 | 2.400 | 0.69 | 1.60 | 0.95 | 0.92 | 1.44 | 5% of 98% |
| 17 | SD2 | S | | 2.30 | 2.18 | | 3.5 | 0.55 | | | 1.600 | 3.850 | 0.42 | 1.55 | 0.98 | 0.97 | 5.00 | 17% of 98% |
| 18 | SD3 | S | | 2.30 | 2.18 | | 3.5 | 0.55 | | | 1.600 | 3.850 | 0.42 | 1.55 | 0.98 | 0.97 | 5.00 | 17% of 98% |
| 19 | SD4 | S | | 2.30 | 2.66 | | 3.5 | 0.55 | | | 1.250 | 3.500 | 0.36 | 1.20 | 0.97 | 0.95 | 6.12 | 21% of 98% |
| 20 | SD5 | S | | 2.30 | 2.66 | | 3.5 | 0.55 | | | 1.250 | 3.500 | 0.36 | 1.20 | 0.97 | 0.95 | 6.12 | 21% of 98% |
| 21 | W16 | S | | 1.30 | 2.08 | | 3.5 | 0.55 | | | 1.250 | 2.530 | 0.49 | 1.23 | 0.97 | 0.96 | 2.70 | 9% of 98% |
| 22 | W17 | S | | 1.30 | 1.80 | | 3.5 | 0.55 | | | 0.450 | 1.750 | 0.26 | 0.45 | 0.96 | 0.93 | 2.34 | 8% of 98% |

| GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS | | | | | | | | SHADING | | CALCULATED OUTCOMES OK (if inputs are valid) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Glazing element | | Facing sector | | Size | | | Performance | | P&H or device | | Shading | | Multipliers | | Size | Outcomes |
| ID | Description (optional) | Option A facades | Option B facades | Height (m) | Width (m) | Area ($m^2$) | 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 ($m^2$) | Element share of % of allowance used |

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

***if inputs are valid***

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

Main Menu

# LIGHTING CALCULATOR FOR USE WITH J6.2(b) VOLUME ONE (First issued with NCC 2014)

Multiple Lighting Systems Calculator | Help screen

Building name/description: Proposed child care centre: 22 Curtis Road Chester Hill 2162

Classification: Class 9b

Number of rows preferred in table below: 14 *(as currently displayed)*

| ID | Description | Floor area of the space | Perimeter of the space | Floor to ceiling height | Design Illumination Power Load | Space | Adjustment Factor One | | | | Adjustment Factor Two | | | | OVERALL DESIGN PASSES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Adjustment Factor One | Dimming Percentages | | Design Lumen Depreciation Factor | Adjustment Factor Two | Dimming Percentages | | Design Lumen Depreciation Factor | System Illumination Power Load Allowance | Lighting System Share of % of Aggregate Allowance Used |
| | | | | | | | Adjustment Factors | % Area | % of full power | | Adjustment Factors | % Area | % of full power | | | |
| 1 | 23 Children room | 78.7 | 35.5 | 2.75 | 708.3 | An illuminance more than 240 lx to 320 lx | | | | | | | | | 1125 W | 26% of 47% |
| 2 | Toilet | 12.9 | 15 | 2.75 | 64.5 | Toilet, locker room, staff room, rest room and the like | | | | | | | | | 128 W | 2% of 47% |
| 3 | Storage 1 | 6.2 | 10 | 2.75 | 55.8 | Storage with shelving higher than 75% of the height of the aisle lighting | | | | | | | | | 107 W | 2% of 47% |
| 4 | Storage 1 | 3.58 | 7.78 | 2.75 | 32.22 | Storage with shelving higher than 75% of the height of the aisle lighting | | | | | | | | | 64 W | 1% of 47% |
| 5 | 22 Children room | 79 | 39.2 | 2.75 | 711 | An illuminance more than 240 lx to 320 lx | | | | | | | | | 1174 W | 26% of 47% |
| 6 | Entry/Reception/ Hwy | 38.78 | 45.8 | 2.75 | 349.02 | Entry lobby from outside the building | | | | | | | | | 970 W | 13% of 47% |
| 7 | Office | 14.3 | 15.2 | 2.75 | 128.7 | Office - artificially lit to an ambient level of less than 200 lx | | | | | | | | | 164 W | 5% of 47% |
| 8 | Laundry | 9.87 | 12.7 | 2.75 | 49.35 | Service area, cleaner's room and the like | | | | | | | | | 83 W | 2% of 47% |
| 9 | Staff Room | 24.53 | 20 | 2.75 | 220.77 | An illuminance more than 240 lx to 320 lx | | | | | | | | | 415 W | 8% of 47% |
| 10 | Disabled toilete | 6.95 | 10.5 | 2.75 | 34.75 | Toilet, locker room, staff room, rest room and the like | | | | | | | | | 72 W | 1% of 47% |
| 11 | Kitchen | 14.14 | 17.54 | 2.75 | 127.26 | Kitchen and food preparation area | | | | | | | | | 188 W | 5% of 47% |
| 12 | Storage (Kitchen) | 5.23 | 9 | 2.75 | 47.07 | Storage with shelving higher than 75% of the height of the aisle lighting | | | | | | | | | 91 W | 2% of 47% |
| 13 | Toilets (External) | 5.6 | 9 | 2.75 | 28 | Toilet, locker room, staff room, rest room and the like | | | | | | | | | 59 W | 1% of 47% |
| 14 | Outdoor covered area | 70.1 | 72.3 | 2.75 | 210.3 | An illuminance more than 240 lx to 320 lx | | | | | | | | | 1244 W | 8% of 47% |
| | | | | ***Total*** | 2767 W | | | | | | | | | ***Total*** | 5884 W | |

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE LIGHTING CALCULATOR

The Lighting Calculator has been developed by the ABCB to assist in developing a better understanding of lighting energy efficiency parameters. While the ABCB believes that the Lighting Calculator, if used correctly, will produce accurate results, the calculator 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 Lighting Calculator is entirely at your own risk and the ABCB accepts no liability of any kind.

*if inputs are valid*