

BCA 2022 SECTION J INDICATIVE COMPLIANCE REPORT FOR DA LODGEMENT

**69-73 George Street,
Marulan NSW 2579**



Prepared for: Dacoas Holdings Pty Ltd
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Document History

Date	Issue	Status	Prepared by	Assessed by	Reviewed by
07/12/2023	Draft Report v0.1	Initial document created	Kathryn Petropoulos	Joseph Bond	Joseph Bond
21/12.2023	Report Issue v1.0	Report issued to client	Kathryn Petropoulos	Joseph Bond	Joseph Bond

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1.0. INTRODUCTION

1.1. Location and Description

This report is prepared in preparation of a Development Application (DA) lodgement and is for assessment purposes; it comprises a National Building Code of Australia 2022 (NBCA) Section J assessment ONLY of the proposed childcare centre located at [69-73 George Street, Marulan NSW 2579].

The development incorporates the demolition of existing structures and construction of a new one (1) storey Class 9b Childcare Centre with associated parking spaces located externally on the Ground Floor Level



Figure 1 Site location and topography.

1.2. Report Purpose

The purpose of this report is to provide an indicative compliance assessment of the CC design documentation for the proposal, against the current requirements of Section J of the BCA.

1.3. Basis of Report

This report is based upon and limited to:

- An assessment of design documentation referenced in Appendix A of this report.
- The Deemed-to-Satisfy provisions of the National Building Code of Australia 2022 (Section J Only).

1.4. Referenced Documents

The following documentation was relied upon when preparing this report:

- Assessment of design documentation referenced in Appendix A of this report.
- The performance and deemed-to-satisfy provisions of the National Building Code of Australia 2022 incorporating the NSW Appendices where applicable.
- Guide to the National Building Code of Australia.

1.5. Limitations and Exclusions

The limitations and exclusions of this report are as follows:

- This Report does not address issues in relation to the following:
 - a) The structural adequacy of the building including the Fire Resistance Levels (FRL's) of any building elements (unless specifically referred to).
 - b) The design, maintenance or operation electrical, mechanical, hydraulic or fire protection services.
 - c) Environmental Planning and Assessment Act and Regulations (unless specifically referred to).
 - d) Local Government Act and Regulations.
 - e) Occupational Health and Safety Act and Regulations.
 - f) WorkCover Authority requirements.
 - g) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Sydney Water, Electricity Supply Authority, RTA, Council and the like.
 - h) Disability Discrimination Act (DDA) other than minimum requirements under the Disability (Access to Premises — Buildings) Standards 2010. DDA is a Case by Case Assessment, this building will comply with the set items under the Premises Standards.
 - i) Construction Safety Act.
 - j) Conditions of Development Consent issued by the relevant Local Council.
- This assessment does not incorporate the detailed requirements of the Australian Standards.
- BCA Innovations cannot guarantee acceptance of this report by the Local Council, NSW Fire Brigades or other approval authorities.
- Without written permission from BCA Innovations, no part of this document may be reproduced in any form or by any means. This report is based solely on client instructions, and therefore should not be used by any third party without prior knowledge of such instructions.

Note: it is the responsibility of the designer to adequately portray the recommendation of this report on the design plans, which are to be used in the construction of the Subject Building. All recommendations provided are to be interoperated in conjunction with the requirements listed in this report.

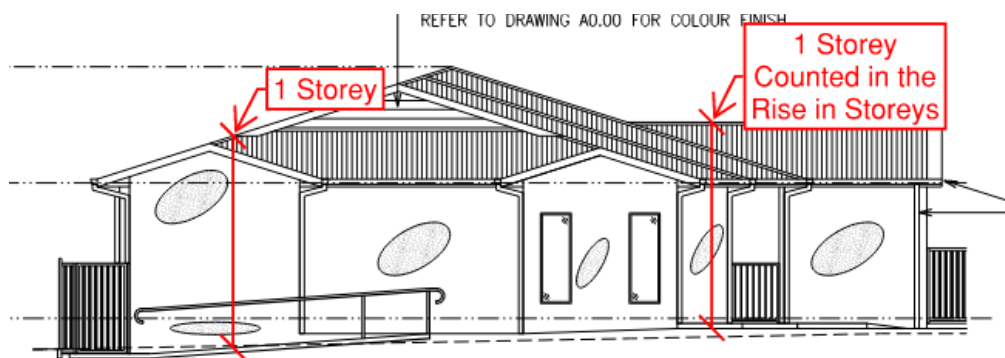
2.0. BUILDING DESCRIPTION – PROPOSED DEVELOPMENT

2.1. Building Code of Australia Description

For the purposes of the Building Code of Australia 2022 (BCA) the proposed development may be described as follows.

2.2. Rise in Storeys (RIS) (Clause C2D3)

The overall building appears to have a rise in storeys of one (1) as illustrated below;
The number of storeys contained appears to be one (1).



2.3. Building Classifications (Part A6)

The proposed building has been assessed for Energy Efficiency as follows.

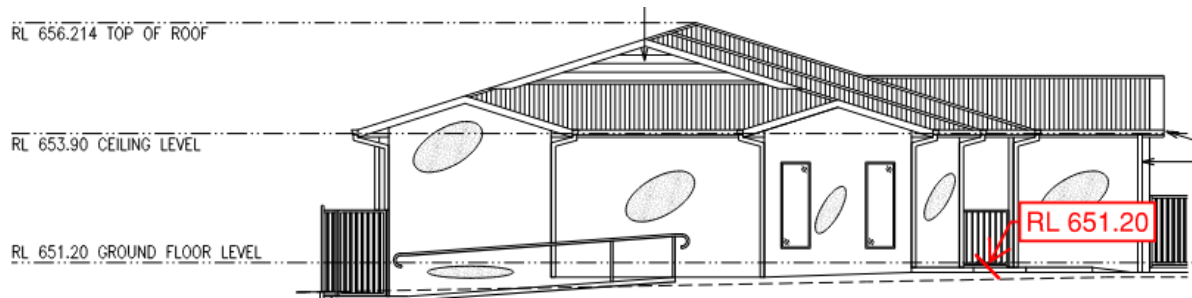
BUILDING LEVELS	PLAN LEVELS	CLASSIFICATION	USE	RIS
Ground Floor	Ground Floor Layout	Class 7a & 9b	Carpark & Childcare Centre	1
Roof	Roof Plan	-	-	-

2.4. Effective Height (Schedule 3)

The building appears to have an effective height (EH) of approximately **0m** when measured from the floor of the topmost storey which is less than 12m.

*Lowest Point taken @ RL 651.20 (Approx.)

*Highest Point taken @ RL 651.20



2.5 Type of Construction (Table C2D2)

The building is required to be of **Type 'C'** Construction

2.6 Floor area and Volume Limitations (Table C3D3)

Class of Building Part	Floor Area & Volume		Outcome
	Max Permitted (Table C3D3)	Max. Proposed	
▪ Class 7a	2,000 m ²	< 2,000 m ²	Complies
	12,000 m ³	< 12,000 m ³	
▪ Class 9b	3,000 m ²	< 3,000 m ²	Complies
	18,000 m ³	< 18,000 m ³	

3.0. BCA REQUIREMENTS

Noting that the level of documentation at this stage is for a Development Application (DA) assessment purposes, an indicative compliance assessment of the referenced documents identified in Appendix B of this report has been undertaken against the Deemed-to-Satisfy Provisions of the National Building Code of Australia 2022 (BCA).

Outlined below is a summary of the Deemed-to-Satisfy Provisions of the BCA. All Deemed-to-Satisfy clauses that are applicable to the subject building have been referred to below, including a comment adjacent to each clause of the proposal's ability to satisfy each respective clause.

The abbreviations outlined below have been used in the following tables:

N / A	The Deemed-to-Satisfy clause does not apply to the subject Building.
Complies	The relevant provisions of the Deemed-to-Satisfy clause have been demonstrated by the proposed design and existing building features, notwithstanding it is at DA documentation stage.
CRA	'Compliance Readily Achievable'. It is considered that the level of detail included in the DA documentation will not determine strict compliance with the individual BCA clause requirements. However, subject to noting the requirements of each clause, it is considered BCA compliance can be readily demonstrated without significant implication to the approved design. This will occur through progression of documentation to the Construction Certificate stage of the development.
FI	Further information is necessary to determine the compliance potential of the building design.
PS	Performance Solution with respect to this Deemed-to-Satisfy Provision is possible to satisfy the relevant BCA Performance Requirements.
DNC	Does Not Comply.
DTS	Deemed-To-Satisfy provisions as defined by the National Building Code of Australia 2022.

3.1. BCA 2022 Clause by Clause Assessment

Part J2 – Energy Efficiency

NSW J2D2 Application of Section J

CRA.

- (1) For a Class 3 and 5 to 9 building, Performance Requirement NSW J1P1 is satisfied by complying with—
 - (a) Part J4, for the building fabric; and
 - (b) Part J5, for building sealing; and
 - (c) Part J6, for air-conditioning and ventilation; and
 - (d) Part J7, for artificial lighting and power; and
 - (e) Part J8, for heated water supply and swimming pool and spa pool plant; and
 - (f) J9D3, for facilities for energy monitoring.
- (2) For a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, Performance Requirement NSW J1P5 is satisfied by complying with—
 - (a) J3D5 and J3D6, for thermal breaks; and
 - (b) J4D3, for general thermal construction; and
 - (c) J3D10(3), J3D10(5) and J3D10(6), for floor edge insulation.
- (3) For a Class 2 building or a Class 4 part of a building, Performance Requirement NSW J1P6 is satisfied by complying with Part J5 for building sealing.
- (4) For a Class 2 building or a Class 4 part of a building, Performance Requirement NSW J1P7 is satisfied by complying with—
 - (a) Part J6, for air-conditioning and ventilation; and
 - (b) J8D2, for heated water supply; and
 - (c) J9D3, for facilities for energy monitoring.
- (5) For a Class 2 to 9 building, Performance Requirement NSW J1P4 is satisfied by complying with J9D4 and J9D5.

As the subject development is a Class 5-9 building, Parts J4-J9 of Section are required to be complied with. The Climate Zone in Marulan is 7.



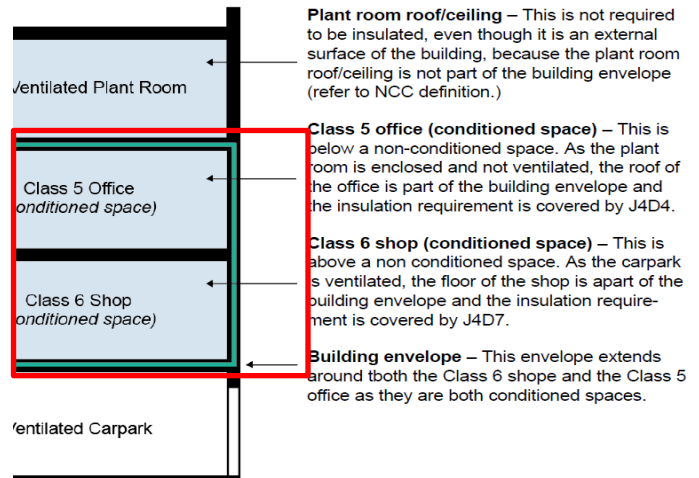
NSW J2D2 Application of Section J

Conditioned Spaces

The requirements relating to reducing the heating or cooling loads outlined in the following clauses of Parts J4 & J5 refer to the building envelope.

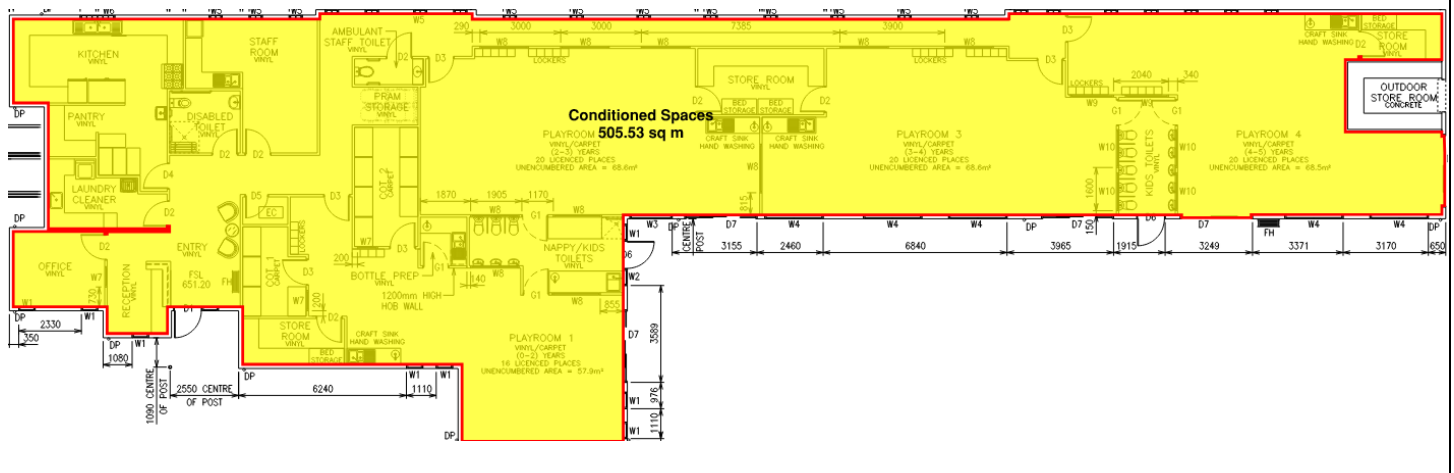
For the purposes of Section J in Volume One, the BCA defines an envelope as the parts of a building's fabric that separate a conditioned space or habitable room from the exterior of the building or a non-conditioned space including:

- the floor of a rooftop plant room, lift-machine room or the like; and
- the floor above a carpark or warehouse; and
- the common wall with a carpark, warehouse or the like.



The below plan overlays outline the areas identified as conditioned spaces:

Ground Floor Conditioned Spaces



Part J3 – Elemental provisions for a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

NSW J3D2 Application of Part

N / A	The Deemed-to-Satisfy Provisions of this Part apply to building elements forming the external building fabric of a sole-occupancy unit of a Class 2 building and a Class 4 part of a building.
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J3D3 Reducing heating and cooling loads of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building using house energy rating software

N / A	J3D3 does not apply in NSW.
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J3D4 Ceiling fans in a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D4 does not apply in NSW.
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J3D5 Roof thermal breaks of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	<p>(1) For compliance with J3D5(c), a roof that—</p> <ul style="list-style-type: none"> (a) has metal sheet roofing directly fixed to metal purlins, metal rafters or metal battens; and (b) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens, <p>must have a thermal break, consisting of a material with an R-Value of greater than or equal to R0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.</p> <p>(2) The requirements of (1) do not apply to roofs constructed using insulated sandwich panels.</p> <p>Only applies to the sole-occupancy units of Class 2 buildings & Class 4 Parts</p>
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J3D6 Wall thermal breaks

N / A	<p>(1) A metal-framed wall that forms part of the building envelope must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed at all points of contact between the external cladding and the metal frame if the wall—</p> <ul style="list-style-type: none"> (a) does not have a wall lining or has a wall lining that is fixed directly to the same metal frame; and (b) is clad with weatherboards, fibre-cement or the like, or metal sheeting fixed to a metal frame. <p>(2) The requirements of (1) do not apply to walls constructed using insulated sandwich panels.</p> <p>Only applies to the sole-occupancy units of Class 2 buildings & Class 4 Parts</p>
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NSW J3D7 Roofs and ceilings of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D7 does not apply in NSW.
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NSW J3D8 External walls of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D8 does not apply in NSW.
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NSW J3D9 Wall-glazing construction of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D7 does not apply in NSW.
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NSW J3D10 Floors of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	<p>(1) this subclause does not apply in NSW.</p> <p>(2) This subclause does not apply in NSW.</p> <p>(3) A concrete slab-on-ground with an in-slab or in-screed heating or cooling system must have insulation with an R-Value at least 1.0 installed around the vertical edge of its perimeter.</p> <p>(4) This subclause does not apply in NSW.</p>
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No in-slab or in-screed heating or cooling system proposed.

Only applies to the sole-occupancy units of Class 2 buildings & Class 4 Parts

NSW J3D11 External winter glazing of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D11 does not apply in NSW.
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NSW J3D12 External summer glazing of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D12 does not apply in NSW.
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NSW J3D13 Shading of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D13 does not apply in NSW.
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NSW J3D14 Net equivalent energy usage of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

N / A	J3D14 does not apply in NSW.
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NSW J3D15 Net equivalent energy usage for a sole-occupancy unit of a Class 2 building or Class 4 part of building – home energy rating software

N / A	J3D7 does not apply in NSW.
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Part J4 – Building Fabric

J4D2 Application of Part

Noted	<p>(1) The Deemed-to-Satisfy Provisions of this Part apply to building elements forming the envelope of a Class 3 and Class 5 to 9 building.</p> <p>(2) NSW J4D3, applies to building elements forming the envelope of a sole-occupancy unit in a Class 2 building and a Class 4 part of a building.</p> <p>(3) (2) only applies to thermal insulation in a sole-occupancy unit in a Class 2 building and a Class 4 part of a building where a development consent specifies that the insulation is to be provided as part of the development.</p>
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NSW J4D3 Thermal construction — general

CRA	<p>(1) <i>Where required</i>, insulation must comply with AS/NZS 4859.1 and be installed so that it—</p> <ul style="list-style-type: none"> (a) 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 (b) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and (c) does not affect the safe or effective operation of a service or fitting. <p>(2) <i>Where required</i>, reflective insulation must be installed with—</p> <ul style="list-style-type: none"> (a) the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and (b) the reflective insulation closely fitted against any penetration, door or window opening; and (c) the reflective insulation adequately supported by framing members; and (d) each adjoining sheet of roll membrane being- <ul style="list-style-type: none"> (i) overlapped not less than 50 mm; or (ii) taped together. <p>(3) <i>Where required</i>, bulk insulation must be installed so that—</p> <ul style="list-style-type: none"> (a) 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 (b) 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. <p>(4) Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in Specification 36.</p> <p>(5) The required Total R-Value and Total System U-Value, including allowance for thermal bridging, must be—</p> <ul style="list-style-type: none"> (a) calculated in accordance with AS/NZS 4859.2 for a roof or floor; or (b) determined in accordance with Specification 37 for wall-glazing construction; or (c) determined in accordance with Specification 39 or Section 3.5 of CIBSE Guide A for soil or sub-floor spaces. <p>Note: <i>Where required</i> is deemed to refer to “Where a development consent specifies that insulation is to be provided as part of the development.”.</p> <p>In addition to detailing how insulation is to be selected and installed, BCA2022 and later requires thermal bridging to be accounted for. Where thermal bridging exists, it is either required to be calculated when determining a roof, wall or floor’s total R-Value or thermal breaks are to be installed.</p> <p>Design verification demonstrating compliance with this clause must be provided prior to the issue of the Construction Certificate.</p>
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J4D4 Roof and Ceiling Construction

CRA	<p>(1) A roof or ceiling must achieve a Total R-Value greater than or equal to—</p> <ul style="list-style-type: none"> (a) in climate zones 1, 2, 3, 4 and 5, R3.7 for a downward direction of heat flow; and (b) in climate zone 6, R3.2 for a downward direction of heat flow; and (c) in climate zone 7, R3.7 for an upward direction of heat flow; and (d) in climate zone 8, R4.8 for an upward direction of heat flow. <p>(2) In climate zones 1, 2, 3, 4, 5, 6 and 7, the solar absorptance of the upper surface of a roof must be not more than 0.45.</p> <p>Roof and ceiling construction above conditioned spaces of the subject building forming part of the building envelope requires a minimum Total R-Value of R3.7, with a solar absorptance of ≤ 0.45.</p> <p>Designer to confirm compliance with this Clause prior to the issue of the Construction Certificate.</p>
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Metal Roof, Horizontal Ceiling – Required Insulation:

The subject proposed roof and ceiling construction is a metal clad roof with timber framing and horizontal ceiling, located above Playrooms 1 – 5 and the associated store rooms, cot rooms, and nappy/toilets on the Ground Floor.

The proposed construction's R-Value is assumed as follows:

Roof construction description	Item	Item description	R-Value Unventilated Down
Horizontal ceiling on roof with 5° to 15° pitch – Metal cladding with timber framing	1.	Outdoor air film (3-7 m/s)	0.03
	2.	Metal cladding	0.00
	3.	Roof airspace (non-reflective)	0.28
	4.	Plasterboard, gypsum (10 mm, 880 kg/m ³)	0.06
	5.	Indoor air film (still air)	0.16
Total R-Value			0.53

As the Total R-Value required is R3.7 and the proposed roof system R-Value is R0.53, the **Minimum Ceiling Insulation** is required to be **≥ R3.17**.

Therefore, the **proposed ceiling insulation** of **R3.5** appears to comply with the requirements of this clause.

Metal Roof, Horizontal Ceiling – Required Insulation:

The subject proposed roof and ceiling construction is a metal clad roof with timber framing and horizontal ceiling, located above the staff room, office, kitchen, laundry room and associated bathrooms on the Ground Floor.

The proposed construction's R-Value is assumed as follows:

Roof construction description	Item	Item description	R-Value Unventilated Down
Horizontal ceiling on roof with 15° to 45° pitch – Metal cladding with timber framing	1.	Outdoor air film (3-7 m/s)	0.04
	2.	Metal cladding	0.00
	3.	Roof airspace (non-reflective)	0.28
	4.	Plasterboard, gypsum (10 mm, 880 kg/m ³)	0.06
	5.	Indoor air film (still air)	0.16
Total R-Value			0.54

As the Total R-Value required is R3.7 and the proposed roof system R-Value is R0.54, the **Minimum Ceiling Insulation** is required to be **≥ R3.16**.

Therefore, the **proposed ceiling insulation** of **R3.5** appears to comply with the requirements of this clause.

J4D4 Roof and Ceiling Construction

Metal Roof, Cathedral Ceiling – Required Insulation:

The subject proposed roof and ceiling construction is a metal clad roof with timber framing and cathedral ceiling, located above the reception area, corridor and pram storage area on the Ground Floor.

The proposed construction's R-Value is assumed as follows:

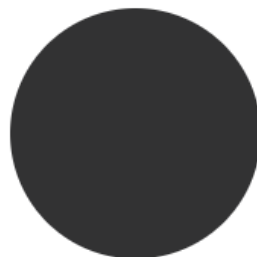
Roof construction description	Item	Item description	R-Value Unventilated Down
Cathedral ceiling parallel to roof with 5° to 15° pitch — Metal cladding with timber framing	1.	Outdoor air film (3-7 m/s)	0.03
	2.	Metal cladding	0.00
	3.	Roof airspace (non-reflective)	0.21
	4.	Plasterboard, gypsum (10 mm, 880 kg/m ³)	0.06
	5.	Indoor air film (still air)	0.15
Total R-Value			0.45

As the Total R-Value required is R3.7 and the proposed roof system R-Value is R0.45, the **Minimum Ceiling Insulation** is required to be **≥ R3.25**.

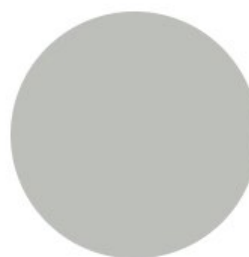
Therefore, the **proposed ceiling insulation of R3.5 appears to comply** with the requirements of this clause.

Metal Roofing Systems – Solar Absorbance:

The metal roof systems appear to be comparable to 'Monument' by Colorbond, as illustrated below:



Monument®
SA 0.73 | SRI 27



Shale Grey™
SA 0.44 | SRI 66

As the proposed colour has a **Solar Absorbance of 0.73**, **the proposed colour of the roof system appears not to comply with requirements of J4D4(2).**

A colour such as 'Shale Grey' is suggested to ensure an SA value of 0.45 or less.

Compliance can be achieved by a slight redesign prior to issue of the Construction Certificate.

J4D5 Roof Lights

- N / A
- Roof lights must have—
- (1) a total area of not more than 5% of the floor area of the room or space served; and
 - (2) transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of—
 - (a) for Total system SHGC, in accordance with Table J4D5; and
 - (b) for Total system U-Value, not more than U3.9.

Table J4D5 Roof lights – Total system SHGC

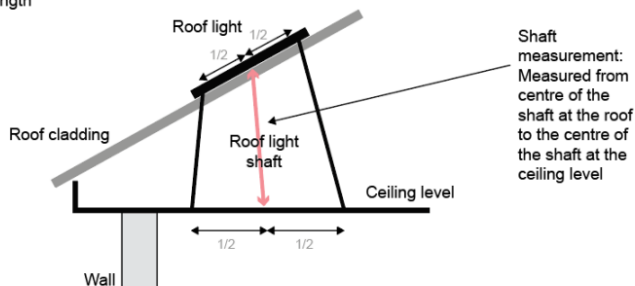
Roof light shaft index	Total area of roof lights $\leq 3.5\%$ of the floor area of the room or space	Total area of roof lights $> 3.5\%$ and $\leq 5\%$ of the floor area of the room or space
< 1.0	≤ 0.45	≤ 0.29
≥ 1.0 to < 2.5	≤ 0.51	≤ 0.33
≥ 2.5	≤ 0.76	≤ 0.49

Notes to Table J4D5:

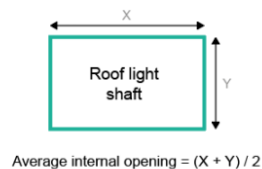
1. The roof light shaft index is determined by measuring the distance from the centre of the shaft at the roof to the centre of the shaft at the ceiling level and dividing it by the average internal dimension of the shaft opening at the ceiling level (or the diameter for a circular shaft) in the same units of measurement.
2. The area of a roof light is the area of the roof opening that allows light to enter the building. The total area of roof lights is the combined area for all roof lights serving the room or space.

**Determining roof light shaft index –
Figure 4.5 of Housing Energy Efficiency Handbook 2022**

STEP ONE:
Measure shaft length
(Section view)



STEP TWO:
Measure average internal shaft opening at ceiling level
(Plan view)



STEP THREE:
Divide the centre shaft length (step one) by the average internal shaft opening (step two)

No roof lights appear to be proposed in this design.

NSW J4D6 Walls and Glazing

- CRA**
- (1) The Total System U-Value of wall-glazing construction, including wall-glazing construction which wholly or partly forms the envelope internally, must not be greater than—
 - (a) for a Class 2 common area, a Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area, U2.0; and
 - (b) for a Class 3 or 9c building or a Class 9a ward area—
 - (i) in climate zones 1, 3, 4, 6 or 7, U1.1; or
 - (ii) in climate zones 2 or 5, U2.0; or
 - (iii) in climate zone 8, U0.9.
 - (2) The Total System U-Value of display glazing must not be greater than U5.8.
 - (3) The Total System U-Value of wall-glazing construction must be calculated in accordance with Specification 37.
 - (4) Wall components of a wall-glazing construction must achieve a minimum Total R-Value of—
 - (i) where the wall is less than 80% of the area of the wall-glazing construction, R1.0; or
 - (ii) where the wall is 80% or more of the area of the wall-glazing construction, the value specified in Table J4D6a.

Table J4D6a Minimum wall Total R-Value - Wall area 80% or more of wall-glazing construction area

Climate Zone	Class 2 common area, Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area	Class 3 or 9c building or Class 9a ward area
1	2.4	3.3
2	1.4	1.4
3	1.4	3.3
4	1.4	2.8
5	1.4	1.4
6	1.4	2.8
7	1.4	2.8
8	1.4	3.8

- (5) The solar admittance of externally facing wall-glazing construction must not be greater than—
 - (a) for a Class 2 common area, a Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area, the values specified in Table J4D6b; and
 - (b) for a Class 3 or 9c building or a Class 9a ward area, the values specified in Table JD46c.
- (6) The solar admittance of a wall-glazing construction must be calculated in accordance with Specification 37.
- (7) The Total system SHGC of display glazing must not be greater than 0.81 divided by the applicable shading factor specified in S37C7.

Table J4D6b Maximum wall-glazing construction solar admittance - Class 2 common area, Class 5, 6, 7, 8 or 9b building or Class 9a building other than a ward area

Climate Zone	Eastern aspect solar admittance	Northern aspect solar admittance	Southern aspect solar admittance	Western aspect solar admittance
1	0.12	0.12	0.12	0.12
2	0.13	0.13	0.13	0.13
3	0.16	0.16	0.16	0.16
4	0.13	0.13	0.13	0.13
5	0.13	0.13	0.13	0.13
6	0.13	0.13	0.13	0.13
7	0.13	0.13	0.13	0.13
8	0.2	0.2	0.43	0.36

NSW J4D6 Walls and Glazing

Table J4D6c Maximum wall-glazing construction solar admittance – Class 3 or 9c building or Class 9a ward area

Climate Zone	Eastern aspect solar admittance	Northern aspect solar admittance	Southern aspect solar admittance	Western aspect solar admittance
1	0.07	0.07	0.10	0.07
2	0.10	0.10	0.10	0.10
3	0.07	0.07	0.07	0.07
4	0.07	0.07	0.07	0.07
5	0.10	0.10	0.10	0.10
6	0.07	0.07	0.07	0.07
7	0.07	0.07	0.08	0.07
8	0.08	0.08	0.08	0.08

The following Volume One Façade Calculator is for NCC 2019 Amendment 1, however at the time of this assessment, the ABCB have yet to release a specific NCC 2022 Volume One Façade Calculator for commercial developments (Class 3 & 5-9 buildings).

As there are no clause wording or calculation changes between NCC 2019 Amendment 1's Clause J1.5, and NCC 2022's Clause J4D6, the calculator's results are still deemed valid for NCC 2022.

NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) –
General Information



Façade

General Information

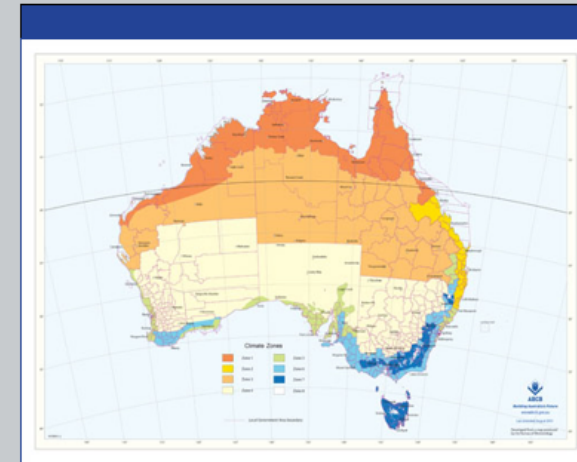


User Input User Dropdown

Calculator

General Information

Name	<input type="text" value="Joseph Bond"/>
Position	<input type="text" value="Senior ESD Consultant"/>
Company	<input type="text" value="BCA Innovations"/>
Building Name / Address	<input type="text" value="69-73 George Street"/> <input type="text" value="Marulan NSW 2579"/>
Building State	<input type="text" value="NSW"/>
Building Classification	<input type="text" value="Class 9b - early childhood centres"/>
Climate Zone	<input type="text" value="Climate Zone 7 - Cool temperate"/>
Storeys Above Ground	<input type="text" value="1"/>



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NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) – Glazing Systems



Façade

Glazing Systems



User Input

Active Row - All Inputs Required

User Dropdown

Calculator

Glazing Systems

	Glazing Reference	System Type	Glass Type	Frame Type	Glass U-Value (W/m ² .K)	Glass SHGC	Total System U-Value (W/m ² .K)	Total System SHGC
1	FW	Fixed	Single glazing	Aluminium	5.60	0.56	5.70	0.78
2	SW	Sliding Door	Single glazing	Aluminium	5.60	0.56	5.30	0.56
3	AW	Awning	Single glazing	Aluminium	5.60	0.56	5.78	0.40
4	DHW	Sliding Door	Single glazing	Aluminium	5.60	0.56	5.00	0.50
5	FRGB	Fixed	Double Glazed Unit - single low-E coating	Aluminium	1.80	0.40	3.10	0.60
6	HD	Casement	Single glazing	Aluminium	5.60	0.56	5.70	0.53
7	SD	Sliding Door	Single glazing	Aluminium	5.60	0.56	5.70	0.58
8	AW - Low E	Awning	Single Glazing - low-E coating	Aluminium	3.60	0.53	5.50	0.33
9	FW - Low E	Fixed	Single Glazing - low-E coating	Aluminium	3.60	0.53	4.50	0.53
10	SW - Low E	Sliding Door	Single Glazing - low-E coating	Aluminium	3.60	0.53	4.40	0.51
11	HD - Low E	Casement	Single Glazing - low-E coating	Aluminium	3.60	0.53	4.60	0.52
12	SD - Low E	Sliding Door	Single Glazing - low-E coating	Aluminium	3.60	0.53	4.40	0.51
13	AW - DG Low E	Awning	Double Glazed Unit - single low-E coating	Aluminium	1.80	0.40	3.60	0.48
14	FW - DG Low E	Fixed	Double Glazed Unit - single low-E coating	Aluminium	1.80	0.40	2.50	0.25
15	HD - DG Low E	Casement	Double Glazed Unit - single low-E coating	Aluminium	1.80	0.40	2.90	0.37
16	SD/SW - DG Low E	Sliding Door	Double Glazed Unit - single low-E coating	Aluminium	1.80	0.40	3.80	0.39

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NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) –
Wall Systems



Façade
Wall Systems



Calculator

Wall Systems

	Wall Reference	Wall Type	Spandrel Methodology	Wall Construction	Wall Thickness (mm)	Total System R-Value (m ² .K/W)	Solar Absorptance
1	Brick GlassWool	Wall		Masonry (90mm glass wool + timber studs)	250	2.39	0.75
2	Concrete	Wall		Solid Concrete 230mm (90mm glass wool + steel studs)	230	1.76	0.75
3	Metal LW	Wall		Metal Clad (90mm glass wool + steel studs & thermal break)	140	1.42	0.75
4	Fibre cement	Wall		Timber wall (90mm glass wool + timber studs)	110	2.32	0.75
5	Spandrel	Spandrel	NCC Specification J1.5b - Method 1	DEFAULTS (GENERIC)	250	0.00	0.75
6	Brick GlassWool	Wall		Masonry (90mm glass wool + timber studs)	250	2.39	0.75



**NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) –
Shading Systems**



Façade

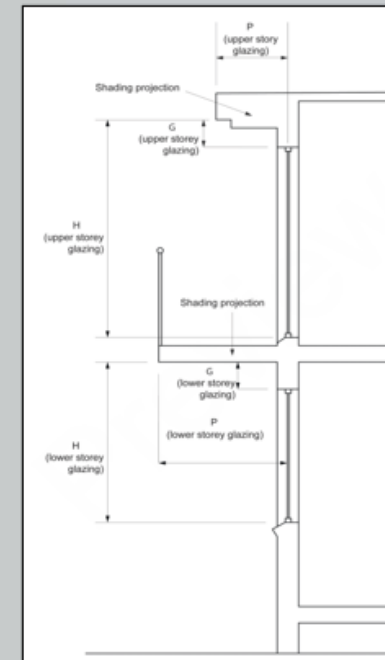
Shading Systems



Calculator

Shading Systems

	Shading Reference	Shading Type	P (m)	G (m)	H (m)
1	Device	Device			
2	0.55_0.6_2.29	Horizontal	0.55	0.6	2.29
3	0.75_0.6_2.29	Horizontal	0.75	0.6	2.29
4	0.75_1_1.69	Horizontal	0.75	1	1.69
5	3.15_0.6_2.4	Horizontal	3.15	0.6	2.4
6	3.15_0.6_2.7	Horizontal	3.15	0.6	2.7
7	3.15_0.6_1.63	Horizontal	3.15	0.6	1.63
8	0.6_0.6_2.4	Horizontal	0.6	0.6	2.4
9	2.75_0.6_2.7	Horizontal	2.75	0.6	2.7
10					
11					
12					
13					
14					
15					
16					



NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) – Wall Glazing Areas + Results



Façade

Wall Glazing Areas + Results



User Input

Active Row - All Inputs Required

User Dropdown

Calculator

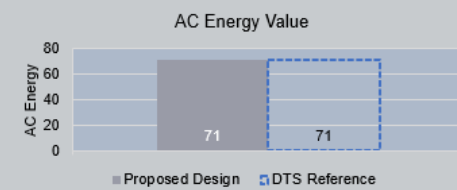
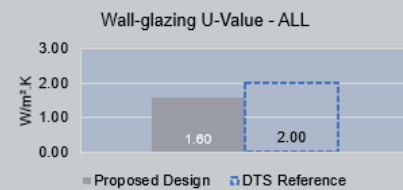
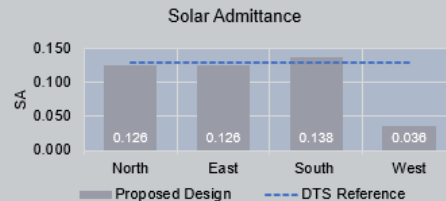
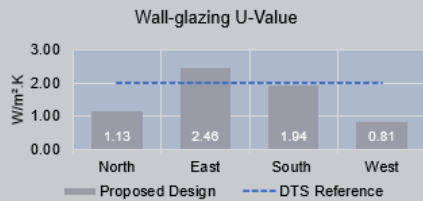
Results

Class 9b - early childhood centres

Climate Zone 7 - Cool temperate

Method 1

Method 2



Wall Glazing Area

Compliant Solution =
Non-Compliant Solution =

North	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	FRGB			9.11	0.55_0.6_2.29	Concrete	31.66	40.77	<input type="checkbox"/>
2	FRGB			9.11	0.75_0.6_2.29	Concrete	31.66	40.77	<input type="checkbox"/>
3	FRGB	0.69	1.29	0.8901	0.75_1_1.69	Concrete	66.02	66.91	<input type="checkbox"/>
4									<input type="checkbox"/>
5									<input type="checkbox"/>
6									<input type="checkbox"/>
		Result		Target					
		Wall-glazing U-Value (W/m².K)		2.00		27.33		Average Glazing U-Value (W/m².K)	
		Solar Admittance		0.130		94.98		Average Glazing SHGC	
				Glazing to Façade Ratio		22%		Average Wall R-Value (m².K/W)	
								3.10	
								0.60	
								1.76	

**NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) –
Wall Glazing Areas + Results**

Wall Glazing Area										
East	Glazing Reference	Height (m)	Width (m)	Glazing Area (m ²)	Shading Reference	Wall Reference	Wall Area (m ²)	Total Area (m ²)	Internal	
1	FW - Low E	1.8	0.61	1.098	3.15_0.6_2.4	Concrete	1.89	2.99	<input type="checkbox"/>	
2	FW - Low E	1.8	0.61	1.098	3.15_0.6_2.4	Concrete	1.89	2.99	<input type="checkbox"/>	
3	SD/SW - DG Low E	2.1	2.684	5.6364	3.15_0.6_2.4	Concrete	9.71	15.35	<input type="checkbox"/>	
4	FW - Low E	1.03	0.61	0.6283	3.15_0.6_1.63	Concrete	1.08	1.71	<input type="checkbox"/>	
5	HD - DG Low E	2.1	1	2.1	3.15_0.6_2.7	Concrete	3.62	5.72	<input type="checkbox"/>	
6	FW - Low E	1.8	0.61	1.098	3.15_0.6_2.4	Concrete	1.89	2.99	<input type="checkbox"/>	
7	SD/SW - DG Low E	2.1	2.684	5.6364	3.15_0.6_2.7	Concrete	9.71	15.35	<input type="checkbox"/>	
8									<input type="checkbox"/>	
9									<input type="checkbox"/>	
10									<input type="checkbox"/>	
11									<input type="checkbox"/>	
12									<input type="checkbox"/>	
13									<input type="checkbox"/>	
14									<input type="checkbox"/>	
15									<input type="checkbox"/>	
16									<input type="checkbox"/>	
				Result	Target					
Wall-glazing U-Value (W/m ² .K)				2.46	2.00	Glazing Area (m ²)		17.7648	Average Glazing U-Value (W/m ² .K)	3.87
Solar Admittance				0.126	0.130	Wall Area (m ²)		13.23	Average Glazing SHGC	0.42
						Glazing to Façade Ratio		57%	Average Wall R-Value (m ² .K/W)	1.76

NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) – Wall Glazing Areas + Results

Wall Glazing Area									
South	Glazing Reference	Height (m)	Width (m)	Glazing Area (m ²)	Shading Reference	Wall Reference	Wall Area (m ²)	Total Area (m ²)	Internal
1	FW - Low E			5.49	0.6_0.6_2.4	Concrete	9.7	15.19	<input type="checkbox"/>
2	FW - Low E			3.29		Concrete	5.82	9.11	<input type="checkbox"/>
3	HD - Low E	2.1	1.66	3.486	2.75_0.6_2.7	Concrete	6.16	9.65	<input type="checkbox"/>
4	FW - Low E	1.8	1.57	2.826	3.15_0.6_2.4	Concrete	5	7.83	<input type="checkbox"/>
5	SD - Low E	2.1	2.684	5.6364	3.15_0.6_2.7	Concrete	9.96	15.60	<input type="checkbox"/>
6	FW - Low E	1.8	2.17	3.906	3.15_0.6_2.4	Concrete	6.9	10.81	<input type="checkbox"/>
7	FW - Low E	1.8	2.17	3.906	3.15_0.6_2.4	Concrete	6.9	10.81	<input type="checkbox"/>
8	FW - Low E	1.8	2.17	3.906	3.15_0.6_2.4	Concrete	6.9	10.81	<input type="checkbox"/>
9	SD - Low E	2.1	2.684	5.6364	3.15_0.6_2.7	Concrete	9.96	15.60	<input type="checkbox"/>
10	HD - Low E	2.1	1	2.1	3.15_0.6_2.7	Concrete	3.71	5.81	<input type="checkbox"/>
11	SD - Low E	2.1	2.684	5.6364	3.15_0.6_2.7	Concrete	9.96	15.60	<input type="checkbox"/>
12	FW - Low E	1.8	2.17	3.906	3.15_0.6_2.4	Concrete	6.9	10.81	<input type="checkbox"/>
13	FW - Low E	1.8	2.17	3.906	3.15_0.6_2.4	Concrete	6.9	10.81	<input type="checkbox"/>
14									<input type="checkbox"/>
15									<input type="checkbox"/>
16									<input type="checkbox"/>

	Result	Target							
Wall-glazing U-Value (W/m ² .K)	1.94	2.00	Glazing Area (m ²)	67.8012	Average Glazing U-Value (W/m ² .K)	4.49			
Solar Admittance	0.138	0.130	Wall Area (m ²)	126.1	Average Glazing SHGC	0.52			
			Glazing to Façade Ratio	35%	Average Wall R-Value (m ² .K/W)	1.76			

Wall Glazing Area									
West	Glazing Reference	Height (m)	Width (m)	Glazing Area (m ²)	Shading Reference	Wall Reference	Wall Area (m ²)	Total Area (m ²)	Internal
1	FW	1.8	0.61	1.098		Concrete	22.43	23.53	<input type="checkbox"/>
2	FW	1.8	0.61	1.098		Concrete	22.43	23.53	<input type="checkbox"/>
3									<input type="checkbox"/>
4									<input type="checkbox"/>
5									<input type="checkbox"/>
6									<input type="checkbox"/>

	Result	Target							
Wall-glazing U-Value (W/m ² .K)	0.81	2.00	Glazing Area (m ²)	2.196	Average Glazing U-Value (W/m ² .K)	5.70			
Solar Admittance	0.036	0.130	Wall Area (m ²)	44.86	Average Glazing SHGC	0.78			
			Glazing to Façade Ratio	5%	Average Wall R-Value (m ² .K/W)	1.76			

NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) – Report



Façade Report



Calculator

Project Summary

Date
21/12/2023

Name
Joseph Bond

Company
BCA Innovations

Position
Senior ESD Consultant

Building Name / Address
69-73 George Street
Marulan NSW 2579

Building State
NSW

Climate Zone
Climate Zone 7 - Cool temperate

Building Classification
Class 9b - early childhood centres

Storeys Above Ground
1

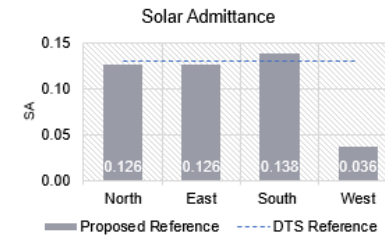
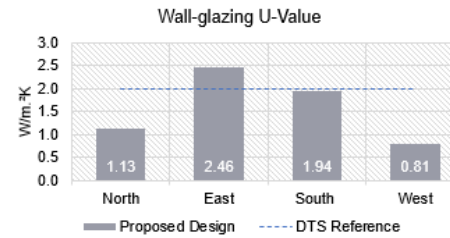
Tool Version
1.2 (June 2020)

The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

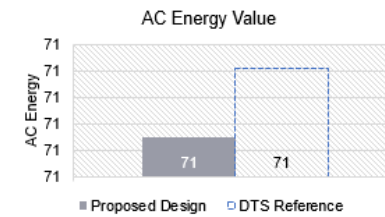
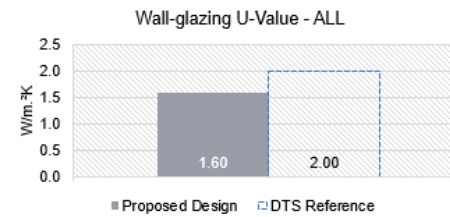
Compliant Solution =
Non-Compliant Solution =

	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	1.13	2.46	1.94	0.81	1.60
Solar Admittance	0.13	0.13	0.14	0.04	
AC Energy Value					71

Method 1



Method 2



NCC 2019 J1.5 Façade Calculator (Valid for NCC 2022 Clause J4D6) – Report

Project Details

	North	East	South	West
Glazing Area (m ²)	27.33	17.7648	67.8012	2.196
Glazing to Façade Ratio	22%	57%	35%	5%
Glazing References	FRGB	FW - Low E SD/SW - DG Low E HD - DG Low E	FW - Low E HD - Low E SD - Low E	FW
Glazing System Types	Fixed	Fixed Sliding Door Casement	Fixed Casement Sliding Door	Fixed
Glass Types	Double Glazed Unit - single low-E coating	Single Glazing - low-E coating Double Glazed Unit - single low-E coating	Single Glazing - low-E coating	Single glazing
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m ² .K)	3.10	3.87	4.49	5.70
Average Glazing SHGC	0.60	0.42	0.52	0.76
Shading Systems	Device Horizontal	Device Horizontal	Device Horizontal	Device Horizontal
Wall Area (m ²)	94.98	13.23	126.1	44.86
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Solid Concrete 230mm (90mm glass wool + steel studs)	Solid Concrete 230mm (90mm glass wool + steel studs)	Solid Concrete 230mm (90mm glass wool + steel studs)	Solid Concrete 230mm (90mm glass wool + steel studs)
Wall Thickness	230	230	230	230
Average Wall R-value (m ² .K/W)	1.76	1.76	1.76	1.76
Solar Absorptance	0.75	0.75	0.75	0.75

J4D7 Floors

Complies

- (1) A floor must achieve the Total R-Value specified in Table J4D7.
- (2) For the purposes of (1), a slab-on-ground that does not have an in-slab heating or cooling system is considered to achieve a Total R-Value of R2.0, except-
 - (a) in climate zone 8; or
 - (b) a Class 3, Class 9a ward area or Class 9b building in climate zone 7 that has a floor area to floor perimeter ratio of less than or equal to 2.
- (3) A floor must be insulated around the vertical edge of its perimeter with insulation having an R-Value greater than or equal to 1.0 when the floor—
 - (a) is a concrete slab-on-ground in climate zone 8; or
 - (b) has an in-slab or in-screed heating or cooling system, except where used solely in a bathroom, amenity area or the like.
- (4) Insulation required by (3) for a concrete slab-on-ground must—
 - (a) be water resistant; and
 - (b) be continuous from the adjacent finished ground level—
 - (i) to a depth not less than 300 mm; or
 - (ii) for the full depth of the vertical edge of the concrete slab-on-ground.

Table J4D7 Floors – Minimum Total R-Value

Location	Climate zone 1 – upwards heat flow	Climate zones 2 and 3 – upwards and downwards heat flow	Climate zones 4, 5, 6 and 7 – downwards heat flow	Climate zone 8 – downwards heat flow
A floor without an in-slab heating or cooling system	2.0	2.0	2.0	3.5
A floor with an in-slab heating or cooling system	3.25	3.25	3.25	4.75

Non-SOU Floor Systems:

A floor without an in-slab heating or cooling system must have Total System R-value of not less than R2.0.

According to J4D7(2) the slab-on-ground is considered to achieve a Total R-value of R2.0, and therefore requires not additional insulation.

Part J5 – Building Sealing

NSW J5D2 Application of Part

Noted	<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 Part F6 provides sufficient pressurisation to prevent infiltration; or (d) parts of buildings that cannot be fully enclosed.
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J5D3 Chimneys and flues

N / A	<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> <p>No open solid-fuel burning appliance proposed.</p>
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J5D4 Roof lights

N / A	<ul style="list-style-type: none"> (1) A roof light must be sealed, or capable of being sealed, when serving— <ul style="list-style-type: none"> (a) a conditioned space; or (b) a habitable room in climate zones 4, 5, 6, 7 or 8. (2) A roof light required by (1) to be sealed, or capable of being sealed, must be constructed with— <ul style="list-style-type: none"> (a) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or (b) a weatherproof seal; or (c) a shutter system readily operated either manually, mechanically or electronically by the occupant. <p>No roof lights proposed.</p>
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NSW J5D5 Windows and doors

CRA	<p>(1) A door, openable window or the like must be sealed—</p> <ul style="list-style-type: none"> (a) when forming part of the envelope; or (b) in climate zones 4, 5, 6, 7 or 8. <p>(2) The requirements of (1) do not apply to—</p> <ul style="list-style-type: none"> (a) a window complying with AS 2047; or (b) a fire door or smoke door; or (c) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security. <p>(3) A seal to restrict air infiltration—</p> <ul style="list-style-type: none"> (a) for the bottom edge of a door, must be a draft protection device; and (b) for the other edges of a 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. <p>(4) An entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, rapid roller door, revolving door or the like, other than—</p> <ul style="list-style-type: none"> (a) where the conditioned space has a floor area of not more than 50 m²; or (b) where a café, restaurant, open front shop or the like has— <ul style="list-style-type: none"> (i) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and (ii) at all other entrances to the café, restaurant, open front shop or the like, self-closing doors. <p>(5) A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like.</p> <p><i>Note: NSW J5D5(5) does not apply to a Class 2 building or a Class 4 part of a building.</i></p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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J5D6 Exhaust fans

CRA	<p>(a) An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like 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 or 8. <p>All exhaust fans within a conditioned space must be fitted with a sealing device.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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J5D7 Construction of roofs, walls and floors

CRA	<p>(1) 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 (2)—</p> <ul style="list-style-type: none"> (i) when forming part of the envelope; or (ii) in climate zones 4, 5, 6, 7 or 8. <p>(2) Construction required by (1) must be—</p> <ul style="list-style-type: none"> (i) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or (ii) sealed at junctions and penetrations with— <ul style="list-style-type: none"> (A) close fitting architrave, skirting or cornice; or (B) expanding foam, rubber compressible strip, caulking or the like. <p>(3) The requirements of (1) do not apply to openings, grilles or the like required for smoke hazard management.</p> <p>Unless exempted by Clause J5D7(3), ceilings, walls, floors and openings in the development are required to be either enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions, or to be sealed at junctions and penetrations with a close fitting architrave, skirting or cornice, or expanding foam, rubber compressible strip, caulking or the like.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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J5D8 Evaporative coolers

N / A

An evaporative cooler must be fitted with a self-closing damper or the like—
(a) when serving a heated space; or
(b) in climate zones 4, 5, 6, 7 or 8.

No evaporative cooler proposed.

Part J6 – Air-Conditioning and Ventilation Systems

NSW J6D2 Application of Part

Noted	(1) The Deemed-to-Satisfy Provisions of this Part do not apply to a Class 8 electricity network substation. (2) J6D10 does not apply to a Class 2 building or a Class 4 part of a building.
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J6D3 Air-conditioning system control

CRA	An air-conditioning system is to be designed, installed and commissioned by suitably-qualified person(s) in accordance with the requirements of Clause J6D3. Design verification to be provided prior to the issue of the Construction Certificate.
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J6D4 Mechanical ventilation system control

CRA	A mechanical ventilation system is to be designed, installed and commissioned by suitably-qualified person(s) in accordance with the requirements of Clause J6D4. Design verification to be provided prior to the issue of the Construction Certificate.
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J6D5 Fan systems

CRA	Fans, ductwork and duct components that form part of an air-conditioning system or mechanical ventilation system are to be included in an appropriate design by suitably-qualified person(s) and must comply with the requirements of Clause J6D5. Design verification to be provided prior to the issue of the Construction Certificate.
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J6D6 Ductwork insulation

CRA	Ductwork and fittings in an air-conditioning system must be provided with insulation in accordance with the requirements of Clause J6D6. Design verification to be provided prior to the issue of the Construction Certificate.
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J6D7 Ductwork sealing

CRA	Ductwork in an air-conditioning system with a capacity of 3000 L/s or greater, not located within the only or last room served by the system, must be sealed against air loss in accordance with the duct sealing requirements of AS 4254.1 and AS 4254.2 for the static pressure in the system. Design verification to be provided prior to the issue of the Construction Certificate.
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J6D8 Pump systems

CRA	Pumps and pipework that form part of an air-conditioning system are to be included in an appropriate design by suitably-qualified person(s) and must comply with the requirements of Clause J6D8. Design verification to be provided prior to the issue of the Construction Certificate.
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J6D9 Pipework insulation

- CRA** Piping, vessels, heat exchangers and tanks containing heating or cooling fluid, where the fluid is held at a heated or cooled temperature, that are part of an air-conditioning system, other than in appliances covered by MEPS, must be provided with insulation in accordance with the requirements of Clause J6D9.
- Design verification to be provided prior to the issue of the Construction Certificate.

NSW J6D10 Space heating

- CRA**
- (1) A heater used for air-conditioning or as part of an air-conditioning system must be—
 - (a) a solar heater; or
 - (b) a gas heater; or
 - (c) a heat pump heater; or
 - (d) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or
 - (e) an electric heater if—
 - (i) the heating capacity is not more than—
 - (A) 10 W/m² of the floor area of the conditioned space in climate zone 1; or
 - (B) 40 W/m² of the floor area of the conditioned space in climate zone 2; or
 - (C) the value specified in Table J6D10 where reticulated gas is not available at the allotment boundary; or
 - (ii) the annual energy consumption for heating is not more than 15 kWh/m² of the floor area of the conditioned space in climate zones 1, 2, 3, 4 and 5; or
 - (iii) the in-duct heater complies with J6D3(a)(ii)(C); or
 - (f) any combination of (a) to (e).
 - (2) An electric heater may be used for heating a bathroom in a Class 3, 9a or 9c building if the heating capacity is not more than 1.2 kW and the heater has a timer.
 - (3) A fixed heating or cooling appliance that moderates the temperature of an outdoor space must be configured to automatically shut down when—
 - (a) there are no occupants in the space served; or
 - (b) a period of one hour has elapsed since the last activation of the heater; or
 - (c) the space served has reached the design temperature.
 - (4) A gas water heater, that is used as part of an air-conditioning system, must—
 - (i) if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86%; or
 - (ii) if rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%.

Table J6D10 Maximum electric heating capacity

Floor area of the conditioned space	W/m ² of floor area in climate zone 3	W/m ² of floor area in climate zone 4	W/m ² of floor area in climate zone 5	W/m ² of floor area in climate zone 6	W/m ² of floor area in climate zone 7
≤ 500 m ²	50	60	55	65	70
> 500 m ²	40	50	45	55	60

Design verification to be provided prior to the issue of the Construction Certificate.

J6D11 Refrigerant chillers

- CRA** An air-conditioning system refrigerant chiller must comply with MEPS and the full load operation energy efficiency ratio and integrated part load energy efficiency ratio in Table J6D11a or Table J6D11b when determined in accordance with AHRI 551/591.
- Design verification to be provided prior to the issue of the Construction Certificate.

J6D12 Unitary air-conditioning equipment

CRA	<p>Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS and for a capacity greater than or equal to 65 kW—</p> <p>(a) where water cooled, have a minimum energy efficiency ratio of $4.0 W_r / W_{input\ power}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power; or</p> <p>(b) where air cooled, have a minimum energy efficiency ratio of $2.9 W_r / W_{input\ power}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power.</p> <p>Minimum Energy Performance Standards (MEPS) means the Minimum Energy Performance Standards for equipment and appliances established through the Greenhouse and Energy Minimum Standards Act 2012. Visit www.energyrating.gov.au/products/air-conditioners for more information.</p> <p>If installing unitary air-conditioning equipment, the unit(s) must comply with MEPS and either have a capacity of less than 65kw of refrigeration or have the appropriate minimum energy efficiency ratio in accordance with Clause J6D12.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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J6D13 Heat rejection equipment

CRA	<p>Fans in a cooling tower, closed circuit cooler, evaporative condenser or air-cooled condenser must not exceed the allowances set in Clause J6D13.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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Part J7 – Artificial Lighting and Power

NSW J7D2 Application of Part

Noted	(1) The Deemed-to-Satisfy Provisions of this Part do not apply to a Class 2 building or a Class 4 part of a building. (2) J7D3, J7D4 and J7D6(1)(b) do not apply to a Class 8 electricity network substation.
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NSW J7D3 Artificial lighting

CRA	<p>(1) This subclause does not apply in NSW.</p> <p>(2) In a Class 3 or Class 5 to 9 building</p> <p>(a) 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 J7D3a; and</p> <p>(b) the aggregate design illumination power load in (i) is the sum of the design illumination power loads in each of the spaces served; and</p> <p>(c) where there are multiple lighting systems serving the same space, the design illumination power load for (ii) is—</p> <p>(i) the total illumination power load of all systems; or</p> <p>(ii) where a control system permits only one system to operate at a time based on the highest illumination power load; or determined by the formula—</p> $[H \times T/2 + P \times (100 - T/2)] / 100$ <p>Where:</p> <p>H = the highest illumination power load; and</p> <p>T = the time for which the maximum illumination power load will occur, expressed as a percentage; and</p> <p>P = the predominant illumination power load.</p> <p>(3) The requirements of (1) and (2) do not apply to the following:</p> <p>(i) Emergency lighting provided in accordance with Part E4.</p> <p>(ii) Signage, display lighting within cabinets and display cases that are fixed in place.</p> <p>(iii) Lighting for accommodation within the residential part of a detention centre.</p> <p>(iv) A heater where the heater also emits light, such as in bathrooms.</p> <p>(v) Lighting of a specialist process nature such as in a surgical operating theatre, fume cupboard or clean workstation.</p> <p>(vi) Lighting of performances such as theatrical or sporting.</p> <p>(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.</p> <p>(viii) Lighting installed solely to provide photosynthetically active radiation for indoor plant growth on green walls and the like.</p> <p>(d) For the purposes of Table J7D3b, the following control devices must comply with Specification 40:</p> <p>(i) Lighting timers.</p> <p>(ii) Motion detectors.</p> <p>(iii) Daylight sensors and dynamic lighting control devices.</p>
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NSW J7D3 – Artificial Lighting Assessment

Interior Lighting Calculator Overview:

An artificial lighting assessment has been completed for this development for any Class 3 and 5-9 portions, first with markups on architectural plans to indicate intended uses of appropriate areas and secondly providing this information to the ABCB NCC 2022 Volume 1 Artificial Lighting Calculator.

Artificial Lighting Assessment Mark-ups

The plan mark-ups that follow provide a guide for the areas assessed in artificial lighting assessment.

Class 3 and 5-9 Buildings Assessment

A level-by-level assessment of all areas has been conducted with the following assumptions:

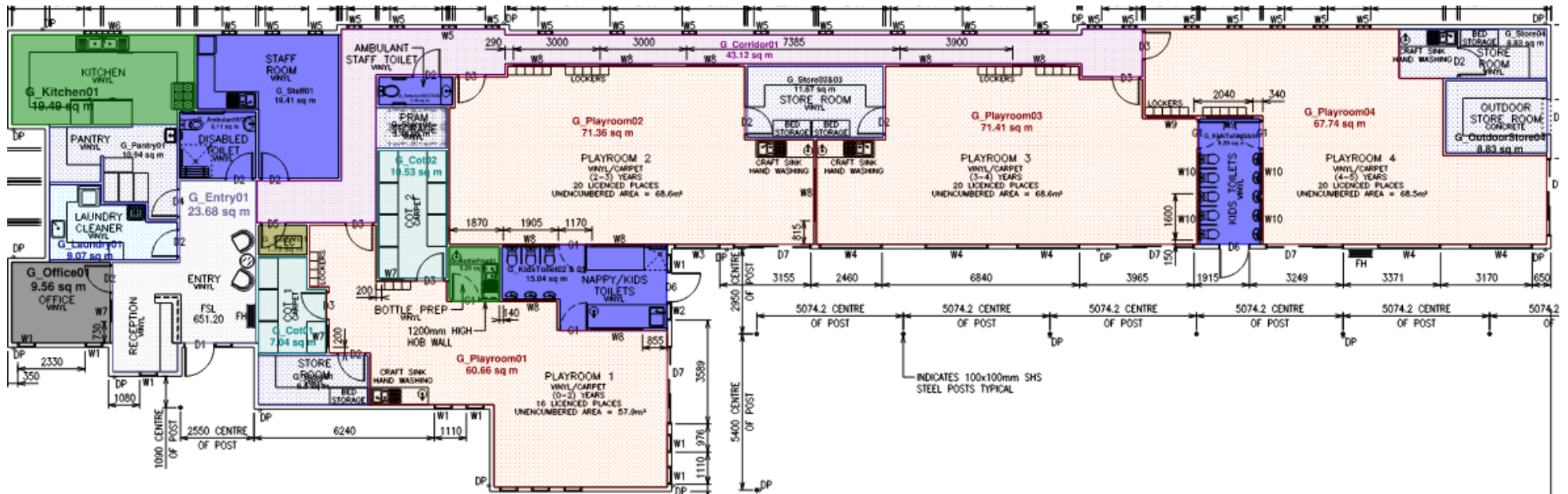
- As no design loads have been provided, full use of available System Illumination Power Load Allowance has been assumed for each area.

NSW J7D3 Artificial Lighting Assessment –
Marked up Plans

Artificial Lighting Assessment – Marked-up Plans


Below are the area mark-ups and labels used to create the artificial lighting assessment for Clause J7D3 compliance:

Ground Floor Labels:





NSW J7D3 Artificial Lighting Assessment – Class 3 & 5-9 Assessment

An assessment of the relevant areas of the development has been conducted using the areas detailed in the plan mark-ups earlier in this section, with the following results:



Non-residential Lighting




 **Calculator**

Building name/description	Classification
60-73 George Street, Marulan NSW 2576	Class 6b
Number of rows preferred in table below	24 (as currently displayed)

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design illumination power load	Space	Illuminance		Adjustment factor 1			Adjustment factor 2			Light colour adjustment factors		SATISFIES PART J7D3		
							Designed lux level	Recommended lux level	Adjustment factor 1	Dimming % area	Illuminance turndown	Adjustment factor 2	Dimming % area	Illuminance turndown	Light colour adjustment factor 1	Light colour adjustment factor 2	System illumination power load allowance	Lighting system share of % of aggregate allowance used	
1	G_AccessWC01	6.1 m²	10 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like											30 W	4% of 1%	
2	G_Ambulance01	2.5 m²	7 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like											13 W	4% of 1%	
3	G_BottlePrep01	3.2 m²	7 m	2.1 m	1 W	Kitchen and food preparation area											23 W	4% of 1%	
4	G_Corridor01	43.2 m²	76 m	2.7 m	1 W	Corridors											379 W	4% of 1%	
5	G_Cor01	7.1 m²	11 m	2.4 m	1 W	Dormitory of a Class 3 building used for sleeping only											36 W	4% of 1%	
6	G_Cor02	10.5 m²	14 m	2.4 m	1 W	Dormitory of a Class 3 building used for sleeping only											52 W	4% of 1%	
7	G_Entry01	29.7 m²	23 m	2.7 m	1 W	Entry lobby from outside the building											338 W	4% of 1%	
8	G_KidsToile01 & 02	14.2 m²	17 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like											87 W	4% of 1%	
9	G_KidsToile03 & 04	9.2 m²	13 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like											48 W	4% of 1%	
10	G_Kitchen01	19.5 m²	19 m	2.1 m	1 W	Kitchen and food preparation area											118 W	4% of 1%	
11	G_Laundry01	9.1 m²	14 m	2.1 m	1 W	Service area, cleaner's room and the like											23 W	4% of 1%	
12	G_Office01	9.6 m²	12 m	2.7 m	1 W	Office - artificially lit to an ambient level											73 W	4% of 1%	
13	G_OutdoorStorage01	8.8 m²	12 m	2.1 m	1 W	Storage											21 W	4% of 1%	
14	G_Pantry01	11.0 m²	17 m	2.1 m	1 W	Storage											27 W	4% of 1%	
15	G_Playroom01	60.6 m²	43 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms											408 W	4% of 1%	
16	G_Playroom02	71.3 m²	38 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms											440 W	4% of 1%	
17	G_Playroom03	71.3 m²	39 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms											440 W	4% of 1%	
18	G_Playroom04	71.2 m²	44 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms											458 W	4% of 1%	
19	G_Playroom05	3.6 m²	8 m	2.1 m	1 W	Storage											3 W	4% of 1%	
20	G_Staff01	19.4 m²	20 m	2.4 m	1 W	Toilet, locker room, staff room, rest room and the like											91 W	4% of 1%	
21	G_Store01	6.5 m²	11 m	2.1 m	1 W	Storage											17 W	4% of 1%	
22	G_Store02 & 03	11.7 m²	14 m	2.1 m	1 W	Storage											27 W	4% of 1%	
23	G_Store04	5.2 m²	9 m	2.1 m	1 W	Storage											14 W	4% of 1%	
24	G_Staff01	1.7 m²	5 m	2.1 m	1 W	Plant room where an average of 100 lx vertical illuminance is required on a											13 W	4% of 1%	
Total							24 W									Total		3162 W	

if inputs are valid



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**NSW J7D3 Artificial Lighting Assessment –
Class 3 & 5-9 Assessment**

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design Illumination Power Load	Space
1	G_AccessWC01	6.1 m ²	10 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like
2	G_AmbulantWC01	2.5 m ²	7 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like
3	G_BottlePrep01	3.2 m ²	7 m	2.1 m	1 W	Kitchen and food preparation area
4	G_Corridor01	43.2 m ²	76 m	2.7 m	1 W	Corridors
5	G_Cot01	7.1 m ²	11 m	2.4 m	1 W	Dormitory of a Class 3 building used for sleeping only
6	G_Cot02	10.5 m ²	14 m	2.4 m	1 W	Dormitory of a Class 3 building used for sleeping only
7	G_Entry01	23.7 m ²	23 m	2.7 m	1 W	Entry lobby from outside the building
8	G_KidsToilet01 & 02	14.2 m ²	17 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like
9	G_KidsToilet03 & 04	9.2 m ²	13 m	2.1 m	1 W	Toilet, locker room, staff room, rest room and the like
10	G_Kitchen01	19.5 m ²	19 m	2.1 m	1 W	Kitchen and food preparation area
11	G_Laundry01	9.1 m ²	14 m	2.1 m	1 W	Service area, cleaner's room and the like
12	G_Office01	9.6 m ²	12 m	2.7 m	1 W	Office - artificially lit to an ambient level of 200 lx or more
13	G_OutdoorStore01	8.8 m ²	12 m	2.1 m	1 W	Storage
14	G_Pantry01	11.0 m ²	17 m	2.1 m	1 W	Storage
15	G_Playroom01	60.5 m ²	43 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms
16	G_Playroom02	71.3 m ²	38 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms

**NSW J7D3 Artificial Lighting Assessment –
Class 3 & 5-9 Assessment**

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design Illumination Power Load	Space
17	G_Playroom03	71.3 m ²	39 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms
18	G_Playroom04	71.2 m ²	44 m	2.7 m	1 W	School - general purpose learning areas and tutorial rooms
19	G_PramStore01	3.5 m ²	8 m	2.1 m	1 W	Storage
20	G_Staff01	19.4 m ²	20 m	2.4 m	1 W	Toilet, locker room, staff room, rest room and the like
21	G_Store01	6.5 m ²	11 m	2.1 m	1 W	Storage
22	G_Store02 & 03	11.7 m ²	14 m	2.1 m	1 W	Storage
23	G_Store04	5.2 m ²	9 m	2.1 m	1 W	Storage
24	G_Switch01	1.7 m ²	5 m	2.1 m	1 W	Plant room where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms

NSW J7D4 Interior artificial lighting and power control

- CRA**
- (1) All artificial lighting of a room or space must be individually operated by—
 - (a) a switch; or
 - (b) other control device; or
 - (c) a combination of (i) and (ii).
 - (2) 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.
 - (3) An artificial lighting switch or other control device in (a) must—
 - (a) if an artificial lighting switch, be located in a visible and easily accessed position—
 - (i) in the room or space being switched; or
 - (ii) in an adjacent room or space from where 90% of the lighting being switched is visible; and
 - (b) for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse—
 - (i) not operate lighting for an area of more than 250 m² if in a Class 5 building or a Class 8 laboratory; or
 - (ii) not operate lighting for an area of more than—
 - (a) 250 m² for a space of not more than 2000 m²; or
 - (b) 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.
 - (4) 95% of the light fittings in a building or storey of a building, other than a Class 3 building, of more than 250 m² must be controlled by—
 - (a) a time switch in accordance with Specification 40; or
 - (b) an occupant sensing device such as—
 - (i) a security key card reader that registers a person entering and leaving the building; or
 - (ii) a motion detector in accordance with Specification 40.
 - (5) 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—
 - (a) the room containing the natural lighting zone is less than 20 m²; or
 - (b) the room's natural lighting zone contains less than 4 luminaires; or
 - (c) 70% or more of the luminaires in the room are in the natural lighting zone.
 - (6) Artificial lighting in a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp, must be controlled by a motion detector in accordance with Specification 40.
 - (7) Artificial lighting in a foyer, corridor and other circulation spaces—
 - (a) of more than 250 W within a single zone; and
 - (b) adjacent to windows,
 must be controlled by a daylight sensor and dynamic lighting control device in accordance with Specification 40.
 - (8) Artificial lighting for daytime travel in the first 19 m of travel in a carpark entry zone must be controlled by a daylight sensor in accordance with Specification 40.
 - (9) The requirements of (1), (2), (3), (4), (5), (6), (7) and (8) do not apply to the following:
 - (a) Emergency lighting in accordance with Part E4.
 - (b) 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.
 - (10) The requirements of (4) do not apply to the following:
 - (a) Artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as—
 - (i) in a patient care area in a Class 9a building or in a Class 9c building; or
 - (ii) a plant room or lift motor room; or
 - (iii) a workshop where power tools are used.
 - (b) A heater where the heater also emits light, such as in bathrooms.

NSW J7D4 Interior artificial lighting and power control	
	<p>As the subject development is greater than 250 m² 95% of this building must be fitted with a time switch or occupant sensing device in accordance with Specification 40 unless exempt by sub-clauses J4D7(9) & (10).</p> <p>Artificial lighting in a foyer, corridor and other circulation spaces of more than 250 W within a single zone and adjacent to windows, must be controlled by a daylight sensor and dynamic lighting control device in accordance with Specification 40.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
J7D5 Interior decorative and display lighting	
N / A	<p>(1) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled—</p> <ul style="list-style-type: none"> (a) separately from other artificial lighting; and (b) 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 (c) by a time switch in accordance with Specification 40 where the display lighting exceeds 1 kW. <p>(2) Window display lighting must be controlled separately from other display lighting.</p> <p>No interior decorative & display lighting has been mentioned in the design.</p>
J7D6 Exterior artificial lighting	
N / A	<p>(1) Exterior artificial lighting attached to or directed at the facade of a building, must—</p> <ul style="list-style-type: none"> (a) be controlled by— <ul style="list-style-type: none"> (i) a daylight sensor; or (ii) 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 (b) when the total lighting load exceeds 100 W— <ul style="list-style-type: none"> (i) use LED luminaires for 90% of the total lighting load; or (ii) be controlled by a motion detector in accordance with Specification J6; or (iii) when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with Specification 40. <p>(2) The requirements of (a)(ii) do not apply to the following:</p> <ul style="list-style-type: none"> (a) Emergency lighting in accordance with Part E4. (b) Lighting around a detention centre. <p>No artificial lighting around the perimeter of the building has been mentioned in the design.</p>
J7D7 Boiling water and chilled water storage units	
CRA	<p>Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification 40.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>

J7D8 Lifts

N / A	<p>Lifts must—</p> <p>(a) be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes; and</p> <p>(b) achieve the idle and standby energy performance level in Table J7D8a; and</p> <p>(c) achieve—</p> <p style="margin-left: 20px;">(i) the energy efficiency class in Table J7D8b; or</p> <p style="margin-left: 20px;">(ii) if a dedicated goods lift, energy efficiency class D in accordance with ISO 25745-2.</p> <p>Table J7D8a Lift idle and standby energy performance level</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Rated load</th> <th style="text-align: center;">Idle and standby ^{Note} energy performance level in accordance with ISO 25745-2</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Less than or equal to 800 kg</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">801 kg to less than or equal to 2000 kg</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">2001 kg to less than or equal to 4000 kg</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">Greater than 4000 kg</td> <td style="text-align: center;">5</td> </tr> </tbody> </table> <p>Note to Table J7D8a: Applies to the standby power used after 30 minutes.</p> <p>Table J7D8b Lift energy efficiency class</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Usage category in accordance with ISO 25745-2</th> <th style="text-align: center;">Energy efficiency class in accordance with ISO 25745-2</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 – 4</td> <td style="text-align: center;">C</td> </tr> <tr> <td style="text-align: center;">> 5</td> <td style="text-align: center;">D</td> </tr> </tbody> </table> <p>No lift is proposed in this development</p>	Rated load	Idle and standby ^{Note} energy performance level in accordance with ISO 25745-2	Less than or equal to 800 kg	2	801 kg to less than or equal to 2000 kg	3	2001 kg to less than or equal to 4000 kg	4	Greater than 4000 kg	5	Usage category in accordance with ISO 25745-2	Energy efficiency class in accordance with ISO 25745-2	1 – 4	C	> 5	D
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> 5	D																

J7D9 Escalators and moving walkways

N / A	<p>Escalators and moving walkways must have the ability to slow to between 0.2 m/s and 0.05 m/s when unused for more than 15 minutes.</p> <p>No escalators or moving walkways are proposed in this development.</p>
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Part J8 – Heated Water Supply and Swimming Pool and Spa Pool Plant

J8D2 Heated water supply

Noted	<p>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.</p> <p>Please provide evidence from a qualified plumber the heated water supply system complies with Part B2 of Volume Three of the BCA.</p>
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NSW J8D3 Swimming pool heating and pumping

N / A	<p>(1) Heating for a swimming pool must be by—</p> <ul style="list-style-type: none"> (a) a solar heater; or (b) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or (c) a geothermal heater; or (d) a gas heater that— <ul style="list-style-type: none"> (i) if rated to consume 500 MJ/hour or less, achieves a minimum gross thermal efficiency of 86%; or (ii) if rated to consume more than 500 MJ/hour, achieves a minimum gross thermal efficiency of 90%; or (e) a heat pump; or (f) a combination of (a) to (e). <p>(2) Where some or all of the heating required by (1) is by a gas heater or a heat pump, the swimming pool must have—</p> <ul style="list-style-type: none"> (a) a cover with a minimum R-Value of 0.05; and (b) a time switch to control the operation of the heater. <p>(3) A time switch must be provided to control the operation of a circulation pump for a swimming pool.</p> <p>(4) Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.</p> <p>(5) Pipework carrying heated or chilled water for a swimming pool must comply with the insulation requirements of J6D9.</p> <p>(6) For the purpose of J8D3, a swimming pool does not include a spa pool.</p> <p><i>NSW J8D3 does not apply to a Class 2 building and a Class 4 part of a building.</i></p> <p>No swimming pool is proposed in this development.</p>
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J8D4 Spa pool heating and pumping

<p>N / A</p>	<p>(1) Heating for a spa pool that shares a water recirculation system with a swimming pool must be by—</p> <ul style="list-style-type: none"> (a) a solar heater; or (b) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or (c) a geothermal heater; or (d) a gas heater that— <ul style="list-style-type: none"> (i) if rated to consume 500 MJ/hour or less, achieves a minimum gross thermal efficiency of 86%; or (ii) if rated to consume more than 500 MJ/hour, achieves a minimum gross thermal efficiency of 90%; or (e) a heat pump; or (f) a combination of (a) to (e). <p>(2) Where some or all of the heating required by (1) is by a gas heater or a heat pump, the spa pool must have—</p> <ul style="list-style-type: none"> (a) a cover with a minimum R-Value of 0.05; and (b) a push button and a time switch to control the operation of the heater. <p>(3) A time switch must be provided to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.</p> <p>(4) Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.</p> <p>(5) Pipework carrying heated or chilled water for a spa pool must comply with the insulation requirements of J6D9.</p> <p>No spa pool is proposed in this development.</p>
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Part J9 – Facilities for Energy Monitoring

J9D2 Application of Part

Noted	The Deemed-to-Satisfy Provisions of this Part do not apply— (a) within a sole-occupancy unit of a Class 2 building or a Class 4 part of a building; or (b) to a Class 8 electricity network substation.
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J9D3 Facilities for energy monitoring

CRA	<p>(1) A building or sole-occupancy unit with a floor area of more than 500 m² must have an energy meter configured to record the time-of-use consumption of gas and electricity.</p> <p>(2) A building with a floor area of more than 2 500 m² must have energy meters configured to enable individual time-of-use energy consumption data recording, in accordance with (3), of the energy consumption of—</p> <ul style="list-style-type: none"> (a) air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and (b) artificial lighting; and (c) appliance power; and (d) central hot water supply; and (e) internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and (f) on- site renewable energy equipment; and (g) on-site electric vehicle charging equipment; and (h) on-site battery systems; and (i) other ancillary plant. <p>(3) Energy meters required by (2) must be interlinked by a communication system that collates the time-of-use energy consumption data to a single interface monitoring system where it can be stored, analysed and reviewed.</p> <p>(4) The provisions of (2) do not apply to energy meters serving—</p> <ul style="list-style-type: none"> (a) a Class 2 building where the total floor area of the common areas is less than 500 m²; or (b) individual sole-occupancy units with a floor area of less than 2 500 m². <p>Based on the total floor area of the building of between 500m² and 2500m², the building must comply with the requirements of part (1) of this Clause.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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J9D4 Facilities for electric vehicle charging equipment

- CRA**
- (1) Subject to (2), a carpark associated with a Class 2, 3, 5, 6, 7b, 8 or 9 building must be provided with electrical distribution boards dedicated to electric vehicle charging—
 - (a) in accordance with Table J9D4 in each storey of the carpark; and
 - (b) labelled to indicate use for electric vehicle charging equipment.
 - (2) Electrical distribution boards dedicated to serving electric vehicle charging in a carpark must—
 - (a) be fitted with a charging control system with the ability to manage and schedule charging of electric vehicles in response to total building demand; and
 - (b) when associated with a Class 2 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 11:00 pm to 7:00 am daily; and
 - (c) when associated with a class 5 to 9 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 9:00 am to 5:00 pm daily; and
 - (d) when associated with a Class 3 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 48 kWh from 11:00 pm to 7:00 am daily; and
 - (e) be sized to support the future installation of a 7 kW (32 A) type 2 electric vehicle charger in—
 - (i) 100% of the car parking spaces associated with a Class 2 building; or
 - (ii) 10% of car parking spaces associated with a Class 5 or 6 building; or
 - (iii) 20% of car parking spaces associated with a Class 3, 7b, 8 or 9 building; and
 - (f) contain space of at least 36 mm width of DIN rail per outgoing circuit for individual sub-circuit electricity metering to record electricity use of electric vehicle charging equipment; and
 - (g) be labelled to indicate the use of the space required by (f) is for the future installation of metering equipment

Limitations: J9D4 does not apply to a stand-alone Class 7a building.

Table J9D4: Electric vehicle distribution board requirement for each storey of a carpark

Carpark spaces per storey for electric vehicles	Electrical distribution boards for electric vehicle charging per storey
0-9	0
10-24	1
25-48	2
49-72	3
73-96	4
97-120	5
121-144	6
145-168	7

Table Notes: Where there are more than 168 carpark spaces per storey, one additional distribution board must be provided for each additional 24 spaces or part thereof.

As up to 69 car spaces are available for a Class 9 building, with some being modified, some existing, and some not allocated to the childcare centre, **the provision for a maximum of 3 electric vehicle charges** is required, with **1 required electrical distribution boards** for electrical vehicle charging.

Exact numbers can be determined at CC stage, when the total number of new spaces assigned to the childcare centre are finalised.

Design verification to be provided prior to the issue of the Construction Certificate.

J9D5 Facilities for solar photovoltaic and battery systems

CRA	<p>(1) The main electrical switchboard of a building must—</p> <ul style="list-style-type: none"> (a) contain at least two empty three-phase circuit breaker slots and four DIN rail spaces labelled to indicate the use of each space for— <ul style="list-style-type: none"> (i) a solar photovoltaic system; and (ii) a battery system; and (b) be sized to accommodate the installation of solar photovoltaic panels producing their maximum electrical output on at least 20% of the building roof area. <p>(2) At least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels, except for buildings—</p> <ul style="list-style-type: none"> (a) with installed solar photovoltaic panels on— <ul style="list-style-type: none"> (i) at least 20% of the roof area; or (ii) an equivalent generation capacity elsewhere on-site; or (b) where 100% of the roof area is shaded for more than 70% of daylight hours; or (c) with a roof area of not more than 55m; or (d) where more than 50% of the roof area is used as a terrace, carpark, roof garden, roof light or the like. <p><i>Limitations:</i></p> <p>(1) <i>The requirements of J9D5(1)(a)(i) and (b) do not apply to a building with solar photovoltaic panels installed on at least 20% of the roof area.</i></p> <p>(2) <i>The requirements of J9D5(1)(a)(ii) and (b) do not apply to a building with battery systems installed</i></p> <p>At least 20% of the roof area of the building, approx. 148m² must be left clear for the future potential installation of solar photovoltaic panels.</p> <p>The MSB must be provided with two (2) empty three phase circuit breaker slots and four (4) DIN rail spaces, sized to accommodate the max. output of the required solar PV provision.</p> <p>Design verification to be provided prior to the issue of the Construction Certificate.</p>
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APPENDIX A – REFERENCED DOCUMENTATION

The following documentation was used in the preparation of this report:

Drawing No.	Title	Rev.	Project No.	Date	Drawn By
A1.01	GROUND FLOOR LAYOUT	A	231370	January 2024	Creative Drafting Services
A1.02	ROOF LAYOUT	A	231370	January 2024	Creative Drafting Services
A1.03	CARPARK SET-OUT	A	231370	January 2024	Creative Drafting Services
A1.04	PLAYGROUND SET-OUT AND NOTES	A	231370	January 2024	Creative Drafting Services
A1.05	ELEVATIONS 1-4 AND SECTION 5	A	231370	January 2024	Creative Drafting Services
A1.05	COLOURED SCHEME ELEVATIONS	A	231370	January 2024	Creative Drafting Services