SECTION J ENERGY EFFICIENCY REPORT

PROJECT NAME: North Narrabeen SLSC Alterations and additions

ADDRESS: 225-229 Ocean Street Narrabeen. NSW 2101

CLIENT: Northern Beaches Council

DOCUMENT CONTROL

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ISSUE:	Variation FINAL
REVISION:	1
DATE:	14/03/2025

DTS ENERGY EFFICIENCY DECLARATION

Pursuant to NCC A2.2 (vi) this report relies on supplied documentation for assessment with regards to adopting measures contributing to deemed-to-satisfy of designed and built deliverables. This report documents the energy efficiency assessment undertaken on the proposed building work described herein to confirm compliance with the Section J – Energy Efficiency Provisions of the National Construction Code Volume One – Class 2 to Class 9 Buildings. It is our opinion that this project can be constructed to satisfy the requirements of the National Construction Code.

ABN: 95 164 564 210
Association of Building Sustainability Assessors (ABSA) No. 100765

CERTIFIED ENERGY

Table of Contents

1 - Introduction

The term Proposed alteration and additions in this report refers to North Narrabeen SLSC located at 222-229 Ocean Street, Narrabeen, NSW.

This report presents the findings from the design assessment of the Proposed Development against the Deemed-to-Satisfy (DTS) requirements of Section J of the Building Code of Australia 2022 –Volume 1, Energy efficiency.

The purpose of this report is to provide an assessment of the design plans and documentation for the Proposed Development and to satisfy the requirements of Local Government Area of the development for issuance of Construction Certificate for construction operations in the development site.

The scope of this report is limited to the design documentation referenced in Section 2 of this report and only covers Section J of BCA 2022 – V1 provisions.

2 - Referenced Documents

The following documents and design plans have been referenced in compilation of this report:

1. National Construction Code Series, Volume 1, Building Code of Australia 2022 – Class 2 to Class 9 Buildings.

2. Architectural Plans listed below provided by “Building Assets-Planning Design and Delivery Northern Beaches Council” and received by Certified Energy at 28/02/2025.
    - DA00 - Cover, Issue E Section 4.55 – Feb/2025
    - DA01 – Site plan, Issue F Section 4.55 – Feb/2025
    - DA07 - Ground Floor plan, Issue E Section 4.55 – Feb/2025
    - DA08 – Upper floor plan, Issue E Section 4.55 – Feb/2025
    - DA09 - Roof plan, Issue E Section 4.55 – Feb/2025
    - DA10 – Elevations, Issue E Section 4.55 – Feb/2025
    - DA11 – Elevations, Issue E Section 4.55 – Feb/2025
    - DA12 – Sections, Issue E Section 4.55 – Feb/2025
    - DA13 – Sections, Issue E Section 4.55 – Feb/2025

3. Email correspondence and response to information request received from the project officer “Bernard Koon” of the Proposed Development.

3 – Proposed Development

The Proposed Development in this report comprise of alteration and Additions to a Class 9b located at 225-229 Ocean Street Narrabeen, NSW. The development is a class 9b building in BCA Climate Zone 5 according to BCA Climate Map for Sydney Surrounds.

The following construction elements are being proposed in the building design according to architectural plans and design documents referenced in this report:

Roof and Ceiling: Concrete slab and suspended ceiling/Metal roofing with plasterboard ceiling lining.

External Walls: Cavity Brick wall and metal cladded work.

Internal Walls: Plasterboard on metal stud.

Floors: Concrete slab on ground.

Windows: Standard Aluminium framed windows.

Skylights: No skylights.

Air Conditioning System: No design plans provided.

Lighting System: Lighting layout has been provided in board meeting room (G Floor).

4 - Scope of Report (Building Envelope)

"**Envelope**", for the purposes of Section J, means the parts of the buildings fabric that separate a conditioned space or habitable room from-

- the exterior of the building; or
- a non-conditioned space including-
  - (i) the floor of a rooftop plant room, lift-machine room or the like; and
  - (ii) the floor above a carpark or warehouse; and
  - (iii) the common wall with a carpark, warehouse or the like.

Legend: Building Envelope and scope of this report

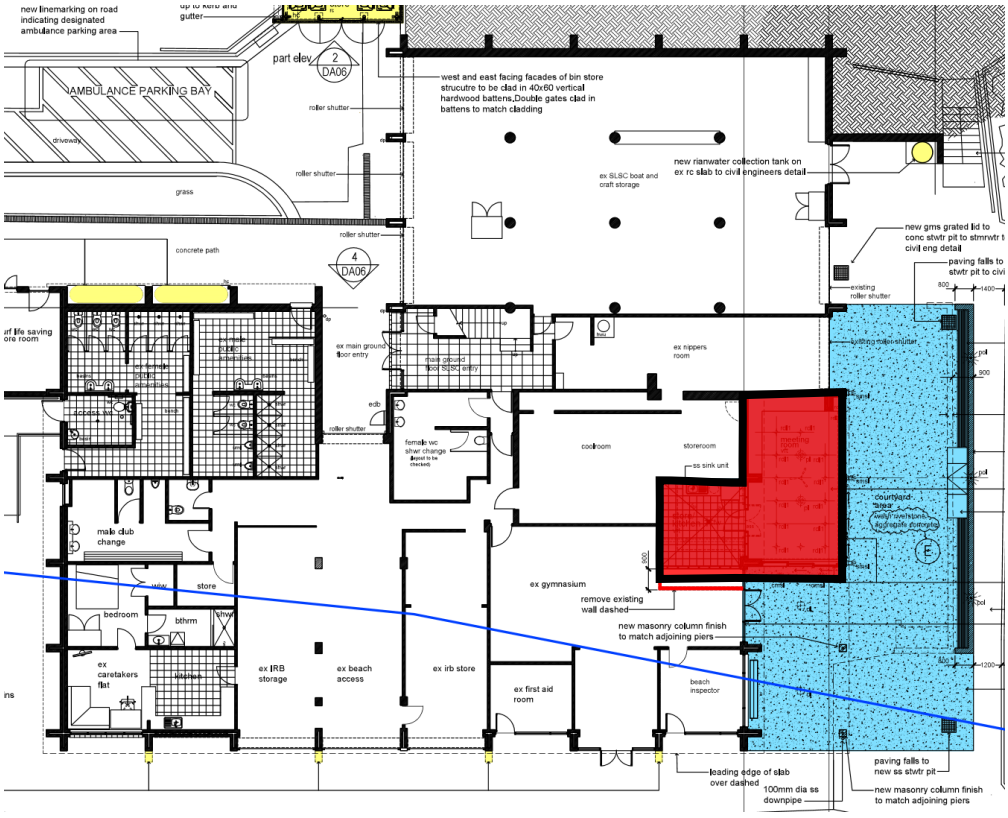


Figure 1 – Building Envelope - Ground Floor

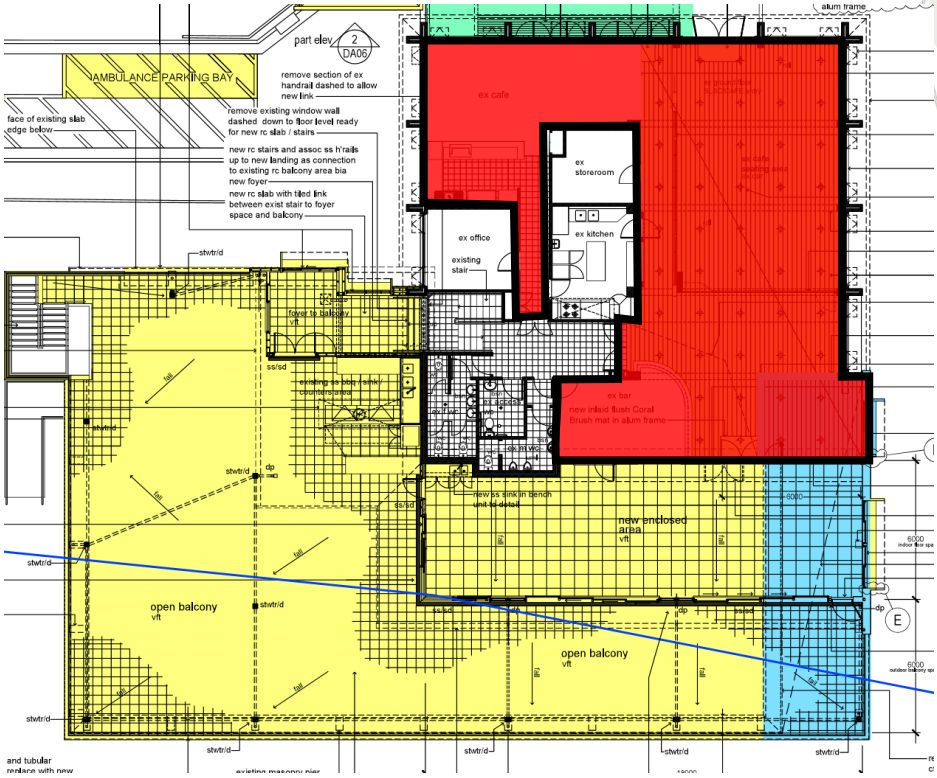


Figure 2 – Building Envelope - First Floor

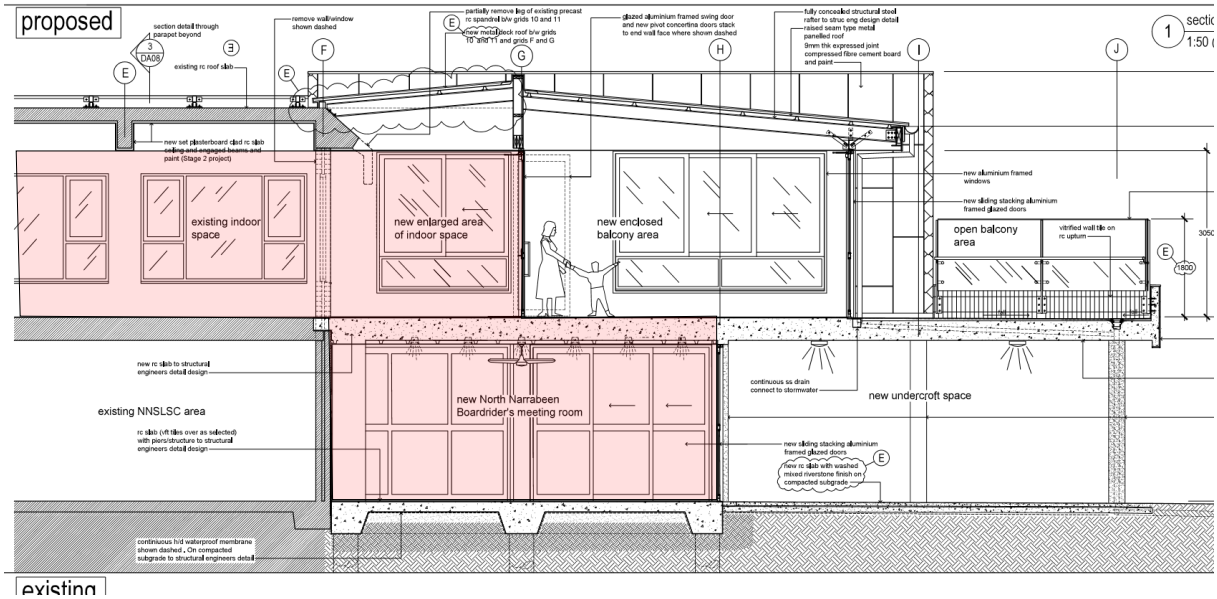
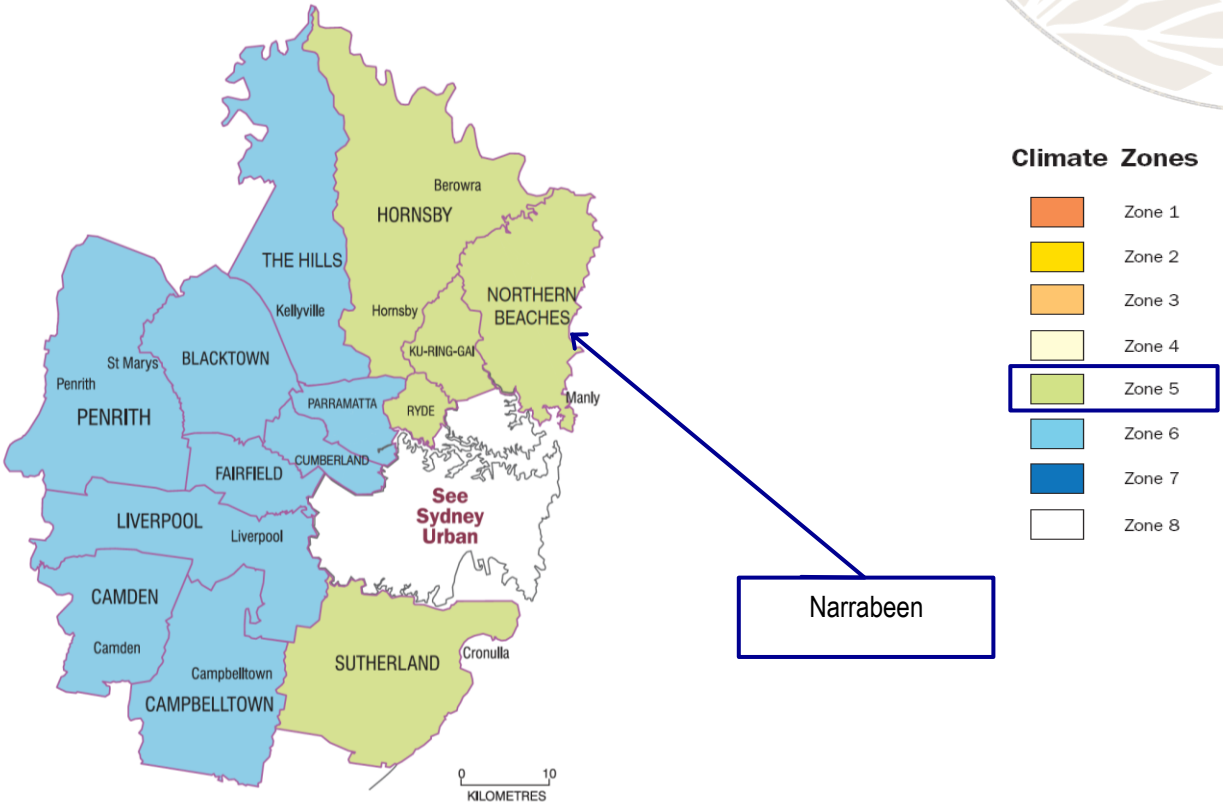


Figure 3 – Building Envelope - Sections

5 - Project Classification and Climate Zone

BUILDING CLASS 9b



CLIMATE	COLOUR	SUBURB
ZONE 5	**LIGHT GREEN**	**NARRABEEN**

Climate Characteristics of Zone 5

Warm Temperate

- Moderate diurnal (day-night) temperature range near coast to high diurnal range inland
- Four distinct seasons: summer and winter can exceed human comfort range, spring and autumn are ideal for human comfort
- Mild winters with low humidity
- Hot to very hot summers with low to moderate humidity
- Widely variable solar access and cooling breeze directions and patterns

Key Design Objectives

Minimising heating and cooling energy use should be a primary design objective

6 - NCC Section J Compliance Provisions

This section analyses the current elements of the of Proposed Development design against provisions of Section J of the Building Code of Australia 2022 –Volume 1, Energy Efficiency. In case of a non-complying element, advisory notes are provided to bring the building in compliance with Section J requirements.

A summary note of these provisions is provided in **Section 7-Conclusions** of this report that can be incorporated into specification blocks of architectural plans and, as a result, be deployed during construction. It is however the responsibility of the entity responsible for the submission of the design plans and documents to the council to ascertain each and every element of this report is clearly referenced and reflected on the submitted plans and documents.

6.1 – Part J1 Energy Efficiency Performance Requirements

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part
1	Renewable energy and electric vehicle charging	The proposed building must have features that facilitate the future installation of on-site renewable energy generation and storage and electric vehicle charging equipment.	J1P4

6.2 – Part J4 Building Fabric

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part
J4D4 Roof and ceiling construction			
1	Metal cladding roof and plasterboard ceiling of the Proposed Development	Install minimum R3.18 m^2.K/W insulation OR Provide a roof and ceiling system with total performance of R3.7 m^2.K/W	Part J4D4(1) and Material Properties from Specification - J1.2
1.1	Suspended Concrete slab and plasterboard ceiling of the Proposed Development	Install minimum R3.02 m^2.K/W insulation OR Provide a roof and ceiling system with total performance of R3.7 m^2.K/W	Part J4D4(1) and Material Properties from Specification - J1.2
2		The solar absorptance of the upper surface of the roof should not exceed 0.45	Part J4D4(2)
J4D6 Walls and Glazing			
3	External cavity brick wall of the Proposed Development	Install minimum R0.93 m^2.K/W insulation and Thermal break tape over metal studs OR Provide a wall-glazing construction system that not exceed the U-value of U2.0 W/ m^2.K	Part J4D6a, Façade Calculator and Material Properties from Specification - J1.2

3.1	External Metal cladded wall of the Proposed Development	Install minimum R1.03 m^2.K/W insulation and Thermal break tape over metal studs OR Provide a wall-glazing construction system that not exceed the U-value of U2.0 W/ m^2.K	Part J4D6a, Façade Calculator and Material Properties from Specification - J1.2
4	Plasterboard on metal stud internal walls adjacent to unconditioned spaces	Install minimum R0.88 m^2.K/W insulation Thermal break tape over metal studs OR provide an internal wall system with total performance of R1.4 m^2.K/W.	Part J4D6a, Façade Calculator and Material Properties from Specification - J1.2
4.1	Cavity Brick internal walls adjacent to unconditioned spaces	Install minimum R0.84 m^2.K/W insulation Thermal break tape over metal studs OR provide an internal wall system with total performance of R1.4 m^2.K/W.	Part J4D6a, Façade Calculator and Material Properties from Specification - J1.2
5	All new windows	Install windows with Total System U-value no more than 4.6 W/m^2.K and SHGC no more than 0.80 check J4D6(7)	Part J4D6a, Façade Calculator
J4D7 Floors			
6	Concrete slab on ground (meeting room)	Install minimum R0.91 m^2.K/W insulation or provide a suspended slab system with total performance of R2.0 m^2.K/W.	Part J1.6(a)(i) and Table J1.6 considering the material properties from specification - J1.2 & J1.6 Figure 2(c)

6.2.1 – Building Fabric Breakdown

	Metal Roof	R value [m^2K/W]
1	Outdoor air film (7m/s)	0.03
2	Metal roof	0.00
3	Roof airspace	0.28
4	Bulk insulation	-
5	Plasterboard gypsum (10mm, 880kg/m^3)	0.06
6	Indoor air film	0.15
	Default System R value	**R0.52**
	Total system R value required	R3.70
	Additional insulation required for compliance	**R3.18**

	Suspended Concrete Roof (GF meeting room)	R value [m2K/W]
1	Outdoor air film (7m/s)	0.03
2	Concrete	0.23/1.44=0.16
3	Roof airspace	0.28
4	Bulk insulation	-
5	Plasterboard gypsum (10mm, 880kg/m3)	0.06

6	Indoor air film	0.15
	Default System R value	**R0.68**
	Total system R value required	R3.70
	Additional insulation required for compliance	**R3.02**

	Cavity Brick Wall (Meeting Room)	**R value [m^2K/W]**
1	Outdoor air film (7m/s)	0.03
2	Cement render (10 mm)	0.01/0.53=0.01
3	Brick (110 mm)	0.78/0.11=0.14
4	Bulk insulation	-
5	Air gap (40 mm)	0.16
6	Cement render (10 mm)	0.01
7	Indoor air film	0.12
	Default System R value	**R0.47**
	Total system R value required (with factored thermal bridging)	R1.40
	Additional insulation required for compliance (with factored thermal bridging) *	**R0.93 + EPS Thermal break tapes over metal studs**

	Metal cladded Wall (First floor N Ele)	**R value [m^2K/W]**
1	Outdoor air film (7m/s)	0.03
2	Metal cladding	0.00
3	Air gap (40 mm)	0.16
4	Bulk insulation	-
5	Plasterboard gypsum (10mm, 880kg/m^3)	0.06
6	Indoor air film	0.12
	Default System R value	**R0.37**
	Total system R value required (with factored thermal bridging)	R1.40
	Additional insulation required for compliance (with factored thermal bridging) *	**R1.03 + EPS Thermal break tapes over metal studs**

	Internal plasterboard walls	**R value [m^2K/W]**
1	Indoor air film	0.12
2	Plasterboard gypsum (10mm, 880kg/m^3)	0.06
3	Airspace (20 to 40mm)	0.16
4	Bulk insulation	-

5	Plasterboard gypsum (10mm, 880kg/m^3)	0.06
6	Indoor air film	0.12
	Default System R value	**R0.52**
	Total system R value required (with factored thermal bridging)	R1.40
	Additional insulation required for compliance (with factored thermal bridging) *	**R0.88 + EPS Thermal break tapes over metal studs**

	Internal Cavity Brick Wall	R value [m^2K/W]
1	Indoor air film	0.12
2	Cement render (10 mm)	0.01/0.53=0.01
3	Brick (110 mm)	0.78/0.11=0.14
4	Bulk insulation	-
5	Air gap (40 mm)	0.16
6	Cement render (10 mm)	0.01
7	Indoor air film	0.12
	Default System R value	**R0.56**
	Total system R value required (with factored thermal bridging)	R1.40
	Additional insulation required for compliance (with factored thermal bridging) *	**R0.84 + EPS Thermal break tapes over metal studs**

	Concrete Slab on Ground (Seating Area)	R value [m^2K/W]
1	Indoor air film	0.11
2	Concrete floor slab (150mm)	0.08
3	Bulk insulation	-
4	Ground thermal resistance	0.09
	Default System R value	**R1.09**
	Total system R value required	R2.00
	Additional insulation required for compliance	**R0.91**

6.3 – Part J5 Building Sealing

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part

3	Each edge of a door, all openable windows, or the like forming part of the envelope of a conditioned space	Provide air seals on all edges or provide doors and windows complying with AS2047 for the Proposed Development except for fire doors, smoke doors, roller shutter doors roller shutter grille or other security door or device installed only for out-of-hours security The bottom seals to doors are to be a draft protection device and all other edges to be of foam or rubber compression strip, fibrous, or similar material.	Part J5D5(1)(2)(3)
4	Entry doors to the building which leads to conditioned spaces greater than 50m^2	Provide self-closing mechanism, revolving door or similar system other than where a café, restaurant, open front shop or the like has a 3 m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and at all other entrances to the café, restaurant, open front shop or the like, self-closing doors	Part J5D5(4)
5	Exhaust fans of the conditioned areas of the Proposed Development if any	Must be equipped with a self-closing damper or similar	Part J5D6
6	Roofs, ceilings, walls, floors, windows frame, door frame and roof light frame of the conditioned areas of the Proposed Development	Must be enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions OR be sealed by caulking, skirting, architraves, cornices or similar elements unless required for smoke hazard management	Part J5D7
7	Evaporative coolers	All evaporative coolers serving heated space or, habitable room/public area in climate zones 4 to 8, must be fitted with a self-closing damper or the like	Part J5D8

6.4 – Part J6 Air-Conditioning and Ventilation Systems

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part
Air Conditioning Systems			
1	Control	All air conditioning systems must be capable of being deactivated when the air-conditioned space is not occupied.	Part J6D3(1)a
2	Zoning	All air conditioning units serve multiple zones, then each zone temperature should be thermostatically controlled. Zone temperature cannot be controlled by mixing actively heated and cooled air. If the zone needs reheating, for a fixed supply air rate, limit the reheating to not more than 7.5K rise in temperature and for a variable supply air rate, limit rise in temperature to not more than 7.5K at the nominal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased.	Part J6D3(1)b

3	Economy Cycle	All air conditioning systems with required mechanical ventilation except climate zone 1will be required to have outdoor economy cycle fitted.	Part J6D3(1)c
4	Water Flow Control	If the air-conditioning system has more than one water heater, chiller or coil, must be capable of stopping the flow of water to those not operating.	Part J6D3(1)d
5	Variable Fan Loads	When the supply air quantity is capable of being varied or with an airflow of more than 1000L/s, must provide a variable speed fan.	Part J6D3(1)e
6	Control systems	The air-conditioning system must have an ability to use direct signals from the control components responsible for the delivery of comfort conditions in the building to regulate the operations of central plant and must have a control dead band of not less than 2 degree C, except where a smaller range is required for specialised applications	Part J6D3(1)gh
7	Dampers & Valves	The air-conditioning system must be provided with balancing dampers and balancing valves that ensure the maximum design air or fluid flow is achieved but not exceeded by more than 15% above design at each component or group components operating under a common control	Part J6D3(1)i
8	Control	Must ensure that each independently operating space of more than 1000 sq.m and every separate floor of the building has provision to terminate airflow independently of the remainder of the system sufficient to allow foe different operating times.	Part J6D3(1)j
9	Control	Must have automatic variable temperature operation of heated and chilled water circuits	Part J6D3(1)k
10	Outside & Return Air Dampers	Motorised outside air and return air dampers should be closed when the air conditioning system is deactivated.	Part J6D3(1)l
11	Control	When two or more air-conditioning systems serve the same space, they must use control sequences that prevent the systems from operating in opposing heating and cooling modes	Part J6D3(2)
12	Time Switches	An air-conditioning system of more than 2 kWr and heater of more than 1kW used for air-conditioning must provide a time switch complying with Part J6D3(3)c.	Part J6D3(3)
13	Fans and Duct Systems	Fans, ductwork and duct components that forms part of an air-conditioning systems or mechanical ventilation system must – i. Separately comply with J6D5(2), (3), (4) and (5); or Achieve a fan motor input power per unit to flowrate lower than the fan motor input power per unit of flowrate achieved when applying J6D5(2), (3), (4) and (5) together.	Part J6D5
14	Pump Systems	All pumps and pipework that form part of an air-conditioning system must either I. Separately comply with (2), (3), (4); or Achieve a pump motor power per unit of flowrate	Part J6D8

		lower than the pump motor power per unit of flowrate achieved when applying (2), (3) and (4) together.	
15	Insulations	Duct work insulation specification to be in accordance with Part J6D6 (1), (2), (3), & (4). Piping, vessels, heat exchangers & tanks that contain cool or heat fluid must meet MEPS rating or insulate in accordance with Part J6D9 (1), (2), (3), (4), & (5).	Part J6D6 & Part J6D9
16	Heat rejection equipment	a. The motor rated power of a fan in a cooling tower, closed circuit cooler or evaporative condenser must not exceed the allowances in Table J6D13 b. The fan in an air-cooled condenser must have a motor rated power of not more than 42 W for each kW of heat rejected from the refrigerant, when determined in accordance with AHRI 460 except for – I. A refrigerant chiller in an air-conditioning system that complies with the EER in Part J6D11; or Packaged air-conditioners, split systems and VRF air-conditioning equipment that complies with the EER in Part J6D12.	Part J6D13
17	Space Heating	Heater of an air-conditioning system must comply with Part J6D10.	Part J6D10
18	Energy Efficiency Ratios	Water or Air cooled refrigerant chiller must comply with MEPS and full load operation EER and part load EER in Table J6D11a or Table J6D11b when determined in accordance with AHRI 551/591 Unitary, Package *air-conditioning, split systems, and VRF systems* with MEPS a capacity of 65 kWr, must have a minimum Cooling COP of • 4.0 for water cooled when tested in accordance with AS/NZS 3823.1.2 at test condition T1. 2.9 for air-cooled when tested in accordance with AS/NZS 3823.1.2 at test condition T1.	Part J6D11 & Part J6D12
Mechanical Ventilation Systems			
18	Controls	The Ventilation Systems are to be capable of being deactivated when the building is not occupied.	Part J6D4(1)
19	Controls	When the air flow rate is more than 1000 L/s, and variable demand, must capable of stopping the motor when the system is not needed and fan to be variable speed.	Part J6D4(2)
20	Carpark exhaust	Must be in accordance with 4.11.2 of AS 1668.2; or 4.11.3 of AS 1668.2	Part J6D4(3)
21	Time switches	Time switch complying must be provided to a mechanical ventilation system with an air flow rate of more than 1000 L/s	Part J6D4(4)

6.5 – Part J7 Artificial Lighting and Power

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part
1	Lighting electrical power of the Proposed Development	Maximum design power allowed is 5749 Watts	Part J7D3(2)
2	Artificial light switch or other lighting control devices of Proposed Development	Artificial lighting of a room or space must be individually operated by a switch or other control device. An artificial lighting switch must be located in a visible position. Light switch or control device must control lighting of no more than 250 m^2 of area.	Part J7D4(3)(b)(ii)
3	Windows display lighting if installed	Must be controlled separately from other display lighting.	Part J7D5(2)
4	External lighting of the Proposed Development if installed	Must be controlled by either a daylight sensor or a time switch which is capable of being pre-programmed for different times of the day on variable days.	Part J7D6(1)a
5	If the total perimeter lighting load of the Proposed Development exceeds 100 Watts	Use LED luminaires for 90% of the total lighting load or control with a motion detector device in accordance with Specification 40 except when providing emergency lighting in accordance with Part E4	Part J7D6(1)b
6	Façade lighting or signage lighting of the Proposed Development if installed	Must be provided with a separate time switch in accordance with Specification 40.	Part J7D6(1)(b)(iii)
7	Lifts	Lifts must be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 mins; and achieve the idle and standby energy performance level in Table J7D8a and achieve the energy efficiency class in Table J7D8b	Part J7D8
8	Escalators and moving walkways	Escalators and moving walkways must have the ability to slow to between 0.2 m/s and 0.5 m/s when unused for more than 15 minutes	Part J7D9

6.6 – Part J8 Heated Water Supply and Swimming Pool and Spa Pool Plant

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part
1	Hot water supply of the Proposed Development	Must be designed and installed in accordance with Part B2 of NCC Volume Three- Plumbing Code of Australia	Part J8D2

6.7 – Part J9 Energy Monitoring and On-site Distributed Energy Resources

	Building Element	Energy Efficiency Provisions	Corresponding BCA Part
1	For the Proposed Development with a floor area of more than 500 m^2	Provide facilities to record gas and electricity consumption	Part J9D3(1)
	Carparks of a Class, 9 buildings	Each storey of the carpark must be provided with electrical distribution boards dedicated to electric vehicle charging in accordance with Table J9D4. These must also be labelled to indicate use for electric vehicle charging.	Part J9D4(1)
	Electric distribution boards serving electric vehicles	Must be fitted with a charging control system that can manage and schedule charging of vehicles in response to total building demand. For Class 5 to 9 buildings: Each circuit should support an electric vehicle charger able to deliver 12 kWh minimum from 9:00am to 5:00pm daily. Must be sized to support future installation of 7 kW (32 A) type 2 electric vehicle charger in 20% of car parking spaces (class 3, 7b, 8, 9)	Part J9D4(2)
	Solar and battery facilities	At least 20% of the building roof area must be left clear for the installation of solar photovoltaic panels.	Part J9D5

	Solar and battery facilities	The above condition is not applicable if: (i) Solar photovoltaic panels are installed on at least 20% of the roof area; or (ii) There is equivalent generation capacity elsewhere on-site; or (iii) 100% of the roof area is shaded for more than 70% of daylight hours; or (iv) Roof area is less than 55m^2; or (v) More than 50% of roof area is used as a terrace, carpark, roof garden, roof light or similar	Part J9D5(2)

7 - Conclusions

Considering the design elements nominated on the Proposed Development provided by Northern Beaches Council, the following can be concluded for the Proposed Development to meet the Deemed to Satisfy requirements of Section J of the Building Code of Australia 2022 –Volume 1, Energy Efficiency;

Part J1 – Energy Efficiency Performance Requirements

- The proposed building must have features that facilitate the future installation of on-site renewable energy generation and storage and electric vehicle charging equipment.

Part J4 – Building Fabric:

Roof & Ceiling:

- Install minimum R3.18 m^2.K/W insulation or provide a ceiling and roof system with total performance of R3.70 m^2.k/w for the metal roof over upper floor seating area of Proposed Development on top of conditioned areas.
- Install minimum R3.02 m^2.K/W insulation or provide a ceiling and roof system with total performance of R3.70 m^2.k/w for the suspended concrete roof over GF meeting room of Proposed Development on top of conditioned areas.
- All the upper surfaces of the roof should not exceed the solar absorptance of 0.45.

Walls:

- Install minimum R0.93 m^2.K/W insulation and thermal break tape over metal studs OR Provide an external cavity brick wall system with total performance of R1.40 m^2.K/W
- Install minimum R1.03 m^2.K/W insulation and thermal break tape over metal studs OR Provide an external Metal clad wall system with total performance of R1.40 m^2.K/W
- Install minimum R0.88 m^2.K/W insulation and thermal break tape over metal studs OR Provide an internal plasterboard on metal stud wall system with total performance of R1.40 m^2.K/W.
- Install minimum R0.84 m^2.K/W insulation and thermal break tape over metal studs OR Provide an internal Cavity Brick wall system with total performance of R1.40 m^2.K/W.

»

Glazing:

» Provide the following minimum performance requirements for doors & windows of conditioned areas, adjacent to unconditioned spaces.

- All new windows; Install windows with Total System U-value no more than 4.6 W/m2.K and SHGC no more than 0.80

Flooring:

» Install minimum R0.91 m2.K/W insulation OR provide a concrete on slab on ground floor system with total performance of R2.0 m2.K/W.

Insulations:

» Installed insulation must comply with AS/NZS 4859.1 and be installed in such a way to meet the following requirements:

- The insulation must abut or overlap adjoining insulation other than at supporting members such as studs, noggins, joists, furring channels and the like where the insulation must be against the member.
- The installed insulation must form a continuous barrier with ceiling, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier while does not affect the safe and effective operation of a service or fitting.
- The bulk insulation must maintain its position and thickness other than when it is compressed between cladding and supporting members, water pipes, electrical cabling or the like.
- Reflective insulation must be installed with the necessary airspace to achieve the required R Value and be adequately supported by framing members. Each adjoining sheet of role membrane must be overlapped by not less than 50mm or tapped together. It must be closely fitted against any penetration, door or window opening.

Part J5 – Building Sealing:

» Provide air seals on all edges or provide windows complying with AS 2047 for all external doors and openable windows of the Proposed Development servicing conditioned areas except fire doors, smoke doors, roller shutter doors roller shutter grille or other security door or device installed only for out-of-hours security.

» Provide self-closing mechanism, revolving door or similar system to conditioned spaces greater than 50m^2 other than where a café, restaurant, open front shop or the like has a 3 m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and at all other entrances to the café, restaurant, open front shop or the like, self-closing doors.

» Exhaust fans of the Proposed Development serving conditioned areas must be equipped with a self-closing damper or similar.

» Roofs, ceilings, walls, floors, windows frame, door frame and roof light frame of conditioned areas of the Proposed Development must be enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions OR be sealed by caulking, skirting, architraves, cornices or similar elements unless required for smoke hazard management.

» Air infiltration seal for bottom edge of external swing doors of the Proposed Development must be a draft protection device and for other edges of an external door or the edges of an openable window or other such openings may be a foam or rubber compression strip,

fibrous seal or the like.

- All evaporative coolers serving heated space or, habitable room/public area in climate zones 4 to 8, must be fitted with a self-closing damper or the like.

Part J6 – Air Conditioning & Ventilation:

- All Air Conditioning units and Ventilation Systems are to be capable of being deactivated when the space is not occupied.
- All air conditioning units serves multiple zones, then each zone temperature should be thermostatically controlled. If the zone needs reheating, then limit the reheating to not more than 7.5K to the air conditioning supply air. Zone temperature cannot be controlled by mixing actively heated and cooled air.
- All air conditioning systems which provides required mechanical ventilation will be required to have economy cycle fitted (Climate Zone 2 - 8).
- When the supply air quantity is capable of being varied, must provide a variable speed fan.
- All air-conditioning systems having more than one water heater, chiller or coil must be capable of stopping the flow of water to those not operating.
- Motorised outside air and return air dampers should be closed when the air conditioning system is deactivated.
- Air-conditioning systems must have the ability to use direct signals from the control components responsible for the delivery of comfort conditions in the building to regulate the operation of central plant; and must have a control dead band of not less than 2-degree C.
- Balancing dampers and valves must be provided that ensures the maximum design air or fluid flow is achieved but not exceeded by more than 15% above design at each component or group of components.
- Must ensure that it independently operates for space more than 1000 sq.m and every separate floor of the building.
- Pump systems must comply with Part J6D8.
- Insulation specification for duct work and fittings in air-conditioning system to be in accordance with J6D6.
- An air-conditioning system of more than 2 kWr and heater of 1kW must provide a time switch. Refer to Part J6D3(3)
- Heater of an air-conditioning system must comply with Part J6D10.
- Minimum Energy Efficiency Ratio or EER must be as per J6D11.
- Mechanical ventilation systems that are to be capable of being deactivated when the building is not occupied.
- Time switch must be provided to control a mechanical ventilation system with an air flow rate of more than 1000 L/s.
- Miscellaneous Exhaust Systems with air flow rate is more than 1000 L/s, and variable demand, must capable of stopping the motor when the system is not needed and fan to be variable speed.

Part J7 – Artificial Lighting & Power:

- Maximum design lighting power allowed for the Proposed Development is 5749 Watts.
- Artificial lighting of a room or space must be individually operated by a switch or other control device. An artificial lighting switch must be located in a visible position. Artificial light switch or other lighting control devices of the Proposed Development must control lighting of no more than 250 m^2 of area.

- Windows display lighting if installed must be controlled separately from other display lighting.
- External lighting of the Proposed Development if installed must be controlled by either a daylight sensor or a time switch which is capable of being pre-programmed for different times of the day on variable days.
- Façade lighting or signage lighting of the Proposed Development if installed must be provided with a separate time switch.
- All lighting and power control devices of the Proposed Development including timers, time switches, motion detectors and daylight control devices must follow the guidelines and specifications outlined in Appendix D Artificial Lighting and Power Notes of this report.

Part J8 – Heater Water Supply & Swimming Pool & Spa Pool Plant:

- Hot water supply of the Proposed Development must be designed and installed in accordance with section 8 of AS/NZS 3500.4

Part J9 – Energy Monitoring and On-site Distributed Energy Resources:

- For the Proposed Development provide facilities to record gas and electricity consumption.
- For the Proposed Development provide facilities to record individually the energy consumption of air conditioning plant, heating plant, cooling plant, air handling fans, artificial lighting, appliance power, central hot water supply, and internal transport devices including lifts, escalators and travelators where there is more than one serving the building and other ancillary plant.
- The energy meters required must be connected to a communication system that collates the time-of-use energy data to a single interface monitoring system where it can be stored, analysed, and reviewed.
- Each storey of carparks in Class 2, 3, 5, 6, 7b, 8, 9 buildings must be provided with electrical distribution boards dedicated to electric vehicle charging in accordance with Table J9D4.
- These must also be labelled to indicate use for electric vehicle charging.
- Electric distribution boards serving electric vehicles must be fitted with a charging control system that can manage and schedule charging of vehicles in response to total building demand.
- For Class 9 buildings: Each circuit should support an electric vehicle charger able to deliver 12 kWh minimum from 9:00am to 5:00pm daily.
- Must be sized to support future installation of 7 kW (32 A) type 2 electric vehicle charger in 20% of car parking spaces (class 9)

- At least 20% of the building roof area must be left clear for the installation of solar photovoltaic panels, except for buildings where-
  (i) Solar photovoltaic panels are installed on at least 20% of the roof area; or
  (ii) There is equivalent generation capacity elsewhere on-site; or
  (iii) 100% of the roof area is shaded for more than 70% of daylight hours; or
  (iv) Roof area is less than 55m2; or
  (v) More than 50% of roof area is used as a terrace, carpark, roof garden, roof light or similar

8 - Appendix

This section of the report demonstrates the results of employing BCA Calculators for Glazing, Lighting Power, and other referenced calculations and plans in this report.

8.1 – Appendix A – Façade Calculator

Façade

Report

Calculator

Project Summary

Date
23/10/2023

Name
Tom Chen

Company
Certified Energy

Position
ESD Consultant

Building Name / Address
225-229 Ocean St, Narrabeen
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 9b - public halls, function rooms or the like

Storeys Above Ground
2

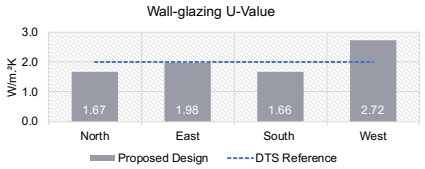
Tool Version
1.1 (April 2020)

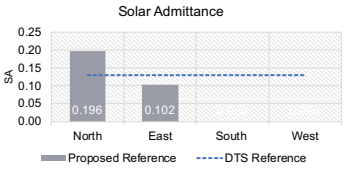
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

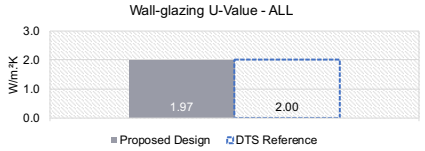
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	1.67	1.98	1.66	2.72	1.97
Solar Admittance	0.20	0.10			
AC Energy Value					103

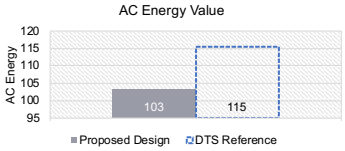
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	45.658	37.544	20.016	54.336
Glazing to Façade Ratio	25%	32%	24%	52%
Glazing References	FF Sliding GF fixed	FF Sliding GF sliding	FF awning	FF awning
Glazing System Types	Sliding Door Casement	Sliding Door Casement	Awning	Awning
Glass Types	0	0	0	0
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	4.60	4.60	4.60	4.60
Average Glazing SHGC	0.80	0.80	0.00	0.00
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	139.63	78	62.57	50.92
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	FF External cavity wall FF internal wall	FF internal wall FF External cavity wall	FF External cavity wall FF internal wall	FF External cavity wall FF internal wall
Wall Thickness	300 100	100 300	300 100	300
Average Wall R-value (m².K/W)	1.40	1.40	1.40	1.40
Solar Absorptance	0.6	0.6	0.6	0.6

8.2 – Appendix B – Lighting Calculator

ABCB

Non-residential Lighting

(Beta release)

National Construction Code

Calculator

Building name/description	Classification
North Narrabeen SLSC	Class 6

Number of rows preferred in table below 4 *(as currently displayed)*

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design illumination power load	Space	Illuminance: Designed lux level	Illuminance: Recommended lux level	Adjustment factor 1: Adjustment factor 1	Adjustment factor 1: Dimming % area	Adjustment factor 1: Illuminance turndown	Adjustment factor 2: Adjustment factor 2	Adjustment factor 2: Dimming % area	Adjustment factor 2: Illuminance turndown	Light colour adjustment factors: Light colour adjustment factor 1	Light colour adjustment factors: Light colour adjustment factor 2	SATISFIES PART J7D3: System illumination power load allowance	SATISFIES PART J7D3: Lighting system share of % of aggregate allowance used
							These columns do not represent a requirement of the NCC and are suggestions only.		Adjustment factors			Adjustment factors						
1	Meeting room	28.0 m²	25 m	3.0 m	1 W	Board room and conference room											222 W	**25% of 0%**
2	Enclosed verandah	105.6 m²	50 m	3.0 m	1 W	Auditorium, church and public hall											1158 W	**25% of 0%**
3	Kitchen	12.8 m²	14 m	3.0 m	1 W	Kitchen and food preparation area											85 W	**25% of 0%**
4	Seating area	232.5 m²	101 m	3.0 m	1 W	Restaurant, café, bar, hotel lounge and a space for the serving and consumption of food or drinks											4284 W	**25% of 0%**

Total 4 W

Total 5749 W

if inputs are valid ✓

8.3 – Appendix C – Insulation Mark-Up

LEGEND

- R1.4 EXTERNAL METAL CLADDING WALLS
- R1.4 EXTERNAL DOUBLE BRICK WALLS
- R1.4 INTERNAL PLASTERBOARD WALLS
- R1.4 INTERNAL CAVITY BRICK WALLS
- R3.7 METAL FRAMED ROOF
- R3.7 CONCRETE SLAD ROOF
- R2.0 SLAB ON GROUND

R3.7 METAL FRAMED ROOF (IN FLOOR PLAN)

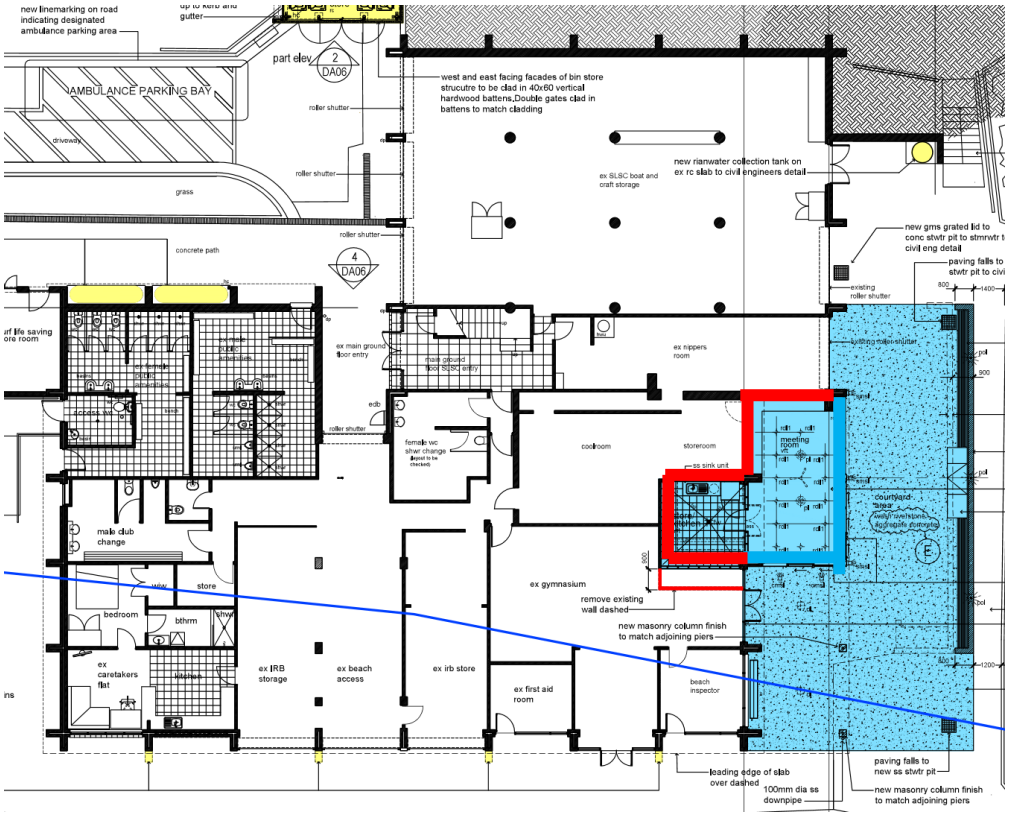


Figure 4 – Insulation markup - Ground Floor

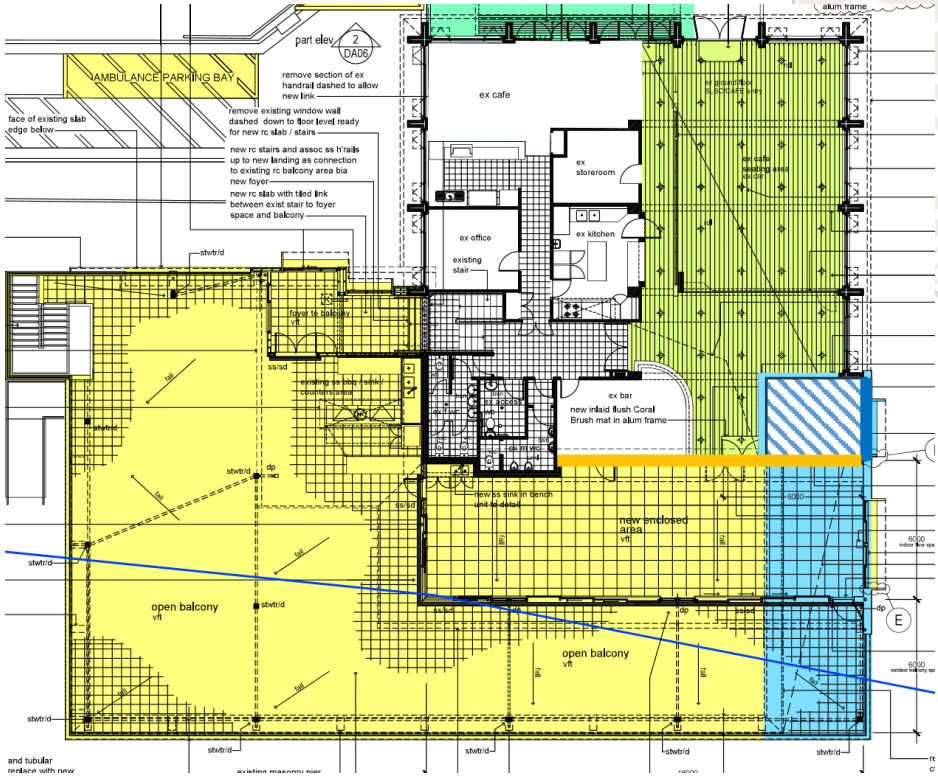


Figure 5 – Insulation markup - Upper Floor

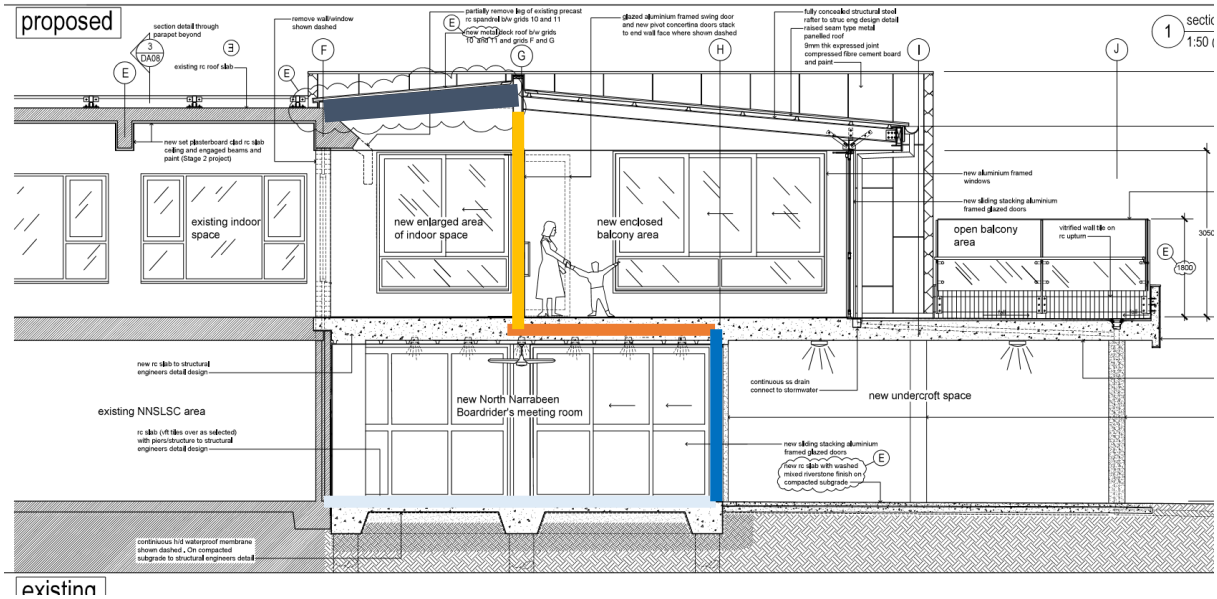


Figure 6 – Insulation markup - Section

8.4 – Appendix D – Artificial Lighting & Power Notes

1- A lighting timer must;
   a. be located within 2 m of every entry door to the space; and
   b. have an indicator light that is illuminated when the artificial lighting is off; and
   c. not control more than
      i. an area of 100 m^2 with a single push button timer; and
      ii. 95% of the lights in spaces of area more than 25 m^2; and
   d. be capable of maintaining the artificial lighting
      i. for not less than 5 minutes and not more than 15 minutes unless it is reset; and
      ii. without interruption if the timer is reset.

2- Time switch;
   a. A time switch must be capable of switching on and off electric power at variable pre-programmed times and on variable pre-programmed days.
   b. A time switch for internal lighting must be capable of being overridden by
      i. a means of turning the lights on, either by
         1. a manual switch or an occupant sensing device that on sensing a person's presence, overrides the time switch for a period of up to 2 hours, after which there is no further presence detected, the time switch must resume control; or
         2. an occupant sensing device that overrides the time switch upon a person's entry and returns control to the time switch upon the person's exiting, such as a security card reader; and
      ii. a manual "off" switch
   c. A time switch for external lighting must be capable of
      i. limiting the period the system is switched on to between 30 minutes before sunset and 30 minutes after sunrise is determined or detected including any pre-programmed period between these times; and
      ii. being overridden by a manual switch or a security access system for a period of up to 30 minutes, after which the time switch must resume control.
   d. A time switch for boiling water and chilled water storage units must be capable of being overridden by a manual switch or a security access system that senses a person's presence, overrides for a period of up to 2 hours, after which if there is no further presence detected, the time switch must resume control.

3- Motion detectors;
   a. In a Class 9b building, a motion detector must
      i. be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and
      ii. be capable of detecting
         1. a person before they have entered 1 m into the space; and
         2. movement of 500 mm within the useable part of the space; and
      ii. not control more than
         1. in other than a carpark an area of 500 m^2 with a single sensor or group of parallel sensors; and
         2. 75% of the lights in spaces using high intensity discharge; and
      iii. be capable of maintaining the artificial lighting when activated
         1. for a maximum of 30 minutes unless it is reset; and
         2. without interruption if the motion detector is reset by movement; and
      iv. not be overridden by a manual switch to permanently leave the lights on.
   b. When outside a building, a motion detector must

i. be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and
ii. be capable of detecting a person within a distance from the light equal to
    1. twice the mounting height; or
    2. 80% of the ground area covered by the light's beam; and
        ii. not control more than five lights; and
        iii. be operated in series with a photoelectric cell or astronomical time switch so that the light will not operate in daylight hours; and
        iv. be capable of maintaining the artificial lighting when the switch is on for a maximum of 10 minutes unless it is reset; and
        v. have a manual override switch which is reset after a maximum period of 4 hours.

4- Daylight sensor and dynamic lighting control device;

a. A daylight sensor and dynamic control device for artificial lighting must
    i. for switching on and off
        1. be capable of having the switching level set point adjusted between 50 and 1000 Lux; and
        2. have a delay of more than 2 minutes; and a differential of more than 100 Lux for a sensor controlling high pressure discharge lighting, and 50 Lux for a sensor controlling other than high pressure discharge lighting; and
        3. for dimmed or stepped switching, be capable of reducing the power consumed by the controlled lighting in proportion to the incident daylight on the working plane either
            5- continuously down to a power consumption that is less than 50% of full power; or
            6- in no less than 4 steps down to a power consumption that is less than 50% of full power.

a. Where a daylight sensor and dynamic control device has a manual override switch, the manual override switch must not be able to switch the lights permanently on or bypass the lighting controls.

9 - Disclaimer

Recommendations:

Based on the information available on the supplied drawings and data, I am of the opinion that there is nothing that should prevent this project from compliance with the requirements of the Building Code of Australia 2022.

This report is based on details available at the time of writing. Selected contractors and other parties contributing to the scope of the works should confirm that their supplied work will be in compliance with the BCA/NCC. It is advisable that this confirmation be requested prior to the commencement of construction. Final certification of BCA/NCC compliance at completion of works should be obtained to aid final certifier's approval.

Dimensions:

The dimensions used in this report are scaled from the supplied project documents. There may be some minor variation between the scaled dimensions, the dimensions on the window schedule and the actual dimensions on site.

Checked by:

Jamie Ian Bonnefin

BSc (Arch) MArch Cert IV (NatHERS Assessment)
HERA Assessor 10056

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