154-158 Pacific Pde, Dee Why

Section J Assessment – Deemed to Satisfy

Harrington Dee Why Pty Limited

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Prepared by:

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Harrington Dee Why Pty Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

SLR Consulting Pty Ltd (SLR) has been engaged by Harrington Dee Why Pty Limited to assess the proposed mixed-use development at 154-158 Pacific Pde, Dee Why, for compliance with the National Construction Code (NCC) 2022 provisions for Energy Efficiency under Section J. The objective of the NCC Section J is to reduce greenhouse gas emissions by efficiently using energy in buildings.

From the plans provided, the proposed development comprises the following features:

- Two (2) levels of basement car parking
- Ground Floor with retails, restaurant, and residential lobby area
- Level 1 to Level 3 with lobby area and residential apartments

The sub-classification for the proposed building is:

- Residential – Class 2
- Restaurant and Retail – Class 6
- Basement Carpark – Class 7a

This requirement has been defined in Volume 1 of the 2022 NCC under Section J and is titled Energy Efficiency. Eight Deemed-to-Satisfy subsections, J1 to J8, focus on separate aspects of energy efficiency.

- J1 - Building Fabric and Glazing.
- J3 - Building Sealing.
- J5 - Air Conditioning and Ventilation Systems.
- J6 - Artificial Lighting and Power.
- J7 - Heated Water Supply and Swimming Pool and Spa Pool Plant.
- J8 - Facilities for Energy Monitoring.

The NCC currently defines the development area as climate zone 5. This report covers the NCC Section J requirements of the non-residential components only (restaurant and retail)

SLR recommends the following to the building fabrics to comply with NCC 2022 Section J:

- Roof and ceiling insulation requirements have been specified within Table 1. SLR recommends R3.5 bulk insulation be added to the roof envelope where specified in Appendix A;
- Wall-glazing requirements and wall requirements have been specified within Table 2 and Table 3 SLR recommends R2.0 bulk insulation be added to wall envelope where specified in Appendix C; and
- Table 4 specifies floor insulation requirements. SLR recommends adding R1.7 bulk insulation to the floor envelope where specified in Appendix B.

This report contains requirements for building sealing, air conditioning, artificial lighting, hot water supply, and the Facilities for Energy Monitoring.

This report has provided advice about each subsection under Section J and identified how compliance with the NCC can be achieved regarding the proposed building. It shall remain the responsibility of the building designers to ensure that the installation meets the requirements of this report, and in turn the NCC.

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1.0 Introduction

SLR Consulting Pty Ltd (SLR) has been engaged by Harrington Dee Why Pty Limited to assess the proposed mixed-use development at 154-158 Pacific Pde, Dee Why, for compliance with the National Construction Code (NCC) 2022 provisions for Energy Efficiency under Section J. The objective of the NCC Section J is to

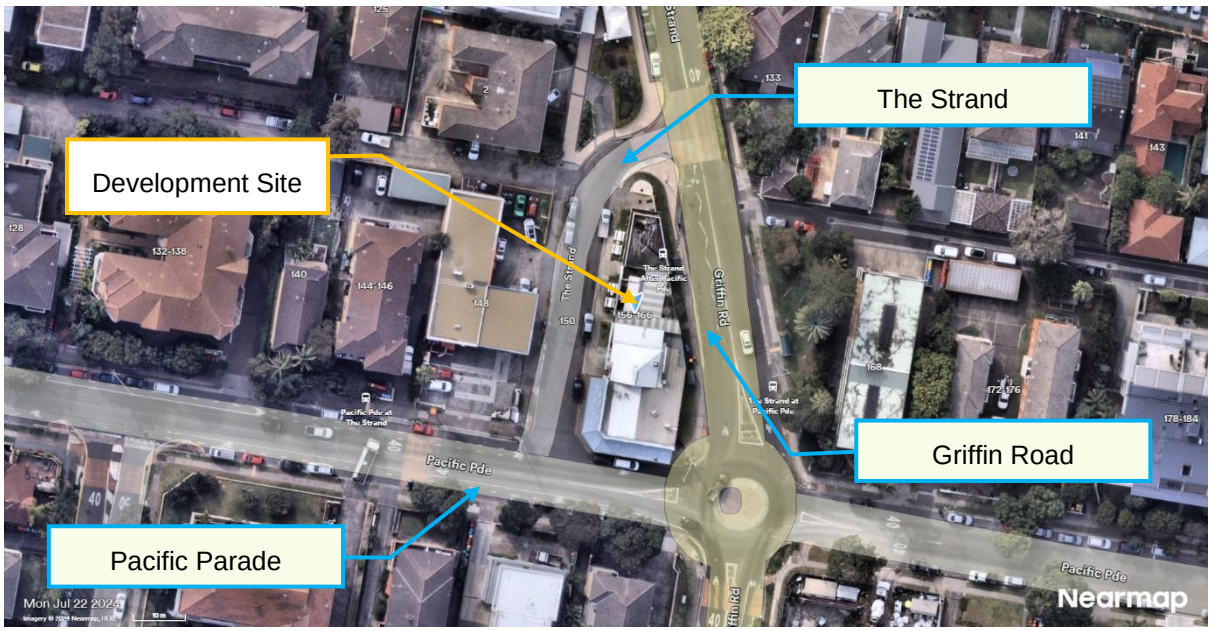
a. reduce energy consumption and energy peak demand;

b. and reduce greenhouse gas emissions;

c. and improve occupant health and amenity.

The project site is located at 154-158 Pacific Pde, Dee Why, is just a short walk from Dee Why Beach. It is bounded by The Strand to the west, Griffin Road to the east, and Pacific Parade to the south. The surrounding area includes residential buildings, local shops, and various amenities.

Figure 1: Representative Architectural Plan Views of the Development



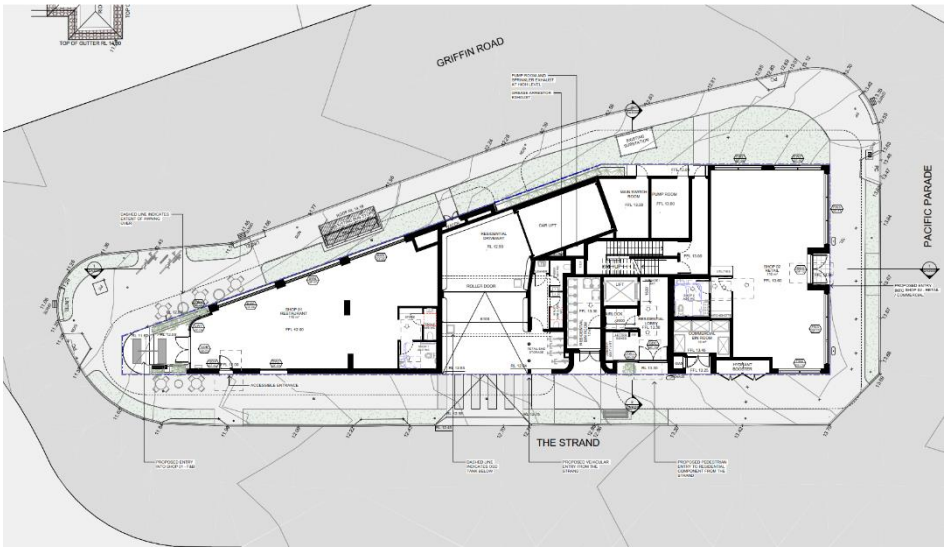
1.1 Proposed Development Description

The proposal is for construction of a mixed-use development at 154-158 Pacific Pde, Dee Why. From the plans provided, the proposed development will consist of the following:

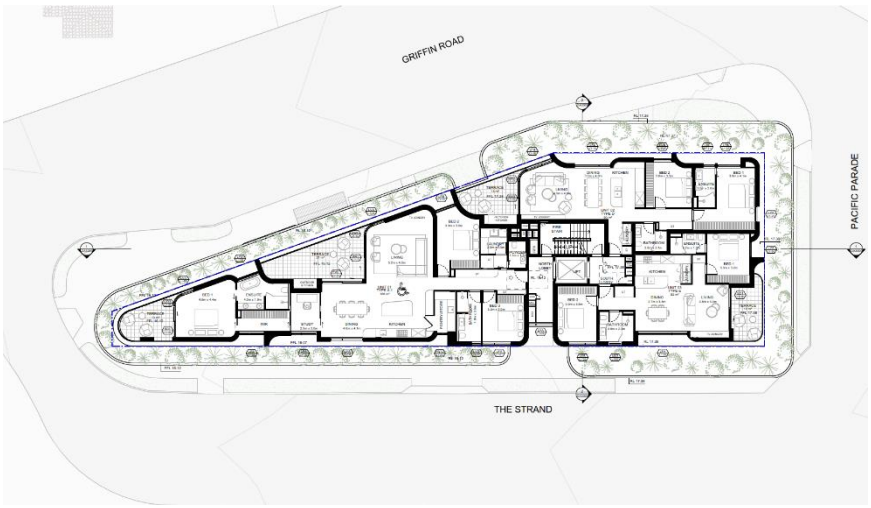
- Two (2) levels of basement car parking
- Ground Floor with retails, restaurant, and residential lobby area
- Level 1 to Level 3 with lobby area and residential apartments

Figure 2: Representative Architectural Plan Views of the development

Ground Floor



Level 01



2.0 Building Code of Australia Energy Efficiency Requirements

Since the 2006 release of the Building Code of Australia (BCA) it is a mandatory requirement for all BCA class buildings, except Class 4 and Class 10 buildings, to achieve efficient use of energy.

This requirement has been defined in Volume 1 of the 2022 NCC under Section J and is titled *Energy Efficiency*. There are eight (7) Deemed-to-Satisfy subsections, J2 to J9, that focus on separate aspects of energy efficiency.

- J4 - Building Fabric.
- J5 - Building Sealing.
- J6 - Air Conditioning and Ventilation Systems.
- J7 - Artificial Lighting and Power.
- J8 - Heated Water Supply and Swimming Pool and Spa Pool Plant.
- J9D3 - Facilities for Energy Monitoring.

This report will provide advice about each subsection and identify how compliance with the NCC can be achieved for these new requirements regarding the proposed development.

It shall remain the responsibility of the building designers to ensure that the installation meets the requirements of this report, and in turn the NCC.

2.1 Defining the Building Class

The sub-classification for the proposed building is:

- Residential – Class 2
- Restaurant and Retail – Class 6
- Basement Carpark – Class 7a

2.2 Defining the Energy Efficiency Requirements

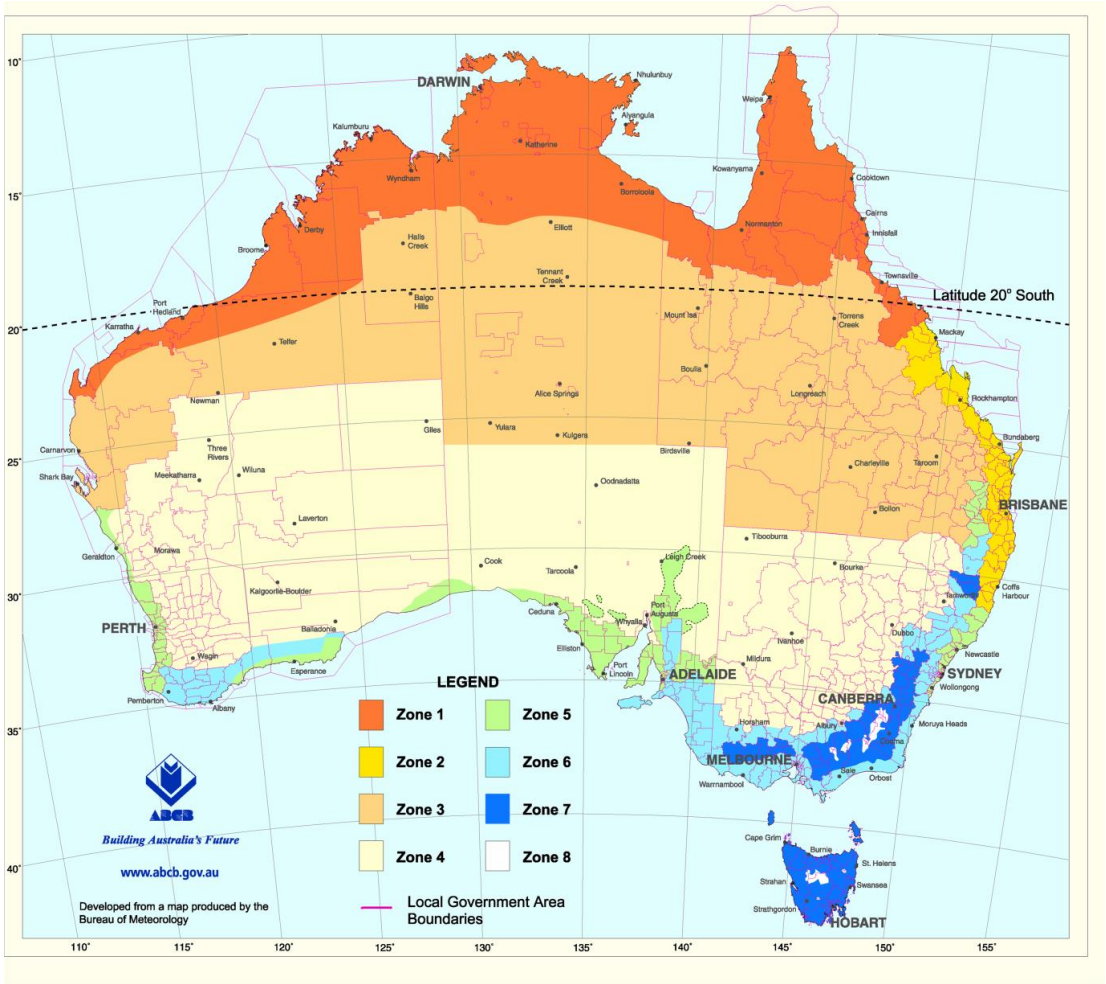
The objective of Section J from Volume 1 of the NCC defines this section as being applicable to Class 2 to 9 buildings, other than Class 7, 8 or 9b buildings that do not have conditioned space. In this instance of the proposed development, there are requirements for compliance with Section J.

This report assumes the 2022 NCC Section J compliance for this development will be achieved through the Deemed-to-Satisfy method. To achieve compliance with Section J of the 2022 NCC, the proposed development must satisfy and achieve all requirements of every Deemed-to-Satisfy subsection. This report will include the requirements for the class 9b public halls - conditioned within the 2022 NCC Section J scope via the deemed-to-satisfy method.

2.3 Defining the BCA Climate

As the proposed development is situated within Northern Beaches Council, parts of the NCC requirements will be based on these climate characteristics. The NCC currently defines the development area as climate zone 5 (shown in **Figure 3**).

Figure 3 : Building Code of Australia Climate Zone Map



2.4 Design Documents

The report is prepared based on the architectural drawing set provided 11 November 2024. The mark-up drawings used in this report are attached in Appendices.

3.0 Part J4 – Building Fabric

Part J4 of the 2022 NCC contains the requirements of the Deemed-to-Satisfy compliance of the building fabric. The purpose of this subsection is to ensure that the building fabric will provide sufficient thermal insulation to minimise heating and cooling loads placed on the building and the commensurate energy consumption HVAC systems servicing internal building spaces.

3.1 J4D2 – Application

As stated by the 2022 NCC, Part J1 applies to the Class 9b building.

3.2 J4D3 – General Thermal Construction

Where thermal insulation is installed in exterior envelope walls or roof of the proposed development, the insulation must comply with AS/NZS 4859.1 and be installed so that it:

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;

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.

Where reflective insulation is installed in exterior envelope walls or roof of the proposed development, it must be installed with:

a. the necessary airspace to achieve the *required R-Value* between a reflective side of the *reflective insulation* and a building lining or cladding;

b. the *reflective insulation* closely fitted against any penetration, door or *window* opening;

c. the *reflective insulation* adequately supported by framing members; and

d. each adjoining sheet of roll membrane being:

- overlapped not less than 50 mm; or
- taped together.

Where bulk insulation is installed in exterior envelope walls or roof of the proposed development, it must be installed so that:

- 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
- in ceilings where there is no bulk insulation or *reflective insulation* in the wall, it overlaps the wall member by not less than 50 mm.

The required Total R-Value and Total System U-Value, including allowance for thermal bridging, must be

- calculated in accordance with AS/NZS 4859.2 for a roof or floor; or
- determined in accordance with Specification 37 for wall-glazing construction; or

- determined in accordance with Specification 39 or Section 3.5 of CIBSE Guide A for soil or sub-floor spaces.

3.3 J4D4 – Roof and Ceiling Insulation

The proposed development is located in climate zone 5, the roof and ceiling system that is part of the envelope must achieve the minimum Total R-value of:

- in climate zones 1, 2, 3, 4 and 5, R3.7 for a downward direction of heat flow; and
- in climate zones 6, R3.2 for a downward direction of heat flow; and
- 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.

The roof/ceiling system for the roof exposed to unconditioned areas of the development is:

- Concrete slab + Insulation + PB

Table 1 Roof R-value

Proposed Roofing System	R-Value	R-Value Requirement	Compliance	Additional R-Value Required	Recommendations
Concrete slab + Plasterboard	0.3	3.7 (with a roof upper surface solar absorptance value not more than 0.45)	Compliance Readily Achievable	3.4	SLR recommends R3.5 roof insulation to roof/ceiling.

Detailed markups of required roof insulation are shown in **Appendix A**.

3.4 J4D5 – Roof Lights

No roof lights have been provided to the proposed commercial building areas, therefore this section is not applicable.

3.5 J4D6 – Walls and Glazing

The Total System U-Value of wall-glazing construction must not be greater than—

- 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
- 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.

The Total System U-Value of display glazing must not be greater than U5.8.

The Total System U-Value of wall-glazing construction must be calculated in accordance with Specification 37.

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

The solar admittance of externally facing wall-glazing construction must not be greater than—

(i) 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

(ii) for a Class 3 or 9c building or a Class 9a ward area, the values specified in Table J4D6c.

The solar admittance of a wall-glazing construction must be calculated in accordance with Specification 37.

The Total system SHGC of display glazing must not be greater than 0.81 divided by the applicable shading factor specified in Clause 7 of Specification 37c7.

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	0.42	0.36

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

Table 2 Wall-Glazing Calculation Results and Recommended average U-value and SHGC

Description	Facade	Wall-Glazing U-Value[1]	Solar Admittance	Compliance[2]		Recommended Average[3] – Glazing System	
				Method 1	Method 2 (Combined)	U-Value	SHGC
Shop 1 - Restaurant	North	5.62	0.14	No	Yes	4.8	0.33
	East	2.87	0.12	No	Yes	4.8	0.24
	South	0.42	-	Yes	Yes	No Glazing	No Glazing
	West	1.05	0.03	Yes	Yes	4.8	0.33
Shop 2 - Retail	North	1.38	-	Yes	Yes	No Glazing	No Glazing
	East	2.38	0.08	No	Yes	4.2	0.48
	South	2.22	0.18	No	Yes	4.2	0.48
	West	1.72	0.05	Yes	Yes	4.2	0.48

Table 3 R-value of Proposed Wall System

Proposed Wall System	Proposed Average Wall R-Value[4]	Solar Adsorption	Compliance	Recommendations
Concrete Block + Plasterboard	R0.37	0.35	Compliance Readily Achievable	Additional insulation is required to meet the prescribed average R-value. The additional R-value required would be R2.0.

Wall-glazing calculations summary reports are shown in **Appendix C**.

Note:

U-value for the wall glazing system including Aluminium frame.

[2] Nominated compliance pathway: Either method can achieve compliance

[3] A JV3 Alternative Solution offers opportunities to reduce/remove higher glazing options finish.

[4] Average R-value is calculated for a Concrete wall with 10mm Plasterboard. Any other alternative wall system with a minimum R2.32 can satisfy the DtS requirements.

3.6 J4D7 – Floors

A floor must achieve the total R-value specified in Table J4D7.

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

Note to Table J1.6: For the purpose of calculating the Total R-Value of a floor, the sub-floor and soil R-Value must be calculated in accordance with Specification 39 or Section 3.5 of CIBSE Guide A.

The proposed floor system is as described below:

- Suspended concrete floor

Table 4 Summarises the R-values of the proposed floor systems, and the recommendations to achieve compliance.

Table 4 Floor Systems Summary and Recommendations

Proposed System	R-Value	R-Value Requirement	Compliance	Additional R-Value Required	Recommendations
Suspended Concrete Slab	0.3	2.0	Compliance Readily Achievable	1.7	SLR recommends additional insulation of R1.7 be applied to concrete slab.

Detailed mark ups of required floor insulation are shown in **Appendix B**.

4.0 Part J5 – Building Sealing

Part J5 of the 2022 NCC contains the requirements of the Deemed-to-Satisfy compliance for building sealing. The purpose of this subsection is to ensure that additional heating and cooling loads will not be introduced through building leakage.

4.1 J5D2 – Application

Building sealing is applicable to the conditioned spaces within the building.

4.2 J5D3 – Chimneys and Flues

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.

4.3 J5D4 – Roof Lights

No roof lights have been provided to the proposed commercial building areas, therefore this section is not applicable.

4.4 J5D5 – External Windows and Doors

The Part J5D5 of the NCC Section J requirements will apply to the development.

Part J5D5 of the 2022 NCC requires that a seal to restrict air infiltration must be fitted to each edge of an external door, openable external window or the like when serving a conditioned space. This requirement does not apply to:

- a window complying with AS 2047; or
- a fire door or smoke door; or
- a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security.

The seal may be a foam or rubber compressible strip, fibrous seal or the like.

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.

A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like.

4.5 J5D6 – Exhaust fans

An exhaust fan must be fitted with a sealing device such as a self-closing damper.

4.6 J5D7 – Construction of ceilings, walls and floors

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.

4.7 J5D8 – Evaporative coolers

An evaporative cooler must be fitted with a self-closing damper or the like—

(i) when serving a heated space; or

(ii) in climate zones 4, 5, 6, 7 or 8.

5.0 Part J6 – Air Conditioning and Ventilation Systems

Part J6 of the 2022 NCC contains the requirements of the Deemed-to-Satisfy compliance of a building's air conditioning and ventilation systems. The purpose of this subsection is to ensure that conditioned air (when required) is generated, controlled and supplied to the building in an energy efficient manner. This subsection also ensures that ventilation and exhaust systems are efficient, while also keeping the wasted conditioned air to a minimum.

The mechanical services engineer should ensure that the proposed air-conditioning systems for the development comply with the following sections.

5.1 J6D2 – Application

The Deemed-to-Satisfy Provisions of this Part do not apply to a Class 8 electricity network substation.

5.2 J6D3 – Air Conditioning System Control

The air-conditioning unit or system serving the conditioned spaces is to comply with the following performance requirements.

An air-conditioning unit or system must:

- Be capable of -
    - being inactivated when the building served is not occupied; and
- Thermostatically control the temperature of each zone or area when serving more than one zone
- Provides the required mechanical ventilation, other than in climate zone 1 or where dehumidification control is needed, must have an outdoor air economy cycle if the total air flow rate of any airside component of an air-conditioning system is greater than or equal to the figures in **Table 5**.
- 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.
- Contains more than one water heater, chiller or coil, must be capable of stopping the flow of water to those not operating; and with an airflow of more than 1000 L/s, must have a variable speed fan when its supply air quantity is capable of being varied;

Table 5 Copy of Table J6D3 - Requirement for an outdoor air economy cycle

Table J6D3 Requirement for an outdoor air economy cycle

Climate zone	Total air flow rate requiring an economy cycle (L/s)
2	9000
3	7500
4	3500
5	3000
6	2000
7	2500
8	4000

5.3 J6D4 – Mechanical Ventilation System Control

This subsection of J6D4 applies all components of the proposed development as all spaces are to be mechanically ventilated. The mechanical ventilation systems are to comply with the following performance requirements.

A mechanical ventilation system must:

- Be capable of being deactivated when the building or part of the building served by that system is not occupied; and
- When serving a conditioned space-
    - Not provide mechanical ventilation in excess of the minimum quantity required by part F6 of the NCC for a mechanical ventilation system, where relevant, by more than 20% other than where there is-
        - Additional unconditioned outside air supplied to provide free cooling or to balance process exhaust as from a health-care building or laboratory; or
        - additional exhaust ventilation needed to balance the required mechanical ventilation; or
        - an energy reclaiming system that preconditions outsider air.
    - Where the number of square metres per person is 1 or less as specified in NCC section D1.13 and the air flow rate is more than 1000 L/s, have-
        - An energy reclaiming system that preconditions outsider air; or
        - The ability to automatically modulate the mechanical ventilation required by Part F4 in proportion to the number of occupants; and
- When the mechanical ventilation is provided by means other than an air-conditioning system and the air flow rate is more than 1000 L/s-
    - Have a fan power to air flow rate ration of 0.65 W/ (L/s) without filters or 0.98 W/ (L/s) with filters for a general mechanical ventilation system.

5.4 J6D4 – Time Switch

Part J6D4 applies to the proposed development where applicable.

- A time switch must be provided to a mechanical ventilation system with an air flow rate of more than 1000 L/s.
- The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.
- The above requirements do not apply to—

    (i) a mechanical ventilation system that serves—

        a. only one sole-occupancy unit in a Class 2, 3 or 9c building; or
        b. a Class 4 part of a building; or

    (ii) a building where mechanical ventilation is needed for 24-hour occupancy.

5.5 J6D5 – Fan and Duct Systems

There are two options to demonstrate that a fan system that forms part of an air-conditioning system is compliant with J6D5.

- The first option is to demonstrate that each of the individual components of a fan system are individually more efficient than the values specified in J6D5.
- The second option is to demonstrate that the fan system as a whole is more efficient than a system that is designed meeting the individual component requirements.

5.6 J6D6 – Ductwork Insulation

Ductwork and fittings in an air-conditioning system must be provided with insulation—

- complying with AS/NZS 4859.1; and
- having an insulation R-Value greater than or equal to—
    - for flexible ductwork, 1.0; or
    - for cushion boxes, that of the connecting ductwork; or
    - that specified in Table J6D6.

Insulation must—

- be protected against the effects of weather and sunlight; and
- be installed so that it abuts adjoining insulation to form a continuous barrier; and maintains its position and thickness, other than at flanges and supports.

5.7 J6D7 – Ductwork sealing

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.

5.8 J6D8 – Pump Systems

Pumps and pipework that form part of an air-conditioning system must either—

- separately comply with
- achieve a pump motor power per unit of flowrate lower than the pump motor power per unit of flowrate achieved when applying together.

5.9 J6D9 – Pipework insulation

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—

- complying with AS/NZS 4859.1
- for piping of heating and cooling fluids, having an insulation R-Value in accordance with Table J6D9a; and
- for vessels, heat exchangers or tanks, having an insulation R-Value in accordance with Table J6D9b; and
- for refill or pressure relief piping, having an insulation R-Value equal to the required insulation R-Value of the connected pipe, vessel or tank within 500 mm of the connection.

Table 6 Copy of Table J6D9a Piping – Minimum Insulation R value

Table J6D9a Piping — Minimum insulation R-Value

Fluid temperature	Minimum insulation R-Value nominal pipe diameter ≤ 40 mm	Minimum insulation R-Value — nominal pipe diameter > 40 mm and ≤ 80 mm	Minimum insulation R-Value — nominal pipe diameter between > 80 mm and ≤ 150 mm	Minimum insulation R-Value — nominal pipe diameter > 150 mm
Low temperature chilled — ≤ 2°C	1.3	1.7	2.0	2.7
Chilled — > 2°C but ≤ 20°C	1.0	1.5	2.0	2.0
Heated — > 30°C but ≤ 85°C	1.7	1.7	1.7	1.7
High Temperature heated — > 85°C	2.7	2.7	2.7	2.7

Table 7 Copy of Table J6D9b Vessels, Heat Exchangers and Tanks — Minimum Insulation R-Value

Table J6D9b Vessels, heat exchangers and tanks — Minimum insulation R-Value

Fluid temperature range	Minimum insulation R-Value
Low temperature chilled — ≤ 2°C	2.7
Chilled — > 2°C but ≤ 20°C	1.8
Heated — > 30°C but ≤ 85°C	3.0
High temperature heated — > 85°C	3.0

5.10 J6D10 – Space Heating

- A heater used for air-conditioning or as part of an air-conditioning system must be a solar heater; or a gas heater; or a heat pump; or a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or 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(1)(b)(iii); or

any combination of a solar heater to an electric heater.

- An electric heater may be used for heating a bathroom in a Class 2, 3, 9a or 9c building if the heating capacity is not more than 1.2 kW and the heater has a timer.

- A gas water heater, that is used as part of an air-conditioning system, must—

    a) if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86%; or

    b) if rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%.

5.11 J6D11 – Refrigerant chillers

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.

5.12 J6D12 – Unitary air-conditioning equipment

Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS.

5.13 J6D13– Heat rejection equipment

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.

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—

- a refrigerant chiller in an air-conditioning system that complies with the energy efficiency ratios in J6D11;

- packaged air-conditioners, split systems, and variable refrigerant flow air-conditioning equipment that complies with the energy efficiency ratios in J6D12.

Table 8 Copy of Table J6D13 Maximum Fan Motor Power — Cooling Towers, Closed Circuit Coolers and Evaporative Condensers

Table J6D13 Maximum fan motor power – Cooling towers, closed circuit coolers and evaporative condensers

Type	Cooling tower maximum fan motor input power (W/kW_{rej})	Closed circuit cooler maximum fan motor input power (W/kW_{rej})	Evaporative condenser maximum fan motor input power (W/kW_{rej})
Induced draft	10.4	16.9	11.0
Forced draft	19.5	Note	11.0

6.0 Part J7 – Artificial Lighting and Power

Part J7 of the 2022 NCC contains the requirements of the Deemed-to-Satisfy compliance of a building's artificial lighting and power. The purpose of this subsection is to ensure that efficient lighting systems are installed to maintain required lighting levels while keeping energy consumption to a minimum. This subsection also ensures that effective lighting control is utilised to reduce wasted energy consumption.

6.1 J7D2 – Application

As stated by the 2022 NCC, Part J7 applies to all classes of buildings with the exception of Class 8 electricity network substation. **Part J7 therefore applies to the proposed development.**

6.2 J7D3 – Artificial Lighting

There is a requirement for the proposed building that the artificial lighting must not exceed the maximum lamp power density in **Table 9**, except that in a bathroom, dressing rooms or the like, an average artificial *light source efficacy* of not less than 40 Lumens/W may be used.

Table 9 Maximum Lamp Power Density

Location	Maximum Lamp Power Density (W/m^2)
Auditorium, church and public hall (class 9b)	8
Board room and conference room	5
Carpark - general	2
Carpark - entry zone (first 15 m of travel) during the daytime	11.5
Carpark - entry zone (next 4 m of travel) during the day	2.5
Carpark - entry zone (first 20 m of travel) during the night time	2.5
Common rooms, spaces and corridors in a Class 2 building	4.5
Control room, switch room and the like - intermittent monitoring	3
Control room, switch room and the like - constant monitoring	4.5
Corridors	5
Entry lobby from outside the building	9
Kitchen and food preparation area	4
Office - artificially lit to an ambient level of less than 200 lx	2.5
Plant room where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4
Restaurant, café, bar, hotel lounge and a space for the serving and consumption of food or drinks	14

Retail space including a museum and gallery whose purpose is the sale of objects	14
Sole occupancy unit of a Class 3 building	5
Storage	1.5
Service areas such as cleaner's room and the like	1.5
Toilet, locker room, staff room, rest room	3
Wholesale storage area with a vertical illuminance target of 160 lx	4
Stairways, including fire-isolated stairways	2
Lift cars	3

The maximum illuminance power density may be increased by multiplying by any adjustment factor provided in NCC Table J7D3b which provides adjustment factors based on methods of controlling the lighting systems, such as motion detectors, dimming systems and room properties.

6.3 J7D4 – Interior Artificial Lighting and Power Control

A light switch must be located in a visible position in the room or space being switched, or in an adjacent room or space from where the lighting being switched is visible. The light switch must not operate lighting within an area of more than 250 m^2.

These lighting and power control requirements do not apply to Emergency Lighting in accordance with Part E4, NCC Volume One.

6.4 J7D5 – Interior Decorative and Display Lighting

Any interior/ lighting for display or decorative purposes, such as the illumination of foyer murals, must be separately controlled from other artificial lighting.

Each group of decorative/display lighting must be controlled by a manual light switch.

6.5 J7D6 – Exterior Artificial lighting

Artificial lighting around the perimeter of a building will be controlled by a time switch or daylight sensor complying with Section J6 lighting controls requirements.

A time switch needs to abide by the specification set out in the 2022 NCC. Switching on and off electric power to systems at variable pre-programmed times and on variable pre-programmed days.

When the total perimeter lighting load exceeds 100W, it must have an average light source efficacy of not less than 60 Lumens/W or be controlled by a motion detector in accordance with Specification 40 and when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with Specification 40.

6.6 J7D7 – Boiling Water and Chilled Water Storage Units

Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification 40.

6.7 J7D8 – Lifts

No lifts have been provided to the proposed commercial building areas, therefore this section is not applicable.

6.8 J7D9 – Escalators and moving walkways

No escalators or moving walkways have been provided to the proposed commercial building areas, therefore this section is not applicable.

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

Part J8 of the 2022 NCC contains the requirements of the Deemed-to-Satisfy compliance of a building's hot water supply system. The purpose of this subsection is to ensure that efficient hot water units and systems are installed.

7.1 J8D2 - Heated water supply

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.

8.0 Part J9 – Facilities for energy monitoring

Part J9 of the 2022 NCC contains the requirements of the Deemed-to-Satisfy compliance of a building's Facilities for energy monitoring. The purpose of this subsection is to ensure that access can be gained to all services and 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.

8.1 J9D2 - Application

As stated by the 2022 NCC, Part J9 does not apply to within a sole-occupancy unit of a Class 2 building or a Class 4 part of a building; or to a Class 8 electricity network substation. Part J9 therefore applies to the proposed development.

8.2 J9D3 Facilities for energy monitoring

(a) A building or sole-occupancy unit with a floor area of more than 500 m^2 must have the facility to record the consumption of gas and electricity.

(b) A building with a floor area of more than 2,500 m^2 must have the facility to record individually the energy consumption of:

i. air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans;

ii. artificial lighting;

iii. appliance power;

iv. central hot water supply;

v. internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and

vi. other ancillary plant.

8.3 J9D4 Facilities for Electric Vehicle Charging Equipment

- 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.

- 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. 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 when associated with a Class 2 building; and
    c. 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 when associated with a Class 5 to 9 building; and
    d. 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
    e. 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
    f. be labelled to indicate the use of the space required by (f) is for the future installation of metering equipment.

8.4 J9D5 Facilities for Solar Photovoltaic and Battery Systems

- The main electrical switchboard of a building must contain at least two empty three-phase circuit breaker slots and four DIN rail spaces labelled to indicate the use of each space for a solar photovoltaic system and a battery system; and be sized to accommodate the installation of solar photovoltaic panels producing their maximum electrical output on at least 20% of the building roof area.

- At least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels, except for buildings—
    a. with installed solar photovoltaic panels on at least 20% of the roof area; or 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 55 m2; or

d. where more than 50% of the roof area is used as a terrace, carpark, roof garden, roof light or the like.

9.0 Conclusion

SLR Consulting Pty Ltd (SLR) has been engaged by Harrington Dee Why Pty Limited to assess the proposed mixed-use development at 154-158 Pacific Pde, Dee Why, for compliance with the National Construction Code (NCC) 2022 provisions for Energy Efficiency under Section J. The objective of the NCC Section J is to reduce greenhouse gas emissions by efficiently using energy in buildings.

From the plans provided, the proposed development comprises the following features:

- Two levels of basement car parking
- Ground Floor with retails, restaurant, and residential lobby area
- Level 1 to Level 3 with lobby area and residential apartments

The sub-classification for the proposed building is:

- Residential – Class 2
- Restaurant and Retail – Class 6
- Basement Carpark – Class 7a

This requirement has been defined in Volume 1 of the 2022 NCC under Section J and is titled Energy Efficiency. Eight Deemed-to-Satisfy subsections, J1 to J8, focus on separate aspects of energy efficiency.

- J1 - Building Fabric and Glazing.
- J3 - Building Sealing.
- J5 - Air Conditioning and Ventilation Systems.
- J6 - Artificial Lighting and Power.
- J7 - Heated Water Supply and Swimming Pool and Spa Pool Plant.
- J8 - Facilities for Energy Monitoring.

The NCC currently defines the development area as climate zone 5. This report covers the NCC Section J requirements of the non-residential components only (restaurant and retail)

SLR recommends the following to the building fabrics to comply with NCC 2022 Section J:

- Roof and ceiling insulation requirements have been specified within Table 1. SLR recommends R3.5 bulk insulation be added to the roof envelope where specified in Appendix A;
- Wall-glazing requirements and wall requirements have been specified within Table 2 and Table 3 SLR recommends R2.0 bulk insulation be added to wall envelope where specified in Appendix C; and
- Table 4 specifies floor insulation requirements. SLR recommends adding R1.7 bulk insulation to the floor envelope where specified in Appendix B.

10.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our Charity Partner - Lifeline, for every completed form.

Appendix A NCC 2022 roof/ceiling insulation requirements

154-158 Pacific Pde, Dee Why

Section J Assessment – Deemed to Satisfy

Harrington Dee Why Pty Limited

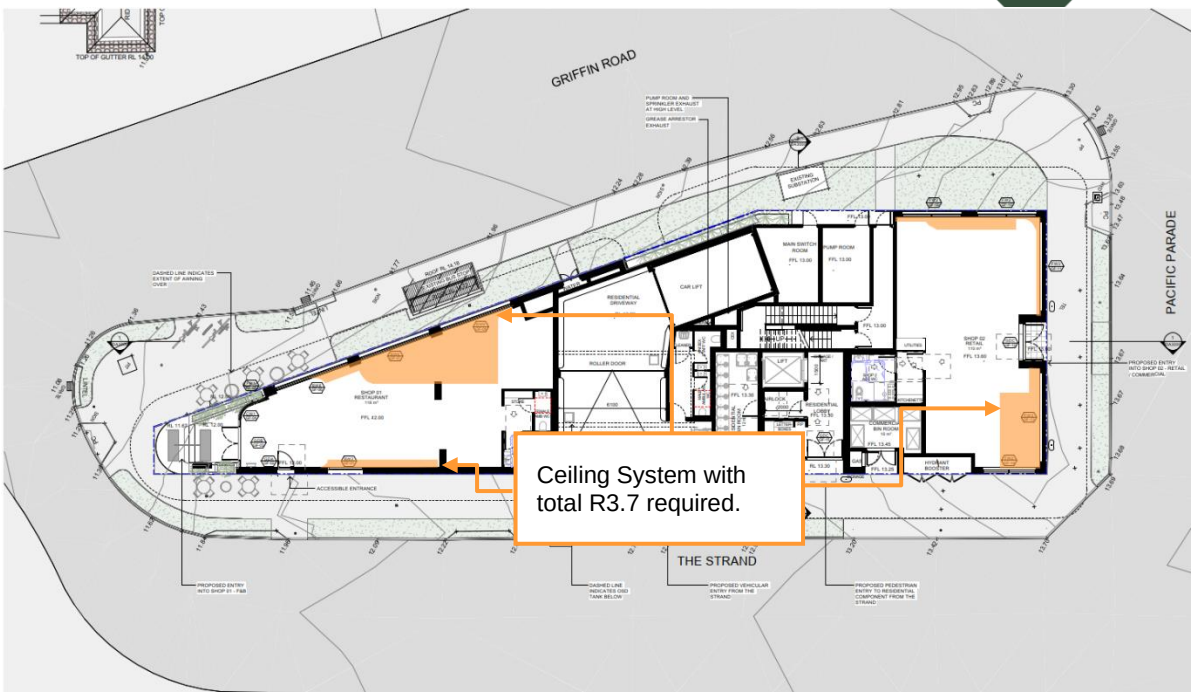
SLR Project No.: 610.032229.00002

26 November 2024

A.1 NCC 2022 Roof/Ceiling Insulation Requirements

Figure 4: Representative Architectural Plan Views of the Development

Ground Floor



Appendix B NCC 2022 envelope floor DTS requirements

154-158 Pacific Pde, Dee Why

Section J Assessment – Deemed to Satisfy

Harrington Dee Why Pty Limited

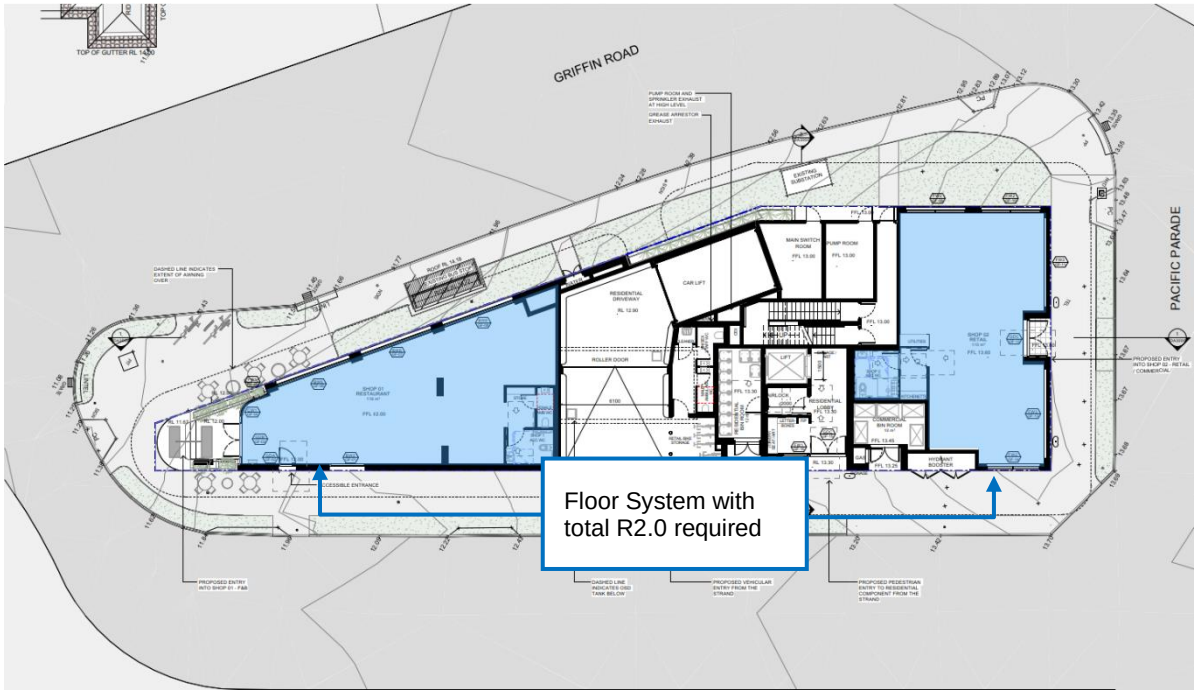
SLR Project No.: 610.032229.00002

26 November 2024

B.1 NCC 2022 Envelope Floor DTS Requirements

Figure 5: Representative Architectural Plan Views of the development

Ground Floor



Appendix C Marked-up drawing for and NCC 2022 wall-glazing calculator DTS requirements external wall

154-158 Pacific Pde, Dee Why

Section J Assessment – Deemed to Satisfy

Harrington Dee Why Pty Limited

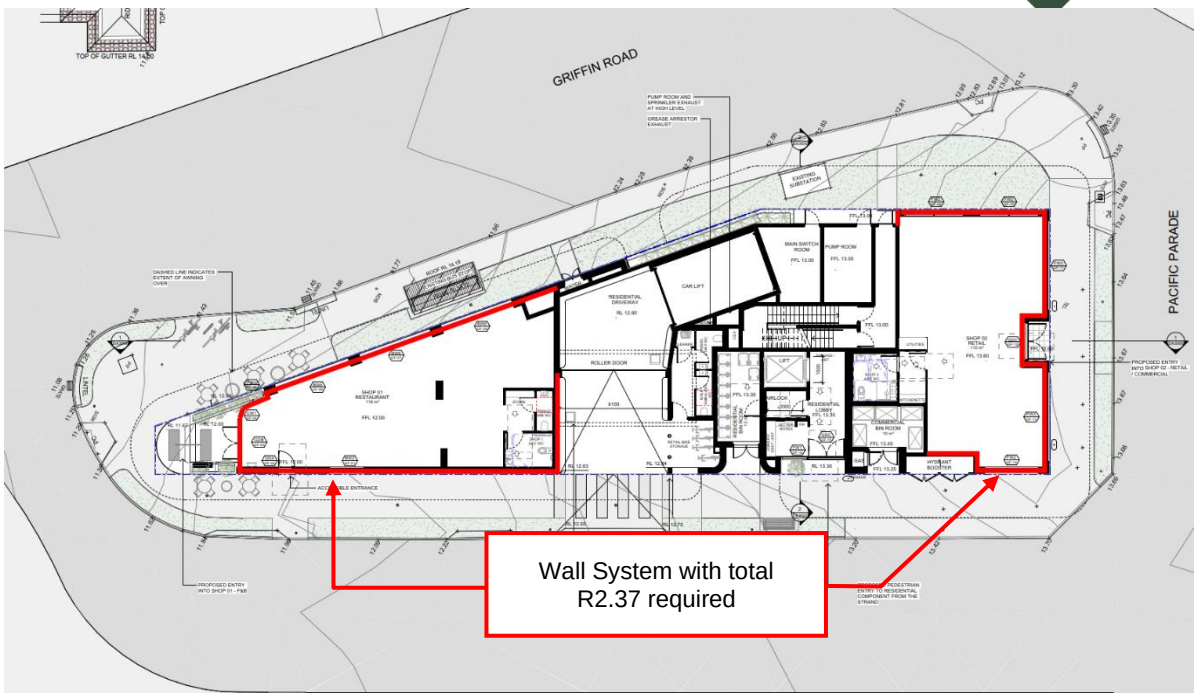
SLR Project No.: 610.032229.00002

26 November 2024

C.1 Marked-up drawing for external wall and NCC 2022 wall-glazing calculator DTS requirements

Figure 6: Representative Architectural Plan Views of the development

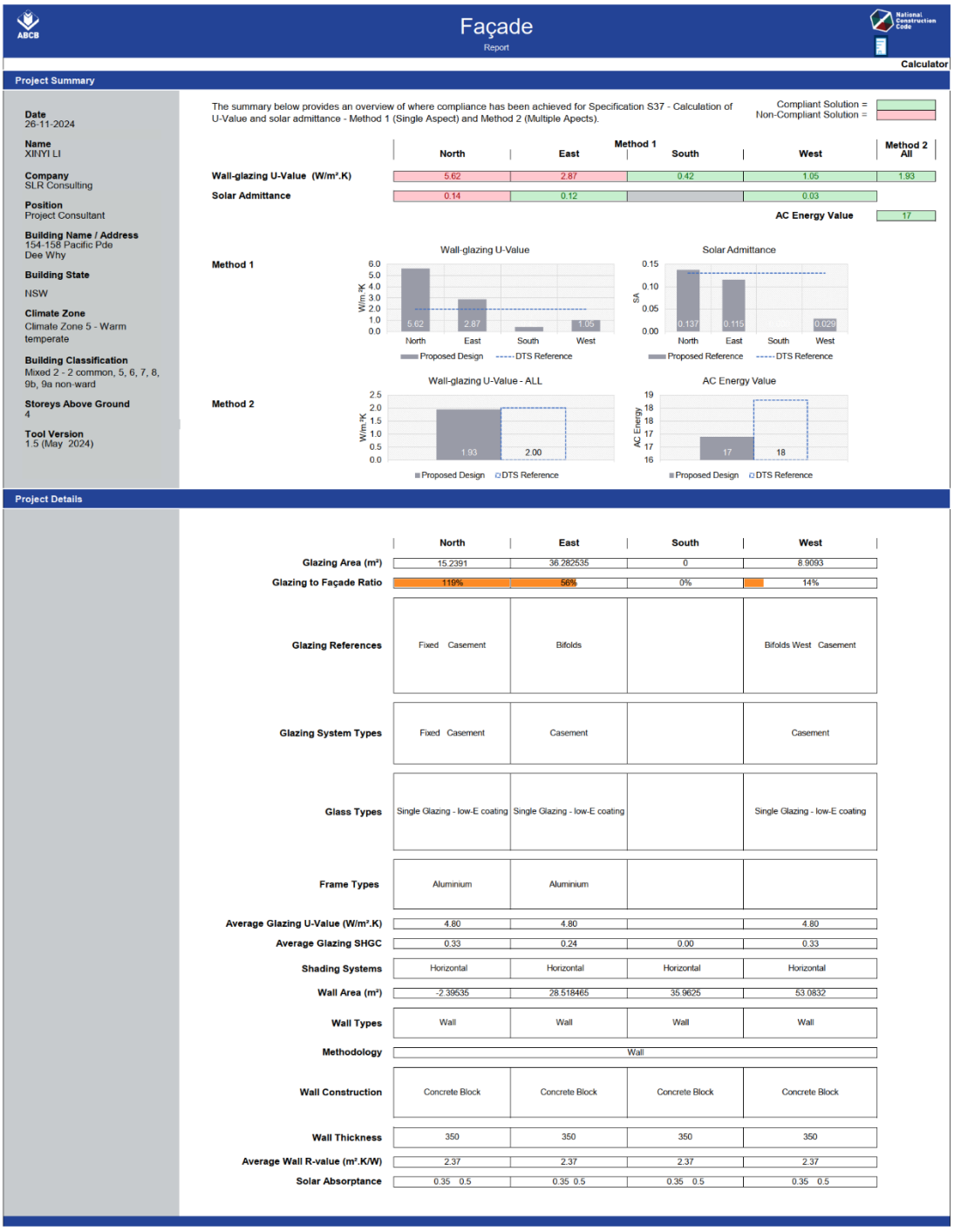
Ground Floor



Appendix D Glazing Calculator

D.1 Glazing calculators

Figure 7: Calculation of U value and solar admittance for Shop 1 - Restaurant from the Façade calculator-NCC-Volume-One- 2022



ABCB

Façade

Report

National Construction Code

Calculator

Project Summary

Date
26-11-2024

Name
XINYI LI

Company
SLR Consulting

Position
Project Consultant

Building Name / Address
154-158 Pacific Pde
Dee Why

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Mixed 2 - 2 common, 5, 6, 7, 8, 9b, 9a non-ward

Storeys Above Ground
4

Tool Version
1.5 (May 2024)

The summary below provides an overview of where compliance has been achieved for Specification S37 - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

	Method 1 North	East	South	West	Method 2 All
Wall-glazing U-Value (W/m².K)	5.62	2.87	0.42	1.05	1.93
Solar Admittance	0.14	0.12		0.03	
AC Energy Value					17

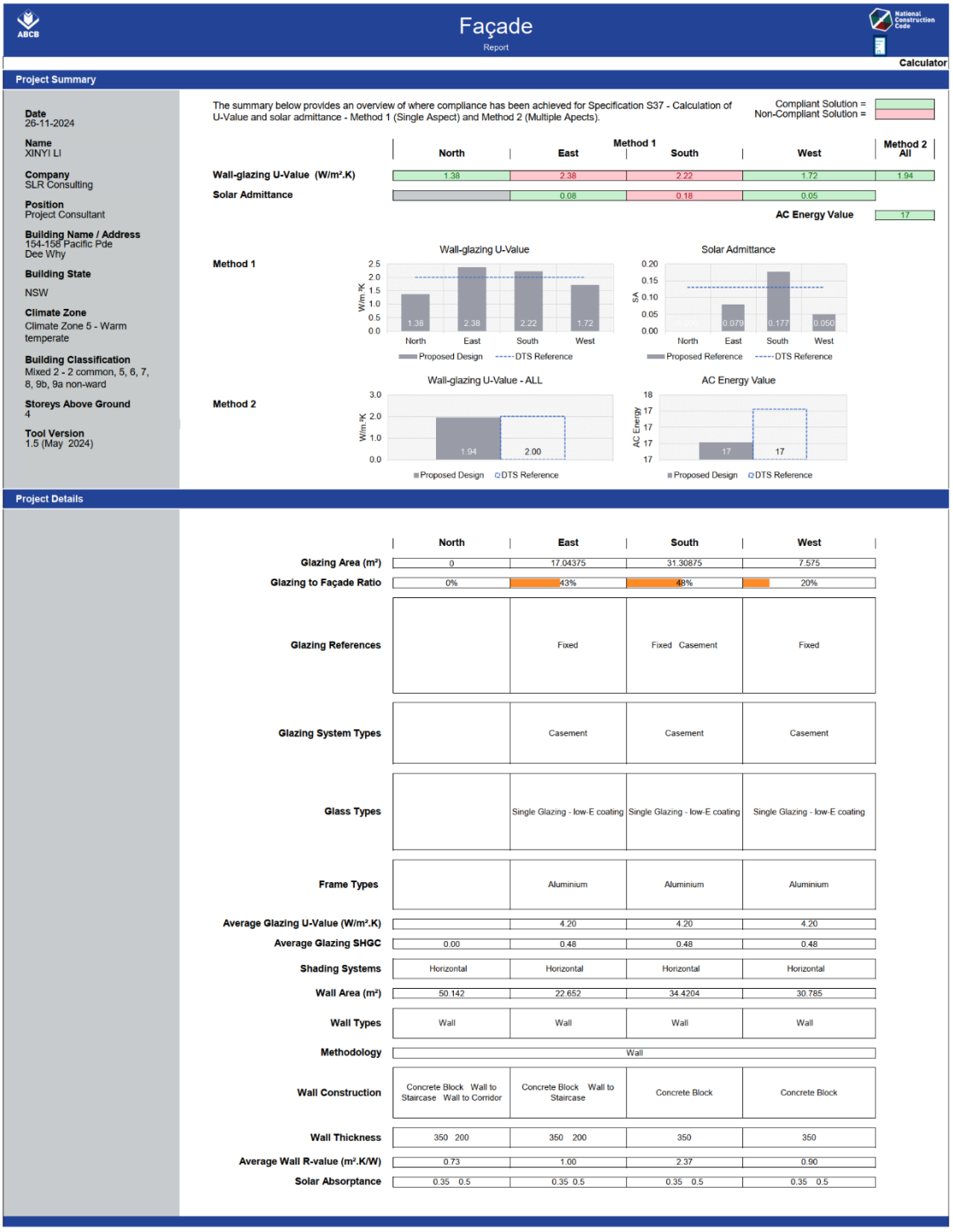
Method 1

Method 2

Project Details

	North	East	South	West
Glazing Area (m²)	15.2391	36.282535	0	8.9093
Glazing to Façade Ratio	119%	56%	0%	14%
Glazing References	Fixed Casement	Bifolds		Bifolds West Casement
Glazing System Types	Fixed Casement	Casement		Casement
Glass Types	Single Glazing - low-E coating	Single Glazing - low-E coating		Single Glazing - low-E coating
Frame Types	Aluminium	Aluminium		
Average Glazing U-Value (W/m².K)	4.80	4.80		4.80
Average Glazing SHGC	0.33	0.24	0.00	0.33
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	-2.39535	28.518465	35.9625	53.0832
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Concrete Block	Concrete Block	Concrete Block	Concrete Block
Wall Thickness	350	350	350	350
Average Wall R-value (m².K/W)	2.37	2.37	2.37	2.37
Solar Absorptance	0.35 0.5	0.35 0.5	0.35 0.5	0.35 0.5

Figure 8:Calculation of U value and solar admittance for Shop 2 - Retail from the Façade calculator-NCC-Volume-One- 2022



Façade

Report

Calculator

Project Summary

Date
26-11-2024

Name
XINYI LI

Company
SLR Consulting

Position
Project Consultant

Building Name / Address
154-158 Pacific Pde
Dee Why

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Mixed 2 - 2 common, 5, 6, 7, 8, 9b, 9a non-ward

Storeys Above Ground
4

Tool Version
1.5 (May 2024)

The summary below provides an overview of where compliance has been achieved for Specification S37 - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

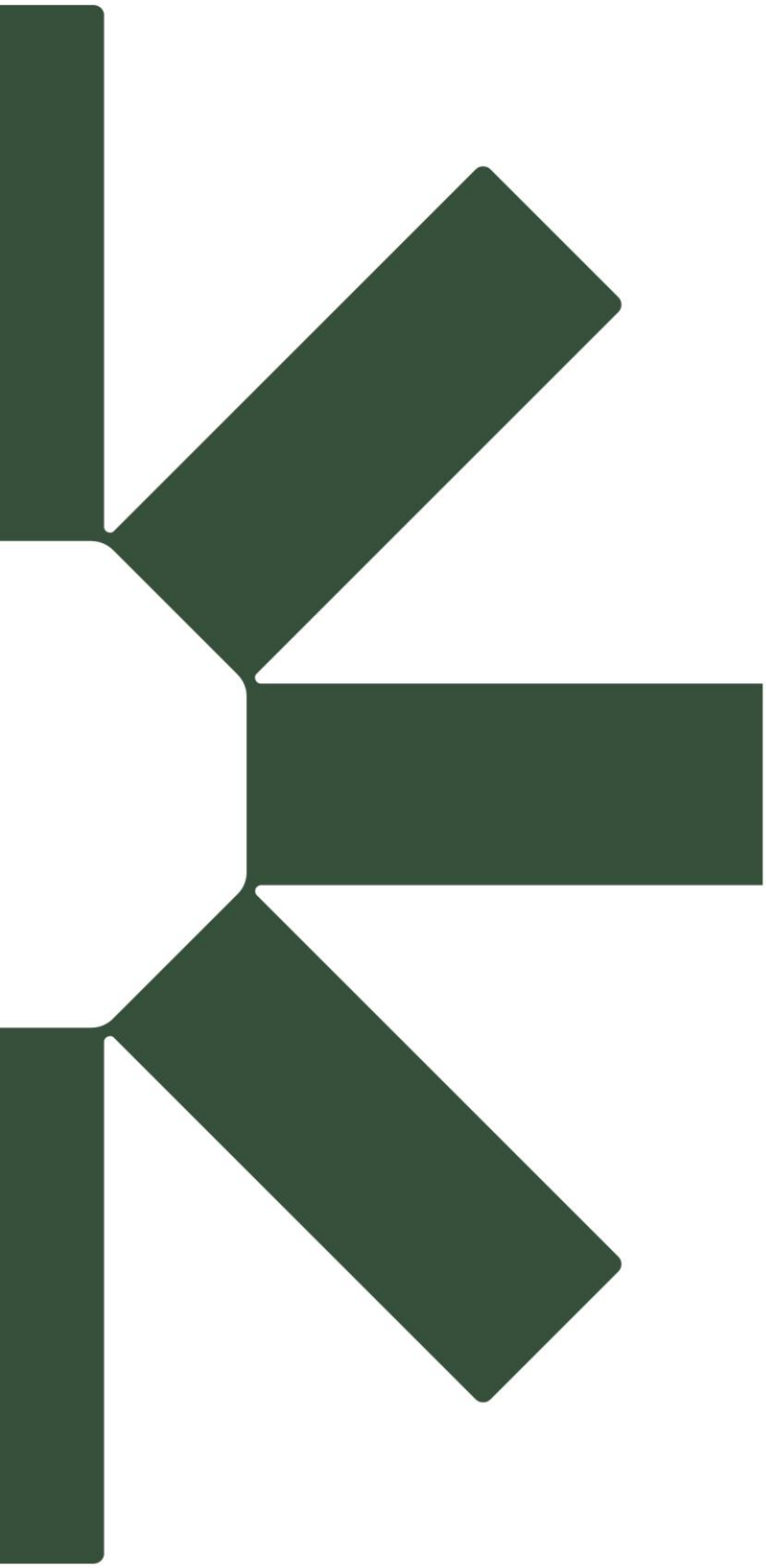
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	1.38	2.38	2.22	1.72	1.94
Solar Admittance		0.08	0.18	0.05	
AC Energy Value					17

Method 1

Method 2

Project Details

	North	East	South	West
Glazing Area (m²)	0	17.04375	31.30875	7.575
Glazing to Façade Ratio	0%	43%	48%	20%
Glazing References		Fixed	Fixed Casement	Fixed
Glazing System Types		Casement	Casement	Casement
Glass Types		Single Glazing - low-E coating	Single Glazing - low-E coating	Single Glazing - low-E coating
Frame Types		Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)		4.20	4.20	4.20
Average Glazing SHGC	0.00	0.48	0.48	0.48
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	50.142	22.652	34.4204	30.785
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Concrete Block Wall to Staircase Wall to Corridor	Concrete Block Wall to Staircase	Concrete Block	Concrete Block
Wall Thickness	350 200	350 200	350	350
Average Wall R-value (m².K/W)	0.73	1.00	2.37	0.90
Solar Absorptance	0.35 0.5	0.35 0.5	0.35 0.5	0.35 0.5



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