Section J Assessment
NCC 2022

9-11 Victoria Parade, Manly
Commercial / Retail

for

Momentum Projects

Version	Date	
3.0	14th September 2023	Issue for CC
4.0	12th February 2024	Issue for S4.55 (LEC)

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File MMP002-SectionJ-Report-NCC2022-02.doc Printed 22/03/2024 2:28:00 PM

CONTENTS

1 INTRODUCTION

This report assesses the proposed development for its compliance with the Section J energy efficiency deemed-to-satisfy provisions of NCC 2022.

The location details for the project are as follows:

Address: 9-11 Victoria Parade,
Manly NSW 2095

Council: Northern Beaches Council

Location Map

2 SCOPE

2.1 SECTION J PROVISIONS

The NSW Section J Deemed-to-Satisfy (DTS) provisions of the NCC 2022 have been applied for the assessment of commercial/ retail portion of the proposed development.

This report is concerned with the following parts:

- Part J4: Building fabric
- Part J5: Building sealing
- Part J8: Heated water supply and swimming pool
- Part J9: Facilities for energy monitoring

The following sections will not form part of this report, as they will require the expertise of service consultants:

- Part J6: Air-conditioning and ventilation systems
- Part J7: Artificial lighting and power

2.2 BUILDING CLASS AND CLIMATE ZONE

The Section J requirements are dependent on the building class (or classes) that apply to the project and the climate zone in which it is located:

Building Classification

- Class 5 (office)
- Class 6 (retail / shop)
- Class 7a (carpark)

Climate Zone

- Zone 5 (Sydney surrounds)

3 REFERENCES

Drawings

Project: Proposed Shop-Top Housing - 9-11 Victoria Parade, Manly
By: Platform Architects
Date: Issue A, 20/12/23 – S4.55 (8) Modification

National Construction Code (NCC)

NCC 2022, Volume One, Section J Deemed-to-satisfy provisions.

4 SUMMARY

A summary of the actions needed to satisfy the deemed to satisfy requirements of Section J are as follows:

4.1 ROOF AND CEILING INSULATION (PART J4D4)

Added insulation to ceilings / roof over ground floor conditioned spaces	R-Value
Insulation required for ceilings below roof for new retail and commercial spaces	3.0

The solar absorptance of the upper surface of a roof over a conditioned space must be not more than 0.45 (i.e. no darker than Colorbond 'Shale Grey' colour or equivalent)

4.2 ROOF LIGHTS (PART J4D5)

Not applicable

4.3 WALLS AND GLAZING (PART J4D6)

Wall insulation requirements for conditioned retail spaces	Added Insulation R-Value to be provided
External wall: Concrete + stud frame (WT E.03a, E.03b)	1.5
Internal wall: Concrete + stud frame (WT P.04a)	1.5
Internal wall: Double 92mm Stud wall (WT P.13)	3.0

The performance figures required for the glazing elements are:

Glazing performance requirements	U-Value	SHGC
Glazing for ground floor commercial and retail spaces (refer to 5.3.3 for allowance for qualifying display glazing)	5.5	0.48

4.4 FLOOR INSULATION (PART J4D7)

Added insulation for floors for conditioned retail spaces	R-Value
Added insulation for new concrete floor to retail and commercial space suspended over carpark and non-conditioned space)	1.6

4.5 BUILDING SEALING (PART J5)

The building envelope - ceiling, floors, walls, doors and windows - must be constructed to minimise air leakage or infiltration.

Entrances to the building must have self-closing doors (or airlock)

Exhaust fans must be fitted with self-closing dampers, or equivalent.

4.6 PART J6 AND PART J7 (MECHANICAL & ELECTRICAL)

Refer to separate submissions prepared by service consultants.

4.7 HEATED WATER SUPPLY (PART J8)

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.

4.8 FACILITIES FOR MONITORING (PART J9)

The building must have the facilities for energy monitoring, electric vehicle charging, solar photovoltaic, and battery systems.

5 PART J4 – BUILDING FABRIC

The BCA Section J Part J4 is concerned with four provisions:

- J4D4 - Roof and ceiling construction
- J4D5 - Roof lights
- J4D6 - Walls and glazing
- J4D7 - Floors

The provisions in Part J4 apply to the conditioned spaces in the development. The NCC uses the term 'envelope' to demarcate the conditioned space from non-conditioned space and the exterior of the building. A space is deemed to be conditioned if the air contained is likely to be actively heated or cooled by an air-conditioning service.

The images below show the proposed floor plans with the envelope enclosing the conditioned space marked by a red dotted line. The provisions in this section will apply to the construction of roof/ ceilings and floors enclosed by this marked area, and the external and internal walls on the boundary of these areas.

The requirements for J4 are detailed in the following sections. Where insulation is required, this should be installed in accordance with the provisions set out in J4D3

Figure 5.1a – Envelope – Ground floor (Commercial)

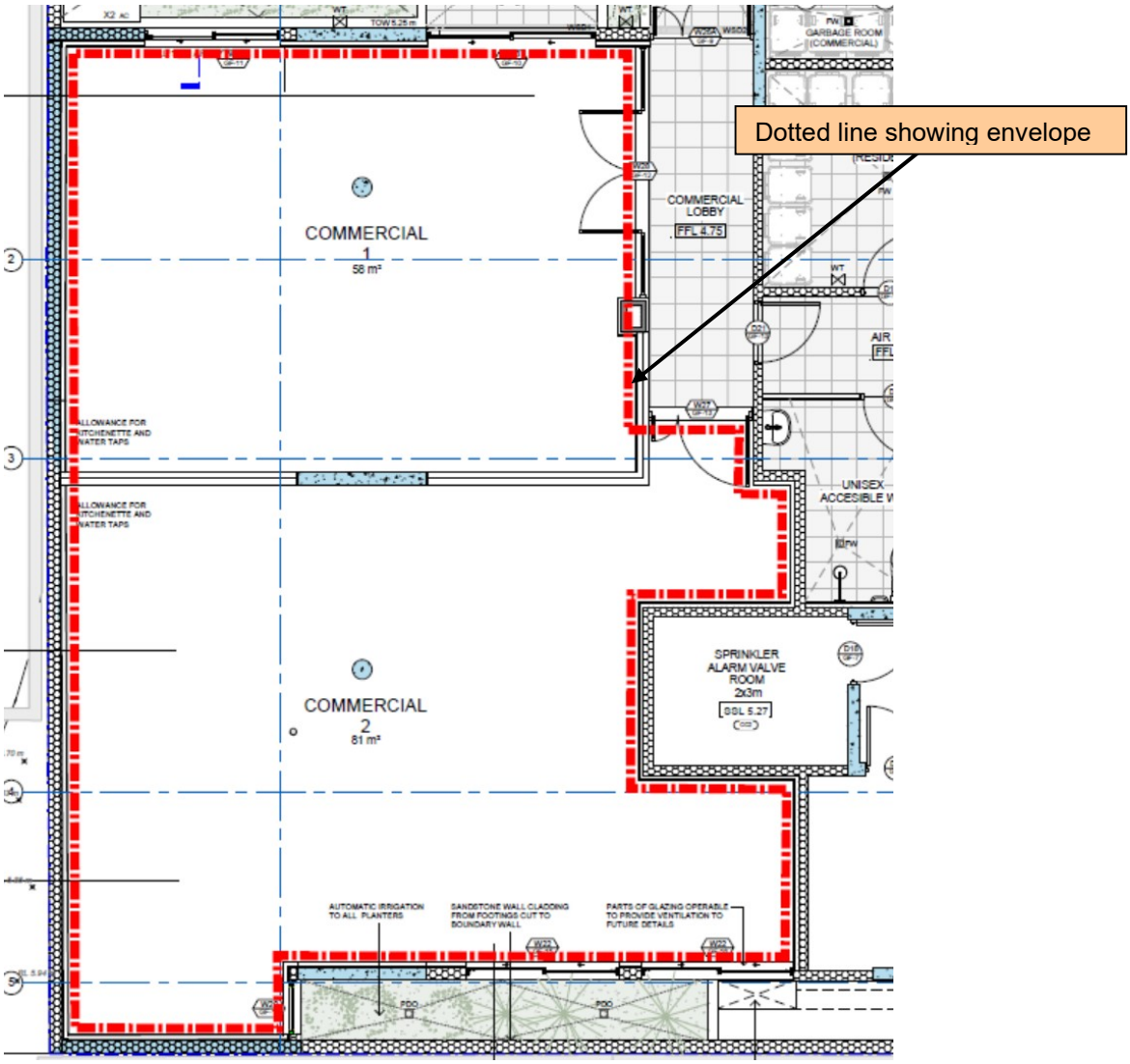
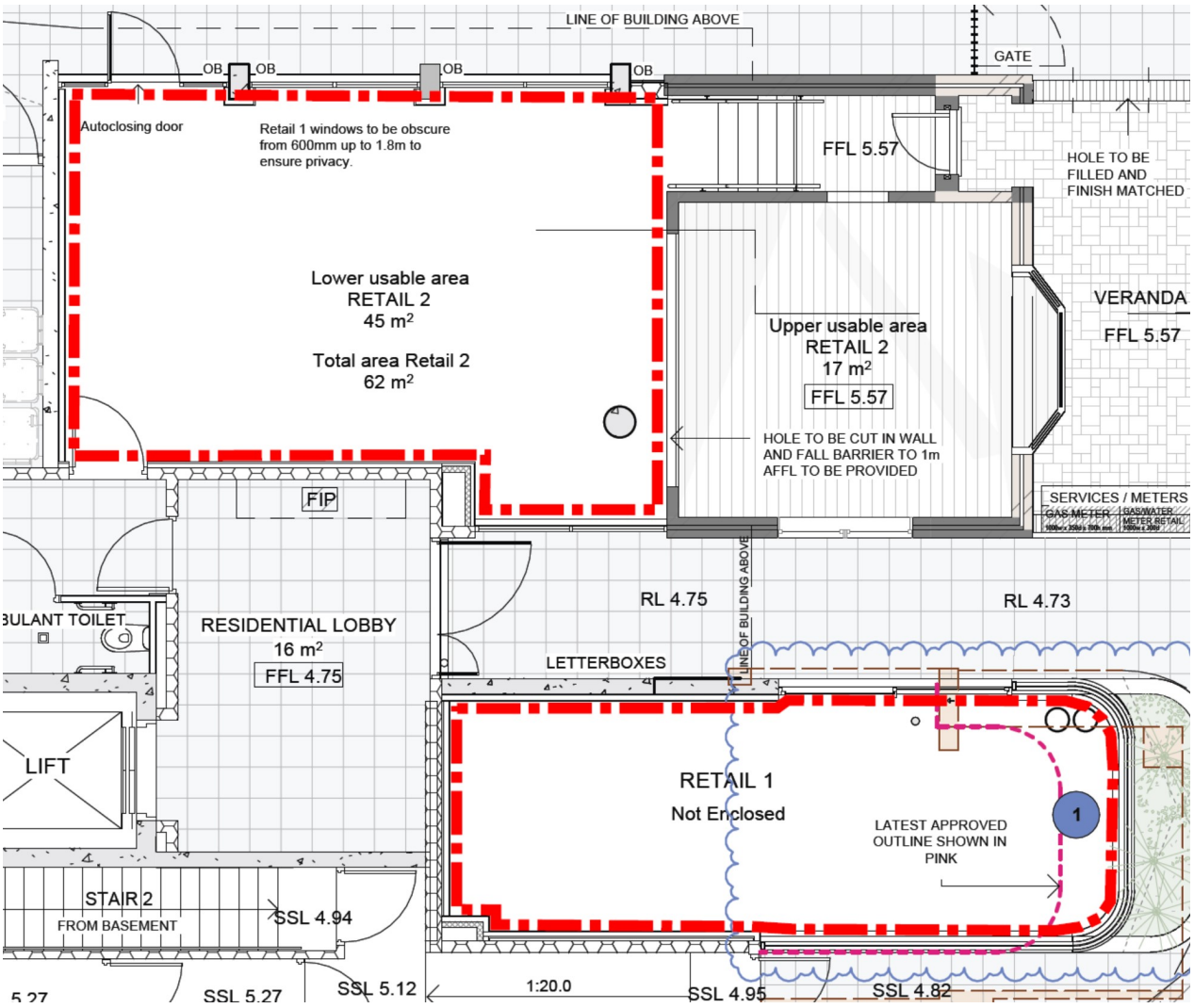


Figure 5.1b – Envelope – Ground floor (Retail)



5.1 J4D4 - ROOF AND CEILING CONSTRUCTION

5.1.1 Roof and ceiling insulation requirement

The table below shows the total insulation *R-Value* that is required for climate zone.

Roof and ceiling insulation required for climate zone 5	***Total R-Value***	**Direction of heat flow**
All ceilings below roof forming part of the envelope - see figure 5.1a & 5.1b **The solar absorptance of the upper surface of a roof must be not more than 0.45.** This means a roof colour equivalent to 'Shade Grey' (solar absorptance 0.43) in the Colorbond range will be the darkest colour allowable. An alternative assessment method will be required for roof colours exceeding 0.45	**3.7**	**Downward**

5.1.2 Proposed Roof and Ceiling Construction

The proposed roof construction type is concrete slab. The table below details the typical construction, including the added insulation to achieve the required total R-Value (based on NCC specifications).

	Concrete	***R-Value (for heat flow direction: downwards)***
1	Outdoor air film (7m/s)	0.04
2	Tile Finish	0.01
3	Waterproof membrane, rubber synthetic (4 mm, 961 kg/m3)	0.03
4	Solid concrete, (200 mm, 2400 kg/m3)	0.14
5	Ceiling airspace (100 mm to 300 mm, non-reflective)	0.22
6	Bulk insulation required (assuming ceiling airspace is retained after addition of insulation)	3.04
7	Plasterboard, gypsum (10mm, 880 kg/m^3)	0.06
8	Indoor air film (still air)	0.16
	Total *R-Value*	**3.70**

5.1.3 Action Required for Compliance

Roof / ceiling insulation Requirements	**Added Insulation R-Value to be provided**
Insulation required for ceilings below roof for new retail and commercial spaces	**3.0**

5.2 J4D5 – ROOF LIGHTS

Not applicable.

5.3 J4D6 – WALLS AND GLAZING

5.3.1 Walls and Glazing Performance Requirement

Under J4D6 the walls and glazing are assessed under a combined thermal performance requirement. The table below shows the minimum requirements for wall-glazing construction.

Walls and glazing for building classes 5, 6 in climate zone 5 For wall-glazing construction forming part of the envelope - see figs 5.1a, 5.1b	***Performance Requirement***
Total system U-Value for wall-glazing construction	Not greater than U 2.0
Total system R-Value for wall components of a wall-glazing construction • where the wall is less than 80% of the area of the wall-glazing construction • where the wall is 80% or more of the area of the wall-glazing construction	 Minimum of R 1.0 Minimum of R 1.4
The solar admittance of externally facing wall-glazing construction	Not greater than 0.13

5.3.2 Proposed External Wall Construction

The tables below detail the proposed wall construction types, including the added insulation to achieve the performance requirement.

External Walls

	Concrete + stud frame (WT E.03a, E.03b)	***R-Value***
1	Outdoor air film (7m/s)	0.04
2	Concrete / AFS Rediwall 194 - 200mm nominal	0.14
3	Cavity + steel stud 64mm with R 1.5 bulk insulation (allowing for thermal bridging)	1.07
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
5	Indoor air film (still air)	0.14
	Total *R-Value*	**1.45**

Internal walls

	Concrete + stud frame (WT P.04a)	***R-Value***
1	Indoor air film (7m/s)	0.14
2	Concrete / AFS Rediwall 150	0.11
3	Cavity + steel stud 64mm with R 1.5 bulk insulation (allowing for thermal bridging)	1.07
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
5	Indoor air film (still air)	0.14
	Total *R-Value*	**1.52**

	Double 92mm Stud wall (WT P.13)	***R-Value***
1	Indoor air film (7m/s)	0.14
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
3	2 x steel stud 90 mm with R3.0 (2 x R1.5) bulk insulation (allowing for thermal bridging)	1.88
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
5	Indoor air film (still air)	0.14
	Total *R-Value*	**2.28**

5.3.3 Action Required for Compliance

The required wall insulation and glazing specifications are shown below. This performance requirement applies to walls and glazing forming part of the envelope - see figure 5.1a, 5.1b

Wall insulation Requirements	**Added Insulation R-Value to be provided**
External wall: Concrete + stud frame (WT E.03a, E.03b)	1.5
Internal wall: Concrete + stud frame (WT P.04a)	1.5
Internal wall: Double 92mm Stud wall (WT P.13)	3.0

The performance figures required for the glazing elements are:

Glazing performance requirements	**U-Value**	**SHGC**
Glazing for ground floor commercial and retail spaces	5.5	0.48

Allowance for Display Glazing - J4D6 (2) and J4D6 (7)

The Section J DTS provisions include an allowance for display glazing.

The NCC defines the term ‘Display glazing’ as glazing used to display retail goods in a shop or showroom directly adjacent to a walkway or footpath, but not including that used in a café or restaurant.

If the glazing meets this definition, then the glazing performance figures in the table below may be used.

Glazing performance requirements Display Glazing	**Total system**	
	U-Value	**SHGC**
Glazing for ground floor retail spaces that meets the definition of display glazing	Not greater than 5.8	Not greater than 0.81

The NCC façade calculator report is shown in appendix A.

Compliance has been achieved under Specification 37 - Calculation of U-Value and solar admittance - Method 2 (Multiple Aspects).

5.4 J4D7 – FLOORS

5.4.1 Floor insulation requirement

The table below shows the minimum total insulation R-Value that is required for floors to conditioned spaces (from NCC table J4D7).

Insulation required for climate zone 5	*R-Value*
New floors forming part of the envelope - see figures 5.1a, 5.1b - assuming no in-slab heating or cooling systems	2.0

5.4.2 Proposed Floor Construction

The proposed floor construction type is shown in the tables below, including the added insulation to achieve the performance requirement.

	Concrete floor to retail / commercial space (Suspended over carpark and non-conditioned space)	*R-Value*
1	Indoor air film (still air)	0.14
2	Concrete slab 200 mm (assumed)	0.14
3	Added insulation, under slab	1.60
4	Air film (outside air)	0.14
	Total *R-Value*	**2.02**

5.4.3 Action Required For Compliance

Concrete floor to conditioned retail space	Action to achieve compliance
Added insulation for concrete floor to retail and commercial space	1.6

6 PART J5 – BUILDING SEALING

6.1 J5D3 – CHIMNEY AND FLUES

Not applicable for this project.

6.2 J5D4 – ROOF LIGHTS

Not applicable

6.3 J5D5 - WINDOWS AND DOORS

A seal to restrict air infiltration must be fitted to each door or openable window (or the like) that separates conditioned spaces from external or non-conditioned spaces, except for:

- a window that comply with AS 2047 “Windows in Buildings – Selection and Installation”, or
- a fire door or smoke door, or
- a roller shutter door, roller shutter grille, or security door or device used only for out-of-hours security.

The seal required for the bottom edge of a door must be a draft protection device.

The seal required for the other edges of an external door, or the edges of an openable window (or the like), may be a foam or rubber compressible strip, fibrous seal or the like.

The entrances to the building that lead into a conditioned space must have a self-closing door, or airlock, revolving door (or the like) other than —

- where the conditioned space has a floor area of not more than 50 m2; or
- 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.

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

6.4 J5D6 - EXHAUST FANS

If any exhaust fans are to be installed in a conditioned space, they must be fitted with a sealing device, such as a self-closing damper.

6.5 J5D7 – CONSTRUCTION OF ROOFS, WALLS AND FLOORS

Ceilings, walls, external floors, doors, windows, roof light frames (and other such openings) in conditioned spaces must be constructed to minimise air leakage by

- enclosing with internal lining systems that are close fitting at ceiling, wall and floor junctions; or
- sealed at junctions and penetrations with—
    - close fitting architrave, skirting or cornice; or
    - expanding foam, rubber compressible strip, caulking or the like.

These requirements do not apply to openings, grilles and the like required for smoke hazard management.

6.6 J5D8 – EVAPORATIVE COOLERS

Not applicable for this project.

7 PART J6 – AIR CONDITIONING AND VENTILATION SYSTEMS

Refer to separate submission prepared by service consultants.

8 PART J7 – ARTIFICIAL LIGHTING AND POWER

Refer to separate submission prepared by service consultants.

9 PART J8 – HEATED WATER SUPPLY

9.1 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.

Parts J8D3 and J8D4 – not applicable

10 PART J9 – FACILITIES FOR ENERGY MONITORING

The provisions for energy monitoring and on-site distributed energy resources are shown in the sections below. Refer to separate submission prepared by service consultants for the detailed requirements.

10.1 PART J9D3 – FACILITIES FOR ENERGY MONITORING

The building must have energy meters configured to record the time-of-use consumption of gas and electricity.

10.2 PART J9D4 – FACILITIES FOR ELECTRIC VEHICLE CHARGING EQUIPMENT

The carpark must be provided with electrical distribution boards dedicated to electric vehicle charging, in accordance with Table J9D4, in each storey of the carpark.

Table J9D4

Carpark spaces per storey for electric vehicles	Electrical distribution boards for electric vehicle charging per storey
0 - 9	0
10 - 24	1

The electrical distribution boards must be 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) when associated with a Class 2 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 11:00 pm to 7:00 am daily; and

(c) when associated with a Class 5 to 9 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 9:00 am to 5:00 pm daily; and

(d) 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; 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 (e) is for the future installation of metering equipment.

10.3 PART J9D5 – FACILITIES FOR SOLAR PHOTOVOLTAIC AND BATTERY SYSTEMS

(1) The main electrical switchboard of a building must—

(a) contain at least two empty three-phase circuit breaker slots and four DIN rail spaces labelled to indicate the use of each space for—

  i. a solar photovoltaic system; and

  ii. a battery system; and

(b) be sized to accommodate the installation of solar photovoltaic panels producing their maximum electrical output on at least 20% of the building roof area.

(2) At least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels, except for buildings—

(a) with installed solar photovoltaic panels on—

i. at least 20% of the roof area; or

ii. an equivalent generation capacity elsewhere on-site; or

(b) where 100% of the roof area is shaded for more than 70% of daylight hours; or

(c) with a roof area of not more than 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.

Limitations

1. The requirements of J9D5(1)(a)(i) and (b) do not apply to a building with solar photovoltaic panels installed on at least 20% of the roof area.

2. The requirements of J9D5(1)(a)(ii) and (b) do not apply to a building with battery systems installed.

11 DEFINITIONS

The following definitions are pertinent to Section J

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

(a) the exterior of the building; or
(b) a non-conditioned space including:
    a. the floor of a rooftop plant room, lift machine room or the like; and
    b. the floor above a car park or warehouse; and
    c. the common wall with a car park, warehouse or the like.

Conditioned space means a space within a building where the environment is likely, by the intended use of the space, to be controlled by air-conditioning, but does not include:

(a) a non-habitable room of a Class 2 building or Class 4 part of a building in which a heater with a capacity of not more than 1.2 kW provides the air-conditioning, or

(b) a space in a Class 7, 8 or 9b building where the input power to an air-conditioning system is not more than 15 W/m2.

Air-conditioning for the purposes of Section J, means a service that actively cools or heats a space within a building, in order to provide a suitable environment for the building occupants but does not include process needs such as temperature or humidity control as occurs in cold rooms and hot rooms.

Wall-glazing construction, for the purposes of Section J in Volume One, means the combination of wall and *glazing* components comprising the *envelope* of a building, excluding—
(a) *display glazing*; and
(b) opaque non-glazed openings such as doors, vents, penetrations and shutters.

Display glazing means glazing used to display retail goods in a shop or showroom directly adjacent to a walkway or footpath, but not including that used in a café or restaurant.

12 APPENDIX A

The NCC Façade calculator report is shown on the following page.

Façade

Report

Calculator

Project Summary

Date
12/02/2024

Name
Rob Mallindine

Company
AGA Consultants

Position
Principle / Assessor

Building Name / Address
9-11 Victoria Parade, Manly 0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 6 - department stores, shopping centres

Storeys Above Ground
7

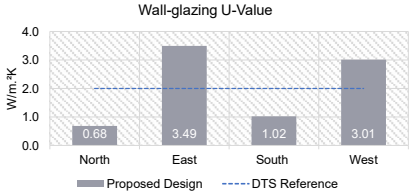
Tool Version
1.1 (April 2020)

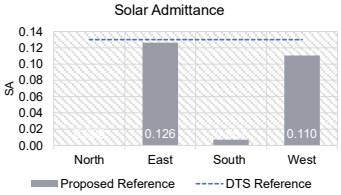
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

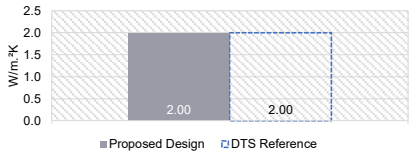
	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	0.68	3.49	1.02	3.01	2.00
Solar Admittance		0.13	0.01	0.11	
AC Energy V					24

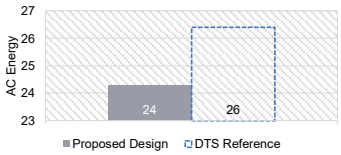
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	0	40	7.7	23.5
Glazing to Façade Ratio	0%	58%	8%	48%
Glazing References		G1 G2 G3 G4	G1 G2	G1 G2 G3
Glazing System Types			USER (DEFINED)	USER (DEFINED)
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)		5.50	5.50	5.50
Average Glazing SHGC	0.00	0.44	0.09	0.35
Shading Systems	Device Horizontal	Device Horizontal	Device Horizontal	Device Horizontal
Wall Area (m²)	43.5	28.6	89.3	25.1
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	E03a,b (conc)	E03a,b (conc)	E03a,b (conc) P13 (stud) P04a (conc) E03a,b (conc) WI	E03a,b (conc) P13 (stud) P04a (conc) E03a,b (conc) WI
Wall Thickness	278	278	278 210 247 280	278
Average Wall R-value (m².K/W)	1.46	1.46	1.57	1.46
Solar Absorptance	0.5 0.1	0.5 0.1	0.5 0.1	0.5 0.1