

Section J Assessment

NCC 2022

3-5 Fingal Street, Brunswick Heads

Ground floor Commercial / Retail

for

Momentum Projects

Version	Date	
1.0	28 th May 2025	1 st Issue (DA)



Rob Mallindine

NatHERS accredited assessor: DMN/12/1475

AGA Consultants

PO Box 6062

ALEXANDRIA NSW 2015

Phone 02 8859 6563

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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: 3-5 Fingal Street, Brunswick Heads
Brunswick Heads NSW 2483

Council: Byron Shire 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 the proposed development.

This report is concerned with the following parts:

- Part J4: Building fabric
- Part J5: Building sealing
- Part J8: Heated water supply
- 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 6 (commercial / retail)

Climate Zone

- Zone 2

3 REFERENCES

Drawings

Project: 3-5 Fingal Street, Brunswick Heads
By: CHROFI
Date: Rev 4, 30/04/2025

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 requirements for concrete roof over shops 01 - 05	Added Insulation R-Value to be provided
Bulk insulation above ceiling	3.0

The solar absorptance of the upper surface of a roof over a conditioned space must be not more than 0.45

4.2 ROOF LIGHTS (PART J4D5)

Not applicable

4.3 WALLS AND GLAZING (PART J4D6)

Wall insulation requirements for conditioned spaces for shops 01 - 05	Added Insulation R-Value to be provided
Brick veneer	2.7
Plasterboard on studs	2.5

The performance figures required for the glazing elements are:

Glazing performance requirements	U-Value	SHGC
All glazing for shops 01 - 05	4.0	0.30

*Refer to 5.3.3 for performance allowance for qualifying display glazing

4.4 FLOOR INSULATION (PART J4D7)

Concrete slab on ground for conditioned spaces	Added Insulation R-Value to be provided
Concrete slab on ground	None

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, and make provision for 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 shows the proposed floor plan with the envelope enclosing the conditioned space marked by a 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 – Shops 01 – 04

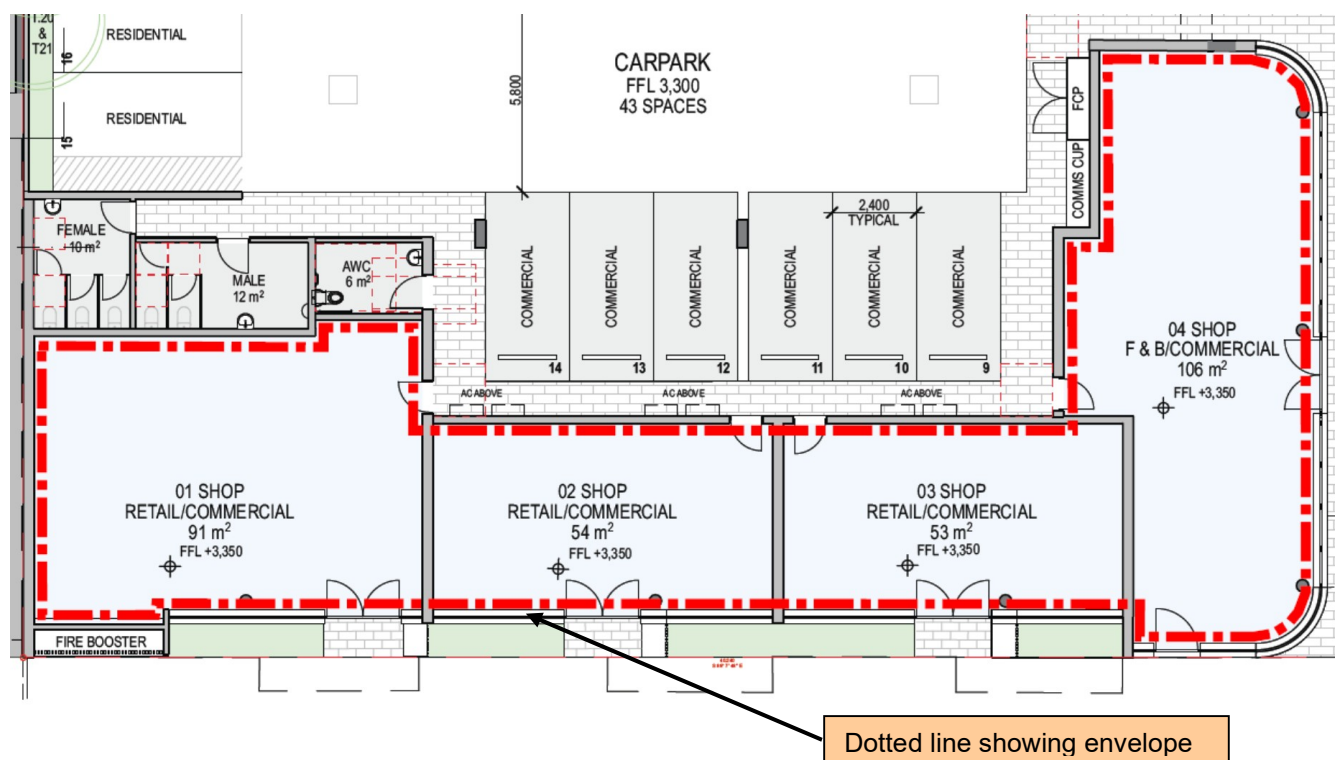
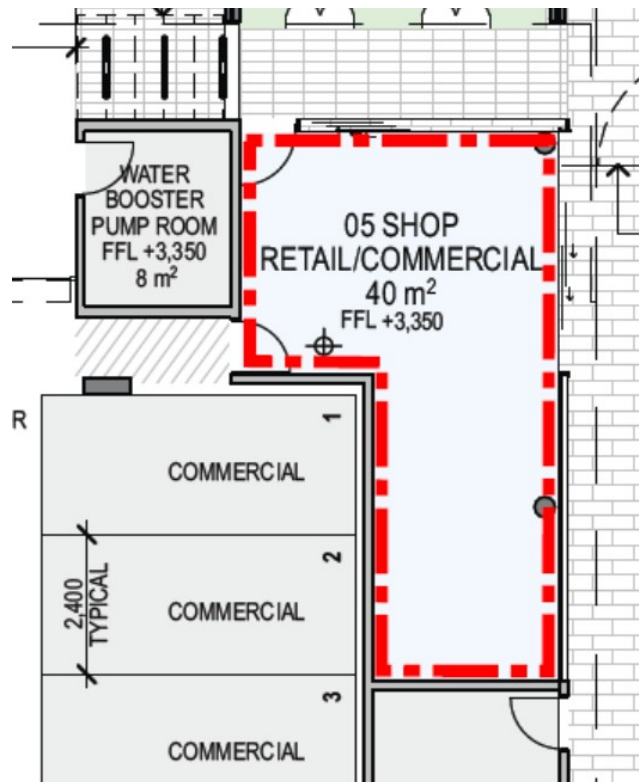


Figure 5.1b – Envelope – Shops 05



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 2	Total <i>R-Value</i>	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 'Shale 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 is shown below. The table below details the typical construction, including the added insulation to achieve the required total *R-Value*

Concrete Roof		<i>R-Value</i> (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/m ³)	0.02
4	Solid concrete, (300 mm, 2400 kg/m ³)	0.21
5	Ceiling airspace (min 40 mm, non-reflective)	0.22
6	Bulk insulation required (assuming ceiling airspace is retained after addition of insulation)	3.00
7	Plasterboard, gypsum (10mm, 880 kg/m ³)	0.06
8	Indoor air film (still air)	0.16
Total <i>R-Value</i>		3.72

5.1.3 Action Required for Compliance

Insulation requirements for sheet metal roof	Added Insulation <i>R-Value</i> to be provided
Bulk insulation above ceiling	3.0

5.2 J4D5 – ROOF LIGHTS

Not applicable - no roof windows over commercial space

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 class 6 in climate zone 2 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 table below shows the proposed wall construction types

External Walls

External wall: Brick veneer		R-Value
1	Indoor air film (7m/s)	0.04
2	Masonry –110mm extruded brick	0.18
3	Steel Stud 90mm with R 2.7 added bulk Insulation (allowing for the effect of thermal bridging)	1.60
4	Plasterboard gypsum (10mm, 880 kg/m ³)	0.06
5	Indoor air film (still air)	0.12
	Total R-Value	2.00

Internal Walls

Internal wall – plasterboard on studs		R-Value
1	Indoor air film (7m/s)	0.12
2	Plasterboard gypsum (10mm, 880 kg/m ³)	0.06
3	Steel Stud 90mm with R 2.5 added bulk Insulation (allowing for the effect of thermal bridging)	1.60
4	Plasterboard gypsum (10mm, 880 kg/m ³)	0.06
5	Indoor air film (still air)	0.12
	Total R-Value	1.96

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 5.1

Wall insulation Requirements	Added Insulation R-Value to be provided
Brick veneer	2.7
Plasterboard on studs	2.5

The performance figures required for the glazing elements are:

Glazing performance requirements	U-Value	SHGC
All glazing for shops 01 - 05	4.0	0.30

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

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

'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.

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 2	R-Value
New floors forming part of the envelope above external air and non-conditioned storage spaces - see fig 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 table below

Concrete slab on ground floor to conditioned spaces		R-Value
1	Indoor air film (still air)	0.12
2	Concrete slab on ground (200 mm assumed) deemed to provide R 2.0	2.00
Total R-Value		2.12

5.4.3 Action Required For Compliance

Concrete slab floors	Added Insulation R-Value to be provided
Concrete slab on ground	None

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), except 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.

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
43 spaces	2

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.

12 APPENDIX A

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

Project Summary

Date
28/05/2025

Name
Rob Mallindine

Company
AGA Consultants

Position
Principle / Assessor

Building Name / Address
3-5 Fingal Street, Brunswick Heads
0

Building State
NSW

Climate Zone
Climate Zone 2 - Warm humid
summer, mild winter

Building Classification
Class 6 - restaurants, cafes,
bars

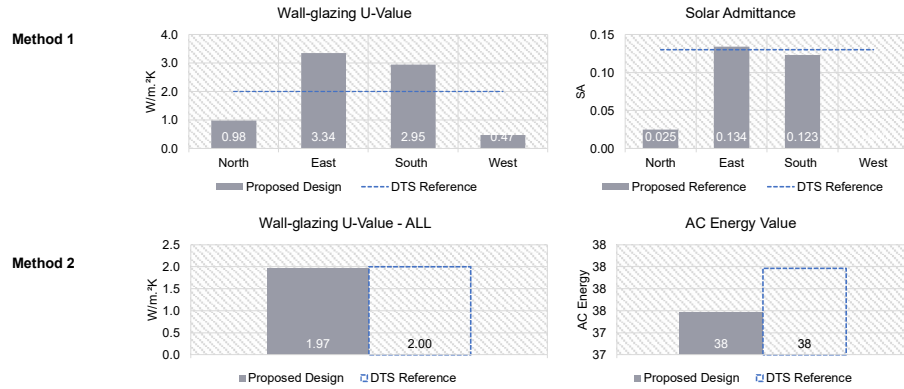
Storeys Above Ground
3

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 Aspects).

Compliant Solution =
Non-Compliant Solution =

	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	0.98	3.34	2.95	0.47	1.97
Solar Admittance	0.02	0.13	0.12		
AC Energy					38



Project Details

	North	East	South	West
Glazing Area (m²)	18.3	77.3	99.6	0
Glazing to Façade Ratio	14%	81%	70%	0%
Glazing References	G1	G1 G2 G3	G1 G2 G3 G4 G5	
Glazing System Types	USER (DEFINED)	USER (DEFINED)	USER (DEFINED)	
Glass Types	Double Glazed Unit - double low-E coating	Double Glazed Unit - double low-E coating	Double Glazed Unit - double low-E coating	
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	4.00	4.00	4.00	
Average Glazing SHGC	0.30	0.30	0.30	0.00
Shading Systems	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
Wall Area (m²)	112.3	17.7	42.5	94.6
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Brick veneer SF Stud framed SF	Brick veneer SF	Brick veneer SF Stud framed SF	Brick veneer SF Stud framed SF
Wall Thickness	250 110	250	250 110	250
Average Wall R-value (m².K/W)	2.07	2.13	2.08	2.11
Solar Absorptance	0.5 0.1	0.5 0.1	0.5 0.1	0.5 0.1