designview

SECTION J REPORT

1 Bilambee Avenue, Bilgola Plateau

Section J Assessment
NCC 2019

1 Bilambee Avenue
Bilgola
Commercial / Retail portion

Version	Date	
1.0	28th September 2020	1st issue for DA

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1 INTRODUCTION

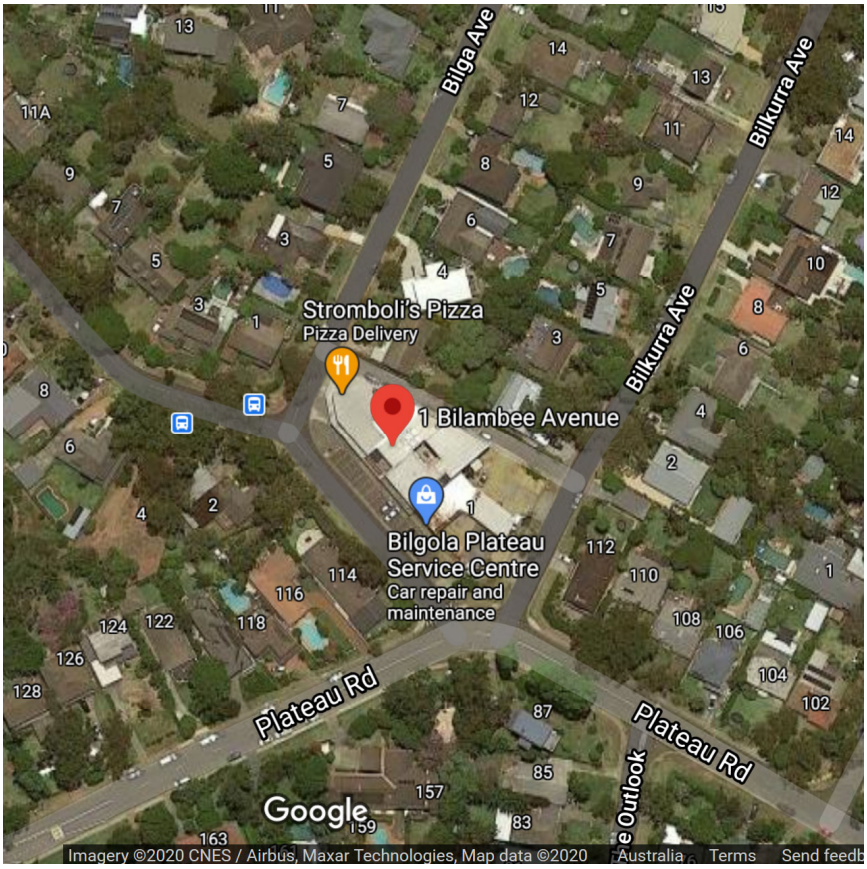
This report assesses the proposed development for its compliance with Section J energy efficiency provisions of the NCC 2019.

The location details for the project are as follows:

Address: 1 Bilambee Avenue
Bilgola NSW 2107

Council: Northern Beaches Council

Location Map



2 SCOPE

2.1 SECTION J PROVISIONS

The Section J Deemed-to-Satisfy (DTS) provisions of the NCC 2019 have been applied for the assessment of this project.

This report is concerned with the following parts:

- Part J1: Building Fabric
- Part J3: Building Sealing
- Part J7: Heated Water Supply
- Part J8: Facilities for Energy Monitoring

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

- Part J5: Air-conditioning and Ventilation Systems
- Part J6: Artificial Lighting and Power

Part J2 Glazing has been removed for NCC 2019. The glazing performance requirements are now assessed under J1.5 Walls and glazing.

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 to be constructed:

Building Classification
The proposed development is classified as:

- Class 6 (commercial / retail)

Climate Zone
The proposed development is in:

- Zone 5 (Sydney urban)

3 REFERENCES

Drawings
Project: Proposed Mixed Use Development - 1 Bilambee, Avenue, Bilgola Plateau
By: Benson McCormack Architecture
Nos: DA-0009; DA-0101 – DA-0103; DA-0200 – DA-0203; DA-0300, DA-0301; DA-0910, DA-0911
Rev: B, Sept 2020

National Construction Code (NCC)
NCC 2019, 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 J1.3)

Added insulation to ceilings / roof over conditioned spaces	R-Value
Insulation required for ceilings below roof	3.1

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 J1.4)

Not applicable for this project

4.3 WALLS AND GLAZING (PART J1.5)

Added insulation for external walls for conditioned spaces	R-Value
External walls (Hebel)	2.5
Internal walls (Hebel, concrete, stud framed)	1.0

Glazing performance requirements	U-Value	SHGC
All glazing	4.7	0.55

4.4 FLOOR INSULATION (PART J1.6)

Added insulation for floors for conditioned spaces	R-Value
Insulation required for floors over basement car park	1.7

4.5 BUILDING SEALING (PART J3)

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 J5 AND PART J6 (MECHANICAL & ELECTRICAL)

Refer to separate submissions prepared by service consultants

4.7 HEATED WATER SUPPLY (PART J7)

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 J8)

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

5 PART J1 – BUILDING FABRIC

The BCA Section J Part J1 is concerned with four provisions:

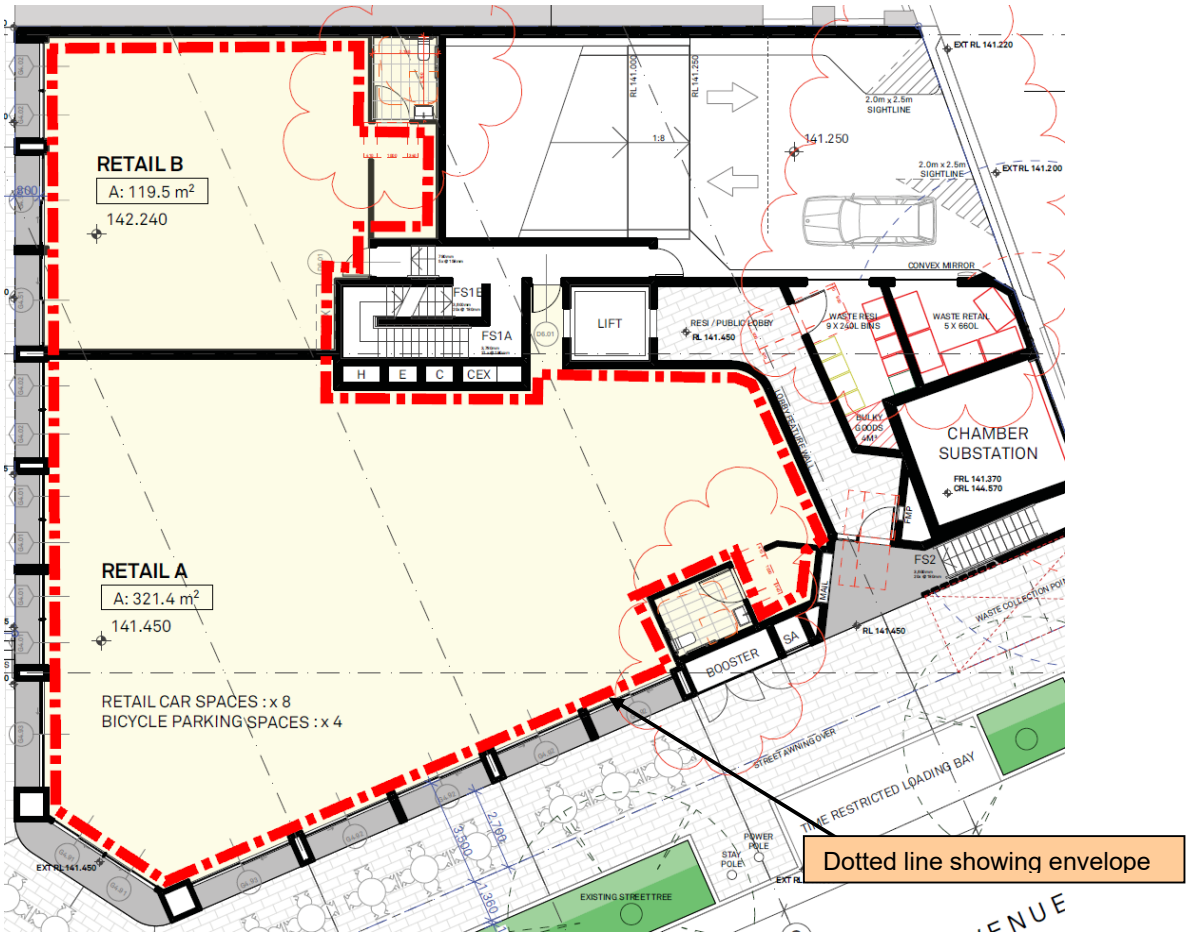
- J1.3 - Roof and ceiling construction
- J1.4 - Roof lights
- J1.5 - Walls and glazing
- J1.6 - Floors

The provisions in Part J1 apply to the conditioned spaces in the development. The BCA 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 diagram below shows 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 J1 are detailed in the following sections. Where insulation is required, this should be installed in accordance with the provisions in J1.2

Figure 5.1 – Envelope – Ground floor



5.1 J1.3 - 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 the building class and climate zone (clause J1.3a).

Roof or ceiling insulation required for climate zone 5	*Total R-Value*	Direction of heat flow
All roof / ceilings forming part of the envelope - see figure 5.1 **Under NCC 2019 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**	**Downwards**

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 BCA specification J1.3a).

	Concrete	*R-Value (for heat flow direction: downwards)*
1	Outdoor air film (7m/s)	0.04
2	Waterproof membrane, rubber synthetic (4 mm, 961 kg/m3)	0.03
3	Solid concrete, (200 mm, 2400 kg/m3)	0.14
4	Ceiling airspace (100 mm to 300 mm, non-reflective)	0.22
5	**Bulk insulation required (assuming ceiling airspace is retained after addition of insulation)**	**3.10**
6	Plasterboard, gypsum (10mm, 880 kg/m^3)	0.06
7	Indoor air film (still air)	0.16
	Total *R-Value*	**3.75**

5.1.3 Action Required for Compliance

Roof / ceiling insulation Requirements	Added Insulation R-Value to be provided
Addition of insulation for roof / ceiling	**3.1**

5.2 J1.4 – ROOF LIGHTS

Not applicable for this project

5.3 J1.5 – WALLS AND GLAZING

5.3.1 Walls and Glazing Performance Requirement

Under J1.5 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 a class 6 building in climate zone 5 For wall-glazing construction forming part of the envelope -see figure 5.1	***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 Wall Construction

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

	External wall type – Hebel + Stud	***R-Value***
1	Outdoor air film (7m/s)	0.04
2	Render finish	0.06
3	Hebel 75mm	0.58
4	**Steel Stud 90mm with R 2.5 added bulk Insulation** (allowing for the effect of thermal bridging, and including 12mm thermal break (EPS) between the framing and adjoining surface)	**1.66**
5	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
6	Indoor air film (still air)	0.12
	Total *R-Value*	**2.52**

	Internal wall type – Hebel + Stud	***R-Value***
1	Outdoor air film (7m/s)	0.12
2	Hebel 75mm	0.58
3	**Steel Stud 64mm with R 1.0 added bulk Insulation** (allowing for the effect of thermal bridging, and including 12mm thermal break (EPS) between the framing and adjoining surface)	**0.87**
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
5	Indoor air film (still air)	0.12
	Total *R-Value*	**1.75**

	Internal wall type - Concrete + Stud	***R-Value***
1	Indoor air film (7m/s)	0.12
2	Solid Concrete 200 mm	0.14
3	**Steel Stud 64mm with R 1.0 added bulk Insulation** (allowing for the effect of thermal bridging, and including 12mm thermal break (EPS) between the framing and adjoining surface)	**0.87**
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
5	Indoor air film (still air)	0.12
	Total *R-Value*	**1.31**

	Internal wall type – stud framed	***R-Value***
1	Indoor air film (7m/s)	0.12
2	Plasterboard gypsum (10mm, 880 kg/m3)	0.06
3	**Steel Stud 64mm with R 1.0 added bulk Insulation** (allowing for the effect of thermal bridging, and including 12mm thermal break (EPS) between the framing adjoining surface)	**0.87**
4	Plasterboard gypsum (10mm, 880 kg/m^3)	0.06
5	Indoor air film (still air)	0.12
	Total *R-Value*	**1.23**

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**
External walls (Hebel)	2.5
Internal walls (Hebel, concrete, stud framed)	1.0

The performance figures required for the glazing elements are:

Glazing performance requirements	**U-Value**	**SHGC**
All glazing	4.7	0.55

The NCC 2019 façade calculator report is shown in appendix A.

Compliance has been achieved under NCC Specification J1.5a - Calculation of U-Value and solar admittance - Method 2 (Multiple Aspects).

5.4 J1.6 – 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 BCA table J1.6).

Insulation required for climate zone 5 (assuming no in-slab heating or cooling systems)	***R-Value Downwards***
Suspended slab floors forming part of the envelope - see figure 5.1 – that are above basement car park	2.0

5.4.2 Proposed Floor Construction

The proposed wall construction type is shown in the table below, with the *R-Values* for the typical construction.

	Suspended concrete slab	***R-Value***
1	Indoor air film (still air)	0.12
2	Concrete 200 mm	0.14
3	Air film (No allowance made for subfloor insulation as the basement space is assumed to be mechanically ventilated by more than 1.5 air changes per hour)	0.04
	Total *R-Value*	**0.30**

5.4.3 Action Required For Compliance

Floor Type	**Insulation Provided by construction *R-Value****1**	**Insulation Requirement *R-Value***	**Action to achieve compliance**
Suspended concrete floor	0.30	Achieve R2.0 Total	The addition of **R 1.7** insulation

*1 - without added insulation

6 PART J3 – BUILDING SEALING

6.1 J3.2 – CHIMNEY AND FLUES

Not applicable for this project.

6.2 J3.3 – ROOF LIGHTS

Not applicable for this project.

6.3 J3.4 - WINDOWS AND DOORS

A seal to restrict air infiltration must be fitted to each edge of a 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 an external swing 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 J3.5 - 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 J3.6 – 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
- sealing by caulking, skirting, architraves, cornices or the like.

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

6.6 J3.7 – EVAPORATIVE COOLERS

Not applicable for this project.

7 PART J5 – AIR CONDITIONING AND VENTILATION SYSTEMS

Refer to separate submission prepared by service consultants.

8 PART J6 – ARTIFICIAL LIGHTING AND POWER

Refer to separate submission prepared by service consultants.

9 PART J7 – HEATED WATER SUPPLY

9.1 J7.2 – 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 J7.3 and J7.4 – not applicable

10 PART J8 – FACILITIES FOR ENERGY MONITORING

10.1 PART J8.3 – FACILITIES FOR ENERGY MONITORING

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

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 2019 Façade calculator report is shown on the following page.