JEA Holdings (Australia) Pty Ltd

90 Cartwright Avenue, Miller

2014 BCA Section J Assessment Report

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1. SITE APPRECIATION

The proposed development is located in BCA Climate Zone 6 at 90 Cartwright Avenue, Miller and consists of:

- Basement car parking – Class 7a
- Retail spaces on Basement and Level 1 – Class 6
- 145 apartments over 7 levels – Class 2

2. BCA SECTION J (ENERGY EFFICIENCY) OUTLINE

The main objective of Section J is to promote the efficient use of energy via increasing the passive thermal performance of the building as well as improving the mechanical and hydraulic services.

Performance and compliance is achieved in the following areas under BCA Section J:

- J1: Building Fabric
- J2: Glazing
- J3: Building Sealing
- J4: This Part has deliberately been left blank
- J5: Air conditioning and Ventilation Systems
- J6: Artificial Lighting and Power
- J7: Heated Water Supply and Swimming Pool & Spa Pool Plant
- J8: Access For Maintenance and Facilities for Monitoring

3. BCA SECTION J RESIDENTIAL REQUIREMENTS

In order to ensure compliance with all relevant clauses under Section J, the recommendations for the residential component of the project are summarised in Table 1.

Table 1: Residential BCA Section J Compliance Recommendations

NSW SUBSECTION J(A) ENERGY EFFICIENCY		
Class 2 & 4 parts of buildings compliance are subject to BASIX (the Building Sustainability Index) BASIX requirements can be found in ESD Synergy BASIX report ESD Synergy BASIX Report_Miller and BASIX Certificate No's. 598226M & 597888M.		
NSW Part J(A)1 – BUILDING FABRIC		
Clause		***BCA DTS Section J Recommendations & Compliance***
NSW J(A)1.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, Performance Requirement NSW J(A)P1 is satisfied by complying with NSW J(A)1.1 and NSW J(A)1.2. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of NSW J(A)1.1 and NSW J(A)1.2, the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
NSW J(A)1.1 Application of Part	(a) The *Deemed-to-Satisfy Provisions* only apply to thermal insulation in a Class 2 building or Class 4 part of a building where a development consent or complying development certificate specifies that the insulation is to be provided as part of the development. (b) In (a), development consent and complying development certificate, have the meaning given to these terms by the Environmental Planning and Assessment Act 1979. (c) The *Deemed-to-Satisfy* provisions of this Part for thermal breaks apply to all Class 2 buildings and Class 4 parts.	Complies.
NSW J(A)1.2 Compliance with BCA Provisions	Class 2 buildings and Class 4 parts of buildings must comply with the national BCA provisions of J0.2(b) to (e) - except that the reference to "Where *required*" in J1.2 is deemed to refer to "Where a development consent specifies that insulation is to be provided as part of the development."	Complies.
J0.2 Heating and	The *sole-occupancy units* of a Class 2 building or a Class 4 part must—	(b) Complies

Cooling Loads of Sole Occupancy Units of a Class 2 Building or a Class 4 Part	(b) for general thermal construction, comply with J1.2; and (c) for thermal breaks, comply with J1.3(d) and J1.5(c); and (d) for compensating for a loss of ceiling insulation, comply with J1.3(c); and (e) for floor edge insulation, comply with J1.6(c) and J1.6(d)	(c) All metal rafters, purlins, battens and frames fixed to metal sheeting to comply with J1.3(d) and 1.5(c). (d) All exhaust fans, flues or recessed downlights that cause a loss in ceiling insulation to comply with J1.3(c).. (e) There is no in-slab heating and cooling system, hence J0.2(e) is not applicable.
NSW Part J(A)2 – BUILDING SEALING		
Clause		***BCA DTS Section J Recommendations & Compliance***
NSW J(A)2.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* NSW J(A)P2 is satisfied by complying with NSW J(A)2.1 and NSW J(A)2.2. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of NSW J(A)2.1 and NSW J(A)2.2, the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
NSW J(A)2.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to a Class 2 building and a Class 4 part of a building, but exclude— (a) a building in *climate zones* 2 and 5 where the only means of *air-conditioning* is by using an evaporative cooler; and (b) a building *ventilation opening* that is necessary for the safe operation of a gas appliance; and (c) parts of buildings that cannot be fully enclosed.	Complies
NSW J(A)2.2 Compliance with BCA Provisions	Class 2 buildings and Class 4 parts of buildings must comply with the following national BCA provisions— (a) J3.2 Chimneys and flues; and (b) J3.3 Roof lights; and (c) J3.4 External doors and *windows*; and (d) J3.5 Exhaust fans; and (e) J3.6 Construction of roofs, walls and floors; and	(a) There are no chimneys or flues in the residential component of this development hence J3.2 is not applicable. (b) There are no roof lights in the residential component of this development hence J3.3 is not applicable. (c) All sealing requirements will comply with J3.4. (d) All sealing & damper requirements to exhaust fans will comply with J3.5.

	(f) J3.7 Evaporative coolers.	(e) Complies (f) There are no evaporative coolers in the residential component of this development hence J3.7 is not applicable.
NSW Part J(A)3 – AIR-CONDITIONING AND VENTILATING SYSTEMS		
Clause		***BCA DTS Section J Recommendations & Compliance***
NSW J(A)3.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* NSW J(A)P3 is satisfied by complying with NSW J(A)3.1 and NSW J(A)3.2. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of NSW J(A)3.1 and NSW J(A)3.2, the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
NSW J(A)3.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to a Class 2 building and a Class 4 part of a building.	Complies.
NSW J(A)3.2 Compliance with BCA Provisions	Class 2 buildings and Class 4 parts of buildings must comply with the following national BCA provisions, as applicable— (a) J5.2 Air conditioning and ventilating systems; and (b) J5.3 Time switch; and (c) J5.4(a) and (c) to (i) Heating and cooling systems; and (d) J5.5 Ancillary exhaust systems. **Note:** Compliance is not *required* with the national BCA provisions of J5.4(b) as those matters are regulated under BASIX.	(a) Developer intends to comply. (b) ESD Synergy BASIX report ESD Synergy BASIX Report_Miller and BASIX Certificate No's. 598226M & 597888M. (c) Developer intends to comply. (d) Developer intends to comply.
NSW Part J(A)4 – HOT WATER SUPPLY		
Clause		***BCA DTS Section J Recommendations & Compliance***
NSW J(A)4.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* NSW J(A)P3 is satisfied by complying with NSW J(A)4.1 and NSW J(A)4.2. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of NSW J(A)4.1 and NSW J(A)4.2, the relevant	Complies.

	Performance Requirements must be determined in accordance with A0.10.	
NSW J(A)4.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to a Class 2 building and a Class 4 part of a building.	Complies.
NSW J(A)4.2 Compliance with BCA Provisions	Class 2 buildings and Class 4 parts of buildings must comply with the national BCA provisions of J7.2 Heated water supply. **Note:** Compliance is not *required* with the national BCA provisions of J7.3 and J7.4 as those matters are regulated under BASIX.	Complies.
NSW Part J(A)5 – ACCESS FOR MAINTENANCE AND FACILITIES FOR MONITORING		
Clause		***BCA DTS Section J Recommendations & Compliance***
NSW J(A)5.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* NSW J(A)P4 is satisfied by complying with NSW J(A)5.1 to NSW J(A)5.3. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of NSW J(A)5.1 to NSW J(A)5.3, the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
NSW J(A)5.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to a Class 2 building except within a *sole-occupancy unit*	Complies.
NSW J(A)5.2 Access for Maintenance	Access for maintenance must be provided to— (a) adjustable or motorised shading devices; and (b) time switches and motion detectors; and (c) room temperature thermostats; and (d) plant thermostats such as on boilers or refrigeration units; and (e) motorised air dampers and control valves; and (f) reflectors, lenses and diffusers of light fittings; and (g) heat transfer equipment; and (h) plant that receives a concession under JV3(b) for the use of energy obtained from— (i) an on-site renewable	Complies.

	energy source; or (ii) another process as reclaimed energy.	
NSW J(A)5.3 Compliance with BCA Provisions	Class 2 buildings and Class 4 parts of buildings must comply with the national BCA provisions of J8.3.	If the sole-occupancy units total floor area exceeds 500m^2, the facility must be able to record the consumption of gas and electricity as per J(A)5.3.

4. BCA SECTION J NON-RESIDENTIAL REQUIREMENTS

In order to ensure compliance with all relevant clauses under Section J, the recommendations for the non-residential component of the project are summarised in Table 2. Detailed calculations required for specific clauses can be found in the Appendix.

Table 2: Non-Residential Sections J Compliance Recommendations

Part J1 – BUILDING FABRIC		
Clause		***BCA DTS Section J Recommendations & Compliance***
J1.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* JP1 and JP3 are satisfied by complying with— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
J1.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to building elements forming the *envelope* of a Class 2 to 9 building	Complies.
J1.2 Thermal construction - General	(a) Where *required*, insulation must comply with AS/NZS 4859.1 and be installed so that it— (i) abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation	The developer intends to comply with all requirements of installation for bulk or reflective insulation as per J1.2.

	must be against the member; and another process as reclaimed energy. (ii) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and (iii) does not affect the safe or effective operation of a *service* or fitting. (b) Where *required*, *reflective insulation* must be installed with— (i) the necessary airspace to achieve the *required R-Value* between a reflective side of the *reflective insulation* and a building lining or cladding; and (ii) the *reflective insulation* closely fitted against any penetration, door or *window* opening; and (iii) the *reflective insulation* adequately supported by framing members; and (iv) each adjoining sheet of roll membrane being— A. overlapped not less than 50 mm; or B. taped together. (c) Where *required*, bulk insulation must be installed so that— (i) 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 (ii) in a ceiling, where there is no bulk insulation or *reflective insulation* in the wall beneath, it overlaps the wall by not less than 50 mm. (d) Roof, ceiling, wall and floor materials, and associated	

	surfaces are deemed to have the thermal properties listed in Specification J1.2	
J1.3 Roof and ceiling construction	(a) A roof or ceiling that is part of the *envelope*, other than of a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must achieve the *Total R-Value* specified in Table J1.3a for the direction of heat flow (b) For compliance with Table J1.3a, roof and ceiling construction is deemed to have the thermal properties listed in Specification J1.3 (c) Where, for operational or safety reasons associated with exhaust fans, flues or recessed downlights, the area of *required* ceiling insulation is reduced, the loss of insulation must be compensated for by increasing the *R-Value* of the insulation in the remainder of the ceiling in accordance with Table J1.3b. (d) A roof that— (i) is *required* to achieve a minimum *Total R-Value*; and (ii) has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and (iii) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see Specification J1.3 Figure 2(c) and (f)), must have a thermal break, consisting of a material with an *R-Value* of not less than R0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.	R2.7 ceiling/roof insulation is required to satisfy Section J1.3.
J1.4 Roof lights	*Roof lights*, including any associated shaft and diffuser, that form part of the	There are no roof lights in the non-residential

	envelope, other than of a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must— (a) if the *roof lights* are not *required* for compliance with Part F4, comply with Table J1.4; or (b) if the *roof lights* are *required* for compliance with Part F4— (i) have an area not more than 150% of the minimum area *required* by F4.6; and (ii) have transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of not more than— A. 0.29 *SHGC*; and B. 2.9 *Total U-Value*.	component of this development hence J1.4 is not applicable.
J1.5 Walls	(a) Each part of an *external wall* that is part of the *envelope*, other than of a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must satisfy one of the options in Table J1.5a except for— (i) opaque non-glazed openings in *external walls* such as doors (including garage doors), vents, penetrations, shutters and the like; and (ii) *glazing*; and (iii) an earth retaining wall or earth-berm, in other than *climate zone* 8. (b) Any wall, other than an *external wall*, that is part of the *envelope* must achieve the *Total R-Value* in Table J1.5b. (c) A wall that— (i) is *required* to achieve a minimum *Total R-Value*; and (ii) has lightweight external cladding such as weatherboards, fibre	R1.7 external wall insulation is required to satisfy Section J1.5. R0.6 internal wall insulation adjacent to non-conditioned space (i.e. car park) is required to satisfy Section J1.5.

	cement or metal sheeting fixed to a metal frame; and (iii) does not have a wall lining or has a wall lining that is fixed directly to the same metal frame, must have a thermal break, consisting of a material with an *R-Value* of not less than R0.2, installed between the external cladding and the metal frame. (d) For compliance with Table J1.5a and Table J1.5b, wall construction is deemed to have the thermal properties listed in Specification J1.5.	
J1.6 Floors	(a) A floor that is part of the *envelope* of a building, other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, including a floor above or below a *carpark* or a plant room— (i) must achieve the *Total R-Value* specified in Table J1.6; and (ii) with an in-slab heating or cooling system, must be insulated around the vertical edge of its perimeter with insulation having an *R-Value* of not less than 1.0. (b) In *climate zones* 1 to 6, the minimum *Total R-Value required* in (a) may be reduced by R0.5 provided R0.75 is added to the *Total R-Value required* for the roof and ceiling construction. (c) A concrete slab-on-ground— (i) with an in-slab heating or cooling system; or (ii) located in *climate zone* 8, must have insulation installed around the vertical edge of its perimeter. (d) Insulation *required* by (c) must—.	R1.6 floor insulation is required to satisfy Section J1.6 to Retail #2 above the residential bin room. Retail #1has a concrete slab on ground that has no in-slab heating/cooling system hence J1.6 is not applicable.

	(i) have an *R-Value* of not less than 1.0; and (ii) be water resistant; and (iii) be continuous from the adjacent finished ground level— A. to a depth of not less than 300 mm; or B. for the full depth of the vertical edge of the concrete slab-on-ground. (e) Floor construction is deemed to have the thermal properties listed in Specification J1.6	
Part J2 – GLAZING		
Clause		***BCA DTS Section J Recommendations & Compliance***
J2.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* JP1 and JP3 are satisfied by complying with— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
J2.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to elements forming the *envelope* of a building other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building.	Complies.
J2.2	This part has deliberately been left blank	-

J2.3	This part has deliberately been left blank	-
J2.4 Glazing	(a) The *glazing* in each *storey*, including any *mezzanine*, of a building must be assessed separately in accordance with (b) and (c) for— (i) *glazing* in the external *fabric* facing each orientation; and (ii) *glazing* in the internal *fabric* (b) The aggregate *air-conditioning* energy value attributable to the *glazing* must not exceed the allowance obtained by multiplying the facade area that is exposed to the *conditioned space* for the orientation by the energy index in Table J2.4a.	Glazing requirements: Please see Table 11in the Appendix on page 43
J2.5 Shading	Where shading is *required* to comply with J2.4, it must— (a) be provided by an external permanent projection, such as a verandah, balcony, fixed canopy, eaves or shading hood, which— (i) extends horizontally on both sides of the *glazing* for the same projection distance P in Figure J2.4; or (ii) provides the equivalent shading to (i) with a reveal or the like; or (b) be provided by an external shading device, such as a shutter, blind, vertical or horizontal building screen with blades, battens or slats, which— (i) is capable of restricting at least 80% of summer solar radiation; and (ii) if adjustable, is operated automatically in response to the level of solar radiation.	All permanent projections must comply with Section J2.4(a)
Part J3 – BUILDING SEALING		
Clause		***BCA DTS Section J Recommendations & Compliance***
J3.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* JP1	Complies.

	and JP3 are satisfied by complying with— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. the relevant *Performance Requirements* must be determined in accordance with A0.10.	
J3.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part apply to elements forming the *envelope* of a Class 2 to 9 building, other than— (a) a building in *climate zones* 1, 2, 3 and 5 where the only means of *air-conditioning* is by using an evaporative cooler; or (b) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or (c) a building or space where the mechanical ventilation *required* by Part F4 provides sufficient pressurisation to prevent infiltration. (d) parts of buildings that cannot be fully enclosed	Complies.
J3.2 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.	There are no chimneys or flues in the non-residential component of this development hence J3.2 is not applicable.
J3.3 Roof lights	(a) A *roof light* must be sealed, or capable of being sealed when serving— (i) a *conditioned space*; or	There are no roof lights in the non-residential component of this development hence J3.3 is not applicable.

	(ii) a *habitable room* in *climate zones* 4, 5, 6, 7 and 8. (b) A *roof light required* by (a) to be sealed, or capable of being sealed, must be constructed with— (i) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or (ii) a weatherproof seal; or (iii) a shutter system readily operated either manually, mechanically or electronically by the occupant.	
J3.4 Windows and doors	(a) A seal to restrict air infiltration must be fitted to each edge of a door, openable *window* or the like forming part of— (i) the *envelope* of a *conditioned space*; or (ii) the external fabric of a *habitable room* or public area in *climate zones* 4, 5, 6, 7 and 8. (b) The requirements of (a) do not apply to— (i) a *window* complying with AS 2047; or (ii) a fire door or smoke door; or (iii) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security. (c) A seal *required* by (a)— (i) for the bottom edge of an external swing door, must be a draft protection device; and (ii) for the other edges of an external door or the edges of an openable *window* or other such opening, may be a foam or rubber compression strip, fibrous seal or the like. (d) An entrance to a building, if	All sealing requirements to windows and doors will comply with J3.4.

	leading to a *conditioned space* must have an airlock, *self-closing* door, revolving door or the like, other than— (i) where the *conditioned space* has a *floor area* of not more than 50 m^2; or (ii) where a cafe, restaurant, open front shop or the like has— A. a 3 m deep un-conditioned zone between the main entrance, including an open front, and the *conditioned space*; and B. at all other entrances to the cafe, restaurant, open front shop or the like, *self-closing* doors..	
J3.5 Exhaust fans	A miscellaneous exhaust fan, such as a bathroom or domestic kitchen exhaust fan, must be fitted with a sealing device such as a self-closing damper, filter or the like when serving— (c) a *conditioned space*; or (d) a *habitable room* in *climate zones* 4, 6, 7 and 8.	The developer intends that all bathrooms and kitchens (if any) in all retail & commercial spaces will be fitted with a sealing device where applicable hence will comply with J3.5.
J3.6 Construction of roofs, walls and floors	(a) Roofs, 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 in accordance with (b) when forming part of— (i) the *envelope*; or (ii) the external *fabric* of a *habitable room* or a public area in *climate zones* 4, 5, 6, 7 and 8. (b) Construction *required* by (a) must be— (i) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or (ii) sealed by caulking, skirting, architraves,	Complies.

	cornices or the like. (c) The requirements of (a) do not apply to openings, grilles and the like *required* for smoke hazard management.	
J3.7 Evaporative coolers	(a) a heated space; or (b) a *habitable room* or a public area of a building in *climate zones* 4, 5, 6, 7 and 8.	There are no evaporative coolers in the non-residential component of this development hence J3.7 is not applicable.
Part J4 – This Part has deliberately been left blank		
Part J5 – AIR-CONDITIONING AND VENTILATING SYSTEMS		
Clause		***BCA DTS Section J Recommendations & Compliance***
J5.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* JP1 and JP3 are satisfied by complying with— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
J5.1	This part has deliberately been left blank	-
J5.2 Air-conditioning and ventilating systems	An *air-conditioning* unit or system must— (i) be capable of being deactivated when the *sole-occupancy unit*, building or part of the building served is not occupied; and (ii) where the *air-conditioning* unit or system has motorised outside air and	Developer intends to comply.

	return dampers, close the dampers when the *air-conditioning* unit or system is deactivated; and (iii) when serving a *sole-occupancy unit* of a Class 3 building, not operate when any external door including a door opening to a balcony, patio, courtyard or the like is open for more than 1 minute; and (iv) have any supply and return ductwork sealed and insulated in accordance with Specification J5.2; and (v) when serving more than one *air-conditioning* zone or area with different heating and cooling needs— A. thermostatically control the temperature of each zone or area; and B. not control the temperature by mixing actively heated air and actively cooled air; and C. limit reheating to not more than— aa. for a fixed supply air rate, a 7.5 K rise in temperature; and bb. for a variable supply air rate, a 7.5 K rise in temperature at the nominal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased; and (vi) other than where a packaged *air-conditioning* unit is used, have a variable speed fan when its supply air quantity is varied; and (vii) where the *air-conditioning* system provides the *required* mechanical ventilation, in other than process related applications where humidity control is needed, have an *outdoor air economy cycle*— A. in *climate zone* 2 and 3,	

	when the *air-conditioning* unit capacity is over 50 kWr; and B. in *climate zones* 4, 5, 6, 7 and 8 when the *air-conditioning* unit capacity is over 35 kWr; and (viii) in a Class 3 building, be capable of controlling the temperature of a *sole-occupancy unit* at a different temperature during sleeping periods than during other periods; and (ix) be designed so that the total *fan power* of the *air-conditioning* supply air and return air fans in the building, divided by the *floor area* served by those fans is, in accordance with Table J5.2, except the following need not comply with this requirement:. A. fans in unducted *air-conditioning* units with a supply air capacity of less than 1000 L/s, B. The power for a fan in an energy reclaiming system that preconditions outdoor air. C. The power for process related components such as high efficiency particulate air filters. (b) A system that provides mechanical ventilation to other than a *sole-occupancy unit* in a Class 2 building or a Class 4 part of a building, either as part of an *air-conditioning* system or as a separate ventilation system, must— (i) be capable of being deactivated when the building or part of the building served by that system is not occupied; and (ii) when serving a	

	conditioned space— A. not provide mechanical ventilation in excess of the minimum *outdoor air* quantity *required* by Part F4 for a mechanical ventilation system, where relevant, by more than 20% other than where there is— aa. additional unconditioned outside air supplied to provide free cooling or to balance process exhaust such as from a *health-care building* or laboratory; or bb. additional exhaust ventilation needed to balance the *required* mechanical ventilation; or cc. an energy reclaiming system that preconditions all the outside air; and B. in other than *climate zone* 2, where the number of square metres per person is 1 or less as specified in D1.13 and the air flow rate is more than 1000 L/s, have— aa. an energy reclaiming system	

	that preconditions outside air; or bb. the ability to automatically modulate the mechanical ventilation *required* by Part F4 in proportion to the number of occupants; and (iii) 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— A. have a *fan motor power* to air flow rate ratio of 0.65 W/(L/s) without filters or 0.98 W/(L/s) with filters for a general mechanical ventilation system; and B. for *carpark* exhaust, when serving a *carpark* with more than 40 vehicle spaces, be controlled by an atmospheric contaminant monitoring system in accordance with AS 1668.2 (c) The requirements of (a) and (b) must not inhibit— (i) the smoke hazard management operation of *air-conditioning* and mechanical ventilation systems; and (ii) essential ventilation such as for a garbage room, lift motor room, gas meter enclosure or gas	

	regulator enclosure or the like. (d) The provisions of (b)(iii) do not apply to the following: (i) The power for an energy reclaiming system that preconditions outside air. (ii) The power for process related components such as high efficiency particulate air filters. (iii) The power for a miscellaneous exhaust system complying with J5.5. (iv) The power for a mechanical ventilation system for a Class 8 *electricity network substation*.	
J5.3 Time switch	(a) A time switch in accordance with Specification J6 must be provided to control each of the following: (i) An *air-conditioning* system of more than 10 kWr. (ii) A ventilation system with an air flow rate of more than 1000 L/s. (iii) A heating system of more than 10 $kW_{heating}$. (b) The requirements of (a) do not apply to— (i) an *air-conditioning* system or ventilation system that serves only one *sole-occupancy unit* of— A. a Class 2 or 3 building; or B. a Class 4 part of a building; or C. a Class 9c *aged care building*; or (ii) a building where *air-conditioning* or ventilation is needed for 24 hour occupancy such as a manufacturing process or emergency services. (iii) a Class 8 *electricity network substation*.	If a time switch is being installed, it will comply with J5.2.

J5.4 Heating and cooling systems	(a) Systems that provide heating or cooling for *air-conditioning* systems must—: (i) have any *piping*, vessels, heat exchangers or tanks containing heated or chilled fluid, other than those with insulation levels covered by Minimum Energy Performance Standards (MEPS), insulated in accordance with Specification J5.4; and (ii) where water is circulated by pumping at greater than 2 L/s— A. be designed so that the total of the *pump power* to the pump is in accordance with Table J5.4a; and B. have the pump capable of varying its speed in response to varying load when it is rated at more than 3 kW of *pump power*, except where the pump is needed to run at full speed for safe or efficient operation; and (iii) if the system contains more than one water heater used for heating a building, chiller or coil, be capable of stopping the flow of water to those not operating. (b) A heater— (i) for heating a space via water, such as a boiler, that is part of an *air-conditioning* system, must— A. achieve a thermal efficiency complying with	The heating & cooling system to be installed in the development will comply with J5.4.

	Table J5.4b when tested in accordance with BS 7190; and B. use reticulated gas where it is available at the allotment boundary; and (ii) for heating a space other than via water, must be— A. a solar heater; or B. a gas heater; or C. an oil heater, but only if reticulated gas is not available at the allotment boundary; or D. a heat pump heater; or E. a solid-fuel burning heater; or F. a heater using reclaimed heat from another process such as reject heat from refrigeration plant; or G. an electric heater if— aa. if the heating capacity is not more than— AA. 10 W/m^2 of the *floor area* of the *conditioned space* in *climate zone* 1; or BB. 40 W/m^2 of the *floor area* of the *conditioned space* in *climate zone* 2; or CC. the value specified in Table J5.4c where reticulated gas is not available at the allotment boundary; or bb. if the annual energy consumption for heating is not more than 15 kWh/m^2 of the *floor area* of the *conditioned space* in	

	climate zones 1 to 5; or cc. if for an in-duct heater complying with J5.2(a)(v)(C); and H. a combination of (A) to (G); and (iii) for heating a bathroom in a Class 3 or Class 9c *aged care building*, may be electric if the heating capacity is not more than 1.2kW; and (iv) that is a fixed space heating appliance installed outdoors, must be controlled to automatically turn off when not needed by an outdoor air temperature sensor, timer, motion detector, or the like. (c) Package *air-conditioning* equipment with a capacity of not less than 65 kWr, including a split unit and a heat pump, must have an energy efficiency ratio when cooling complying with Table J5.4d when tested in accordance with AS/NZS 3823.1.2 at test condition T1. (d) A refrigerant chiller up to 350 kWr capacity that is part of an *air-conditioning* system, must have an energy efficiency ratio complying with Table J5.4e when determined in accordance with ARI 550/590 or AHRI 550/590. (e) The fan motor of an air cooled condenser that is part of an *air-conditioning* system, other than one that is part of package *air-conditioning* equipment in (c) or that is part of a Liquid Chilling Package, using the vapour compression cycle in (d), must not use more than 42 W of *fan power*, for each kW of heat rejected from the refrigerant when determined in accordance with ARI 460 or AHRI 460.	

	(f) The fan of a cooling tower that is part of an *air-conditioning* system must not use more than— (i) if a propeller or axial fan, 310 W of *fan power* for each L/s of cooling water circulated; or (ii) if a centrifugal fan, 590 W of *fan power* for each L/s of cooling water circulated. (g) The fan of a closed circuit cooler that is part of an *air-conditioning* system must not use more than— (i) if a propeller or axial fan, 500 W of *fan power* for each L/s of cooled fluid circulated; and (ii) if a centrifugal fan, 670 W of *fan power* for each L/s of cooled fluid circulated. (h) The fan of an evaporative condenser that is part of an *air-conditioning* system must not use more than— (i) if a propeller or axial fan, 18 W of *fan power* for each kW of heat rejected; and (ii) if a centrifugal fan, 22 W of *fan power* for each kW of heat rejected. (i) The spray water pump of a closed circuit cooler or evaporative condenser that is part of an *air-conditioning* system must not use more than 150 W of *pump power* for each L/s of spray water circulated.	
J5.5 Miscellaneous exhaust systems	(a) A miscellaneous exhaust system with an air flow rate of more than 1000 L/s, that is associated with equipment having a variable demand such as a stove in a commercial kitchen or a chemical bath in a factory, must— (i) have the means for the operator to— A. reduce the energy used, such as by a	The miscellaneous exhaust system to be installed in the development will comply with J5.5.

	variable speed fan, and B. stop the motor when the system is not needed; and (ii) be designed to minimise the exhausting of conditioned air. (b) The requirements of (a) do not apply to— (i) within a *sole-occupancy unit* of a Class 2 or 3 building, Class 4 part of a building or Class 9c *aged care building*; or (ii) where additional exhaust ventilation is needed to balance the *required* outside air for ventilation; or (iii) where air flow must be maintained for safe operation.. (iv) to a Class 8 *electricity network substation*.	
Part J6 – ARTIFICIAL LIGHTING AND POWER		
Clause		***BCA DTS Section J Recommendations & Compliance***
J6.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* JP1 and JP3 are satisfied by complying with— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. the relevant *Performance Requirements* must be	Complies.

	determined in accordance with A0.10.	
J6.1 Application of Part	J6.2, J6.3 and J6.5 (a)(ii) do not apply to a Class 8 *electricity network substation*.	Complies.
J6.2 Artificial lighting	(b) In a Class 5, 6, 7, 8, 9a or 9b building — (i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum *illumination power density* in Table J6.2a; and— (ii) the aggregate design illumination power load in (i) is the sum of the design illumination power loads in each of the spaces served; and (iii) in determining the design illumination power load for (ii) the following must be used: A. Where there are multiple lighting systems serving the same space— aa. the total illumination power load of all systems; or bb. for a control system that permits only one system to operate at a time, the design illumination power load is— AA. based on the highest illumination power load; or BB. determined by the formula— [H x T/2 + P x (100 - T/2)] / 100 B. Where there is adjustable position lighting such as trapeze lighting or track lighting other	Lighting intensities are listed in Table 12 in Appendix.

	than trunking systems that accept fluorescent lamps— aa. the rating of the circuit breaker protecting the track; or bb. of extra low voltage, 80% of the power rating of the transformer; or cc. of mains voltage, 100 W per metre of track. (c) The requirements of (a) and (b) do not apply to the following: (i) Emergency lighting in accordance with Part E4. (ii) Signage and display lighting within cabinets and display cases that are fixed in place. (iii) Lighting for accommodation within the residential part of a *detention centre*. (iv) A heater where the heater also emits light, such as in bathrooms. (v) Lighting of a specialist process nature such as in an operating theatre, fume cupboard or clean workstation. (vi) Lighting of performances such as theatrical or sporting. (vii) Lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.	
J6.3 Interior artificial lighting and power control	(a) Artificial lighting of a room or space must be individually operated by a switch or other control device. (b) An occupant activated device, such as a room security device, a	Any motion detector and dimming systems to be installed in the development will comply with J6.3.

	motion detector in accordance with Specification J6, or the like, must be provided in the *sole-occupancy unit* of a Class 3 building, other than where providing accommodation for people with a disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the *sole-occupancy unit* is unoccupied. (c) An artificial lighting switch or other control device in (a) must— (i) if an artificial lighting switch, be located in a visible position— A. if an artificial lighting switch, be located in a visible position— B. in an adjacent room or space from where the lighting being switched is visible; and (ii) for other than a single functional space such as an auditorium, theatre, *swimming pool*, sporting stadium or warehouse— A. not operate lighting for an area of more than 250 m^2 if in a Class 5 building or a Class 8 laboratory; or B. not operate lighting for an area of more than— aa. 250 m^2 for a space of not more than 2000 m^2; or bb. 1000 m^2 for a space of more than 2000 m^2, If in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building (d) 95% of the light fittings in a building or *storey* of a building, other than a Class 2 or 3 building or a Class 4 part, of more than 250 m^2 must be controlled by—	

	(i) a time switch in accordance with Specification J6; or (ii) an occupant sensing device such as— A. a security key card reader that registers a person entering and leaving the building; or B. a motion detector in accordance with Specification J6. (e) In a Class 5, 6 or 8 building of more than 250 m^2, artificial lighting in a natural lighting zone adjacent to windows must be separately controlled from artificial lighting not in a natural lighting zone in the same *storey* except where— (i) the room containing the natural lighting zone is less than 20 m^2; or (ii) the room's natural lighting zone contains less than 4 luminaires; or (iii) 70% or more of the luminaires in the room are in the natural lighting zone. (f) The requirements of (a), (b), (c), (d) and (e) do not apply to the following: (i) Emergency lighting in accordance with Part E4. (ii) Where artificial lighting is needed for 24-hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a *detention centre*. (g) The requirements of (d) do not apply to the following: (i) Artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as in a *patient care area* in a Class 9a building or in a	

	Class 9c *aged care building*. (ii) A heater where the heater also emits light, such as in bathrooms.	
J6.4 Interior decorative and display lighting	(a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled— (i) separately from other artificial lighting; and (ii) by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and (iii) by a time switch in accordance with Specification J6 where the display lighting exceeds 1 kW. (b) Window display lighting must be controlled separately from other display lighting.	Any display lighting to be installed in the development will comply with J6.4.
J6.5 Artificial lighting around the perimeter of a building	(a) Artificial lighting around the perimeter of a building, must— (i) be controlled by— A. a daylight sensor; or B. a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and (ii) when the total perimeter lighting load exceeds 100 W— A. have an average *light source efficacy* of not less than 60 Lumens/W; or B. be controlled by a motion detector in accordance with	All artificial lighting around the perimeter will comply with J6.5.

	Specification J6; and (iii) when used for decorative purposes, such as facade lighting or signage lighting, have a separate time switch in accordance with Specification J6. (b) The requirements of (a)(ii) do not apply to the following: when used for decorative purposes, such as facade lighting or signage lighting, have a separate time switch in accordance with Specification J6. (i) Emergency lighting in accordance with Part E4. (ii) Lighting around a *detention centre*.	
J6.6 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 J6.	All power supply installation for a boiler and chilled water storage units will comply with J6.6.
Part J7 – HEATED WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT		
Clause		***BCA DTS Section J Recommendations & Compliance***
J7.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* JP1 and JP3 are satisfied by complying with— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of— (i) J0.1 to J0.3; and (ii) J1.1 to J1.6; and (iii) J2.1 to J2.5; and (iv) J3.1 to J3.7; and (v) J5.1 to J5.5; and (vi) J6.1 to J6.6; and (vii) J7.1 to J7.4. the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.

J7.1	This part has deliberately been left blank	-
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.	Developer intends to comply.
J7.3 Swimming pool heating and pumping	(a) Heating for a *swimming pool* must be by— (i) a solar heater not boosted by electric resistance heating; or (ii) a heater using reclaimed energy; or (iii) a gas heater; or (iv) a heat pump; or (v) a combination of 2 or more of (i), (ii), (iii) and (iv). (b) Where some or all of the heating *required* by (a) is by a gas heater or a heat pump, the *swimming pool* must have— (i) a cover other than when located in a *conditioned space*; and (ii) a time switch in accordance with Specification J6 to control the operation of the heater. (c) A time switch must be provided in accordance with Specification J6 to control the operation of a circulation pump for a *swimming pool*. (d) For the purpose of J7.3, a *swimming pool* does not include a spa pool.	There are no pools in the development hence J7.3 is not applicable.
J7.4 Spa pool heating and pumping	(a) Heating for a spa pool that shares a water recirculation system with a *swimming pool* must be by— (i) a solar heater; or (ii) a heater using reclaimed energy; or (iii) a gas heater; or (iv) a heat pump; or (v) a combination of 2 or more of (i), (ii), (iii) and (iv). (b) Where some or all of the heating *required* by (a) is by a gas heater	There are no spas in the development hence J7.4 is not applicable.

	or a heat pump, the *spa pool* must have— (i) a cover; and (ii) a push button and a time switch in accordance with Specification J6 to control the operation of the heater. (c) A time switch must be provided in accordance with Specification J6 to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.	
Part J8 – ACCESS FOR MAINTENANCE AND FACILITIES FOR MONITORING		
Clause		***BCA DTS Section J Recommendations & Compliance***
J8.0 Deemed-to-Satisfy Provisions	(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* JP2 is satisfied by complying with J8.1 to J8.3 (b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of J8.1 to J8.3, the relevant *Performance Requirements* must be determined in accordance with A0.10.	Complies.
J8.1 Application of Part	The *Deemed-to-Satisfy Provisions* of this Part do not apply— (a) within a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building; or (b) to a Class 8 *electricity network substation*.	Complies.
NSW J8.2 Access for maintenance	Access for maintenance must be provided to all plant, equipment and components of *services* that rely on maintenance to continue to perform including — (a) adjustable or motorised shading devices; and (b) time switches and motion detectors; and (c) room temperature thermostats; and (d) plant thermostats such as on boilers or refrigeration units; and (e) motorised air dampers and control	Developer intends to comply.

	valves; and (f) reflectors, lenses and diffusers of light fittings; and (g) heat transfer equipment; and (h) plant that receives a concession under JV3(b) for the use of energy obtained from— (i) an on-site *renewable energy* source; or (ii) another process as reclaimed energy.	
J8.3 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; and (ii) artificial lighting; and (iii) appliance power; and (iv) central hot water supply; and (v) internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and (vi) other ancillary plant. (c) The provisions of (b) do not apply to a Class 2 building with a *floor area* of more than 2,500 m^2 where the total area of the common areas is less than 500 m^2.	If the buildings total floor area exceeds 2,500m^2, the facility must be able to record the consumption of all utilities as per J8.3 (b).

5. ARCHITECTURAL DRAWINGS

The BCA Section J assessment carried out in this report was based on the following architectural drawings supplied by Architex received on 15th December 2014.

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APPENDIX

1. PART J1: BUILDING FABRIC

1.1 J1.3: ROOF AND CEILING CONSTRUCTION

Table 3: Table J1.3a ROOFS AND CEILINGS - MINIMUM TOTAL R-VALUE FOR EACH CLIMATE ZONE

Climate zone	**1, 2,3, 4 and 5**	**6**	**7**	**8**
Direction of heat flow	**Downwards**		**Upwards**	
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of not more than 0.4	3.2	3.2	3.7	4.8
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.4 but not more than 0.6	3.7	3.2	3.7	4.8
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.6	4.2	3.2	3.7	4.8

Retail spaces have **exposed roof & ceilings** type as per Table 4 below.

Table 4: EXPOSED ROOF/CEILING CONSTRUCTION

BCA Specification J1.3 – Roof & Ceiling Construction: Figure2(g) Solid concrete roof to 5°, Unventilated	
Construction	**R-value (m^2. K/W)**
Outdoor air film	0.04
Waterproof membrane, rubber synthetic	0.03
Solid concrete	0.07
Ceiling airspace (non-reflective)	0.22
Plasterboard, gypsum	0.06
Indoor air film (still air)	0.16
Total	**0.58**

Percentage of uninsulated ceiling is approximately is unknown. Hence Total R-value to be satisfied is **R2.62. Therefore an additional R2.7 roof/ceiling insulation is required to comply with BCA requirements.**

1.2 J1.5: WALLS

Table 5: Table J1.5a OPTIONS FOR EACH PART OF AN EXTERNAL WALL THAT IS PART OF AN ENVELOPE

Climate zone	**Options**
1, 2 and 3	(a) (i) Achieve a minimum *Total R-Value* of 3.3.
	(ii) The minimum *Total R-Value* in (i) is reduced—
	(A) for a wall with a surface density of not less than 220 kg/m^2, by 0.5; and
	(B) for a wall that is—
	(aa) facing the south orientation as described in Figure J2.3, by 0.5; or
	(bb) shaded with a projection shade angle in accordance with Figure J1.5 of—
	(AA) 15 degrees to not more than 45 degrees, by 0.5; or
	(BB) more than 45 degrees, by 1.0; and
	(C) if the outer surface solar absorptance value is not more than 0.6, by 0.5.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like—
	(i) achieve a minimum *Total R-Value* of 1.4; and
	(ii) satisfy *glazing* energy index Option B of Table J2.4a.
4, 5 and 6	(a) (i) Achieve a minimum *Total R-Value* of 2.8.
	(ii) The minimum *Total R-Value* in (i) is reduced—
	(A) for a wall with a surface density of not less than 220 kg/m^2, by 0.5; and
	(B) for a wall that is—
	(aa) facing the south orientation as described in Figure J2.3, by 0.5; or
	(bb) shaded with a projection shade angle in accordance with Figure J1.5 of—
	(AA) 30 degrees to not more than 60 degrees, by 0.5; or
	(BB) more than 60 degrees, by 1.0.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like—
	(i) achieve a minimum *Total R-Value* of 1.4; and
	(ii) satisfy *glazing* energy index Option B of Table J2.4a.
7	(a) Achieve a minimum *Total R-Value* of 2.8.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like—
	(i) achieve a minimum *Total R-Value* of 1.4; and
	(ii) satisfy *glazing* energy index Option B of Table J2.4a.
8	(a) Achieve a minimum *Total R-Value* of 3.8.

Climate zone	Options	
	(b)	Where the wall is an earth retaining wall or earth-berm, achieve a minimum *Total R-Value* of 2.0.

Table 6: Table J1.5b AN ENVELOPE WALL OTHER THAN AN EXTERNAL WALL – MINIMUM TOTAL R-VALUE

Location			*Climate zone*							
			1	2	3	4	5	6	7	8
(a)	Where the adjacent enclosed non-conditioned space has—		1.0	1.0	Nil	Nil	1.0	1.0	1.5	2.5
	(i)	ventilation of not more than 1.5 air changes per hour of outside air during occupied hours; and								
	(ii)	glazing in the external *fabric as required* by Part J2; and								
	(iii)	roof lights in the external *fabric as required* by Part J1.4.								
(b)	For other than (a)		2.3	2.3	2.3	1.8	1.8	1.8	2.8	3.8

Retail spaces have **external walls** as per Table 7 below.

Table 7: EXTERNAL WALL CONSTRUCTION

BCA Specification J1.5 – Wall Construction: Figure2(f) 75mm Autoclaved aerated concrete block	
Construction	**R-value (m^2. K/W)**
Outdoor air film	0.04
75mm Autoclaved aerated concrete block	0.75
Airspace (20mm to 40mm non-reflective and unventilated)	0.17
Plasterboard, gypsum	0.06
Indoor air film (still air)	0.12
Total	**1.14**

Therefore an additional minimum R1.7 external wall insulation is required to comply with BCA requirements.

Retail spaces have **internal walls** adjacent to unconditioned spaces (carpark)as per Table 8 below.

Table 8: INTERNAL WALL CONSTRUCTION ADJACENT TO UNCONDITIONED SPACES

BCA Specification J1.5 – Wall Construction: Figure2(f) 75mm Autoclaved aerated concrete block	
Construction	**R-value (m^2. K/W)**
Indoor air film	0.12
75mm Autoclaved aerated concrete block	0.75
Airspace (20mm to 40mm non-reflective and unventilated)	0.17
Plasterboard, gypsum	0.06
Indoor air film (still air)	0.12
Total	**1.22**

Therefore an additional minimum R0.6 internal wall insulation is required to comply with BCA requirements.

1.3 J1.6: FLOORS

Table 9: Table J1.6 FLOORS — MINIMUM TOTAL R-VALUE

Location			***Climate zone***							
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
(a)	A slab on ground:									
	(i)	Without an in-slab heating or cooling system	Nil	Nil	Nil	Nil	Nil	Nil	1.0	2.0
	(ii)	With an in-slab heating or cooling system	1.25	1.25	1.25	1.25	1.25	1.25	1.25	2.25
(b)	A suspended floor without an in-slab heating or cooling system where the non- *conditioned space* is—		1.0	1.0	Nil	Nil	1.0	1.0	1.5	2.5
	(i)	enclosed; and								
	(ii)	where mechanically ventilated by not more than 1.5 air changes per hour.								
(c)	A suspended floor with an in-slab heating or cooling system where the non- *conditioned space* is—		1.25	1.25	1.25	1.25	1.25	1.25	1.75	2.75
	(i)	enclosed; and								
	(ii)	where mechanically ventilated by not more than 1.5 air changes per hour								
(d)	For other than (a), (b) or (c)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.5
Direction of heat flow			Upwards	Downwards and Upwards		Downwards				
Note:										

Location	*Climate zone*							
	1	2	3	4	5	6	7	8
A sub-floor space with not more than 150% of the *required* sub-floor ventilation is considered enclosed.								

Retail#2 have **exposed floors adjacent to the residential bin storage** that is deemed an unconditioned space located on Basement Level 1 as per Table 10 below.

Table 10: FLOOR CONSTRUCTION

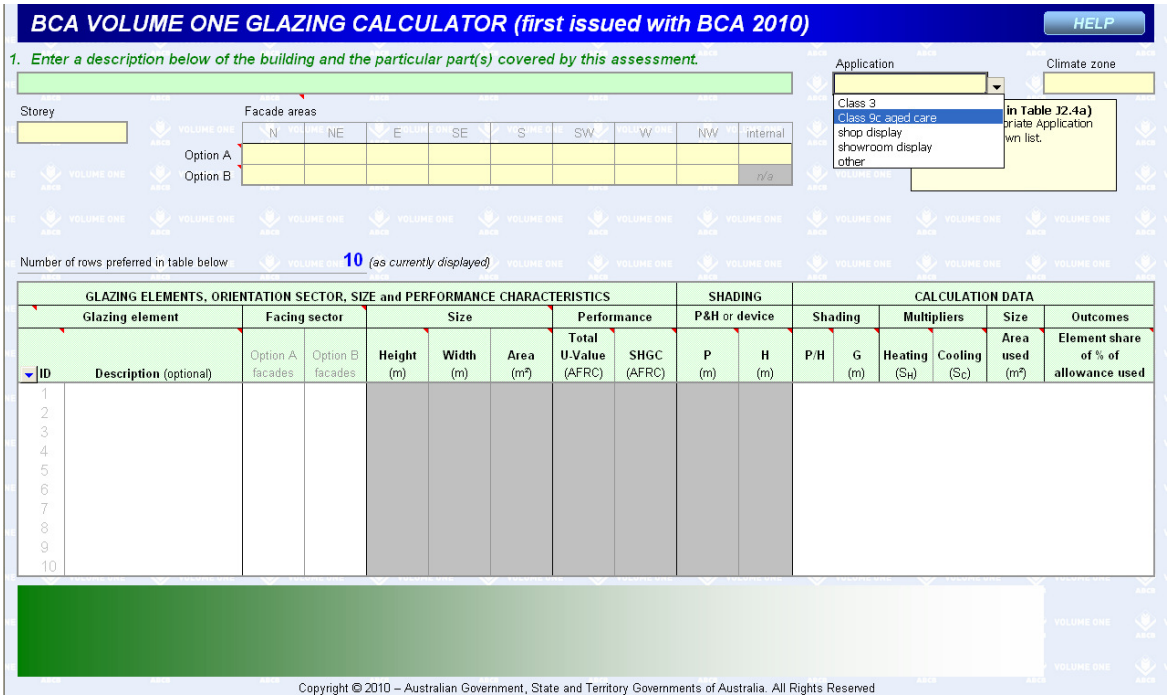
BCA Specification J165 – Floor Construction: Figure2(c) Solid concrete suspended slab	
Construction	**R-value (m^2. K/W)**
Indoor air film	0.16
Solid concrete	0.10
Indoor air film	0.16
Total	**0.42**

Therefore an additional minimum R1.6 floor insulation is required to comply with BCA requirements.

Retail #1 has a floor construction that is a concrete slab on ground without an in-slab heating/cooling system. **Hence no additional insulation is required to comply with BCA requirements.**

2. PART J2: EXTERNAL GLAZING

2.1 GLAZING CALCULATORS



Using the BCA calculator demonstrated above, glazing calculations are performed for all levels

The glazing specifications outlined in Table 11 specify the glazing performance values to achieve compliance with the BCA DTS. The performance glazing requirements follow.

Type 1: U = 2.1, SHGC = 0.31, , VLT = 0.29 (For example: BRD-101-05 – 4mm SmartGlass SP30 Neutral – Panoramic/12mm Argon Gap/ 4mm SmartGlass SP30 Neutral – Panoramic)

Type 2: U = 3.6, SHGC = 0.40, VLT = 0.46 (For example: BRD-054-19 – 6mm Sunergy Clear/12mm Argon Gap/ 6mm Clear)

Table 11: GLAZING TYPES AND LOCATIONS

Location	**Façade Orientation**	**Glazing Requirements** (Area recommendations refer to max area allowable on specified level/orientation)
Retail #1	All	Type 1
Retail #2	All	**Option 1:** Type 1 Glazed area maximum of 28.5m^2 to East façade **Option 2:** Type 2 Glazed area maximum of 20.4m^2 to East façade
Office	All	Type 1 & increase awning to 1.6 metres

3. PART 6: ARTIFICIAL LIGHTING AND POWER

3.1 J6.2: INTERIOR ARTIFICIAL LIGHTING

(b) In a Class 5, 6, 7, 8, 9a or 9b building —

(i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum *illumination power density* in Table J6.2a; and—

(ii) the aggregate design illumination power load in (i) is the sum of the design illumination power loads in each of the spaces served; and

(iii) in determining the design illumination power load for (ii) the following must be used:

(A) Where there are multiple lighting systems serving the same space—

(aa) the total illumination power load of all systems; or

(bb) for a control system that permits only one system to operate at a time, the design illumination power load is—

(AA) based on the highest illumination power load; or

(BB) determined by the formula—

[H x T/2 + P x (100 - T/2)] / 100
Where:
H = the highest illumination power load; and
T = the time for which the maximum illumination power load will occur, expressed as a percentage; and
P = the predominant illumination power load.

(B) Where there is adjustable position lighting such as trapeze lighting or track lighting other than trunking systems that accept fluorescent lamps—

(aa) the rating of the circuit breaker protecting the track; or

(bb) of extra low voltage, 80% of the power rating of the transformer; or

(cc) of mains voltage, 100 W per metre of track.

(c) The requirements of (a) and (b) do not apply to the following:

(i) Emergency lighting in accordance with Part E4.

(ii) Signage and display lighting within cabinets and display cases that are fixed in place.

(iii) Lighting for accommodation within the residential part of a *detention centre*.

(iv) A heater where the heater also emits light, such as in bathrooms.

(v) Lighting of a specialist process nature such as in an operating theatre, fume cupboard or clean workstation.

(vi) Lighting of performances such as theatrical or sporting.

(vii) Lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.

Lighting requirements are shown in Table 12.

Table 12: MAXIMUM LIGHTING INTENSITY FOR ALL COMMERCIAL AND RETAIL AREAS

Area name	Level	Maximum illumination power density (W/m^2)
Car park - General	B2-Level 1	6
Car-park – Entry zone (First 20m of travel)	B1	25
Residential bin room	B1	5
Plant room	B1	5
Retail #1	B1-1	22
Retail bins	1	5
Retail #2	1	22
Office	2	7
Corridors & lobbies	2	8