REPORT ON
BCA SECTION J COMPLIANCE

For

GENESIS CARE CAMPBELLTOWN

Prepared by

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All in accordance with this Specification and the accompanying drawings.

THIS REVISION ISSUE:
DA

REVISION	DATE	PROJECT No.	CHECKED	APPROVED	REMARKS
C	01/06/2021	220077	EF	DS	

Amendments

Revision	Description	Date	Approved
A	Preliminary Issue	08/03/2021	DS
B	Issued for review	27/04/2021	DS
C	Issued for DA	01/06/2021	DS

Contents

1 EXECUTIVE SUMMARY

The Genesis Care Campbelltown consists of a class 9a facility building including Linac Bunker, consulting suites, medical imaging centre, pathology and a wellness pavilion. The development is within climate zone 6 under Building Code of Australia (BCA).

This assessment is to assess the energy efficiency performance of the building as per Deemed-to-satisfy requirement of BCA 2019 Section J Energy Efficiency requirements.

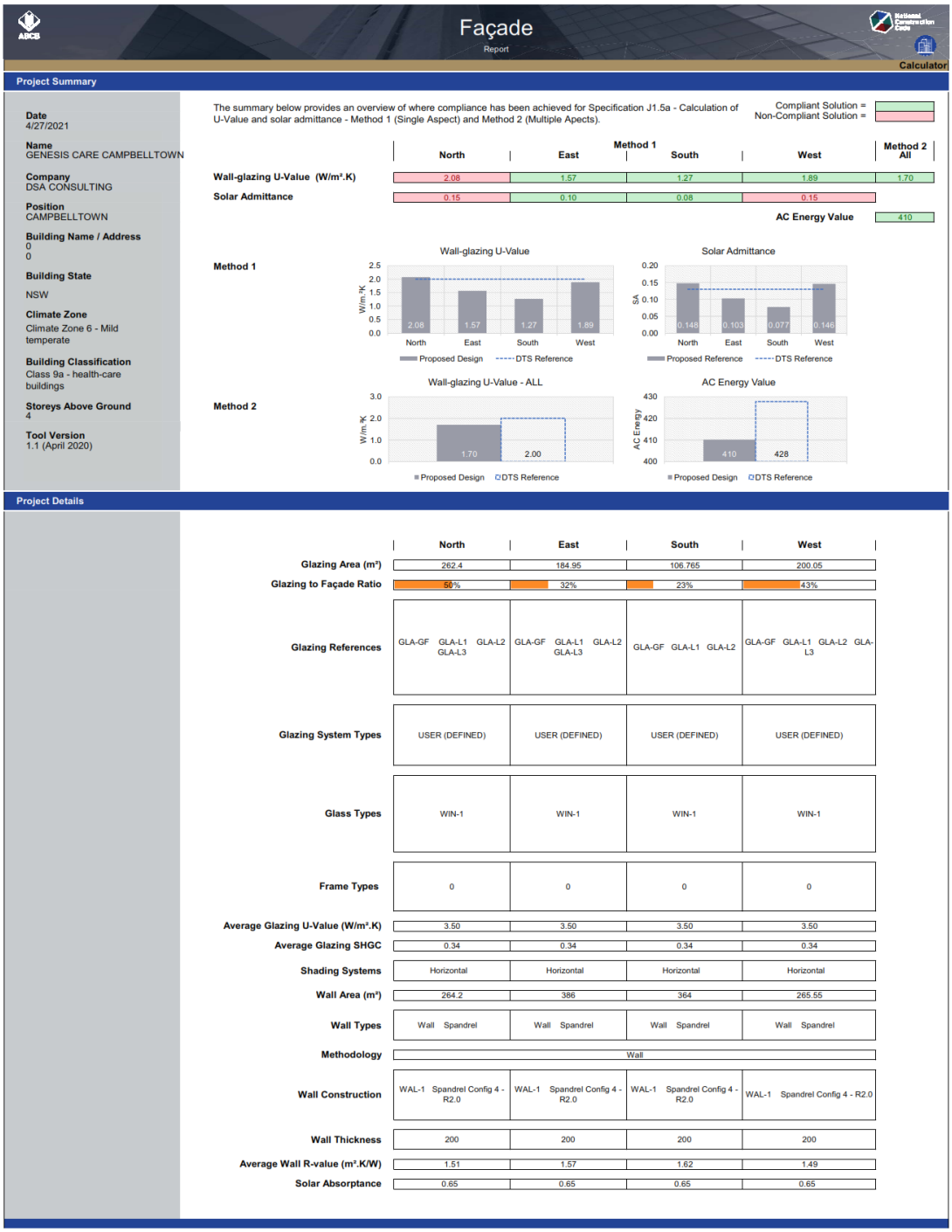
The building has the following classification under BCA:

Heath care facility Class 9a

Table 1.1 The building fabric requirements are summarised in the table below.

BCA CLAUSES	DETAILS	DESCRIPTION
J1.3	Roof and ceiling	Total R3.2 required
J1.5	Walls and glazing	Total R2.8 required for external wall DTS required double glazed; U-value 3.5 W/m^{2}K SHGC 0.34 Required Double Glazed to Comply U-value 3 W/m^{2}K SHGC 0.3
J1.6	Floors	N/A
J2	n/a	
J6	Artificial lighting and power	Compliance with the specification in BCA J6; Confirmed by Electrical Contractor

Table 1.2 Based on current architectural design, the section J1.5 wall and glazing results are as follow.



Façade
Report
Calculator

Project Summary

Date
4/27/2021

Name
GENESIS CARE CAMPBELLTOWN

Company
DSA CONSULTING

Position
CAMPBELLTOWN

Building Name / Address
0
0

Building State
NSW

Climate Zone
Climate Zone 6 - Mild temperate

Building Classification
Class 9a - health-care buildings

Storeys Above Ground
4

Tool Version
1.1 (April 2020)

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

Compliant Solution =
Non-Compliant Solution =

	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	2.08	1.57	1.27	1.89	1.70
Solar Admittance	0.15	0.10	0.08	0.15	
AC Energy Value					410

Method 1

Wall-glazing U-Value

Solar Admittance

Method 2

Wall-glazing U-Value - ALL

AC Energy Value

Project Details

	North	East	South	West
Glazing Area (m²)	262.4	184.95	106.765	200.05
Glazing to Façade Ratio	50%	32%	23%	43%
Glazing References	GLA-GF GLA-L1 GLA-L2 GLA-L3	GLA-GF GLA-L1 GLA-L2 GLA-L3	GLA-GF GLA-L1 GLA-L2	GLA-GF GLA-L1 GLA-L2 GLA-L3
Glazing System Types	USER (DEFINED)	USER (DEFINED)	USER (DEFINED)	USER (DEFINED)
Glass Types	WIN-1	WIN-1	WIN-1	WIN-1
Frame Types	0	0	0	0
Average Glazing U-Value (W/m².K)	3.50	3.50	3.50	3.50
Average Glazing SHGC	0.34	0.34	0.34	0.34
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	264.2	386	364	265.55
Wall Types	Wall Spandrel	Wall Spandrel	Wall Spandrel	Wall Spandrel
Methodology	Wall			
Wall Construction	WAL-1 Spandrel Config 4 - R2.0	WAL-1 Spandrel Config 4 - R2.0	WAL-1 Spandrel Config 4 - R2.0	WAL-1 Spandrel Config 4 - R2.0
Wall Thickness	200	200	200	200
Average Wall R-value (m².K/W)	1.51	1.57	1.62	1.49
Solar Absorptance	0.65	0.65	0.65	0.65

Based on the Deemed-to-satisfy glazing Calculation, U value of 3.5 W/m^{2}K and SHGC 0.34 is required. Double glazed system with a maximum U value of 3.0W/m2K and SHGC 0.3 is required in order to comply with the DTS requirement of NCC 2019. The glazing framing system shall be provided with thermal break for optimized thermal performance. Note this is based on the external wall to be insulated at R2.8 and R2.0 insulation to be provide for the spandrel wall as per the NCC Specification J1.5b.

COMPLIANCE

At the completion of the review where the outcome results in compliance for all clauses this document can be utilised as the certification for the project.

Compliance is achieved with the completion of the recommendations of this report

Compliance to Deemed to satisfy is achieved by compliance with the following clauses

Table 0.1 Table of compliance

SECTION	COMPLIANCE / REMARK
J1.1 – J1.6	Compliant
J2.1 – J2.5	-
J3.1 – J3.7	To be confirmed by builder and mech contractor
J4	-
J5.1 – J5.12	Compliant
J6.1 – J6.8	To be confirmed by Electrical contractor
J7.1 – J7.4	Not applicable in this building
J8.1 – J8.3	To be confirmed by Electrical contractor

Certified on behalf of DSA Consulting

David Shreeve
BE Mech
June 2021

2 PERFORMANCE REQUIREMENTS

The performance requirements specified in Part J of the BCA are JP1, JP2 and JP3 as detailed below:

JP1

A building, including its services, must have, to the degree necessary, features that facilitate the efficient use of energy appropriate to:

a) the function and use of the building and;

b) the level of human comfort required for the building use and;

c) Solar radiation being:

i. utilised for heating.

ii. controlled to minimize energy for cooling.

d) the energy source of the services.

e) the sealing of the building envelope against air leakage.

f) for a conditioned space, achieving an hourly regulated energy consumption, averaged over the annual hours of operation, of not more than—

i. for a class 6 building, 80KJ/m^2.hr;

ii. for a class 5, 7b, 8 or 9a building other than a ward area, or a Class 9b school, 43KJ/m^2.hr;

iii. For all other building classification, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, 15KJ/m^2.hr

JP2

JP2 has been deleted as a consequence of a determination that maintenance provisions are primarily a State and Territory regulatory function rather than a matter that is dealt with by the BCA.

JP3

JP3 has been deleted in NCC2019.

3 DOCUMENTATIONS

3.1 GENERAL

The development to be assessed is a new health care building in Campbelltown including carparks, Linac Bunkers, consulting suites, medical imaging and wellness centre.

The development is within climate zone 6 under the Building Code of Australia (BCA).

3.2 BUILDING CLASSIFICATION

The **Table 3.1** below shows the BCA building classification at each functional space**.**

AREA	CLASSIFICATION
Health care facility	9a

3.3 DESIGN DOCUMENTATION

Table 3.2 The report is based upon the following documents.

DISCIPLINE	DRAWING NO.	REV	DESCRIPTION
Architectural			
	936-DA-010	9	SITE PLAN EXISTING
	936-DA-011	16	SITE PLAN PROPOSED OVERALL
	936-DA-012	19	SITE PLAN PROPOSED
	936-DA-101	25	FLOOR PLAN GROUND
	936-DA-102	20	FLOOR PLAN LEVEL 1
	936-DA-103	20	FLOOR PLAN LEVEL 2
	936-DA-104	21	FLOOR PLAN LEVEL 3
	936-DA-105	12	ROOF PLAN
	936-DA-201	12	ELEVATION NORTH/SOUTH
	936-DA-202	12	ELEVATION WEST/EAST
	936-DA-301	13	SECTION AA
	936-DA-302	13	SECTION BB

4 J1 BUILDING FABRIC PART

J1.1 APPLICATION OF PART

The clauses below only apply to building elements forming the envelope of the building of a conditioned space. This includes walls, roofs, ceilings, slabs etc.

This part is not applicable to the unconditioned warehouse.

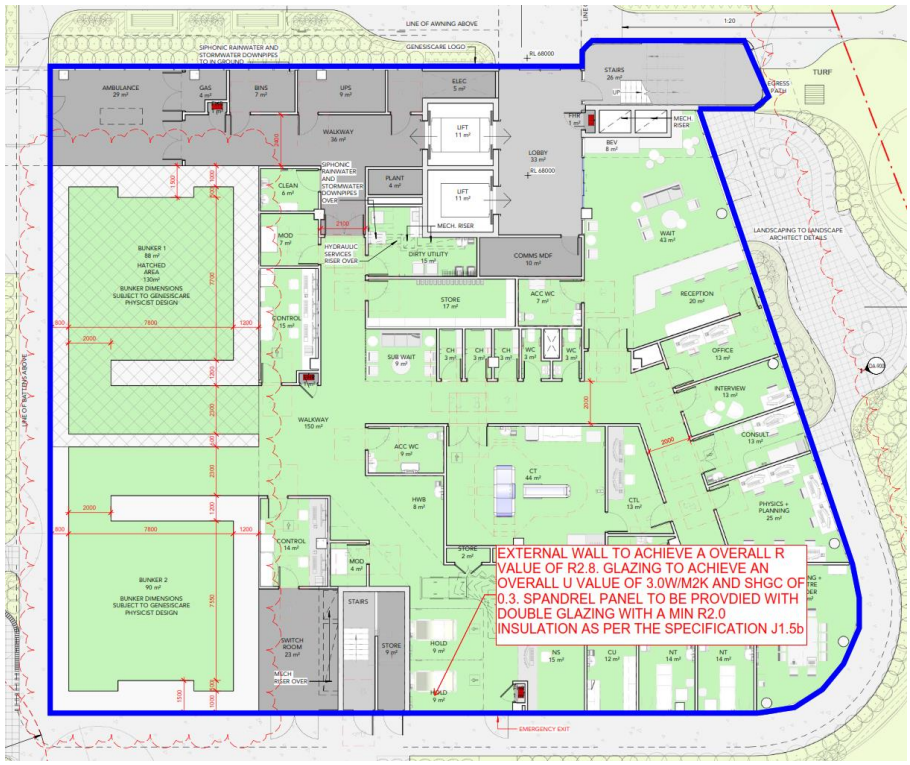
J1.2 THERMAL CONSTRUCTION – GENERAL

Insulation is required to comply with AS/NZS 4859.1 and forms a continuous barrier of insulation ceilings, walls, bulkheads, floors in accordance with **specification J1.2**.

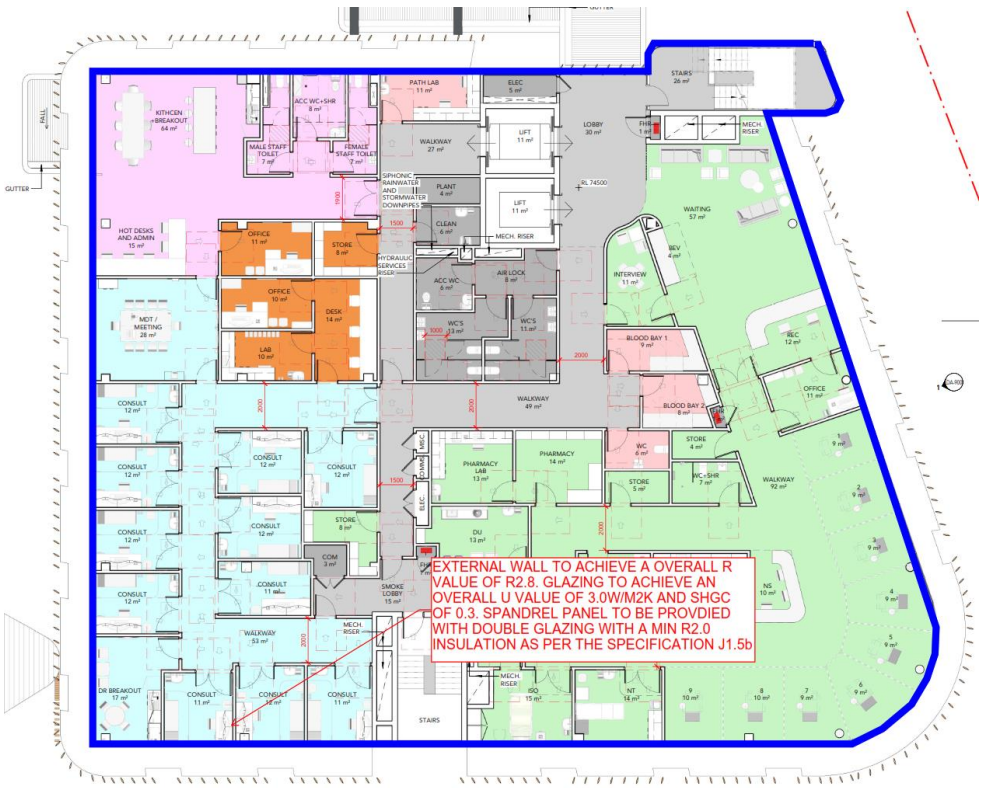
REQUIREMENT			REMARK
(a)		Insulation must comply with AS/NZS 4859.1 and be installed appropriately as per this BCA clause.	Architectural specifications and details shall incorporate the requirements.
	(i)	abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation must be against the member; and .	
	(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)		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	
	(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 50mm; or (B) Taped together	
(c)		Bulk insulation must be installed so that:	
	(i)	It maintains its position and thickness, other than where it crosses roof battens, 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 not less than 50mm.	

The envelope of the building has been outlined in the following diagram:

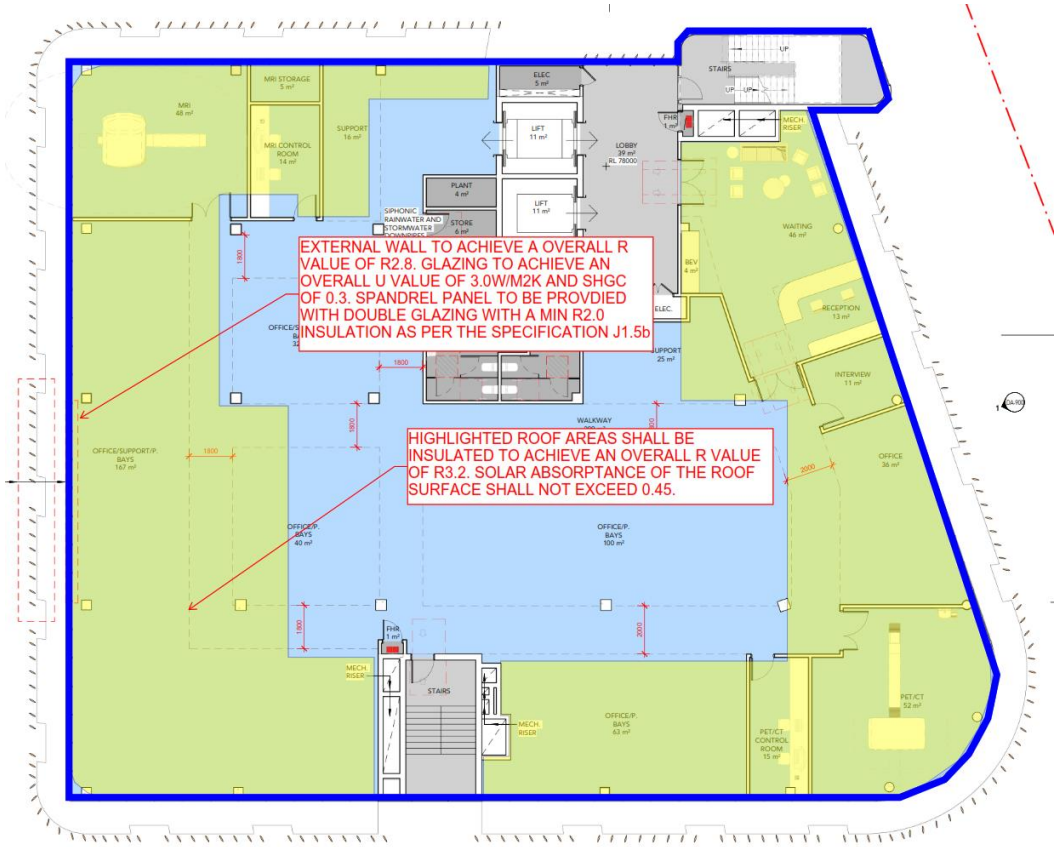
Level Ground Floor Plan



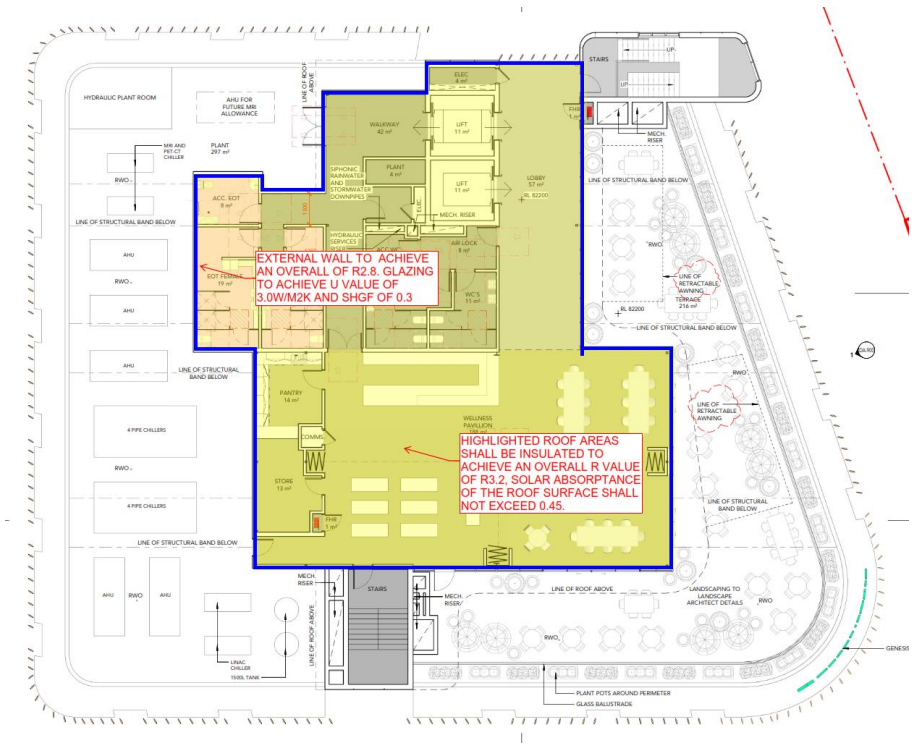
Level 1 Floor Plan:



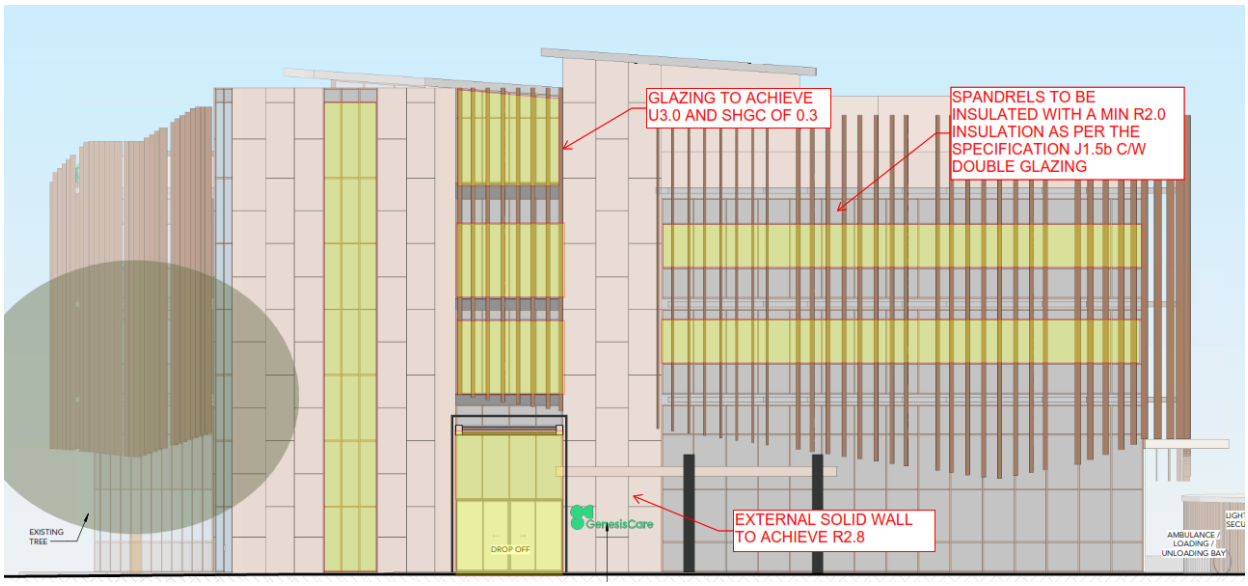
Level 2 Floor Plan:



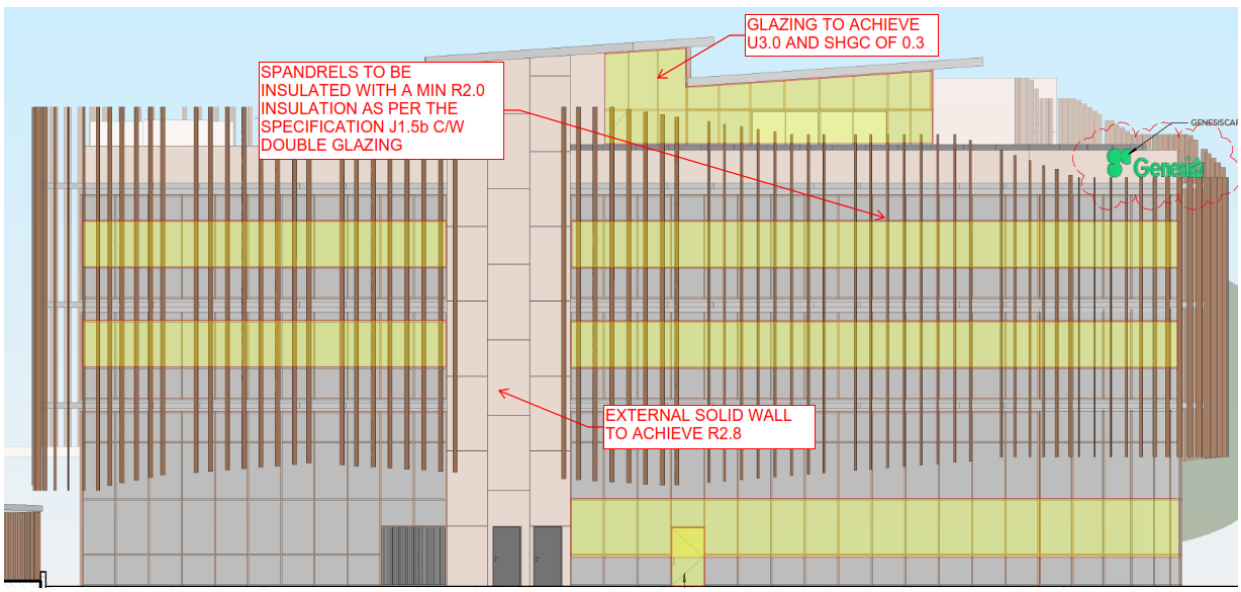
Level 3 Floor Plan :



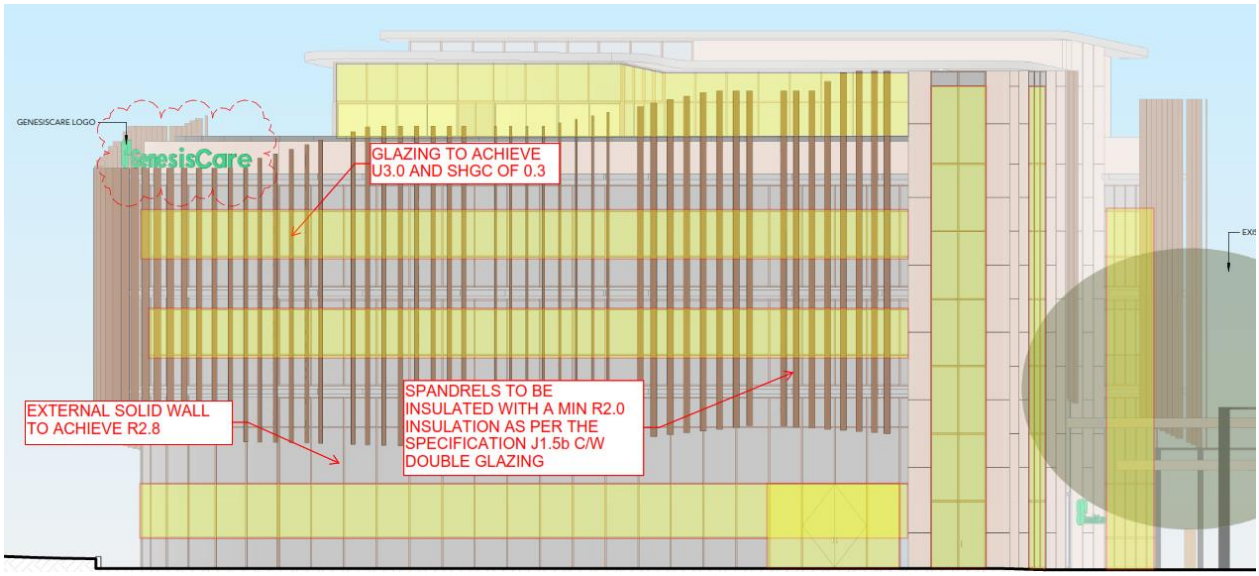
West Elevation :



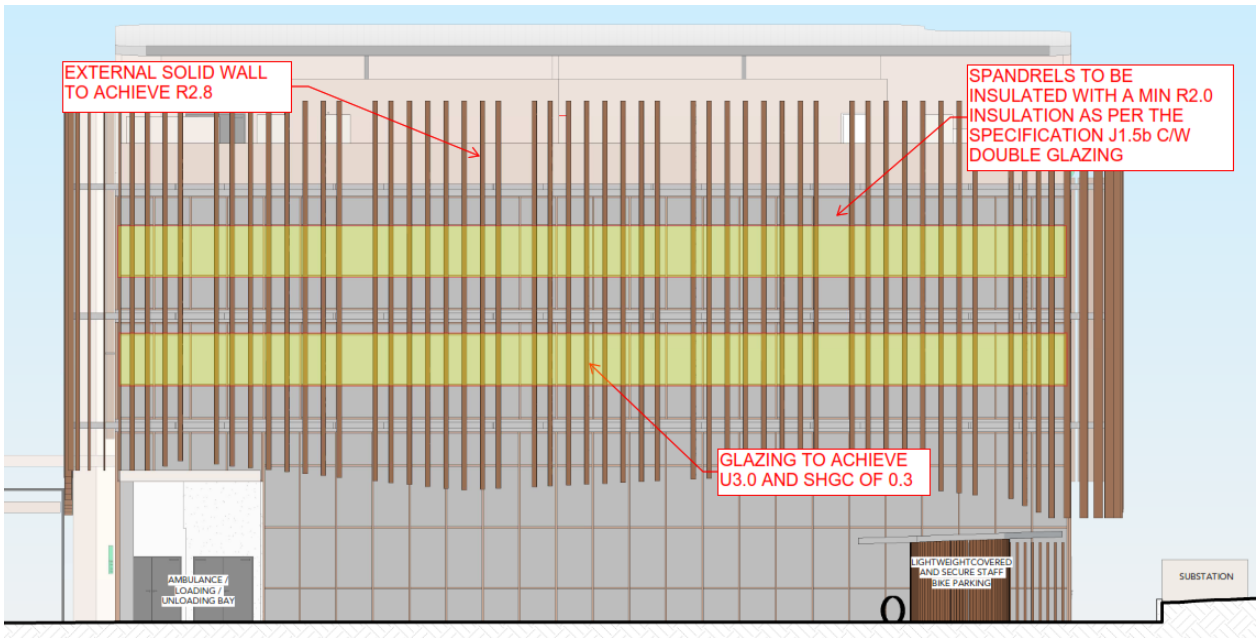
East Elevation :



North Elevation :



South Elevation :



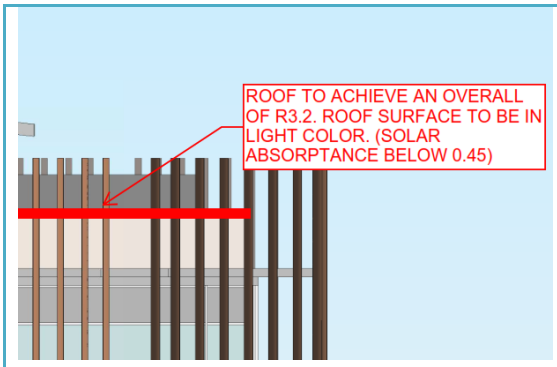
J1.3 Roof and ceiling construction

(a) A roof or ceiling must achieve a Total R-Value greater than or equal to—
- i. in climate zone 1,2,3,4 and 5, R3.7 for a downward direction of heat flow;
- ii. in climate zone 6, R3.2 for a downward direction of heat flow
- iii. in climate zone 7, R3.7 for an upward direction of heat flow and
- iv. in climate zone 8, R4.8 for an upward direction of heat flow.

(b) In climate zone 1, 2, 3, 4, 5, 6 and 7, the solar absorptance of the upper surface of a roof must be not more than 0.45.

Concrete Slab Roof Construction

Roof Requirement: **3.2 m^2K/W HEAT FLOW DOWNWARDS**

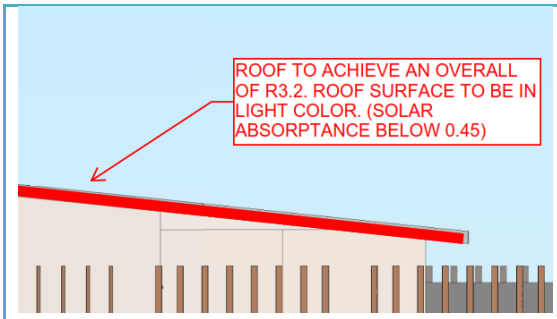


Concrete slab roof construction	R-value (m^2K/W)
1. Outdoor air film	0.04
2. Concrete slab(150-250mm)	0.1
3. Air Film(30-40mm)	0.16
4. Insulation & sarking	**2.68**
5. Plasterboard	0.06
6. Indoor air film	0.16

A minimum **R2.68**insulation with foil faced blanket is required to meet the overall R-value requirement.

Pitched Roof Construction

Roof Requirement: **3.2 m^2K/W HEAT FLOW DOWNWARDS**



Concrete slab roof construction	R-value (m^2K/W)
1. Outdoor air film	0.04
2. Metal roof cladding	0
3. Air Film(30-40mm)	0.16
4. Insulation & sarking	**2.78**
5. Plasterboard	0.06
6. Indoor air film	0.16

A minimum **R2.78** insulation with foil faced blanket is required to meet the overall R-value requirement.

REMARK:

The roof construction detail above is for referenced only. The final detail of the roof construction shall refer to architectural construction detail to comply with J1.3.

J1.4 ROOF LIGHTS

Roof lights must have-

(a) a total area of not more than 5% of the floor area of the room or space served;

(b) transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of

(i) for total system SHGC, in accordance with Table J1.4;

(ii) for total system U-Value, not more than U3.9.

Table J1.4 ROOF LIGHTS – Total system SHGC

Roof light shaft index	Total area of roof lights up to 3.5% of the floor area of the room or space	Total area of roof lights more than 3.5% and up to 5% of the floor area of the room or space
<1.0	≤0.45	≤0.29
≥1.0 to <2.5	≤0.51	≤0.33
≥2.5	≤0.76	≤0.49

Notes to Table J1.4:

1. The roof light shaft index is determined by measuring the distance from the centre of the shaft at the roof to the centre of the shaft at the ceiling level and dividing it by the average internal dimension of the shaft opening at the ceiling level (or the diameter for a circular shaft) in the same units of measurement.
2. The area of a roof light is the area of the roof opening that allows light to enter the building. The total area of roof lights is the combined area for all roof lights serving the room or space.

REMARK:

This Clause is not applicable to the proposed building

J1.5 WALL AND GLAZING

(a) The Total System U-Value of wall-glazing construction must not be greater than-
   i. For a Class 2 common area, a Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area, U2.0; and
   ii. For a Class 3 or 9c building or a Class 9a ward area-
      (a) In Climate zone 1,3, 4, 6 or 7, U1.1; or
      (b) In Climate zone 2 or 5, U2.0; or
      (c) In Climate zone 8, U0.9.

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

(c) The Total System U-Value of wall-glazing construction must be calculated in accordance with Specification J1.5a.

(d) Wall components of a wall-glazing construction must achieve a minimum Total R-Value of -
   i. Where the wall is less than 80% of the area of the wall-glazing construction, R1.0; or
   ii. Where the wall is 80% more of the area of the wall-glazing construction, the value specified in Table J1.5a.

Table J1.5a Minimum Wall Total R-Value – Wall area 80% or more of wall-glazing construction area

Climate zone	Class 2 common area, Class 5,6, 7, 8 or 9b building or a Class 9a building other than a ward area	Class 3 or 9c building or Class 9a ward area
1	2.4	3.3
2	1.4	1.4
3	1.4	3.3
4	1.4	2.8
5	1.4	1.4
6	1.4	2.8
7	1.4	2.8

8	1.4	2.8

(e) The solar admittance of extremely facing wall-glazing construction must not be greater than-
   iii. For a Class 2 common area, a Class 5, 6, 7, 8 or 9b building other than a ward area, the value specified in Table J1.5b; and
   iv. For a Class 3 or 9c building or a Class 9a ward area, the values specified in Table J1.5c.

(f) The solar admittance of a wall-glazing construction must be calculated in accordance with Specification J1.5a.

(g) The total system SHGC of display glazing must not be greater than 0.81 divided by the application shading factor specified in Clause 7 or Specification J1.5a.

Table J1.5b Maximum wall-glazing construction solar admittance- Class 2 common area, Class 5, 6, 7, 8 or 9b building or Class 9a building other than a ward area

Climate Zone	Eastern aspect solar admittance	Northern aspect solar admittance	Southern aspect solar admittance	Western aspect solar admittance
1	0.12	0.12	0.12	0.12
2	0.13	0.13	0.13	0.13
3	0.16	0.16	0.16	0.16
4	0.13	0.13	0.13	0.13
5	0.13	0.13	0.13	0.13
6	0.13	0.13	0.13	0.13
7	0.13	0.13	0.13	0.13
8	0.2	0.2	0.42	0.36

Table J1.5c Maximum wall-glazing construction solar admittance- Class 3 or 9b building or Class 9a ward area

Climate Zone	Eastern aspect solar admittance	Northern aspect solar admittance	Southern aspect solar admittance	Western aspect solar admittance
1	0.07	0.07	0.10	0.07
2	0.10	0.10	0.10	0.10
3	0.07	0.07	0.07	0.07
4	0.07	0.07	0.07	0.07
5	0.10	0.10	0.10	0.10
6	0.07	0.07	0.07	0.07
7	0.07	0.07	0.08	0.07
8	0.8	0.8	0.8	0.8

The wall constructions for the proposed building are tabulated below and the total R-value calculated. The minimum insulation blanket required to achieve compliance is indicated in red bold fonts.

Wall Construction

External Wall: Requirement : **2.8 m^2K/W**

	Brick Cladding wall	**R-value (m^2K/W)**
	1. Outdoor air film	0.04
	2. Light weight cladding	0
	3. Fibre Cement(6mm)	0.03
	4. Air Gap	0.17
	5. **Insulation & sarking required**	**2.38**
	6. 13mm Plasterboard	0.06
	7. Indoor air film	0.12

A minimum **R2.38** insulation with foil faced blanket is required to meet the overall R-value requirement.

Spandrel Panel, R2.0 to be installed behind the double glazed panel as per the Specification J1.54b

	Brick Cladding wall	**R-value (m^2K/W)**
	1. Outdoor air film	0.04
	2. Opaque Double Glazed	0.33(as per Glazing requirement)
	3. Air Gap	0.17
	4. **Insulation & sarking required**	**2.0**
	5. 13mm Plasterboard	0.06
	6. Indoor air film	0.12

A minimum **R2.0** insulation with foil faced blanket is required to meet the overall R-value requirement. The frame of the spandrel wall has to be provided with thermal break. Double glaze with U value of 3.0W/Km2 shall be used for the spandrel face. This will achieve an overall R1.11 on the spandrel panels.

REMARK:

The wall and glazing construction detail above is for referenced only. The final detail of the wall construction shall refer to architectural construction detail to comply with J1.5.

J1.6 FLOORS

(a) A floor must achieve the Total R-Value specified in Table J1.6; and
(b) A floor must be insulated around the vertical edge of its perimeter with insulation having an R-value greater than or equal to 1.0 when the floor-
  i) with a concrete slab-on-ground in climate zone 8 or
  ii) has an in-slab or in-screed heating or cooling system, except where used solely in a bathroom, amenity area or the like
(c) insulation required by (b) for a concrete slab on ground must-
  (i) 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.

Table J1.6 – Floors minimum total R-value

Location	Climate zone 1- up-wards heat flow	Climate zone 2 and 3- upwards heat flow	Climate zone 4,5,6,7- downwards heat flow	Climate zone 8- downwards heat flow
A floor without a in slab heating or cooling system	2.0	2.0	2.0	3.5
A floor with an in-slab heating or cooling system	3.25	3.25	3.25	4.75

REMARK:
This Clause is not applicable to the proposed building. no floor insulation is required.

5 J2

This section has been removed. Glazing provisions are now included in Prat J1

6 J3 BUILDING SEALING

J3.1 APPLICATION OF PART

This part applies 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; or

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.

REMARK:
This clause is not applicable to the proposed building.

J3.3 ROOF LIGHTS

A roof light must be sealed, or capable of being sealed when serving a conditioned space or a habitable room in climate zones 4, 6, 7 and 8. It 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

REMARK:
This clause is not applicable to the proposed building.

J3.4 WINDOWS AND DOORS

(a) a door, openable window or the like must be sealed-

i. when forming part of the envelop; or

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

(b) The requirement 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 to restrict air infiltration-

i. For the bottom edge of a door, must be a draft protection device; and

ii. For the other edges of a 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 leading to a conditioned space must have an airlock, self-closing door, revolving door or the like, excluding:

i. where the conditioned space has a floor area of not more than 50 m^2; or

ii. where a café, 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 café, restaurant, open front shop or the like, self-closing doors.

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

REMARK:

Architectural specifications and details shall incorporate the above requirements to all openable external doors and windows.

J3.5 EXHAUST FANS

(a) An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving-

i. A conditioned space or

ii. A habitable room in climate zone 4, 5, 6, 7 or 8.

REMARK:

Mechanical contractor shall install motorized or non-return damper for exhaust fans

J3.6 CONSTRUCTION OF CEILING, WALLS AND FLOORS

(a) 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 I accordance with (b) when forming part of –

i. The envelope or

ii. In climate zone 4, 5, 6, 7, or 8.

(b) Construction required by (a) must be-

i. Enclosed by internal lining systems that are closed fitting at ceiling, wall and floor junctions or

ii. Sealed at junctions and penetration with

A. Closed fitting architrave, skirting or cornice or

B. Expanding foam, rubber compressible strip, caulking or the like.

(c) The requirement of (a) do not apply to openings, grilles or the like required for smoke hazard management.

REMARK:

The above requirement shall be incorporated in the architectural construction details for compliance.

J3.7 EVAPORATIVE COOLERS

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

i. a heated space; or

ii. in climate zones 4, 5, 6, 7 and 8.

REMARK:

This clause is not applicable to the proposed building.

7 J5 AIR-CONDITIONING AND VENTILATION SYSTEMS

REMARK:
Compliance of Part J5 is to be certified by Mechanical Designer.

The requirement listed below must not inhibit the smoke hazard management operation of air condition and mechanical ventilation systems and any essential ventilation such as for a garbage room, lift motor room, gas meter enclosure or gas regulator enclosure or the like.

J5.2 AIR-CONDITIONING SYSTEMS CONTROL

REQUIREMENT	Remark
1. Control-	
(a) An air conditioning system-	Time schedule
I. must be capable of being deactivated when the building or part of a building served by that system is not occupied; and	
II. when serving more than one *air-conditioning* zone or area with different heating or cooling needs, must-	
i) thermostatically control the temperature of each zone or area; and	All A/C with sensor
ii) not control the temperature by mixing actively heated air and actively cooled air; and	
iii) limit reheating to not more than-	
(1) for a fixed supply air rate, a 7.5 K rise in temperature; and	Mechanical design to comply
(2) 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	
III. which provide the required mechanical ventilation, other than in climate zone 1 or where dehumidification control is needed, must have an outdoor air economy cycle if the total air flow rate of any airside component of an air conditioning system is greater than or equal to the figure in Table J5.2 and	
IV. which contains more than one water heater, chiller or coil, must be capable of stopping the flow of water to those not operating; and	Mechanical design to comply
V. with an airflow of more than 1000L/s, must have a variable speed fan when its supply air quantity is capable of being varied; and	Mechanical design to comply
VI. when serving a *sole-occupancy unit* in a Class 3 building, must not operate when any external door	

REQUIREMENT		Remark
	of the *sole-occupancy unit* that opens to a balcony or the like, is open for more than one minute.	N/A
VII.	Must have the ability to use direct signals from the control components responsible for the delivery of comfort conditions in the building to regulate the operation of central plant and	Mechanical design to comply
VIII.	Must have a control dead band of not less than 2 degree C, except where a smaller range is required for specialised application and	Mechanical design to comply
IX.	Must be provide with balancing dampers and balancing valves that ensure the maximum design air or fluid flow is achieved but not exceeded by more than 15% above design at each- i) component or ii) group of components operating under a common control in a system containing multiple components, as required to meet the needs of the system at its maximum operating condition	Mechanical design to comply
X.	must ensure that each independently operating space of more than 1000m2 and every separate floor of the building has provision to terminate airflow independently of the remainder of the system sufficient to allow for different operating times and	Mechanical design to comply
XI.	must have automatic variable temperature operation of heated water and chilled water circuits and	Mechanical design to comply
XII.	when deactivated, must close any motorised outdoor air or return air damper that is not otherwise being actively controlled.	Mechanical design to comply

Table J5.2 Requirement for an outdoor air economy cycle

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

(b) When two or more air-conditioning systems serve the same space they must use control sequences that prevent the systems from operating in opposing heating and cooling modes.

(c) Time switches-

i. A time switch must be provided to control-

A. An air condition system of more than 2kwr and
B. A heater or more than 1kw heating used for air conditioning.

ii. The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programed days.
iii. The requirement of (i) and (ii) do not apply to –
A. An air conditioning system that serves –
(aa) Only one sole-occupancy unit in Class 2, 3 or 9c building or
(bb) a Class 4 part of a building or
B. A conditioned space where air conditioning is needed for 24 hour continuous use.

REMARK:
Mechanical design to comply

J5.3 MECHANICAL VENTILATION SYSTEMS CONTROL

REQUIREMENT	Remark
1. Control -	
1) A mechanical ventilation system, including one that is part of an *air-conditioning* system, except where the mechanical system serves only one *sole-occupancy unit* in a Class 2 building or serves only a Class 4 part of a building, 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*— i) where specified in Table 5.3, have – aa). An energy reclaiming system that preconditions outside air at a minimum sensible heat transfer effectiveness of 60% or bb). Demand control ventilation in accordance with AS1668.2 if appropriate to application and ii) not exceed the minimum *outdoor air* quantity *required* by **Part F4(Light and Ventilation) or/and AS1668.2**, where relevant, by more than 20% except where aa). Additional unconditioned outdoor air is supplied for free cooling or bb).additional mechanical ventilation is needed to balance the required exhaust or process exhaust or cc). an energy reclaiming system preconditions all the outside air iii) for an airflow of more than 1000L/s, have a variable speed fan unless the downstream airflow is required by Part F4 to be constant.	Mechanical design to comply
2) **Exhaust system**- An exhaust system with an air flow rate of more than 1000L/s must be capable of stopping the motor when the system is no needed, except for an exhaust system in sole-occupancy unit in a Class2, 3 or 9c building	Mechanical design to comply
3) Carpark exhaust systems- Carpark exhaust systems must have a control system in accordance with i. 4.11.2 of AS 1668.2	N/A

REQUIREMENT	Remark
ii. 4.11.3 of AS 1668.2	
4) **Time switches**	
i. A time switch must be provided to a mechanical ventilation system with an air flow rate of more than 1000L/s ii. The time switch must be capable of switching electric power on and off at variable pre-programmed times and variable pre-programmed days iii. The requirements of above do not apply to— a) a mechanical ventilation system that serves— i) only one *sole-occupancy unit* in a Class 2 or 3 building; or ii) a Class 4 part of a building; or iii) only one *sole-occupancy unit* in a Class 9c building; or b) a building where mechanical ventilation is needed for 24 hour occupancy.	Mechanical design to comply

Table 5.3 Required outdoor air treatment

Climate Zone	Outdoor air flow(L/s)	Required measure
1	>500	Modulating control
2	-	Non required measure
3	>1000	Modulating control
4 and 6	>500	Modulating control or energy reclaiming system
5	>1000	Modulating control or energy reclaiming system
7 and 8	>250	Modulating control or energy reclaiming system
REMARK: Mechanical design to comply.		

J5.4 FAN SYSTEM

(a) Fans, ductwork and duct components that form part of an air-conditioning system or mechanical ventilation system must—

i. Separately comply with (b), (c), (d), and (e) or

ii. Achieve a fan motor input power per unit of flowrate lower than the fan motor input power per unit of flowrate achieved when applying (b), (c), (d), and (e) together.

(b) Fan-

i. Fan in systems that have a static pressure of not more than 200pa must have an efficiency at the full load operating point not less than the efficiency calculated with following formula:

$$\eta_{min} = 13 \times \ln(p) - 30$$

Where-

η_{min} = the minimum required system static efficiency for installation type A or C or the minimum required system total efficiency for installation type B or D and

p = the static pressure of the system (pa)

ii. Fan in the systems that have a static pressure above 200pa must have an efficiency at the full load operating point not less than the efficiency calculated with the following formula:

$$\eta_{min} = 0.85 \times (a \times \ln(p) - b + N)/100$$

Where-

η_{min} = the minimum required system static efficiency for installation type A or C or the minimum required system total efficiency for installation type B or D and

p = the motor input power of the fan (kW) and

N= the minimum performance grade obtained from Table J5.4a and

a= regression coefficient a, obtained from Table 5.4b and

b= regression coefficient b, obtained from Table 5.4c and

iii. The requirement of (i) and (ii) do not apply to fans that need to be explosion proof.

Table J5.4a Minimum fan performance grade

Fan Type	Installation type A or C	Installation type B or D
Axial- as component of an AHU or FCU	46	51.5
Axial- other	42	61
Mixed flow- as component of an AHU or FCU	46	51.5
Mixed flow- other	52.5	65
Centrifugal forward curve	46	51.5
Centrifugal radial bladed	46	51.5
Centrifugal backward curved	64	64

Note to Table J5.4a

(a) Installation type A means an arrangement where the fan is installed with free inlet and outlet condition
(b) Installation type B means an arrangement where the fan is installed with free inlet and with duct as its outlet
(c) Installation type C means an arrangement where the fan is installed with duct fit to its inlet and with free outlet condition
(d) Installation type D means an arrangement where the fan is installed with ducted fitted to its inlet and outlet.

Table J5.4b Fan regression coefficient a

Fan Type	Fan input <10kW	Fan input ≥10 kW
Axial	2.74	0.78
Mixed flow	4.56	1.1
Centrifugal forward curve	2.74	0.78
Centrifugal radial bladed	2.74	0.78
Centrifugal backward curved	4.56	1.1

Table J5.4c Fan regression coefficient b

Fan Type	Fan input <10kW	Fan input ≥10 kW
Axial	6.33	1.88
Mixed flow	10.5	2.6
Centrifugal forward curve	6.33	1.88
Centrifugal radial bladed	6.33	1.88
Centrifugal backward curved	10.5	2.6

(c) Ductwork-

i. The pressure drop in the index run across all straight sections of rigid ductwork and all sections of flexible ductwork must not exceed 1 Pa/m when averaged over the entire length of straight rigid duct and flexible duct. The pressure drop of flexible ductwork sections may be calculated as if the flexible ductwork is laid straight.

ii. Flexible ductwork must not account for more than 6 m in length in any duct run.

iii. The upstream connection to ductwork bends, elbows and tees in the index run must have an equivalent diameter to the connected duct.

iv. Turning vanes must be included in all rigid ductwork elbows of 90° or more acute than 90° in the index run except where—

A. The inclusion of turning vanes presents a fouling risk or
B. A long radius bend in accordance with AS 4254.2 is used.

REMARK:
Mechanical design to comply.

(d) Ductwork components in the index run—

i. The pressure drop across a coil must not exceed the value specified in Table J5.4d

Table J5.4d Maximum coil pressure drop

Number of rows	Maximum pressure drop (Pa)
1	30
2	50
4	90
6	130
8	175
10	220

ii. A high efficiency particulate arrestance (HEPA) air filter must not exceed the higher of
A. A Pressure drop of 200pa when clean
B. The filter design pressure drop when clean at air velocity of 1.5m/s

iii. Any other air filter must not exceed-
A. The pressure drop specified in Table J5.4e when clean or
B. The filter design pressure when clean at an air velocity of 2.5m/s

Table J5.4e Maximum clean filter pressure drop

Filter minimum efficiency reporting value	Maximum pressure drop (Pa)
9	55
11	65
13	95
14	110

iv. The pressure drop across intake louvres must not exceed the higher of-
A. For single stage louvres, 30Pa; and
B. For two stage louvres, 60Pa; and
C. For acoustic louvres, 50Pa; and
D. For other non-weatherproof louvres, 30Pa.

v. The pressure drop across a variable air volume box, with the damper in fully open position, must not exceed-
A. For unit with electric reheat, 100Pa; and
B. For other units, 25Pa not including coil pressure losses.

vi. Rooftop cowls must not exceed a pressure drop of 30Pa
vii. Attenuators must not exceed a pressure drop of 40Pa
viii. Fire dampers must not exceed a pressure of 15Pa when open
ix. Balancing and control dampers in the index run must not exceed a pressure drop of 25Pa when in the fully open position
x. Supply air diffusers and grilles must not exceed a pressure drop of 40Pa
xi. Exhaust grilles must not exceed a pressure drop of 30Pa.
xii. Transfer ducts must not exceed a pressure drop of 12Pa.
xiii. Door grilles must not exceed a pressure drop of 12 Pa
xiv. Active chilled beams must not exceed a pressure drop 150Pa.

(e) The requirement of (a), (b), (c) and (d) do not apply to-
i. Fans in un-ducted air conditioning systems with a supply air capacity of less than 1000L/s and
ii. Smoke spill fans, except where also used for air conditioning or ventilation and
iii. The power for process-related components and
iv. Kitchen exhaust system

REMARK:
Mechanical design to comply.

J5.5 DUCT INSULATION

REQUIREMENT	Remark
2. Insulation-	
1) The ductwork of an *air-conditioning* system must be insulated and sealed a) Ductwork and fittings in an *air-conditioning* system must be provided with insulation— i) complying with AS/NZS 4859.1; and ii) having a material *R-Value* greater or equal to (1) for flexible ductwork, 1.0; or (2) For cushion boxes, that of the connecting ductwork or (3) That specified in Table J5.5 b) Insulation must— i) be protected against the effects of weather and sunlight; and ii) be installed so that it— (1) abuts adjoining insulation to form a continuous barrier; and (2) maintains its position and thickness, other than at flanges and supports; and iii) when conveying cooled air— (1) be protected by a vapour barrier on the outside of the insulation; and (2) where the vapour barrier is a membrane, be installed so that adjoining sheets of the membrane— (a) overlap by 50 mm; and (b) are bonded or taped together c) The requirements of (**a)** do not apply to— i) ductwork and fittings located within the only or last room served by the system; or	this clause is not applicable to the proposed building

REQUIREMENT	Remark
ii) fittings that form part of the interface with the *conditioned space*; or iii) return air ductwork in, or passing through, a *conditioned space*; or iv) ductwork for outside air and exhaust air associated with an *air-conditioning* system; or v) the floor of an in-situ air-handling unit; or vi) packaged *air-conditioning, split systems, and variable refrigerant flow air conditioning equipment* complying with MEPS; or vii) flexible fan connections.	N/A
d) For the purpose of (a), (b), (c), fitting- i) Include non-active components of a ductwork system such as cushion boxes ;and ii) Exclude active components such as air-handling unit components	N/A

Table J5.5 ductwork and fitting – minimum insulation R value

Location of ductwork and fittings	Climate zone 1-7	Climate Zone 8
Within a conditioned space	1.2	2.0
Where exposed to direct sunlight	3.0	3.0
All other locations	2.0	3.0

REMARK:
Mechanical contractor to comply with the insualtion requirement for the ductwork

J5.6 DUCTWORK SEALING

Ductwork in an air-conditioning system with a capacity of 3000 L/s or greater, not located within the only or last room served by the system, must be sealed against air loss in accordance with the duct sealing requirements of AS 4254.1 and AS 4254.2 for the static pressure in the system.

REMARK:
Mechanical contractor to comply with the sealing requirement for the ductwork

J5.7 PUMP SYSTEMS

(a) General- Pumps and pipework that form part of an air-conditioning system must either-
   i. Separately comply with (b), (c), and (d); or
   ii. Achieve a pump motor power per unit of flowrate lower than the pump motor power per unit of flowrate achieved when applying (b), (c), and (d) together.

(b) Circular pumps- A glandless impeller pump, with a rated hydraulic power output of less than 2.5kW and that is used in closed loop systems must have an energy efficiency index(EEI) not more than 0.27 calculated in accordance with European union commission regulation No.622/2012.

(c) Other pumps- Pumps that are in accordance with articles 1 and 2 of European Union commissioning regulation No.547/2012 must have a minimum efficiency index(MEI) of 0.4 or more when calculated in accordance with European Union commissioning regulation No.547/2012.

(d) Pipework- Straight segments of pipework along the index run, forming part of an air conditioning system

i. In pipework system that do not have branches and have the same flow rate throughout the entire pipe network, must achieve an average pressure drop of not more than-
   A. For constant speed systems, the values nominated in Table J5.7a; or
   B. For variable speed systems, the values nominated in Table J5.7b; or
ii. In any other pipework system, must achieve an average pressure drop of not more than-
   A. For constant speed systems, the value nominated in Table J5.7c; or
   B. For variable speed systems, the value nominated in Table J5.7d.

(e) The requirement of (d) do not apply-
i. To valves and fittings; or
ii. Where the smallest pipe size compliant with (d) results in a velocities of 0.7m/s or less at design flow.

Table J5.7a Maximum pipework pressure drop – Non distributive constant speed systems

Nominal pipe diameter (mm)	Maximum pressure drop in systems operating 5000 hours/annum or less(Pa/m)	Maximum pressure drop in systems operating more than 5000 hours/annum(Pa/m)
Not more than 20	400	400
25	400	400
32	400	400
40	400	400
50	400	350
65	400	350
80	400	350
100	400	200
125	400	200
150 or more	400	200

Table J5.7b Maximum pipework pressure drop – Non distributive variable speed systems

Nominal pipe diameter (mm)	Maximum pressure drop in systems operating 5000 hours/annum or less(Pa/m)	Maximum pressure drop in systems operating more than 5000 hours/annum(Pa/m)
Not more than 20	400	400
25	400	400
32	400	400
40	400	400
50	400	400
65	400	400
80	400	400
100	400	300
125	400	300
150 or more	400	300

Table J5.7c Maximum pipework pressure drop –distributive constant speed systems

Nominal pipe diameter (mm)	Maximum pressure drop in systems operating 2000 hours/annum or less(Pa/m)	Maximum pressure drop in systems operating between 2000 and 5000 hours/annum(Pa/m)	Maximum pressure drop in systems operating more than 5000 hours/annum(Pa/m)
Not more than 20	400	300	150

25	400	220	100
32	400	220	100
40	400	220	100
50	400	220	100
65	400	400	170
80	400	400	170
100	400	400	170
125	400	400	170
150 or more	400	400	170

Table J5.7d Maximum pipework pressure drop –distributive variable speed systems

Nominal pipe diameter (mm)	Maximum pressure drop in systems operating 5000 hours/annum or less(Pa/m)	Maximum pressure drop in systems operating more than 5000 hours/annum(Pa/m)
Not more than 20	400	250
25	400	180
32	400	180
40	400	180
50	400	180
65	400	300
80	400	300
100	400	300
125	400	300
150 or more	400	300

REMARK:
Mechanical design to comply.

J5.8 PIPEWORK INSULATION

REQUIREMENT	Remark
Pipework Insulation-	
a) *Piping*, vessels, heat exchangers and tanks containing heating or cooling fluid, where the fluid is held at a heated or cooled temperature, that are part of an air conditioning system other than in appliances covered by MEPS must be provided with insulation— i) complying with AS/NZS 4859.1; and ii) for piping of heating and cooling fluid, having an insulation *R-Value* in accordance with **Table J5.8a**; and iii) for vessels, heat exchangers or tanks, having an insulation *R-Value* in accordance with Table **J5.8b**	Mechanical design to specify insulation requirement on the chilled water/heating hot water/refrigerant pipe to comply

REQUIREMENT	Remark
iv) for refill or pressure relief piping, having an insulation R-value equal to the required insulation R-value of the connected pipe, vessel or tank within 500mm of the connection. b) Insulation must— i) be protected against the effects of weather and sunlight; and ii) be able to withstand the temperatures within the *piping*, vessel, heat exchanger or tank. c) Insulation provided to *piping*, vessels, heat exchangers or tanks containing cooling fluid must be protected by a vapour barrier on the outside of the insulation. d) The requirements of **a)** and **b)** do not apply to *piping, vessels, or heat exchangers*— i) located within the only or last room served by the system and downstream of the control device for the regulation of heating or cooling services to that room; or ii) encased within a concrete slab or panel which is part of a heating or cooling system; or iii) supplied as an integral part of a chiller, boiler or unitary air conditioner complying with the requirement of J5.9, J5.10 and J5.11; or iv) inside an air-handling unit, fan-coil unit or the like. e) For the purposes of (a), (b), (c) and (d)- i) Heating fluids include refrigerant, heated water, steam and condensate; and ii) Cooling fluids include refrigerant, chilled water, brines and glycol mixtures, but do not include condenser cooling water.	Mechanical design to comply N/A Mechanical design to comply N/A

Table J5.8a Piping- minimum insulation R value

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

Note to Table J5.8a, the minimum R value may be halved for piping penetrating a structural member.

REMARK:
Mechanical contractor to comply with the insulation requirement for the pipework.

Table J5.8b Vessels, heat exchangers and tanks- Minimum insulation R-value

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

REMARK:
Mechanical contractor to comply with the insulation requirement for the water storage tank.

J5.9 SPACE HEATING

Requirement	
1) A heater used for air-conditioning or as part of an air conditioning system must be— a) a solar heater; or b) a gas heater; or c) a heat pump heater; or d) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or e) an electric heater if— i) the heating capacity is not more than— (1) 10 W/m^2 of the floor area of the conditioned space in climate zone 1; or (2) 40 W/m2 of the floor area of the conditioned space in climate zone 2; or (3) the value specified in **Table J5.9** where reticulated gas is not available at the allotment boundary; or ii) 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 iii) the in-duct heater complies with **J5.2 (a) (iiii)(C)**; or f) any combination of **(a)** to **(e)**. 2) An electric heater may be used for heating a bathroom in a Class 2, 3, 9a building or Class 9c building if the heating capacity is not more than 1.2 kW and the heater has a timer.	**N/A**

3) A fixed heating or cooling appliance that moderates the temperature of an outdoor space must be configured to automatically shut down when i) There is no occupant in the space served; or ii) A period of one hour has elapsed since the last activation of the heater; or iii) The space served has reached the design temperature. 4) A gas water heater, that is used as part of an air conditioning system, must i) If rated to consume 500Mj/hour of gas or less, achieve a minimum gross thermal efficiency of 86%; or ii) If rated to consume more than 500Mj/hour of gas, achieve a minimum gross thermal efficiency of 90%.	

Table J5.9 Maximum electric heating capacity

Floor area of the conditioned space	W/m^2 of floor area in climate zone 3	W/m^2 of floor area in climate zone 4	W/m^2 of floor area in climate zone 5	W/m^2 of floor area in climate zone 6	W/m^2 of floor area in climate zone 7
≤ 500 m2	50	60	55	65	70
>500 m2	40	50	45	55	60

REMARK:
This Clause is not applicable to the proposed building

J5.10 REFRIGERANT CHILLERS

An air-conditioning system refrigerant chiller must comply with MEPS and the full load operation energy efficiency ratio and integrated part load energy efficiency ratio in Table J5.10a or Table J5.10b when determined in accordance with AHRI 551/591.

Table J5.10a Minimum energy efficiency ratio for refrigerant chiller-option 1

Chiller type	Full load operation($W_r/W_{input\ power}$)	Integrated Part load $W_r/W_{input\ power}$)
Air cooled 31≤ 528kWr	2.985	4.048
Air cooled > 528kWr	2.985	4.137
Water cooled positive displacement ≤ 264kWr	4.694	5.867
Water cooled positive displacement >264kWr but ≤ 528kWr	4.889	6.286
Water cooled positive displacement >528kWr, but ≤ 1055kWr	5.334	6.519
Water cooled positive displacement >1055kWr, but ≤ 2110kWr	5.800	6.770

Water cooled positive displacement >2110kWr,	6.286	7.041
Water cooled centrifugal ≤ 528kWr	5.771	6.401
Water cooled centrifugal >528kWr but ≤ 1055kWr	5.771	6.519
Water cooled centrifugal >1055kWr but ≤ 1407kWr	6.286	6.770
Water cooled centrifugal >1407kWr	6.286	7.041

Table J5.10b Minimum energy efficiency ratio for refrigerant chiller-option 2

Chiller type	Full load operation($W_r/W_{input\ power}$)	Integrated Part load $W_r/W_{input\ power}$)
Air cooled 32≤ 528kWr	2.866	4.699
Air cooled > 528kWr	2.866	4.758
Water cooled positive displacement ≤ 264kWr	4.513	7.041
Water cooled positive displacement >264kWr but ≤ 528kWr	4.694	7.184
Water cooled positive displacement >528kWr, but ≤ 1055kWr	5.177	8.001
Water cooled positive displacement >1055kWr, but ≤ 2110kWr	5.633	8.586
Water cooled positive displacement >2110kWr,	6.018	9.264
Water cooled centrifugal ≤ 528kWr	5.065	8.001
Water cooled centrifugal >528kWr but ≤ 1055kWr	5.544	8.001
Water cooled centrifugal >1055kWr but ≤ 1407kWr	5.917	9.027
Water cooled centrifugal >1407kWr	6.018	9.264

REMARK:
Mechanical design to comply

J5.11 UNITARY AIR-CONDITIONING EQUIPMENT

Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS and for a capacity greater than or equal to 65 kWr--

(a) Where water cooled, have a minimum energy efficiency ratio of 4.0 for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power or

(b) Where air cooled, have a minimum energy efficiency ratio of 2.9 for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power.

REMARK:
Mechanical to specify split air condition to comply with MEPS

J5.12 HEAT REJECTION EQUIPMENT

1. The motor rated power of a fan in a cooling tower, closed circuit cooler or evaporative condenser must not exceed the allowances in Table J5.12
2. The fan in an air-cooled condenser must have a motor rated power of not more than 42W for each kW of heat rejection from the refrigerant, when determined in accordance with AHRI 460 except for—
   i. A refrigerant chiller in air conditioning system that complies with the energy efficiency ratio in J5.10;
   ii. Packaged air conditioners, split systems, and variable refrigerant flow air conditioning equipment that complies with the energy efficiency ratios in J5.11.

REMARK:
Mechanical design to comply. Mechanical design to specify air cooled 4 pipe chillers to meet the requirement of J5.10

Table J5.12 Maximum fan motor power—Cooling towers, closed circuit cooler and evaporative condensers

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

Note to **Table J5.12**: A closed circuit, forced draft cooling tower must not be used.

REMARK:
This Clause is not applicable to the proposed building

8 J6 LIGHTING AND POWER CONTROL DEVICES

REMARK:
Compliance of Part J6 is to be certified by Electrical Designer.

J6.2 ARTIFICIAL LIGHTING

The design illumination power load in a building other than a sole-occupancy unit of a Class 2 or a Class 4 part of a building must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density in BCA Section J Table J6.2a.

Table J6.2a – Maximum illumination power density

Space	Maximum illumination power density (W/m^2)
Corridors	5
Board room and conference room	5
Carpark –general	2
Carpark -entry zone (first 15 m of travel) during the day time	11.5
Carpark -entry zone (next 4m of travel) during the day	2.5
Carpark -entry zone (first 20 m of travel) during night time	2.5
Common rooms, spaces and corridors in a Class 2 building	4.5
Control room, switch room and the like- intermittent monitoring	3
Control room, switch room, and the like- constant monitoring	4.5
Health-care-infants' and children's wards and emergency department	4
Health-care- examination room	4.5
Health care- examination room in intensive care and high dependency ward	6
Health-care –all other patient care areas including wards and corridors	2.5
Kitchen and food preparation area	4
Plant room, where an average of 160 lx vertical illuminance is required on a vertical panel such in switch room	4
Plantrooms with a horizontal illuminance target of 80 lx	2
Entry lobby from outside the building	9
Office -artificially lit to an ambient level of 200 lx or more	4.5
Office -artificially lit to an ambient level of less than 200 lx	2.5
Restaurant, café, bar, hotel lounge and a space for the serving and consumption of food or drinks.	14
Service area, cleaner's room and the like	1.5
Notes:	

Space	Maximum illumination power density (W/m^2)
1. In areas not listed above, the maximum illumination power density is: a. For an illuminance of not more than 80 lx, 2 W/m^2; and b. For an illuminance of more than 80 lx and not more than 160 lx, 2.5 W/m^2; and c. For an illuminance of more than 160 lx and not more than 240 lx, 3 W/m^2; and d. For an illuminance of more than 240 lx and not more than 320 lx, 4.5 W/m^2; and e. For an illuminance of more than 320 lx and not more than 400 lx, 6 W/m^2; and f. For an illuminance of more than 400 lx and not more than 600 lx, 10 W/m^2; and g. For an illuminance of more than 600 lx and not more than 800 lx, 11.5 W/m^2; and 2. For enclosed spaces with a Room Aspect Ratio of less than 1.5, the maximum illumination power density may be increased by dividing it by an adjustment factor for room aspect which is: 0.5 + (Room Aspect Ratio/3) The Room Aspect Ratio of the enclosed space is determined by the formula: A/(H x C) Where: A is the area of the enclosed space H is the height of the space measured from the floor to the highest part of the ceiling C is the perimeter of the enclosed space at floor level 3. In addition to 2, the maximum illumination power density may be increased by dividing it by the illumination power density adjustment factor in Table J6.2b and Table J6.2c and where the control device is not installed to comply with J6.3 4. Circulation spaces are included in the allowances listed in the table.	

REMARK:

Compliance is to be certified by Electrical Designer. The lighting load shall be checked against the BCA lighting calculator available for download from ABCB website.

Table J6.2b – Illumination power density adjustment factor for a control device

Item	Description	Illumination power density adjustment factor
Motion Detector	In a toilet or change room, other than a public toilet, in a Class 6 building	0.4
Motion Detector	Where a group of light fitting serving less than 100m^2 is controlled by one or more detectors	0.6
Motion Detector	Where a group of light fitting serving 100m^2 or more is controlled by one or more detectors	0.7
Programmable dimming system	Where not less than 75% of area of a space is controlled by programmable dimmers	0.85
Fixed dimming	All fittings with fixed dimming	Whichever is greater of 0.5 or 0.2+0.8L Where L is the illuminance turndown for the fixed dimming.
Lumen Depreciation dimming	All fittings with lumen depreciation dimming	0.85
Two stage sensor-equipped lights with minimum power of 30% of peak power or less	Fire stairs and other spaces not used for regular transit	0.4
Two stage sensor-equipped lights with minimum power of 30% of peak power or less	Transitory spaces in regular use or in a carpark	0.7
Daylight sensor and dynamic lighting control device- dimmed or stepped switching of lights adjacent windows Note 2 and 4	In a Class 5, 6, 7, 8 or 9b building or a Class 9a building, other than a ward area, where the lights are adjacent windows, other than roof lights, for a distance from the window equal to the depth of the floor to window head height.	0.5 note2
Daylight sensor and dynamic lighting control device- dimmed or stepped switching of lights adjacent windows Note 2 and 4	Serving a Class 3 or 9c building, or a Class 9a ward area, where the lights are adjacent windows, other than roof lights, for a distance from the window equal to the depth of the floor to window head height.	0.75note2
Daylight sensor and dynamic lighting control device- dimmed or stepped switching of lights adjacent windows Note 2 and 4	In a Class 5, 6, 7, 8 or 9b building or a Class 9a building, other than a ward area, where the lights are adjacent roof lights	0.6note2

Item	Description	Illumination power density adjustment factor
Daylight sensor and dynamic lighting control device- dimmed or stepped switching of lights adjacent windows Note 2 and 4	In a Class 3 or a Class 9a ward area, where the lights are adjacent roof lights	0.8[note2]

Notes to Table J6.2b:

1. A maximum of two illumination power density adjustment factors for a control device can be applied to an area. where more than one illumination power density adjustment factor (other than for room aspect) apply to an area, they are to be combined using the following formula:
   A x (B + [(1 – B) / 2]),

Where-

A is the lowest applicable illumination power density adjustment factor; and

B is the second lowest applicable illumination power density adjustment factor.

2. The adjustment factor dese not apply to tungsten, halogen or other incandescent sources.
3. Includes luminaires with a pre-programmed function which provides dimming from ON to OFF(one stage dimming).
4. The illumination power density adjustment factor is only applied to lights controlled by daylight sensor between 8:00am and 7:00pm.

REMARK:

Compliance is to be certified by Electrical Designer. The lighting load shall be checked against the BCA lighting calculator available for download from ABCB website.

Table J6.2c – Illumination power density adjustment factor for light colour

Light source	Description	Illumination power density adjustment factor
CRI ≥ 90	Where lighting with good colour rendering is used	0.9
CCT ≤ 3500K [note]	Where lighting with a warm appearance is used	0.8
CCT ≥ 4500K	Where lighting with a cool appearance is used	1.1

Note to Table J6.2c: includes luminaires that can adjust their CCT to 3500K or below.

J6.3 INTERIOR ARTIFICIAL LIGHTING AND POWER CONTROL

REQUIREMENT		REMARK
(a)	Artificial lighting of a room or space must be individually operated by i. a switch or ii. other control device. iii. Combination of (i) and (ii)	To be confirmed by Electrical Designer
(b)	An occupant activated device, such as a room security device, a motion detector or the like, must be provided in the sole-occupancy unit of a Class 3 building, other than where providing	N/A

REQUIREMENT		REMARK
	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) in the room or space being switched; or (B) in an adjacent room or space from where 90% of 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.	To be confirmed by Electrical Designer
(d)	95% of the lighting in a building or storey of a building, other than a Class 2 or 3 building or a Class 4 part of a building, 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 register a person entering and leaving the building or (B) a motion detector in accordance with specification J6	To be confirmed by Electrical Designer
(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) the luminaires in the natural lighting zone are not more than 70% of the luminaires in the room.	N/A
(f)	Artificial lighting in a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp, must be controlled by a motion detector in accordance with Specification J6.	
(g)	Artificial lighting in a foyer, corridor and other circulation spaces i. of more than 250W within a single zone and ii. adjacent to windows must be controlled by daylight sensor and dynamic lighting control device in accordance with specification J8	

REQUIREMENT		REMARK
(h)	Artificial lighting for daytime travel in the first 19m of travel in a carpark entry zone must be controlled by a daylight sensor devices in accordance with specification J6	
(i)	The requirements of (a), (b), (c), (d), (e), (f), (g) and (h) 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.	Electrical design to provide
(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, or a plantroom or lift motor room or a workshop where power tools are used. (ii) A heater where the heater also emits light, such as in bathrooms.	N/A

J6.4 INTERIOR DECORATIVE AND DISPLAY LIGHTING

REQUIREMENT		REMARK
(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 where the display lighting exceeds 1 kW.	To be confirmed by Electrical Designer
(b)	Window display lighting must be controlled separately from other display lighting.	N/A

J6.5 EXTERIOR ARTIFICIAL LIGHTING

REQUIREMENT	REMARK
(a) Exterior Artificial lighting attached to or directed at the façade of a building, must	This requirement applies to car park and landscape.
(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	To be confirmed by Electrical Designer
(ii) when the total lighting load exceeds 100 W (A) Use LED luminaires for 90% of the total lighting load; or (B) be controlled by a motion detector in accordance with Specification J6; or	To be confirmed by Electrical Designer
(C) when used for decorative purposes, such as facade lighting or signage lighting, have a separate time switch in accordance with Specification J6.	To be confirmed by Electrical Designer
(b) The requirements of (a)(ii) do not apply to the following: (i) Emergency lighting in accordance with Part E4. (ii) Lighting around a detention centre.	N/A

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

REMARK:
In-built time clock shall be incorporated to the unit installed.

J6.7 LIFT

Lift must-

(a) be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes; and

(b) Achieve the idle and standby energy performance level in Table 6.7a and

(c) Achieve

i. the energy efficiency class in Table 6.7b; or

ii. if a dedicated goods lift, energy efficiency class D in accordance with ISO 25745-2.

Table 6.7a Lift idle and standby energy performance level

Rated Load	Idle and standby energy performance level in accordance with ISO 25745-2
Less than or equal to 800kg	2
801 kg to less than or equal to 2000kg	3
2001 kg to less than or equal to 4000kg	4
Greater than 4000kg	5

Table 6.7b Lift energy efficiency class

Usage category in accordance with ISO 25745-2	Energy efficiency class in accordance with ISO 25745-2
1-4	C
> 5	D

J6.8 ESCALATORS AND MOVING WALKWAYS

Escalators and moving walkways must have the ability to slow to between 0.2m/s and 0.05m/s when unused for more than 15minitues.

REMARK:
Lift design to comply.

9 J7 HOT WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT

J7.2 HOT WATER SUPPLY

A hot 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

REMARK:
Hydraulic design to comply. Refer to Part B2 of NCC volume three

J7.3 SWIMMING POOL HEATING AND PUMPING

REQUIREMENT	REMARK
(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 from other process such as reject heat from refrigeration plant; or (iii) a geothermal heater (iv) a gas heater; (A) if rated to consume 500MJ/hour or less, achieve a minimum gross thermal efficiency of 86% (B) if rated to consume more than 500MJ/hour, achieve a minimum gross thermal efficiency of 90%; or (v) a heat pump; or (vi) a combination of (i) to (v)	N/A
(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 with a minimum R value of 0.5; and (ii) a time switch to control the operation of the heater.	N/A
(c) A time switch must be provided to control the operation of a circulation pump for a swimming pool.	N/A
(d) Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days	N/A
(e) Pipe work carrying heated or chilled water for a swimming pool must comply with the insulation requirement of J5.8	
(f) For the purpose of J7.3, a swimming pool does not included a spa pool	

J7.4 SPA POOL HEATING AND PUMPING

REQUIREMENT	REMARK
(a) Heating for a spa pool that shares a water recirculation system with a swimming pool must be by- (i) a solar heater; or	N/A

REQUIREMENT		REMARK
	(ii) a heater using reclaimed energy from another process such as reject heat from a refrigerantion plant; or (iii) a geothermal heater; or (iv) gas heater that (A) if rated to consume 500MJ/hour or less, achieve a minimum gross thermal efficiency of 86% (B) if rated to consume more than 500MJ/hour, achieve a minimum gross thermal efficiency of 90%; or (v) a heat pump; or (vi) a combination of (i) to (v)	
(b)	Where some or all of the heating required by (a) is by a gas heater or a heat pump, the spa pool must have (i) a cover with a minimum R value of 0.50 (ii) a push button and a time switch to control the operation of the heater	N/A
(c)	A time switch must be provided to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.	N/A
(d)	Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed time and on variable pre-programmed days.	
(e)	Pipework carrying heated or chilled water for a spa pool must comply with insulation requirement of J5.8	

10 J8 ACCESS FOR MAINTENANCE AND FACILITIES FOR MONITORING

J8.2 ACCESS FOR MAINTENANCE

J8.2 has been deleted as a consequence of a determination that maintenance provisions are primarily a State and Territory regulatory function rather than a matter that is dealt with by the BCA.

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) Energy meters required by (b) must be interlinked by a communication system that collates the time-of-use energy consumption data to a single interface monitoring system where it can be stored, analysed and reviewed.

(d) The provision of (b) do not apply to Class 2 building with a floor area of more than 2500m^2 where the total area of the common areas is less than 500m^2.

REMARK:
Energy meters shall be provided as per J8.3.

11 APPENDIX

A: DTS GLAZING CALCULATION

Façade

Report

Calculator

Project Summary

Date
4/27/2021

Name
GENESIS CARE CAMPBELLTOWN

Company
DSA CONSULTING

Position
CAMPBELLTOWN

Building Name / Address
0
0

Building State

NSW

Climate Zone
Climate Zone 6 - Mild temperate

Building Classification
Class 9a - health-care buildings

Storeys Above Ground
4

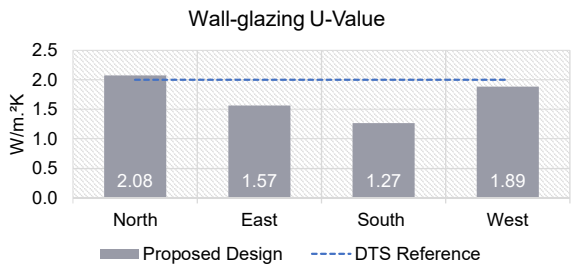
Tool Version
1.1 (April 2020)

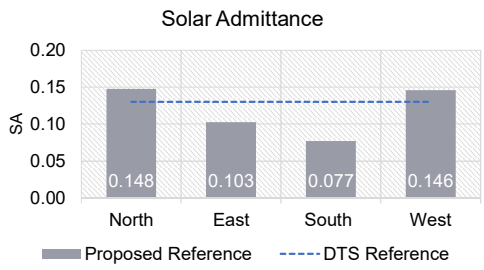
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

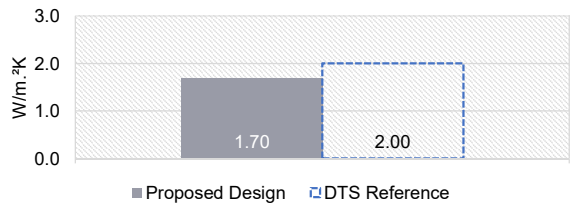
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	2.08	1.57	1.27	1.89	1.70
Solar Admittance	0.15	0.10	0.08	0.15	
AC Energy Value					410

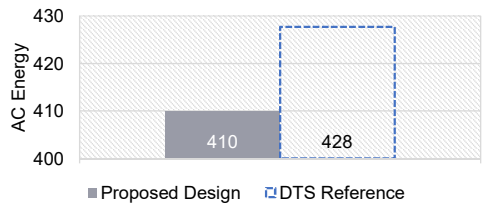
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	262.4	184.95	106.765	200.05
Glazing to Façade Ratio	50%	32%	23%	43%
Glazing References	GLA-GF GLA-L1 GLA-L2 GLA-L3	GLA-GF GLA-L1 GLA-L2 GLA-L3	GLA-GF GLA-L1 GLA-L2	GLA-GF GLA-L1 GLA-L2 GLA-L3
Glazing System Types	USER (DEFINED)	USER (DEFINED)	USER (DEFINED)	USER (DEFINED)
Glass Types	WIN-1	WIN-1	WIN-1	WIN-1
Frame Types	0	0	0	0
Average Glazing U-Value (W/m².K)	3.50	3.50	3.50	3.50
Average Glazing SHGC	0.34	0.34	0.34	0.34
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	264.2	386	364	265.55
Wall Types	Wall Spandrel	Wall Spandrel	Wall Spandrel	Wall Spandrel
Methodology	Wall			
Wall Construction	WAL-1 Spandrel Config 4 - R2.0	WAL-1 Spandrel Config 4 - R2.0	WAL-1 Spandrel Config 4 - R2.0	WAL-1 Spandrel Config 4 - R2.0
Wall Thickness	200	200	200	200
Average Wall R-value (m².K/W)	1.51	1.57	1.62	1.49
Solar Absorptance	0.65	0.65	0.65	0.65