

175-177 Cleveland Street, Redfern

ESD Statement / prepared for Mark Shapiro Architects



Document Status

Project No. 6457	Version 3	Date 17/06/2021
Author(s) Bob Wilson Approved by Bob Wilson		
Version	Issue Description	Date
1	Draft Issue for Comment	28 January 2021
2	Updated	25 February 2021
3	Issued	17 June 2021
This report has been prepared in accordance with the terms and conditions of appointment. Waterman AHW (Vic) Pty Ltd (ABN 46 121 003 334) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.		

Table of Contents

1 INTRODUCTION	1
1.1 Purpose	1
1.2 Design Philosophy	1
1.3 Statutory Framework	1
1.4 Sources of Information and Limitations	2
2 SUMMARY AND CONCLUSIONS	3
2.1 BASIX Results	3
2.2 Design Response to Development Control Plan	3
3 DAYLIGHT PERFORMANCE	5
4 URBAN ECOLOGY	6
5 MATERIALS	7
5.1 Material Preference	7
5.2 Toxic Emissions	7
5.3 Locally Sourced Supply Chain	7
5.4 Timber	7
5.5 Durability and Flexibility	7
5.6 Dematerialisation	7
APPENDIX A BASIX REPORT	
APPENDIX B SECTION J REPORT	

1 Introduction

1.1 Purpose

Waterman has been engaged to prepare an Environmentally Sustainable Design (ESD) Statement for the proposed commercial development.

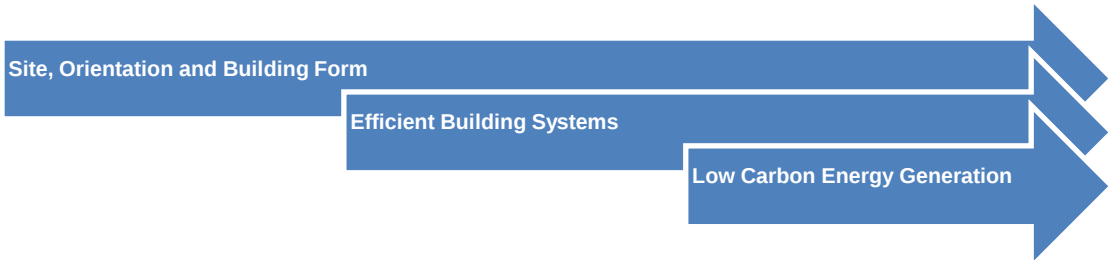
This ESD Statement lists the sustainable initiatives and attributes currently considered for the design of this project. The project team will endeavour to ensure that all aspects of the design listed within this report are fully implemented into the design documents and the constructed building.

1.2 Design Philosophy

The proposed development is a Class 3 residential development located at 175-177 Cleveland Street, Redfern. The development includes 120 co-living accommodation beds, with associated common areas.

Sustainability has been integrated into the heart of this development with careful consideration given to sustainable outcomes from the initial siting, massing and orientation of the building.

In addition to these core features, this project has included wide ranging initiatives to ensure the building is a healthy, energy and water efficient building with a minimal ecological footprint.



1.3 Statutory Framework

This ESD Statement benchmarks the project against the relevant planning requirements of the relevant authority.

For this project, the relevant authority is Sydney City Council and the following benchmarks are required to be satisfied.

Planning Control	Project Response
Development Control Plan Section 3.6 Ecologically Sustainable Development Applications are to meet the following objects and provisions. • The objectives of the Section as set out in the DCP. • The provisions for energy efficiency in non-residential developments (3.6.1). • The provisions for water efficiency in non-residential developments (3.6.2). • The requirements for solar panels and wind turbines in 3.6.3 and 3.6.4. • The requirements for materials and components in 3.6.5.	This ESD Statement has provided a response to each item applicable to the development. Refer to Section 2.2.

1.4 Sources of Information and Limitations

This report has been based on the following architectural information:

- > Mark Shapiro Architects. Drawings Revision A dated 26 February 2021.

This ESD Statement is based on our interpretation of the architectural documentation and project briefing requirements issued to us to date. It is also based on our understanding of the key design considerations that we believe are beneficial to a development of this type and size in order to reduce the development's impact on the environment.

This report has been specifically prepared for the organisation noted on the cover of the report.

No responsibility or liability to any third party is accepted for any loss or damage arising from the use of this report by any third party. Any third party wishing to act upon any material contained in this report should confer with Waterman for detailed advice to take into account that party's particular requirements.

This report is not to be used for any other project.

2 Summary and Conclusions

This report outlines a number of sustainable design initiatives which are to be integrated into the design and specification of the proposed development in order to reduce the development's environmental impact.

The performance outcomes presented in this report demonstrate that the proposed development meets the Sydney City Council standard for sustainable development.

2.1 BASIX Results

The project meets the minimum requirements for thermal comfort and energy, and achieves a best practice outcome for water.

Section	Minimum Requirement	Score
Water	40	41
Thermal Comfort	Pass	Pass
Energy	45	45

Refer to Appendix A for the BASIX Report.

2.2 Design Response to Development Control Plan

DCP Section	Control	Design Response
DCP Section 3.6 Introduction	Council encourages the application of ecologically sustainable development principles for all development. Implementing the principles means that the development will be designed and constructed so that it complies with the following objectives: (a) Greenhouse gas emissions will be reduced. (b) The use of cogeneration and tri-generation systems will be increased. (c) Energy that is used will be renewable and low carbon. (d) Potable water use will be reduced. (e) Development can adapt to climate change. (f) Waste will be reduced. (g) Recycling of waste and use of products from recycled sources will be increased. (h) Indoor environmental quality will be improved.	(a) Greenhouse gas emissions: Refer BASIX commitments. (b) Cogeneration and trigeneration: Not suitable for this development and not proposed. (c) (e) Energy source and climate change adaptation: The project is avoiding fossil fuel use onsite by implementing electric source heating as the main source of heating in the building. (d) Potable water use: Refer BASIX commitments. (f) (g) Waste and recycling: Refer Section 5 for construction waste. Refer waste management plan for operational waste. (h) Indoor environment quality: Refer Section 3.

DCP Section	Control	Design Response
	(i) The environmental impact from building materials will be reduced through reduction, re-use and recycling of materials, resources and building components. (j) The biodiversity will be improved.	(i) Materials: Refer Section 5. (j) Biodiversity: Refer Section 4.
DCP Section 3.6 Introduction	Section J of the Building Code of Australia contains mandatory requirements for the design of building envelopes and fixtures to minimise energy use.	The project will defer the Section J assessment as per BASIX approach for large boarding houses.
DCP Section 3.6 Introduction	The Commonwealth Commercial Building Disclosure Program requires energy efficiency information to be provided in most cases when commercial office space of 1,000 sqm or more is offered for sale or lease. The aim is to improve the energy efficiency of Australia's large office buildings and to ensure prospective buyers and tenants are informed. The Commercial Building Disclosure Program is an initiative of the Council of Australian Governments. It was established by the Building Energy Efficiency Disclosure Act 2010 and is managed by the Australian Government Department of the Environment and Energy.	This program is not applicable to this development.
DCP Section 3.6 Introduction	In NSW, State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (BASIX SEPP) mandates provisions that aim to reduce consumption of mains-supplied potable water, reduce emissions of greenhouse gases and improve thermal comfort in all residential development. The BASIX SEPP sets the minimum standards that a development is to achieve. The BASIX SEPP also mandates that a DCP cannot include provisions which require a development to exceed its minimum standards. However, where voluntarily proposed, Council encourages development to exceed minimum BASIX scores.	Refer Appendix A
DCP Section 3.6.1	Energy efficiency in non-residential developments	We note that this requirement does not apply to residential developments.
DCP Section 3.6.2	Water efficiency in non-residential developments	We note that this requirement does not apply to residential developments.

DCP Section	Control	Design Response
DCP Section 3.6.3	The use, location and placement of photovoltaic solar panels is to take into account the potential permissible building form on adjacent properties. Where possible proposals for new buildings, alterations and additions and major tree plantings are to maintain solar access to existing photovoltaic solar panels having regard to the performance, efficiency, economic viability and reasonableness of their location.	We note that no solar panels are proposed on this development as minimal roof space is available, and the nearby buildings do not contain solar panels.
DCP Section 3.6.4	Wind turbines	We note that no wind turbines are proposed on this development.
DCP Section 3.6.5	Materials and building components	Refer to Section 5 of this report which outlines the project response to this section.

3 Daylight Performance

Allowing daylight entry into a building can not only reduce reliance on electric lighting and save energy, but also improve indoor environment quality. Daylight has a natural quality that is not replicated using artificial lighting. The changing colour of daylight throughout the day also helps maintain occupants' circadian rhythm, which improves physical and mental health, and resilience.

Daylight performance for the accommodation suites has been maximised through the following layout designs.

- All living / sleeping areas have a large window to provide daylight to the room, incorporating a blind for glare control.
- Single and double rooms generally have a maximum room depth of 7.3m, with the living and sleeping areas within 4.1m of the façade, noting that a small number of rooms have some living areas extending up to 5.7m of the façade.

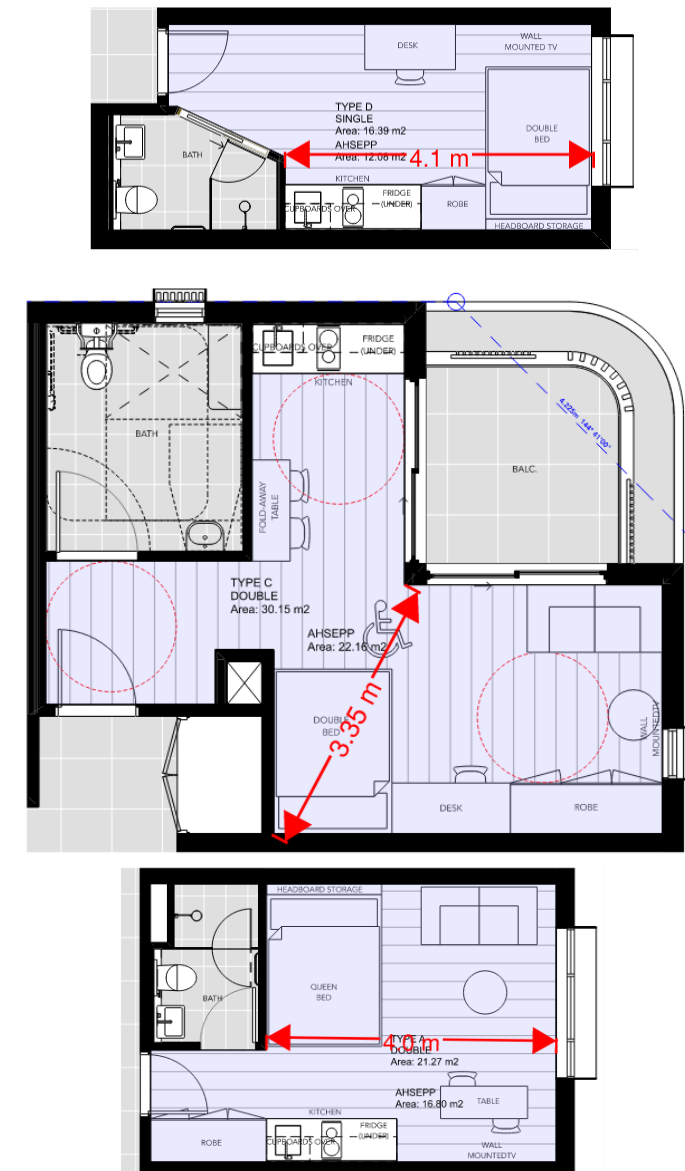


Figure 1: Typical room designs for single and double rooms, with consideration to how to maximise daylight access to rooms and priorities the main living and sleeping areas.

4 Urban Ecology

Urban ecology has been a significant focus of the design, with the aim to improve the biodiversity of plantings onsite from the existing conditions.

213m² of vegetation has been provided, with most landscaped areas being usable by occupants, providing additional amenity to this student accommodation building.

Landscaped areas include:

- The courtyard in the central atrium, which is expected to be well-daylit and with vegetation.
- Planter boxes on the edge of the site on ground floor.
- Vertical planting along the northern wall in the courtyard.
- Planter boxes on the Level 3 terrace.
- Extensive planting throughout the Level 5 communal areas.
- A communal garden on Level 5.
- Extensive planting throughout the Level 6 communal areas.



5 Materials

5.1 Material Preference

The following opportunities will be considered to limit the environmental impact of the building and furnishing materials:

- > Reused products or products with recycled content.
- > Reduced impact concrete:
 - Cement reduction
 - Aggregate reduction
 - Potable water reduction
- > Certified timber (FSC or PEFC)
- > Low impact PVC (best practice certified)
- > Selection of third party certified products (i.e. GECA, Greentag etc.)
 - Flooring
 - Joinery
 - Furniture
 - Ceilings
 - Plasterboard
 - Insulation
 - Blinds

The external cladding will be designed with durability and low maintenance requirements in mind.

5.2 Toxic Emissions

All paints, adhesives, sealants and carpets will be selected to be low VOC and comply with the Green Star VOC requirements.

All joinery will have low formaldehyde emissions where possible.

5.3 Locally Sourced Supply Chain

Products which must be sourced from overseas will be avoided unless there are no local alternatives.

5.4 Timber

All timber used onsite will be reused, recycled or from a sustainably managed forestry operation (i.e. FSC or PEFC certified timber).

5.5 Durability and Flexibility

Building components, such as structural framing, roofing and cladding will be designed for longevity, adaptation, disassembly, re-use and recycling where possible.

5.6 Dematerialisation

The following dematerialisation strategies will be explored as the design progresses:

- > Minimising the use of external cladding (over and above that required for weatherproofing etc.)
- > Including spaces with exposed services, no ceilings, minimal and durable internal finishes.
- > Supplying prefabricated rooms, such as bathrooms, as an integrated pod to reduce waste.

APPENDIX A

BASIX Report

BASIX[®]Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 1171582M

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary

Date of issue: Monday, 01 March 2021

To be valid, this certificate must be lodged within 3 months of the date of issue.



Planning,
Industry &
Environment

Project summary		
Project name	Cleveland St Redfern (job 1335)	
Street address	175-177 Cleveland Street Redfern 2016	
Local Government Area	Sydney City Council	
Plan type and plan number	deposited 57107+	
Lot no.	1,3,4+	
Section no.	-	
No. of residential flat buildings	1	
No. of units in residential flat buildings	120	
No. of multi-dwelling houses	0	
No. of single dwelling houses	0	
Project score		
Water	 41	Target 40
Thermal Comfort		concessionTarget Pass
Energy	 45	Target 45

Certificate Prepared by
Name / Company Name: Sustainable Thermal Solutions
ABN (if applicable): 55146061059

Description of project

Project address

Project name	Cleveland St Redfern (job 1335)
Street address	175-177 Cleveland Street Redfern 2016
Local Government Area	Sydney City Council
Plan type and plan number	deposited 57107+
Lot no.	1,3,4+
Section no.	-

Project type

No. of residential flat buildings	1
No. of units in residential flat buildings	120
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Site details

Site area (m ²)	1062.1
Roof area (m ²)	104
Non-residential floor area (m ²)	91.2
Residential car spaces	8
Non-residential car spaces	0

Common area landscape

Common area lawn (m ²)	0.0
Common area garden (m ²)	278.73
Area of indigenous or low water use species (m ²)	250.0

Assessor details

Assessor number	N/A
Certificate number	N/A
Climate zone	N/A
Ceiling fan in at least one bedroom	N/A
Ceiling fan in at least one living room or other conditioned area	N/A

Project score

Water	 41	Target 40
Thermal Comfort		concessionTarget Pass
Energy	 45	Target 45

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - Building1, 120 dwellings, 1 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.01	1	21.2	0.0	0.0	0.0
1.05	1	20.5	0.0	0.0	0.0
1.09	1	21.2	0.0	0.0	0.0
1.13	1	18.1	0.0	0.0	0.0
1.17	1	18.1	0.0	0.0	0.0
1.21	1	21.2	0.0	0.0	0.0
1.25	1	21.2	0.0	0.0	0.0
2.02	1	21.2	0.0	0.0	0.0
2.06	1	20.5	0.0	0.0	0.0
2.10	1	21.2	0.0	0.0	0.0
2.14	1	23.9	6.0	0.0	0.0
2.18	1	18.1	0.0	0.0	0.0
2.22	1	18.1	0.0	0.0	0.0
2.26	1	16.1	0.0	0.0	0.0
2.30	1	18.1	0.0	0.0	0.0
3.04	1	21.2	0.0	0.0	0.0
3.08	1	21.2	0.0	0.0	0.0
3.12	1	21.2	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.02	1	21.2	0.0	0.0	0.0
1.06	1	22.8	0.0	0.0	0.0
1.10	1	21.2	0.0	0.0	0.0
1.14	1	18.1	0.0	0.0	0.0
1.18	1	29.5	0.0	0.0	0.0
1.22	1	21.2	0.0	0.0	0.0
1.26	1	21.2	0.0	0.0	0.0
2.03	1	21.2	0.0	0.0	0.0
2.07	1	22.8	0.0	0.0	0.0
2.11	1	21.2	0.0	0.0	0.0
2.15	1	18.1	0.0	0.0	0.0
2.19	1	18.1	0.0	0.0	0.0
2.23	1	21.2	0.0	0.0	0.0
2.27	1	16.1	0.0	0.0	0.0
3.01	1	21.2	0.0	0.0	0.0
3.05	1	18.1	0.0	0.0	0.0
3.09	1	21.2	0.0	0.0	0.0
3.13	1	18.1	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.03	1	21.2	0.0	0.0	0.0
1.07	1	21.2	0.0	0.0	0.0
1.11	1	21.2	0.0	0.0	0.0
1.15	1	18.1	0.0	0.0	0.0
1.19	1	18.1	0.0	0.0	0.0
1.23	1	16.1	0.0	0.0	0.0
1.27	1	18.1	0.0	0.0	0.0
2.04	1	21.2	0.0	0.0	0.0
2.08	1	21.2	0.0	0.0	0.0
2.12	1	21.2	0.0	0.0	0.0
2.16	1	18.1	0.0	0.0	0.0
2.20	1	18.1	0.0	0.0	0.0
2.24	1	21.2	0.0	0.0	0.0
2.28	1	21.2	0.0	0.0	0.0
3.02	1	21.2	0.0	0.0	0.0
3.06	1	20.5	0.0	0.0	0.0
3.10	1	21.2	0.0	0.0	0.0
3.14	1	23.9	6.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.04	1	18.1	0.0	0.0	0.0
1.08	1	21.2	0.0	0.0	0.0
1.12	1	18.1	0.0	0.0	0.0
1.16	1	18.1	0.0	0.0	0.0
1.20	1	21.2	0.0	0.0	0.0
1.24	1	16.1	0.0	0.0	0.0
2.01	1	21.2	0.0	0.0	0.0
2.05	1	18.1	0.0	0.0	0.0
2.09	1	21.2	0.0	0.0	0.0
2.13	1	18.1	0.0	0.0	0.0
2.17	1	18.1	0.0	0.0	0.0
2.21	1	23.9	6.0	0.0	0.0
2.25	1	21.2	0.0	0.0	0.0
2.29	1	21.2	0.0	0.0	0.0
3.03	1	21.2	0.0	0.0	0.0
3.07	1	22.8	0.0	0.0	0.0
3.11	1	21.2	0.0	0.0	0.0
3.15	1	18.1	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
3.16	1	18.1	0.0	0.0	0.0
3.20	1	18.1	0.0	0.0	0.0
3.24	1	21.2	0.0	0.0	0.0
3.28	1	18.1	0.0	0.0	0.0
4.04	1	21.2	0.0	0.0	0.0
4.08	1	21.2	0.0	0.0	0.0
4.12	1	21.2	0.0	0.0	0.0
4.16	1	18.1	0.0	0.0	0.0
4.20	1	18.1	0.0	0.0	0.0
4.24	1	21.2	0.0	0.0	0.0
4.28	1	18.1	0.0	0.0	0.0
5.04	1	21.2	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
3.17	1	18.1	0.0	0.0	0.0
3.21	1	23.9	6.0	0.0	0.0
3.25	1	21.2	0.0	0.0	0.0
4.01	1	21.2	0.0	0.0	0.0
4.05	1	18.1	0.0	0.0	0.0
4.09	1	21.2	0.0	0.0	0.0
4.13	1	18.1	0.0	0.0	0.0
4.17	1	18.1	0.0	0.0	0.0
4.21	1	23.9	6.0	0.0	0.0
4.25	1	21.2	0.0	0.0	0.0
5.01	1	18.1	0.0	0.0	0.0
5.05	1	27.5	0.0	7.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
3.18	1	18.1	0.0	0.0	0.0
3.22	1	18.1	0.0	0.0	0.0
3.26	1	21.2	0.0	0.0	0.0
4.02	1	21.2	0.0	0.0	0.0
4.06	1	20.5	0.0	0.0	0.0
4.10	1	21.2	0.0	0.0	0.0
4.14	1	23.9	6.0	0.0	0.0
4.18	1	18.1	0.0	0.0	0.0
4.22	1	18.1	0.0	0.0	0.0
4.26	1	21.2	0.0	0.0	0.0
5.02	1	21.2	0.0	0.0	0.0
5.06	1	24.9	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
3.19	1	18.1	0.0	0.0	0.0
3.23	1	21.2	0.0	0.0	0.0
3.27	1	21.2	0.0	0.0	0.0
4.03	1	21.2	0.0	0.0	0.0
4.07	1	22.8	0.0	0.0	0.0
4.11	1	21.2	0.0	0.0	0.0
4.15	1	18.1	0.0	0.0	0.0
4.19	1	18.1	0.0	0.0	0.0
4.23	1	21.2	0.0	0.0	0.0
4.27	1	21.2	0.0	0.0	0.0
5.03	1	21.2	0.0	0.0	0.0
5.07	1	24.9	0.0	0.0	0.0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - Building1

Common area	Floor area (m²)
Car park area (No. 1)	582.0
Switch room (Basement)	43.2
Plant room (Basement)	27.0
Pump/Sprinkler room (Ground)	31.5
Laundry	34.8
Multi-media area	109.5
Electrical Distribution Sub-Station	15.6
Hallway/lobby type (No. 1)	540.3

Common area	Floor area (m²)
Lift car (No.1)	-
Garbage room (No. 1)	42.2
Plant & store room (Ground)	22.6
Common Study Room	71.8
Bicycle Storage Room	50.8
Mechanical Fan Room (Basement)	20.8
Cleaner/WC (Basement)	4.5

Common area	Floor area (m²)
Lift car (No.2)	-
Common Lounge/kitchen (No. 1)	134.5
Mech Plant room (Basement)	37.3
WCs (Ground)	21.6
Store (Ground)	10.0
Storage (basement)	9.1
Ground floor lobby type (No. 1)	55.2

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building1

(a) Dwellings

- (i) Water
- (ii) Energy
- (iii) Thermal Comfort

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for multi-dwelling houses

3. Commitments for single dwelling houses

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

- (i) Water
- (ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for Residential flat buildings - Building1

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✓	✓	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✓	✓
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✓	✓
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✓	✓
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✓	✓
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✓	✓	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✓	
(g) The pool or spa must be located as specified in the table.	✓	✓	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✓	✓	✓

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 4.5 but <= 6 L/min)	4 star	4 star	4 star	no	-	-	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✓	✓	✓
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✓	✓
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✓	✓
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✓	✓	✓
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✓ ✓	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓ ✓ ✓	✓
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
2.14, 2.21, 3.14, 3.21, 4.14, 4.21	3-phase airconditioning EER < 2.5	-	3-phase airconditioning EER < 2.5	-	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	no

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
1.04, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.19, 1.27, 2.05, 2.13, 2.15, 2.16, 2.17, 2.18, 2.19, 2.20, 2.22, 2.30, 3.05, 3.13, 3.15, 3.16, 3.17, 3.18, 3.19, 3.20, 3.22, 3.28, 4.05, 4.13, 4.15, 4.16, 4.17, 4.18, 4.19, 4.20, 4.22, 4.28,	3-phase airconditioning EER < 2.5	-	3-phase airconditioning EER < 2.5	-	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	yes

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
5.01, 5.05												
All other dwellings	3-phase airconditioning EER < 2.5	-	3-phase airconditioning EER < 2.5	-	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	electric cooktop & electric oven	4.5 star	no	-	-	-	yes	no

(iii) Thermal Comfort								Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The development will be a Class 3 building. The applicant must include in the documentation accompanying the application for a construction certificate (or complying development certificate, if applicable), a report demonstrating that the development will meet Section J of the National Construction Code - Volume 1.								✓	✓	✓

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	4 star (> 4.5 but ≤ 6 L/min)	4 star	4 star	4 star

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Car park area (No. 1)	ventilation exhaust only	carbon monoxide monitor + VSD fan	light-emitting diode	time clock and motion sensors	No
Lift car (No.1)	-	-	light-emitting diode	connected to lift call button	No
Lift car (No.2)	-	-	light-emitting diode	connected to lift call button	No
Switch room (Basement)	no mechanical ventilation	-	light-emitting diode	manual on / manual off	No
Garbage room (No. 1)	ventilation exhaust only	-	light-emitting diode	motion sensors	No
Common Lounge/kitchen (No. 1)	ventilation supply only	time clock or BMS controlled	light-emitting diode	time clock and motion sensors	No
Plant room (Basement)	ventilation exhaust only	thermostatically controlled	light-emitting diode	manual on / manual off	No
Plant & store room (Ground)	ventilation exhaust only	thermostatically controlled	light-emitting diode	manual on / manual off	No
Mech Plant room (Basement)	ventilation exhaust only	thermostatically controlled	light-emitting diode	manual on / manual off	No
Pump/Sprinkler room (Ground)	ventilation exhaust only	thermostatically controlled	light-emitting diode	manual on / manual off	No
Common Study Room	ventilation supply only	time clock or BMS controlled	light-emitting diode	time clock and motion sensors	No
WCs (Ground)	ventilation exhaust only	none ie. continuous	light-emitting diode	time clock and motion sensors	No
Laundry	ventilation exhaust only	none ie. continuous	light-emitting diode	time clock and motion sensors	No
Bicycle Storage Room	ventilation exhaust only	none ie. continuous	light-emitting diode	time clock and motion sensors	No
Store (Ground)	no mechanical ventilation	-	light-emitting diode	manual on / manual off	No
Multi-media area	ventilation supply only	time clock or BMS controlled	light-emitting diode	time clock and motion sensors	No
Mechanical Fan Room (Basement)	ventilation exhaust only	none ie. continuous	light-emitting diode	manual on / manual off	No
Storage (basement)	no mechanical ventilation	-	light-emitting diode	manual on / manual off	No
Electrical Distribution Sub-Station	ventilation exhaust only	none ie. continuous	light-emitting diode	manual on / manual off	No

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Cleaner/WC (Basement)	ventilation exhaust only	none ie. continuous	light-emitting diode	manual on / manual off	No
Ground floor lobby type (No. 1)	no mechanical ventilation	-	light-emitting diode	time clock and motion sensors	No
Hallway/lobby type (No. 1)	no mechanical ventilation	-	light-emitting diode	time clock and motion sensors	No

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas-fired boiler	Piping insulation (ringmain & supply risers): (a) Piping external to building: R0.6 (~25 mm); (b) Piping internal to building: R0.6 (~25 mm)
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 8
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 8

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	4 star (> 4.5 but ≤ 6 L/min)	4 star	4 star	4 star

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Central energy systems	Type	Specification
Other	Common area clothes drying line installed?: yes Common area electric/gas clothes dryer rating: 3 star Common area clothes washer rating: 4.5 star	-

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

APPENDIX B

Section J Report



A: 138 Cowles Rd MOSMAN NSW 2088

M: 0420 312 721

E: enquiries@sustainablethermalsolutions.com.au

W: www.sustainablethermalsolutions.com.au



NCC SECTION J

Energy

Efficiency

Report

Version: 1 (final)

Date: 1 March 2021

Prepared: Bruce Carr

Approved:

(Signature required)

Project:

Boarding Rooms + Cafe:

175-177 Cleveland St REDFERN NSW 2016

Job No. 1335

CONTENTS

1	Introduction	3
2	Application.....	3
3	Building details.....	4
4	SUMMARY AND CERTIFIER CHECK:	6
5	Part J1: Building Fabric	17
5.1	J1.2: THERMAL CONSTRUCTION GENERAL	17
5.2	J1.3: Roof and Ceiling Construction.....	18
5.3	J1.4: Roof Lights	19
5.4	J1.5: Walls and glazing	20
5.5	J1.6: Floors	23
6	Part J2: Glazing	25
7	Part J3: Building Sealing	26
7.1	J3.2: Chimneys and flues	26
7.2	J3.3: ROOF LIGHTS	26
7.3	J3.4: WINDOWS AND DOORS.....	26
7.4	J3.5: EXHAUST FANS.....	26
7.5	J3.6: Construction of CEILINGS, walls and floors	26
7.6	J3.7: EVAPORATIVE COOLERS.....	26
8	Part J4	27
9	Part J5: Air conditioning and ventilation systems	27
10	Part J6: Artificial lighting and power	28
10.1	J6.2 Artificial Lighting	28
10.2	J 6.3 Interior Artificial Lighting and Control.....	29
10.3	J 6.4 Interior DECORATIVE AND DISPLAY LIGHTING	29
10.4	J6.5 ARTIFICIAL LIGHTING AROUND THE PERIMETER OF A BUILDING	29
10.5	J6.6 BOILING WATER AND CHILLED WATER STORAGE UNITS	30
10.6	J6.7 LIFTS	30
10.7	J6.8 ESCALATORS AND MOVING WALKWAYS.....	30
11	Part J7: Heated WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT	31
11.1	J7.2: HEATED WATER SUPPLY	31
11.2	J7.3: SWIMMING POOL HEATING AND PUMPING	31
11.3	J7.4: SPA POOL HEATING AND PUMPING	31
12	PART J8: FACILITIES FOR ENERGY MONITORING	31
12.1	J8.3: FACILITIES FOR ENERGY MONITORING.....	31
13	Definitions.....	32

Document History:

Date	Issue	Status	Prepared By
27 Jan 2021	Draft 1 Version 1	Issued to client	Bruce Carr
19 Feb 2021	Draft 2 Version 1	Issued to client	Bruce Carr
1 March 2021	Version 1 final	Issued to client	Bruce Carr

1 INTRODUCTION

This report assesses the proposed development for its compliance with Section J energy efficiency provisions of the National Construction Code (NCC) 2019 Volume 1. These provisions will apply to all new (and altered) construction work.

This report will detail the measures required to achieve compliance and will be required as part of the submission to the council or the consent authority for the Construction Certificate application.

2 APPLICATION

NSW J(B) states that Class 3 and Class 5 to 9 building must comply with the provisions of the national Section J. Therefore, the Section J Deemed-to-Satisfy (DTS) provisions of the NCC 2019 (Volume One) have been applied for the assessment of this project and this report will outline what measures are required for this building to comply.

The DTS provisions consist of 5 Parts.

This report is concerned with the following parts:

- Part J1: Building Fabric
- Part J3: Building Sealing
- Part J6: Artificial Lighting and Power
- Part J7: Heated Water Supply and Swimming Pool and Spa Pool Plant
- Part J8: Facilities for Energy Monitoring

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

- Part J5: Air-conditioning and Ventilations Systems

Note:

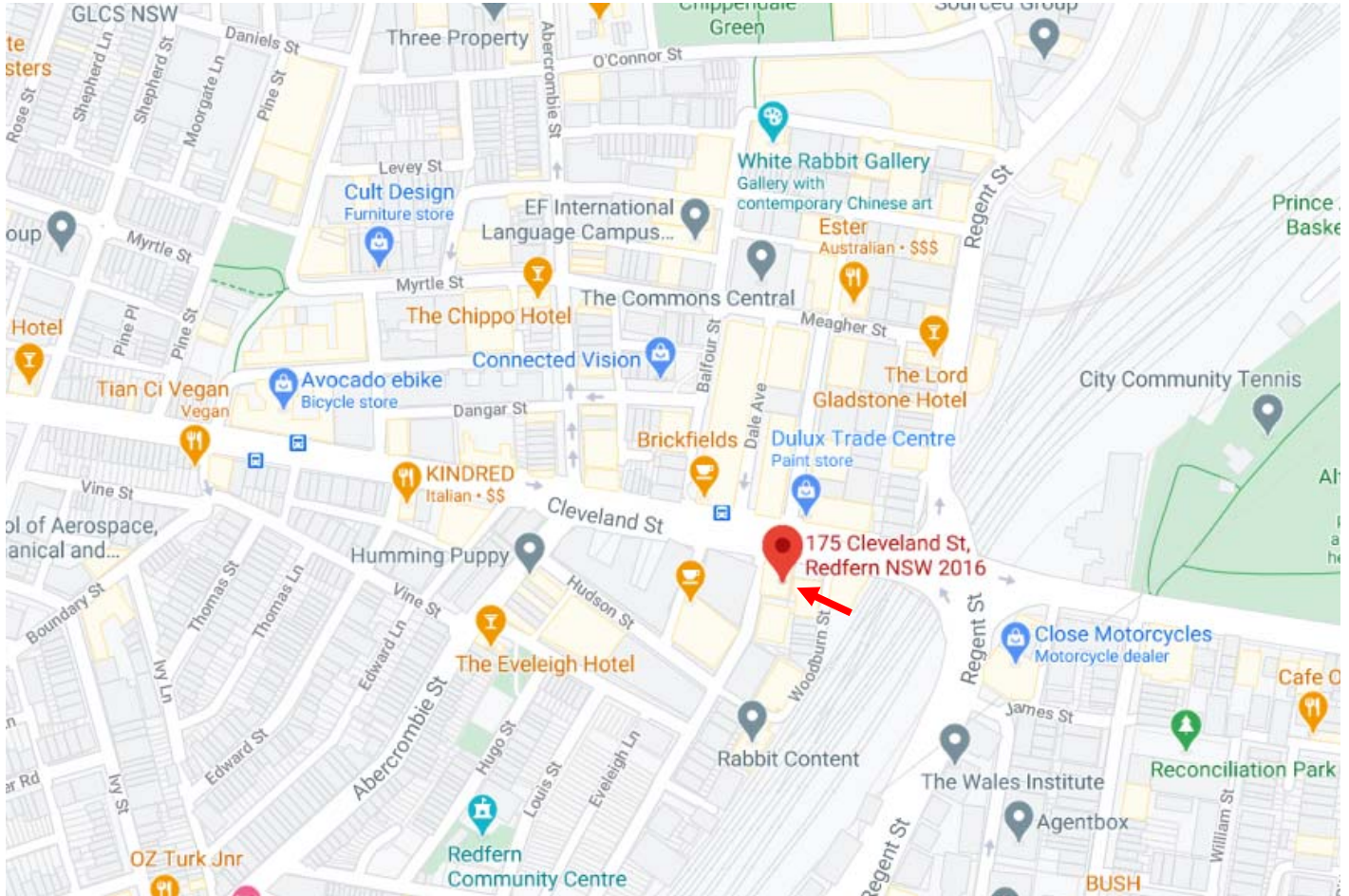
Part J4 has been removed from the NCC since 2010

Part J2 has been removed from the NCC since 2019 which existed in the NCC 2016. Glazing provisions are now included in Part J1.

3 BUILDING DETAILS

The title, address and location details for the project are as follows:

Project: Boarding House + Cafe
Address: 175-177 Cleveland St REDFERN NSW 2016
Authority: Sydney City Council



Climate zone: 5 (Warm Temperate)

- This climate zone is characterised by low diurnal temperatures near the coast to high diurnal ranges inland.
- Four distinct seasons: Summer and winter can exceed human comfort range, spring and autumn are ideal for human comfort
- Mild winters with low humidity, hot to very hot summers with moderate humidity

Description:

A new 6 level Boarding House development is proposed. This will consist of 120 self-contained Boarding rooms. There are also Common Rooms and a single level basement carpark below ground level. There will be new glazing on the north, east and west facades. There will also be a new Café (Class 6) on the ground floor.

The following construction materials are being proposed in the building design in accordance to the plans and design documentation referenced below:

- External Walls:
 - o Brick veneer on steel stud frame lined internally with plasterboard
 - o Other Walls: Insulated steel stud walls lined internally with plasterboard.
- Party walls (separating conditioned and non-conditioned): steel stud frame lined internally with plasterboard
- Floors: 200mm Concrete Slab
- Windows: Single glazed low-e clear
- Skylights: N/A
- Lighting: LED or compact fluorescent

Building class:

Class 6: “A shop or other building for the sale of goods by retail or the supply of services direct to the public eg. Café, restaurant, kiosk, hairdressers, showroom or service station”.

Class 3: “a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons eg. boarding house, hostel, backpacker’s accommodation or residential part of a hotel, motel, school or detention centre.”

References:**a) Plans:**

Mark Shapiro Architects. Received by STS on 1 March 2021

Project Number: 20008 (Revision A – 26/2/21)

Drawing Numbers: DA0000, DA1000, DA1200, DA2000 - DA2015, DA2300, DA2301, DA2302, DA2303, DA2304, DA2400, DA2401, DA2402, DA2403, DA2404, DA9000, DA9001, DA9002, DA9003, DA9004, DA9005, DA9100, DA9101, DA9102, DA9103, DA9104, DA9105, DA9200, DA9201.

b) National Construction Code 2019 Vol. 1

4 SUMMARY AND CERTIFIER CHECK:

Below is a summary of the energy efficiency actions required to meet the requirements of the NCC. Details are available in each relevant section.

Element	Insulation Requirements	Action	Certifier Check
Ceiling/Roof	Insulation is required in the concrete ceilings below any concrete walking surface above.	Add R3.05 (or 3.27 if insulation fills the air space).	
External Walls	Insulation is required in the 'envelope' walls: - Brick veneer on steel frame, lined internally with plasterboard - Corridor Walls: steel stud lined internally with plasterboard	Add minimum insulation of R2.0 Add minimum insulation of R2.0	
Walls other than External: (dividing conditioned & non-conditioned space)	- Walls separating rooms with fire stairs: steel stud lined internally with plasterboard	Add minimum insulation of R2.0	
Floor	Insulation is required in concrete slab: i) Level 1 Floor (over open air or non-conditioned space ii) Café floor (over basement car park):	Add minimum insulation of R1.24 Add minimum insulation of R1.48	
External Glazing	Cafe: Ground floor: Single glazed low-e clear: U-Value=5.8/SHGC=0.55 Boarding Rooms: Levels 1 - 5: Single glazed low-e clear: U-Value=5.8/SHGC=0.55	Ensure that a certificate of compliance is supplied with the windows.	

J3: Building Sealing

Sealing of new doors and windows is required. Refer to the relevant sections below for details.

J5: Air Conditioning and Ventilation Systems:

Refer to the design and installation requirements of the Mechanical Engineer or trade contractor's specifications.

J6: Artificial Lighting and Power:

See Section 10 further requirements on interior lighting and control.

J7: Heated Water Supply & Swimming Pool & Spa Pool Plant:

Hot water system to be installed in accordance with Part B2 of NCC Volume 3 – Plumbing Code of Australia.

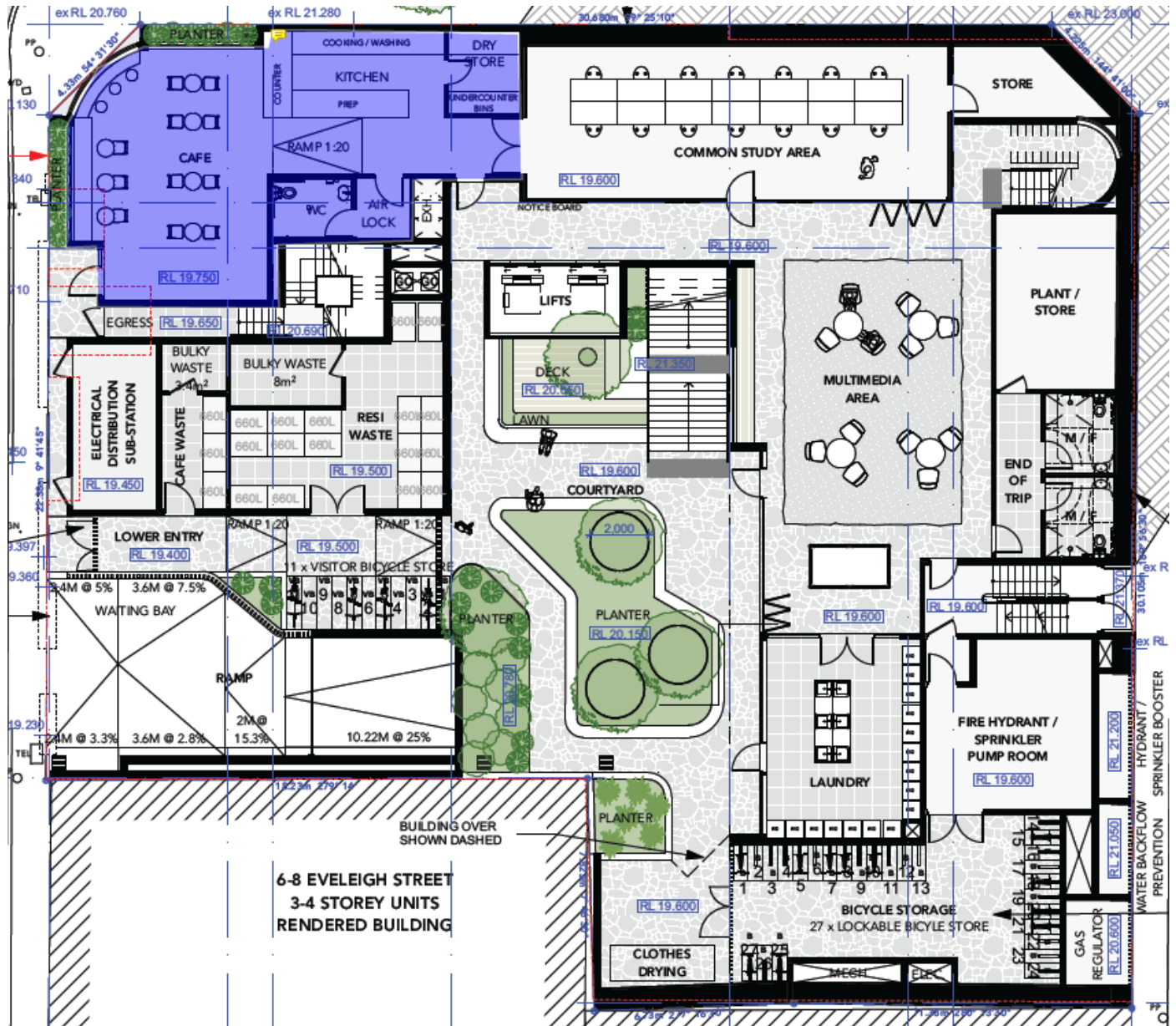
J8: Facilities for Energy monitoring:

A building with a floor area of more than 2500 m² must have energy meters configured to enable individual time-of-use energy consumption data recording, in accordance with (c), of the energy consumption of appliances, lighting, A/C, central hot water, lifts and other plant equipment.

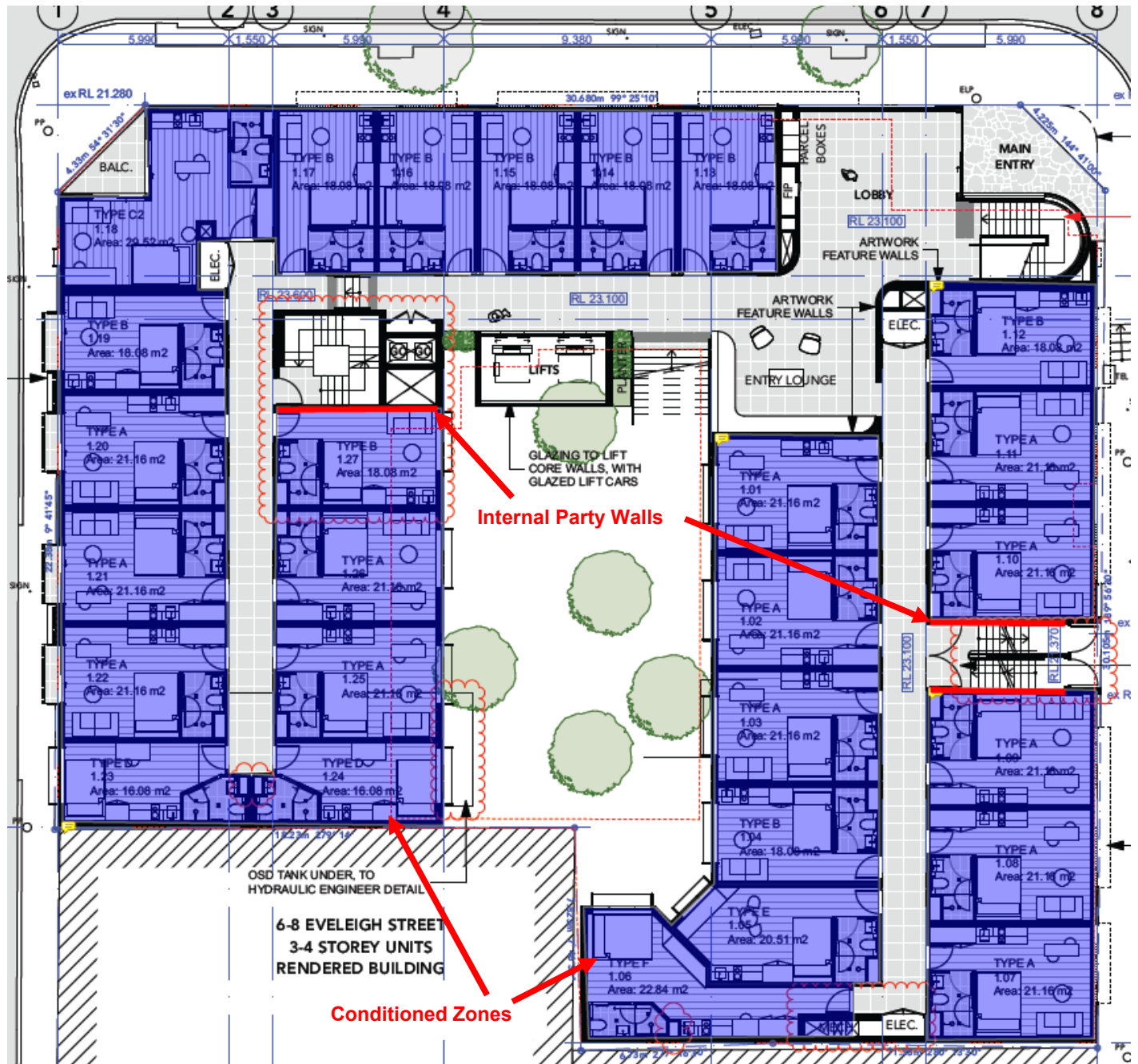
Figure 5.1 (Floor Plan):



Ground Floor:



Level 01:



Architectural floor plan of a 3-storey residential building at 6-8 Eveleigh Street. The plan shows various apartment units (Type A, B, C, E) with their respective areas in square meters. Key features include a central lift core with vertical wires and glazing, a notice board, a planter, and balconies. The building is rendered and has a height of 12.2m.

**6-8 EVELEIGH STREET
3-4 STOREY UNITS
RENDERED BUILDING**

Units and Areas:

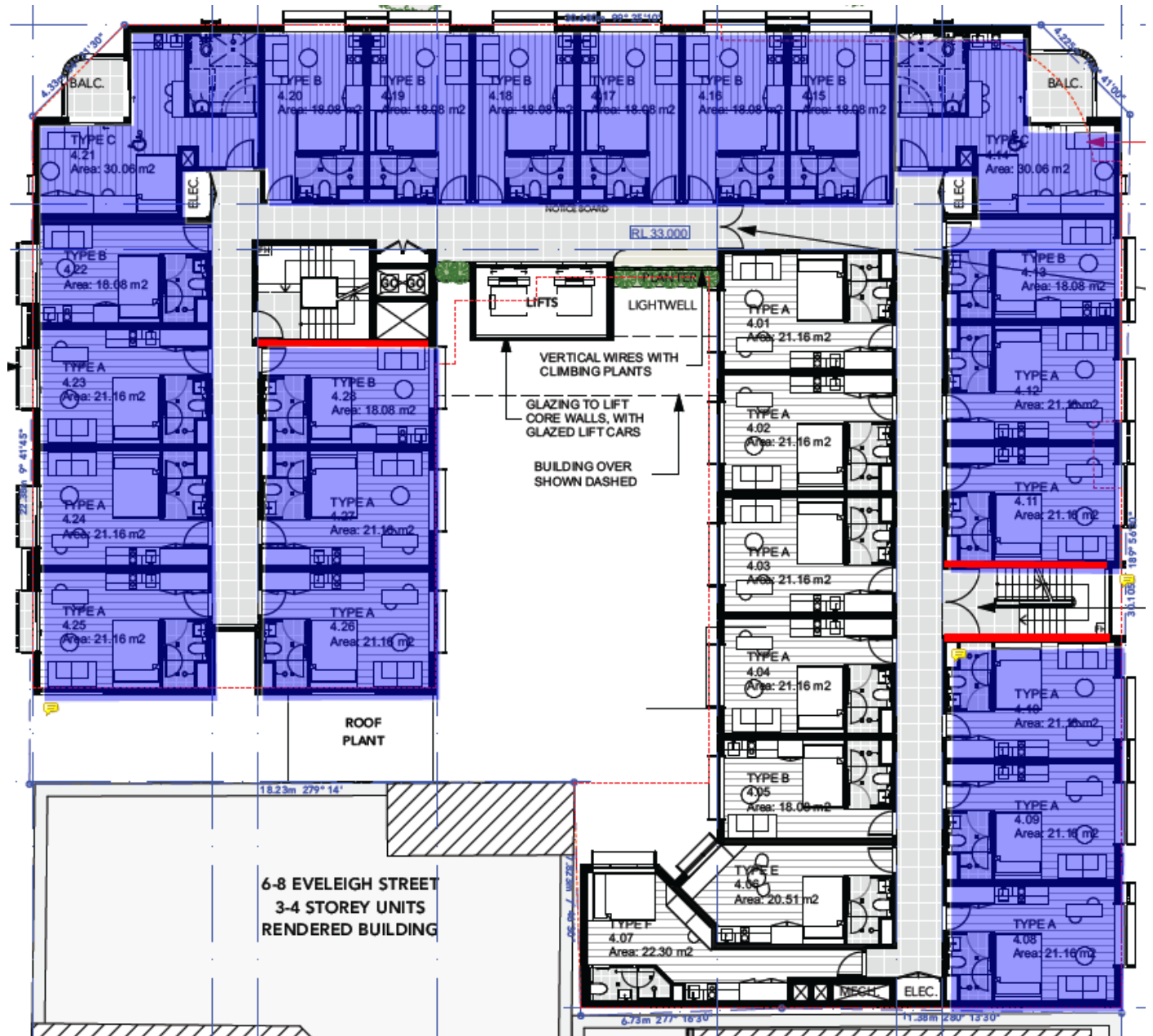
- TYPE B 2.20: Area: 18.08 m²
- TYPE B 2.19: Area: 18.08 m²
- TYPE B 2.18: Area: 18.08 m²
- TYPE B 2.17: Area: 18.08 m²
- TYPE B 2.16: Area: 18.08 m²
- TYPE B 2.15: Area: 18.08 m²
- TYPE C 2.21: Area: 30.06 m²
- TYPE B 2.22: Area: 18.08 m²
- TYPE A 2.23: Area: 21.16 m²
- TYPE A 2.24: Area: 21.16 m²
- TYPE A 2.25: Area: 21.16 m²
- TYPE B 2.26: Area: 18.08 m²
- TYPE A 2.27: Area: 18.08 m²
- TYPE A 2.30: Area: 21.16 m²
- TYPE A 2.28: Area: 21.16 m²
- TYPE A 2.29: Area: 21.16 m²
- TYPE A 2.31: Area: 21.16 m²
- TYPE A 2.32: Area: 21.16 m²
- TYPE A 2.11: Area: 21.16 m²
- TYPE A 2.10: Area: 21.16 m²
- TYPE A 2.09: Area: 21.16 m²
- TYPE A 2.08: Area: 21.16 m²
- TYPE B 2.05: Area: 18.08 m²
- TYPE E 2.06: Area: 20.51 m²
- TYPE F 2.07: Area: 22.30 m²
- TYPE A 2.03: Area: 21.16 m²
- TYPE A 2.04: Area: 21.16 m²
- TYPE A 2.02: Area: 21.16 m²
- TYPE A 2.01: Area: 21.16 m²

Other Features:

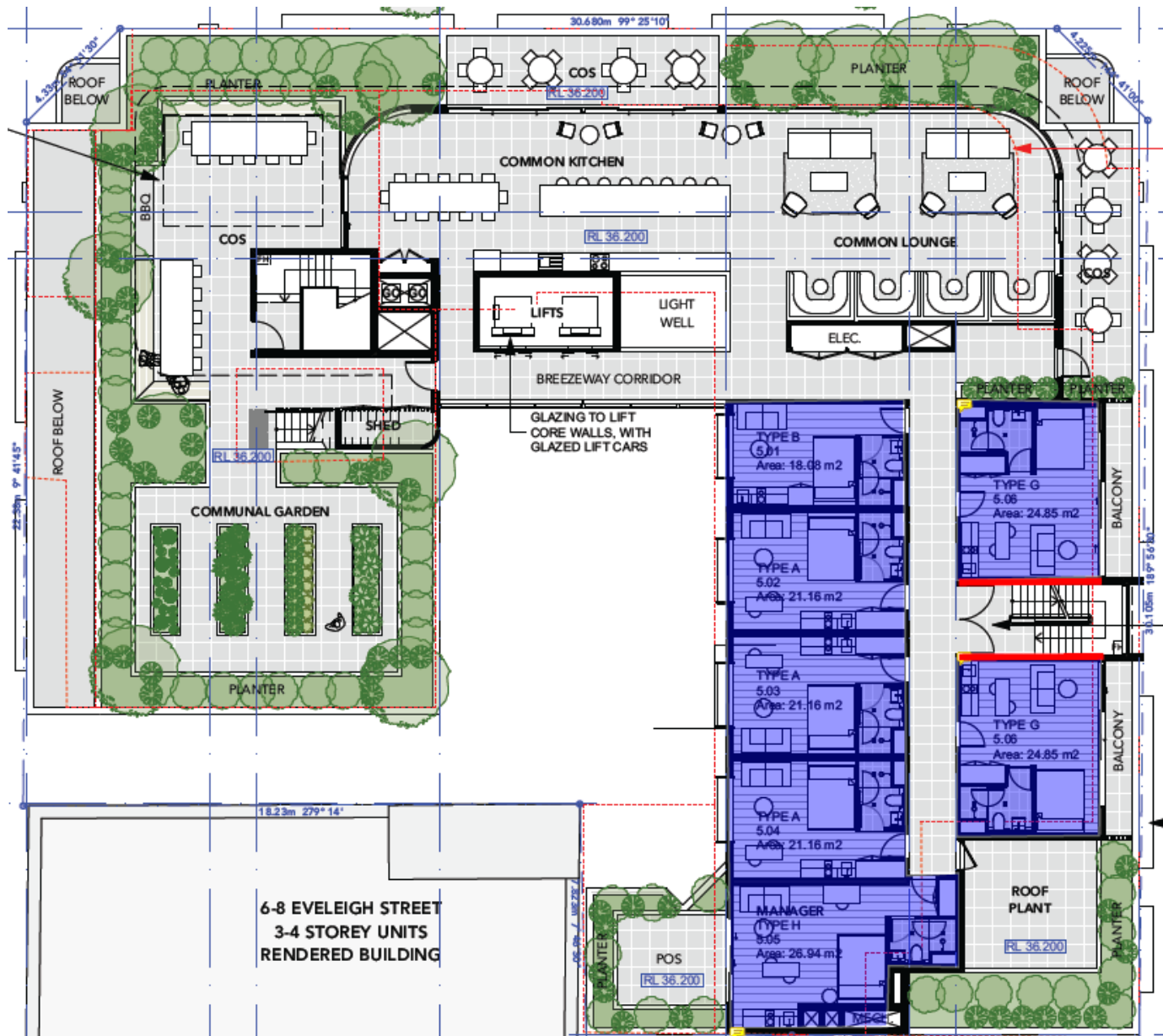
- BALC. (Balcony)
- ELEC. (Electrical)
- NOTICE BOARD
- LIFTS
- VERTICAL WIRES WITH CLIMBING PLANTS
- GLAZING TO LIFT CORE WALLS, WITH GLAZED LIFT CARS
- PLANTER

[illegible]

Level 04:



Level 05:



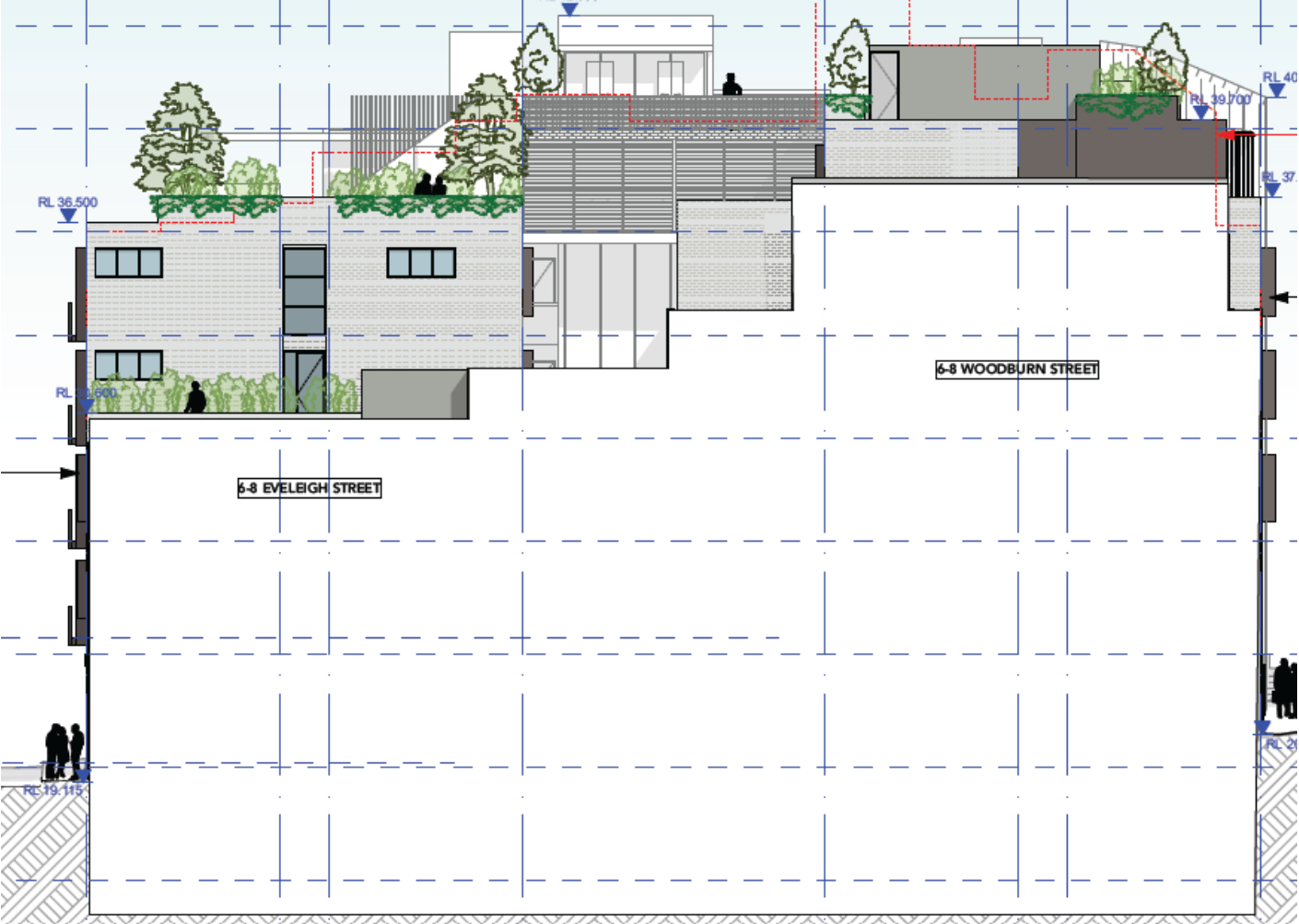
North:



East:



South:



West:



Following is the detail of each part of Section J of the NCC:

Part J1 is applicable only to NEW or ALTERED building works forming part of the external envelope around conditioned areas and the envelope separating the conditioned space from non-conditioned space.

5 PART J1: BUILDING FABRIC

The NCC Part J1 is concerned with the following 4 provisions:

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

The provisions in Part J1 apply to the conditioned spaces in the proposed development. The NCC uses the term 'envelope' to demarcate the conditioned space from non-conditioned space and the exterior of the building. A space is deemed to be conditioned if the air contained will be actively heated or cooled by an air-conditioning service (see definitions at the end of this report).

The diagram above shows the building envelope (Figure 5.1) which is shaded in blue. This is the boundary between the conditioned and non-conditioned zones (or outdoor space).

5.1 J1.2: THERMAL CONSTRUCTION GENERAL

All insulation that is part of the 'envelope' will be installed in accordance with Clause J1.2, the manufacturer's Specifications and AS/NZS 4859.1

5.2 J1.3: ROOF AND CEILING CONSTRUCTION

5.2.1 Roof and ceiling insulation requirement

As per Part J1.3(a), a building's roof & ceiling in climate zone 5 that is part of the 'envelope' is required to achieve a total R-Value of **R3.7** in a downwards direction.

In climate zone 5, the solar absorptance of the upper surface of a roof must not be more than **0.45**.

The following Rooms contain a ceiling/roof below a concrete walking surface above and are required to be insulated:

- Level 2: 2.26-2.27
- Level 4: All rooms except 4.02-4.06
- Level 5: All rooms

This ceiling and roof achieves the following R-Values:

Roof Type: Solid concrete roof to 5°, suspended plaster ceiling		R-Value (heat flow direction: downwards)
1	Outdoor air film (7m/s)	0.04
2	Waterproof membrane, rubber synthetic (4mm, 961 kg/m ³)	0.03
3	Solid Concrete (200mm, 2400 kg/m ³)	0.14*
4	Ceiling Air Space (100mm to 300mm, non-reflective)	0.22
5	Plasterboard (10mm)	0.06
6	Indoor air film (still air)	0.16
Total R-Value		0.65[#]

NB:

*This is calculated from table 2a in Specification J1.2 of the NCC 2019 Vol1 where the thermal conductivity of solid concrete is 1.44.

#This R-Value calculation has assumed there will be no thermal bridging between the concrete and plasterboard ceiling as there will be no studs.

Table 5.2a:

R-Value for Roof & Ceiling Construction	Insulation R-Value Requirements	Action to Achieve Compliance
0.65	3.7 required: Additional insulation needed is: $3.7 - 0.65 = \mathbf{3.05}$	Add minimum insulation of R3.05 to the ceiling below the concrete tiled walking surface above
Assuming the insulation fills the air space between the concrete and plasterboard (air space = 0.22). $0.65 - 0.22 = 0.43$	3.7 Required. Additional R-Value is $3.7 - 0.43 = \mathbf{3.27}$	Addition minimum insulation of R3.27 to the ceiling below the concrete tiled walking surface above

5.3 J1.4: ROOF LIGHTS

5.1.1 Roof light performance requirement

This section of the NCC is not applicable as there are no roof lights being installed directly over the conditioned zones.

5.4 J1.5: WALLS AND GLAZING

5.4.1 Requirement

An external wall that is part of the envelope must achieve the minimum total R-Value or, satisfy one of the options as specified in Table J1.5a.

The total system U-Value of wall-glazing construction must not be greater than:

- 2.0 for a Class 6 (retail) building in climate zone 5
- 2.0 for a Class 3 (boarding room) building in climate zone 5

The 'conditioned' areas are indicated in Figure 5.1 with purple shading. The walls surrounding this 'conditioned' space are the building 'envelope'. These walls therefore need to comply with the NCC.

The internal party walls dividing the conditioned space (of the rooms) with enclosed non-conditioned space (ie. Fire stairs) is also required to be insulated.

The following option in table 5.4a below will achieve compliance:

Table 5.4a:

External Wall Insulation:

i) Class 3 (Boarding Rooms):

Required Total Wall Construction R-Value	Typical Construction Specifications	*Required Added Insulation
North, East & West: R1.0 South: R1.4	External Walls: - Brick Veneer on a steel stud frame lined internally with plasterboard -Corridor Party Walls: Steel stud wall lined internally with plasterboard Internal Party Wall: - Party wall with fire stairs: Steel stud wall lined internally with plasterboard	Add minimum insulation of R2.0 Add minimum insulation of R2.0 Add minimum insulation of R2.0

ii) **Commercial Space: Café (Ground Floor):**

Required Total Wall Construction R-Value	Typical Construction Specifications	*Required Added Insulation
South & North: R1.4 West: R1.0 .	External Walls: - Brick Veneer on a steel stud frame lined internally with plasterboard Internal Party Wall: - Party wall with fire stairs: Steel stud wall lined internally with plasterboard	Add minimum insulation of R2.0 Add minimum insulation of R2.0

Table 5.4b: Glazing Requirements:

		*Minimum Requirements (incl. frame)		Additional Shading Devices Required	
Level/Description	Orientation	U-Value (≤)	SHGC (±10%)		#Typical Glazing
Ground: Commercial	N & W	5.8	0.55	None	Single glazed low-e clear
Boarding Rooms: Levels 1 to 4	All	5.8	0.55	None	Single glazed low-e clear

See **Appendix 1** at the end of this report for a façade report summary generated by the ABCB Façade Calculator for confirmation of compliance of the U-Value and solar admittance for each façade. Compliance was achieved with Method 2.

The performance figures & specifications are indicative only and may vary depending on the chosen manufacturer & supplier.

***The glazing manufacturer must provide performance data to show that the selected glazing complies with the values in the table through the WERS certification.**

NB: The following links to the WERS website provides information on the window manufacturers which are certified under WERS and the energy rating of each of their glazing products: <http://www.wers.net/>

5.5 J1.6: FLOORS

5.5.1 Floor insulation requirement

A floor over non-conditioned air or on ground that is part of the 'envelope' must achieve the minimum Total R-Value in a downwards and upwards direction or satisfy one of the options as specified in Table J1.6.

As per table J1.6, this floor is required to achieve a minimum R-Value of **R2.0** in the downwards direction in climate zone 5.

The new floor of the conditioned cafe on the ground level is over the non-conditioned car park entry below and the ground floor over the basement car park is suspended over the non-enclosed and non-conditioned space of the ground floor.

iii) Café: Ground Floor (over car park):

Floor type: Suspended concrete slab		R-Value
1	Indoor air film	0.16
2	Concrete (200mm)	0.14
3	Sub-floor air space R-Value	0.22
Total R-Value		0.52

The following options in table 5.3a below will achieve compliance:

Table 5.3a:

Insulation Provided by Construction	Required R-Value	Required Action to Achieve Compliance
0.52	R2.0 Required. Additional R-Value is $2.0 - 0.52 = 1.48$	Addition minimum insulation of R1.48

iv) Boarding Rooms: Level 1 (over non-conditioned space/air):

Floor type: Suspended concrete slab		R-Value
1	Indoor air film	0.16
2	Concrete (200mm)	0.14
3	Sub-floor air space R-Value	0.46
Total R-Value		0.76

The following options in table 5.3a below will achieve compliance:

Table 5.3a:

Insulation Provided by Construction	Required R-Value	Required Action to Achieve Compliance
0.76	R2.0 Required. Additional R-Value is $2.0 - 0.76 = \mathbf{1.24}$	Addition minimum insulation of R1.24

6 PART J2: GLAZING

This part is blank as it was removed by the NCC in the 2019 version and integrated into Part J1 (Building Fabric).

7 PART J3: BUILDING SEALING

7.1 J3.2: CHIMNEYS AND FFLUES

Not applicable

7.2 J3.3: ROOF LIGHTS

Not applicable

7.3 J3.4: WINDOWS AND DOORS

A seal to restrict air infiltration must be fitted to each edge of a new door, openable window or the like forming part of the envelope of a conditioned space in climate zones 4, 5, 6, 7 or 8.

Above requirements do not apply to:

- a) Windows complying with AS2047 (Windows in Buildings – Selection and Installation) or
- b) A fire door or smoke door or
- c) A roller shutter door, roller shutter grill or other security or device installed only for out-of-hours security

The seal on the bottom of an external swing door must be a draft protection device and for the other edges of an external door or edges of an openable window or other such opening, may be foam or rubber compression strip, fibrous seal or the like.

As per Clause J3.4d, an entrance to a building, if leading to a conditioned space must have an air lock, self-closing door, rapid roller door, revolving door or the like, other than:

- i) where the conditioned space has a floor area of not more than 50m²; or
- ii) where a café, restaurant, open front shop or the like has-
 - a. a 3m 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.
- iii) A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like

7.4 J3.5: EXHAUST FANS

An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space or a habitable room in climate zones 4, 5, 6, 7 or 8.

7.5 J3.6: CONSTRUCTION OF CEILINGS, WALLS AND FLOORS

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 when forming part of the envelope or in climate zones 4, 5, 6, 7 or 8. This must be constructed by:

- enclosing by internal lining systems that are close fitting at ceiling, wall and floor junctions or,
- sealed by caulking, skirting, architraves, cornices, expanding foam, rubber strips or the like.

The above requirements do not apply to openings, grilles or the like required for smoke hazard management.

7.6 J3.7: EVAPORATIVE COOLERS

Not applicable.

8 PART J4

This part is blank as it was removed by the NCC in a previous version.

9 PART J5: AIR CONDITIONING AND VENTILATION SYSTEMS

Refer to the Mechanical Engineer's documentation for compliance requirements for air-conditioning.

10 PART J6: ARTIFICIAL LIGHTING AND POWER

10.1 J6.2 ARTIFICIAL LIGHTING

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 adjusted 'illumination power density' (IPD) – see last column on the following page for the total maximum Watts allowable for each room. This excludes any emergency lighting, signage or display cabinet lighting or a heater where the heater also emits light.

The aggregate design illumination power load is the sum of the design illumination power loads in each of the spaces served. In determining this design illumination power load, where there are multiple lighting systems serving the same space;

- i) The total illumination power load of all systems must be used; or
- ii) For a control system that permits only one system to operate at a time, the design illumination power load is:
 - a. Based on the highest illumination power load; or
 - b. Determined by the formula:

$$(H \times T/2 + P \times (100 - T/2))/100$$

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.

Table A:

Room	Levels	Unadjusted IPD	Area	Adjusted IPD	*Control Factor	#Max Power (W) Per Unit
Café	Ground	14	51.30	20.9	1.0	1073
Cafe Kitchen	Ground	4	31.80	6.2	1.0	198
Dry Store Room	Ground	1.5	6.30	2.7	1.0	17
Café WC	Ground	3	5.10	5.4	1.0	28
Café Waste Room	Ground	1.5	11.70	2.6	1.0	31

NB:

- *Any control devices such as lighting timers, motion detectors, daylight sensors or dynamic lighting control devices used for any zones listed in the table above must comply with Specification J6 of the NCC Volume 1 2019.
- Only the maximum power output requirements for the commercial areas have been included in the table above as the lighting requirements for the Boarding rooms and related common spaces were covered under BASIX (see the 'Energy' section of the BASIX Report).

10.2 J 6.3 INTERIOR ARTIFICIAL LIGHTING AND CONTROL

Artificial lighting of a room or space must be individually operated by a switch or other control device or a combination of both. An artificial lighting switch must be located in a visible and easily accessible position in the room or space being switched or in an adjacent room or space from where 90% of the lighting being switched is visible.

An occupant activated device such as a room security device, a motion detector in accordance with Specification J6, or the like, must be provided in sole occupancy units of Class 3, other than where the accommodation is for people with a disability or the aged, in order to cut power of the artificial lighting, air conditioning, local exhaust fans and bathroom heaters when the sole occupancy unit is unoccupied.

An artificial lighting switch or other control device must, for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse:

- Not operate lighting for an area of more than 250 m² if in a Class 5 or 8 building, or
- Not operate lighting for an area of more than 250 m² for a space of not more than 2000 m²

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.

Artificial lighting for daytime travel in the first 19m of travel in a carpark entry zone must be controlled by a daylight sensor in accordance with Specification J6.

Artificial lighting in a foyer, corridor and other circulation spaces of more than 250 W within a single zone and adjacent to windows must be controlled by a daylight sensor and dynamic control device in accordance with Specification J6.

10.3 J 6.4 INTERIOR DECORATIVE AND DISPLAY LIGHTING

Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled-

- a) Separately from other artificial lighting; and
- b) By a manual switch for each area other than when the operating times of the displays are the same in an area, in which case they may be combined.
- c) By a time switch in accordance with Specification J6 where the display exceeds 1Kw.

Window display lighting must be controlled separately from other display lighting.

10.4 J6.5 ARTIFICIAL LIGHTING AROUND THE PERIMETER OF A BUILDING

Exterior artificial lighting attached to or directed at the façade 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 loads exceeds 100W:

- 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
- c) when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with Specification with J6.

The requirements in ii) above do not apply to emergency lighting in accordance with Part E4.

10.5 J6.6 BOILING WATER AND CHILLED WATER STORAGE UNITS

Not applicable

10.6 J6.7 LIFTS

Lifts must be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes and achieve the idle and standby energy performance level in Table 6.7a and achieve the energy efficiency class in Table 6.7.

10.7 J6.8 ESCALATORS AND MOVING WALKWAYS

Not applicable

11 PART J7: HEATED WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT

11.1 J7.2: HEATED WATER SUPPLY

A heated water supply system for food preparation and sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume three – Plumbing Code of Australia.

11.2 J7.3: SWIMMING POOL HEATING AND PUMPING

Not applicable

11.3 J7.4: SPA POOL HEATING AND PUMPING

Not applicable

12 PART J8: FACILITIES FOR ENERGY MONITORING

12.1 J8.3: FACILITIES FOR ENERGY MONITORING

- a) A building or sole occupancy unit with a floor area of more than 500 m² must have an energy meter configured to record the time-of-use consumption of gas and electricity.
- b) A building with a floor area of more than 2500 m² must have energy meters configured to enable individual time-of-use energy consumption data recording, in accordance with (c), of the energy consumption of:
 - a. Air conditioning plant including, where appropriate, heating plant, cooling plant and air handling & fans,
 - b. Artificial lighting &
 - c. Appliance power &
 - d. Central hot water supply &
 - e. Internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building &
 - f. 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.

13 DEFINITIONS

The following definitions from the 2019 NCC (Volume 1) are relevant to this Section J Report:

Envelope

Parts of a building's fabric that separate a conditioned space or habitable room from -

- (a) the exterior of the building; or
- (b) a non-conditioned space including -
 - (i) the floor of a rooftop plant room, lift-machine room or the like; and
 - (ii) the floor above a carpark or warehouse; and
 - (iii) the common wall with a carpark, warehouse or the like.

Habitable room

Means a room used for normal domestic activities, and:

- (a) includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom; but
- (b) excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.

Conditioned space

Means a space within a building, including a ceiling or under-floor supply air plenum or return air plenum, where the environment is likely, by the intended use of the space, to have its temperature controlled by air-conditioning, but does not include:

Air-conditioning

A service that actively cools or heats the air within a space, but does not include a service that directly cools or heats cold or hot rooms or; maintains specialised conditions for equipment or processes, where this is the main purpose of the service.

Bulk Insulation

Has a high resistance to the flow of heat by conduction. It includes Fibreglass, Rockwool, Glass Wool, Polyester, expanded or extruded polystyrene or other similar materials.

R-Value (m². K/W)

Means the thermal resistance of a component calculated by dividing its thickness by its thermal conductivity.

End of report

Appendix 1



Façade

Report



Calculator

Project Summary

Date
19/02/2021

Name
Bruce Carr

Company
Sustainable Thermal Solutions

Position
Owner Operator

Building Name / Address
CAFE: 175-177 Cleveland St Redfern NSW
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm
temperate

Building Classification
Class 6 - restaurants, cafes,
bars

Storeys Above Ground
1

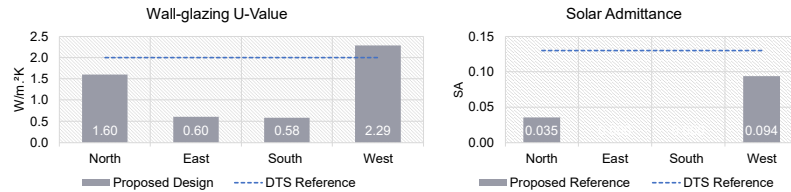
Tool Version
1.1 (April 2020)

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 Aspects).

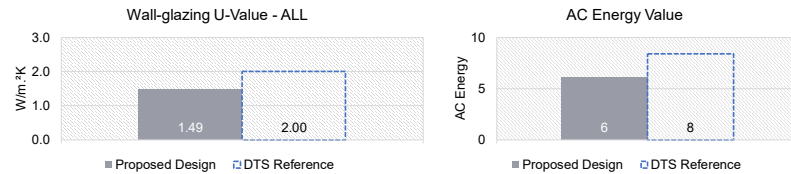
Compliant Solution =
Non-Compliant Solution =

	North	East	Method 1 South	West	Method 2 All
Wall-glazing U-Value (W/m².K)	1.60	0.60	0.58	2.29	1.49
Solar Admittance	0.04			0.09	
AC Energy Value					6

Method 1



Method 2



Project Details

	North	East	South	West
Glazing Area (m²)	13.675348	0	0	12.058
Glazing to Façade Ratio	20%	0%	0%	33%
Glazing References	W1 W2			W1 W2
Glazing System Types	Sliding Door	Sliding Door		Sliding Door
Glass Types	Single Glazing - low-E coating			Single Glazing - low-E coating
Frame Types	Aluminium	Aluminium		
Average Glazing U-Value (W/m².K)	5.80			5.80
Average Glazing SHGC	0.21	0.00	0.00	0.33
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	55.77	14.57	25.67	24.87
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Brick Veneer (steel frame)-R2.0 Internal Party Walls-Steel stud (R2.0)	Internal Party Walls-Steel stud (R2.0)	Brick Veneer (steel frame)-R2.0 Internal Party Walls-Steel stud (R2.0)	Brick Veneer (steel frame)-R2.0 Internal Party Walls-Steel stud (R2.0)
Wall Thickness	210 100	100	210 100	210

	Average Wall R-value (m².K/W)	1.77	1.66	1.72	1.72
	Solar Absorptance	0.7	0.7	0.7	0.7



Façade

Report



Calculator

Project Summary

Date
27/01/2021

Name
Bruce Carr

Company
Sustainable Thermal Solutions

Position
Owner Operator

Building Name / Address
Boarding House: 175-177 Cleveland St Redfern NSW
0

Building State

NSW

Climate Zone

Climate Zone 5 - Warm
temperate

Building Classification

Class 3 - student
accommodation

Storeys Above Ground
6

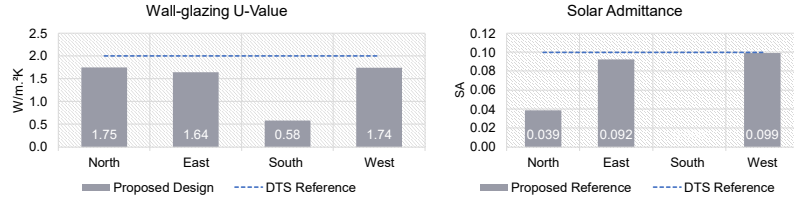
Tool Version
1.1 (April 2020)

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 Aspects).

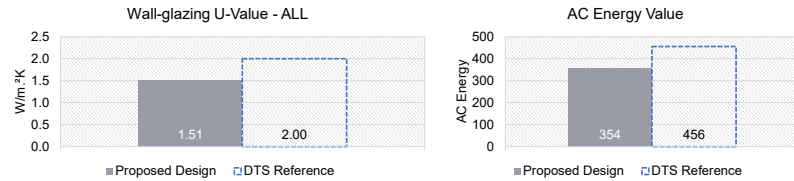
Compliant Solution =
Non-Compliant Solution =

	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	1.75	1.64	0.58	1.74	1.51
Solar Admittance	0.04	0.09		0.10	
AC Energy Value					354

Method 1



Method 2



Project Details

	North	East	South	West
Glazing Area (m²)	171.9	211.28	0	228.93
Glazing to Façade Ratio	22%	20%	0%	22%
Glazing References	w1 w2 w3 w4 w5 w6 w7	w1 w2 w3 w4 w5		w1 w2 w3 w4 w5 w6 w7 w8
Glazing System Types	Awning	Awning		Awning
Glass Types	Single Glazing - low-E coating	Single Glazing - low-E coating		Single Glazing - low-E coating
Frame Types	Aluminium	Aluminium		
Average Glazing U-Value (W/m².K)	5.80	5.80		5.80
Average Glazing SHGC	0.26	0.51	0.00	0.51
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	597.62	834.1	598.7	803.22
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
	Brick Veneer (steel frame)-R2.0 Steel cladding to steel	Brick Veneer (steel frame)-R2.0 Steel cladding to steel	Brick Veneer (steel frame)-R2.0 Steel cladding to steel	Brick Veneer (steel frame)-R2.0

	Wall Construction	frame (R2.0) Corridor Stud Wall (R2.0) Firestairs Stud Wall	R2.0 Steel cladding to steel frame (R2.0) Corridor Stud Wall (R2.0)	R2.0 Steel cladding to steel frame (R2.0) Corridor Stud Wall (R2.0)	Steel cladding to steel frame (R2.0) Corridor Stud Wall (R2.0)
	Wall Thickness	210 100	210 100	210 100	210
	Average Wall R-value (m².K/W)	1.72	1.71	1.73	1.71
	Solar Absorptance	0.7	0.7	0.7	0.7

