05 February 2024

Planning Secretary
Department of Planning, Housing and Infrastructure

Waterloo Metro Quarter Southern Precinct (SSD 10437):
Condition B11 Materials and Finishes

Dear Planning Secretary,

WL Developer (Applicant) seeks the Planning Secretary's approval of the Student Housing Tower glazing and sun shading selection, in accordance with Southern Precinct SSD 10437 consent condition B11 Materials and Finishes.

WL Developer sought the Sydney Metro Design Review Panel (DRP) advice on the glazing and sun shading selection details on Wednesday, 29 November 2023. Evidence of how the DRP advice and recommendations have been addressed are enclosed in the follow appendices for the Planning Secretary's consideration.

Appendix A – Building 3 Student Housing Tower DRP Presentation

Appendix B – Sydney Metro DRP Advice and Actions Record

Appendix C – Building 3 and 4 NCC 2019 JV3 Report

Appendix D – John Holland Building Statement

Appendix E – Façade Subcontractor (Micos) Statement

Appendix F – Bates Smart Architects Statement

Yours sincerely,

Ryan Thomas

Project Director
Waterloo Metro Quarter
78-82 Wyndham Street
Alexandria NSW 2015

Appendix A – Building 3 Student Housing Tower DRP Presentation

WATERLOO METRO QUARTER
BUILDING 3 STUDENT HOUSING TOWER

DRP MEETING CONDITION B11

29TH NOVEMBER 2023

mirvac JOHN HOLLAND

BATESSMART™

SOUTHERN PRECINCT

SSDA CONDITIONS

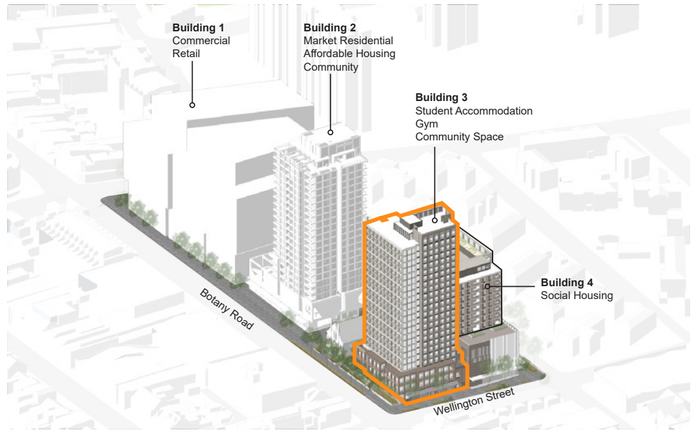
MATERIALS AND FINISHES

B11. Prior to the issue of the relevant construction certificate for the Student Housing Tower, the Applicant shall submit to the satisfaction of the Planning Secretary, further details on the selection of glazing and sun shading for the Student Housing Tower, including thermal qualities of glazing, level of tint darkness within glazing and any adjustments necessary to dimensions and placement of sun shading devices.

The Applicant must seek the advice of the DRP and provide evidence on how the DRP's advice have been addressed before seeking's the Planning Secretary's approval on the selection.

BUILDING 3

Proposed GFA:	13,358 m²
Proposed Storeys (excl. Mezzanine)	24 + plant level
Commercial GFA	919 m²
Community Space GFA	295 m²
Student Accommodation GFA	12,144 m²



Student Accommodation:

	Units	Beds
Typical Studios	393 units	393 Beds
Twin Studios	39 units	78 Beds
Accessible Studios	3 units	3 Beds
Total	**435** units	**474 Beds**

Typical Plan

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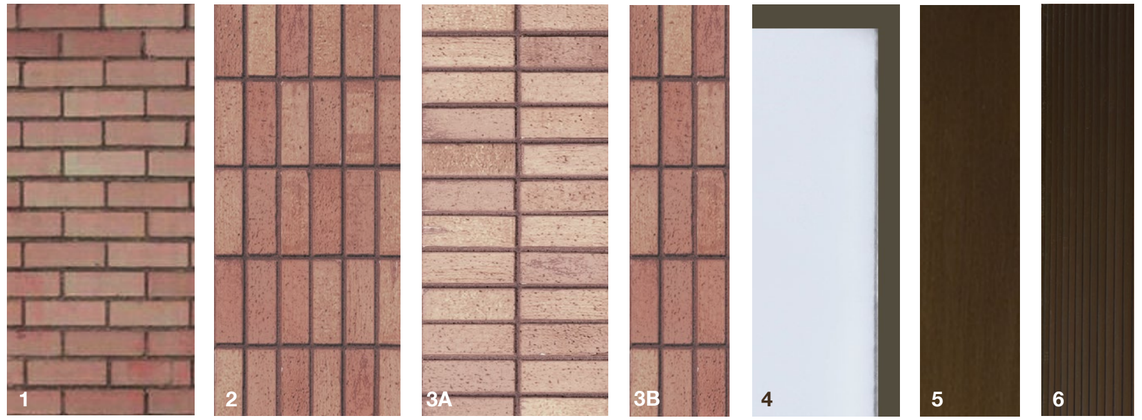
View from corner of Botany Road and Wellington Street

Artist's impression only (Image by Doug & Wolf)

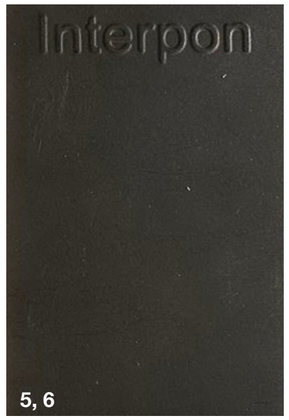
BUILDING 3 MATERIALS BOARD

PODIUM MATERIAL SELECTIONS

Finishes Proposed at SSDA



Selected Finishes



Building 3 Podium Finishes

1/	Brickwork - General podium Stretcher Bond	Dry Pressed Bricks Bowral Bricks Gertrudis Brown
2/	Brick - Soldier Course	Bowral Bricks Gertrudis Brown
3/	3A Brick - Stacked Bond Infill	Bowral Bricks Gertrudis Brown
	3B Brick - Soldier Course Infill	Bowral Bricks Gertrudis Brown
4/	Clear vision glass	Double glazed unit with clear performance vision glass with neutral body tint 6mm Clear HS (SJ79#2) + 12 Argon (Blackspacer) + 5mm Clear HS + 1.52mm PVB + 5mm Clear HS VLT 69%, Reflectivity 12%, U-Value 1.39 W/m2·K, SHGC 0.42
	Window frames	Aluminium window system Powdercoat finish Colour - “Dark Bronze”
5/	Metal Detailing	Solid Aluminium Powdercoat “metallic” finish Colour - “Dark Bronze”
6/	Louvres	Solid Aluminium Powdercoat “metallic” finish Colour - “Dark Bronze”

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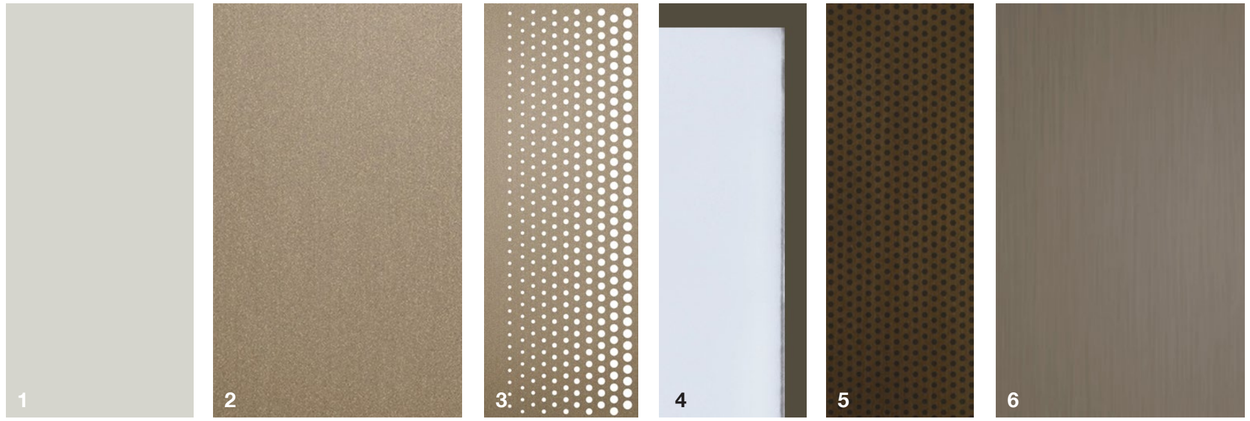
BUILDING 3 MATERIALS BOARD

TOWER MATERIAL SELECTIONS

Finishes Proposed at SSDA



Selected Finishes

Building 3 Tower Finishes

1/	Horizontal Sunshades to western volume	Solid Aluminium Powdercoat “textured matt” finish Colour - “Mannex Suede”
2/	Cladding to to East & West Studios	Solid Aluminium Powdercoat “metallic” finish Colour - “Fresh Gold”
3/	Perforated Aluminium Sunshades to East & West Studios	Solid Aluminium Powdercoat “metallic” finish Colour - “Fresh Gold”
4/	Clear vision glass	Flush glazed DGU with clear performance vision glass with neutral body tint 6mm Clear HS (SJ79#2) + 12 Argon (Blackspacer) + 5mm Clear HS + 1.52mm PVB + 5mm Clear HS VLT 69%, Reflectivity 12%, U-Value 1.39 W/m2·K, SHGC 0.42
	Glass shadow box	Shadow box using clear vision glass and dark bronze back pan
	Window frames	Aluminium curtain wall system Powdercoat “metallic” finish Colour - “Dark Bronze”
5/	Perforated Aluminium Cladding to North, South, and East (L16 and up)	Solid Aluminium Powdercoat “metallic” finish Colour - “Medium Bronze” and “Dark Bronze”
6/	Cladding / Sunshades to North & South Studios	Solid Aluminium Powdercoat “metallic” finish Colour - “Medium Bronze”

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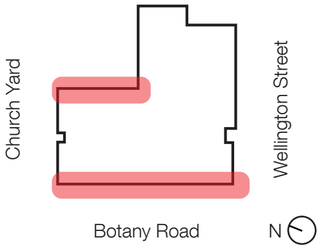
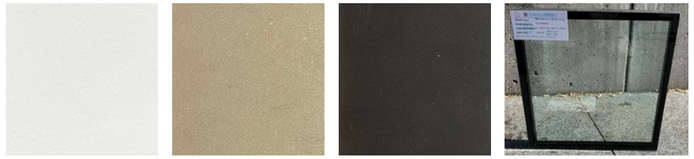
BUILDING 3 GLAZING AND SUNSHADING

FINAL DEVELOPED DESIGN



Key Plan



Mannex Suede | **Fresh Gold** | **Dark Bronze** | **Glass**

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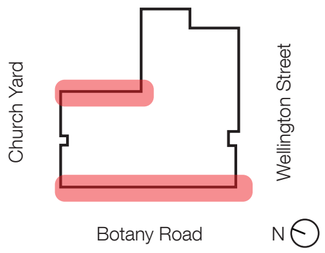
3D facade section of the west facing facade

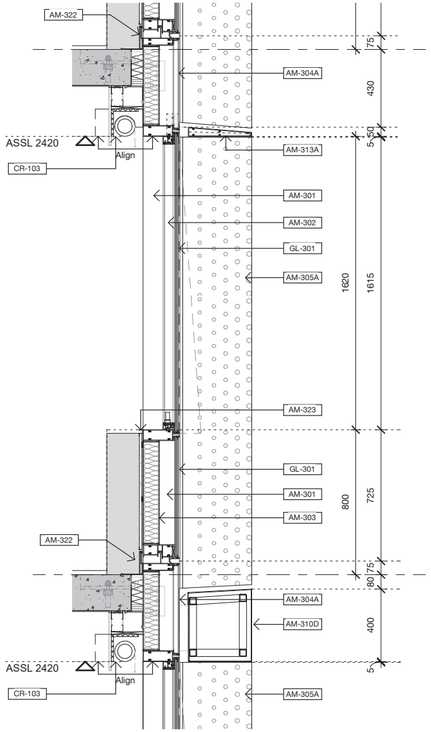
FACADE PROPOSED AT SSDA

BUILDING 3 GLAZING AND SUNSHADING

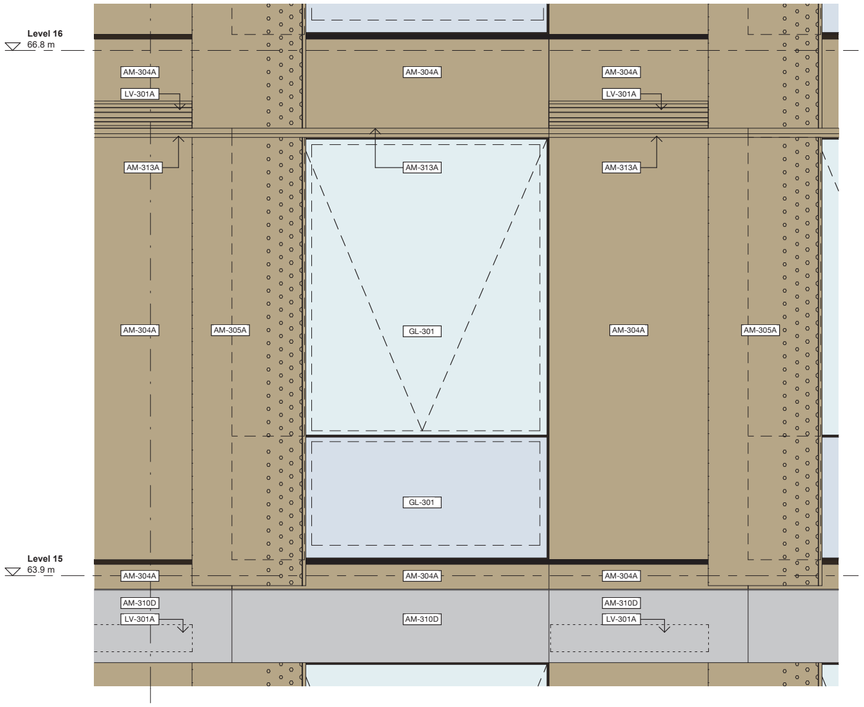
FINAL DEVELOPED DESIGN



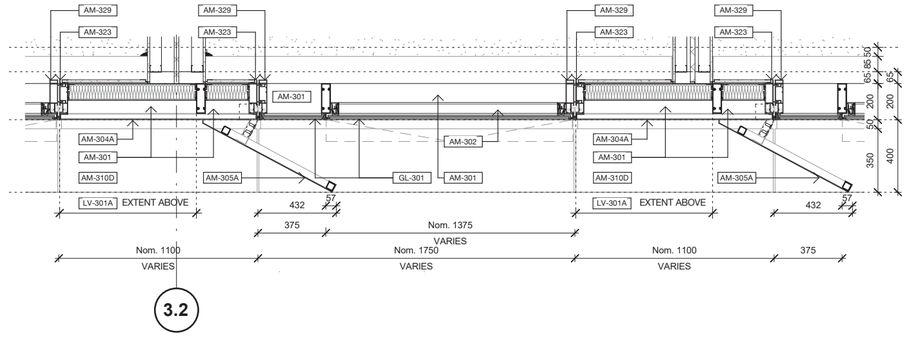
Key Plan



4 FT-301 Section 1 : 20



2 - FT-301 Elevation 1 : 20



1 FT-301 Plan 1 : 20

Mannex Suede

Fresh Gold

Dark Bronze

Glass

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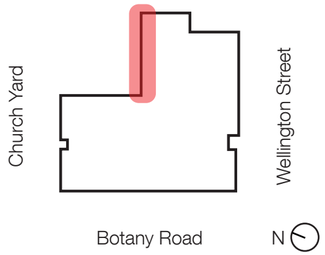
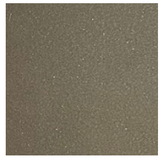
BUILDING 3 GLAZING AND SUNSHADING

FINAL DEVELOPED DESIGN



Key Plan



Medium Bronze

Dark Bronze

Glass

3D facade section of the north facing facade

FACADE PROPOSED AT SSDA

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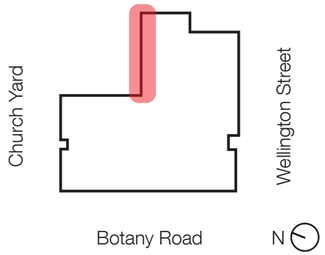
BUILDING 3 GLAZING AND SUNSHADING

FINAL DEVELOPED DESIGN



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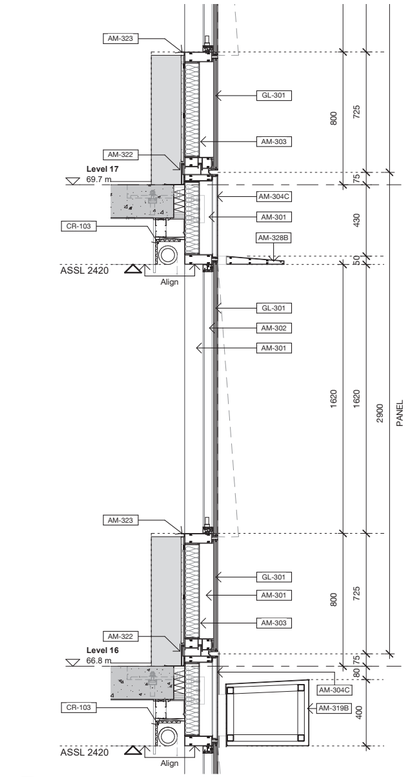
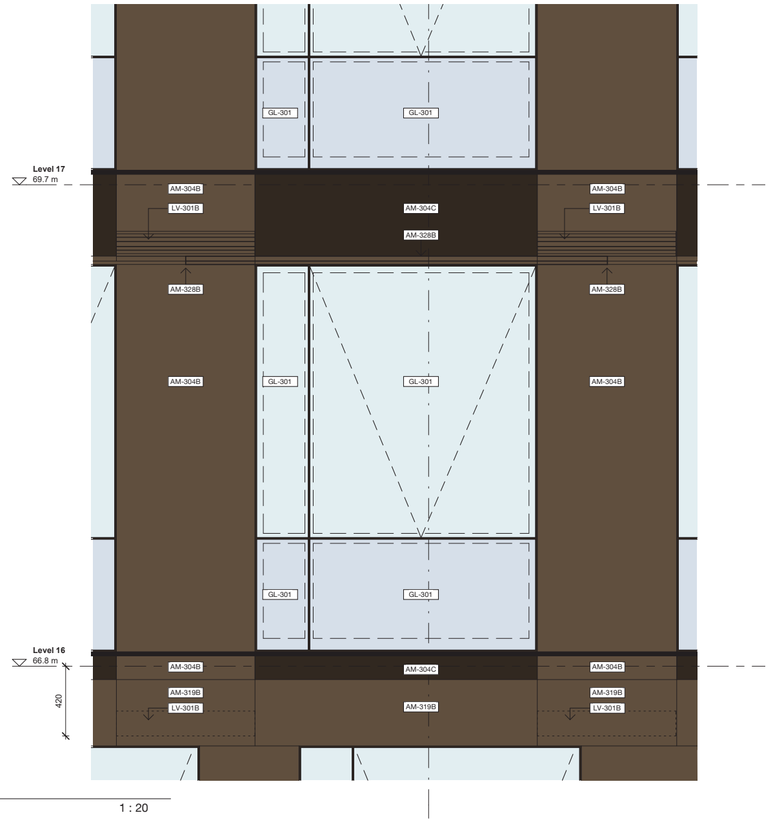
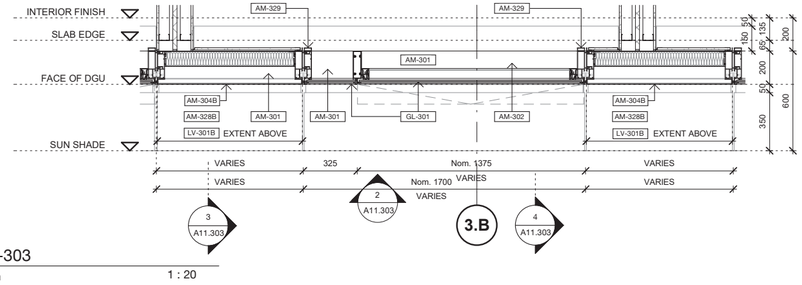


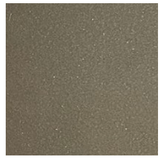
4 FT-303
Section 1 : 20



2 FT-303
Elevation 1 : 20



1 FT-303
Plan 1 : 20



Medium Bronze

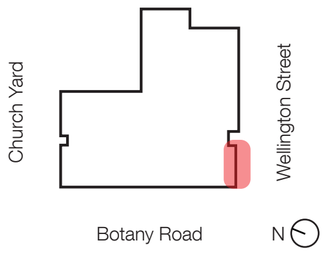
Dark Bronze

Glass

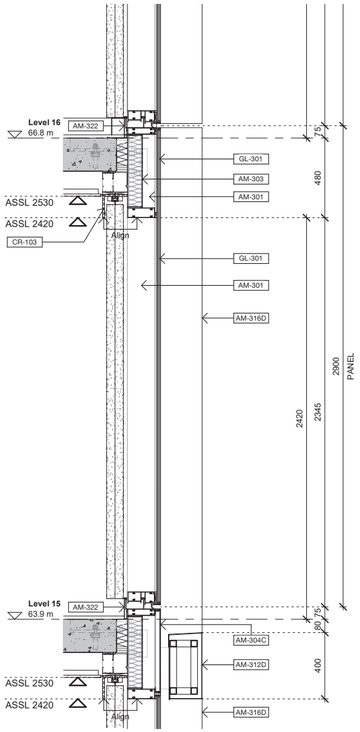
BATESSMART.™ mirvac JOHN HOLLAND

BUILDING 3 GLAZING AND SUNSHADING

FINAL DEVELOPED DESIGN

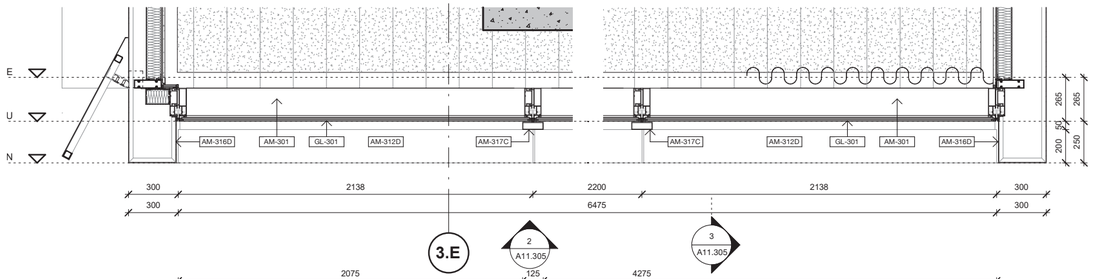


Key Plan



3 FT-305 Section 1 : 20

2 - FT-305 Elevation 1 : 20



1 FT-305 Plan 1 : 20

Mannex Suede

Dark Bronze

Glass

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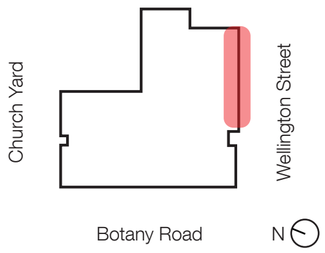
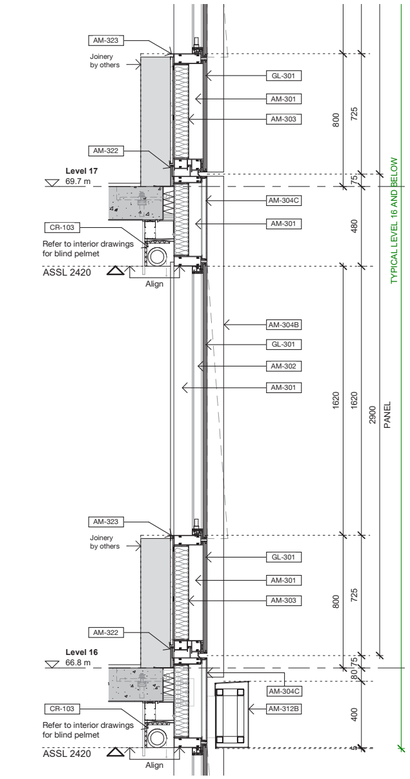
BUILDING 3 GLAZING AND SUNSHADING

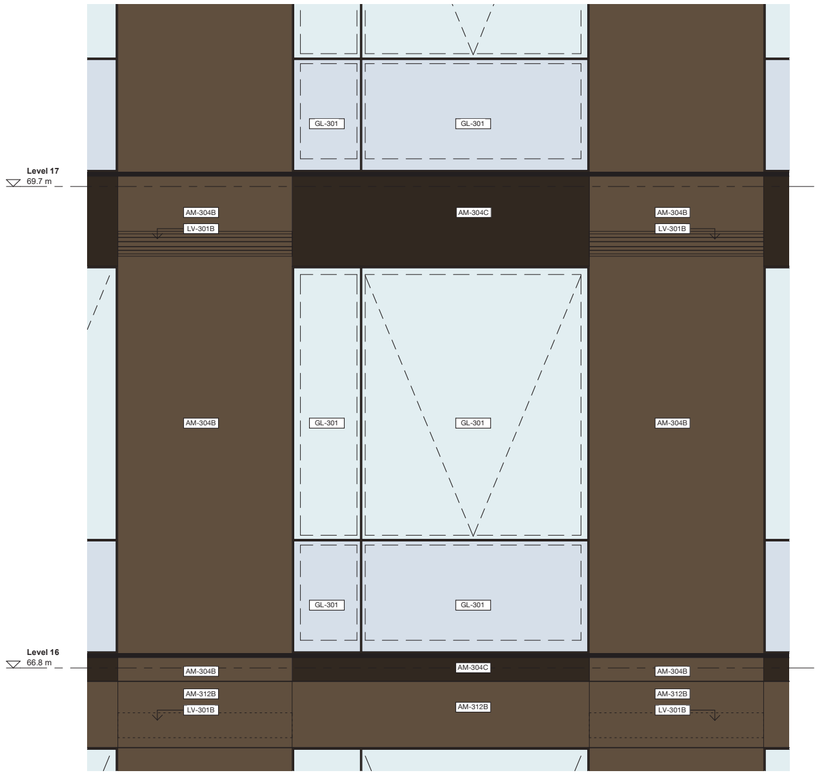
FINAL DEVELOPED DESIGN



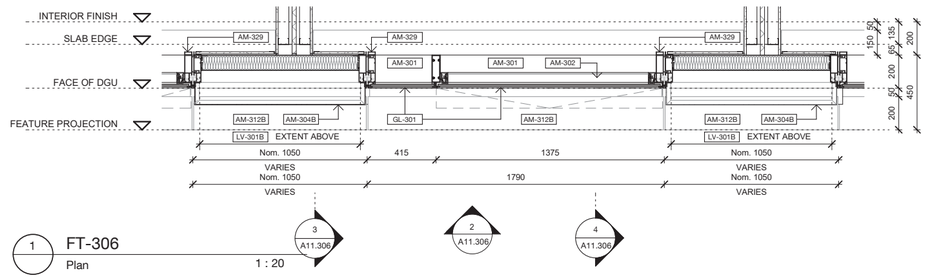
Key Plan



4 FT-306
Section 1 : 20



2 FT-306
Elevation 1 : 20



1 FT-306
Plan 1 : 20

Medium Bronze

Dark Bronze

Glass

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Appendix B – Sydney Metro DRP Advice and Actions Record

Sydney Metro Design Review Panel

Advice and Actions Record

Date:	29 November 2023
Venue:	Microsoft Teams
Panel:	Abbie Galvin (Chair), Yvonne von Hartel, Peter Phillips, Tony Caro
Convenor & Independent Secretariat:	Jason Hammond/Sean Kaufman/Prugya Maini
Sydney Metro:	Gaston Pena, Ned Sando
DPE:	Russell Hand
Waterloo Development Team (WDT):	Adam Sargeant (JHG), Guy Lake and Roger To (Bates Smart), Angela Kavanagh and Anthony Green (Mirvac), Zoey Chen (Hassell)
Apologies:	Kim Crestani, Bob Nation AM, Phil Leijten

	DRP Advice	Action by	Status
01	**Declaration of conflicts** No declared conflicts of interests. All panel members received the drawings prior to the meeting	N/A	Closed
02	**Project Updates** No project updates provided by Sydney Metro.	N/A	Closed
02.01	**Waterloo Metro Quarter – Building 3** WDT provided an overview of the finishes proposed at SSDA and current selected façade treatment and finishes, noting that SSDA conditions stipulate that applicant must seek the advice of the DRP, prior to approval from the planning secretary. The Panel sought clarifications relating to: • Sun penetration modelling and wind/acoustic testing on perforated sunshade • Measures to avoid staining, angled sunshade positioning and how it looks from inside the development • Confirmation that sunshade depth is consistent with SSDA • Colour differences, which may appear less pronounced on screen **Comments:** Panel supports the proposed materials and details and recommends: • Technical reports to confirm the perforated sunshade meets solar protection requirements modelled, and no wind/whistling noise will be present • The design team to review colour selection once visual mock-ups are received to ensure appropriate colour contrast	WDT	Open
02.02	**Waterloo Metro Quarter – Building 2** WDT outlined the proposed the following adjustments included in the MOD application submitted to DPE in Nov 2023: • Façade material and grid profile infill change from FAC-03 Terracotta Panel to FAC-08 Solid Aluminium Panel with textured matt finish to improve consistency, maintain texture and improve angle profile through finer articulated joints at edges. The proposed change would also improve constructability as aluminium is lighter and will reduce	WDT	Open

	DRP Advice	Action by	Status
	required framing. • Change of corner column from circular to rectangular in the north east, north west and south west. The change has no impact to façade on the north elevation, will increase solidity on other facades and will reduce the extent of glazing on the east and west elevation. One circular column to be retained to maintain solar compliance as per SSDA approval calculation. The Panel sought clarifications relating to the grid dimensions, framing to provide stiffness and oil canning, the number of joints with the terracotta panels and the solar compliance calculation. **Comments:** The Panel: • Supports the proposed material change with the need to include measures to minimise oil canning and ensure stability should be considered. • Supports the proposed rectangular columns and resultant façade changes, to make the internal rooms more functional. The Panel notes the remaining circular column, which is being maintained due to solar compliance with the ADG, appears to have minimal beneficial impact on solar amenity– as the sun would be blocked by the column. As such, the Panel suggest the remaining circular column could be reconsidered..		
03	**NEXT MEETING:** TBC – As required.		

Appendix C – Building 3 and 4 NCC 2019 JV3 Report

Waterloo Metro Quarter Buildings 3 and 4

NCC 2019 JV3 Report

Mirvac

Job No:	1024873
Doc Ref:	1024873-RPT-SY-004
Revision:	B
Revision Date:	15 January 2024

Project title	Waterloo Metro Quarter Buildings 3 and 4	**Job Number**
Report title	NCC 2019 JV3 Report	1024873

Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
—	23 February 2021	Issued for review
A	22 November 2023	Building envelope review for CC
B	15 January 2024	CC4 update

Document Validation (latest issue)

16/01/2024	16/01/2024	16/01/2024
X 	X J.Kirrane	X J.kirrane
Principal author	Checked by	Verified by
Signed by: Tom Correa	Signed by: Jordan Kirrane	Signed by: Jordan Kirrane

Executive Summary

The proposed Waterloo Metro Quarter Buildings 3 and 4 development has been assessed against the NCC 2019 Section J1, utilising the alternative verification approach, JV3. The assessment has shown the current design to be compliant.

Below are the required building fabric and glazing thermal performances for the proposed development to meet the thermal performance requirements of Section J1 of the NCC 2019.

Table 1.1 Thermal performance requirements, building fabric elements

Building Envelopment Element	Proposed (m^2.K/W)
Roof or ceiling (solar absorptance of not more than 0.45)	R_T3.7 (DTS performance)
Wall – ▪ External Walls (outer surface solar absorptance value ≤ 0.6): • External walls (WT3-104, WT3-105, WT3-106, WT4-118) • Glazed spandrel (CW FT3-01) • Aluminium spandrel (CW FT3-01) ▪ Internal Walls Separating Conditioned and Unconditioned Zones	 R_T0.70 (Minimum Required Performance) R_T0.57 R_T0.50 R_T1.12 (Minimum Required Performance)
▪ Additional insulation layer at lower portion of the CW façade, behind the joinery box (178Wx800H) in S1 Studios*	R_T0.25 (Minimum Required Performance)
Floor (direction downwards)	R_T2.0 (DTS performance)

Note: R_T means total R-value build-up of the building envelope element. Absorptance is the fraction of solar radiation absorbed by the roof and is affected by the colour and reflectance of the outer surface.

** Insulation to be installed between the joinery box and the lower portion of the CW façade as indicated in the Appendix D. It is imperative that the insulation remains intact in future fit outs to ensure adequate performance and compliance with the Section J requirements.*

Table 1.2 Thermal performance requirements, glazing systems

Glazing Element	Proposed U-value (W/m^2. K) / SHGC
▪ Ground floor:	U-value:3.80/ SHGC:0.40
▪ Levels 1-2	U-value:3.55/ SHGC:0.35
▪ Levels 3-23 • FT301/303/304/306 GL-301B (1750W x 1620H) • FT302 GL-301B (1960W x 1620H) • FT305 GL-301B (2140W x 2420H) • FT309 GL-301B (1965W x 2420H) • FT309 GL-301B (930W x 1620H)	 U-value:2.98/ SHGC:0.35 U-value:3.24/ SHGC:0.34 U-value:2.71/ SHGC:0.39 U-value:2.76/ SHGC:0.39 U-value:2.99/ SHGC:0.38

Contents

1.0 Introduction

Cundall has been engaged by Mirvac to provide a National Construction Code (NCC) 2019 Section J1 assessment for the proposed Waterloo Metro Quarter Buildings 3 and 4 development.

1.1 Scope

This report includes a review of the proposed building envelope design in accordance with Section J1 – Building Fabric. All other Section J compliance requirements are the responsibility of others.

The aim is to verify that the fabric and glazing thermal performance meets the NCC 2019 Section J1 requirements.

1.2 Section J background

The general objective of Section J of the 2019 NCC is to reduce greenhouse gas emissions of the built environment. A building, and its services, is required to use energy efficiently so that the greenhouse gas emissions associated with its operation are minimised. This is subject to the intended use of the building and the necessary level of occupant comfort. For buildings that are air-conditioned, the amount of energy has also been quantified.

This is important, as energy consumption in a building is highly dependent on how the building is used. Energy efficiency cannot be assured simply by 'building-in' appropriate measures, as the building also needs to be operated, managed and maintained in an appropriate way. This also addresses the need for a low greenhouse gas intensity source or a renewable source of energy for the building's services.

There are multiple pathways to ensure compliance with Section J of the NCC. Compliance can be achieved by using the Deemed to Satisfy (DTS) requirements, which set out the thermal performance of envelope elements of a development, or a performance solution which test the thermal performance of a proposed development against pre-defined measures.

1.2.1 Verification Methods

There are three verification methods that can be utilised in lieu of meeting the DTS provisions of Section J1. These are;

- JV1 – NABERS Energy for Offices;
- JV2 – Green Star; and
- JV3 – Verification using a reference building.

This report demonstrates compliance with the Section J1 Building Fabric provisions using the JV3 method.

To comply under a JV3 methodology, the predicted annual greenhouse gas emissions of a building must be less than it would be if the building was constructed to meet the minimum DTS requirements as per 2019 NCC Section J Energy Efficiency.

Typically, a JV3 assessment requires three scenarios to be compared; the reference building with services and fabric based on DTS provisions; the proposed building with proposed services and fabric and the proposed building with DTS services and proposed fabric. However, since the proposed building services are being designed to meet minimum DTS requirements as per the 2019 NCC, only the building fabric is required to be compared.

This JV3 assessment is envelope only and will only include the impact upon heating and cooling. The energy usage of all other services is the same in the proposed building and the reference building. Accordingly, they have been omitted from the calculation of both the proposed building and the reference building.

1.2.2 Exclusion

Building 4 is not included in this JV3 assessment as it is a Class 2 residential building.

Section J0.2(a) of Volume 1 of the Building Code of Australia (BCA) 2019 requires that sole occupancy units in new Class 2 residential buildings collectively achieve an average of 6 stars NatHERS rating and that no individual unit achieves less than 5 stars. In NSW this requirement is replaced by the state appendix clause NSW J(A)1.2 C which states that *"Compliance is not required with the national BCA provisions of J0.2(a) as those matters are regulated under BASIX"*.

1.3 Reference documents

The following resources were used throughout this verification exercise:

- Drawings, a list of which is contained in Appendix A;
- NCC 2019, volume one, class 2 to 9 buildings; and
- NCC 2019 facade calculator, results of which are contained in Appendix B.

1.4 Limitations and disclaimers

This report considers the building for compliance against Section J1 of the NCC 2019, and only considers the design from an energy efficiency perspective. This assessment does not consider, proposed building services, peak load, thermal comfort, daylight, glare, condensation or any other issues.

The thermal performance requirements indicated in this report are to be determined and achieved in accordance with AS/NZS 4859.2. The standard comprises a calculation method that takes into account the impact of thermal bridges on the thermal performance of a façade. Depending on the extent of the thermal bridges within a façade, extra insulation or thermal breaks may be required for a façade to be compliant. As such, achieving the as-built thermal performance of elements shall be the responsibility of the contractors.

Cundall are not responsible for verifying the compliance or suitability of any individual product, system or construction.

2.0 Design details

2.1 Location and weather zones

The proposed Waterloo Metro Quarter Buildings 3 and 4 development is located in Waterloo, New South Wales. The climate zone as defined by the NCC is climate zone 5.

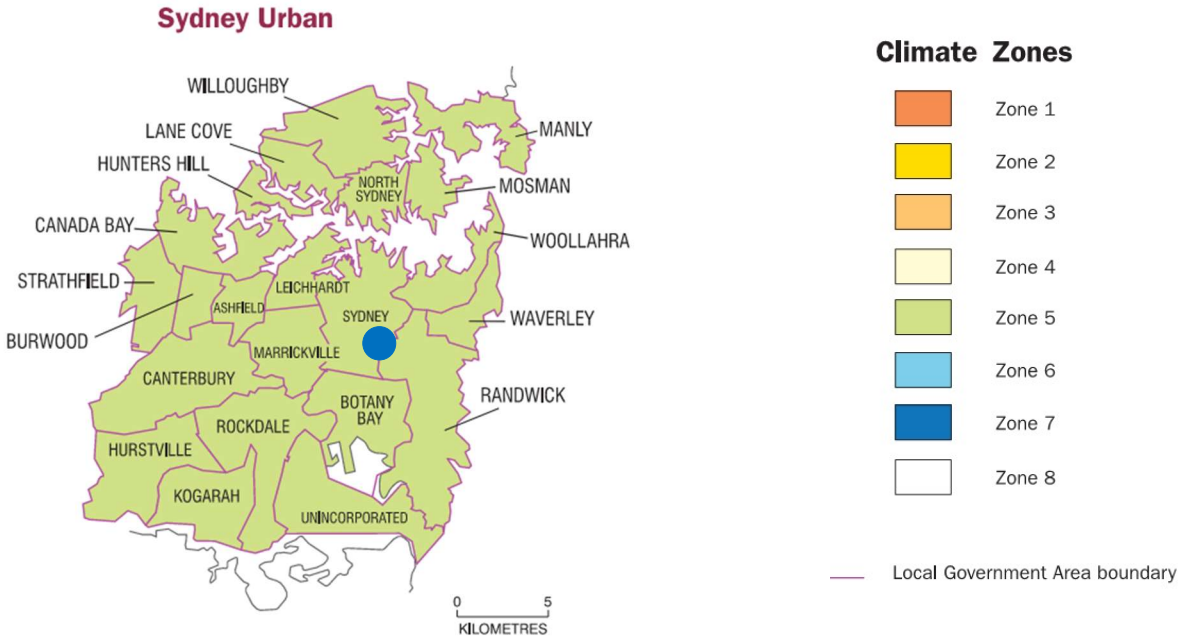


Figure 2.1 Climate zones of proposed development location

2.2 Building classification

The proposed development has been identified as a Class 3 Student Housing, Class 6 Retail and Class 9b Gym mixed-used building as per Building Code of Australia Assessment Report (Report Number: 200497 B3&4 Rev 04, CityPlan 2023).

2.3 Building geometry

The following images show the general form of the building as modelled.

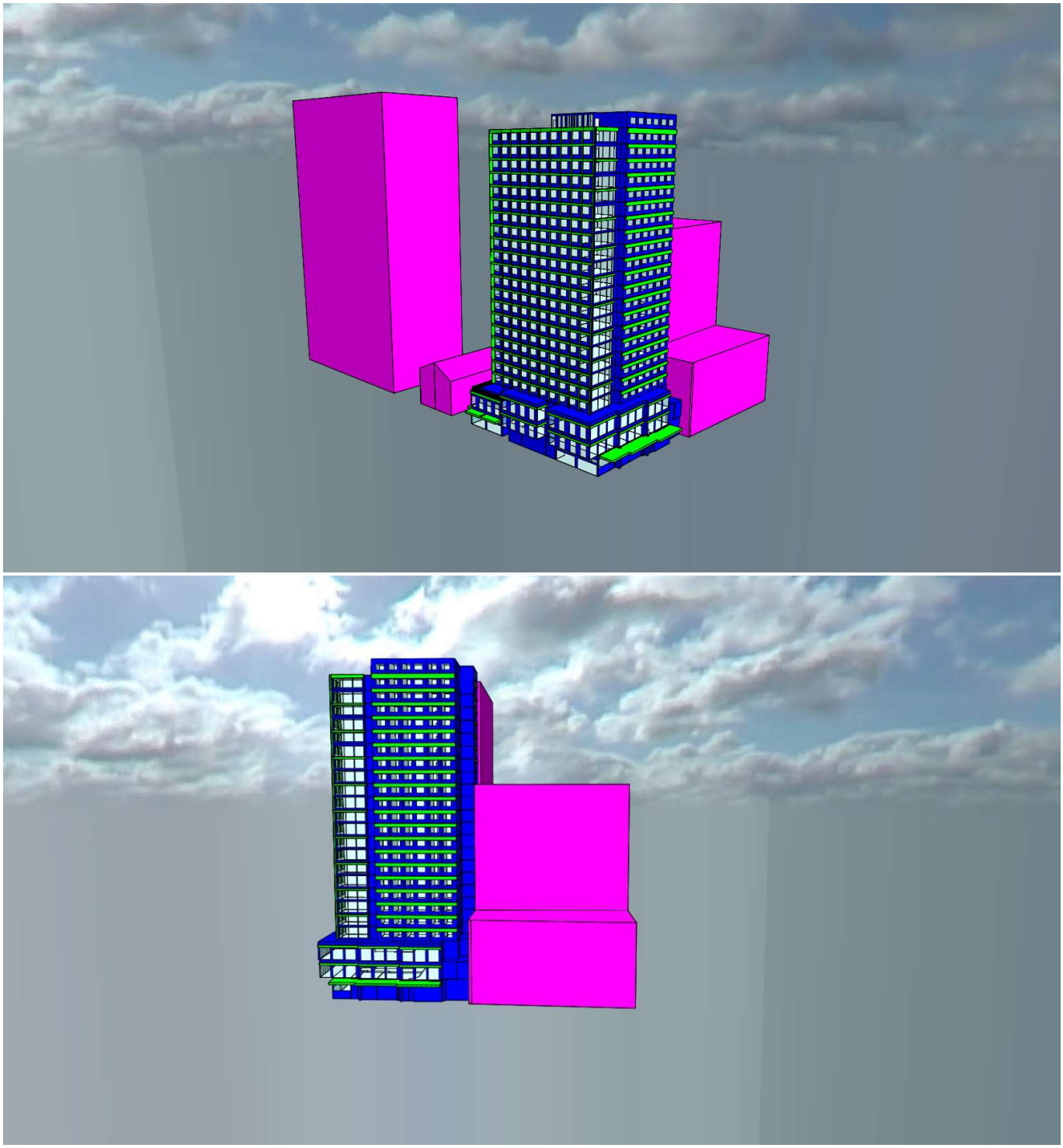


Figure 2.2 JV3 model images (Adjacent Buildings shown in purple to account for all shading impact)

3.0 JV3 modelling parameters

3.1 Energy modelling software

IES Virtual Environment was used to construct the building model including materials, glazing, internal loads and a representation of the mechanical systems. IES is validated in accordance with ANSI/ASHRAE Standard 140.

3.2 Modelling Parameters

Table 3.1 JV3 modelling parameters

Parameter	Value		
Climate File	SydneyIWEC.fwt		
Space Temperatures	21°CDB to 24°CDB in all conditioned spaces		
Cooling System Type, Fuel, COP	Multi-split / VRF	Electricity	2.9
Heating System Type, Fuel, COP	Multi-split / VRF	Electricity	2.9
Operational Loads	Internal heat gains for appliances and equipment	Studio Rooms	160 W/SOU
		Retail	5 W/m^2
		Gym	15 W/m^2
	Internal heat gains for occupants	Other applications	75 W Sensible/person 55 W Latent/person
	Occupant density	Student Housing	10 m^2/person
		Retail	3 m^2/person
		Gym	3 m^2/person
	Lighting heat gains	Student Housing	4 W/m^2
		Retail	14 W/m^2
		Gym	3 W/m^2
		Services	1.5 W/m^2
		Lift Cars	3 W/m^2
		Stairs	2 W/m^2
		Corridor	5 W/m^2
		Store	1.5 W/m^2
Operational Profiles	Student Housing: As per Specification JVc, Table 2b Occupancy and operation profiles of a Class 3 hotel Retail: As per Specification JVc, Table 2e Occupancy and operation profiles of a Class 6 shop or shopping centre Gym: As per Green Star Energy Consumption and Greenhouse Gas Emissions Calculation Guide, Table 45 University gymnasium operational profiles		
Gas Emission Factors	NSW [51.5 kg CO_2-e/GJ]		
Electricity Emission Factors	NSW [256.0 kg CO_2-e/GJ]		

The following parameters were selected to reflect the levels of human activity, clothing and wind speed within the development. These parameters are used to determine the predicted mean vote (PMV) for the zones. These are assigned on a seasonal basis to account for the different levels of clothing of occupants throughout the year.

Table 3.2 Summary of comfort parameters modelled

Typical Season	Month	Airspeed
Hot	January	0.15 m/s
	February	0.15 m/s
	March	0.15 m/s
	April	0.15 m/s
Cold	May	0.10 m/s
	June	0.10 m/s
	July	0.10 m/s
	August	0.10 m/s
	September	0.10 m/s
	October	0.10 m/s
Hot	November	0.15 m/s
	December	0.15 m/s

Class 3 – Student Housing

Parameter	Nov-Apr (hotter months)	May-Oct (colder months)
Clothing Level (Iclu (clo))	0.22	1.05
Metabolic Rate (W/m²)	61.9	
Nominal air speed (m/s)	0.3	0.15

Class 6 – Retail

Parameter	Nov-Apr (hotter months)	May-Oct (colder months)
Clothing Level (Iclu (clo))	0.35	0.99
Metabolic Rate (W/m²)	112.6	
Nominal air speed (m/s)	0.3	0.15

Class 9b – Gym

Parameter	Nov-Apr (hotter months)	May-Oct (colder months)
Clothing Level (Iclu (clo))	0.26	0.53
Metabolic Rate (W/m²)	175	
Nominal air speed (m/s)	0.3	0.15

4.0 Building fabric properties

4.1 Fabric Properties

The following table summarises the DTS and proposed thermal performance properties.

Table 4.1 Thermal performance requirements, building fabric elements

Building Envelopment Element	DTS (m^2.K/W)	Proposed (m^2.K/W)
Roof or ceiling (solar absorptance of not more than 0.45)	R_T3.7	R_T3.7 (DTS performance)
Wall – ▪ External Walls (outer surface solar absorptance value ≤ 0.6): • External walls (WT3-104, WT3-105, WT3-106, WT4-118) • Glazed spandrel (CW FT3-01) • Aluminium spandrel (CW FT3-01) ▪ Internal Walls Separating Conditioned and Unconditioned Zones	R_T1.0 for Class 3 R1.4 for Class 6 & 9b For both external & internal envelope walls	R_T0.70 (Minimum Required Performance) R_T0.57 R_T0.50 R_T1.12 (Minimum Required Performance)
▪ Additional insulation layer at lower portion of the CW façade, behind the joinery box (178Wx800H) in S1 Studios*		R_T0.25 (Minimum Required Performance)
Floor (direction downwards)	R_T2.0	R_T2.0 (DTS performance)

Note: R_T means total R-value build-up of the building envelope element. Absorptance is the fraction of solar radiation absorbed by the roof and is affected by the colour and reflectance of the outer surface.

** Insulation to be installed between the joinery box and the lower portion of the CW façade as indicated in the Appendix D. Insulation is required to remain intact in future fit outs to ensure adequate performance and compliance with the Section J requirements.*

Table 4.2 Thermal performance requirements, glazing systems

Glazing Element	DTS U-value (W/m^2. K) / SHGC	Proposed U-value (W/m^2. K) / SHGC
▪ Ground floor:	Class 6: U-value:5.80/ SHGC:0.50 Class 9b: U-value:5.80/ SHGC:0.36	U-value:3.80/ SHGC:0.40
▪ Levels 1-2	Class 3: U-value:4.86/ SHGC:0.42 Class 9b:	U-value:3.55/ SHGC:0.35

Glazing Element	DTS U-value (W/m². K) / SHGC	Proposed U-value (W/m². K) / SHGC
	U-value:5.80/ SHGC:0.50	
▪ Levels 3-23		
• FT301/303/304/306 GL-301B (1750W x 1620H)	Class 3: U-value:4.86/ SHGC:0.42	U-value:2.98/ SHGC:0.35
• FT302 GL-301B (1960W x 1620H)		U-value:3.24/ SHGC:0.34
• FT305 GL-301B (2140W x 2420H)		U-value:2.71/ SHGC:0.39
• FT309 GL-301B (1965W x 2420H)		U-value:2.76/ SHGC:0.39
• FT309 GL-301B (930W x 1620H)		U-value:2.99/ SHGC:0.38

Note: All glazing properties are based on AFRC figures for the total glazing system (glass + frame).

Refer Appendix B for the NCC 2019 J1 Fabric Report.

4.2 Total R-Values and total U-Values

Have been calculated including allowance for thermal bridging.

- calculated in accordance with AS/NZS 4859.2 for a roof or floor; or
- determined in accordance with Specification J1.5a for wall-glazing construction; or
- determined in accordance with Specification J1.6 or Section 3.5 of CIBSE Guide A for soil or sub-floor spaces.

Refer Appendix C for building fabric thermal performance and thermal bridging calculations.

5.0 Modelling results

5.1 Greenhouse gas results

The JV3 assessment results, show that, based on the current building envelope design, the hypothetical building model emits less greenhouse gas than that of the DTS reference building model, and therefore complies with Section J1 of the NCC 2019.

Table 5.1 JV3 Assessment greenhouse gas emission results

Model	Annual GHG Emissions (kgCO2-e)		
	Heating	Cooling	Total
Reference (DTS)	182,367.8	116,680.2	299,048.0
Proposed	171,187.0	106,103.3	277,290.2

5.2 Thermal comfort results

The JV3 comfort assessment results demonstrate a Predicted Mean Vote (PMV) of -1 to +1 is achieved across more than 95% of occupied floor area for more than 98% of the annual hours of operation, when occupation threshold is >=20%. Compliance with the comfort criteria of Section J1 has been satisfied.

Table 5.2 JV3 Assessment comfort results

Class 3 – Student Housing (Sample size: Selected Rooms in First Floor, Second Floor, Level 22 & 23 only)

Location	Occupied Hours <-1.00	Occupied Hours >-1.00 to <=1.00	Occupied Hours >1.0	%Time >-1.00 to <=1.00
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%

Studio	0	6570	0	100%
Studio	0	6570	0	100%
Communal	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Student Communal	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Studio	0	6570	0	100%
Communal	0	6570	0	100%
Studio	0	6570	0	100%

Student Communal	0	6570	0	100%
Student	0	6570	0	100%
Commercial	0	6570	0	100%
Student	0	6570	0	100%
WC	0	6570	0	100%
Student	0	6570	0	100%
Student	0	6570	0	100%
Student	0	6570	0	100%
Student	0	6570	0	100%
Total				**100%**

Class 9b – Gym

Location	Occupied Hours <-1.00	Occupied Hours >-1.00 to <=1.00	Occupied Hours >1.0	%Time >-1.00 to <=1.00
Gym Lobby	0	4176	0	100%
Gym - Student	0	4176	0	100%
Gym – Level 1	0	4176	0	100%
Gym – Level 2	0	4176	0	100%
Total				**100%**

Class 6 - Retail

Location	Occupied Hours <-1.00	Occupied Hours >-1.00 to <=1.00	Occupied Hours >1.0	%Time >-1.00 to <=1.00
Community Space	0	4015	0	100%
Total				**100%**

6.0 Conclusions

A Section J1 fabric assessment has been carried out to demonstrate that the proposed development is able to meet the thermal performance requirements specified within Section J1 of the NCC 2019 by following the JV3 verification methodology.

Based on the documentation listed in Appendix A, the building meets the requirements of Section J1.

Appendix A List of Reference Drawings & Information

Drawing Number	Drawing Title	Revision	Date Issued
A05.000	Ground Floor Plan	A	01.12.23
A05.00M	Mezzanine Floor Plan	A	01.12.23
A05.001	Level 01 Plan	A	01.12.23
A05.002	Level 02 Plan	A	01.12.23
A05.003	Level 03-05 Plan	A	01.12.23
A05.006	Level 06-15 Plan	A	01.12.23
A05.016	Level 16-22 Plan	A	01.12.23
A05.023	Level 23 Plan	A	01.12.23
A05.024	Level 24 Plan	A	01.12.23
A05.102	Wall Types – Sheet 2	A	01.12.23
A09.001	External Elevations – North	A	01.12.23
A09.002	External Elevations – East	A	01.12.23
A09.003	External Elevations – South	A	01.12.23
A09.004	External Elevations – West	A	01.12.23
A10.001	Section A	A	01.12.23
A10.002	Section B	A	01.12.23

Appendix B NCC 2019 Section J1 Façade Report

Please see overleaf.

Façade

Report

Project Summary

Date
18/01/2021

Name
MS

Company
Cundall

Position
ESD Consultant

Building Name / Address
WATERLOO QUARTER METRO

Building State
NSW

Climate Zone
5

Building Classification
Class 3 - student accommodation

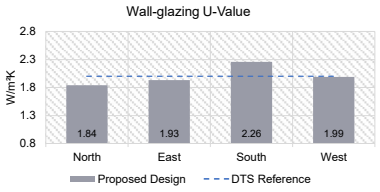
Storeys Above Ground
23.0

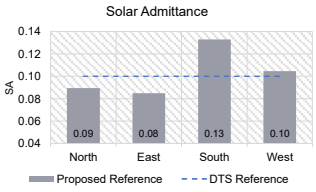
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

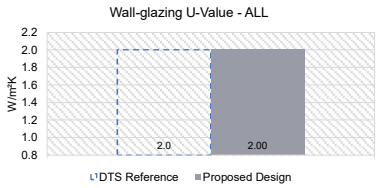
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	1.84	1.93	2.26	1.99	2.00
Solar Admittance	0.09	0.08	0.13	0.10	
AC Energy					1,400

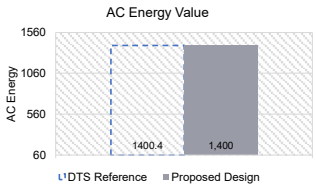
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	601.0	422.9	762.9	651.8
Glazing to Façade Ratio	22%	24%	33%	26%
Glazing References	Uniform REF	Uniform REF	Uniform REF	Uniform REF
Glazing System Types	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
Glass Types	Uniform REF	Uniform REF	Uniform REF	Uniform REF
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Methodology	AFRC (True module size)			
Average Glazing U-Value (W/m².K)	4.86	4.86	4.86	4.86
Average Glazing SHGC	0.42	0.42	0.42	0.42
Shading Systems	P0.15_H2.8_G0 + P0.12_H3.6_G0 + P0.1_H2.42_G0.8 +	P0.4_H2.42_G0 + P0.1_H2.42_G0.8	P0.15_H2.8_G0 + P0.15_H4_G1.2 + P0.25_H4.84_G0 +	P0.15_H3.3_G0.5 + P0.15_H2.8_G0 + P0.4_H2.42_G0.8 +
Wall Area (m²)	2163.1	1330.3	1579.9	1894.1
Wall Types	R1.0	R1.0	R1.0	R1.0
Methodology	NCC Specification J1.5b			
Wall Construction	R1.0	R1.0	R1.0	R1.0
Wall Thickness	300	300	300	300
Average Wall R-value (m²K/W)	1.00	1.00	1.00	1.00
Solar Absorbtance	0.7	0.7	0.7	0.7

Façade

Report

Project Summary

Date
18/01/2021

Name
MS

Company
Cundall

Position
ESD Consultant

Building Name / Address
WATERLOO QUARTER METRO

Building State
NSW

Climate Zone

5

Building Classification
Class 6 - department stores, shopping centres

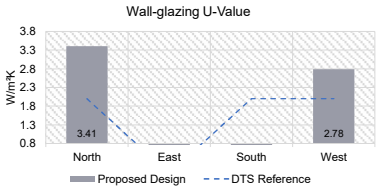
Storeys Above Ground
1.0

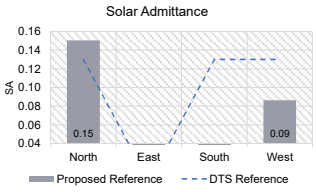
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

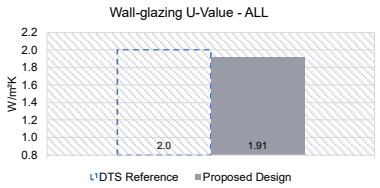
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	3.41	-	0.71	2.78	1.91
Solar Admittance	0.15	-		0.09	
AC Energy					49

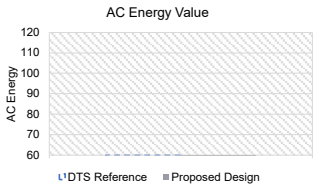
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	60.3	-	0.0	27.8
Glazing to Façade Ratio	53%		0%	41%
Glazing References	Uniform REF			Uniform REF
Glazing System Types	DEFAULTS (GENERIC)			DEFAULTS (GENERIC)
Glass Types	Uniform REF			Uniform REF
Frame Types	Aluminium			Aluminium
Methodology	AFRC (True module size)			
Average Glazing U-Value (W/m².K)	5.80	-	-	5.80
Average Glazing SHGC	0.36	-	-	0.36
Shading Systems	P1.5_H3.66_G0.56 + P1.5_H3.16_G0.58			P2.1_H3.52_G0.42 + P2.1_H3.02_G0.44
Wall Area (m²)	53.5	-	10.9	40.6
Wall Types	R1.4		R1.4	R1.4
Methodology	NCC Specification J1.5b			
Wall Construction	R1.4		R1.4	R1.4
Wall Thickness	300		300	300
Average Wall R-value (m²K/W)	1.40	-	1.40	1.40
Solar Absorbtance	0.7		0.7	0.7

Façade

Report

Project Summary

Date
18/01/2021

Name
MS

Company
Cundall

Position
ESD Consultant

Building Name / Address
WATERLOO QUARTER METRO

Building State
NSW

Climate Zone

5

Building Classification
Class 9b - sports venues or the like

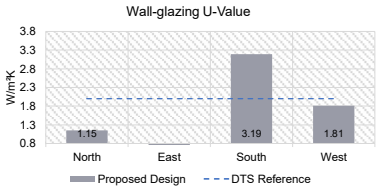
Storeys Above Ground
3.0

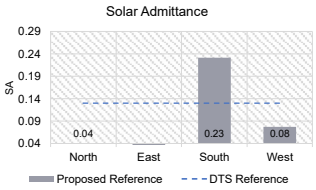
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

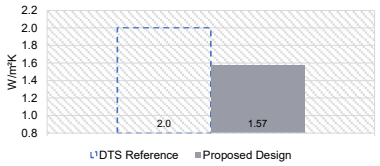
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	1.15	0.71	3.19	1.81	1.57
Solar Admittance	0.04		0.23	0.08	
AC Energy					99

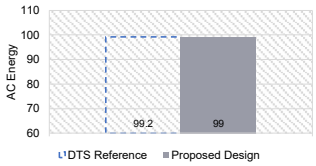
Method 1





Method 2





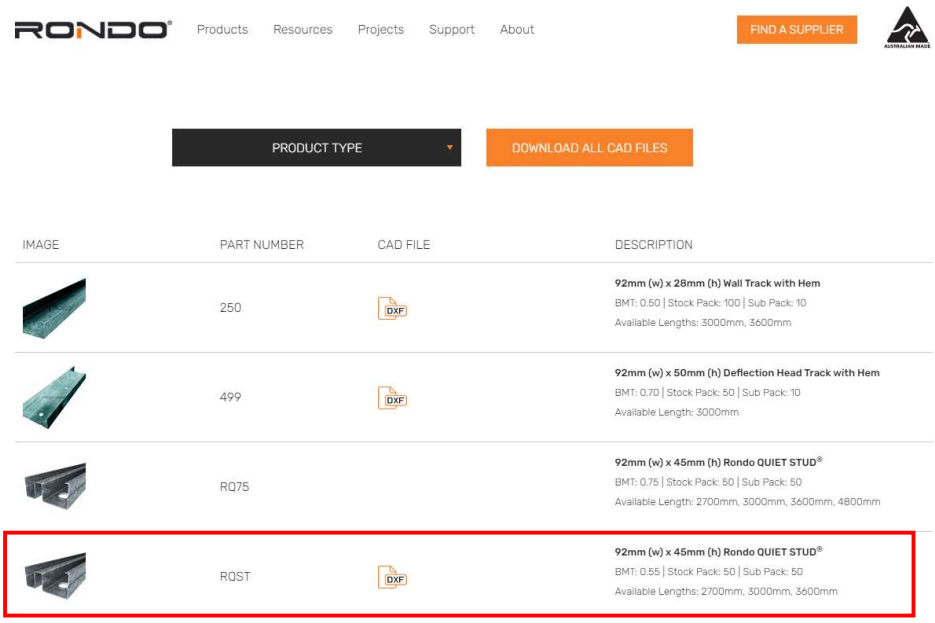
Project Details

	North	East	South	West
Glazing Area (m²)	13.2	0.0	126.3	62.0
Glazing to Façade Ratio	9%	0%	49%	22%
Glazing References	Uniform REF		Uniform REF	Uniform REF
Glazing System Types	DEFAULTS (GENERIC)		DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
Glass Types	Uniform REF		Uniform REF	Uniform REF
Frame Types	Aluminium		Aluminium	Aluminium
Methodology	AFRC (True module size)			
Average Glazing U-Value (W/m².K)	5.80	-	5.80	5.80
Average Glazing SHGC	0.50	-	0.50	0.50
Shading Systems	P0.15_H2.8_G0		P3.55_H4.1_G1.62 + P0.15_H2.8_G0	P3.2_H3_G0.42 + P3.2_H3.6_G0.5 + P0.15_H2.8_G0
Wall Area (m²)	139.4	16.4	133.5	225.5
Wall Types	R1.4	R1.4	R1.4	R1.4
Methodology	NCC Specification J1.5b			
Wall Construction	R1.4	R1.4	R1.4	R1.4
Wall Thickness	300	300	300	300
Average Wall R-value (m²K/W)	1.40	1.40	1.40	1.40
Solar Absorbtance	0.7	0.7	0.7	0.7

Appendix C Fabric Build-up Calculations

The R-values for proposed envelope internal walls were calculated with accordance to NZS 4214-2006. Wall build-ups have been based on the below product and at a standard stud spacing at 800mm x 600mm. The resultant R-value is based on assumptions listed in the calculator. The ESD consultant does not have a preference to the specific product nominated if performance requirements are satisfied. Drawing reference: Wall Types – Sheet 2 (DRG-A05.102, Rev8)

Assumed Wall Studs (92mm Rondo Quiet Studs)



Assumed Wall Insulation (75mm thick 11kg/m2 Glasswool insulation)

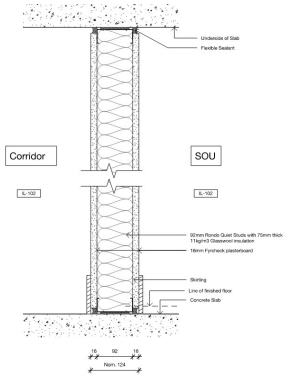
Material R-Value	Density (kg/m^3)	Thickness (mm)	Length (m)	Width (mm)	Rolls per Pack	Coverage per pack (m^2)
R1.0	11	50	16.2	450	3	21.9
R1.0	11	50	16.2	600	2	19.4
R1.7	11	75	13.5	450	3	18.2
R1.7	11	75	13.5	600	2	16.2
R2.5	11	110	8.1	600	2	9.7
R3.5	11	165	5.4	600	2	6.5
R1.2	14	50	16.2	450	3	21.9
R1.2	14	50	16.2	600	2	19.4
R1.8	14	75	13.5	450	3	18.2
R1.8	14	75	13.5	600	2	16.2
R2.2	14	90	10.8	450	3	14.6
R2.2	14	90	10.8	600	2	13.0
R2.4	14	100	10.8	450	3	14.6
R2.4	14	100	10.8	600	2	13.0

Wall Calculator

Required R-Value	
Climate Zone	5
Building Class	Class 3 - student accommodation
Minimum R-Value per Orientation (<80% wall-glazing ratio)	**1.0**
Minimum R-Value per Orientation (≥80% wall-glazing ratio)	**1.4**

Layers to be added as:

OUTDOOR → **INDOOR**



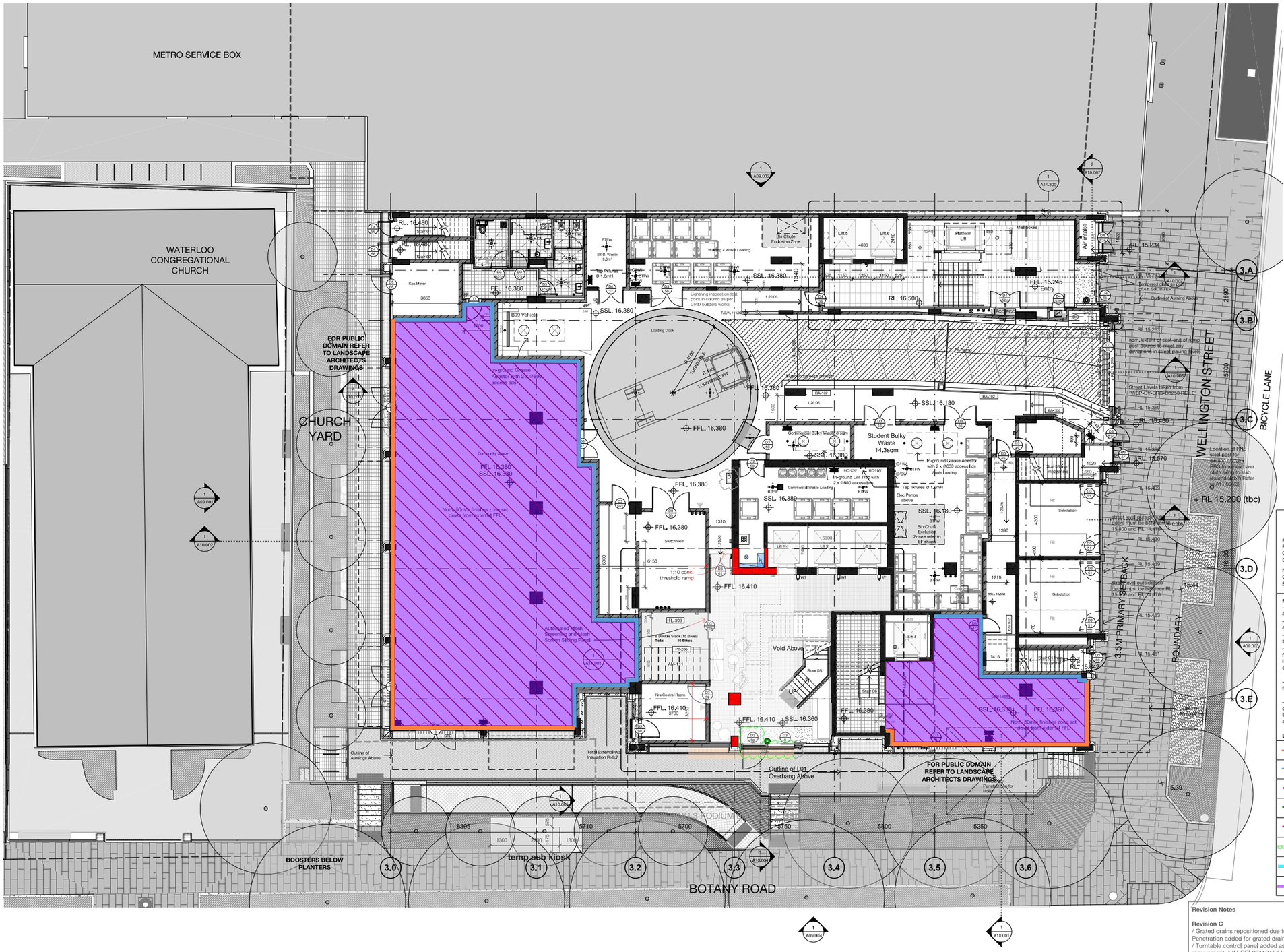
WALL IDENTIFIER	Wall Calculator Template					
Wall Description	**WT3-201 Corridor Walls**					
Wall calculator						
	Exterior				Layer	**Interior**
	1	**2**	**3**	**4**		**5**
Layer Description	Air films Moving air - <3m/s wind	*16mm Fycheck plasterboard*	*92mm Rondo Quiet Studs with 75mm thick Glasswool insulation (600mm stud centres/ 800mm dwang centres)*	*16mm Fycheck plasterboard*		Air films Still Air
Layer Description Override		16mm Fycheck plasterboard	92mm Rondo Quiet Studs with 75mm thick Glasswool insulation (600mm stud centres/ 800mm dwang centres)	16mm Fycheck plasterboard		
Exact details or assumptions		As-Documented	TBC by Architect	As-Documented		
Layer thickness (mm)		16	92	16		
Is the layer homogenous?		Yes	No	Yes		
Is the layer an air space, insulation only or a reflective surface?		No		No		
Material		Gypsum plasterboard		Gypsum plasterboard		
R value override (m2.K / W)						
Conductivity (W / m.K)		0.17		0.17		
R-value of homogenous layer (m2.K / W)		**0.09**		**0.09**		
Is there a thermal break?			No			
Calculated / Percentage cross sectional area ratio?			Calculated			
Insulation area ratio						
Frame + break area ratio						
Variable area ratio: See comment						
Insulation						
Is the insulation an airspace?			No			
Insulation R-Value / Airspace Type			1.7			
Insulation R-value override			1.70			
Insulation nominal R-value						
Insulation nominal thickness (mm)			0%			
Compression ratio			**1.70**			
Insulation R-value, R1 (m2.°K / W)						
Frame						
Stud centres spacing (mm)			600			
Dwangs / Noggins centres spacing (mm)			800			
Wall height (mm)			2700			
Framing material			Steel			
Frame conductivity (W / m.K)			47.50			
Stud depth (mm)						
Stud width (mm)			43			
Flange width (mm)			92			
Flange depth (mm)			0.55			
Web thickness (mm)			0.03			
Contact resistances			0.21			
Frame R-Value (m2.°K / W)						
Frame R-value including thermal break, R2 (m2.°K / W)						
Thermal Break (EPS)						
Thickness (mm)						
Width (mm)						
Conductivity (W / m.K)						
Thermal Break R-value excluding insulation (m2.°K / W)						
Thermal Break R-value including insulation, R3 (m2.°K / W)						
Area ratios						
f1			86%			
R1			1.7000			
f1 / R1			0.5080			
f2			14%			
R2			0.2114			
f2 / R2			0.6449			
f3			0%			
R3			0.2114			
f3 / R3						
Layer Un-Bridged R-value (m2.°K / W)	0.04	0.0941	1.7000	0.0941		0.12
Layer R-value (m2.°K / W)	0.04	0.0941	0.8674	0.0941		0.12

Total Wall thickness (mm)	124.00
Unbridged Wall R-value (m2.°K / W)	2.05
Total Wall R-value (m2.°K / W)	1.22

Appendix D Fabric Mark-ups

Please see overleaf.

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Ground Floor Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.000	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

Notes:
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Legend:

External Wall	R_T: 0.7 SA: 0.60
Internal wall	R_T: 1.12
Glazed spandrel	R_T: 0.57
Aluminium spandrel	R_T: 0.50
Additional insulation	R_T: 0.25
DTS Exposed Roof	R_T: 3.7 SA: 0.45
DTS Suspended Slab	R_T: 2.0
DTS Slab on Ground	R_T: 2.0

Revision Notes

Revision C
/ Grated drains repositioned due to window profile change to 169mm.
Penetration added for grated drain drainage pipe
/ Turntable control panel added as per JHB and Australian turntable requirement. "JH-RFI-001124" "JH-GCOR-009521" "Austurn-GCOR-000008"
/ Ramp and hob added at the door threshold of fire control room "JH-GCOR-007171""B Smart-GCOR-001108"
/ Door tag for pivot door D3.9p at Iglu Lobby Entrance added.

Recent revision history

#	Description	Date
15	75% Issue	06.04.23
16	Ground Floor 75% Issue	13.04.23
17	For Co-Ordination - WIP	12.05.23
18	For Co-Ordination - WIP	02.06.23
19	Ground Switchroom Update + WIP	16.06.23
20	For Coordination - WIP	23.06.23
21	For Coordination	30.06.23
22	For Coordination	25.07.23
23	For Coordination	28.07.23
A	Construction Certificate 2	10.08.23
B	75% Updates Prev. Dect.	06.10.23
C	For Coordination	31.10.23

Notes
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Contractor must verify all dimensions on site before commencing work or preparing shop drawings.

Do not scale drawings.

GENERAL NOTES:

- Refer to drawing series A13.xxx for Iglu SOU plans.

- Refer to drawing series A04.xxx & A12_xxx for Core, Lift & Stairs details.

Penetrations and set out information based on:

WMQ-BLD3-RBG-ST-MDL-001-RVT-R20 [194]
WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

Regulated Design Record
The Building Element for which this design has been prepared and the subject of this Design Declaration is: (Refer to checked item below)
☐ (F) Fire Safety Systems ☐ (W) Waterproofing ☒ (L) Load-bearing ☐ (B) Building Enclosure ☐ (S) Building Services

Key Plan

North Point

Client
Waterloo Integrated Station Development
A Joint Venture Project
JOHN HOLLAND
mirvac
NSW GOVERNMENT
sydney METRO

Consultant
BATESSMART.

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

Project number	Size check
WMQ-BLD3-BSA	20mm

Checked	Approved	Sheet size	Scale
YZ	RT	B1	1 : 100

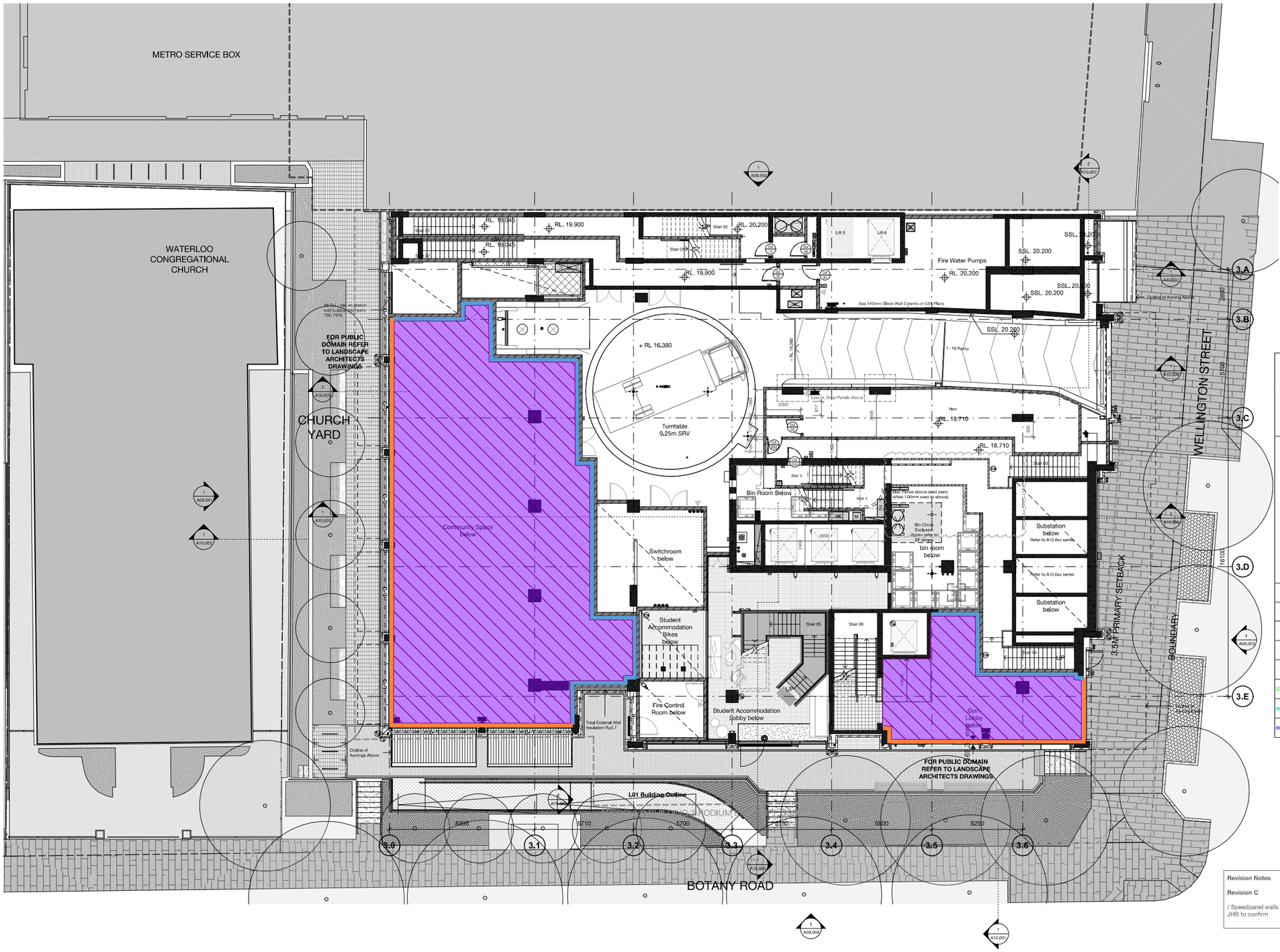
Sheet title
General Arrangement Plans
Ground Floor Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number
WMQ-BLD3-BSA-AR-DRG-A03.000

Revision
C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Mezzanine Floor Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.00M	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

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Legend:

External Wall	R_T: 0.7 SA: 0.60
Internal wall	R_T: 1.12
Glazed spandrel	R_T: 0.57
Aluminium spandrel	R_T: 0.50
Additional insulation	R_T: 0.25
DTS Exposed Roof	R_T: 3.7 SA: 0.45
DTS Suspended Slab	R_T: 2.0
DTS Slab on Ground	R_T: 2.0

Revision Notes

Revision C

/ Speedpanel walls added to enclose the hydraulic pipes. HPA JHB to confirm

Recent revision history

#	Description	Date
13	WIP Core Update	21.03.23
14	75% Issue	06.04.23
15	For Co-Ordination - WIP	12.05.23
16	For Co-Ordination - WIP	19.05.23
17	For Co-Ordination - WIP	02.06.23
18	For Coordination - WIP	23.06.23
19	For Coordination	30.06.23
20	For Coordination	25.07.23
21	For Coordination	28.07.23
A	Construction Certificate 2	10.08.23
B	75% Updates Prev. Dacl.	06.10.23
C	For Coordination	31.10.23

GENERAL NOTES:

- Refer to drawing series A13.xxx for Iglu SOU plans.

- Refer to drawing series A04.xxx & A12.xxx for Core, Lift & Stairs details.

Penetrations and set out information based on:

WMQ-BLD3-RBG-ST-MDL-001-RVT-R20 [194]
WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

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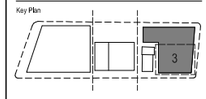
Key Plan



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mirvac

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Consultant

BATESSMART.

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

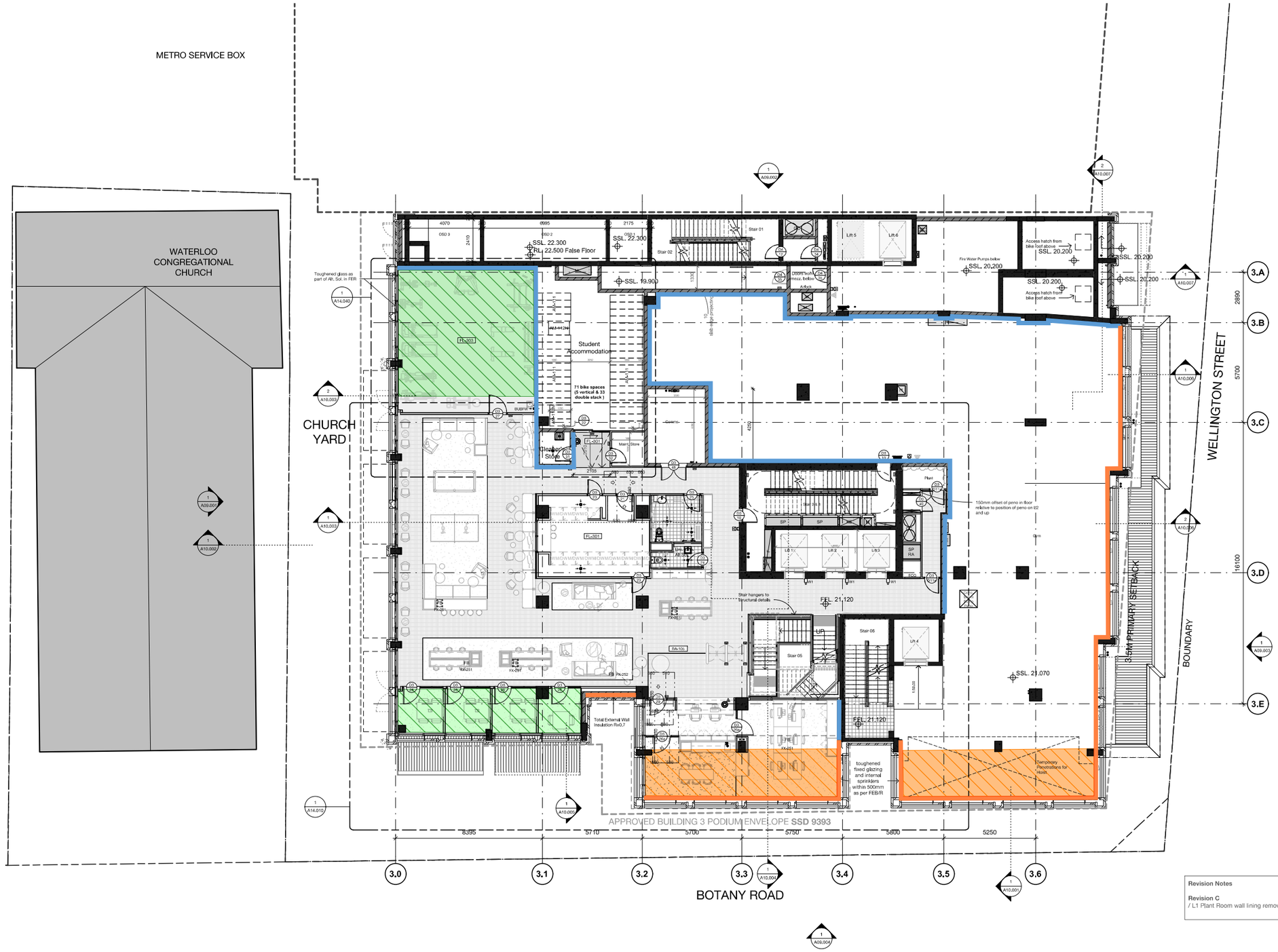
Project number	Size check
WMQ-BLD3-BSA	25mm
Checked: YZ	Approved: RT
Sheet size: B1	Scale: 1 : 100

Sheet title
General Arrangement Plans
Mezzanine Floor Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number: **WMQ-BLD3-BSA-AR-DRG-A03.00M**
Revision: C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 01 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.001	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



Revision Notes

Revision C
/ L1 Plant Room wall lining removed for hydraulic pipes.

Recent revision history

#	Description	Date
14	WIP Core Update	21.03.23
15	75% Issue	06.04.23
16	For Co-Ordination - WIP	12.05.23
17	For Co-Ordination - WIP	19.05.23
18	For Co-Ordination - WIP	02.06.23
19	For Coordination - WIP	23.06.23
20	For Coordination	30.06.23
21	For Coordination	25.07.23
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A	Construction Certificate 2	10.08.23
B	75% Updates Prev. Decl.	06.10.23
C	For Coordination	31.10.23

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WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

Notes:
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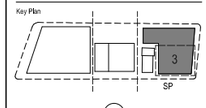
- ☒ (W) Waterproofing
- ☐ (L) Load-bearing
- ☐ (B) Building Enclosure
- ☐ (S) Building Services

Key Plan



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BATESSMART

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

Project number
WMQ-BLD3-BSA

Size check
25mm

Checked
YZ

Approved
RT

Sheet size
B1

Scale
1 : 100

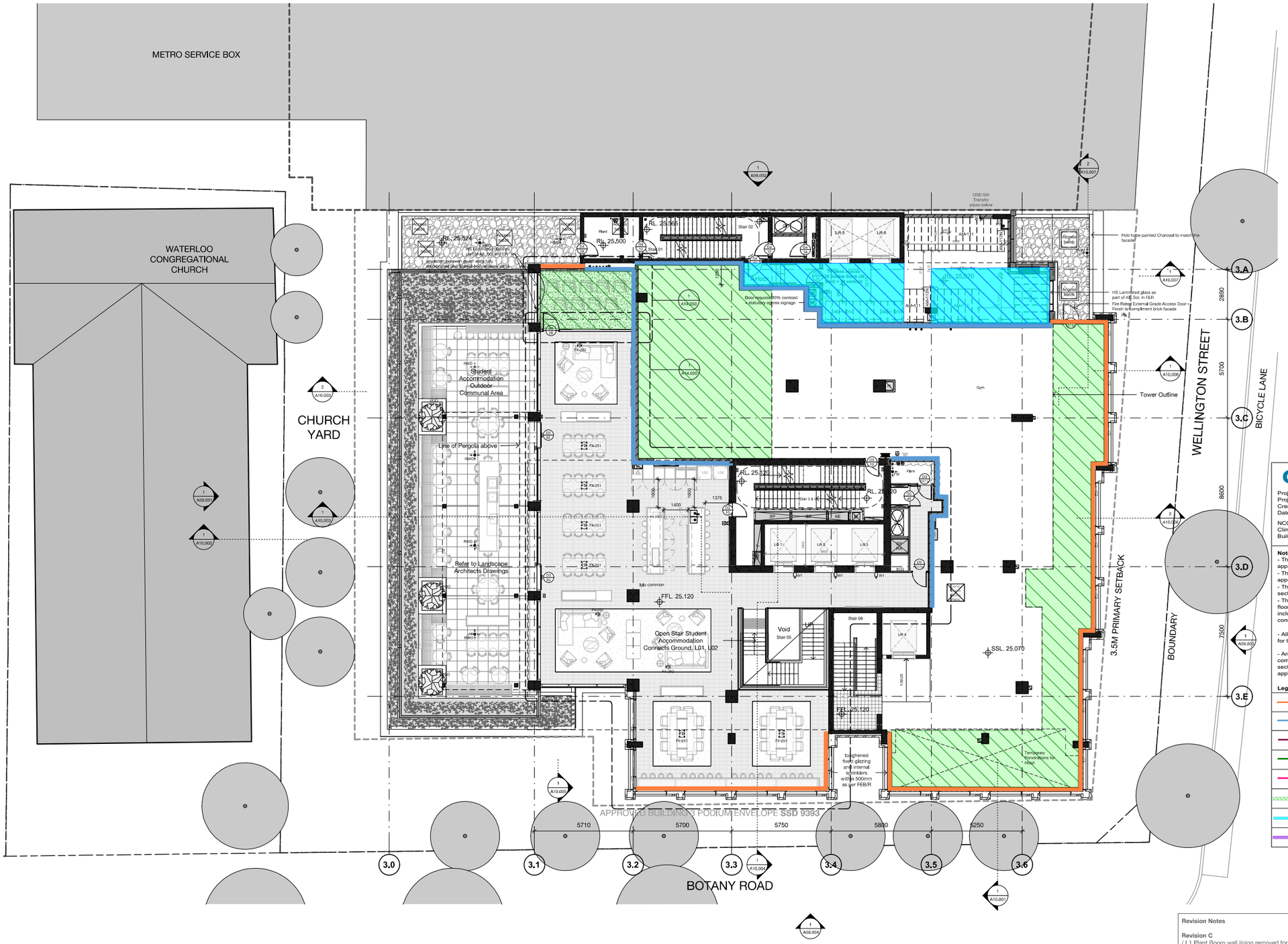
Sheet title
General Arrangement Plans
Level 01 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number
WMQ-BLD3-BSA-AR-DRG-A03.001

Revision
C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 02 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.002	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.06.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

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Revision Notes

Revision C
/ L1 Plant Room wall lining removed for hydraulic pipes.

Recent revision history

#	Description	Date
15	WIP Core Update	21.03.23
16	75% Issue	06.04.23
17	For Co-Ordination - WIP	12.05.23
18	For Co-Ordination - WIP	19.05.23
19	For Co-Ordination - WIP	02.06.23
20	For Coordination - WIP	23.06.23
21	For Coordination	30.06.23
22	For Coordination	25.07.23
23	For Coordination	28.07.23
A	Construction Certificate 2	10.06.23
B	75% Updates Prev. Dect.	06.10.23
C	For Coordination	31.10.23

GENERAL NOTES:

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- Refer to drawing series A04.xxx & A12_xxx for Core, Lift & Stairs details.

Penetrations and set out information based on:

WMQ-BLD3-RBG-ST-MDL-001-RVT-R20 [194]
WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
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WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

Regulated Design Record
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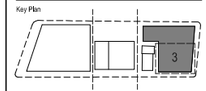
Key Plan



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JOHN HOLLAND
mirvac

NSW GOVERNMENT
sydney METRO

Consultant
BATESSMART

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

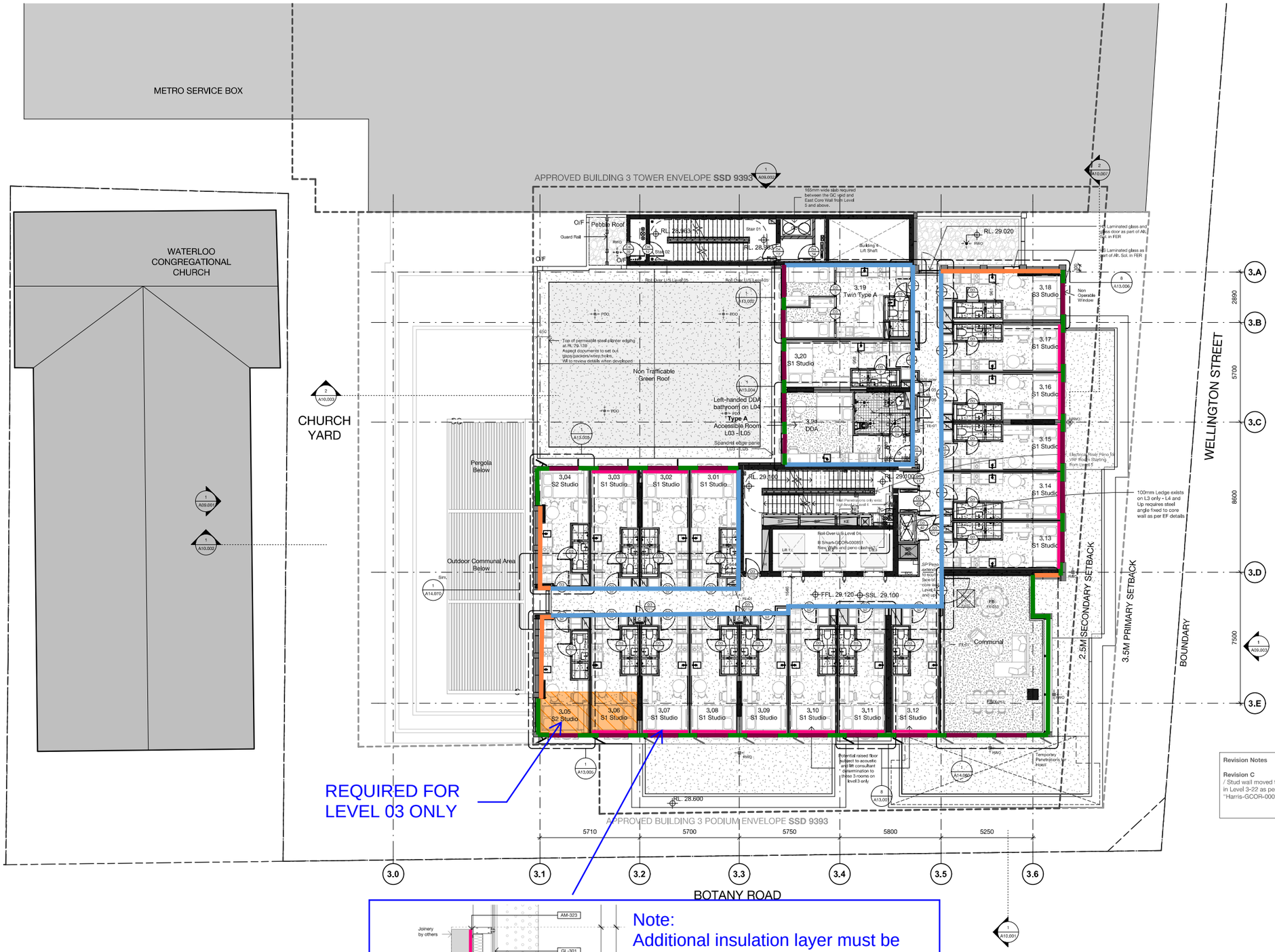
Project number	Size check
WMQ-BLD3-BSA	25mm
Checked: YZ	Approved: RT
Sheet size: B1	Scale: 1 : 100

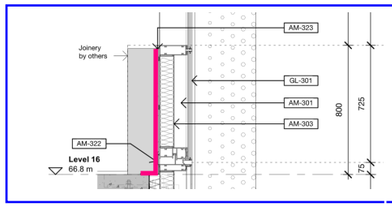
Sheet title
General Arrangement Plans
Level 02 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number
WMQ-BLD3-BSA-AR-DRG-A03.002
Revision C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 03 - 05 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.003	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				





Note:
Additional insulation layer must be installed in all S1 Studios - Levels 3 to 23, at lower portion of the CW façade, behind the joinery box (178Wx800H)

Recent revision history

#	Description	Date
14	WIP Core Update	21.03.23
15	75% Issue	06.04.23
16	For Co-Ordination - WIP	12.05.23
17	For Co-Ordination - WIP	19.05.23
18	For Coordination - WIP	23.06.23
19	For Coordination	30.06.23
20	For Coordination	25.07.23
21	For Coordination	28.07.23
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B	75% Updates Prev. Decl.	06.10.23
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WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

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Legend:

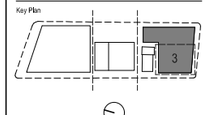
External Wall	R_T: 0.7 SA: 0.60
Internal wall	R_T: 1.12
Glazed spandrel	R_T: 0.57
Aluminium spandrel	R_T: 0.50
Additional insulation	R_T: 0.25
DTS Exposed Roof	R_T: 3.7 SA: 0.45
DTS Suspended Slab	R_T: 2.0
DTS Slab on Ground	R_T: 2.0

Revision Notes

Revision C
/ Stud wall moved to the north to allow the hydraulic riser size to grow 94mm in Level 3-22 as per HPA's requirement and RBG's confirmation structually. "Harris-GCOR-000211" RBG-GCOR-000989"

Regulated Design Record
The Building Element for which this design has been prepared and the subject of this Design Declaration is: (Refer to checked item below)
☐ (F) Fire Safety Systems ☐ (W) Waterproofing ☐ (L) Load-bearing ☐ (B) Building Enclosure ☐ (S) Building Services

Key Plan



Client
Waterloo Integrated Station Development
A Joint Venture Project
JOHN HOLLAND
mirvac

NSW GOVERNMENT
sydney METRO

Consultant
BATESSMART

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

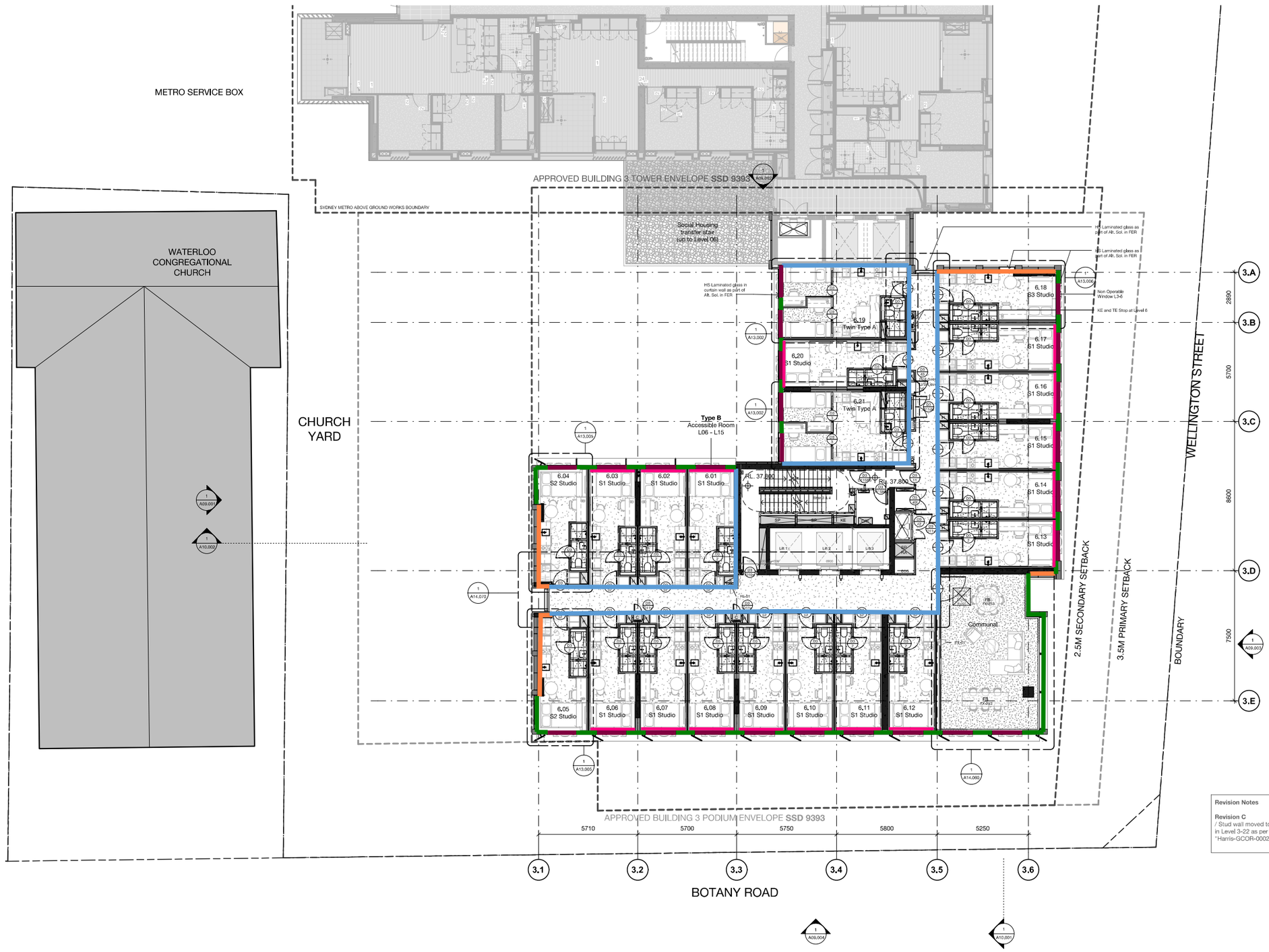
Project number: WMQ-BLD3-BSA
Size check: 25mm
Checked: YZ
Approved: RT
Sheet size: B1
Scale: 1 : 100

Sheet title
General Arrangement Plans
Level 03 - 05 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number: WMQ-BLD3-BSA-AR-DRG-A03.003
Revision: C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 06 - 15 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.006	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



Revision Notes

Revision C
/ Stud wall moved to the north to allow the hydraulic riser size to grow 94mm in Level 3-22 as per HPA's requirement and RBG's confirmation structually.
"Harris-GCOR-000211""RBG-GCOR-000989"

Recent revision history

#	Description	Date
13	WIP Core Update	21.03.23
14	75% Issue	06.04.23
15	For Co-Ordination - WIP	12.05.23
16	For Co-Ordination - WIP	19.05.23
17	For Coordination - WIP	23.06.23
18	For Coordination	30.06.23
19	For Co-Ordination	19.07.23
20	For Coordination	28.07.23
A	Construction Certificate 2	10.08.23
B	75% Updates Prev. Decl.	06.10.23
C	For Coordination	31.10.23

Notes
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Do not scale drawings.

GENERAL NOTES:

- Refer to drawing series A13.xxx for Iglu SOU plans.

- Refer to drawing series A04.xxx & A12_xxx for Core, Lift & Stairs details.

Penetrations and set out information based on:

WMQ-BLD3-RBG-ST-MDL-001-RVT-R20 [194]
WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

Notes:
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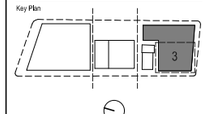
- ☐ (F) Fire Safety Systems
- ☐ (W) Waterproofing
- ☒ (L) Load-bearing
- ☐ (B) Building Enclosure
- ☐ (S) Building Services

Key Plan



Client
Waterloo Integrated Station Development
A Joint Venture Project
JOHN HOLLAND
mirvac

NSW GOVERNMENT
sydney METRO

Consultant
BATESSMART

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

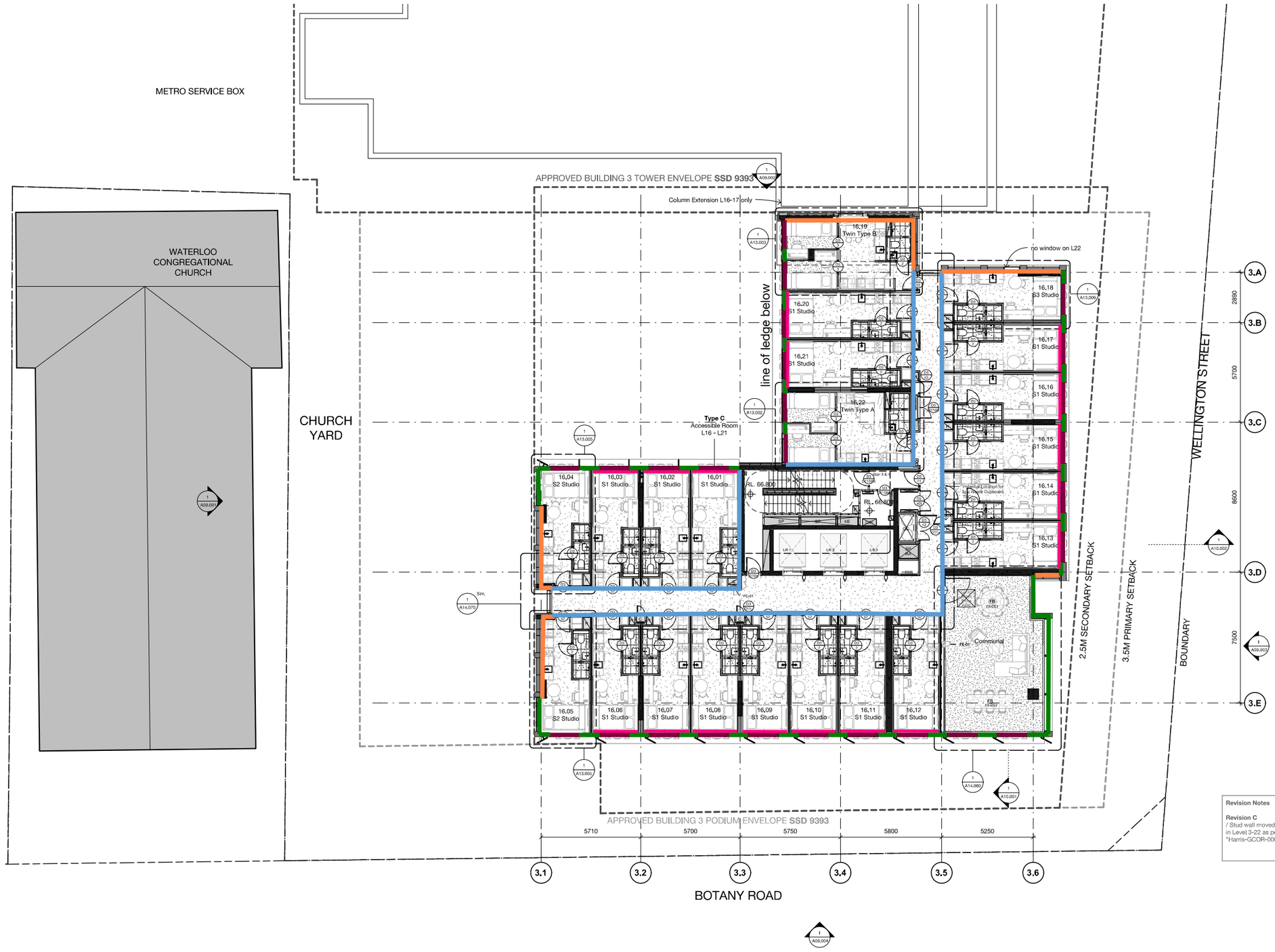
Project number: WMQ-BLD3-BSA
Size check: 25mm
Checked: YZ
Approved: RT
Sheet size: B1
Scale: 1 : 100

Sheet title
General Arrangement Plans
Level 06 - 15 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number: **WMQ-BLD3-BSA-AR-DRG-A03.006**
Revision: C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 16 - 21 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.016	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



Revision Notes

Revision C
/ Stud wall moved to the north to allow the hydraulic riser size to grow 94mm in Level 3-22 as per HPA's requirement and RBG's confirmation structually.
"Harris-GCOR-000211""RBG-GCOR-000989"

Recent revision history

#	Description	Date
13	WIP Core Update	21.03.23
14	75% Issue	06.04.23
15	For Co-Ordination - WIP	12.05.23
16	For Co-Ordination - WIP	19.05.23
17	For Coordination - WIP	23.06.23
18	For Coordination	30.06.23
19	For Co-Ordination	19.07.23
20	For Coordination	28.07.23
A	Construction Certificate 2	10.08.23
B	75% Updates Prev. Decl.	06.10.23
C	For Coordination	31.10.23

GENERAL NOTES:

- Refer to drawing series A13.xxx for Iglu SOU plans.

- Refer to drawing series A04.xxx & A12_xxx for Core, Lift & Stairs details.

Penetrations and set out information based on:

WMQ-BLD3-RBG-ST-MDL-001-RVT-R20 [194]
WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

Notes:
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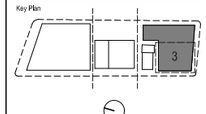
- ☐ (W) Waterproofing
- ☒ (L) Load-bearing
- ☐ (B) Building Enclosure
- ☐ (S) Building Services

Key Plan



Client

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Consultant

BATESSMART

Project

WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

Project number	Size check
WMQ-BLD3-BSA	25mm

Checked	Approved	Sheet size	Scale
YZ	RT	B1	1 : 100

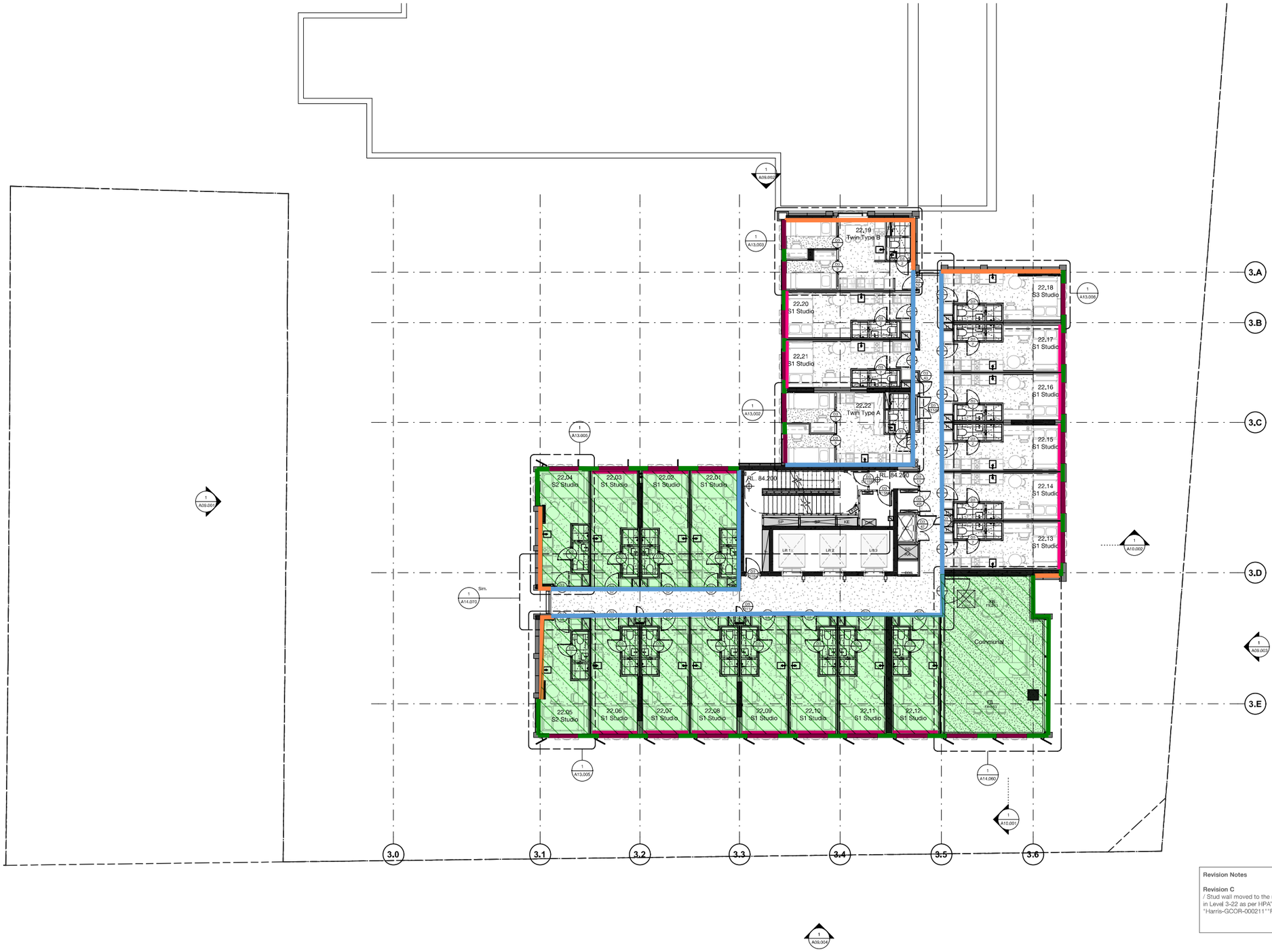
Sheet title
General Arrangement Plans
Level 16 - 21 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number
WMQ-BLD3-BSA-AR-DRG-A03.016

Revision
C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 22 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.022	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



Revision Notes
Revision C / Stud wall moved to the north to allow the hydraulic riser size to grow 94mm in Level 3-22 as per HPA's requirement and RBG's confirmation structually. "Harris-GCOR-000211" "RBG-GCOR-000989"

CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

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DTS Slab on Ground	R_T: 2.0

Recent revision history

#	Description	Date
7	WIP Core Update	21.03.23
8	75% Issue	06.04.23
9	For Co-Ordination - WIP	12.05.23
10	For Co-Ordination - WIP	19.05.23
11	For Coordination - WIP	23.06.23
12	For Coordination	30.06.23
13	For Co-Ordination	19.07.23
14	For Coordination	28.07.23
A	Construction Certificate 2	10.08.23
B	75% Updates Prev. Decl.	06.10.23
C	For Coordination	31.10.23

GENERAL NOTES:

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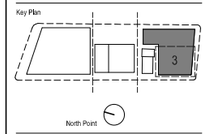
WMQ-BLD3-FFR-FS-MDL-6000 [46]
WMQ-BLD3-GES-EL-MDL-4000-RVT-R20 [172]
WMQ-BLD3-PFG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

Regulated Design Record
The Building Element for which this design has been prepared and the subject of this Design Declaration is: (Refer to checked item below) ☐ (F) Fire Safety Systems ☐ (W) Waterproofing ☒ (L) Load-bearing ☐ (B) Building Enclosure ☐ (S) Building Services

Key Plan



Client

Waterloo Integrated Station Development
A Joint Venture Project
JOHN HOLLAND
mirvac

NSW GOVERNMENT
sydney METRO

Consultant

BATESSMART

Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

Project number
WMQ-BLD3-BSA

Size check
25mm

Checked	Approved	Sheet size	Scale
YZ	RT	B1	1 : 100

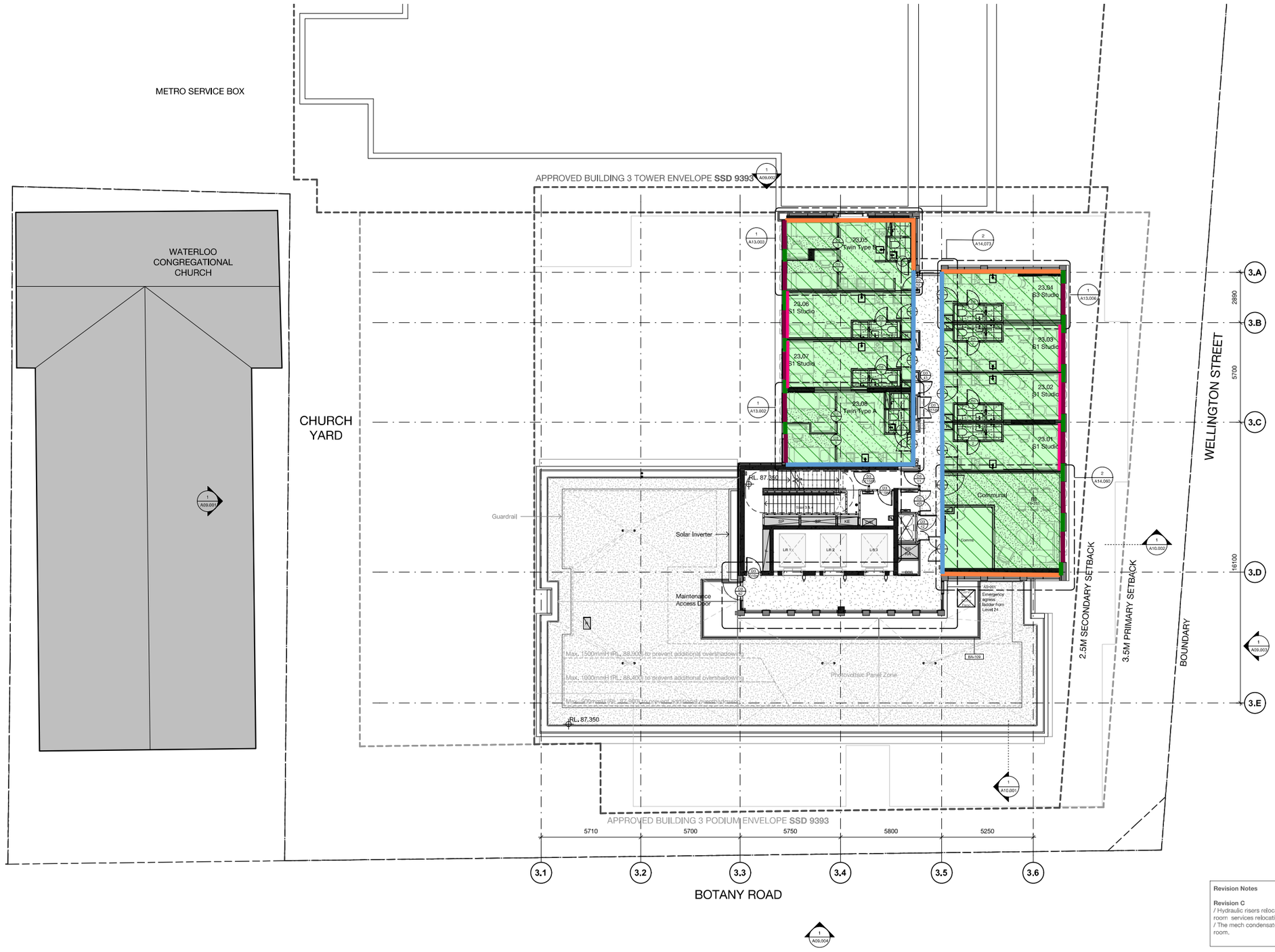
Sheet title
General Arrangement Plans
Level 22 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number
WMQ-BLD3-BSA-AR-DRG-A03.022

Revision
C

Regulated Design Record				
Project Address: 49 Botany Road, Waterloo 2017 (Lot 190 DP 1257150)				
Project Title: Waterloo Metro Quarter Development - Southern Precinct				
Consent No: SSD 10437			Body Corporate No: DEP0001256	
Drawing Title: Level 23 Plan			Drawing No: WMQ-BLD3-BSA-AR-DRG-A03.023	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
A	10.08.23	Construction Certificate 2	Guy Lake	DEP0001730
ONLY INFORMATION ON THE REVISIONS ABOVE IS APPROVED FOR CONSTRUCTION SUBSEQUENT REVISIONS HAVE NOT BEEN DECLARED				



Revision Notes

Revision C
/ Hydraulic risers relocated and enclosure walls added as part of L23 comms room services relocation,"JH-GCOR-006949"
/ The mech condensate peno for the wall mounted split added on L23 comms room.

Recent revision history

#	Description	Date
12	WIP Core Update	21.03.23
13	75% Issue	06.04.23
14	For Co-Ordination - WIP	12.05.23
15	For Co-Ordination - WIP	19.05.23
16	For Coordination - WIP	23.06.23
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Notes
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WMQ-BLD3-PPG-HY-MDL-001-RVT-R20 [138]
WMQ-BLD3-DEA-ME-MDL-0101-RVT-R2 [106]

CUNDALL

Project Name: Waterloo Metro Quarter
Project Number: 1024873
Created by: Tom Correa
Date: 17/11/2023

NCC Version: 2019
Climate Zone: 5
Building Class: Mixed - 3, 6 and 9b

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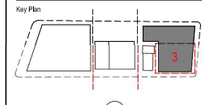
Key Plan



Client
Waterloo Integrated Station Development
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JOHN HOLLAND
mirvac

NSW GOVERNMENT
sydney METRO

Consultant
BATESSMART

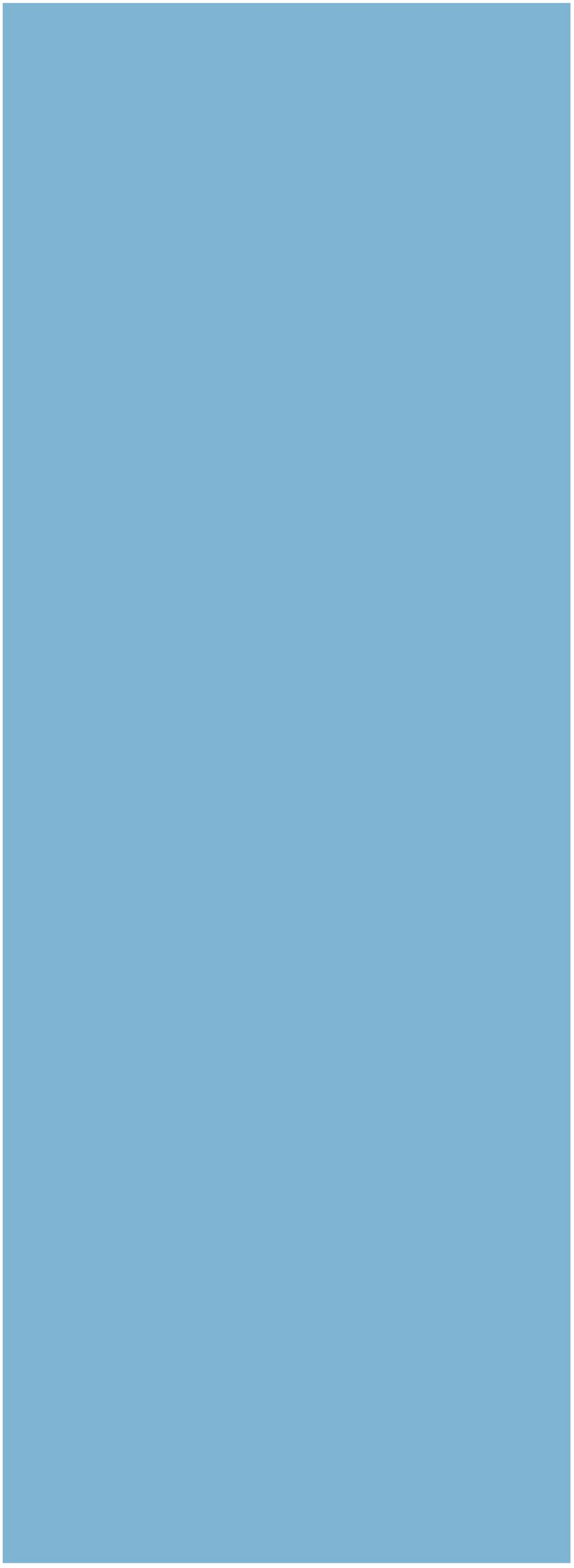
Project
WATERLOO METRO QUARTER DEVELOPMENT - SOUTHERN PRECINCT

Project number: WMQ-BLD3-BSA
Size check: 25mm
Checked: YZ
Approved: RT
Sheet size: B1
Scale: 1 : 100

Sheet title
General Arrangement Plans
Level 23 Plan

Status
ISSUED FOR CONSTRUCTION

Sheet number: WMQ-BLD3-BSA-AR-DRG-A03.023
Revision: C



Cundall Johnston & Partners PTY

Asia Australia Europe MENA UK and Ireland
www.cundall.com

Appendix D – John Holland Building Statement

31st January 2024

Department of Planning, Housing and Infrastructure
4 Parramatta Square
12 Darcy Street, Parramatta
NSW Australia 2150

Dear Planning Secretary,

RE: Condition B11 – Materials and Finishes
Design Review Panel Comments

This letter has been prepared in response to Sydney Metro's DRP advice and recommendations.

John Holland Building are currently undergoing the production of a Wind Generated Noise study for the façade(s) with assistance from a specialist consultant to provide a benchmark for the contractor testing, for the production of the external feature and sunshade fins.

Once prepared, the Wind Generated Noise Study will provide a base line acoustic level which the façade install contractor (Micos) will adhere to while manufacturing the fin/blades & acoustic testing regime.

We trust this satisfies the Planning Secretary. Please do not hesitate to contact me on 0461 250 417 or Matthew.Davies@jhg.com.au

Yours sincerely,

Matthew Davies

Waterloo OSD Design Director
John Holland

Appendix E – Façade Subcontractor (Micos) Statement

Date: 24th November 2024

Client Name: John Holland Pty Ltd
Street address: Level 3, 65 Pirrama Road
Suburb Pyrmont NSW
Postcode: 2009

Attention: Eugene Choo

BUILDING 3 DA CONDITION B11 - GLAZED FAÇADE PROJECTIONS (SUNSHADES AND FINS) STATEMENT

Project Name	Waterloo Metro Quarter Development - Southern Precinct – SSD 10437
Address	*49 Botany Road, Waterloo 2017(Lot 190 DP 1257150)*
Part of Building	*EXTERNAL GLAZED FAÇADE PROJECTIONS identified on the MICOS Shop drawings as SUNSHADES AND FINS references Levels 3 to Level 22*

I acknowledge the following message:

MICOS plans to test the external projecting feature fins, but this is subject to receiving the Wind Generated Noise Study for the building. The study aims to set the benchmark for the conditions of the acoustical external feature fins.

The test results aim to prove that the glazed façade projections will not have a negative impact on the internal occupancy levels, as specified in the acoustic specification WMQ-BLD3-WGEHQ-AC-SPC-0001[B]. However, there is no specific testing standard outlined for compliance.

Therefore, John Holland Group and/or the project Acoustical Consultant Stantec will approve the testing regime.

Name: Che Daries
Position: Project Manager
Company: Micos Curtain Wall (NSW) Pty Ltd
Address: U16 1801 BOTANY ROAD ABNKSMEADOW NSW 2019
Phone Number: 02 8058 3049

Signature

Appendix F – Bates Smart Architects Statement

Bates Smart
Architects Pty Ltd
ABN 68 094 740 986

Melbourne 1 Nicholson Street
Melbourne Victoria 3000 Australia
T+613 8664 6200 F+613 8664 6300
melb@batessmart.com

Sydney 43 Brisbane Street
Surry Hills NSW 2010 Australia
T+612 8354 5100 F+612 8354 5199
syd@batessmart.com

www.batessmart.com

19th January 2024

Architecture
Interior Design
Urban Design
Strategy

BATESSMART.™

Project: Waterloo Metro Quarter Development – Southern Precinct
Purpose: Condition B11 Design Review Panel Colour Contrast Endorsement
Reference: SSD-10437 MOD 2

This Statement has been prepared by Bates Smart Architects on behalf of WL Developer Pty Ltd (the applicant) with regards to State Significant Development SSD 10437 MOD 2– Waterloo Metro Quarter Development - Southern Precinct.

Bates Smart in collaboration with the Design Team consisting of John Holland Building, and Micos Façade have undertaken reviews of colour selections proposed for the Building Tower Façade Perforated Sunshades. Multiple large scale powder coated perforated aluminium panels were provided by Micos Façade to ensure consistency with the proposed finishes presented to the Design Review Panel, the approved SSDA colour and finishes, and that the desired architectural contrast between the perforated sun shades and surrounding framing and panels was achieved.

……..
Guy Lake
Director