# WATERLOO METRO QUARTER
# BUILDING 3&4

**SSD-10437 - RESPONSE TO SUBMISSIONS**
**SUPPLEMENTARY DESIGN REPORT**

**PREPARED FOR WATERLOO DEVELOPER PTY LTD**
**DOCUMENT NO. WMQ-BLD34-BSA-AR-RPT-DA210**

Revision A

Date of Issue 12.02.2021

mirvac JOHN HOLLAND

BATESSMART™

**DOCUMENT NAME**
SSD-10437 - Response To Submissions
Supplementary Design Report

**PROJECT NUMBER**
s12398

**CLIENT**
WL Developer Pty Ltd

**CONSULTANTS**

| | |
|---|---|
| Urbis | Planning |
| Aspect Studios | Landscape Design |
| Robert Bird Group | Structure |
| WSP | Services & Lifts |
| Stantec | Acoustics |
| Omni | Fire |
| Morris Goding | Accessibility |
| McKenzie Group | BCA |
| PTC Consulting | Traffic |
| WSP | Civil |
| Cundall | ESD |
| Elephants Foot | Waste |
| RWDI | Wind, Solar Access, Cross Ventilation |
| Veris | Surveyor |
| Doug & Wolf | 3D Visualisations |


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# INTRODUCTION

This supplementary design report has been prepared to accompany the Response to Submissions received for SSD-10437.

This report is intended to be read in conjunction with the updated Architectural Drawings submitted as part of the Responses to Submission.

This report contains three parts:

**Part One - Response to Submissions**

Responses to the City of Sydney comments (dated 3rd December 2020) relating to the architecture and design.

**Part Two - Proponent Led Changes to Building 3**

**Part Three - Proponent Led Changes to Building 4**

Artist's impression only

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

# PART ONE: RESPONSE TO SUBMISSIONS

Artist's impression only

## DESIGN EXCELLENCE

13. Awnings

The applicant and DPIE are to ensure that all awnings located over the public domain and through-site links are to be between 3.2 metres and 4.2 metres above finished ground level and to be setback a minimum 800mm from the kerb. Awning widths are to be between 2 metres and 3.6 metres whilst remaining clear of smartpoles by 1 metre and street trees by 1.5 metres. This is to allow for under awning signage, provide suitable weather protection for pedestrians and provide sufficient clearance for vehicles, trees and infrastructure.

(City of Sydney)


### Awning Types

- Type A - Community Space (Church Yard)
- Type B - Community Space (Botany Road)
- Type C - Student Accommodation and Gym
- Type D - Wellington Street (Back of House)
- Type E - Social Housing Entry

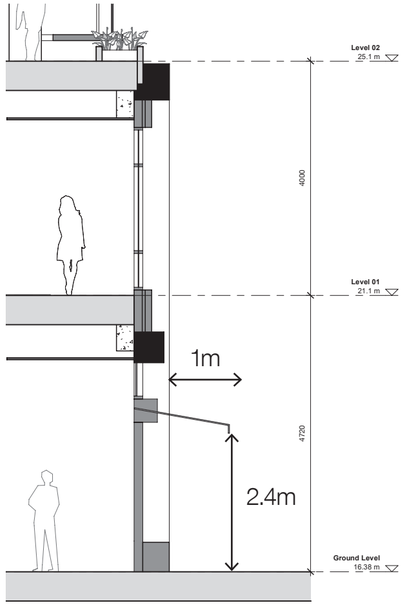
## RESPONSE

The design incorporates a variety of awning types to provide shelter from the elements in front of building entries.

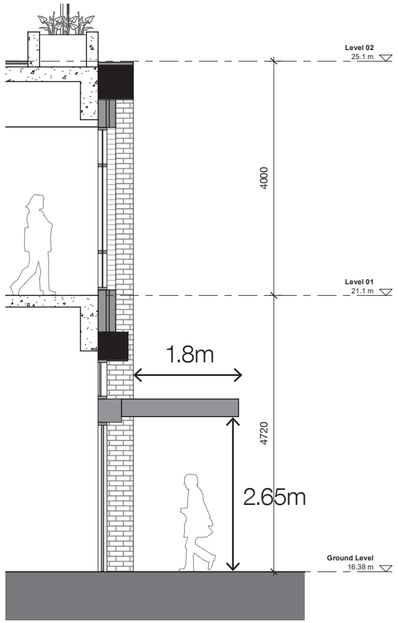
/ The variety of awning types is consistent with the Urban Design principles for the precinct, Building 3 has an eclectic mix of awning types

/ Types C, D and E are consistent with the City of Sydney requirements

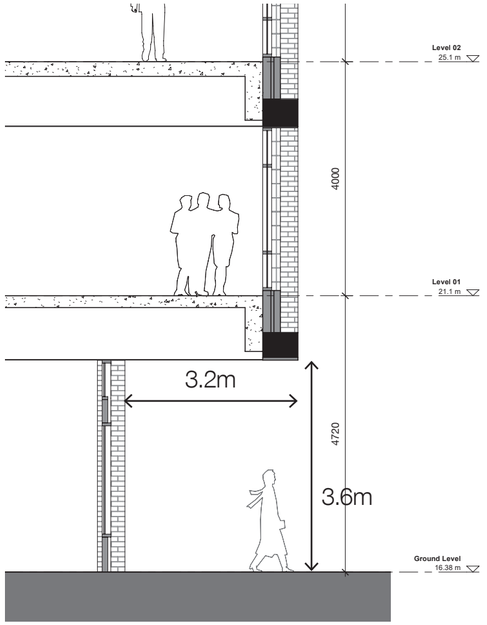
/ Types A and B are typically lower to create a more intimate scale to the community space. These awnings are located above an elevated terrace, as opposed to a typical street footpath, and therefore the City of Sydney control does not apply.



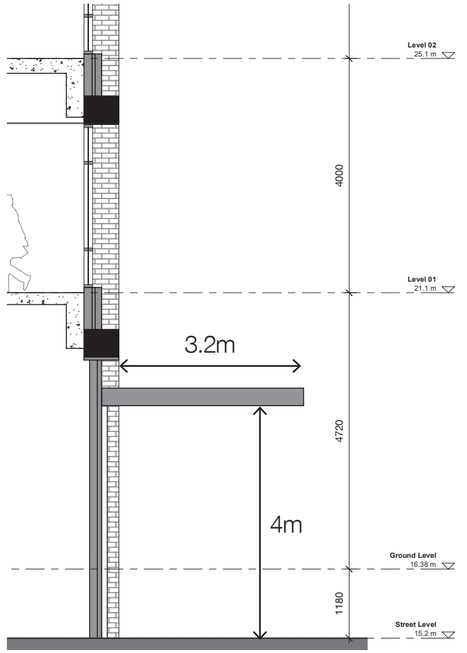

Type A Community Space (Church Yard)



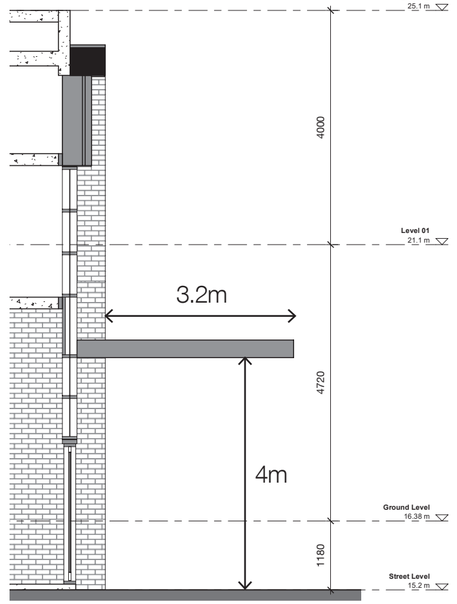

Type B Community Space (Botany Road)




Type C Student Accommodation and Gym




Type D Wellington Street (Back of House)



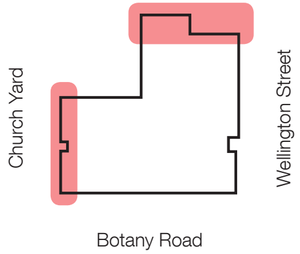

Type E Social Housing Entry

## DESIGN EXCELLENCE

17. Buildings 3 and 4

(a) Blank side walls – The north and east elevations of Building 3 feature large expanses of solid cladding. The east elevation is proposed to be clad in a moderately dark colour. The design would be improved by adding a window to the east wall of the studios in the SE corner on levels 6 and above. While the cladding is articulated into horizontal and vertical framing with infill panels, the materials for each of the elements is the same, resulting in monotony. This could be relieved by using alternate materials or textures for the infill panels;

(City of Sydney)

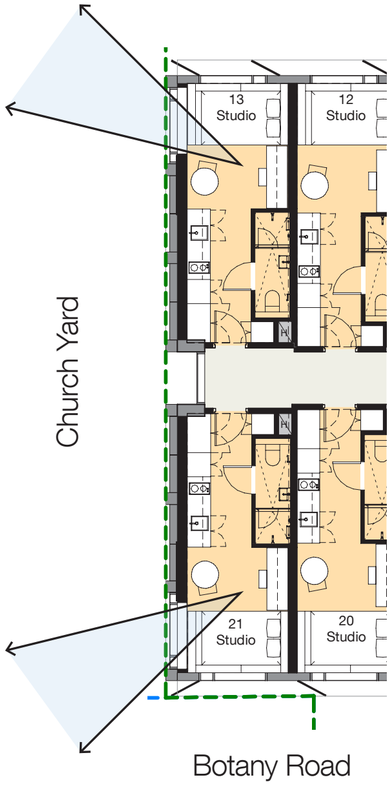



Key Plan

## RESPONSE

The design of the building ends have been developed in response to feedback from the DRP to ensure the facade design to these elevations are highly considered.

This page provides further justification and rationale to the SSDA design, whilst the following page describes proposed improvements to the east facing side wall.




Plan of northern building end


### Northern Building End

/ The built from is articulated into 2 volumes with the corridor expressed as a glass slot

/ The light-coloured grid frame creates a legible 2 storey scale. The expressed grid frame gives the elevation depth, and creates shadows on the solid aluminium cladding

/ Windows to corner studios further reduces the extent of solid cladding

/ Signage is proposed to top of building


### Eastern Building End

/ The built from is articulated into 2 volumes with the corridor expressed as a glass slot

/ The two volumes are stepped in plan and height to emphasise this articulation

/ The light-coloured grid frame creates a legible 2-3 storey scale. The expressed grid frame gives the elevation depth, and creates shadows on the solid aluminium cladding

/ Window to the NE twin room breaks up the solid cladding

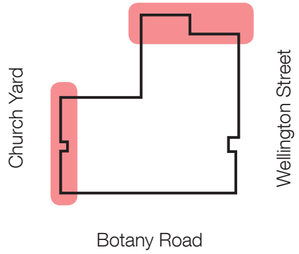
/ Signage is proposed to top of building

# RESPONSE

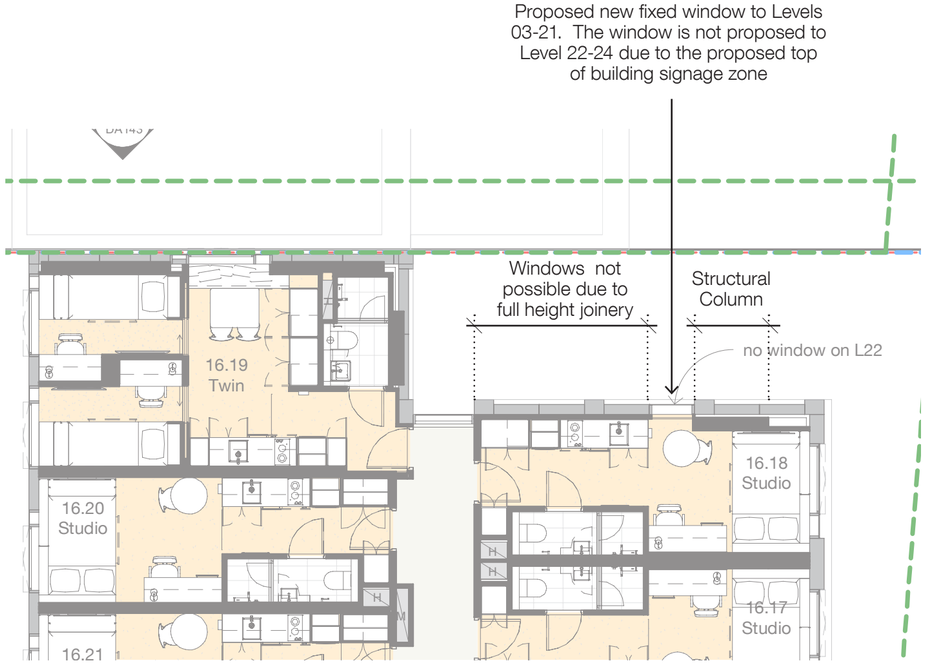
## Additional Window to the SE Studio

In response to the City of Sydney comments, an additional window is proposed to the south east studio on the eastern elevation.

This window will help break up the solid cladding to this elevation, whilst also providing solar access and easterly views to this corner studio.




Key Plan




Detailed Plan

3D view of the east elevation showing the additional windows proposed to the south east studio

## DESIGN EXCELLENCE

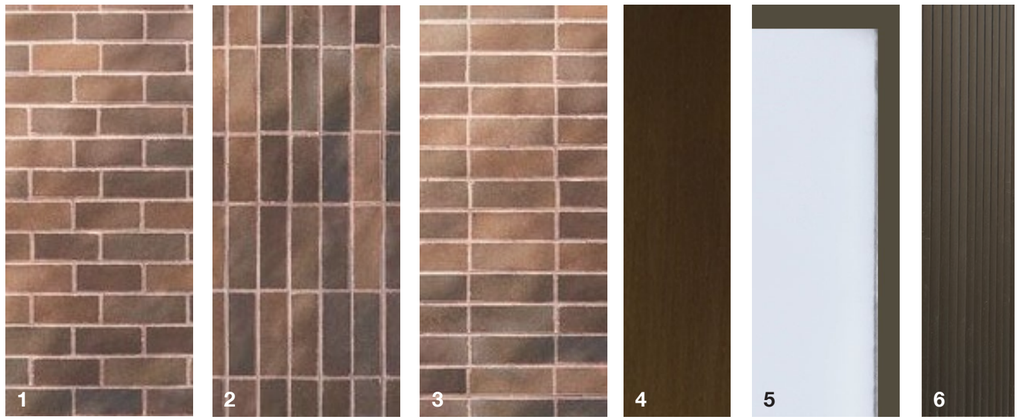
17. Buildings 3 and 4

(b) There is a general lack of certainty or clarity of the actual finishes. Actual products must be specified rather than generic descriptions such as “brickwork – light / cream” and “brickwork – dark grey / brown”;

(City of Sydney)

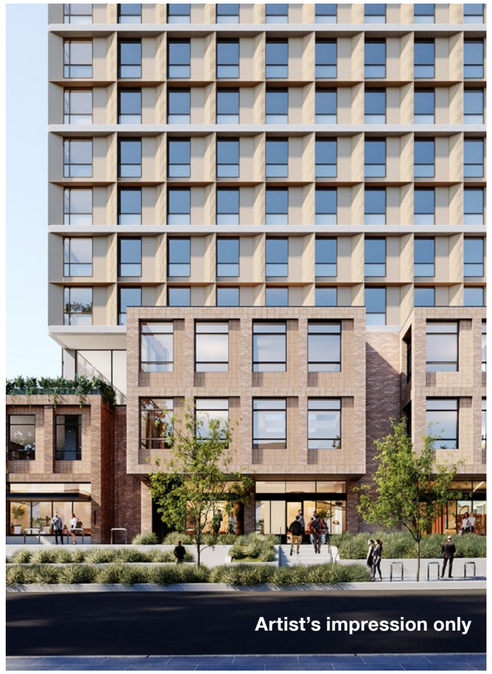
# BUILDING 3 MATERIALS BOARD

## PODIUM



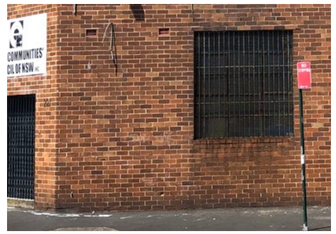

## RESPONSE

Additional information regarding the proposed materials and finishes is provided.



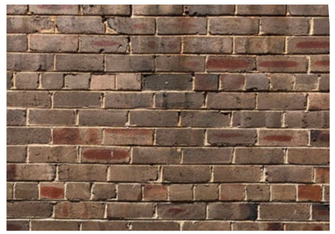

The bricks for the podium are intended to relate to the materiality of the local context, without trying to mimic it. Dry pressed bricks are proposed for their textural quality and the range of tones that are produced from a single brick type.

**Materiality of buildings within the immediate vicinity of the southern precinct:**



291 George Street

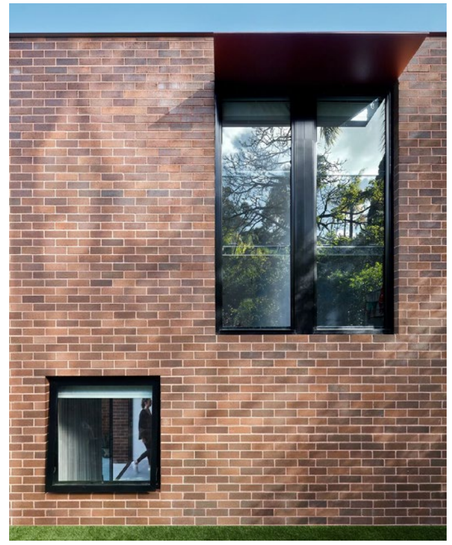
116 Wellington St



130 Botany Lane

### Building 3 Podium Finishes

| | | |
|---|---|---|
| 1/ | Brickwork - General podium | Dry Pressed Bricks<br>Colour - Brown/Red |
| 2/ | Brick - Soldier Course | As above |
| 3/ | Brick - Stacked Bond Infill | As above |
| 4/ | Clear vision glass | Double glazed unit with clear performance vision glass with neutral body tint |
| | Window frames | Aluminium window system<br>Powdercoat finish “metallic” finish<br>Colour - “Dark Bronze” |
| 5/ | Metal Detailing | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 6/ | Louvres and metalwork to back of house areas | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |



Example: House Lincoln, Those Architects

## DESIGN EXCELLENCE

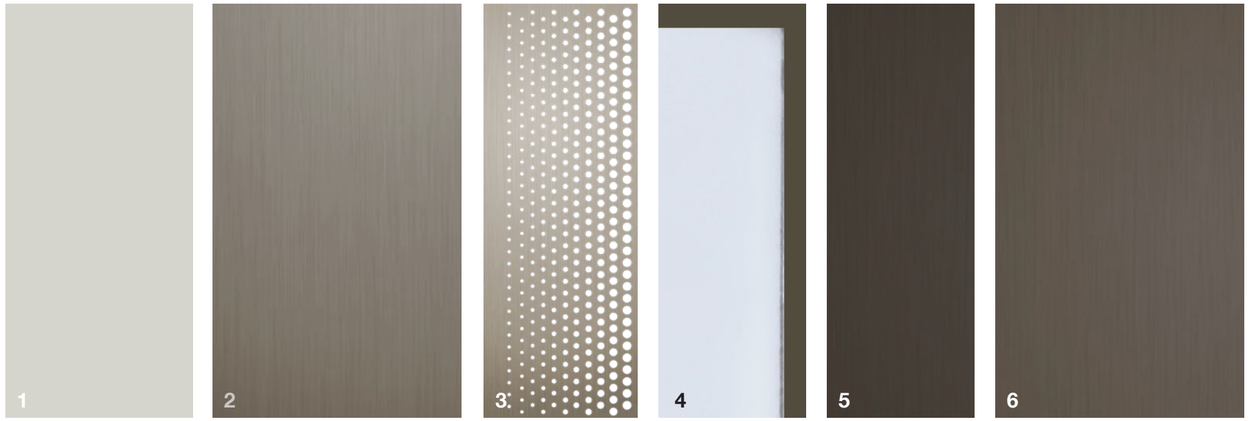
17. Buildings 3 and 4

(b) There is a general lack of certainty or clarity of the actual finishes. Actual products must be specified rather than generic descriptions such as “brickwork – light / cream” and “brickwork – dark grey / brown”;

(City of Sydney)

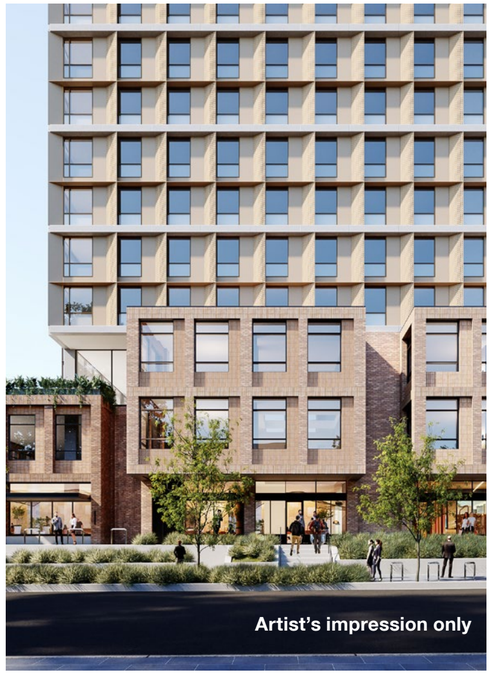
# BUILDING 3 MATERIALS BOARD

## TOWER




## RESPONSE

Additional information regarding the proposed materials and finishes is provided.





### Building 3 Tower Finishes

| | | |
|---|---|---|
| 1/ | Horizontal Sunshades to western volume | Solid Aluminium<br>Powdercoat “matt” finish<br>Colour - “Warm Grey/Champagne” |
| 2/ | Cladding to East & West Studios | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Light/Medium Bronze” |
| 3/ | Perforated Aluminium Sunshades to East & West Studios | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Light/Medium Bronze” |
| 4/ | Clear vision glass | Flush glazed DGU with clear performance vision glass with neutral body tint |
| | Glass spandrels | Flush glazed DGU with colorback |
| | Window frames | Aluminium curtain wall system<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 5/ | Aluminium Spandrel Cladding Panel to North & South Studios | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 6/ | Cladding / Sunshades to North & South Studios | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Medium/Dark Bronze” |

## DESIGN EXCELLENCE

17. Buildings 3 and 4

(b) There is a general lack of certainty or clarity of the actual finishes. Actual products must be specified rather than generic descriptions such as “brickwork – light / cream” and “brickwork – dark grey / brown”;

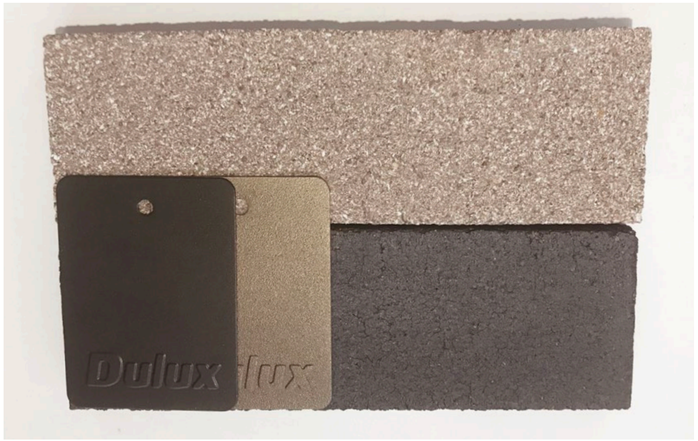
(City of Sydney)

## RESPONSE

Additional information regarding the proposed materials and finishes is provided.

# BUILDING 4 MATERIALS BOARD






## Building 4 Finishes

| | | |
|---|---|---|
| 1/ | Exposed slab edges | Off form concrete |
| 2/ | Brickwork - General | Dry Pressed Bricks<br>Colour - Light Cream/Beige |
| 3/ | Vertical shading battens | Solid Aluminium<br>Powdercoat finish “metallic” finish<br>Colour - “Natural Bronze” |
| 4/ | Balcony balustrades | 40-50% Perforated Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 5/ | Clear vision glass | Double glazed unit with clear performance vision glass with neutral body tint |
| | Window frames | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 6/ | Acoustic Ventilator Panel | Perforated Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Natural Bronze” |
| 7/ | Spandrels to Windows | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 8/ | Profiled cladding to Level 9 | Solid Aluminium<br>Powdercoat “metallic” finish<br>Colour - “Dark Bronze” |
| 9/ | Mesh screen to roof terrace | “Marine grade” stainless steel woven wire mesh |
| 10/ | Vertical sun blades to Apartment type 2D | Solid Aluminium<br>Powdercoat finish “metallic” finish<br>Colour - “Natural Bronze” |
| 11/ | Brickwork - Level 01 | Dry Pressed Bricks<br>Colour - Dark Grey |

## DESIGN EXCELLENCE

17. Buildings 3 and 4

(c) Further clarity should be sought on the proposed glazing – “performance vision glass” is specified and no information is provided to describe any tint or reflectivity issues associated with this selection. Clear glazing is always preferred;

(City of Sydney)

## RESPONSE

In co-ordination with the facade consultant, we are currently exploring a range of glass products to meet the desired building aesthetic and the required environmental performance.

Our preference is for high VLT, low reflectivity and a neutral body tint, however these preferences will need to be balanced with the required environmental performance and cost.

Whilst the final glass selection has yet to be determined, the photos and descriptions on this page demonstrate the design intent.


**Building 3**

The glass samples above, that are currently being considered for Building 3, represent a range of tints, VLT’s and reflectivity criteria. The glass samples with X’s were rejected due to being ‘too dark’ and/or ‘too blue’.

**Target specification based on glass samples:**

/ Clear performance vision glass with neutral body tint (not too blue or too green)

/ Target range 52-66% VLT (higher VLT preferred)

/ Target range 9-17% Reflectivity


**Building 4**

The glass samples above, that are currently being considered for Building 4, represent a range of tints, VLT’s and reflectivity criteria. The glass sample with an X was rejected due to being ‘too dark’ and ‘too blue’.

**Target specification based on glass samples:**

/ Clear performance vision glass with neutral body tint

/ Target range 65-72% VLT (higher VLT preferred)

/ Target range 13-18% Reflectivity

## AMENITY - STUDENT ACCOMMODATION

24. External sun shading

While it is acknowledged that the design includes some elements for shading to the western frontage, the current measures are not considered to properly address the building's exposure to direct western summer sun and urban heat considerations. Ideally, the west facade should be capable of providing close to 100% shading on extreme heat days. This can only be balanced with the requirement for midwinter sunlight ingress through the provision of externally mounted, individually operable shading devices, allowing students the ability to control heat themselves. The use of occupant-operated external blinds would also alleviate the monotony of the building expression by creating a dynamic facade, where each 'unit' of the facade would take on an individual appearance depending on the position of the louvres. This improvement could be achieved through a condition of consent and the City is able to provide the wording upon request.

(City of Sydney)

## RESPONSE

The design of the western elevation has been developed through the DRP process to create a highly articulated facade that responds to the western sun.

Individually operable shading devices were considered, but were deemed not practically viable for student accommodation for ongoing maintenance and management reasons. Due to the high cost of individually operable devices, fixed shading was considered to be more cost effective solution to shading the building.

### Design Responses to External Shading and Thermal Comfort

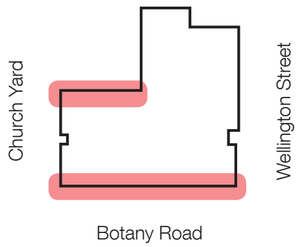
/ The western elevation has a high degree of solidity - the extent of glass to the west elevation is approximately 32%- (i.e the elevation is 2/3 solid)

/ An insulated colourback glass spandrel at lower level further reduces the area of vision glass

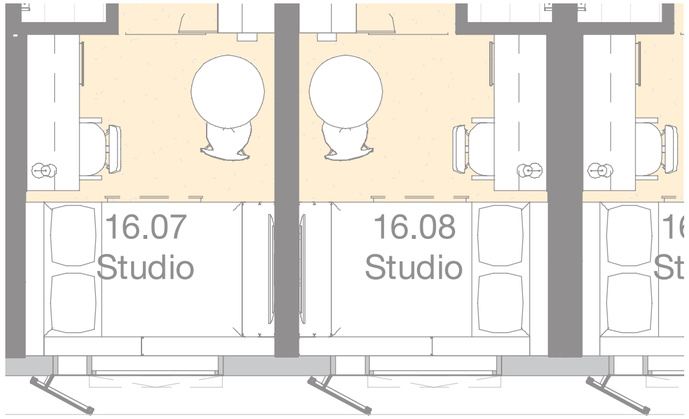
/ The west facade has a considered response to shading with horizontal sunshades for the early afternoon sun and vertical shading for the middle/ late afternoon sun. As shown in the plan below, the vertical shading panel extends in front of the window to further assist in shading

/ All studios will be fitted with an internal pull-down roller blind for students

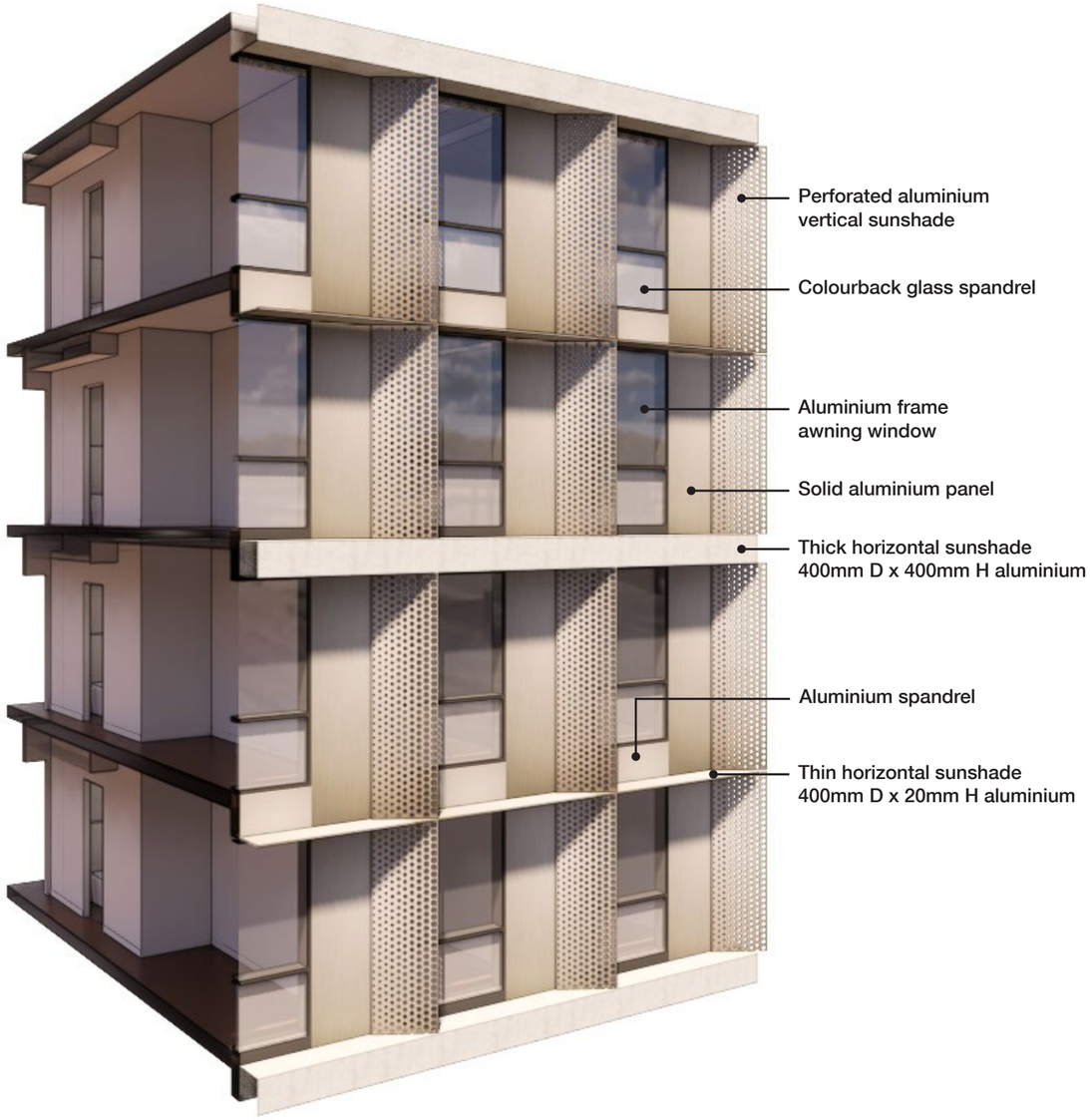
/ Performance double glazing to reduce heat transmission




Key Plan




Plan detail of west facing facade



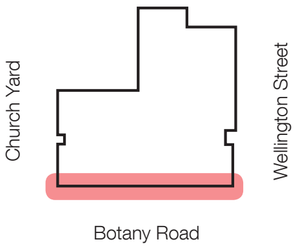

3D facade section of the west facing facade

# SHADING ANALYSIS

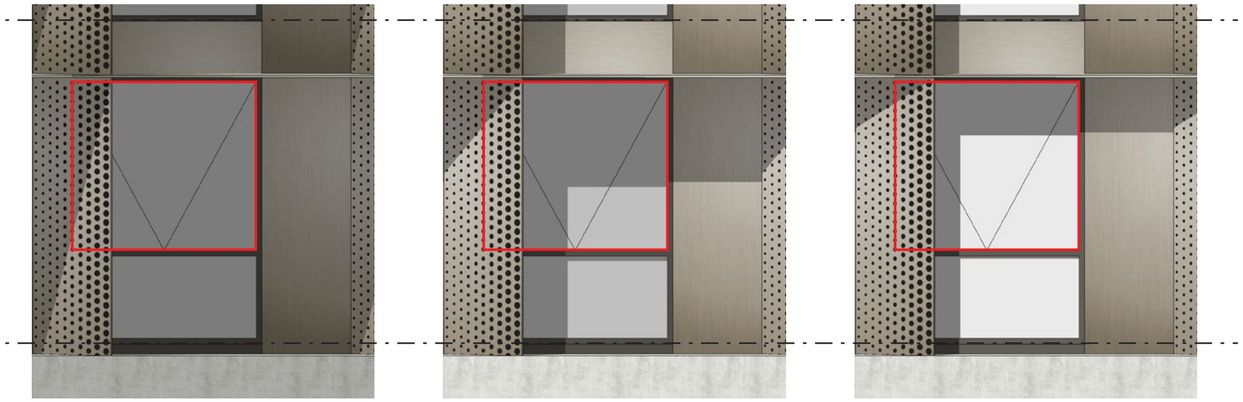
February 4th 'Summernox'
(average of Summer Solstice and Equinox)

Extent of vision glass
(32% of studio facade)

Line of floor levels



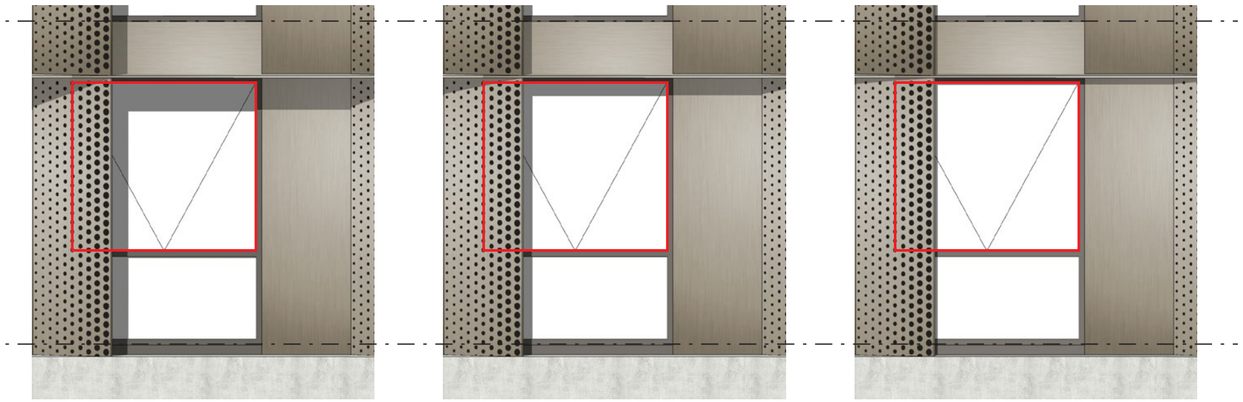

Key Plan



1pm Full shade

2pm 80% shade

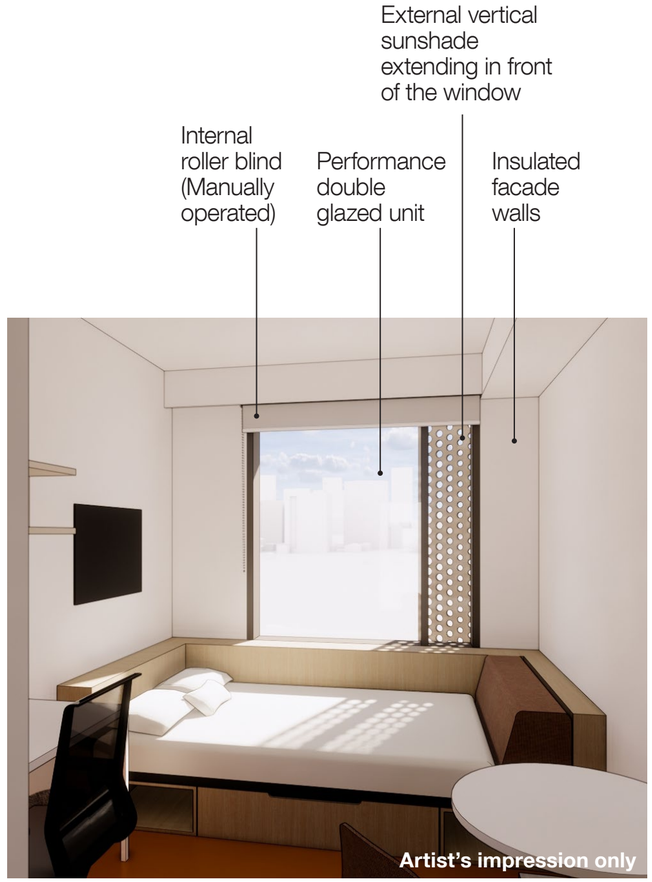
3pm 55% shade



4pm 40% shade

5pm 35% shade

6pm 25% shade




Internal view of a typical studio

## AMENITY - STUDENT ACCOMMODATION

24. External sun shading

On the northern facade, the design does not provide any shading. The design concept would not be compromised through the addition of horizontal shading elements, which could be incorporated within the window framing, similar to the proposed “thin horizontal sunshade” which is proposed on the western elevation. On the western elevation, the horizontal sunshade has no effect on low altitude afternoon summer sun. The Design Integrity report notes that prior to closing out this issue, the Panel was supportive of the proposed ‘moveable screens’ solution. This has now been removed from the scheme and further endorsement should be sought from the Panel. The application of both changes discussed above could easily be achieved through a condition of consent and the City is able to provide the wording upon request.

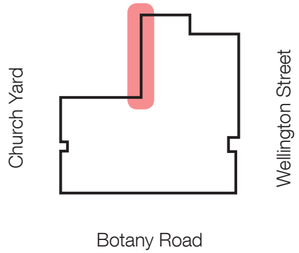
(City of Sydney)

## RESPONSE

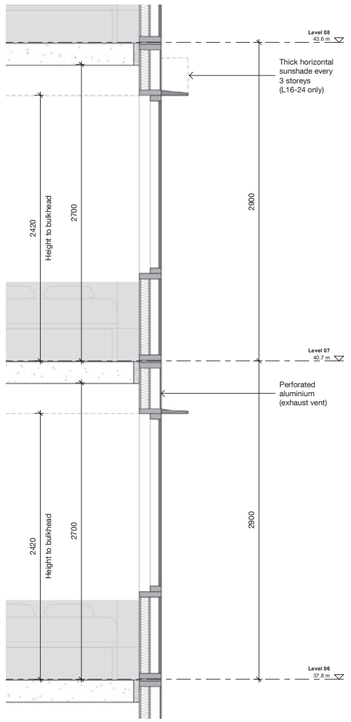
The north facade currently has 250mm horizontal sunshades located directly above each window.

The north elevation is heavily shaded by the adjacent buildings, particularly to the lower levels, which help reduce the overall heat load on the northern elevation. As the upper levels are less shaded by adjacent buildings, the horizontal sunshades to Level 16-23 are proposed to be increased to 400mm deep, to match the depth of the horizontal sunshades on the western elevation, per the City of Sydney recommendation. Refer to the following pages for further detail.

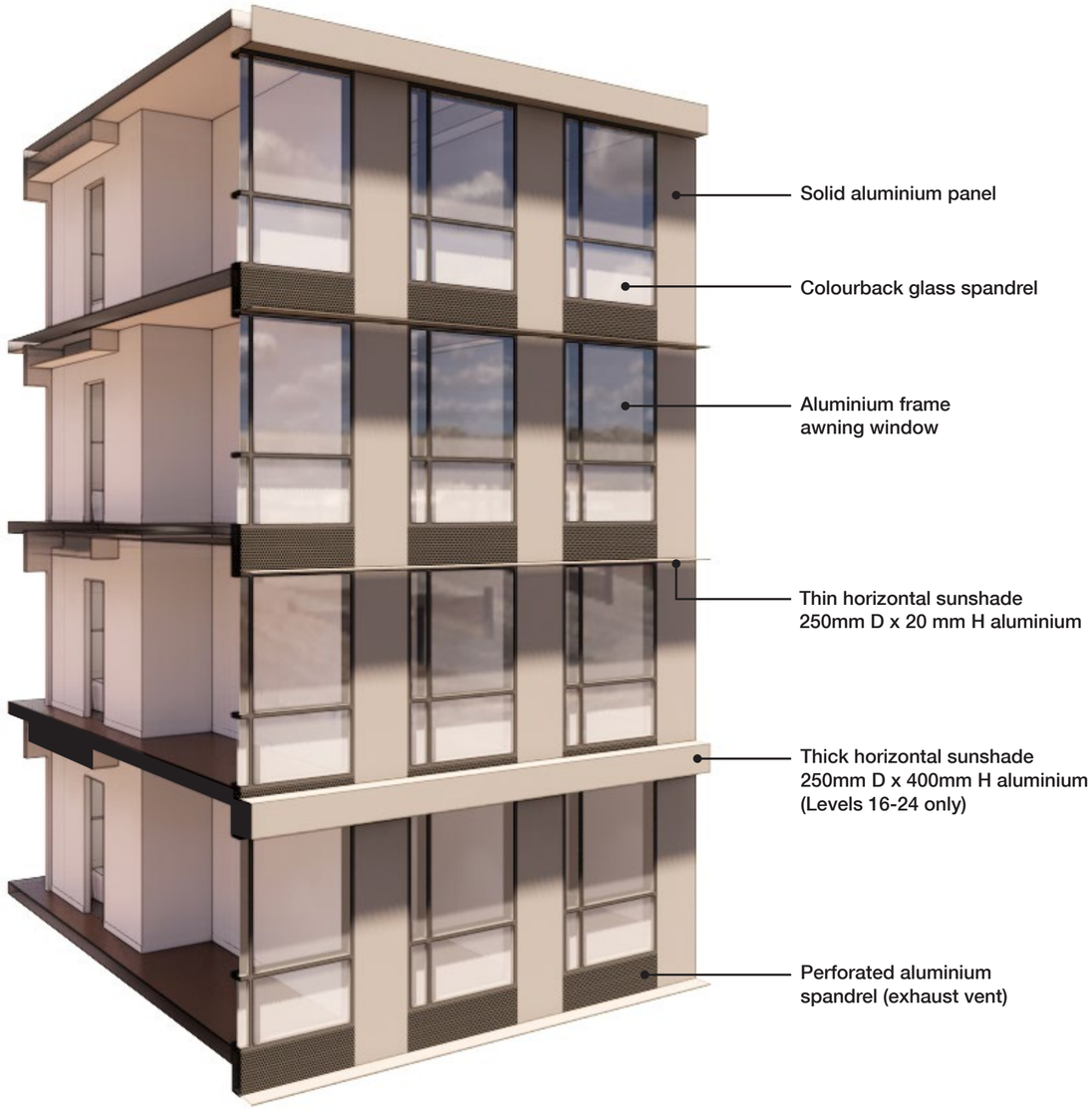
With regards to the comment about ‘moveable screens’, we believe this relates to screens proposed to the eastern elevation of Building 4 - and therefore does not apply to this facade. Moveable screens have never been proposed for Building 3.




Key Plan




Indicative Section of SSDA




3D facade section of the north facing facade

# NORTH ELEVATION SHADING DIAGRAM

Summer Solstice

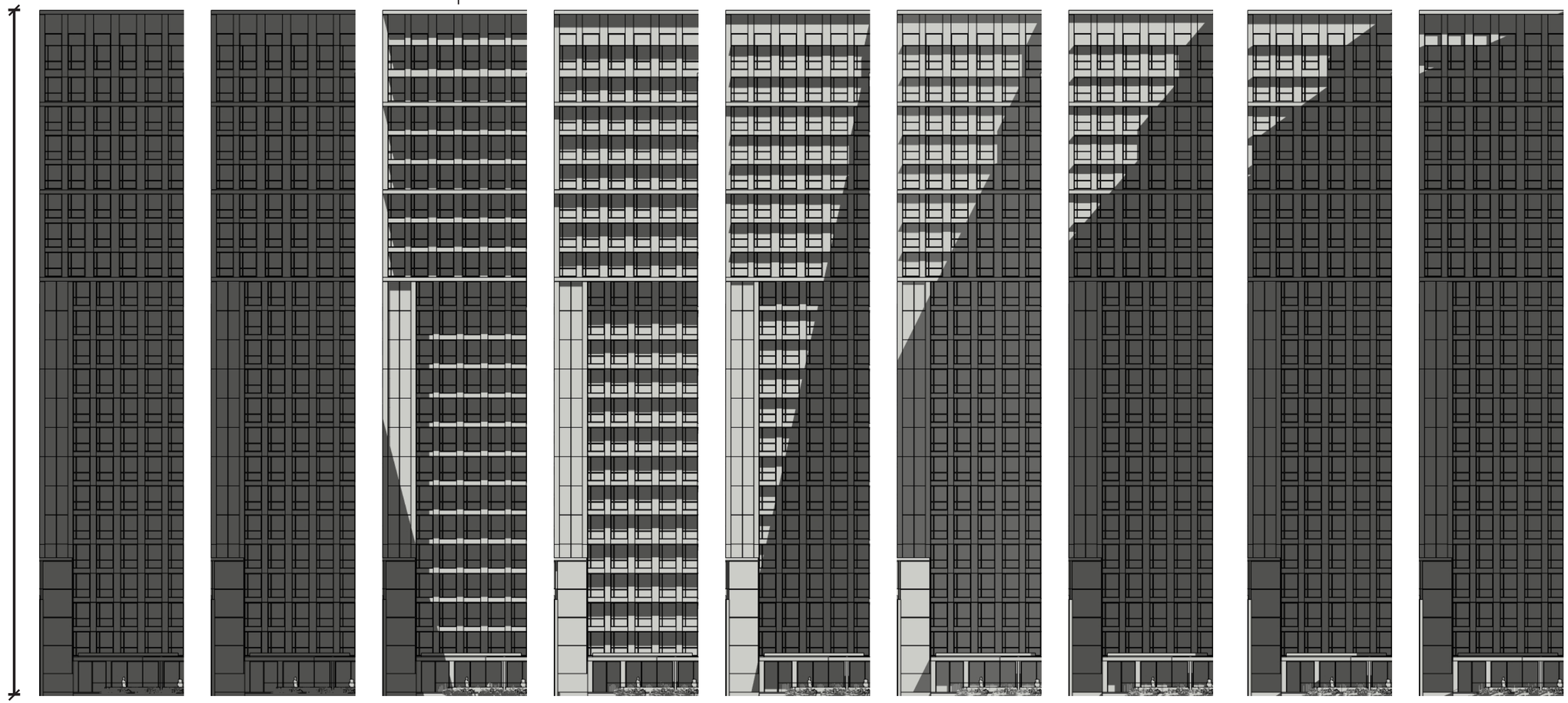
21st Dec

Note: The northern elevation receives direct sunlight from approximately 11.10am

## SSDA

250mm deep horizontal sunshades to all levels.

The shadow analysis demonstrates that the studios to the lower 2/3 of the elevation are heavily shaded throughout the day by adjacent buildings



# NORTH ELEVATION SHADING DIAGRAM

Summer Solstice

21st Dec

Note: The northern elevation receives direct sunlight from approximately 11.10am

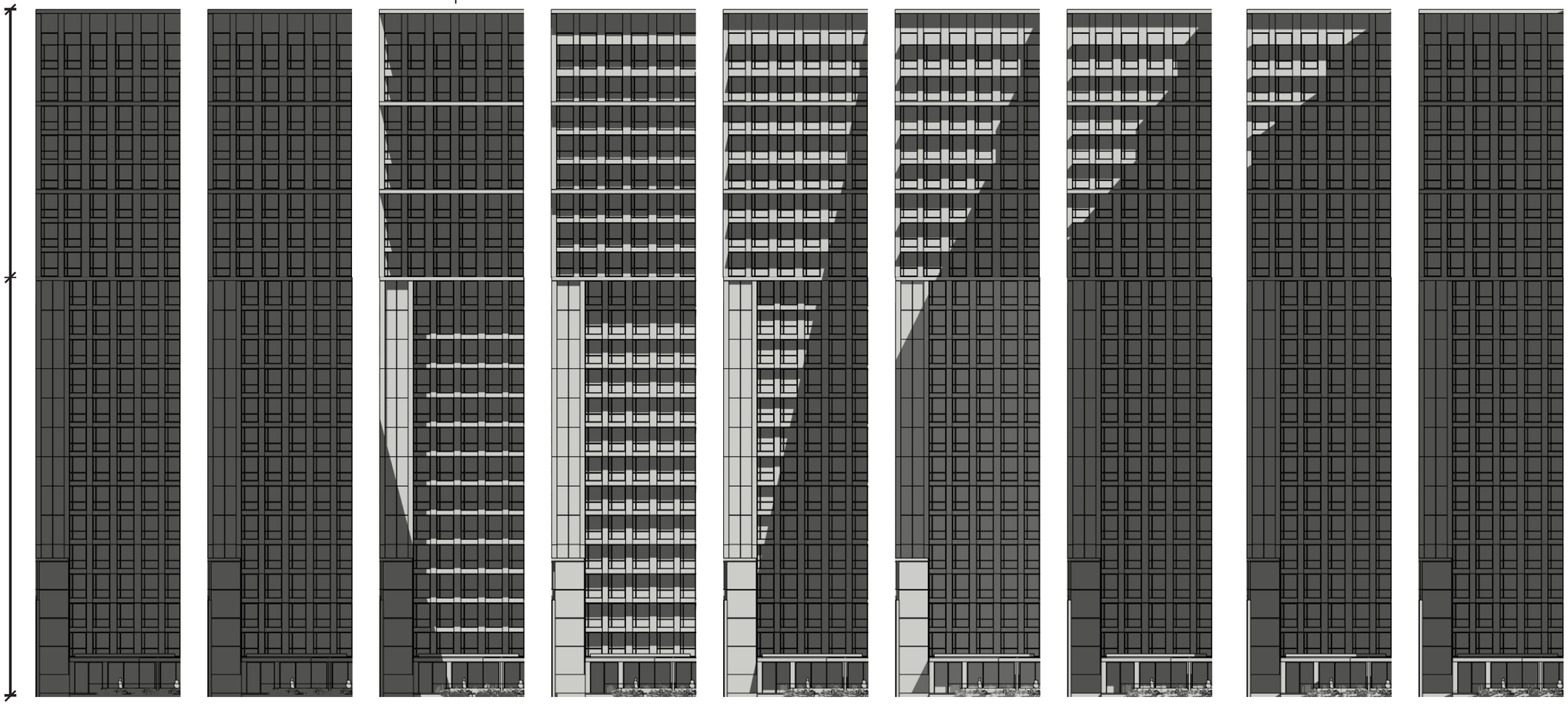
## Proposed Amendment

Horizontal sunshades increased in depth to 400mm to Levels 16-23. The deeper sunshades allow the north facing windows to be entirely in shade throughout the day at mid summer.

Studios to these levels are shaded to a lesser extent by the adjacent buildings.

250mm deep horizontal sunshades retained to Levels 03-15.

Studios to these levels are heavily shaded throughout the day by adjacent buildings.



9am 10am 11am 12pm 1pm 2pm 3pm 4pm 5pm

## AMENITY - STUDENT ACCOMMODATION

25. Wind

The wind report identifies that the communal terrace will only achieve the standing comfort criteria, even accounting for mitigation measures. It is preferable that further design work be undertaken to try to improve the amenity of this area for residents such that it meets the sitting comfort criteria.

(City of Sydney)

The adjacent diagram illustrates the expected wind conditions to the communal roof terraces, based on wind tunnel testing undertaken on the SSDA design by the wind consultant RWDI.

**Building 4 Communal Roof Terrace**

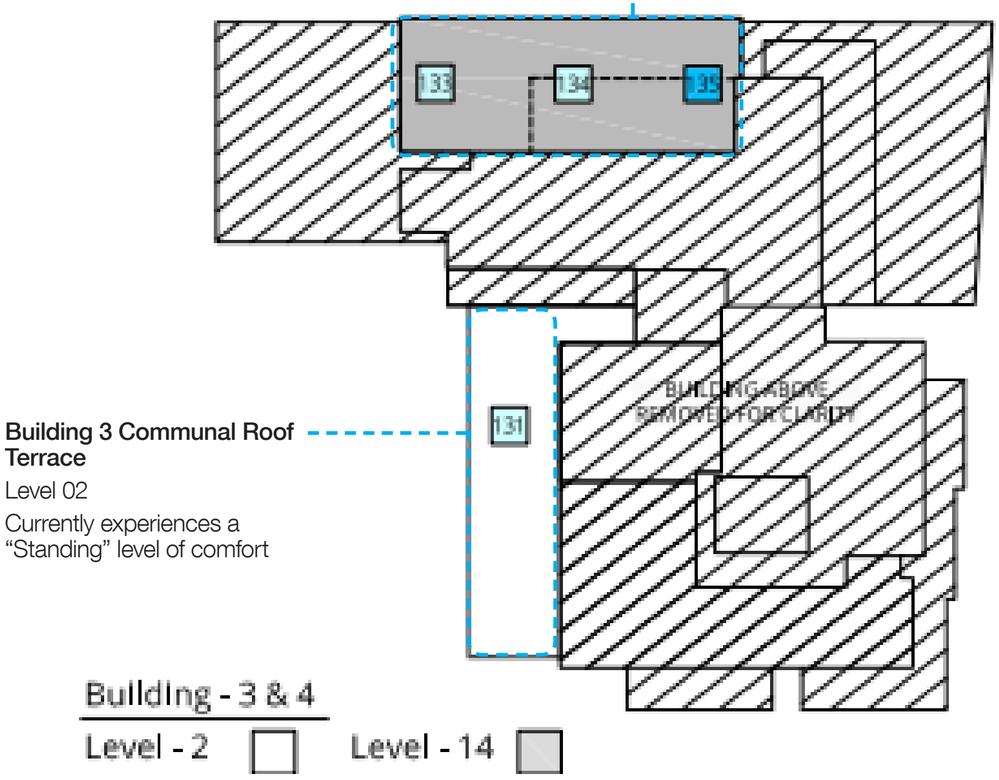
Level 09

Currently experiences a “Standing” level of comfort to the north and a ”Sitting” level of comfort to the south

**Building 3 Communal Roof Terrace**

Level 02

Currently experiences a “Standing” level of comfort

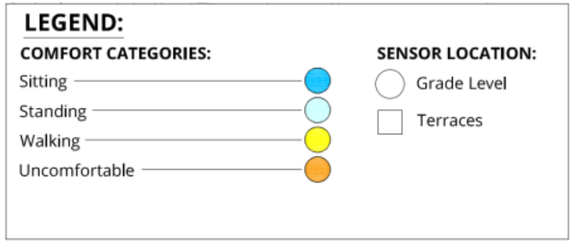



Building - 3 & 4

Level - 2 Level - 14

**Communal Terrace Wind Comfort Results**

Analysis by RWDI



## RESPONSE (BUILDING 3)

The wind conditions affecting the Building 3 roof terrace are primarily generated from downwash from the tower above.

The pergola to the communal roof terrace has been developed in response to the City of Sydney comments by amending the following:

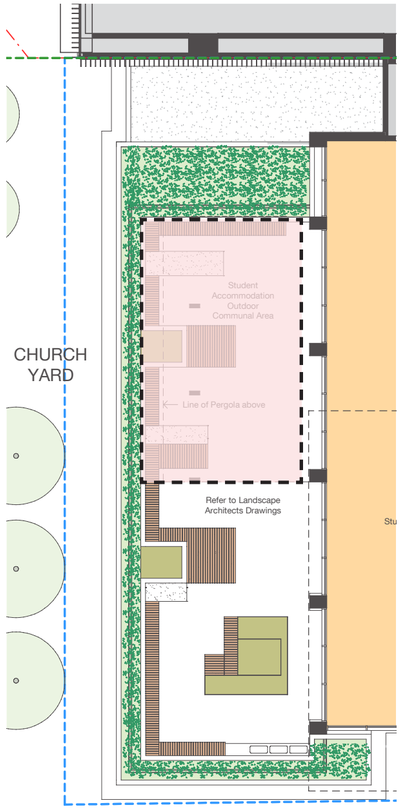
/ Pergola moved further west to align with the tower above

/ Pergola length increased

/ The pergola is proposed to have operable openings to allow for solar access in winter whilst still providing weather protection

### SSDA

3D View

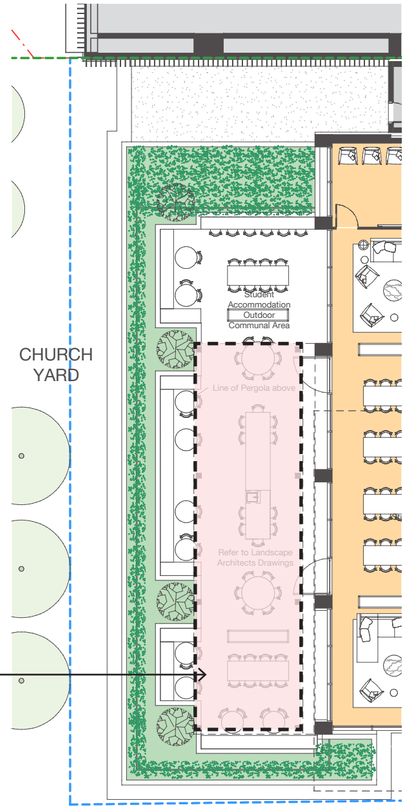



Plan

### PROPOSED AMENDMENT

3D View

Pergola moved further west (towards Botany Road) and length increased to help reduce wind downwashing off the tower form above to improve wind conditions on the communal terrace

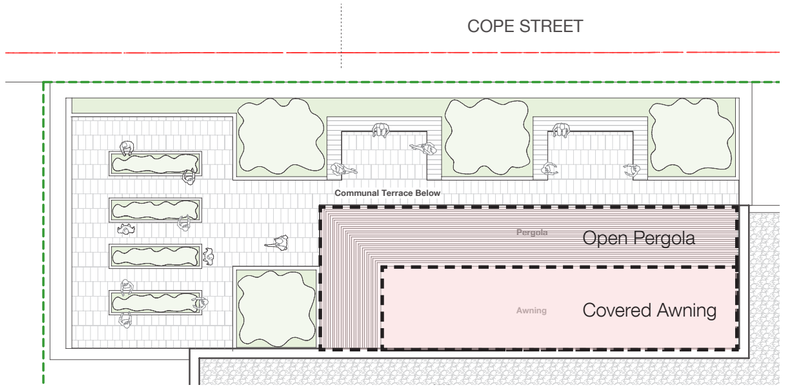



Plan

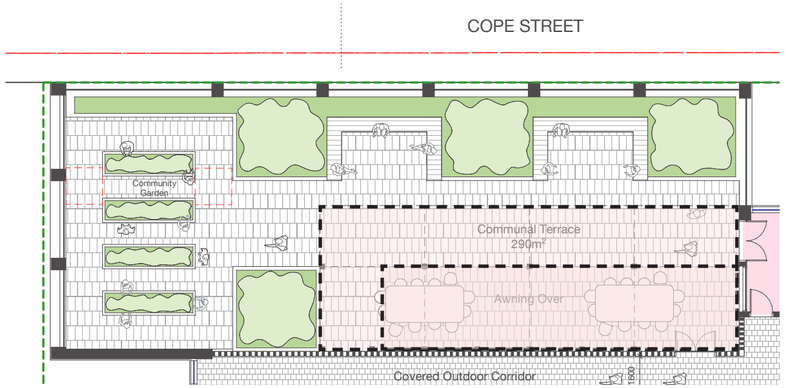
## RESPONSE (BUILDING 4)

Whilst item 25 relates soley to the Building 3 terrace, we have also reviewed the design of the pergola/awning structure to the communal roof terrace on Building 4. The pergola has been extended 2.6m to the north to further improve the wind conditions for residents.

### Building 4 Communal Roof Terrace
### SSDA

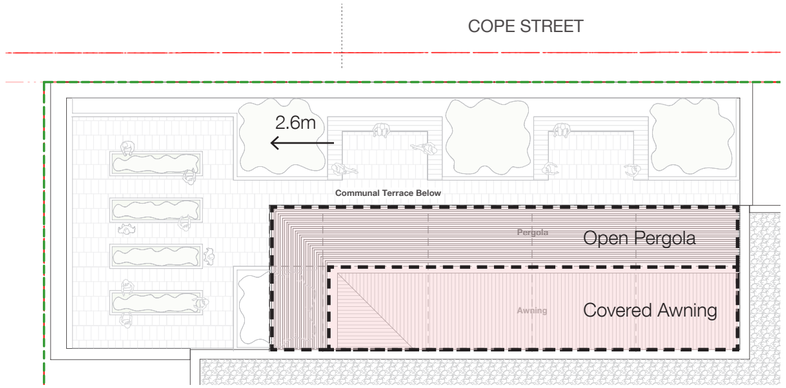



Roof Plan

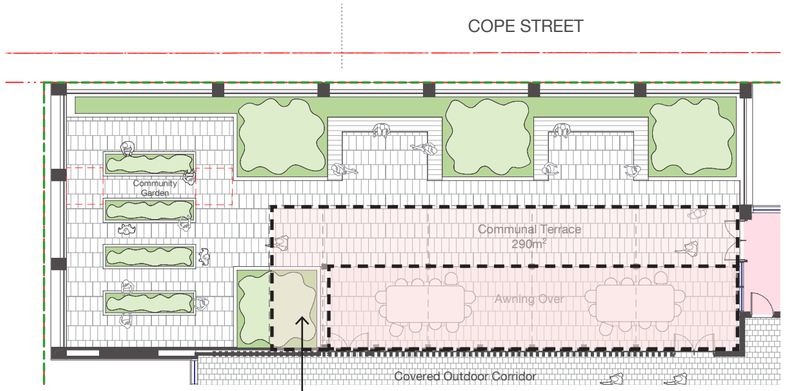



Level 09

### Building 4 Communal Roof Terrace
### PROPOSED




Roof Plan




Level 09

Pergola extended north by approx. 2.6m to further improve wind conditions on the communal terrace

## AMENITY - STUDENT ACCOMMODATION

26. Visual privacy

Insufficient building separation and visual privacy is provided between the west facing social housing apartments and east facing boarding rooms pursuant to Objectives 2F and 3F of the ADG. The proposed privacy screens to the boarding rooms are inadequate to mitigate overlooking and ensure sufficient amenity to residents. An alternative design solution is required. For example, the boarding rooms could be provided bay windows with glazing oriented towards the north and either a solid wall or similar obscuring material presented to residents of the affected social housing units.

(City of Sydney)

## RESPONSE

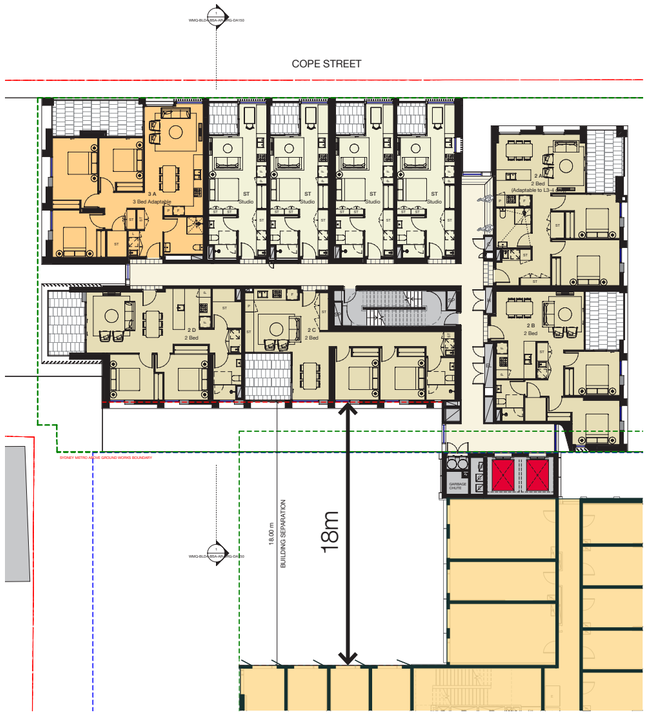
### Envelope Constraints

/ The envelopes for Building 3 and 4 are located back to back in an L-shaped plan, limiting the potential to orientate the building layouts to face away from one another.

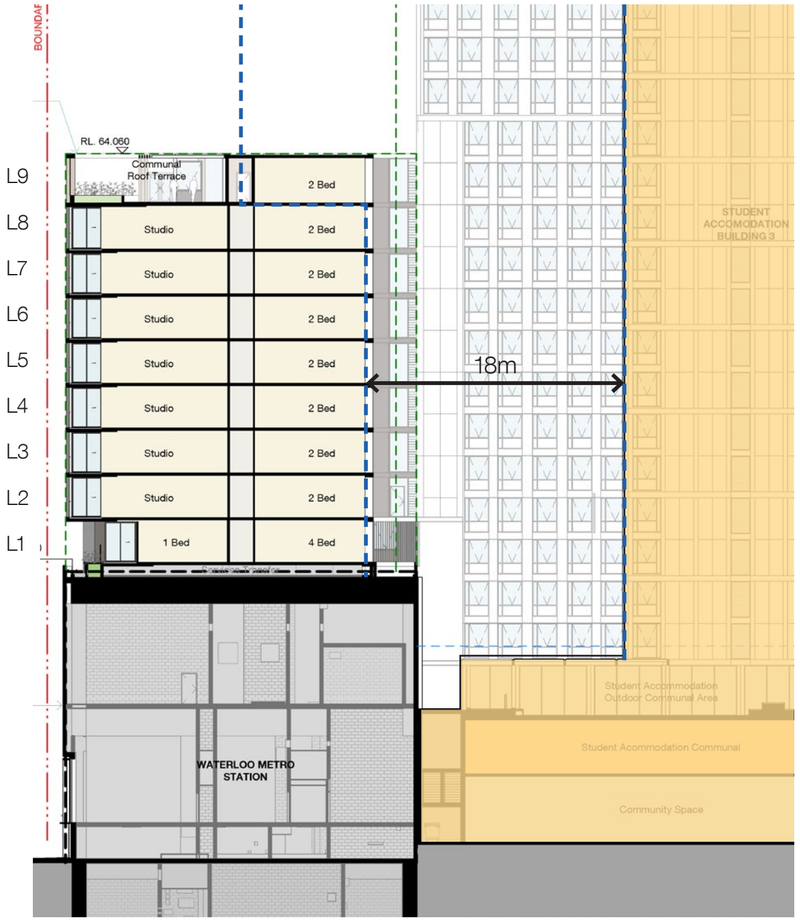
/ Due to the constraints of the metro station box, the Building 4 lift core is located within the Building 3 envelope. The internal corner, which would typically be used for the core, subsequently becomes usable floor space.

/ The Building 4 envelope is atypical in the sense that it is located above a ~20m high metro box and being adjacent to the 3 storey high podium of Building 3.

/ To utilise the Building 4 envelope efficiently a double loaded corridor is required, with west facing apartments being unavoidable.




Typical Plan NTS




Section NTS

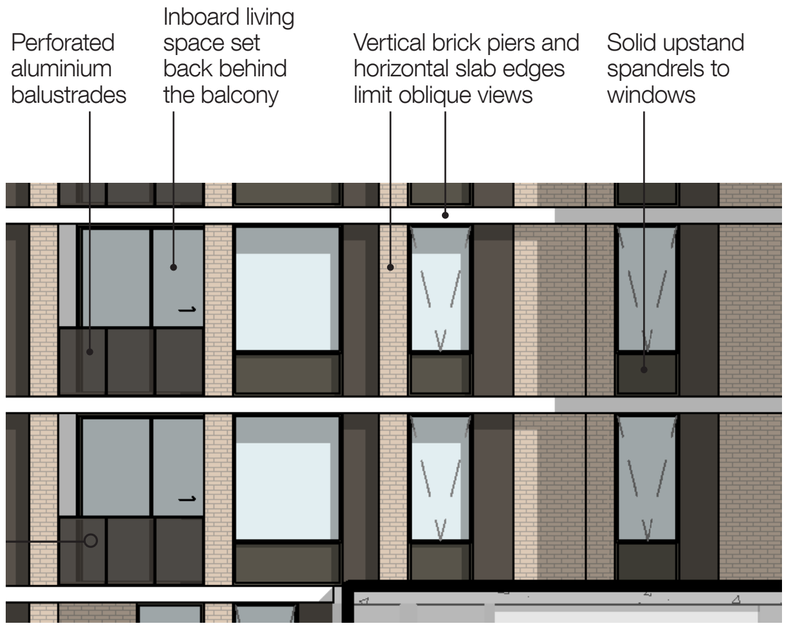
# RESPONSE

## Privacy Measures to Building 4:

/ Glazing to bedrooms is limited to a single window that is 1.05m wide with 0.8m high solid spandrels. Bedroom windows are also located in the corner of the rooms to limit view angles

/ Perforated aluminium balustrades provide further visual privacy to the west facing balcony

/ Providing a high level of facade depth and solidity on the western facade through the use of projecting horizontal slab edges, vertical brick piers and spandrels to windows helps restricts oblique views from floors above and below




**Closeup elevation of Building 4 west facade**


**Building 4 west elevation**

## Privacy Measures to Building 3:

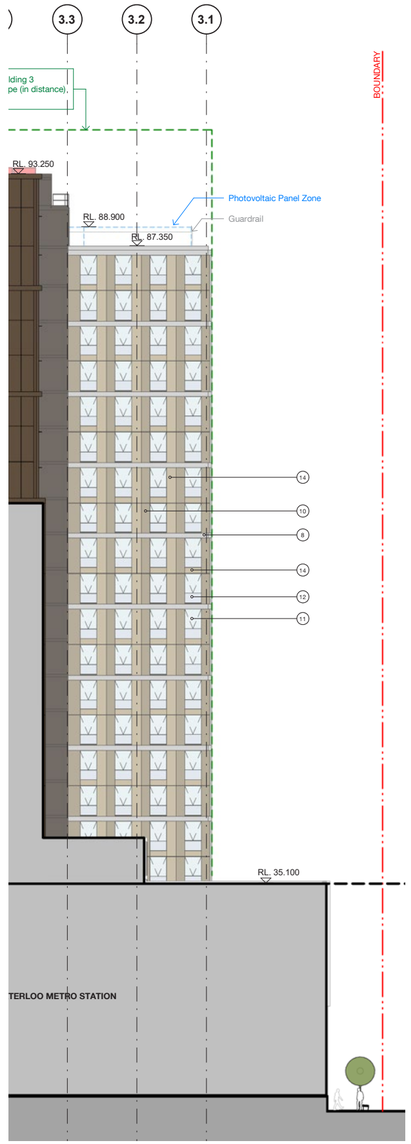
/ Angled privacy screens to the Building 3 facade help to partially obscure the windows to the student accommodation studios.

/ Locating the shared common space to each floor on western side of the floorplate, therefore not overlooking other buildings.

/ Integrated internal roller blinds installed to all studios allowing a degree of user control

**Closeup elevation of Building 3 east facade**

The privacy screen covers approx. 21% of the east facing student accommodation windows (when viewed in elevation)




**Building 3 east elevation**

## AMENITY - SOCIAL HOUSING

27. Solar Access

The City notes that 15 of 70 apartments (21%) do not receive any direct solar access during mid-winter, four more than is permitted (15%) in accordance with Objective 4A-1 of the ADG. The City does not support the applicant's justification by including direct sunlight received after 3.00pm as this is not reflected in the design guidance or criteria and is of little thermal benefit due to the low altitude of the sun. Furthermore, some assertions regarding solar access are overstated, for example the quality of solar access to the living room of apartment 106 (the four-bedroom apartment).

(City of Sydney)

# RESPONSE

The proposed design has 15 of 70 apartments (21%) that do not receive direct solar access during mid-winter. Our response includes an analysis of the envelope constraints that have limited the ability to achieve compliance, as well as our design responses to maximise solar amenity through other design responses.

### Envelope Constraints

The Stage 1 DA envelope for Buildings 3 & 4 has a number of constraints that have limited the ability to achieve solar access to Building 4. These constraints include:

/ The envelopes for Building 3 and 4 are located back-to-back in an L-shaped plan, reducing the extent of available facade frontage

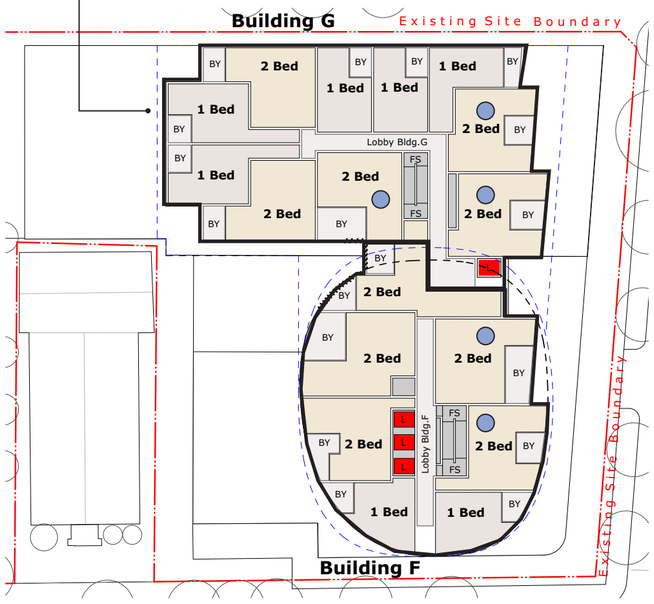
/ Solar access to west facing apartments in mid winter is limited by the shadow cast by Building 2 - an inherent limitation of the Stage 1 masterplan. The solar access studies from the Stage 1 DA demonstrate that the west elevation of Building 4 did not receive sunlight between 1pm and 3pm at Mid Winter. As a comparison, the reference scheme had 30% of apartments recieving 0hrs direct sunlight between 9am and 3pm.

/ The location of the core, which is constrained by the station box below, limits the extent of available facade frontage.

/ To utilise the Building 4 envelope efficiently a double loaded corridor is required

**Refer to the following page for the design responses to maximise solar amenity**

Concentrating apartments on the northern elevation means no natural light or cross ventilation to corridor




Stage 1 DA Reference Scheme

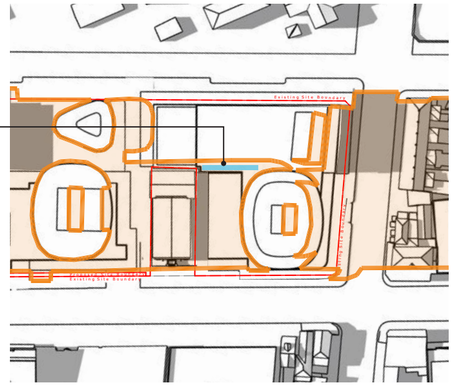
Building 4 Envelope

- 0hrs sunlight to 3 / 10 apartments (30%)

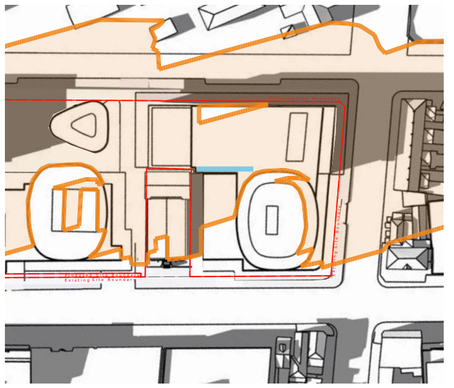
Building 3 & 4 Envelope

- 0hrs sunlight to 5 / 17 apartments (29.5%)

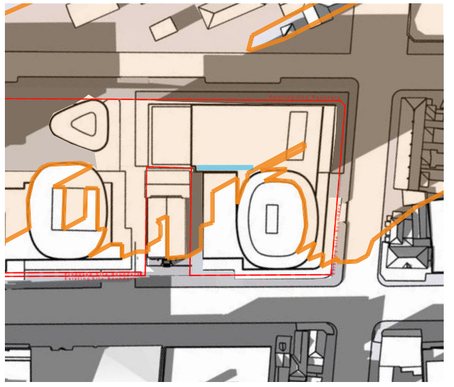
Western elevation of Stage 1 DA reference scheme in shadow from 1pm to 3pm



Mid Winter 1pm



Mid Winter 2pm



Mid Winter 3pm

# RESPONSE

## Design Moves to Maximise Solar Amenity

/ The east facing volume has been designed to be deeper (than the west facing volume) to maximise apartments on this frontage for solar access

/ The west and south facing volumes have been designed to be shallower to minimise the quantity of apartments in these orientations

/ The quantity of apartments to the south and west has been minimised

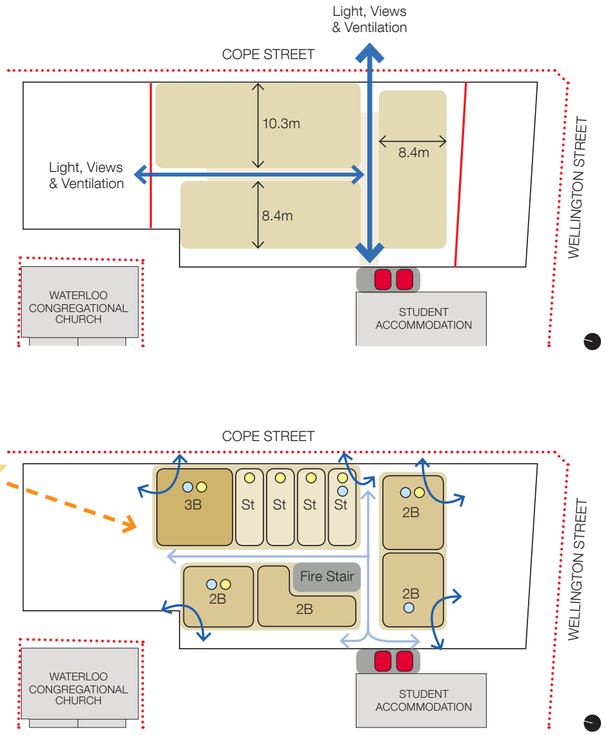
/ Whilst outside the hours prescribed under the ADG, we note the the solar access analysis shows the west facing apartment receives direct sunlight from 3.30pm onwards at mid winter.

## Providing Solar Amenity to Common Spaces

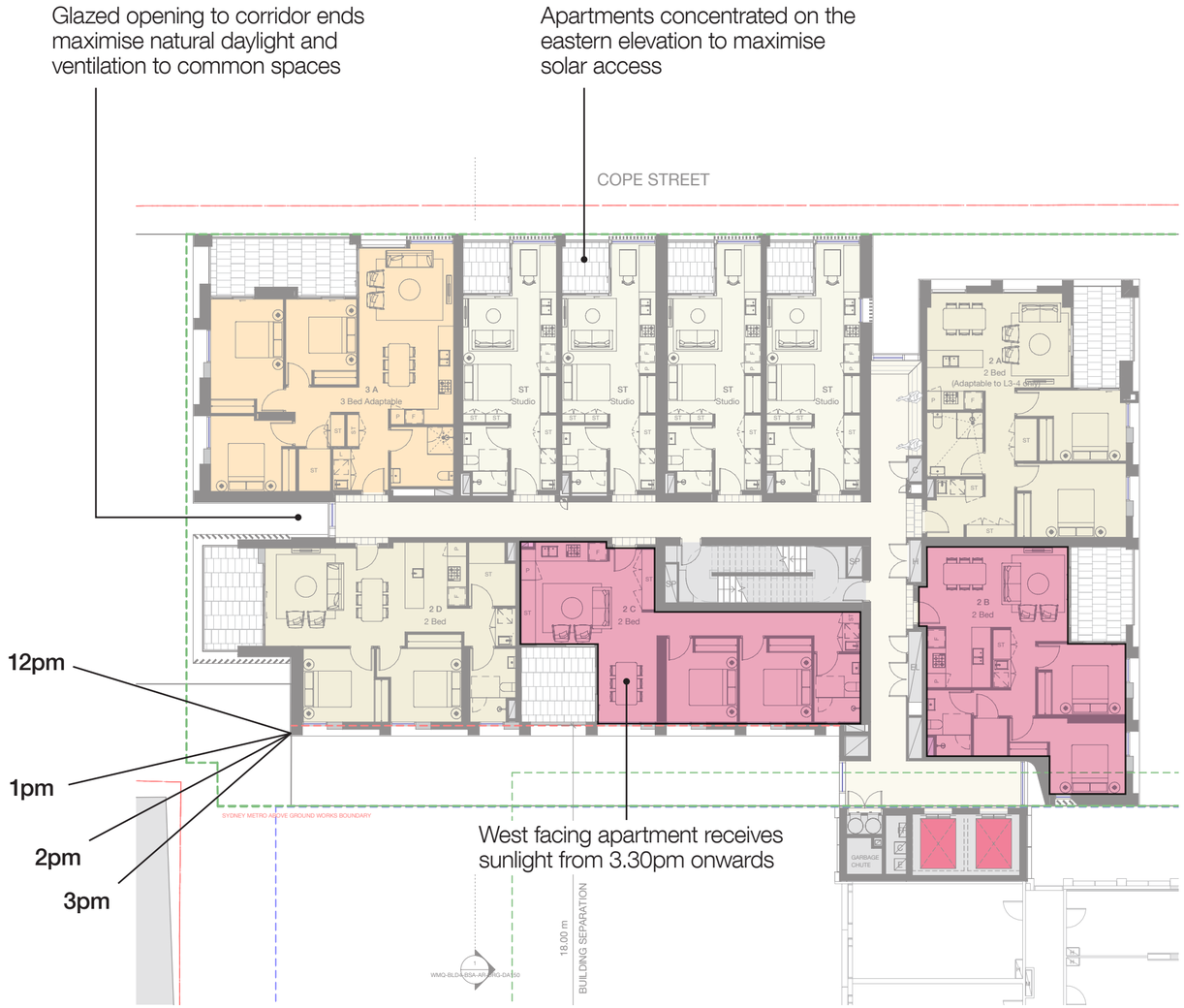
/ Multiple windows to the corridors and lift lobby provide solar access and natural daylight and ventilation to the common spaces

/ The communal roof terrace on Level 09 has been orientated to the north east to have a high level of solar access and is accessible for all residents.

| | ADG | | |
|---|---|---|---|
| | 2 Hours | 0 Hours 9am-3pm | 0 Hours 9am-3.45pm |
| Level 09 | 1 / 2 | 0 / 2 | 0 / 2 |
| Level 08 | 5 / 8 | 2 / 8 | 1 / 8 |
| Level 07 | 7 / 9 | 2 / 9 | 1 / 9 |
| Level 06 | 7 / 9 | 2 / 9 | 1 / 9 |
| Level 05 | 7 / 9 | 2 / 9 | 1 / 9 |
| Level 04 | 7 / 9 | 2 / 9 | 1 / 9 |
| Level 03 | 7 / 9 | 2 / 9 | 1 / 9 |
| Level 02 | 7 / 9 | 2 / 9 | 1 / 9 |
| Level 01 | 3 / 6 | 1 / 6 | 1 / 6 |
| **Total** | **51 / 70** | **15 / 70** | **8 / 70** |
| **Achieved** | **73%** | **21%** | **11%** |
| Target | Min 70% | Max 15% | |




Floorplate Design Response




Apartments with 0hrs direct sunlight between 9am and 3pm on winter solstice

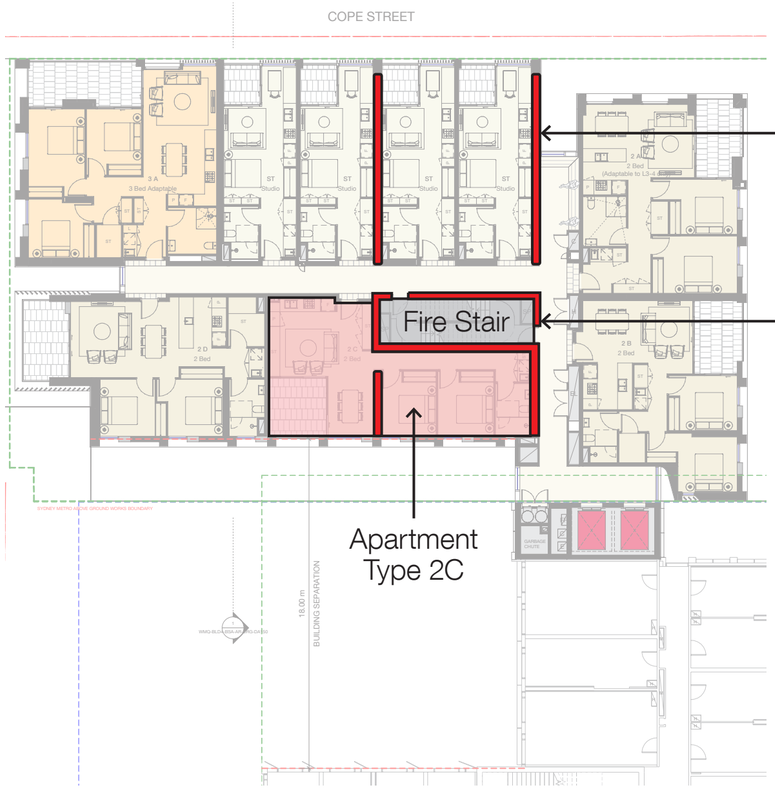
# RESPONSE

## West Facing Apartment

The current apartment layout for the west facing apartment (Type 2C) has been designed to maximise functionality, privacy and outlook.

Alternative layouts A and B were considered to re-locate the living space and balcony further south to achieve direct solar access to this apartment in midwinter. However, given the constraints of the envelope, and the required building structure, these alternative layouts did not achieve the desired outcomes for apartment living.

The diagram below illustrates the structural constraints for planning this apartment:



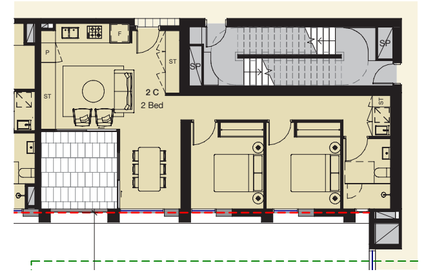

Red elements are structural bracing elements for lateral stiffness. These are required as the lift core (which would typically provide lateral stiffness) needs to be located outside of the building.

Fire scissor stair is centrally located due to travel distances

### Current Layout - Per SSDA (PREFERRED)

✓ The living space is located as far north as possible to help improve visual privacy to Student Accommodation rooms and the adjacent Social Housing lift lobby

✓ The in-board living space helps further improve visual privacy and reduces the facade heat load in summer



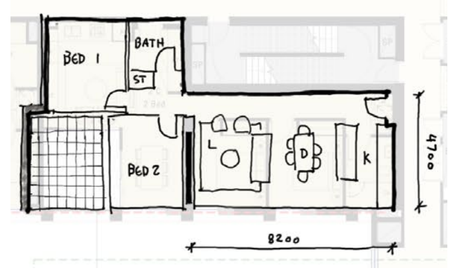

### Alternative Layout A

✓ Good sized living space

× Living space located in close proximity to the lift lobby

× Living space is disconnected from the balcony due to the structural column

× Party wall with adjacent apartment is cranked to reapportion area, to allow for a bedroom and balcony on the facade

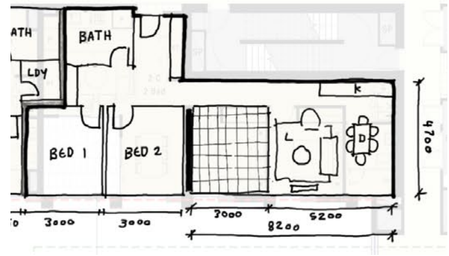



### Alternative Layout B

✓ Balcony located adjacent to the living space

× Living space located in close proximity to the lift lobby

× Living space and kitchen is undersized and compromised

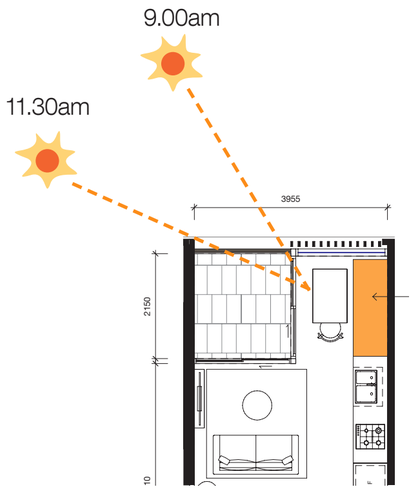


## AMENITY - SOCIAL HOUSING

27. Solar access

The analysis ignores the fixed vertical louvres to the east facing studios on Level 2 to 7 which block winter morning sunlight to living spaces. This removes 4 apartments per floor on levels 2-7 (24 apartments) and reduces the tally to well below 70%. This issue can easily be mitigated through a condition of consent requiring the fixed vertical blades to be changed to operable vertical blades. It should be noted that the Design Integrity Report records at item 4.03 that the supported privacy solution for these apartments is a “sliding privacy and sunscreen”. This has now been removed from the scheme and further endorsement should be sought from the Panel.

(City of Sydney)




Plan of Studio balcony and living space

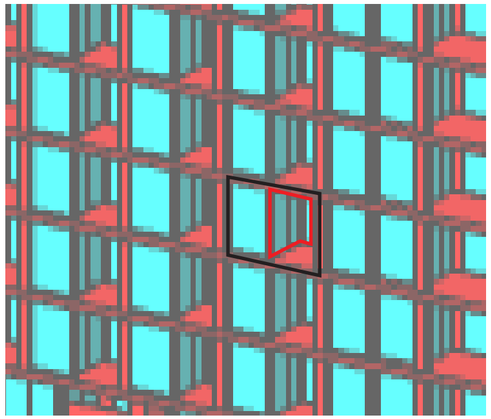
## RESPONSE

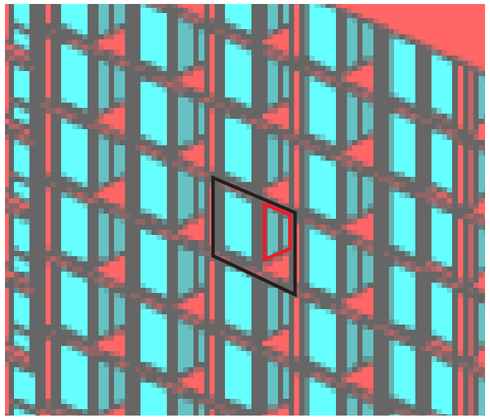
The studio apartments are not reliant on sunlight hitting the east facing facade to achieve 2hrs solar access. The ‘view from the sun’ diagrams below demonstrate that the studio apartments receive direct sunlight to the living space, via the glazed sliding door to the side of the balcony, from 9:00am to 11:30am.

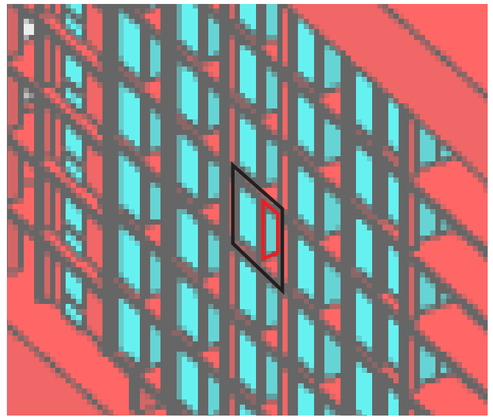
The individual vertical louvres are proposed to be fixed in a due to concerns about ongoing maintenance of operable louvres.

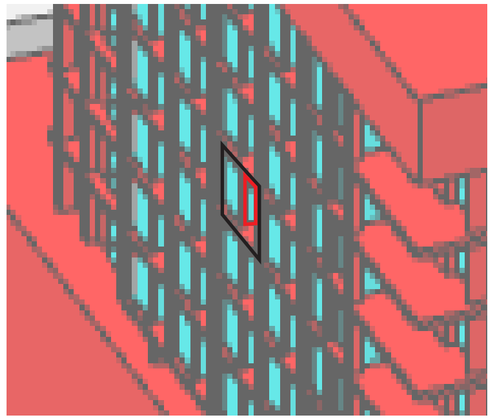
The DRP presentation noted that the sliding mechanism for the bank of vertical louvres was intended for facade cleaning only. The provision of the sliding mechanism for cleaning will be reviewed in further detail during the design development.

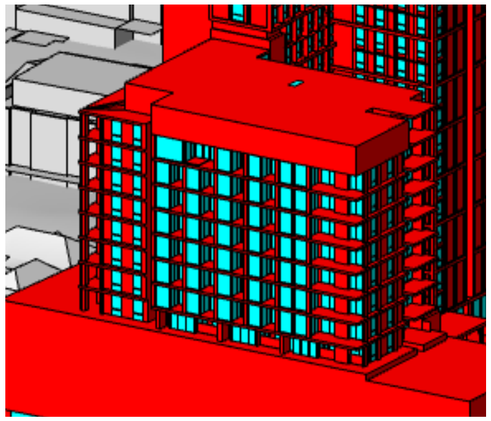
**View from the Sun diagrams (by RWDI):**



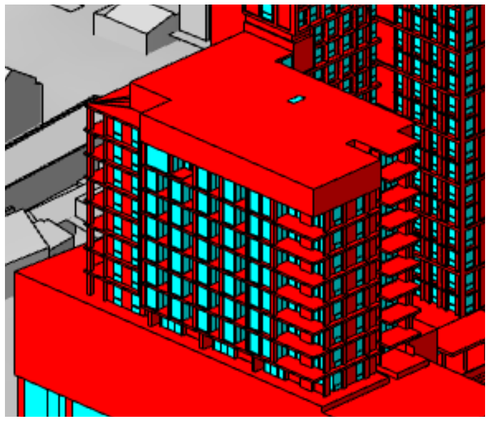




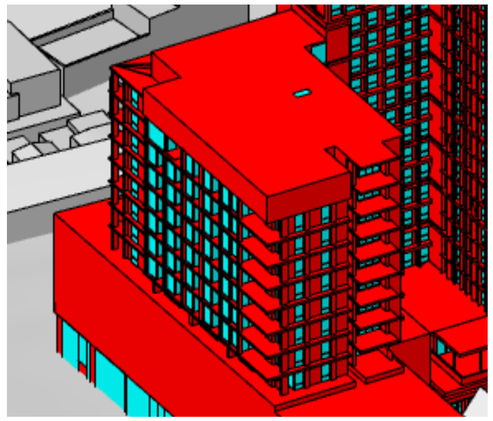




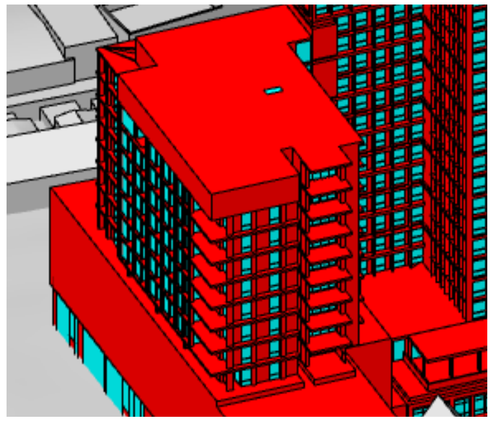
**June 21st 09:00 AEST**



**June 21st 10:00 AEST**



**June 21st 11:00 AEST**



**June 21st 11:30 AEST**

## AMENITY - SOCIAL HOUSING

28. Natural cross ventilation

The application erroneously claims that 60% of apartments are designed to achieve natural cross ventilation, however only 34% of apartments meet the definition of naturally cross ventilated. For example:

(a) Plenums must not be used to claim natural cross ventilation as they do not provide equal sized outlets for pressure-based airflows.

(b) Corner apartments that do not have opposite openings of equal size and do not provide a logical flow path of air should not be counted.

(c) Natural ventilation paths should not cross common circulation spaces.

Furthermore, 21 apartments are identified as being noise affected and are designed with acoustic ventilators to achieve natural ventilation and acoustic privacy to achieve Objectives 3B-2, 4J-1 and 4J-2 of the ADG. As a result, only 10% of apartments achieve natural cross ventilation.

(City of Sydney)

# RESPONSE

The proposed design has 33 of 70 apartments (47.1%) that are conventionally cross ventilated in accordance with the ADG, whilst an additional 13% achieve appropriate ventilation through alternative measures as supported by the Design Guidance under the ADG where sites are otherwise constrained, as is the case here. Our response includes an analysis of the envelope constraints that have limited the ability to achieve compliance, as well as our design responses to maximise cross ventilation amenity through alternative design strategies.

### Envelope Constraints

The Stage 1 DA envelope for Buildings 3 & 4 has a number of constraints that have limited the ability to provide natural cross ventilation to Building 4. These constraints include:

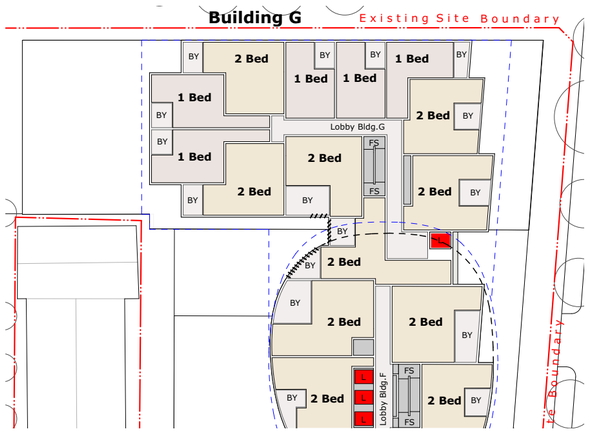
/ The envelopes for Building 3 and 4 are located back-to-back in an L-shaped plan, reducing the extent of available frontage

/ Solar access to west facing apartments in mid winter is limited by the shadow cast by Building 2

/ The south western corner is constrained by the location of the lift core, which needs to be outside of the station box. This eliminates the potential for a multi-cored building with cross-through apartments.

/ To utilise the Building 4 envelope efficiently a double loaded corridor is required, meaning a single load corridor is not viable

/ A multi-cored building, which would enable more “through” apartments, is not possible due to the location of the vents to the station box below




Stage 1 Reference Scheme

### Apartment Mix Brief

/ The brief for the apartment mix has been prescribed by LAHC. Due to this brief, the apartment mix is not comparable with a typical build-to-sell apartment development in that it requires 26 studio apartments, making up 37% of the total development.

/ To efficiently utilise the available facade frontage, these studios are designed as narrower, single aspect apartments, which are located on the eastern elevation for solar access.

/ The higher than usual quantity of single aspect apartments limits the number of apartments than can be located on building corners.

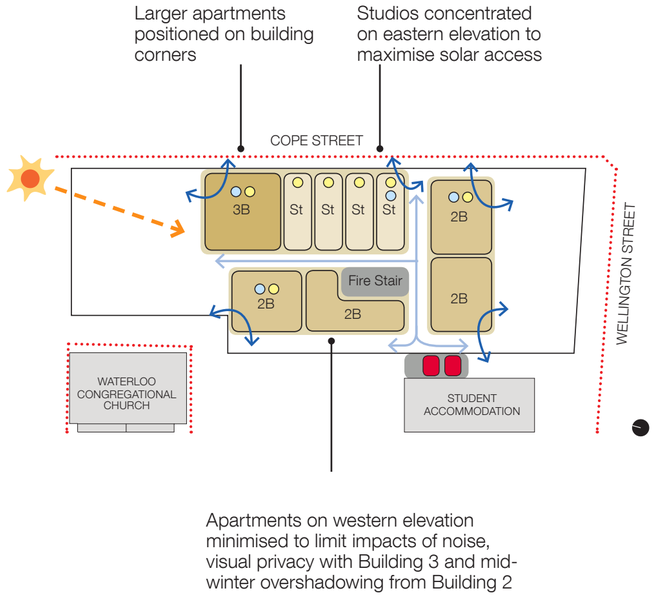
/ 2 storey apartments were not considered to be appropriate for this typology of housing were access and mobility were key design considerations.

### Design Moves to Maximise Amenity

/ Narrower studios concentrated on eastern elevation to maximise solar access

/ Corridors ends are glazed to maximise natural light and operable louvres allows natural cross ventilation through the corridors

/ Avoid any apartments buried into the internal corner - the living space for the west facing apartment has been positioned as far north as possible to address visual privacy.




Floorplate Design Response

# RESPONSE

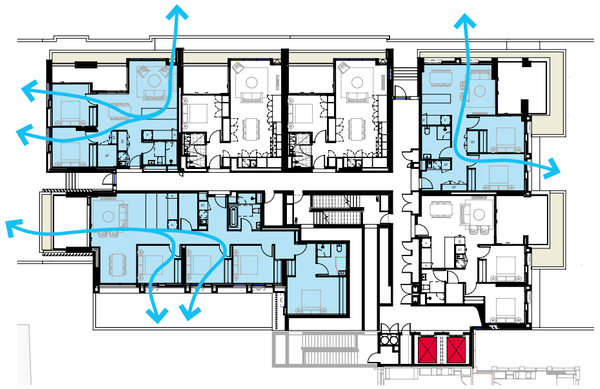
A total of 33 (47.1%) dwellings are naturally cross ventilated by virtue of windows facing in more than one orientation. Due to the constraints of the envelope and the prescribed apartment mix, achieving compliance through conventional cross ventilation is limited. To achieve cross ventilation amenity elsewhere, we have proposed the following alternative strategies:

**A** - The south west 2 bedroom apartment takes advantage of the cross ventilation flow path through the open lift lobby to create a pressure differential. This pressure differential draws air through the apartment via openings on opposing sides.

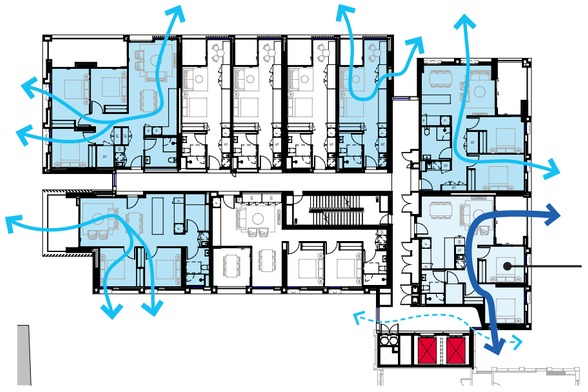
**B** - Two apartments on Levels 06 & 07 will be connected to the northern slot via a plenum in the ceiling of the common corridor to provide natural cross ventilation. In these instances, the distance between openings does not exceed 18m.

The addition of these alternate cross ventilation strategies enable the building to achieve 42/70 (60%).

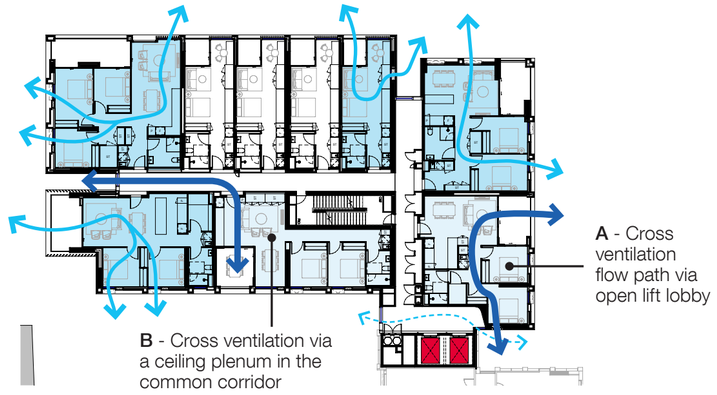
| | ADG Conventional Cross Vent | CV via Alternative Strategies | | Total with alternative strategies |
|---|---|---|---|---|
| | | 1. Cross Vent via open lift lobby (SW apt) | 2. Cross Vent via Plenum | |
| Level 09 | 2 / 2 | 0 / 2 | 0 / 2 | 2 / 2 |
| Level 08 | 4 / 8 | 1 / 8 | 0 / 8 | 5 / 8 |
| Level 07 | 4 / 9 | 1 / 9 | 1 / 9 | 6 / 9 |
| Level 06 | 4 / 9 | 1 / 9 | 1 / 9 | 6 / 9 |
| Level 05 | 4 / 9 | 1 / 9 | 0 / 9 | 5 / 9 |
| Level 04 | 4 / 9 | 1 / 9 | 0 / 9 | 5 / 9 |
| Level 03 | 4 / 9 | 1 / 9 | 0 / 9 | 5 / 9 |
| Level 02 | 4 / 9 | 1 / 9 | 0 / 9 | 5 / 9 |
| Level 01 | 3 / 6 | 0 / 6 | 0 / 6 | 3 / 6 |
| **Total** | **33 / 70** | **7 / 70** | **2 / 70** | **42 / 70** |
| **Achieved** | **47.1%** | **10.0%** | **2.9%** | **60.0%** |

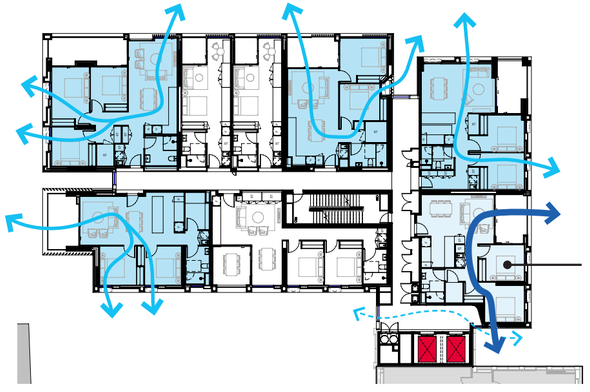
**LEVEL 01**



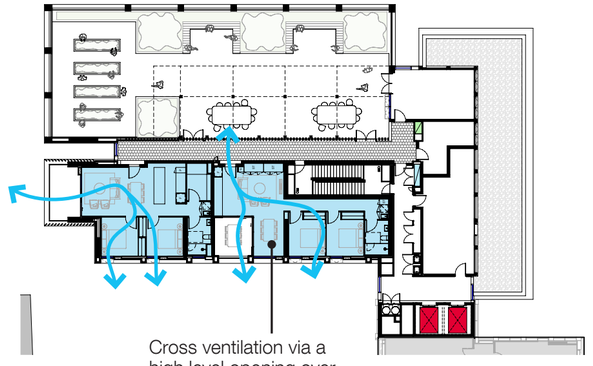

**LEVEL 02-05**




**LEVEL 06-07**




**LEVEL 08**

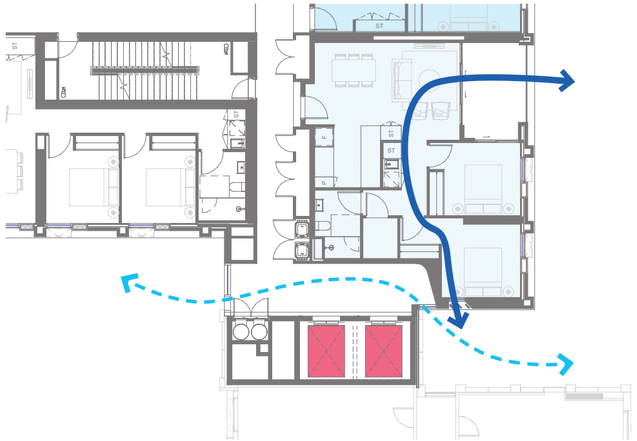



**LEVEL 09**

# RESPONSE

## Alternative Strategy A

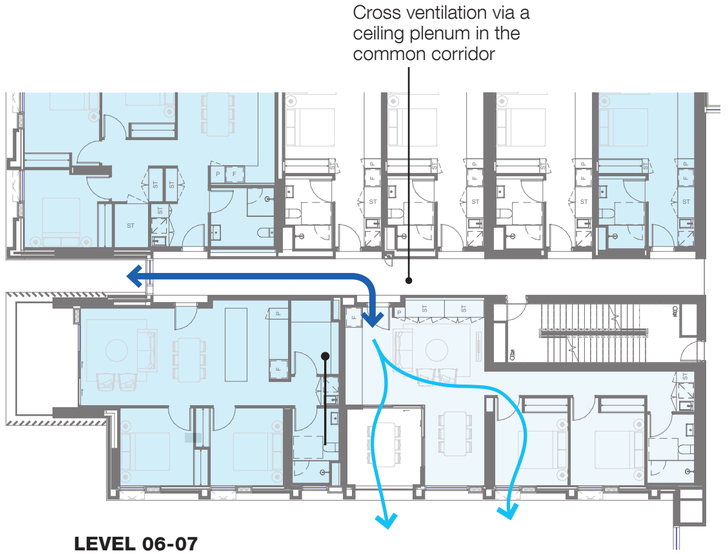
The south west 2 bedroom apartment takes advantage of the cross ventilation flow path through the open lift lobby to create a pressure differential. This pressure differential draws air through the apartment via openings on opposing sides.



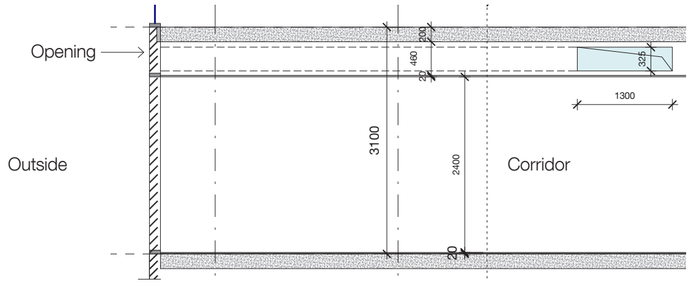
**LEVEL 02-08**

## Alternative Strategy B

Two apartments on Levels 06 & 07 will be connected to the northern slot via a plenum in the ceiling of the common corridor to provide natural cross ventilation. In these instances, the distance between openings does not exceed 18m.




**LEVEL 06-07**




Indicative section through Level 06 & 07 corridor

## NATURAL VENTILATION AND NOISE

29-34 Objective 3B-1 of the ADG requires all habitable rooms to be naturally ventilated. Objective 4J-1 requires development in noisy or hostile environments to minimise the impact of external noise and pollution through the careful siting and layout of buildings. The applicant has identified apartments within the central and southern precincts as being noise affected and requiring acoustically attenuated natural (non-mechanical) ventilation systems to meet these objectives.

(City of Sydney)

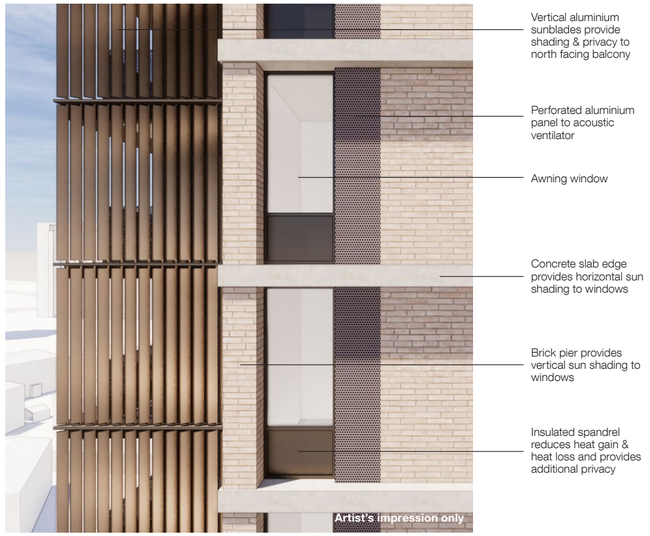
## RESPONSE

The primary noise source affecting the apartments is from Botany Road. The apartment spaces affected by noise are on the west and northern elevations of the buildings.

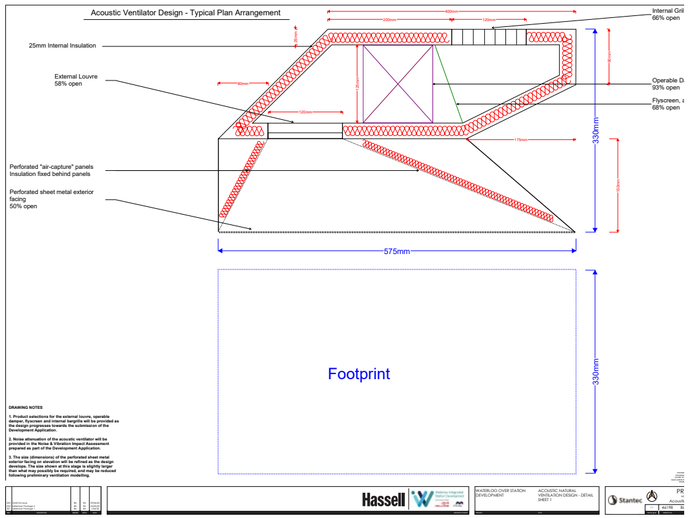
Acoustic ventilators are proposed to all of the noise affected spaces to provide acoustically attenuated natural ventilation without having to open the windows. The acoustic ventilators have been integrated into the building facade design, and are expressed on the facade as bronze coloured perforated aluminium panels.

CFD modelling has been undertaken by Stantec, with a physical prototype proposed to be fabricated for further testing. For further detail, refer to the technical response prepared by Stantec.


Internal View of Typical Room

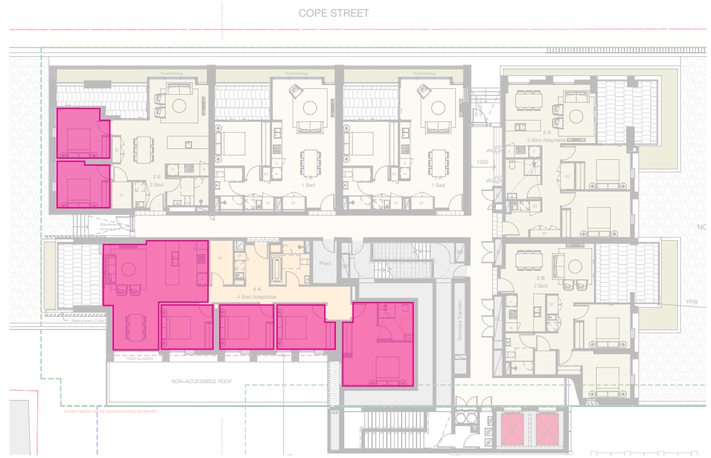



External Elevation




Plan Detail of Acoustic Ventilator

(Drawing by Stantec)




Noise affected spaces to Level 01


Noise affected spaces to a typical level

## TRANSPORT

73. The turntable is to be a minimum dimension of 10.5 metres in accordance with the City's Guidelines for Waste Management in New Developments and Section 3P of the Waterloo Metro Design and Amenity Guidelines.

(City of Sydney)

## RESPONSE

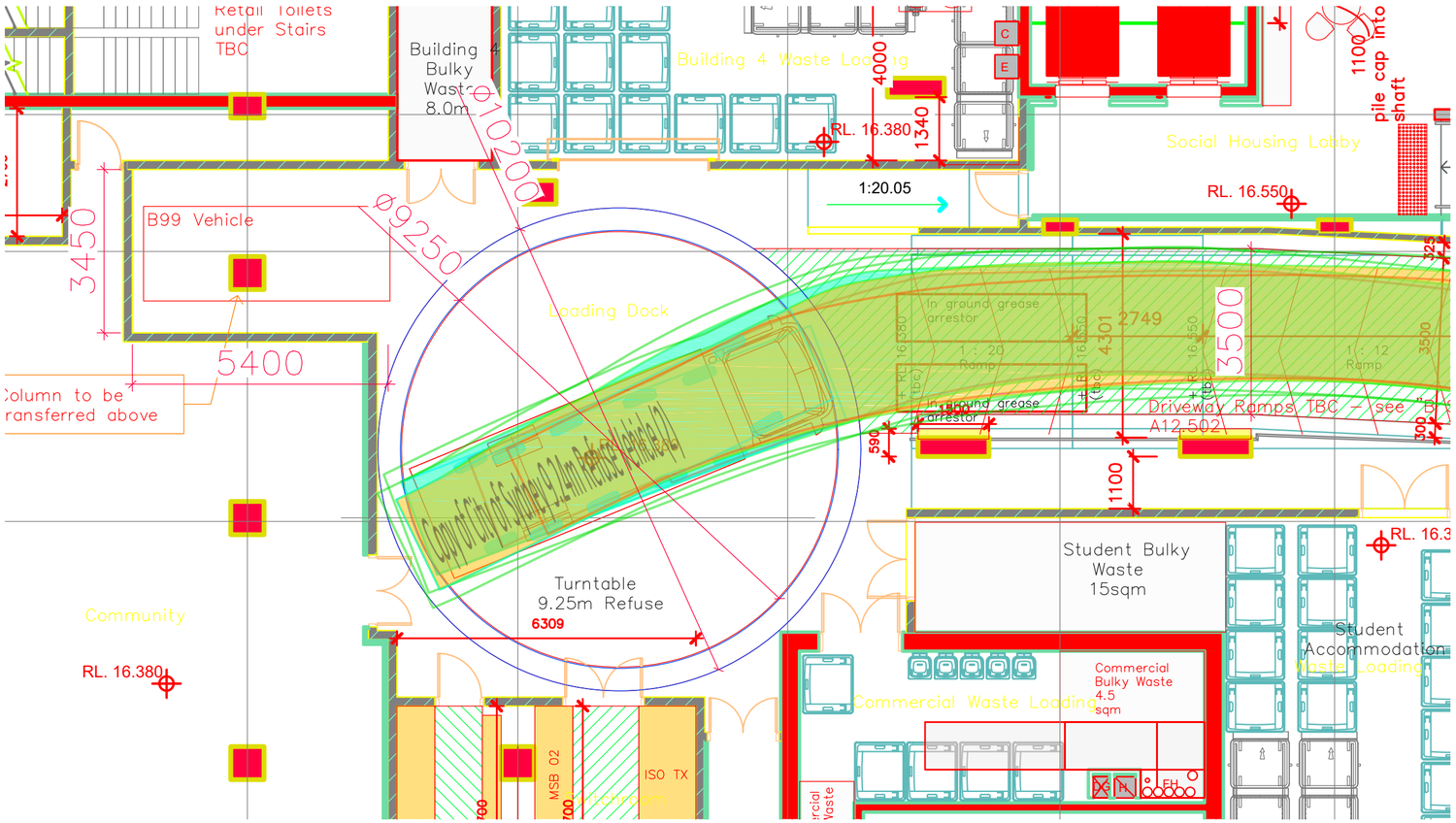
The turntable has been designed in co-ordination with the Traffic Consultant to accommodate the 9.25m City of Sydney Refuse Collection Vehicle - the largest expected vehicle. Below is further commentary from the Traffic consultant:

*Section B19 of the Guidelines for Waste Management in New Developments state that the 'minimum radius turning circle required is 10.5 metres'*

*This dimension relates to the minimum turning circle radius required for a moving vehicle and is not the requirement for the diameter of a turntable.*

*The turntable has been provided at 9.25m diameter to accommodate the largest expected vehicle and the design also includes a minimum 500mm clearance from the edge of the turntable to any walls or structure.*

(Advice from PTC Traffic Consultants)

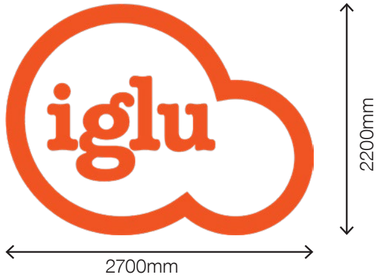



*Swept Path Diagram* (Drawing by PTC Traffic Consultants)

## SIGNAGE

76. Top of building signs are proposed to the commercial and student housing buildings. The proposal is inconsistent with the Schedule 1 Assessment Criteria under State Environmental Planning Policy 64 – Advertising and Signage as top of building signs are prohibited within this location in accordance with sections 3.16.5.2 and 3.16.12.15 of the SDCP. Furthermore, the signs are not accommodated under the Waterloo Metro Quarter Design and Amenity Guidelines.

(City of Sydney)




Proposed signage for the Student Accommodation

## RESPONSE

Top of building signage is proposed in two locations on the tower; on Level 23 of the eastern building end facade to provide signage visible from Wellington Street, and on Level 22 of the northern building end facade to provide signage visible from Botany Road and Cope Street Plaza.

The proposed top of building signage shall be:

/ 2700mm W x 2200mm H

/ display the student accommodation operators name/logo using individual letters

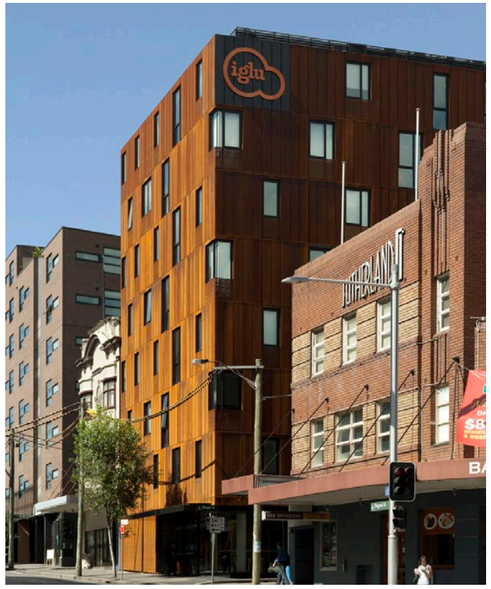
/ not illuminated

/ integrated with overall building design

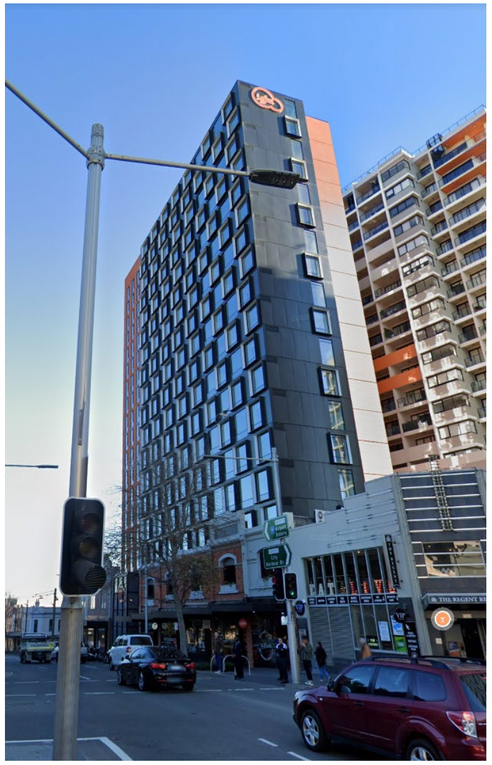
/ integrated with facade design to ensure concealed fixings

/ located to avoid clashes with mechanical louvres or openings in the facade

**Examples of top of building signage on other Iglu student accommodation buildings:**

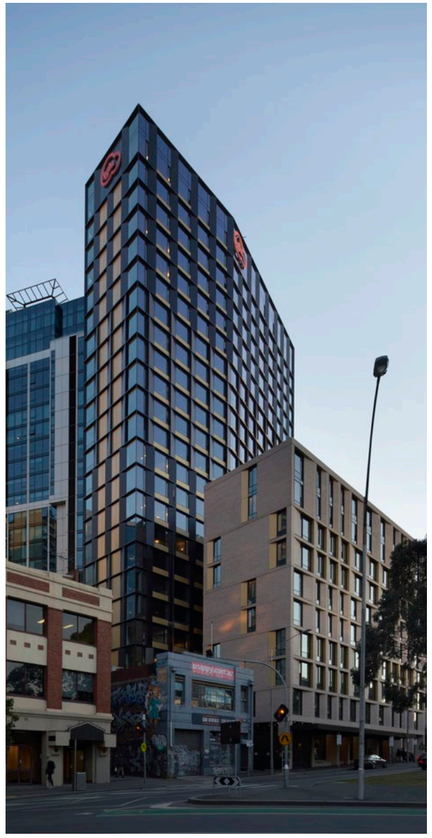



Iglu Central



Iglu Redfern

Iglu Redfern 2

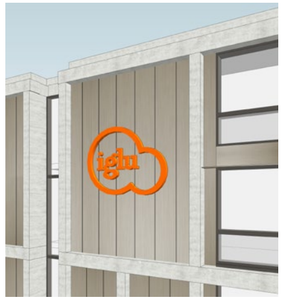


Iglu Franklin Street, Melbourne

## RESPONSE

The 3D images on this page show the proposed top of building signage to the north and east elevations, as viewed from the street level.

The placement and scale of the signage has been designed to be integrated with the overall building design.



Proposed signage for
Student Accommodation
2700mm W x 2200mm H

INDICATIVE VIEW OF THE NORTH ELEVATION

Proposed signage for
Student Accommodation
2700mm W x 2200mm H

INDICATIVE VIEW OF THE EAST ELEVATION

# PART TWO: BUILDING 3 PROPONENT LED CHANGES

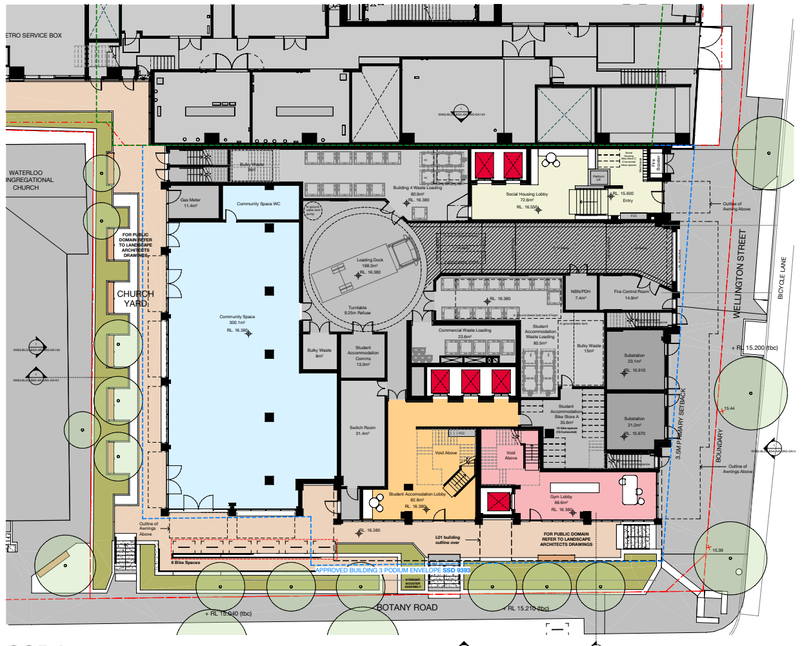
*Proposed amendments to respond to the Submissions and further Design Development*

Artist's impression only

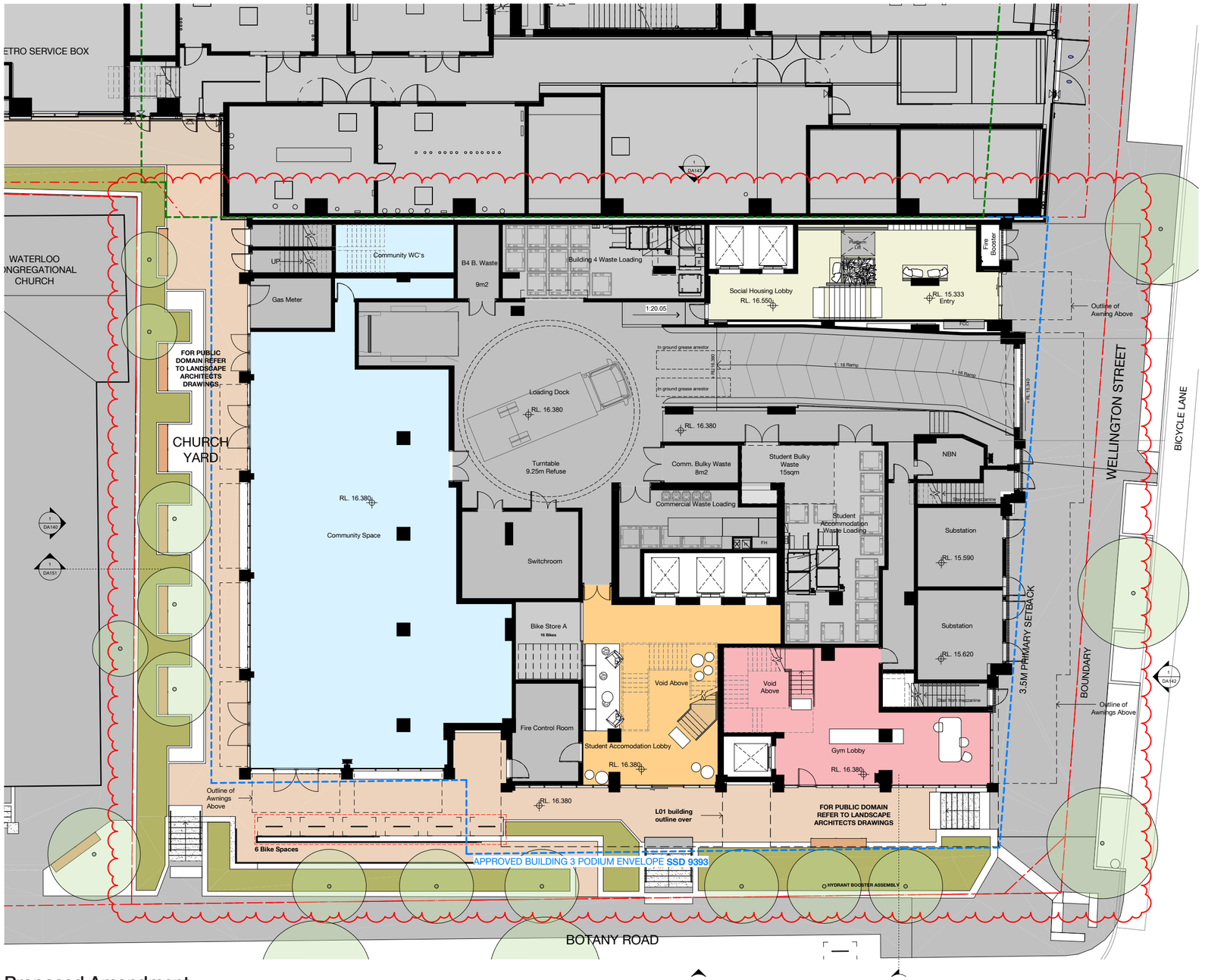
# GROUND FLOOR PLAN

**Proposed Amendments to SSDA:**

/ Allowance for B99 Vehicle
/ Reconfiguration of Community Space
/ Student Accommodation Bike Store relocated
/ Allowance for BOH corridor from Commercial lobby to the Loading Dock
/ Allowance for pedestrian corridor from street level to the Loading Dock
/ Fire control room relocated
/ NBN room relocated
/ Relocation of Student comms room to Level 2
/ Reconfiguration of Waste room facilities
/ Relocation of Social bicycle spaces to Level 2
/ Additional detail shown on Student Accommodation Lobby fitout
/ Revised driveway ramp grading
/ In ground tanks removed
/ Revised Landscaping along Botany Road frontage
/ Social Housing Lobby reconfiguration
/ Reconfiguration of Ground Floor to accommodate above changes




SSDA




Proposed Amendment

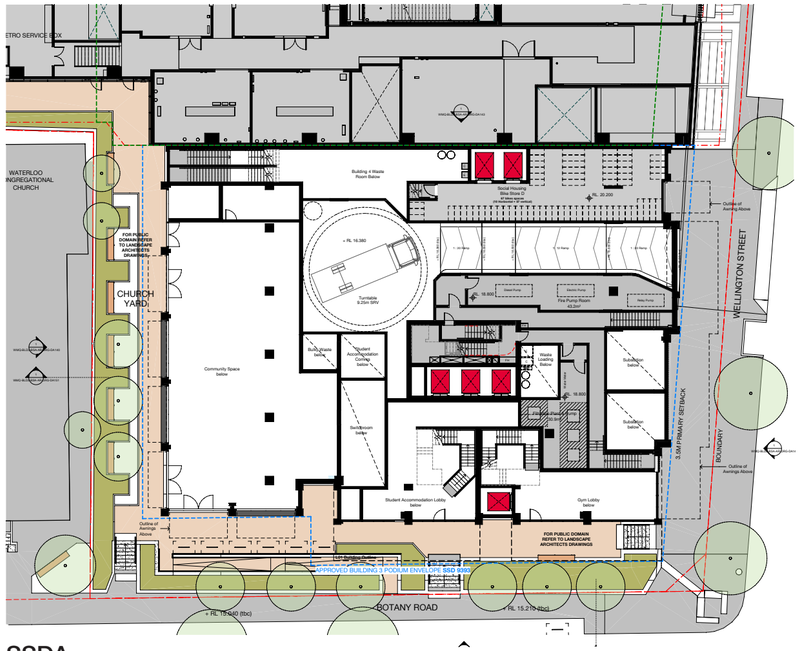
# MEZZANINE PLAN

**Proposed Amendments to SSDA:**

/ Relocation of the Social Housing Bike Store to Level 2

/ Replacement of Social Housing Bike Store with Fire plant

/ Plant extents reduced near core

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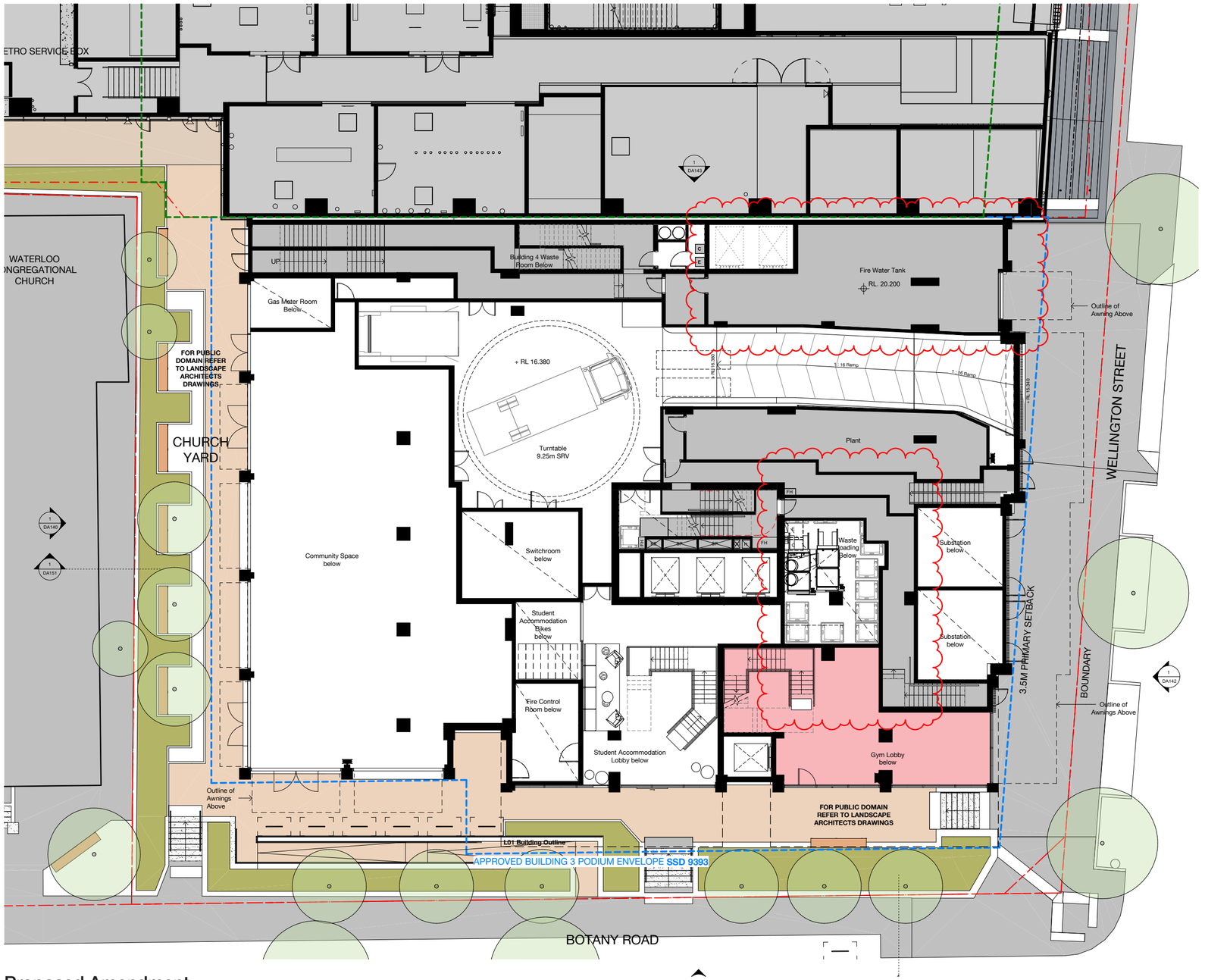



Proposed Amendment

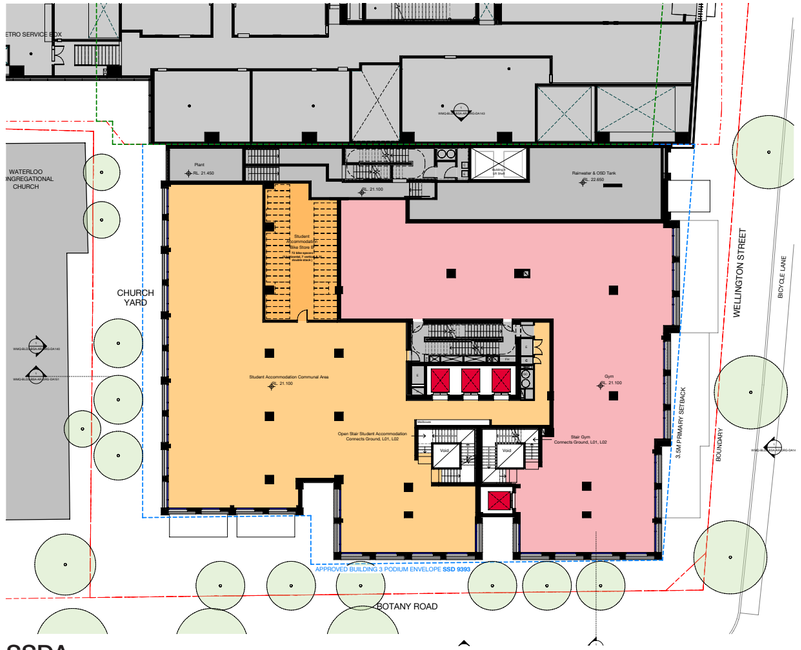
# LEVEL 01 PLAN

**Proposed Amendments to SSDA:**

/ Relocation of OSD tank to North-East corner of building

/ Additional detail on Iglu fitout

/ Fire plant in location of old OSD tank

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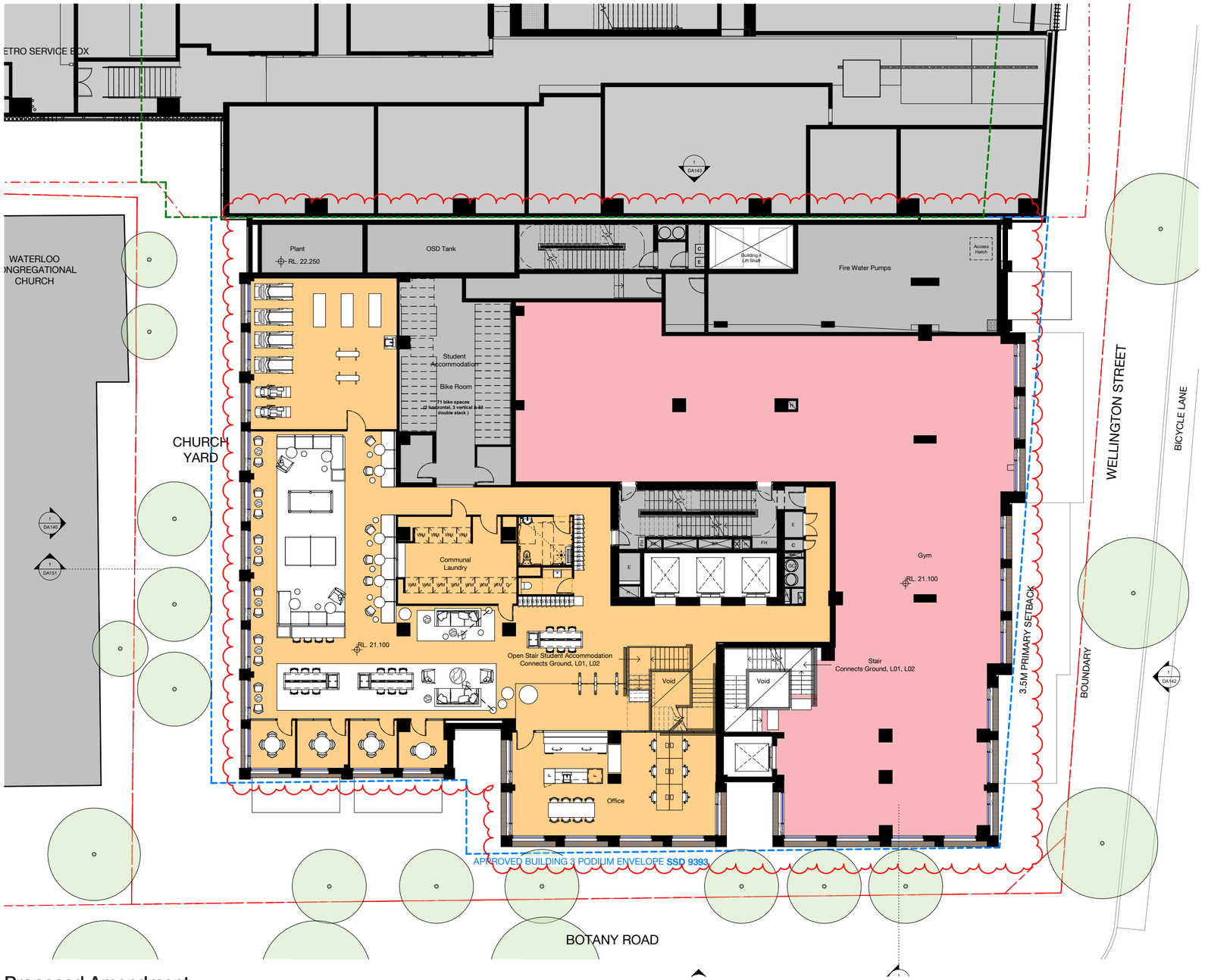
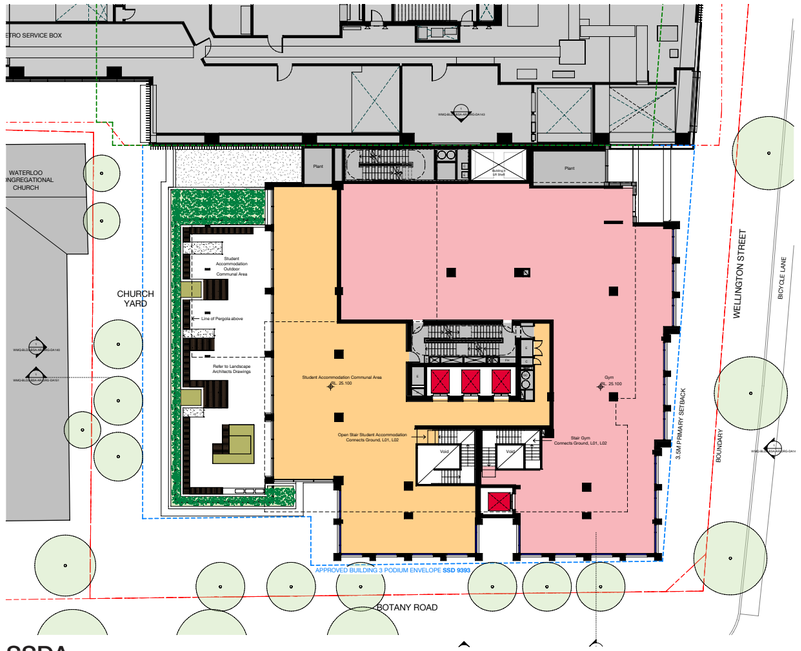



Proposed Amendment

# LEVEL 02 PLAN

**Proposed Amendments to SSDA:**

/ Landscape plans changed
/ Social Housing Bike Store in location previous plant area
/ Additional detail on Iglu Fitout
/ Comms Room added
/ Doors added to NE plant room for roof maintenance access

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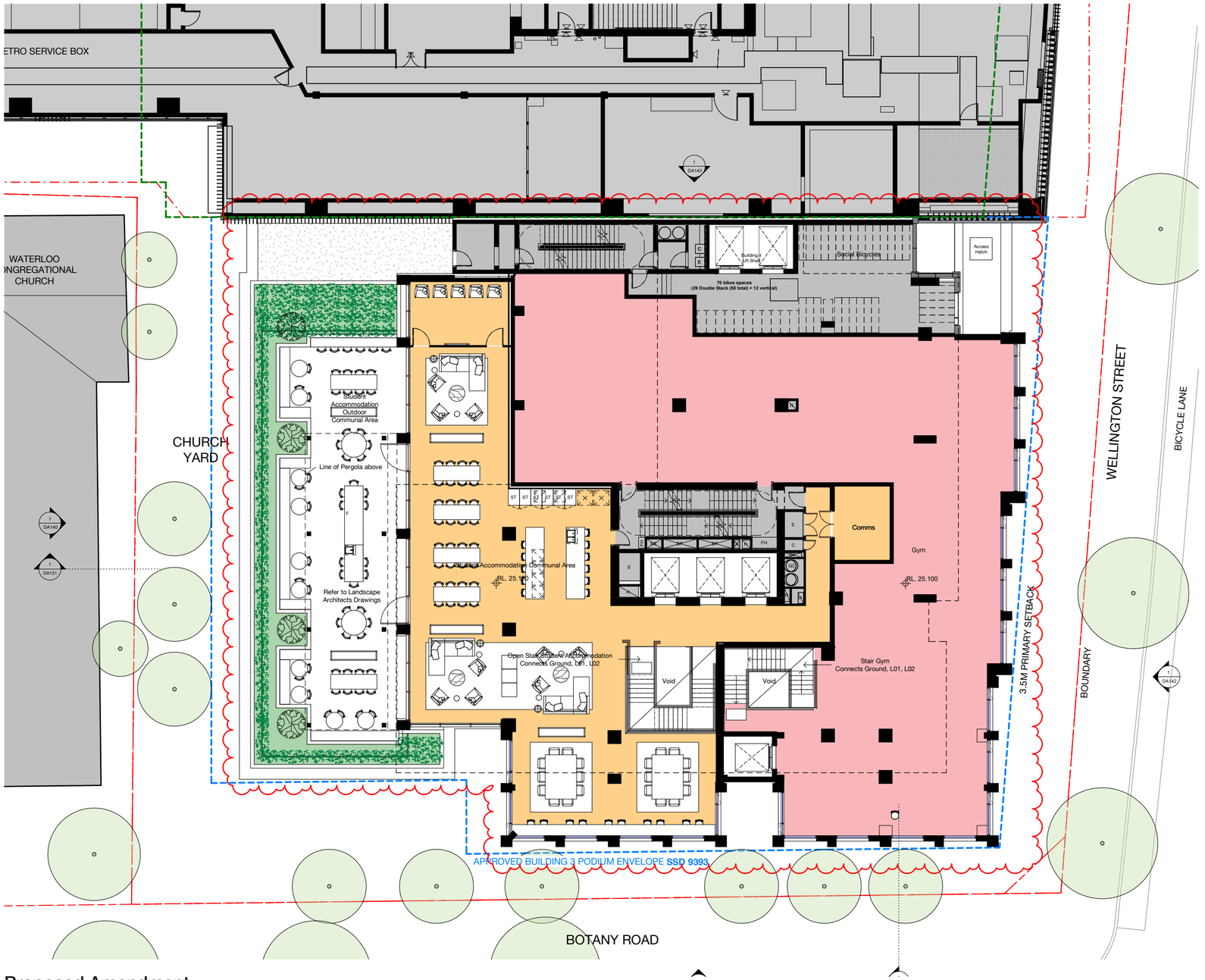
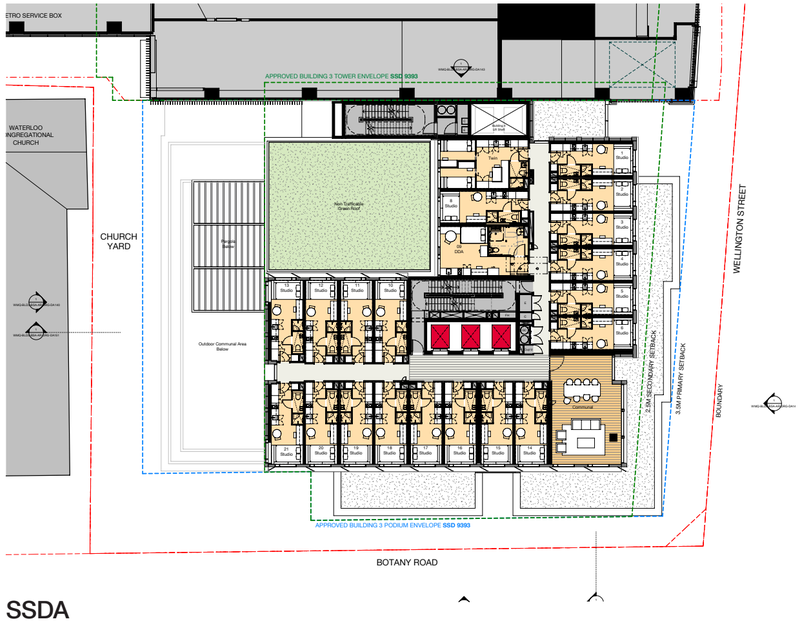



Proposed Amendment

# LEVEL 03-05 PLAN

**Proposed Amendments to SSDA:**

/ Reposition of Level 2 Terrace Pergola
/ Fixed windows to studios 3.18, 4.18 and 5.18 on Levels 3-5
/ Additional fixed window to the studio on SE corner Level 3-5
/ Additional detail on Iglu Fitout - Communal Space
/ Fire Stair wall shifted 250mm north
/ Doors added to NE plant room for roof maintenance access
/ Pergola Extents

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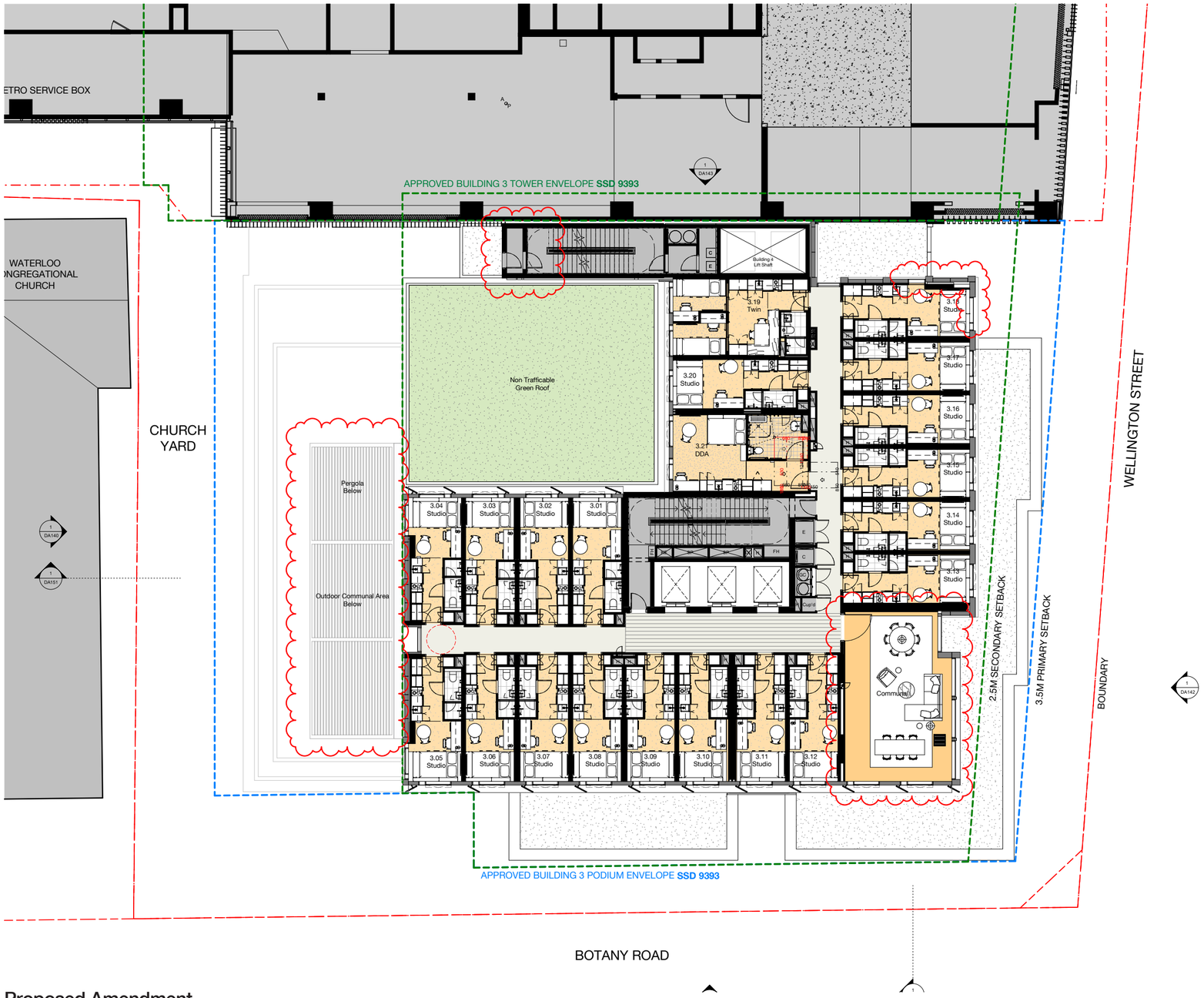


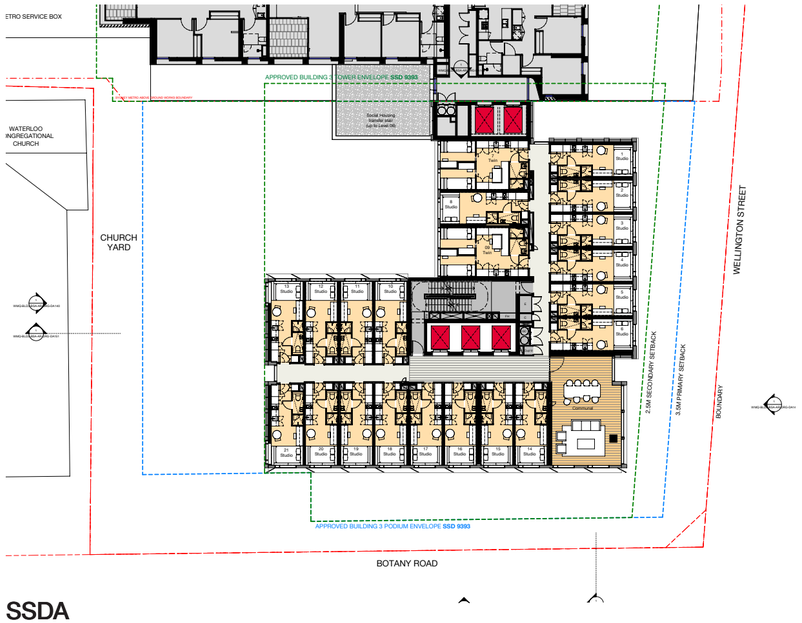

Proposed Amendment

# LEVEL 06-15 PLAN

**Proposed Amendments to SSDA:**

/ Additional fixed window to the studios 6.18-15.18 on SE corner Level 6-15

/ Additional detail on Iglu Fitout - Communal Space

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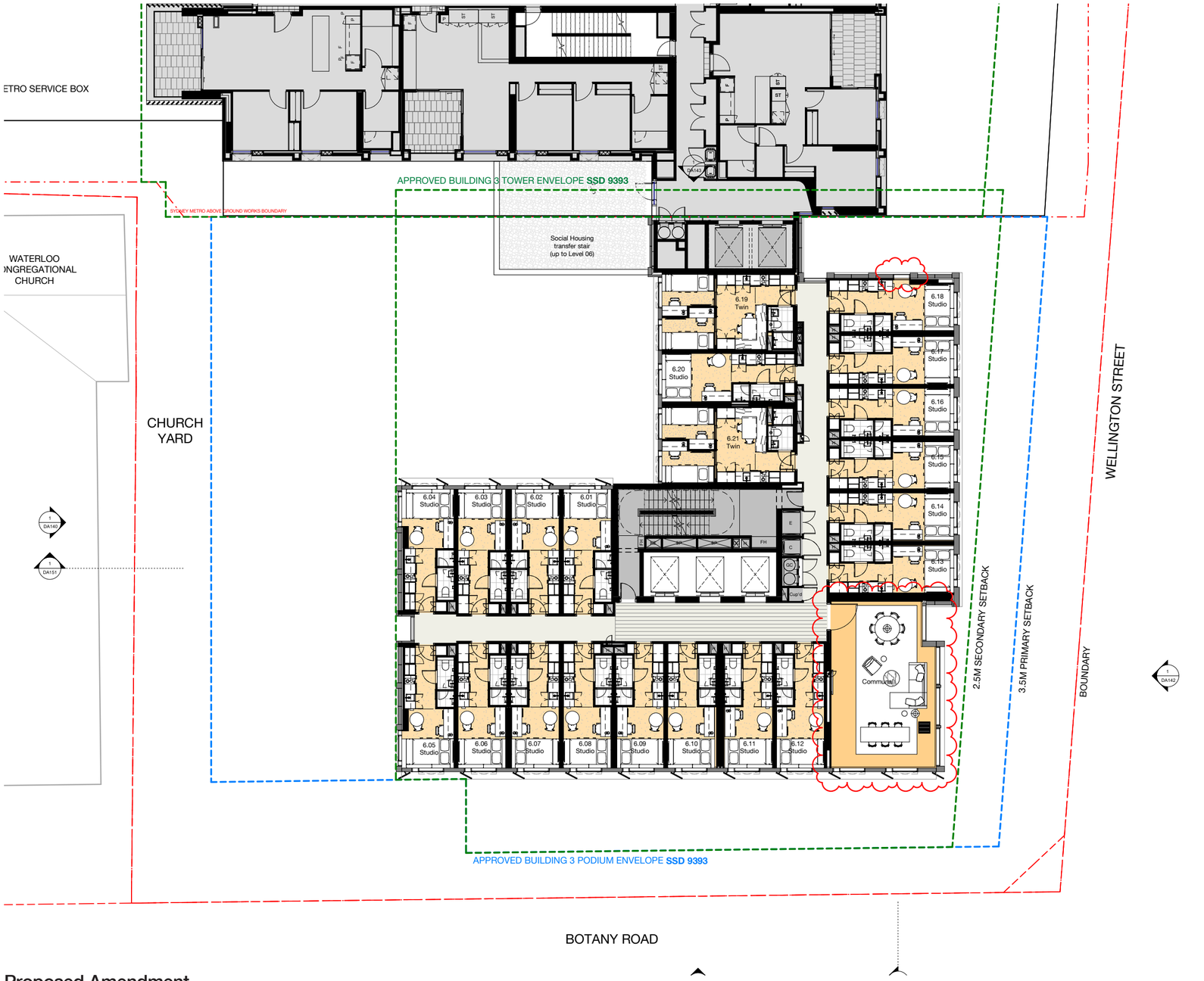


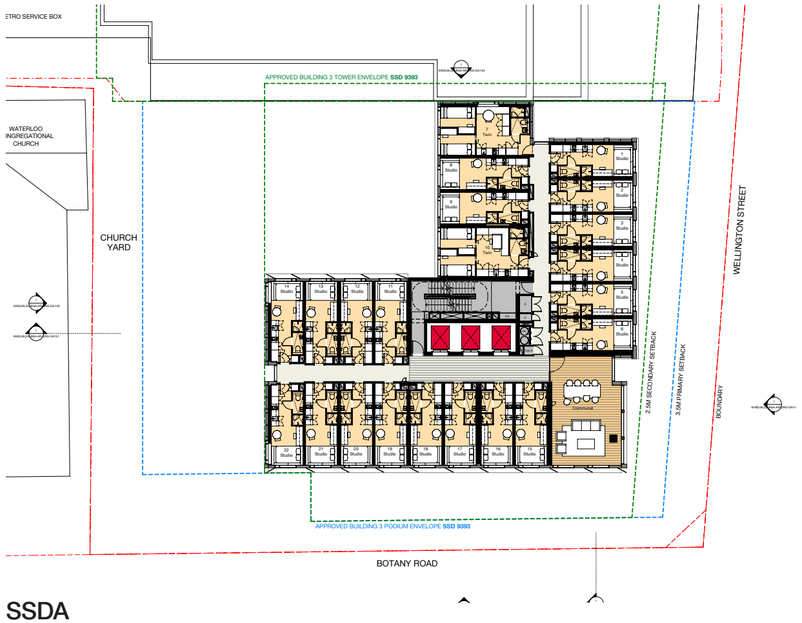

Proposed Amendment

# LEVEL 16-22 PLAN

**Proposed Amendments to SSDA:**

/ Additional fixed window to the studio on SE corner Level 16-21

/ Additional detail on Iglu Fitout - Communal Space

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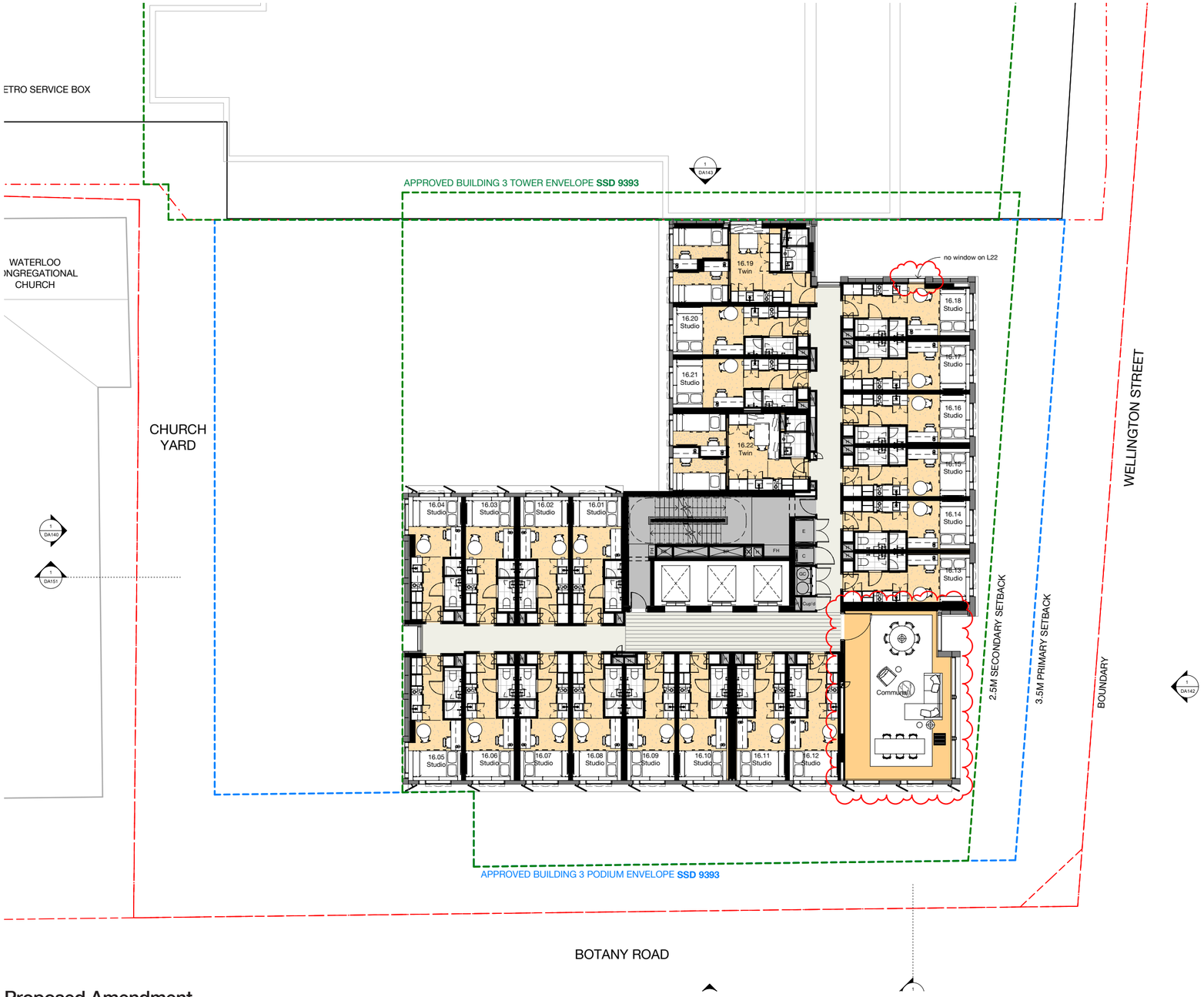


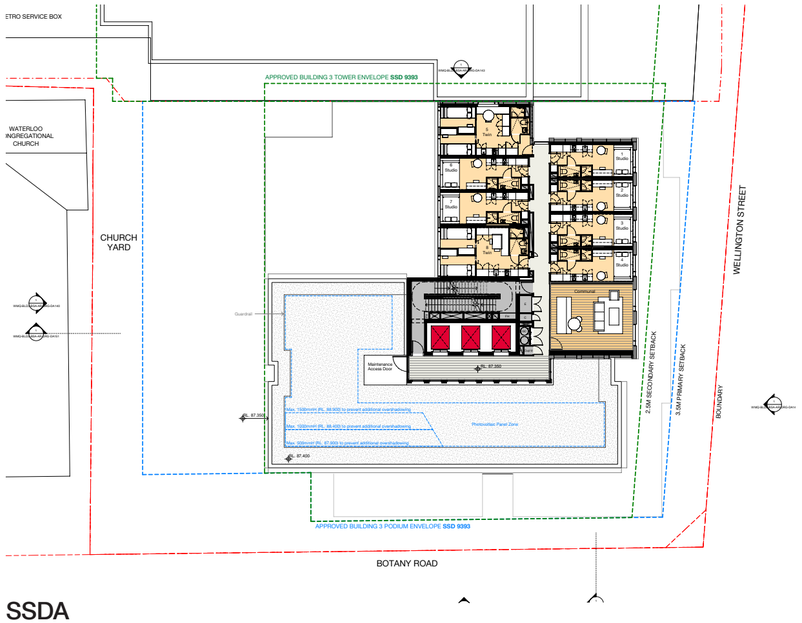

Proposed Amendment

# LEVEL 23 PLAN

**Proposed Amendments to SSDA:**

/ Additional ladder adjacent to Maintenance access door

/ PV Inverters with screening

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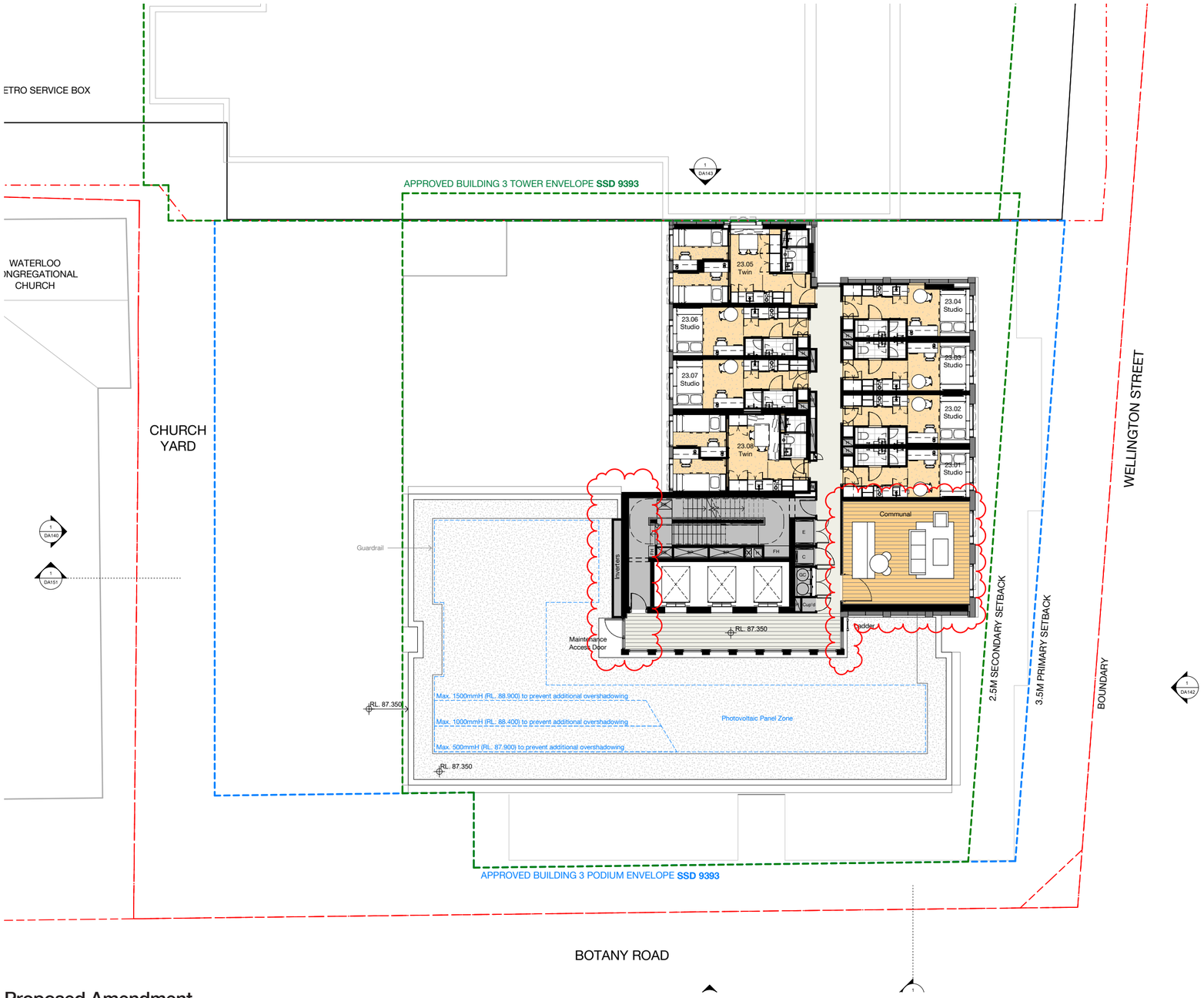
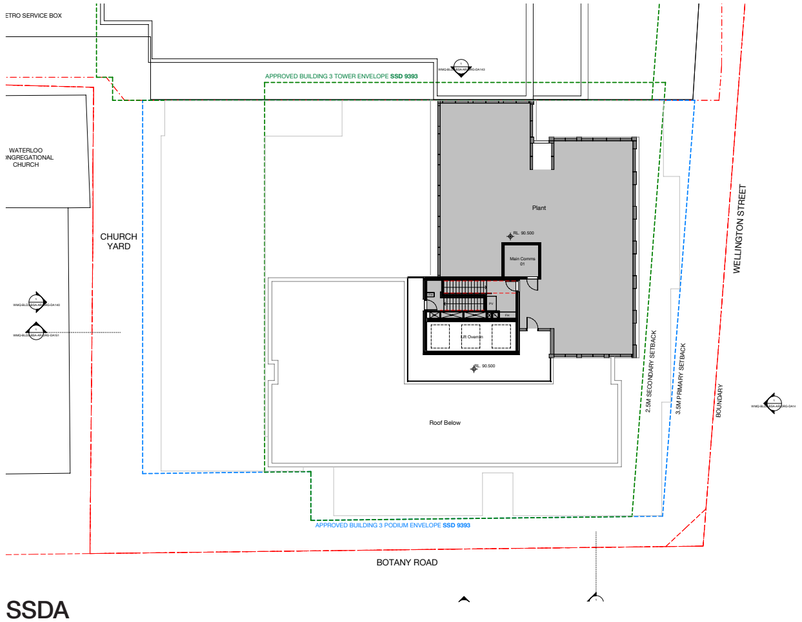



Proposed Amendment

# LEVEL 24 (PLANT) PLAN

**Proposed Amendments to SSDA:**

/ Removable panel to façade for maintenance access
/ Removal of 1 doors, fire stair and guard rail
/ Additional ladder adjacent to Maintenance access door
/ Plant room equipment added

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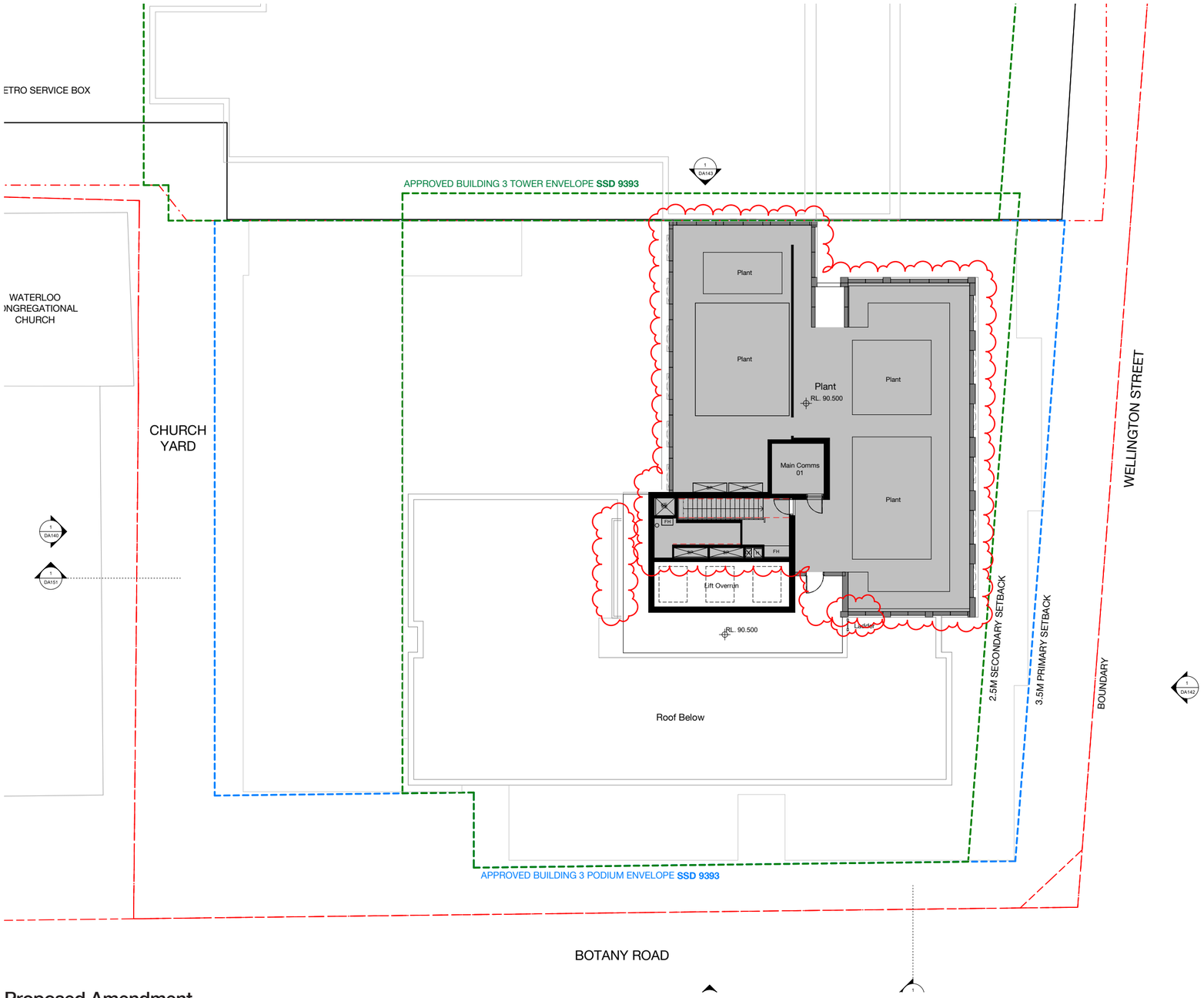


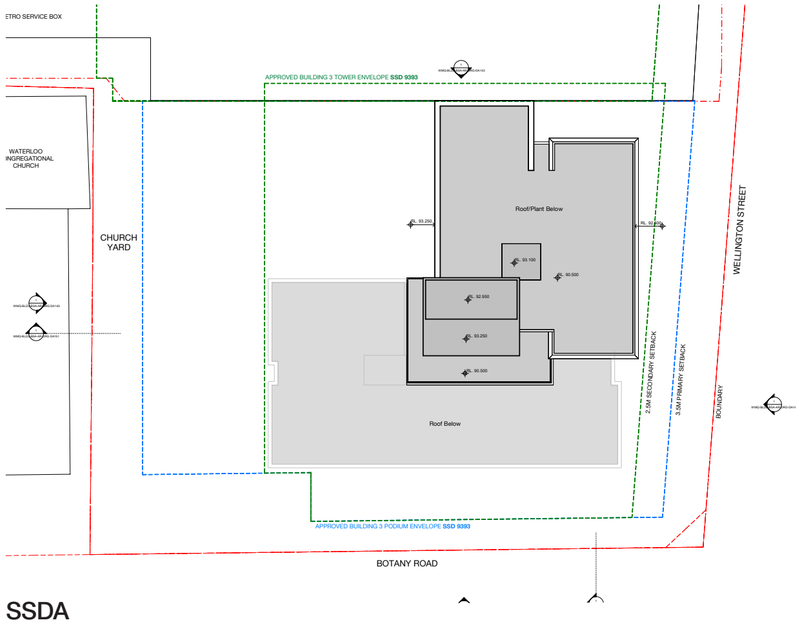

Proposed Amendment

# ROOF PLAN

**Proposed Amendments to SSDA:**

/ Plant Room reconfiguration

/ Plant Room screening to maximum RL93.95

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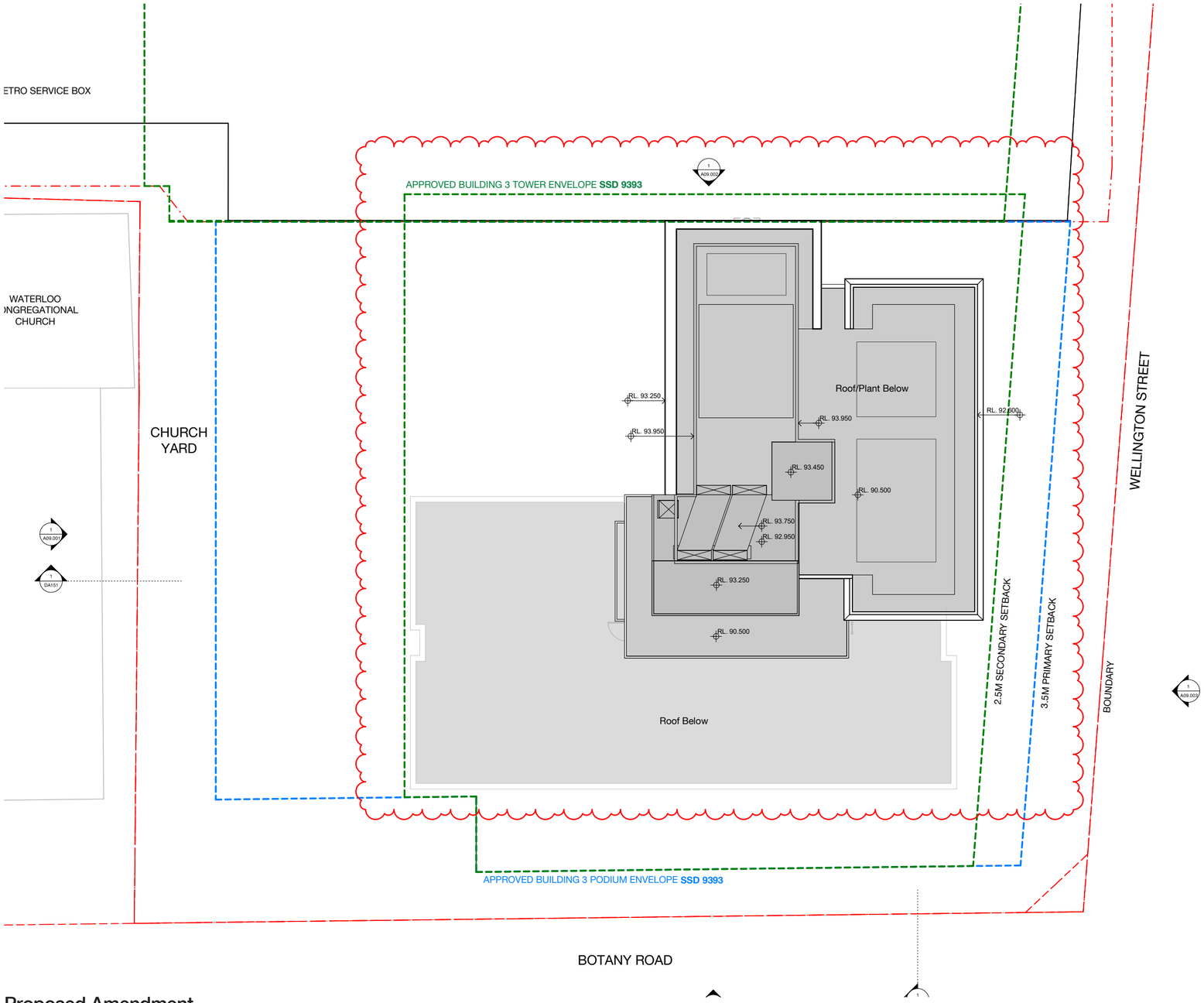



Proposed Amendment

# ROOF PLANT ELEVATIONS

**Proposed Amendments to SSDA:**

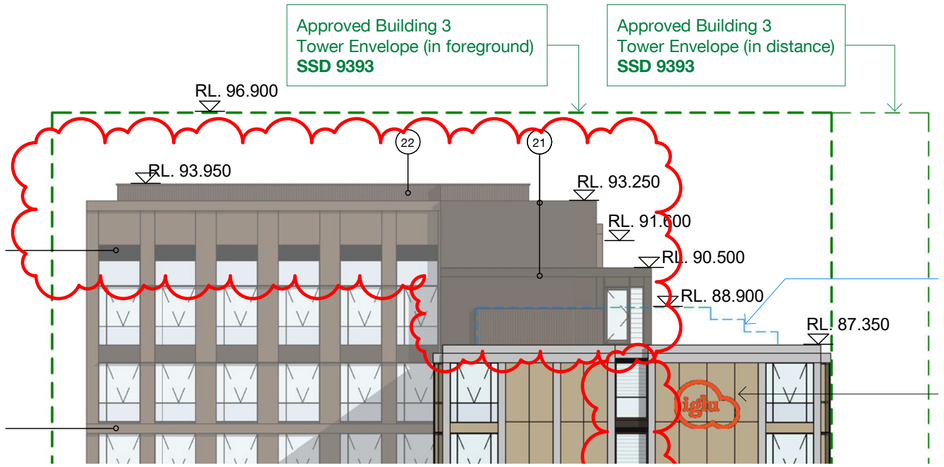
/ Additional Louvres to plant level in lieu of windows

/ Additional ladder adjacent to Maintenance access door

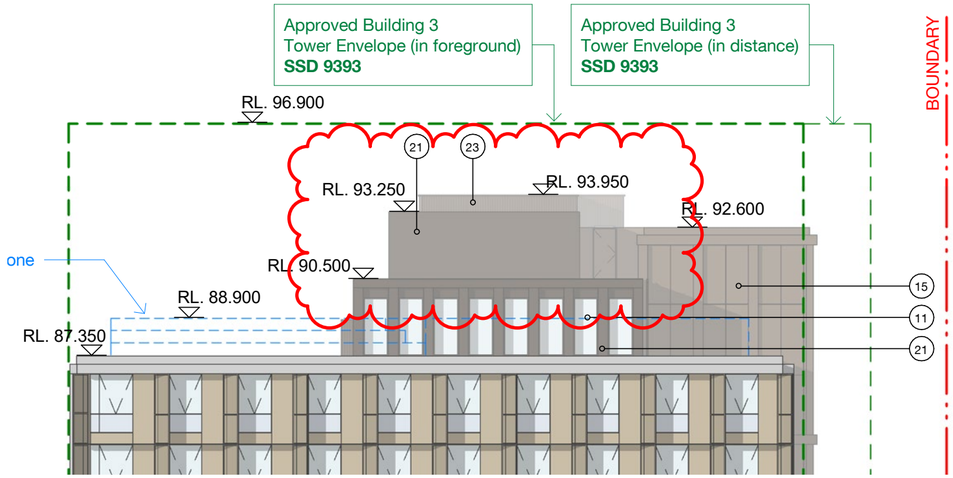
/ Louvres to Corridor Facades, inclusion of transom with fixed panel

/ High level spandrel panels to corridor facade L23

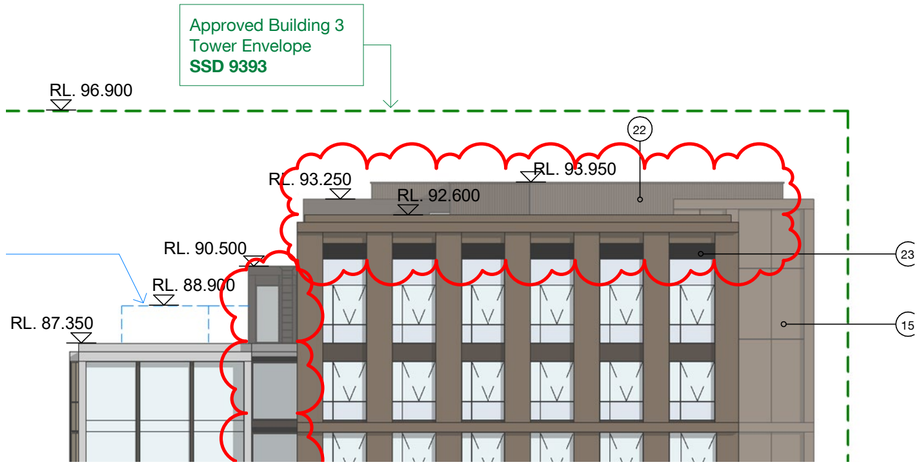
/ Removal of 1 door and guard rail



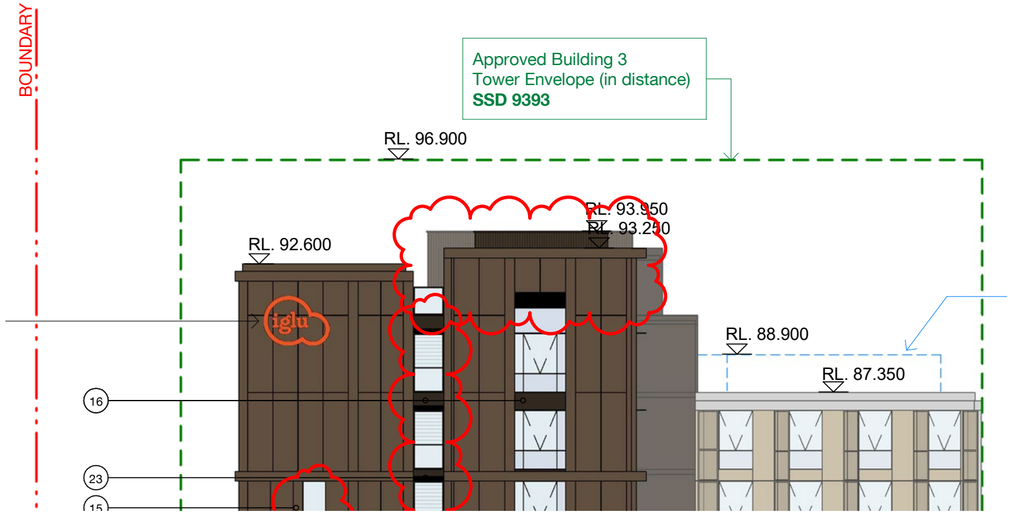

Proposed Amendment - North Elevation




Proposed Amendment - West Elevation




Proposed Amendment - South Elevation




Proposed Amendment - East Elevation

# EAST ELEVATION

**Proposed Amendments to SSDA:**

/ Additional windows to East studios

/ Louvres to plant level

/ Louvres to Corridor Facades

/ High level spandrel panels to corridor facade L23


Proposed Amendment - East Elevation

# PART THREE: BUILDING 4 PROPONENT LED CHANGES

*Proposed amendments to respond to the Submissions and further Design Development*

Artist's impression only

# LEVEL 01 PLAN

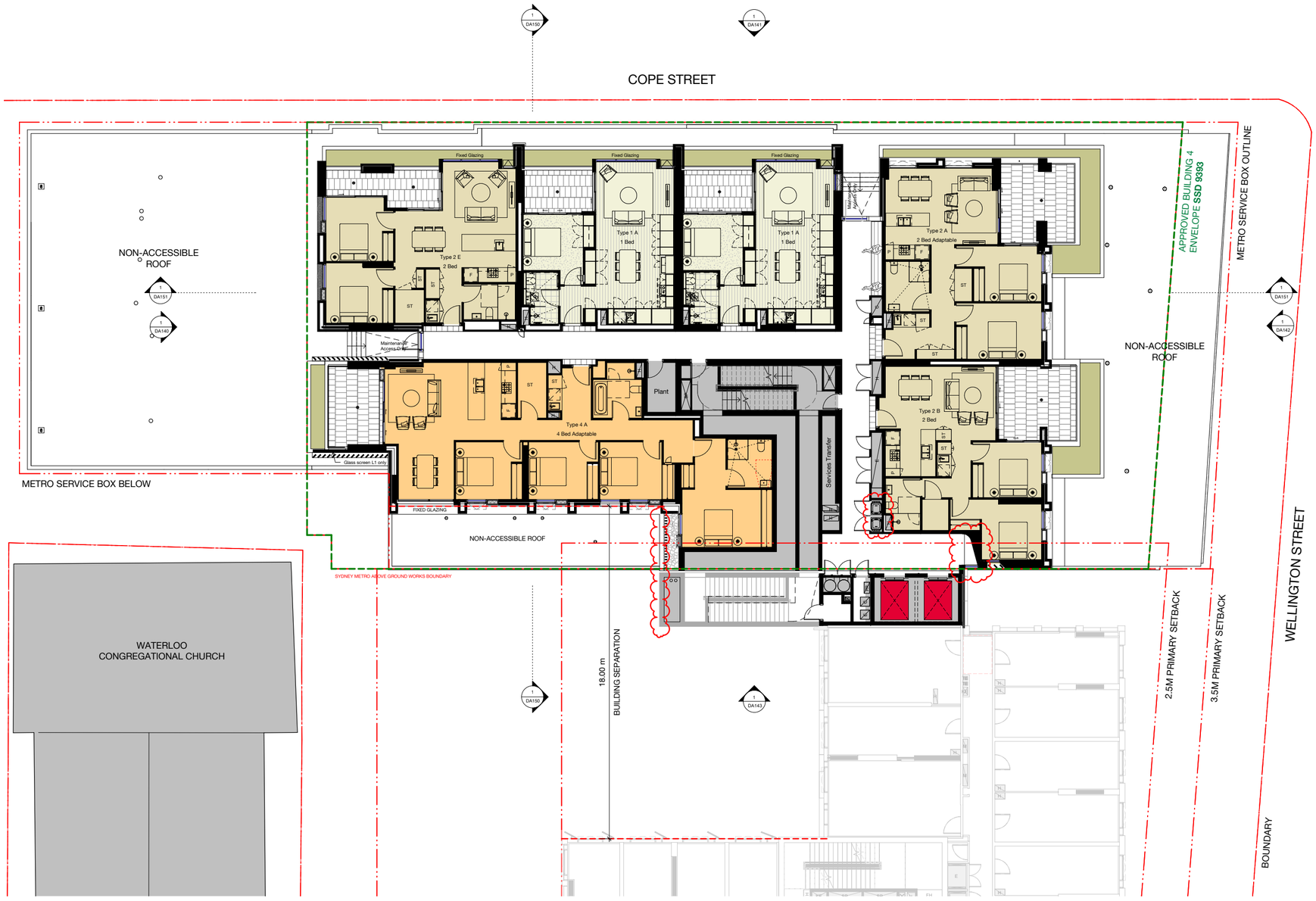
**Proposed Amendments to SSDA:**

/ Fire stair wall shifted 250mm North

/ Infill slab to South East corner of residential lobby

/ Allowance for 2 x 240L bin cupboard


SSDA




Proposed Amendment

# LEVEL 02 PLAN

**Proposed Amendments to SSDA:**

/ Fire stair wall shifted 250mm North

/ Infill slab to South East corner of residential lobby

/ Allowance for 2 x 240L bin cupboard


SSDA


Proposed Amendment

# LEVEL 03-07 PLAN

**Proposed Amendments to SSDA:**

/ Infill slab to South East corner of residential lobby

/ Allowance for 2 x 240L bin cupboard


SSDA

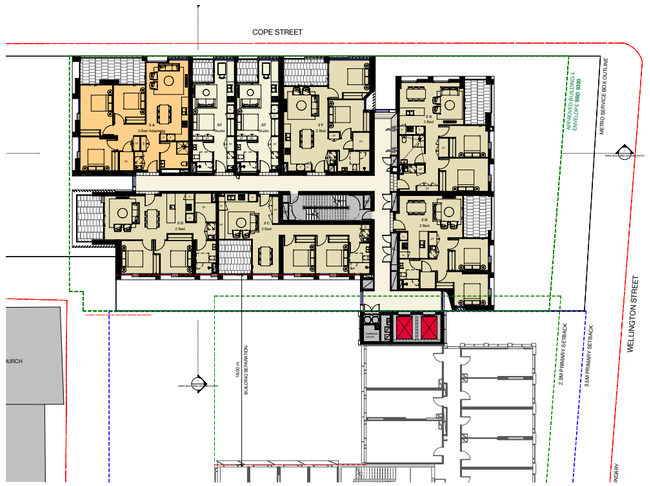

Proposed Amendment

# LEVEL 08 PLAN

**Proposed Amendments to SSDA:**

/ Infill slab to South East corner of residential lobby

/ Allowance for 2 x 240L bin cupboard

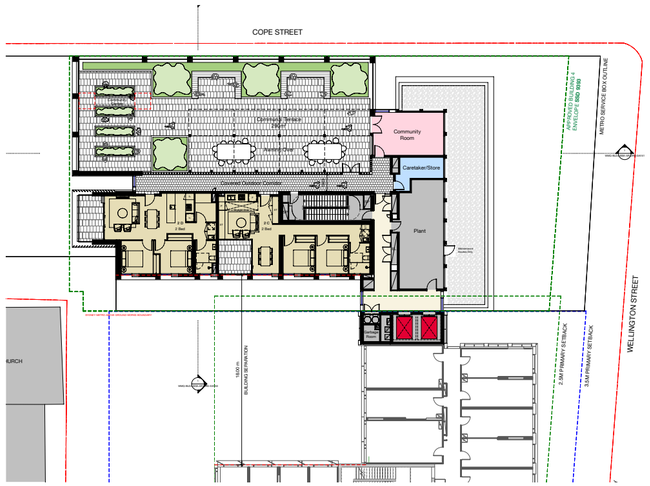



SSDA


Proposed Amendment

# LEVEL 09 PLAN

**Proposed Amendments to SSDA:**
/ Allowance for 2 x 240L bin cupboard




SSDA

Proposed Amendment

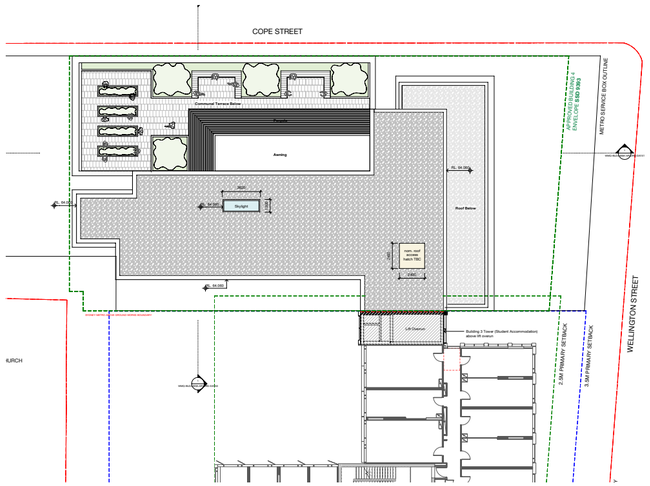
# ROOF PLAN

**Proposed Amendments to SSDA:**

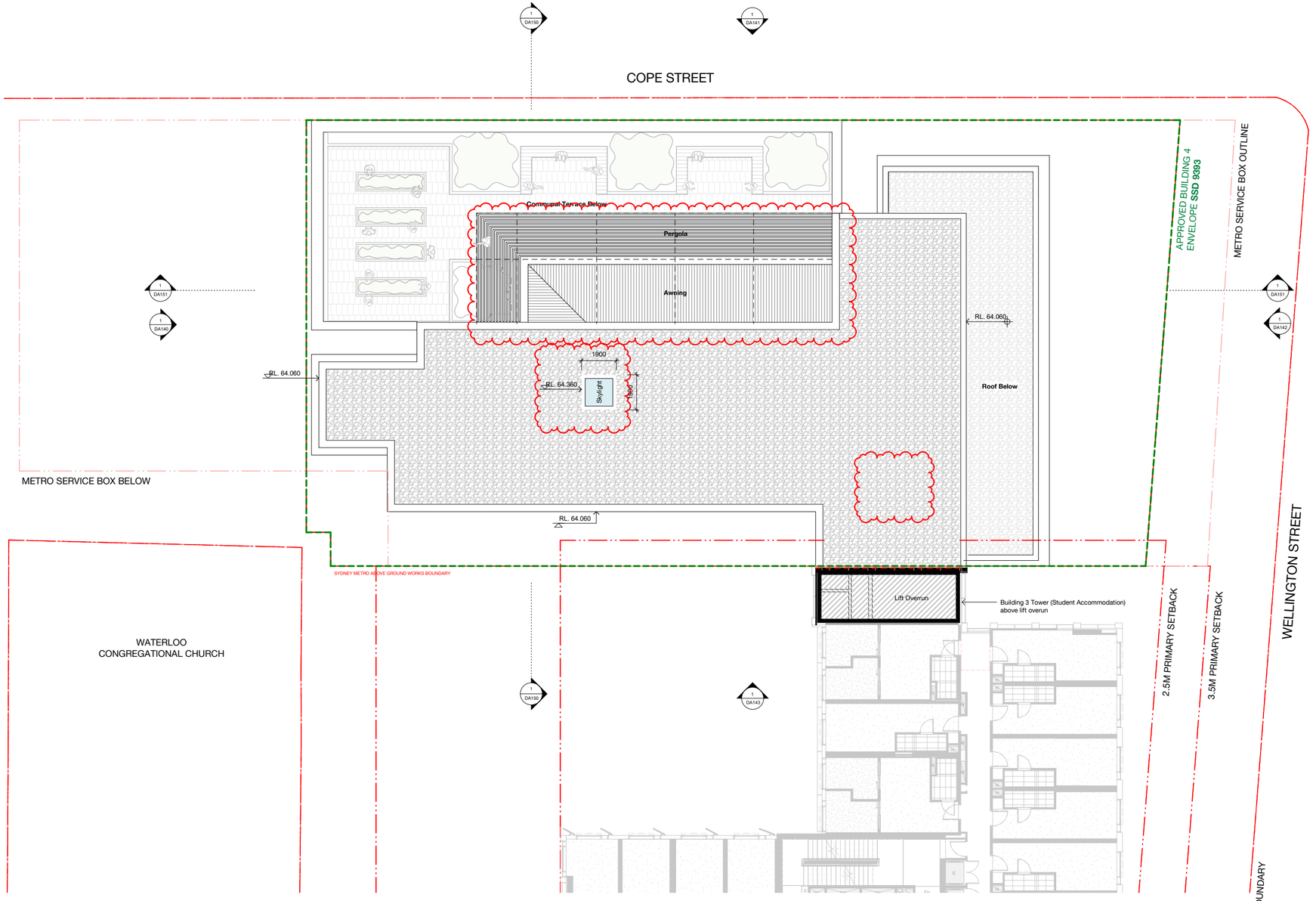
/ Remove access hatch to roof

/ Increase height of skylight

/ Increase area of Pergola




SSDA



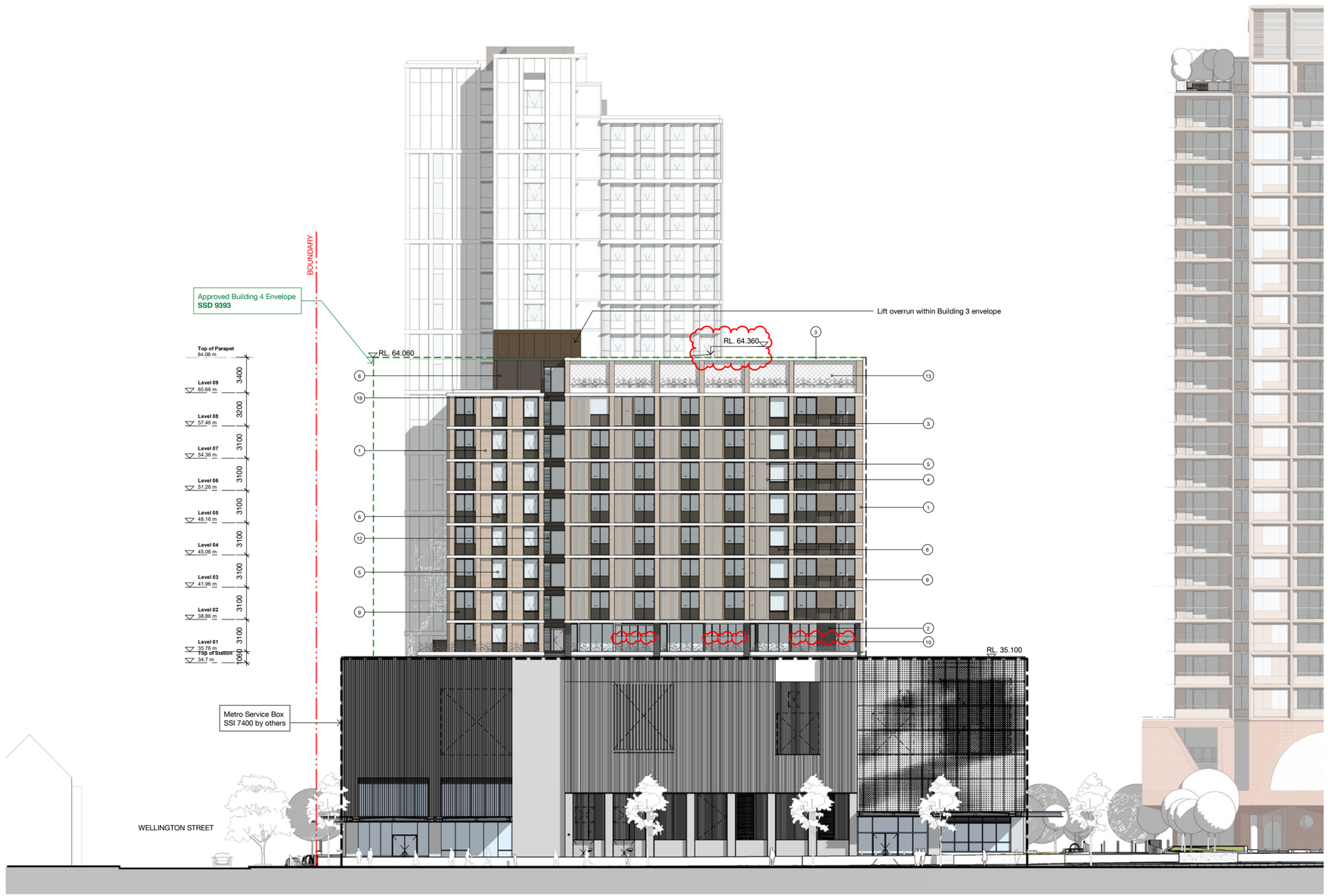

Proposed Amendment

# EAST ELEVATION

**Proposed Amendments to SSDA:**

/ Increased height of skylight RL = 64.36

/ Balustrade height increased on Level 1




Proposed Amendment