

5.1 NO. 357 (LOT: 3; D/P: 1879) LORD STREET, HIGHGATE - PROPOSED MIXED USE DEVELOPMENT

Ward: South

- Attachments:
1. Consultation and Location Map
 2. Development Plans
 3. Shading, Solar and Ventilation Analysis
 4. Acoustic Report
 5. Environmentally Sustainable Design Report
 6. Waste Management Plan
 7. Summary of Submissions - Administration's Response
 8. Summary of Submissions - Applicant's Response
 9. Design Review Panel Minutes 20 April 2022
 10. Determination Advice Notes

RECOMMENDATION:

That Council, in accordance with the provisions of the City of Vincent Local Planning Scheme No. 2 and the Metropolitan Region Scheme, APPROVES the application for Mixed Use Development at No. 357 (Lot: 3; D/P: 1879) Lord Street, Highgate, in accordance with the plans shown in Attachment 2, subject to the following conditions, with the associated determination advice notes in Attachment 10:

1. Development Plans

This approval is for Mixed Use Development as shown on the approved plans dated 4 July 2022. No other development forms part of this approval;

2. Use of Commercial Tenancy

This approval is for a Restaurant/Café as defined in the City of Vincent Local Planning Scheme No. 2:

Restaurant/Café means premises primarily used for the preparation, sale and serving of food and drinks for consumption on the premises by customers for whom seating is provided, including premises that are licensed under the Liquor Control Act 1988;

3. Boundary Walls

The surface finish of boundary walls facing adjoining property shall be of a good and clean condition, prior to the occupation or use of the development, and thereafter maintained, to the satisfaction of the City. The finish of boundary walls is to be fully rendered or face brick, or material as otherwise approved, to the satisfaction of the City;

4. Visual Privacy

Prior to the occupation or use of the development, all privacy screening devices shown on the approved plans shall be installed in accordance with the details and annotations indicated on the approved plans, to the satisfaction of the City;

5. Colours and Materials

Prior to the occupation or use of the development, the colours, materials and finishes of the development shall be in accordance with the details and annotations as indicated on the approved plans which forms part of this approval, and thereafter maintained, to the satisfaction of the City;

6. Landscaping

6.1 A detailed landscape and reticulation plan for the development site and adjoining road verge, to the satisfaction of the City, shall be lodged with and approved by the City prior to commencement of the development. The plan shall be drawn to a scale of

1:100, be generally in accordance with the landscaping plans dated 4 July 2022 and show the following:

- The location and type of existing and proposed trees and plants;
- Areas to be irrigated or reticulated;
- The provision of a minimum 10.4 percent deep soil areas, as defined by the Residential Design Codes Volume 2;
- The provision of a minimum of 6.6 percent on structure planting areas surrounding the roof terraces in accordance with the location and dimensions in the approved plans; and
- The provision of a minimum of 16 trees contributing towards canopy coverage within the deep soil and on structure planting areas provided. The tree species are to be in accordance with the City's recommended tree species list;

6.2 All works shown in the plans as identified in Condition 6.1 above shall be undertaken in accordance with the approved plans to the satisfaction of the City, prior to occupancy or use of the development and maintained thereafter to the satisfaction of the City, at the expense of the owners/occupiers; and

6.3 Prior to occupation or use of the development, two new verge trees shall be planted within the Broome Street verge adjacent to the subject site, at the expense of the applicant/owner, to the satisfaction of the City. The species of the new street trees shall be *Jacaranda mimosaeifolia* (Jacaranda) and they shall be a minimum of 35 litre capacity;

7. Car Parking, Access and Bicycle Facilities

7.1 Prior to occupation or use of the development, one visitor parking space, eight multiple residential parking spaces and one commercial tenancy parking space, shall be provided on site and are to be permanently marked for the exclusive use of visitor, multiple dwelling, and commercial tenancy parking in accordance with Australian Standard AS2890.1;

7.2 All driveways, car parking and manoeuvring area(s) which form part of this approval shall be sealed, drained, paved, line marked and allocated in accordance with the approved plans and with Australian Standard AS2890.1, prior to the occupation or use of the development and maintained thereafter by the owner/occupier to the satisfaction of the City; and

7.3 Prior to the occupation or use of the development, a minimum of two short-term bicycle parking bays and four long-term bicycle parking bays shall be provided on site in accordance with the approved plans to the satisfaction of the City. The design and construction of the bike bays shall be in accordance with Australian Standards AS2890.3: 2015 Parking Facilities Part 3: Bicycle Parking;

8. Building Design

8.1 The Restaurant/Café shall maintain an active and interactive relationship with Lord Street and Broome Street during the hours of operation, to the satisfaction of the City. Darkened, obscured, mirrored or tinted glass, roller shutters or the like are prohibited. Curtains, blinds and other internal treatments that obscure the view of the internal area from Lord Street and Broome Street are not permitted to be used during the hours of the Restaurant/Café's operation;

8.2 Ground floor glazing and/or tinting to the Restaurant/Cafe shall be a minimum of 70 percent visually permeable to provide unobscured visibility. Darkened, obscured, mirrored or tinted glass or other similar materials as considered by the City are prohibited;

8.3 All external fixtures, such as television antennas (of a non-standard type), radio and other antennae, satellite dishes, solar panels, external hot water heaters, air conditioners, and the like, shall not be visible from the street(s), are designed

integrally with the building, and be located so as not to be visually obtrusive to the satisfaction of the City;

8.4 Meter boxes and fire boosters shall be located behind the street setback area, not be visible from the street and where integrated into the building designed and located so as not to be visually obtrusive to the satisfaction of the City; and

8.5 The awning, outdoor terrace, balustrading and other structures located within the Lord Street Other Regional Road reservation shall be designed to be of a temporary nature and removable, and shall be removed at the time when the reserved land is required for the upgrading of the regional road, at expense of the owners/occupiers if required;

9. Acoustic Report

Prior to issue of a Building Permit, the submitted acoustic report (Acoustic Consultants Australia, 1 July 2022) shall be updated to demonstrate compliance with the City's Sound Attenuation Policy No. 7.5.21, namely in relation to Section 4.4 and demonstrating that all mechanical plant / equipment proposed to be installed would comply with the Environmental Protection (Noise) Regulations 1997. All recommended measures included in this updated report shall be implemented as part of the development and operated in accordance with, to the satisfaction of the City prior to the use or occupation of the development and maintained thereafter to the satisfaction of the City at the expense of the owners/occupiers;

10. Waste Management Plan

Prior to the occupation or use of the development, an updated Waste Management Plan shall be submitted to and approved by the City. The plan shall be in accordance with the City's Waste Management Guidelines and must include the following details to the satisfaction and specification of the City:

- The location of bin storage areas and bin collection areas;
- The number, volume and type of bins, and the type of waste to be placed in the bins;
- Details on the future ongoing management of the bins and the bin storage areas, including cleaning, rotation and moving bins to and from the bin collection areas; and
- The service and frequency of bin collections;

The Waste Management Plan must be implemented at all times to the satisfaction of the City;

11. Construction Management Plan

Prior to the development commencing a Construction Management Plan shall be lodged with and approved by the City (including demolition and/or forward works). The Construction Management Plan is required to detail how the construction will be managed to minimise the impact on the surrounding area and shall include the following:

- Public safety, amenity and site security;
- Contact details of essential site personnel;
- Construction operating hours;
- Noise control and vibration management;
- Dilapidation Reports of nearby properties;
- Air, sand and dust management;
- Stormwater and sediment control;
- Soil excavation method;
- Waste management and materials re-use;
- Traffic and access management;
- Parking arrangements for contractors and subcontractors;
- Crane location and operation;
- Consultation plan with nearby properties; and
- Compliance with AS4970-2009 relating to the protection of trees on the development site;

12. Public Art

- 12.1 In accordance with the City's Policy No. 7.5.13 – Percent for Art the application is required to make a public art contribution of \$15,000 being one percent of the \$1.5 million cost of development.**

In order to comply with the Policy, the owner(s) or applicant, on behalf of the owner(s) shall submit a statutory declaration prior to the lodgement of a Building Permit stipulating the choice of:

Option 1: Owner/Applicant chooses to co-ordinate the Public Art project themselves or by engaging an art consultant

OR

Option 2: Owner/Applicant chooses to pay cash-in-lieu. Owner/Applicants who choose Option 2 will receive a 15 percent discount on the Percent for Art contribution; and

- 12.2 The owner(s), or the applicant on behalf of the owner(s), shall comply with the City of Vincent Policy No. 7.5.13 – Percent for Public Art in conjunction with the above chosen option:**

Option 1 –

Prior to the issue of a Building Permit for the development, obtain approval for the Public Art Project and associated Artist; and

Prior to the first occupation of the development, install the approved public art project, and thereafter maintain the art work;

OR

Option 2 –

Prior to the issue of an Occupancy Permit pay the above cash-in-lieu contribution amount;

13. Clothes Drying Facilities

Prior to the occupation or use of the development, each multiple dwelling shall be provided with a clothes drying area screened from the public realm in accordance with the Residential Design Codes Volume 2, to the satisfaction of the City; and

14. Stormwater

Stormwater from all roofed and paved areas shall be collected and contained on site. Stormwater must not affect or be allowed to flow onto or into any other property or road reserve.

PURPOSE OF REPORT:

To consider an application for development approval for a Mixed Use Development at No. 357 Lord Street, Highgate (the subject site).

PROPOSAL:

The application proposes a four storey mixed use development comprising of the following:

- Four multiple dwellings facing Broome Street. Each dwelling is spread across the first, second and third floors and has four bedrooms with a central walkway on the first level providing access to all units;
- A café tenancy on the ground floor at the corner of Lord Street and Broome Street;

- Vehicle access provided from Broome Street, with 10 car parking bays provided on the ground floor;
- Pedestrian access provided from Lord Street to the café tenancy and the residential lobby and dwelling entries; and
- A community pocket park in the north-west corner along Broome Street with seating and a section of wall designated for future public art work.

The subject site currently contains an existing single house fronting Lord Street which would be demolished.

A location plan is included as **Attachment 1**. The proposed development plans are included as **Attachment 2**. The applicant's supporting documentation, including a shading, solar and ventilation analysis, an acoustic report, an environmentally sustainable design (ESD) report and a waste management plan (WMP), are included as **Attachments 3, 4, 5 and 6** respectively.

BACKGROUND:

Landowner:	Imak Development Pty Ltd
Applicant:	Arconic Design
Date of Application:	4 April 2022
Zoning:	MRS: Urban LPS2: Zone: Residential R Code: R100
Built Form Area:	Transit Corridor
Existing Land Use:	Single House
Proposed Use Class:	Multiple Dwellings – P use Restaurant/Café – A use
Lot Area:	544m ²
Right of Way (ROW):	No
Heritage List:	No

DETAILS:

Site Context and Zoning

The subject site is bound by Lord Street to the east, Broome Street to the north, a single house to the south and 11 grouped dwellings to the west.

The subject site and all adjoining properties are zoned Residential R100 under the City's Local Planning Scheme No.2 (LPS2). The subject site and all adjoining properties are within the Transit Corridor built form area and have a building height standard of six storeys under the City's Policy No. 7.1.1 – Built Form (Built Form Policy).

The existing development context along Lord Street generally consists of single and two storey residential development, with some multi-storey commercial, mixed use and multiple dwelling developments further to the south of the subject site.

The existing development context along Broome Street generally consists of single and two storey residential development. On the opposite side of Broome Street to the subject site there is a medical clinic, Highgate Primary School Kindergarten and Jack Marks Reserve.

The section of Lord Street that abuts the subject site is designated as an Other Regional Road (ORR) in the Metropolitan Region Scheme and is classified as Category 2. The subject site is affected by a portion of the ORR reservation, being a 6.0 metre x 6.0 metre truncation at the corner of Lord Street and Broome Street.

Development at No. 70 Wright Street, Highgate

The subject site is located in close proximity to an existing development site at No. 70 Wright Street, Highgate.

The site received development approval in June 2017 for a five storey development comprising of two buildings with 38 multiple dwellings.

The development received a building permit in May 2020 with the works commencing soon after. Following the collapse of Pindan Pty Ltd a building permit was issued in November 2021 for a change of builder, with this permit being valid to November 2023. Works have not been completed and are ongoing.

Summary Assessment

The proposal was assessed in accordance with the standards of the Built Form Policy and State Planning Policy 7.3 Residential Design Codes – Apartments (R Codes Volume 2) which relates to multiple dwelling and mixed use developments.

The R Codes Volume 2 provides guidance for multiple dwellings and focuses on improved design outcomes for apartments that are responsive and appropriate to the context and character of the site and locality.

This is a performance-based assessment and applicants are required to demonstrate that the design achieves the objectives of each design element as well as the overall objectives of the R Codes Volume 2.

Consideration of Element Objectives and Acceptable Outcomes

The R Codes Volume 2 includes Element Objectives and Acceptable Outcomes for each design element.

Proposals are required to demonstrate that the design achieves the Element Objectives for each design element.

While addressing the Acceptable Outcomes is likely to achieve the relevant Element Objectives, they are not a deemed-to-comply pathway and the proposal is still to be assessed against the relevant Element Objectives.

Where Acceptable Outcomes are not met, proposals may still satisfy the Element Objective via alternative means or solutions.

Detailed Assessment

The Acceptable Outcomes that are not achieved in the proposal are as follows:

Land Use	
Use Class Permissibility	Proposal
LPS2 – Zoning Table	
'P' Use	Restaurant/Café – 'A' Use
Street Setbacks	
Acceptable Outcomes	Proposal
R Codes Volume 2, Element 2.3 – Street Setback	
Broome (Secondary) Street Setback: 2.0m	Broome (Secondary) Street Setback: <ul style="list-style-type: none"> GF – 1.8m to 2.0m 1F – 1.1m to 2.0m
Side and Rear Setbacks	
Acceptable Outcomes	Proposal
R Codes Volume 2, Element 2.4 – Side and Rear Setbacks	
3 rd floor South (Side) Setback: 3.0m with an average of 3.5m 3 rd floor West (Rear) Setback: 6.0m	3F South (Side) Setback: 2.7m 3F West (Rear) Setback: 3.7m to 8.2m
Plot Ratio	
Acceptable Outcomes	Proposal
R Codes Volume 2, Element 2.5 – Plot Ratio	
1.3 (707.2m ²)	1.38 (749.7m ²)

Visual Privacy	
Acceptable Outcomes	Proposal
<p>R Codes Volume 2, Element 3.5 – Visual Privacy</p> <p>Cone of vision setbacks to adjoining lot boundaries as follows:</p> <ul style="list-style-type: none"> • 3 metres to major openings to bedrooms, studies and open access walkways. • 4.5 metres to major openings to habitable rooms other than bedrooms and studies. • 6 metres to unenclosed balconies or roof terraces. 	<p><u>West Boundary</u></p> <ul style="list-style-type: none"> • Unit 4 1F Theatre/Sitting Room West Window – 3.2m • Unit 4 3F Roof Terrace West Opening – 4.8m <p><u>South Boundary</u></p> <ul style="list-style-type: none"> • Unit 4 1F Bedroom 4 West Window – 2.5m • 3F Roof Terraces South Openings – 3.9m
Public Domain Interface	
Acceptable Outcomes	Proposal
<p>R Codes Volume 2, Element 3.6 – Public Domain Interface</p> <p>Balcony balustrading is to have a mix of visually opaque and permeable materials to provide residents with privacy while maintaining surveillance.</p>	<p>The balconies facing Broome Street have balustrading which is made up of only visually permeable materials.</p>
Natural Ventilation and Size and Layout of Dwellings	
Acceptable Outcomes	Proposal
<p>R Codes Volume 2, Element 4.2 – Natural Ventilation and Element 4.3 – Size and Layout of Dwellings</p> <p>Habitable rooms are to have openings on at least two walls with a straight line distance between the centre of the openings of at least 2.1m.</p> <p>The length of a single aspect open plan living area is equal to or less than three times the ceiling height, up to a maximum length of 9.0m where a kitchen is the furthest point from the window.</p>	<p>The bedrooms for all units do not have openings on at least two walls.</p> <p>The length of the single aspect open plan living areas are:</p> <ul style="list-style-type: none"> • Unit 2 and Unit 3 – 9.7m • Unit 4 – 9.5m
Circulation and Common Spaces and Universal Design	
Acceptable Outcomes	Proposal
<p>R Codes Volume 2, Element 4.5 – Circulation and Common Spaces</p> <p>Either 20 percent of all dwellings meet Silver Level requirements or 5 percent meet the Platinum Level requirements as defined in the Liveable Housing Design Guidelines.</p> <p>Circulation and common spaces are to be designed for universal access.</p>	<p>None of the four dwellings provided meet the Silver or Platinum Level requirements.</p> <p>The residential lobby and first floor access way are not designed for universal access as they're only accessible via stairs.</p>

Façade Design	
Acceptable Outcomes	Proposal
<p>R Codes Volume 2, Element 4.10 and Built Form Policy Clause 1.8 – Façade Design</p> <p>Doorways are to have a depth of between 0.5m and 1.5m to clearly articulate entrances to commercial tenancies.</p> <p>Commercial developments are to provide a continuous awning over the pedestrian footpath with a minimum height of 3.5m.</p>	<p>The doorway to the café tenancy is not recessed.</p> <p>An awning is only provided over the café terrace area and not over any part of the footpath. The awning has a minimum height of 3.0m.</p>

An assessment of how the proposal meets the Element Objectives of the R Codes Volume 2 – Apartments is discussed in the comments section below.

CONSULTATION/ADVERTISING:

Community Consultation

Community consultation was undertaken for a period of 14 days in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*, from 3 May 2022 to 16 May 2022. The method of advertising included notice on the City's website and 23 letters being mailed to all owners and occupiers of the properties adjoining the subject site in accordance with the City's Community and Stakeholder Engagement Policy. Given the proposal scale and orientation, the extent of consultation was increased to include the owners and occupiers of all properties on Broome Street between Lord and Wright Street.

At the conclusion of the consultation period 10 submissions were received.

- Two submissions were received in support;
- Seven submissions were in objection; and
- One submission was neither in support or objection but expressed some concerns.

The key concerns raised during the community consultation period are as follows:

- The design of the proposal not being sympathetic to the character of the street and area;
- Construction management, and concerns with an extended period of construction and the use of a crane. Associated concerns with ongoing visual, noise and privacy impacts on adjoining properties, which have already been experienced with the nearby development at No. 70 Wright Street;
- Building height, scale and setbacks, and associated impacts of overlooking, overshadowing and building bulk on the adjoining properties. Specific concerns with overlooking from the roof terraces; and
- Concerns with increased parking demand and traffic along Broome Street from future residents, visitors and café patrons of the development. Associated concerns of reduced parking availability and safety impacts on users of the street.

A summary of all the submissions received and Administration's response is included as **Attachment 7**. The applicant's response is included as **Attachment 8**.

Amended Plans

Following community consultation the applicant submitted amended plans to respond to the Element Objectives and the Design Review Panel minutes. The key changes are summarised below:

- Addition of an access point off Broome Street to the café terrace;
- Modifications to landscaping, including increasing the planter width and adding small trees on the roof terrace, and the inclusion of larger, non-deciduous and native tree species across the site; and
- Modifications to materiality, including adding vertical timber elements, reducing the amount of dark cladding on the upper levels and increasing the amount of recycled brickwork.

As the changes did not significantly alter the plans in relation to the key concerns raised during consultation or propose any new or greater discretion of the Acceptable Outcomes, a second consultation period was not

required in accordance with the Community and Stakeholder Engagement Policy. The submitters were notified prior to the Council Meeting of the key changes made to the plans and of the response to submissions from Administration and the applicant.

Department of Planning, Lands and Heritage (DPLH)

The application was referred to DPLH as the subject site is affected by the Lord Street road reservation which is a Category 2 ORR under the Metropolitan Region Scheme.

DPLH advised that they had no objection to the proposal on ORR planning grounds. They also advised that they did not support development of a permanent nature within the area reserved for future widening of the ORR, being the 6.0 metre x 6.0 metre truncation at the corner of Lord Street and Broome Street.

The application proposes a raised terrace, a retaining wall and an awning within this corner truncation area. A condition has been recommended to be imposed stating that these structures shall be designed to be of a temporary nature and shall be removed at the applicant/owner’s cost at the time when the reserved area is required for road widening. This has been confirmed as acceptable by DPLH.

Design Review Panel (DRP):

Referred to DRP: Yes

The development was initially referred to the DRP pre-lodgement on the 29 September 2021 and following lodgement on the 20 April 2022 and for a third time to the DRP Chair. The DRP meeting minutes are included in **Attachment 9**.

The table below outlines how the application has progressed through the DRP process to achieve the 10 design principles.

Design Review Progress Report			
Design Quality Evaluation			
	<i>Supported</i>		
	<i>Pending further attention – refer to detailed comments provided</i>		
	<i>Not supported</i>		
	<i>Insufficient information for design quality evaluation colours to be attributed</i>		
	DRP 1 29 September 2021	DRP 2 20 April 2022	DRP Chair 18 July 2022
Principle 1 - Context and character			
Principle 2 - Landscape quality			
Principle 3 - Built form and scale			
Principle 4 - Functionality and build quality			
Principle 5 – Sustainability			
Principle 6 – Amenity			
Principle 7 – Legibility			
Principle 8 – Safety			
Principle 9 – Community			
Principle 10 - Aesthetics			

Following lodgement of the application, the proposal was presented to the DRP on 20 April 2022. Amended plans and additional information were submitted in response to the previous DRP Minutes. The key changes are summarised below:

- Reducing the number of dwellings from nine to four, and increasing the size of each dwelling;
- Extending the café interface and the associated outdoor terrace area along Broome Street;
- Adding a pocket park space along Broome Street in the north-western corner of the site;

- Reducing the size and extent of the upper floors, and adding an individual roof terrace for each dwelling;
- Refining the colours, materials and finishes of the elevations to Broome Street and Lord Street; and
- Submission of an environmentally sustainable design report.

Amended plans and additional information were submitted in response to the 20 April 2022 DRP Minutes. The key changes are outlined in the Consultation/Advertising section.

The amended proposal was referred to the DRP Chairperson who was satisfied that the amendments addressed the previous concerns, advising that major improvements had been made to the Broome Street ground level interface which was a key concern previously.

LEGAL/POLICY:

- *Planning and Development Act 2005;*
- *Planning and Development (Local Planning Schemes) Regulations 2015;*
- *City of Vincent Local Planning Scheme No. 2;*
- *State Planning Policy 5.4 – Road and Rail Noise;*
- *State Planning Policy 7.3 – Residential Design Codes Volume 2 – Apartments;*
- *Community and Stakeholder Engagement Policy;*
- *Policy No. 7.1.1 – Built Form Policy;*
- *Policy No. 7.5.13 – Percent for Public Art;*
- *Policy No. 7.5.21 – Sound Attenuation;*
- *Policy No. 7.5.23 – Construction Management Plans; and*
- *Policy No. 7.7.1 – Non-Residential Development Parking Requirements.*

Planning and Development Act 2005

In accordance with Schedule 2, Clause 76(2) of the Planning and Development (Local Planning Schemes) Regulations 2015 and Part 14 of the Planning and Development Act 2005, the applicant would have the right to apply to the State Administrative Tribunal for a review of Council's determination.

City of Vincent Local Planning Scheme No. 2

In considering the acceptability of the Restaurant/Café land use, Council is to have regard to the objectives of the relevant zone.

The objectives of the Residential zone under LPS2 are as follows:

- *To provide for a range of housing and a choice of residential densities to meet the needs of the community.*
- *To facilitate and encourage high quality design, built form and streetscapes throughout residential areas.*
- *To provide for a range of non-residential uses, which are compatible with and complementary to residential development.*
- *To promote and encourage design that incorporates sustainability principles, including but not limited to solar passive design, energy efficiency, water conservation, waste management and recycling.*
- *To enhance the amenity and character of the residential neighbourhood by encouraging the retention of existing housing stock and ensuring new development is compatible within these established areas.*
- *To manage residential development in a way that recognises the needs of innovative design and contemporary lifestyles.*
- *To ensure the provision of a wide range of different types of residential accommodation, including affordable, social and special needs, to meet the diverse needs of the community.*

Delegation to Determine Applications:

This matter is being referred to Council for determination in accordance with the City's Register of Delegations, Authorisations and Appointments. This is because the delegation does not extend to applications for development approval that received more than five objections during the City's community consultation period.

RISK MANAGEMENT IMPLICATIONS:

There are minimal risks to Council and the City's business function when Council exercises its discretionary power to determine a planning application.

STRATEGIC IMPLICATIONS:

This is in keeping with the City's Strategic Community Plan 2018-2028:

Innovative and Accountable

We are open and accountable to an engaged community.

SUSTAINABILITY IMPLICATIONS:

The City has assessed the application against the environmentally sustainable design provisions of the City's Policy No. 7.1.1 – Built Form. These provisions are informed by the key sustainability outcomes of the City's Sustainable Environment Strategy 2019-2024, which requires new developments to demonstrate best practice in respect to reductions in energy, water and waste and improving urban greening.

PUBLIC HEALTH IMPLICATIONS:

This report has no implication on the priority health outcomes of the City's *Public Health Plan 2020-2025*.

FINANCIAL/BUDGET IMPLICATIONS:

There are no finance or budget implications of this report.

COMMENTS:Land Use

A Restaurant/Café is an 'A' use within the Residential zone, which requires discretion to be exercised in approving this use.

The proposal satisfies the objectives of the Residential zone under LPS2 for the following reasons:

- Location: The café is located at the street corner and on the ground floor of the building where it would not be directly adjacent to any residential dwellings. It is located away from the residential dwellings on Broome Street, providing a transition from the higher density mixed use context of Lord Street to the lower density residential context of Broome Street.
- Size: The café has an internal floor area of 24.7 square metres with a small outdoor terrace. It would only be capable of accommodating a limited amount of seating and customers, and this is compatible with the predominantly residential nature of the area. The applicant has stated the café would primarily cater for local residents or people travelling to and from work given its size, and that they've provided an external servery window to promote the takeaway aspect for these patrons.
- Site Context: Lord Street contains some existing mixed use developments and commercial land uses, including the medical clinic located on the opposite side of Broome Street at No. 361 Lord Street. Lord Street is also a transit corridor location undergoing transition with further higher density development expected. A small café along Lord Street providing services to the local area is considered appropriate in this context.
- Design: The café tenancy is designed with bi-fold doors, large areas of glazing and an outdoor terrace providing pedestrian access to both street frontages. This ensures that a high level of activation and surveillance will be provided at the street corner without encroaching into the lower density residential context to the west along Broome Street.

Building Height and Plot Ratio*Building Height and Scale*

The R Codes Volume 2 acceptable outcome relating to plot ratio outlines that developments on R100 coded sites shall have a plot ratio of 1.3(707.2 square metres). The proposal would have a plot ratio of 1.38 (749.7 square metres).

Concerns were received during consultation regarding the height and scale of the proposal. The Built Form Policy acceptable outcomes relating to building height outline that developments shall have a height of six storeys and a concealed roof height of 20.5 metres. The proposal would have a height of four storeys and a concealed roof height of 14.9 metres.

The proposed building height and plot ratio would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- Future Context: – The proposal would not be inconsistent with the desired future scale and character of the area because:
 - The proposal is consistent with the desired future scale and character of Lord Street which is a higher density location undergoing transition, with it being identified as a Transit Corridor built form area under the Built Form Policy.
 - The subject site is zoned Residential R100 under LPS2 and is recognised as a higher density residential area under the R Codes Volume 2.
 - Multiple dwellings are a permitted land use within the Residential zone under LPS2, and the provision of four storey development containing multiple dwellings is consistent with the expected dwelling density of the surrounding area and Lord Street and an appropriate response to the size of the site.
 - The Built Form Policy provides a six storey height standard for Lord Street with a density of R100 in the immediate locality and Commercial zoning (allowing a higher density) located further to the north and south. There are existing recent developments on Lord Street with similar heights, including to the south near the intersection of Bulwer and Lords Streets, and at No. 337 Lord Street which is a four storey development containing 28 multiple dwellings.
 - The subject site is a corner location with two street frontages, and the only two adjoining properties to the south and west both share the same zoning under LPS2 and height standards under the Built Form Policy. As they both have the same development potential, they are expected to transition over time with developments of a similar built form and scale to this proposal.
- Site Topography: The site slopes down by approximately 1 metre to north. In response to this, the residential lobby and café have a higher floor level to match into the existing levels of Lord Street, while the parking area is graded down to a lower floor level to match into the existing levels of Broome Street. This ensures that the proposal would present appropriately to both street frontages and the adjoining properties without exacerbating the height of the proposal by not responding to the site's topography.
- Roof Design: The development incorporates a skillion roof which is highest at Broome Street and slopes down to the south, reducing the impact of bulk and overshadowing on the southern adjoining property. This is further assisted by the third floor having open roof terraces on the south and sides of this level, ensuring that the proposal predominantly presents as three storeys to the western and southern adjoining properties. This ensures the proposal respects the current single and two storey context of these sites while recognising that they are expected to transition in-line with the future context set out above.
- Building Design: The building design incorporates varying colours and materials, high levels of glazing, open balconies and roof terraces, and proposes art work along the southern and western façades to break up the bulk and scale of the building. Landscaping is provided along the sides of the roof terraces and around the street and western interfaces to soften the appearance of the building, including multiple medium and large trees.
- Solar Access: In addition to the roof design, the third and fourth storeys are set back further from the southern boundary this assists in maintaining an appropriate level of solar access to the southern adjoining property in considering the existing single dwelling along with the site's future development potential. A level of overshadowing to the southern property is also inevitable considering the orientation of the subject site, the high density planning framework that is applicable to the subject site, and that the proposal is coming before similar development of the southern property has occurred.
- DRP: The DRP supported the built form and scale of the proposal, identifying that it is consistent with the planning framework and an increased plot ratio can be considered with a high quality design outcome which the final DRP comments identified had been provided.

Street Setback and Public Domain Interface

Broome Street Interface

The R Codes Volume 2 acceptable outcomes relating to street setback and public domain interface outline that developments are to have a 2.0 metre secondary street setback and that balconies are to have a mix of visually opaque and permeable materials.

The proposal would have a secondary street setback of 1.8 metres and 1.1 metres from the ground and first floors respectively to the secondary street (Broome Street). The balconies facing Broome Street have balustrading which is made up of only visually permeable materials.

The proposed street setback and public domain interface would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- **Landscaping:** The ground floor setback is a minimum of 1.8 metres which allows deep soil areas of sufficient dimension (a minimum of 1.0 metre) to be provided along Broome Street which would accommodate eight trees. This compliments the existing landscape character along Broome Street where there is a high level of landscaping provided both within and outside properties between the buildings and the street, while also assist to soften the appearance of the building.
- **Private and Public Realm Transition:** The ground floor setback to Broome Street contains landscaping, retaining walls, the outdoor café terrace and the community pocket park with public seating and art work. This provides a clear transition between the public and private realm, with these areas designed and landscaped to be publicly accessible and to add to the amenity of Broome Street. These will also assist to activate and provide visual interest to the proposal at ground level to Broome Street.
- **Internal Privacy:** The street setbacks provided assist in achieving visual privacy to the dwellings by allowing trees to be planted between the building and Broome Street to provide natural screening to the upper floors, noting that there are no dwellings located on the ground floor. The first floor proposes a setback of less than 2.0 metres to the balconies of unit 1 and 4. This provides articulation to the Broome Street façade and provides a frame around the balcony openings to provide articulation and assist with privacy to these areas. Roof terraces are provided as an alternative outdoor space to the balconies which take advantage of the City views. These would not be visible from the public realm due to their location on the third floor. The upper floor terrace are proposed to include planters surrounding the entire perimeter with a height of 1.0 metre above the roof terrace floor level and containing a series of small plantings with expected heights ranging from 10 to 50 centimetres along with four *Prunus cerasifera* (Flowering Plum) trees with expected heights of 5 metres. These would offer further screening and amenity to residents using these spaces.
- **Passive Surveillance:** The street setbacks provided enable passive surveillance to the street, with high levels of glazing provided from all of the upper floors which face and will look over Broome Street. This would be assisted by the balconies on the first floor which also face Broome Street and have visually permeable balustrading. This balustrading type would not compromise the internal privacy of residents as alternative private outdoor spaces are provided in the form of roof terraces on the third floor. On the ground floor, passive surveillance is provided with the café and outdoor terrace wrapping around to Broome Street, a perforated garage door and a publicly accessible community pocket park.
- **DRP:** The DRP supported the community, aesthetics and context and character aspects of the proposal, identifying that the level of activation to Broome Street within the site's constraints was positive.

Side and Rear Setbacks, Orientation (Overshadowing) and Visual Privacy

Relationship to Adjoining Properties

The R Codes Volume 2 acceptable outcomes relating to side and rear setbacks outline that developments, for the third floor and above, are to have a 3.0 metre and 3.5 metre average setback to side boundaries and a 6.0 metre setback to rear boundaries. The acceptable outcomes relating to visual privacy outline that the following cone of vision setbacks shall be provided to adjoining lot boundaries:

- 3 metres to major openings to bedrooms, studies and open access walkways.
- 4.5 metres to major openings to habitable rooms other than bedrooms and studies.
- 6 metres to unenclosed balconies or roof terraces.

The third floor of the proposal would have a side (southern) setback of 2.7 metres and rear (western) setback ranging from 3.7 metres to 8.2 metres. The proposal would have openings with the following setbacks:

- Unit 4 First Floor Theatre/Sitting Room west facing window: 3.2 metres to the western boundary.
- Unit 4 First Floor Bedroom 3 west facing window: 2.5 metres to the southern boundary.
- Third Floor Roof Terraces: 4.8 metres to the western boundary and 3.9 metres to the southern boundary.

In addition to concerns received during consultation about visual privacy and setbacks, concerns were also received with regards to overshadowing of the adjoining properties from the proposal. The acceptable outcomes relating to orientation outline that developments that adjoin properties coded R80 and above do not have overshadowing requirements. The proposal adjoins properties to the south and west that are coded R100.

The proposed side and rear setbacks, orientation and visual privacy would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- **Building Separation:**
 - Southern Adjoining Property: The proposal is separated from the adjoining property to the south by an existing 3 metre setback which in conjunction with the proposed setback of 2.7 metres to 3 metres from the second and third floors would provide adequate separation between neighbouring properties.
 - Western Adjoining Property: The proposal is separated from the adjoining property to the west by an existing landscaped area and driveway which separates the proposal and the dwellings on the western property. This in conjunction with the 1.9 metre wide landscaped setback area provided at ground level along the western boundary, along with the minimum setback of the upper floors of 3.2 metres, would provide adequate separation between neighbouring properties.
- **Future Context:** The setbacks of the proposal are consistent with desired streetscape character and future development context of the adjoining properties and Lord Street as set out above. Both the western and southern adjoining properties are coded R100, and under the Built Form Policy they have a height standard of six storeys and a setback standard allowing nil setbacks for the first three storeys.
- **Landscaping and Transition:** The 1.9 metre minimum ground floor setback to the western boundary enables the provision of 25.3 square metres of deep soil areas and supports tree canopy with four trees provided in this area. This would assist to soften the appearance and to transition the development into the landscape character and lower density residential context of Broome Street to the west. The setbacks of the third floor from the western and southern boundaries allow roof terraces to be provided with on-structure planting surrounding them to the south and west. These 1.3 metre wide planters provide separation between the third floors and the adjoining properties, and the provision of small plantings and four trees within them will assist to provide screening and soften the appearance of the third floor.
- **Design:** In addition to landscaping, building bulk and scale would be reduced as the design incorporates varying colours and materials, high levels of glazing and art work to break up the western and southern elevations. This is further assisted by the skillion roof design and the location of the third floor in the centre along the north side of the building, away from the western and southern properties. The 2.7 metre southern and 3.7 metre western setbacks of the third floor relate to the edge of the planters on the third floor roof terraces, with building bulk and scale being reduced as the planters present with a lower height of 1.3 metres to the adjoining properties compared to the height of a full building floor.
- **Overshadowing:** Overshadowing of the adjoining properties in mid-winter (between 9am and 3pm) is demonstrated by the diagrams in **Attachment 3** (SK1 to SK7). These demonstrate that in the worst-case periods of the morning in mid-winter, overshadowing to the west will only fall on the driveway and landscaped areas of the western adjoining property and not onto any private open spaces or windows to habitable rooms. To the south, although overshadowing will fall over habitable rooms and open spaces of the southern adjoining properties, the diagrams demonstrate that in the afternoon that the open spaces of the southern adjoining properties would still be capable of receiving solar access. This is considered an appropriate outcome when looking at the future development context and the applicable planning framework of these properties as set out above, with the existing buildings likely to change in the future to be of a similar built form and scale. It's also noted that no submission was received during consultation from the primarily affected southern adjoining property (No. 355 Lord Street).
- **Visual Privacy:**
 - First Floor West Windows: The windows face west and look towards the eastern side of the western adjoining property, containing a driveway, bin store and landscaped area. They also look towards the north-western corner of the southern adjoining property, containing a small area of

garden between an outbuilding and the rear boundary fence. The impact of overlooking is minimised as these windows would not directly overlook any habitable rooms or private outdoor living areas on the adjoining properties. This is further assisted by the screening provided from existing mature trees and shrubs located on the western property adjacent to the shared boundary and with the proposal including trees within the western setback area on the subject site which are expected to grow to heights of 6 to 12 metres depending on the species type. The Bedroom 4 window has also been designed with a section of obscure glazing and with louvres over the section of clear glazing, with this further reducing overlooking while still maintaining internal solar access and ventilation to this bedroom.

- **Roof Terraces:** The roof terraces are open on the sides facing west and south towards the adjoining properties. The impact of overlooking is minimised as the usable area of the roof terrace is separated from the adjoining properties by planters with a width of 1.3 metres and an internal height of 1.0 metre above the floor level. This restricts the ability of users to look directly down towards the outdoor living areas and habitable rooms of the adjoining properties, and provides that views are directed out from the roof terraces above these properties. This is demonstrated by the diagrams in the development plans in **Attachment 1** (Sheet 12 and 13). This would be further assisted by the planters containing landscaping offering screening, including small plantings with expected heights ranging from 10 to 50 centimetres along with four *Prunus cerasifera* (Flowering Plum) trees with expected future heights of 5 metres.

Tree Canopy and Deep Soil Areas

Landscaping

In addition to the acceptable outcomes of the R Codes Volume 2, the application has also been assessed against the landscaping provisions of the Built Form Policy Volume 2, Clause 4.3 that set out acceptable outcomes. The acceptable outcomes set out in the Built Form Policy have not yet been approved by the Western Australian Planning Commission (WAPC) and as such, these provisions are given regard only in the assessment of the application and do not have the same weight as other policy provisions.

The Built Form Policy acceptable outcomes set out 12 percent of the site to be provided as deep soil areas, 3 percent of the site to be provided as planting areas, 30 percent of the site to be provided as canopy coverage at maturity and 50 percent of the front setback area to be provided as soft landscaping.

The proposal provides 10.4 percent of the site as deep soil areas, 16.9 percent of the site as planting areas, 24.2 percent of the site as canopy coverage and 44.9 percent of the front setback area as soft landscaping.

The proposed tree canopy and deep soil areas would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- **Existing Landscaping:** The building is setback from the western and Broome Street boundaries which would maintain the viability of the existing trees on the western adjoining property along the shared boundary, as well as the existing street trees along the verge of Broome Street which would be retained.
- **Canopy Coverage:** Adequate measures have been taken to improve tree canopy, with 12 trees provided across the ground level within all of the deep soil areas available along the Lord Street, Broome Street and western setback areas. Five different species are proposed with a mix of evergreen and deciduous species provided. Their sizes also vary with large trees located along the western setback area and to Lord Street, including a *Brachychiton acerifolium* (Illawarra Flame Tree) in the north-west corner of the site which has an expected height of 12 metres and a canopy width of 6 metres at maturity. Due to the location of these trees along the boundaries of the subject site, they would also contribute canopy coverage that falls outside the site in addition to the 24.2 percent on-site, with this also benefitting the locality and contributing to improved tree canopy. This would be further assisted by the four *Prunus cerasifera* (Flowering Plum) trees provided on the roof terraces which have an expected height of 5 metres and a canopy width of 3 metres at maturity. The provision of these trees along all frontages of the proposal and on the upper level will also assist to soften the appearance of the building to the street and adjoining properties, particular with the expected height and canopy widths of the larger tree species.
- **Deep Soil Areas and On-Structure Planting:** The proposal includes 56.4 square metres of deep soil areas in the landscaped areas and planters along the Lord Street, Broome Street and western frontages of the development. In addition, 35.7 square metres of on-structure planting areas are provided surrounding the roof terraces. These areas meet the specified 1 metre minimum dimensions and depths, ensuring that they will be capable of supporting mature tree growth of the species selected. The R Codes Volume 2 acceptable outcomes also allow a shortfall in deep soil areas to be compensated

with on-structure planting equivalent to two times the shortfall. The shortfall in deep soil areas is 8.9 square metres or 1.6 percent of the site area, and 35.7 square metres or 6.6 percent of the site area is provided as on-structure planting surrounding the roof terraces, with this being equivalent to approximately four times the shortfall.

- Soft Landscaping: In addition to the deep soil areas, soft landscaping areas are incorporated along the frontages to both Lord Street and Broome Street which are capable of accommodating smaller plantings. These would contribute to the overall landscaping outcome of the proposal and add to the amenity of both streets along with the amenity of the publicly accessible community pocket park and the outdoor terrace for the café tenancy.
- Street Trees: Two new trees could be accommodated within the Broome Street verge adjacent to the subject site. A condition is recommended to be imposed requiring the planting of these trees at the expense of the applicant/owner and to the satisfaction of the City. This would assist to provide additional canopy coverage, to soften the building's appearance to the street and to enhance the overall landscaping outcome of the proposal.

Car and Bicycle Parking

The R Codes Volume 2 acceptable outcomes relating to car and bicycle parking outline that the proposal, as it is located within an 800 metre walkable catchment of a train station, shall provide four resident and one visitor car parking bays, along with two resident and one visitor bicycle parking bays. The proposal would have eight resident and one visitor car parking bays, along with two resident and one visitor bicycle parking bays.

For the café tenancy, the City's Policy No. 7.7.1 – Non-Residential Development Parking Requirements (Parking Policy) states that 0.25 car parking bays along with 0.019 short term and 0.042 long term bicycle parking bays should be provided per person. The number of persons associated with the café tenancy has not been confirmed, and the applicant has stated that they expect it to have a maximum number of one staff and five patrons at any one time. This would be equivalent to 1.5 car parking bays and no bicycle parking bays. The proposal would have one car parking bay, two short term bicycle bays and one long term bicycle bay for the café tenancy.

Concerns were received during consultation regarding increased car parking and traffic on the surrounding streets associated with residents, visitors and café patrons.

The proposed car and bicycle parking would satisfy the element objectives of the R Codes Volume 2 and the objectives of the Parking Policy for the following reasons:

- Resident Car Parking: Two car bays are provided for each dwelling within the internal parking area. This is considered appropriate given that each of the four dwellings has four bedrooms.
- Visitor Car Parking: One car bay is provided within the internal parking area for visitors to the dwellings. This is considered appropriate given that the proposal only includes four dwellings and that additional visitor car parking demand can be accommodated with the on-street parking available in the surrounding area.
- Bicycle Parking: A total of six bicycle bays are provided on site. Four bays are provided within the internal parking area, with two being allocated for the use of residents, one for the use of visitors and one (long-term) for the use of café staff. The remaining two (short-term) bays are located outside the café terrace and residential lobby to Lord Street, with these available for public use by café patrons and visitors. This is considered appropriate to accommodate bicycle parking demand for the proposal given the small size of the café and as only four dwellings are proposed.
- Café Staff: The parking allocated for café staff is one car parking bay and one long-term bicycle parking bay within the internal parking area. Given the café's size and the likelihood of it having a takeaway aspect, the applicant has stated that they expect there only to be one staff member for the café. The parking provided is considered appropriate for café staff given that one car bay is provided, while any additional staff would be able to use the long-term bicycle bay and alternative transport options available. This includes the four bus services that operate on Lord Street which is a high frequency bus route, and East Perth Train Station which is on a high frequency rail route and is an approximately 500 metre walk away. To a lesser extent these alternative transport options could also be used by visitors and café patrons associated with the proposal.
- Café Patrons: No car parking is allocated for café patrons. This is considered appropriate given the café's size as it would only be capable of accommodating a limited amount of seating and customers. The applicant has also stated that the café would primarily cater for local residents or people travelling to and from work, which is considered likely given the residential nature of the immediate surrounding area. These patrons would be able to walk to the café using the existing pedestrian paths along Broome

Street and Lord Street, with cyclists then accommodated by the provision of two short term bicycle parking bays outside the café to Lord Street. Any additional patron demand can then be accommodated with the on-street parking available in the surrounding area.

- **On-Street Parking:** The City's parking data from November/December 2018 indicates that there are 119 car parking spaces along Broome Street between Lord Street and Beaufort Street, including parking with restrictions of 10 minutes, two hours and three hours. On weekdays these bays had a maximum occupancy rate of 60 percent and average occupancy rate of 49.5 percent. On the weekend they had a maximum occupancy rate of 51 percent and average occupancy rate of 47.8 percent. This indicates that there is capacity along Broome Street in the event that on-street parking would be needed for visitors or café patrons. Additional on-street bays are also available on Wright Street and other streets within walking distance of the subject site.
- **Car Parking Design:** The car parking area is designed to be safe, accessible and to minimise negative visual and environmental impacts on amenity and the streetscape for the following reasons:
 - The car park is located within an internal area on the ground floor of the building where it would not be visible from the streets.
 - The car park only contains 10 car bays, with a single path of travel and a central access point, ensuring that access will be safe and legible.
 - The external façade to Broome Street has been designed to screen the parking area while still providing visual interest through the use of landscaping, varying colours and materials, a community pocket park and public art work.

Natural Ventilation and Size and Layout of Dwellings

Internal Amenity

The R Codes Volume 2 acceptable outcome relating to natural ventilation and the size and layout of dwellings outlines that habitable rooms shall have openings on at least two walls and that the length of a single aspect open plan living area should be a maximum of 9.0 metres.

The proposal would have bedrooms in all units that do not have openings on at least two walls, and it would have single aspect open plan living areas for Units 2 and 3, and for Unit 4, with lengths of 9.7 and 9.5 metres respectively.

The proposed natural ventilation and size and layout of dwellings would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- **Room Dimensions:** All rooms meet the minimum areas, ceiling heights and dimensions in the acceptable outcomes of the R Codes Volume 2, demonstrating that the dwellings are designed to be functional, well-proportioned and capable of flexibly accommodating future occupants and their needs.
- **Ventilation:** All habitable rooms of each dwelling are capable of being cross ventilated either by having multiple operable openings within the room or by using operable openings in adjacent rooms. This is supported by the applicant's ventilation analysis and diagrams included as **Attachment 3**, demonstrating that natural ventilation has been optimised for each dwelling.
- **Solar Access:** All living areas and balconies for each dwelling have north-facing windows or openings to facilitate good solar access. This is supported by the applicant's solar analysis and diagrams included as **Attachment 3**. The bedrooms and other habitable rooms for each dwelling all have one large opening and are not reliant on highlight windows or skylights as a primary solar access source. Skylights are provided in the living areas of Units 2, 3 and 4 to compensate for their increased length by providing solar access at the furthest points of these spaces from the north-facing windows.
- **DRP:** The DRP supported the amenity, legibility, and functionality and build quality of the proposal, identifying that each dwelling receives good cross ventilation and northern solar access.

Universal Design and Circulation and Common Spaces

Accessibility

The R Codes Volume 2 acceptable outcome relating to universal design outlines that developments shall either have 20 percent of all dwellings meeting Silver Level requirements or 5 percent meeting the Platinum Level requirements as defined in the Liveable Housing Guidelines. It also outlines that developments shall have circulation and common spaces that are designed for universal access.

The proposal would not have any dwellings that fully meet the Silver or Platinum Level requirements as the residential lobby and first floor access way (the circulation and common spaces) are not designed for universal access as they are only accessible via stairs.

The element objective of the R Codes Volume 2 relating to universal design is as follows:

Development includes dwellings with universal design features providing dwelling options for people living with disabilities or limited mobility and/or to facilitate ageing in place.

The proposed universal design and circulation and common spaces would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- **Universal Design Features:** The building and access areas have been designed to incorporate features of universal design, including level entries from the street and parking areas, access ways with a minimum width of 1.5 metres, stairs with a continuous hand rail and minimum width of 1.1 metres, and doorways with a minimum width of 0.9 metres. The lower level of Unit 2 has also been designed to partially meet the Silver Level requirements by including universal design features such as compliant bathroom design and size, minimum doorway and corridor widths, and by including a bedroom, bathroom and living area on the entry level. These features will provide options for safe and convenient access to facilitate ageing in place and for future occupants or visitors who may be living with disabilities or limited mobility.
- **Development Size:** As the proposal is only for four dwellings and the threshold to satisfy the acceptable outcome percentage of dwellings meeting the Silver or Platinum Level requirements is less than one dwelling, it's considered appropriate for features of universal design in addition to those outlined above (such as stair lifts) to be incorporated on a needs basis by future occupants.

Façade Design

The Built Form Policy acceptable outcomes relating to façade design outlines that doorways are to have a depth of 0.5 metres to 1.5 metres to clearly articulate entrances to commercial tenancies, and that commercial developments are to provide a continuous awning over the pedestrian footpath with a minimum height of 3.5 metres.

The proposal would have a doorway to the café tenancy that is not recessed, and would have an awning that has a minimum height of 3.0 metres and is only provided over the café outdoor terrace and not over any part of the pedestrian footpath.

The proposed façade design would satisfy the element objectives of the R Codes Volume 2 for the following reasons:

- **Design:** The building and café tenancy are designed with a high level of glazing and a variety of colours and materials to provide visual interest and activation to the public realm. This ensures that the building façade expresses the internal function of the café tenancy and provides visual interest when viewed from the public realm.
- **Context:** The proposal is located in a transit corridor location undergoing transition and not in a town centre. Within this context it is considered appropriate for the building and café tenancy to not incorporate traditional features of shopfront design and town centres, being recessed doorways, continuous awnings and minimum awning heights to allow under-awning signage. Given that the café is a small tenancy is located on a corner with a high level of glazing, it is considered that there is sufficient alternative locations for signage by future tenants.

Sound Attenuation and State Planning Policy 5.4 – Road and Rail Noise

Noise

The applicant has provided an acoustic report, included as **Attachment 4**. This is to demonstrate that the proposal would be designed and constructed to minimise the effects of noise impacts out from the site, in to the site from Lord Street, and within the site between the dwellings and the café tenancy.

The acoustic report outlines that the proposal is capable of satisfying the acceptable outcomes of the R Codes relating to managing the impact of noise, the provisions of the City's Policy No. 7.5.21 – Sound Attenuation (Sound Attenuation Policy) and the provisions of State Planning Policy 5.4 – Road and Rail

Noise (Road and Rail Noise Policy). This is on the basis that the recommended construction and materials standards included in the report are implemented during the detailed design.

Administration has reviewed the applicant's acoustic report and is satisfied that the development would meet the provisions of the Sound Attenuation Policy and the Road and Rail Noise Policy, along with the element objectives of the R Codes Volume 2.

A condition is recommended to be imposed requiring the proposal to be constructed and to operate in accordance with the requirements and recommendations outlined in the acoustic report, and for this acoustic report to be updated prior to the issue of a building permit with the necessary details on mechanical plant as required in Section 4.4 of the Sound Attenuation Policy.

Environmentally Sustainable Design

In addition to the acceptable outcomes of the R Codes Volume 2, the application has also been assessed against the ESD provisions of the Built Form Policy Volume 2, Clause 1.10 that set out acceptable outcomes. The acceptable outcomes set out in the Built Form Policy have not yet been approved by the Western Australian Planning Commission (WAPC) and as such, these provisions are given regard only in the assessment of the application and do not have the same weight as other policy provisions.

The Built Form Policy acceptable outcomes set out that life cycle assessments are to be provided and are to demonstrate a 30 percent global warming potential saving and 25 percent net fresh water use saving against a code-compliant design for any commercial component, and a 50 percent saving for any residential component.

The applicant has provided an ESD report, included as **Attachment 5**, which provides a sustainable design life cycle assessment for the proposal. The applicant's ESD report demonstrates that the proposal's commercial component would result in a 31 percent global warming potential saving and a 28 percent net fresh water use saving and the residential component would result in a 51 percent and a 42 percent saving respectively.

The report states that a net fresh water saving of 50 percent would not be achieved due to the proposal's high density and minimal roof catchment area meaning that it is not feasible to increase rainwater tank demand internally without significantly decreasing rainwater reliability. This would then negatively impact on the rainwater reuse for landscaping in the summer months. The report states that it would be a better ESD outcome to have the rainwater retention tank solely available for landscape irrigation.

In addition, the proposal includes the following ESD features:

- Solar panels orientated towards the north on the roof of the building.
- A 5000 litre underground water storage tank for the recovery and re-use of rainwater from roof areas.
- Large windows to internal living spaces and outdoor living areas provided for every dwelling that are all north-facing;
- Operable windows and skylights across all floors for every dwelling to provide natural light access and cross-ventilation.
- Efficient fitting and fixtures in accordance with the relevant WELS star rating to reduce water consumption.

The ESD report was reviewed by the City's Sustainability team and the DRP at its 20 April 2022 meeting, who both advised that the proposal and the applicant's ESD report was supported from an ESD perspective. The above would ensure that the proposal satisfies the element objectives of the R Codes Volume 2 relating to energy efficiency.

Waste Management

The applicant has provided a WMP, included as **Attachment 6**. This proposes weekly collection of the general waste and FOGO bins and fortnightly collection of the general recycling bins for the both the café and the dwellings.

A bin storage area is provided internally on the western side of the parking area to accommodate the number and size of bins specified in the WMP, and bins would be collected from Broome Street. The WMP states the dwelling bins would be subject to collection by the City's residential service and the café waste bins would be subject to collection by the City's commercial service or by a private waste collection service.

The City's Waste team has reviewed the plans and WMP in accordance with its Waste Management Guidelines, advising that it is acceptable subject to the following:

- The collection rate of the general waste bins being updated to fortnightly instead of weekly; and
- The café waste being collected by a private service as the City no longer offers a commercial service.

A condition is recommended to be imposed requiring the submission of an updated WMP in accordance with the City's Waste Management Guidelines, and for ongoing implementation of this plan. The above would ensure that the proposal satisfies the element objectives of the R Codes Volume 2 relating to waste management.

Construction Management

The subject site is constrained from a construction perspective due to its size, location adjacent to Lord Street. Primary access would be from Broome Street which is an access road used by surrounding residential properties and visitors to the nearby park, school and businesses.

The careful management of the construction process and associated off-site impacts is required to ensure that the development does not have an adverse impact on the amenity of the surrounding residential properties, in particular those to the west and south. Concerns were also received during consultation in relation to construction of the proposal, including with construction management, crane use and location, and with ongoing visual, noise and privacy impacts.

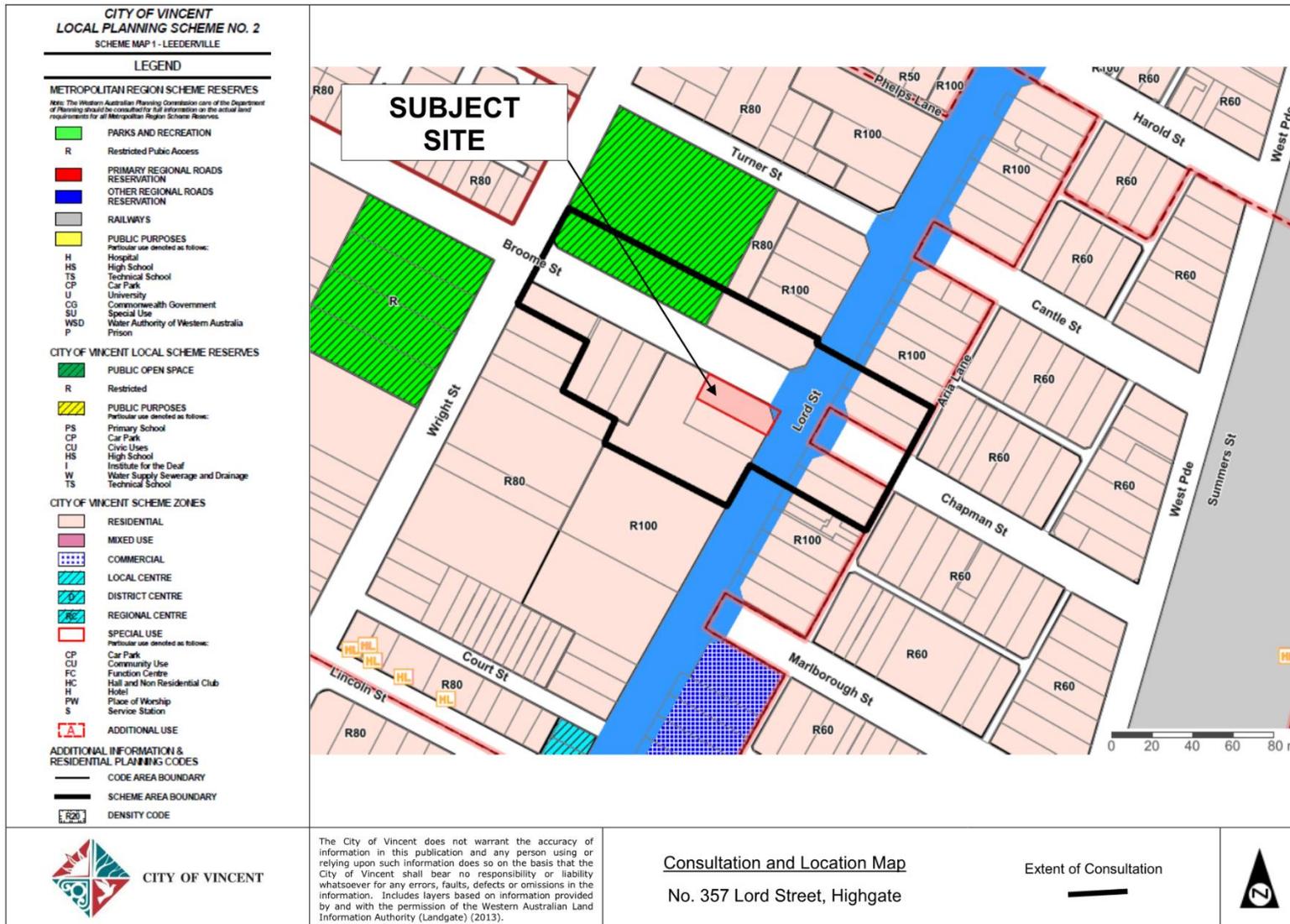
A condition is recommended to be imposed requiring the submission of a construction management plan prior to the issue of a building permit in accordance with the City's Policy No. 7.5.23 – Construction Management Plans. This would require the builder and/or development to demonstrate how the construction process and off-site impacts would be managed, including details on construction hours, crane location and operation, noise control, traffic management and access, and public safety.

Public Art

The proposal is a mixed residential commercial development and is subject to the City's Policy No. 7.5.13 – Percent for Public Art (Percent for Public Art Policy). This states that a minimum of one percent of the total project cost is to be allocated to the contribution of public art, being a contribution of \$15,000 for this proposal.

The Percent for Public Art Policy provides two options for this to be provided, being either the payment of cash-in-lieu to the City, or the owner/applicant coordinating the public art project in consultation with the City.

A condition has been recommended to be imposed for this public art contribution to be made. The applicant has indicated that they would select the second option, and would provide the public art on-site as a feature wall adjacent to the community pocket park along Broome Street.



NOTE: No title viewed by The Land Division. A certificate of title check for easements and encumbrances is highly recommended as should they exist, they may affect design.

Photo taken at **C** facing south



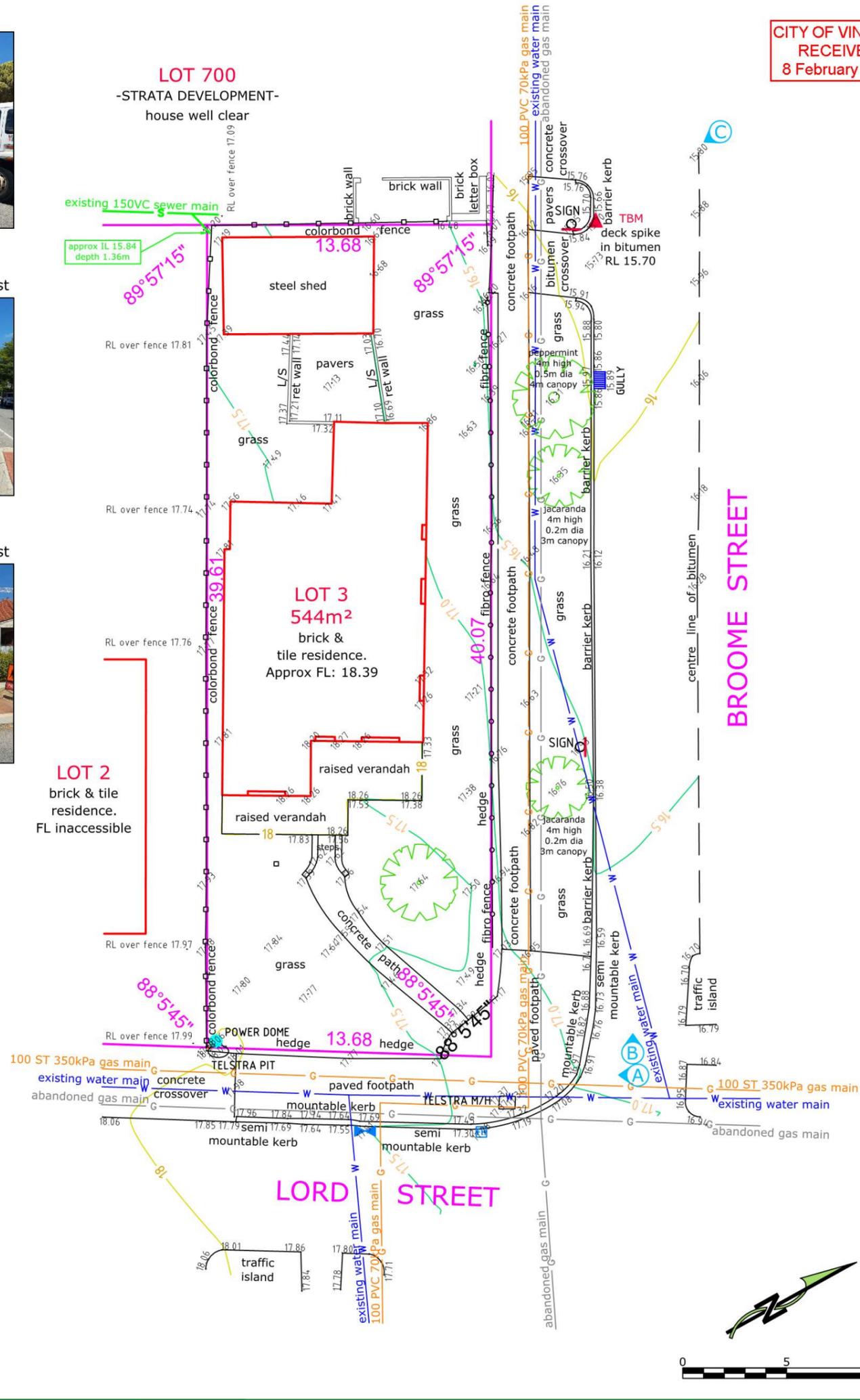
Photo taken at **B** facing north west



Photo taken at **A** facing south west



CITY OF VINCENT
RECEIVED
8 February 2022



LEGEND	
	Abandoned Gas Main
	Gas Main
	Water Main
	Sewer Main
	Gully
	Fire Hydrant
	Stop Valve
	Water Meter
	Power Dome
	Telstra/NBN Pit
	Sign
	Tree

TBM deck spike in bitumen equals RL 15.70 AHD Based on BM - MWS 51 RL 17.288 AHD (Landgate Geodetic Section) Contractor to check datum before adopting levels

Survey Date: 20 January 2021	Scale 1:200@A3			
Client: Daniel Jovanovic - Imak Developments				
Rev	Date	Description	Surv	Drawn
0	28/01/2021	Feature Survey Drafted	JD	TF

FEATURE AND CONTOUR SURVEY OF LOT 3 ON PLAN 1879
357 Lord Street, Highgate
C/T Vol: 1403 Fol: 946
our ref. 21-9175

Feature Survey by
THE LAND DIVISION
PLANNING | SURVEYING | DESIGN
PO Box 2444,
Malaga, WA 6090
Tel 08 9209 3232
Fax 08 9249 2551

NOTES: 1) CONSULT LEGAL ADVICE ON EASEMENTS, ENCUMBRANCES AND CAVEATS THAT MAY APPEAR ON THE CERTIFICATE OF TITLE. 2) LEVELS ON ADJOINING PROPERTIES ARE APPROXIMATE DUE TO ACCESS RESTRICTIONS. 3) SERVICES PLOTTED AS VISUALLY SEEN ON SITE AND ARE APPROXIMATE. 4) SEWER POSITION AND LEVELS FROM WATER CORPORATION PLANS. 5) CONSULT DIAL BEFORE YOU DIG TO CHECK LOCATION OF UNDERGROUND SERVICES. 6) BEWARE OF OVERHEAD POWER LINE HAZARDS. 7) CONSULT TLD ON ANY ANOMALY BEFORE DESIGN AND CONSTRUCTION. 8) POSITION AND DEPTH OF SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR. 9) FEATURES ARE RELATED TO FENCE-LINES ONLY. NO CONNECTION MADE TO BOUNDARIES. **REPEP RECOMMENDED.**

CITY OF VINCENT
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PROPOSED LORD STREET APARTMENTS

4 APARTMENTS + CAFE
VERSION 05, 30th JUNE 2022

Proposed Cafe at ground level at the prominent corner of Lord and Broome Street to enable proper activation of the lower level.

Total amount of apartments for the proposal are 4 in number.
This number consists of
4x 4bed/ 3 bath apartments



This application relates to 357 Lord Street Highgate.

The development presents as a high quality, four storey Mixed Use development when viewed from the street. The Mixed Use development accommodates a ground floor Cafe with residential (multiple) dwellings above. The Subject Site is located less than 1 kilometre from the Perth Central Business District.

The Subject Site has access to high frequency public transport and is located in close proximity to Northbridge, Beaufort Street Precinct, the Central Business District, Perth Stadium, East Perth Train station and Perth Cultural Centre. The provision of multiple dwellings within a Mixed Use development in this location is in line with State strategic objectives regarding activation and densification within easy access to transport, facilities and amenities.

The neighbourhood context consists of a mixture of building heights varying from single storey original cottages to three and four storey developments. Lord Street is within the Transit Zone which permits buildings up to 6 storey in height.

The design strives to achieve a number of sustainability objectives, including passive solar design, increased solar energy use, reduced water usage and cross flow ventilation.

The proposed development facilitates higher residential density in a location where public transport, employment, essential services and amenities are readily accessible reducing the need for travel.

Floor Areas - All Stories			
Floor	Location	Area	Perimeter
Roof Terrace			
	ROOF TERRACE 04	38.67	26.08
	ROOF TERRACE 03	37.67	25.64
	ROOF TERRACE 02	37.67	25.64
	ROOF TERRACE 01	39.02	26.23
	APT 4 STUDIO	16.80	16.51
	APT 3 UPP. LIVING	34.57	25.21
	APT 2 UPP. LIVING	34.57	25.21
	APT 1 STUDIO	16.64	16.33
		255.61 m²	
8			
Second Floor			
	APARTMENT 04- UPPER	71.40	34.87
	APARTMENT 03- UPPER	71.10	33.74
	APARTMENT 02- UPPER	71.10	33.74
	APARTMENT 01- UPPER	70.07	33.91
		283.67 m²	
4			
First Floor			
	WALKWAY FIRST FLOOR	35.03	44.07
	STAIRS FIRST FLOOR VOID	9.00	12.10
	ROOF TERRACE 04	18.99	17.57
	ROOF TERRACE 04	17.57	16.29
	ROOF TERRACE 04	6.59	10.40
	BALCONY 04	13.84	15.67
	BALCONY 03	10.00	12.66
	BALCONY 02	10.00	12.66
	BALCONY 01	13.84	15.67
	APARTMENT 04- LOWER	98.46	45.37
	APARTMENT 03- LOWER	71.87	36.41
	APARTMENT 02- LOWER	72.37	36.56
	APARTMENT 01- LOWER	74.42	36.83
		451.98 m²	
13			
Ground Floor			
	STORE 04	5.00	9.66
	STORE 02	5.04	9.73
	STORE 02	5.00	9.66
	STORE 01	5.18	9.66
	STAIRS GROUND	14.67	15.86
	GROUND- PARKING	315.29	90.96
	ENTRY FOYER	9.87	13.07
	ENTRY FOYER	1.84	5.35
	CAFE CANOPY	21.86	31.24
	CAFE BIN STORE	3.99	9.11
	CAFE	24.67	25.36
	APT. BIN ST.	12.19	16.01
		424.60 m²	
12			
37			
		1,415.86 m²	

TOTAL SITE AREA: 544M2
TOTAL PLOT AREA: 703M2
PLOT RATIO 1.29

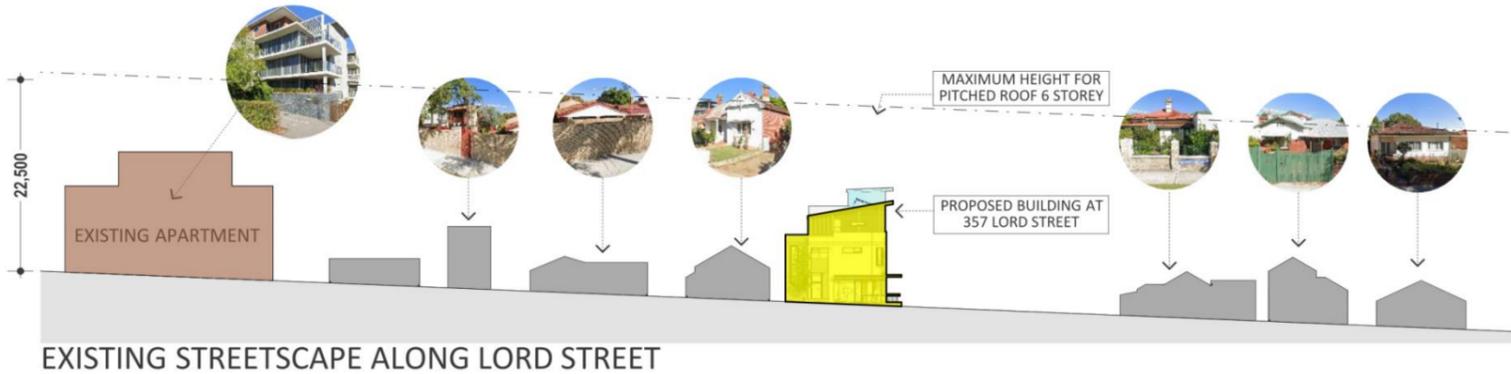
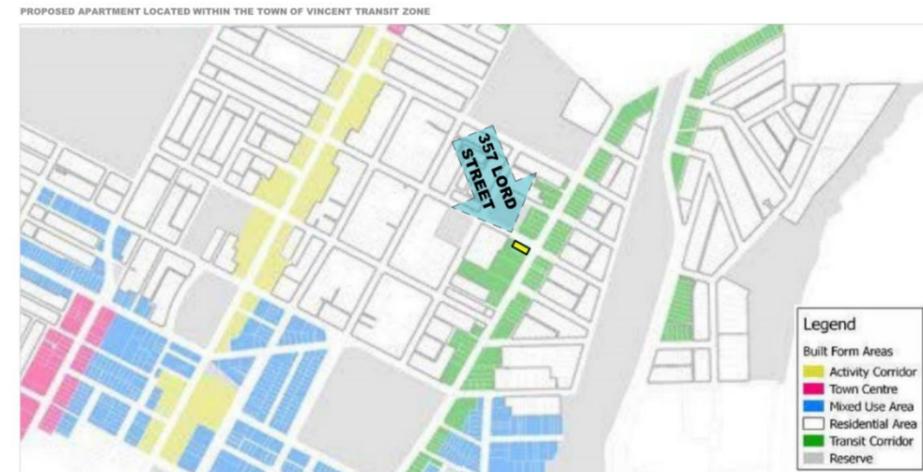
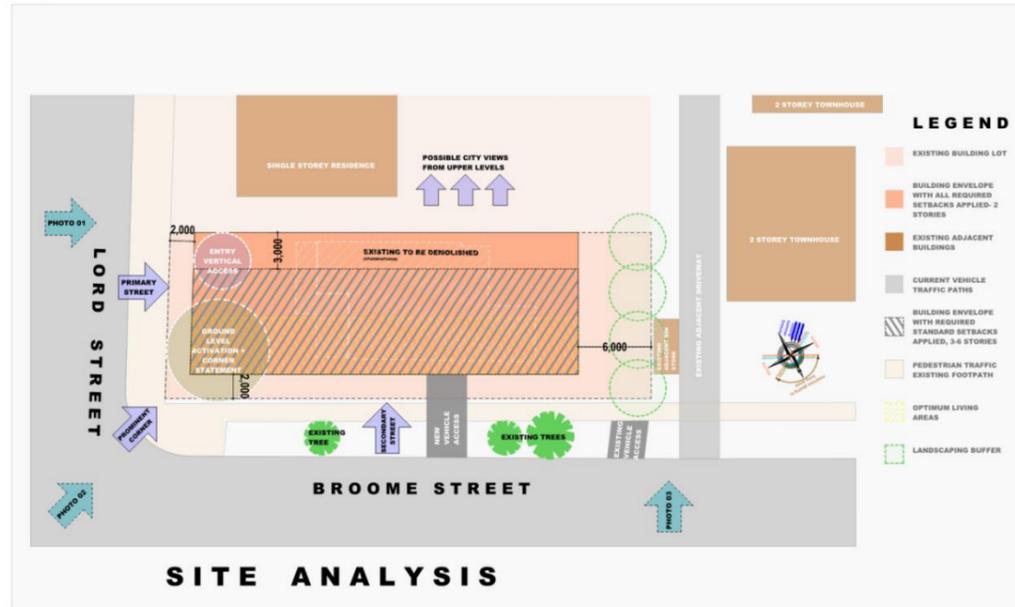
PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 1 OF 20
30th JUNE 2022



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PROPOSED APARTMENTS

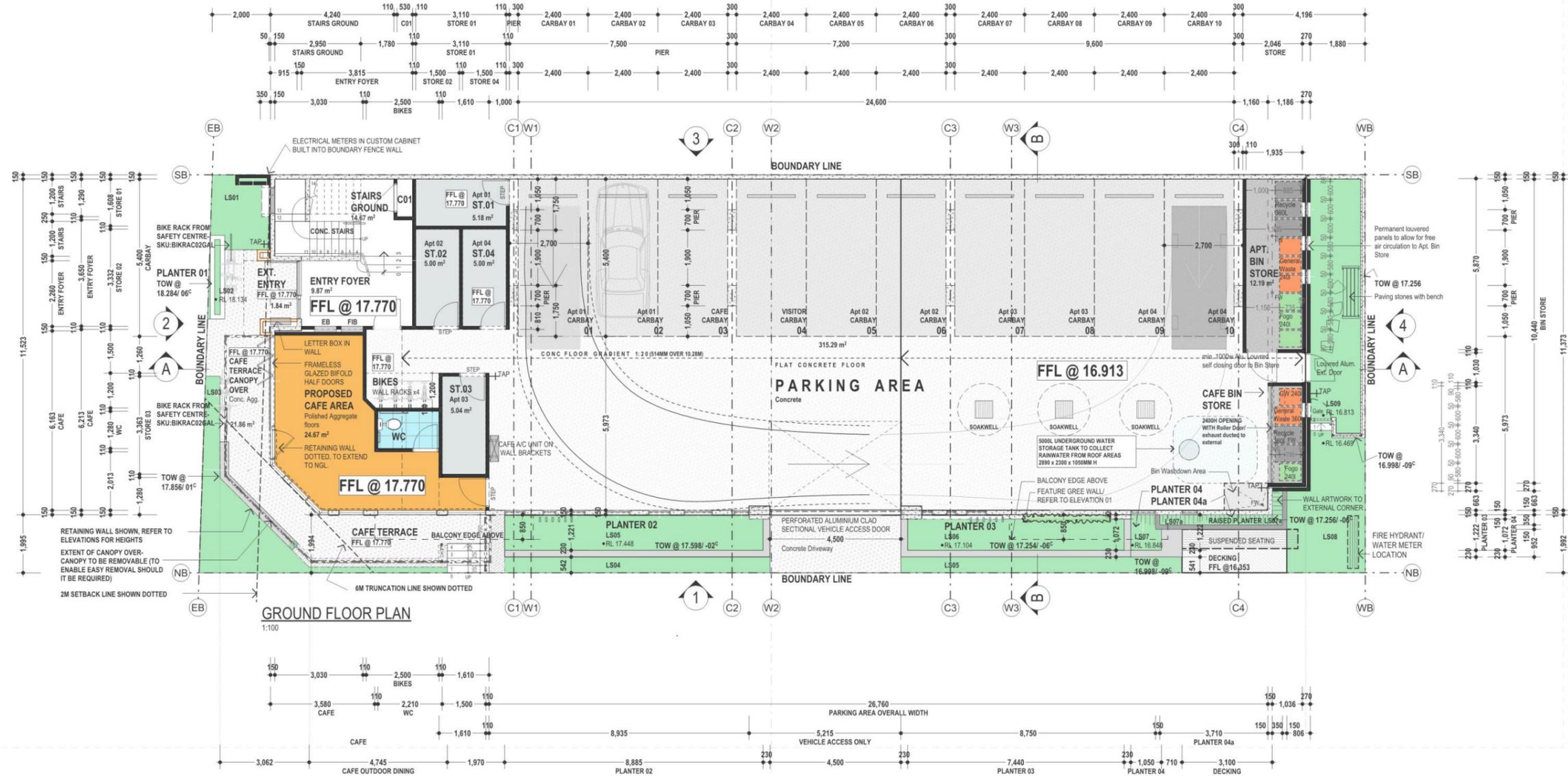
357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 2 OF 20
30th JUNE 2022



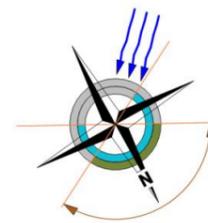
CITY OF VINCENT
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GROUND FLOOR PARKING			
Floor	Location	Area	Perimeter
Ground	GROUND-PARKING	315.29	90.96
	CAFE	24.67	25.36
	CAFE CANOPY	21.86	31.24
	STAIRS GROUND	14.67	15.86
	APT. BIN ST.	12.19	16.01
	ENTRY FOYER	9.87	13.07
	STORE 01	5.18	9.66
	STORE 02	5.04	9.73
	STORE 04	5.00	9.66
	STORE 02	5.00	9.86
	CAFE BIN STORE	3.99	9.11
	ENTRY FOYER	1.84	5.85
		424.60 m²	



PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

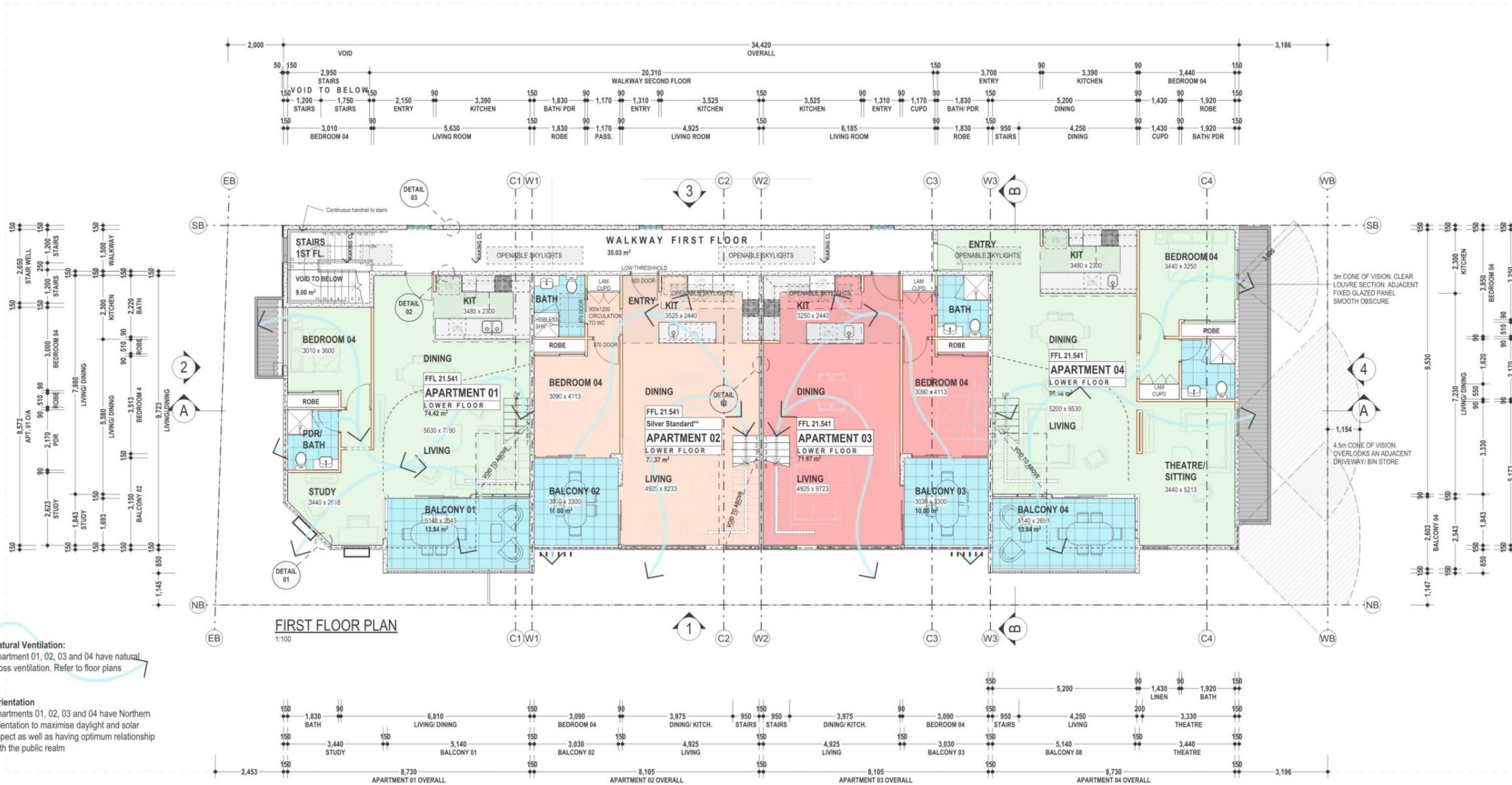


SHEET 3 OF 20
30th JUNE 2022



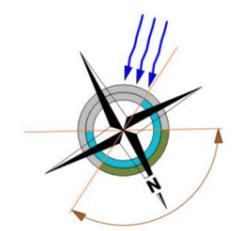
CITY OF VINCENT
RECEIVED
4 July 2022

FIRST FLOOR AREA			
Floor	Location	Area	Perimeter
First Floor	APARTMENT 04- LOWER	98.46	45.37
	APARTMENT 01- LOWER	74.42	36.83
	APARTMENT 02- LOWER	72.37	36.56
	APARTMENT 03- LOWER	71.87	36.41
	WALKWAY FIRST FLOOR	35.03	44.07
	ROOF TERRACE 04	18.99	17.57
	ROOF TERRACE 04	17.57	16.29
	BALCONY 01	13.84	15.67
	BALCONY 04	13.84	15.67
	BALCONY 02	10.00	12.86
	BALCONY 03	10.00	12.86



Natural Ventilation:
Apartment 01, 02, 03 and 04 have natural cross ventilation. Refer to floor plans

Orientation
Apartments 01, 02, 03 and 04 have Northern orientation to maximise daylight and solar aspect as well as having optimum relationship with the public realm



PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 4 OF 20
30th JUNE 2022



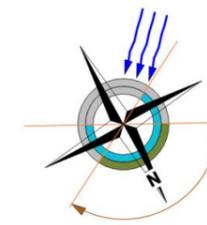
CITY OF VINCENT
RECEIVED
4 July 2022

SECOND FLOOR AREA			
Floor	Location	Area	Perimeter
Second Floor	APARTMENT 04- UPPER	71.40	34.87
	APARTMENT 02- UPPER	71.10	33.74
	APARTMENT 03- UPPER	71.10	33.74
	APARTMENT 01- UPPER	70.07	33.91
		283.67 m²	



Natural Ventilation:
Apartment 01, 02, 03 and 04 have natural cross ventilation. Refer to floor plans

Orientation
Apartments 01, 02, 03 and 04 have Northern orientation to maximise daylight and solar aspect as well as having optimum relationship with the public realm



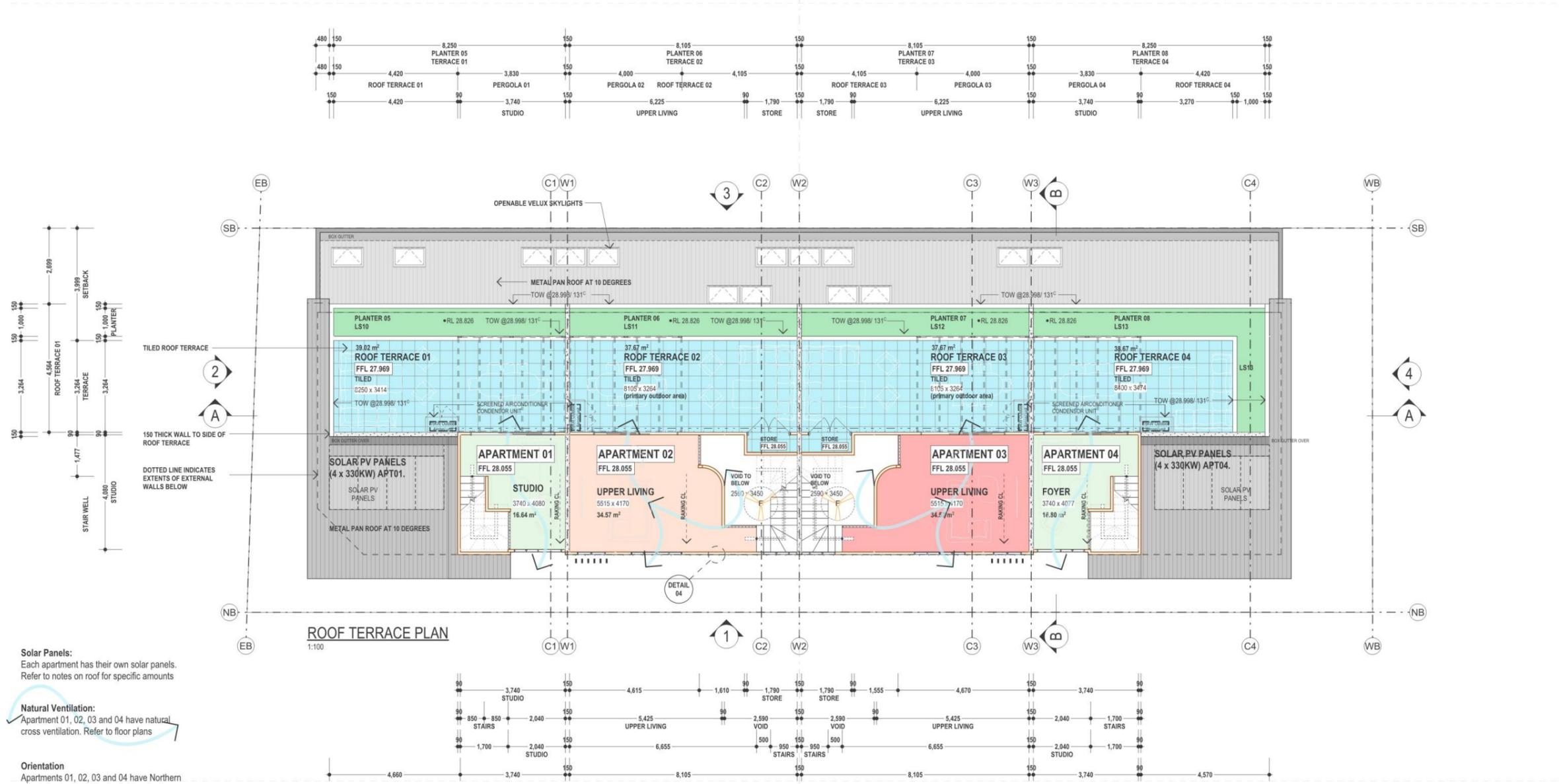
SHEET 5 OF 20
30th JUNE 2022

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

CITY OF VINCENT
RECEIVED
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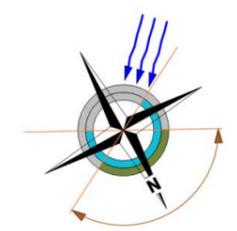
ROOF TERRACE FLOOR AREA			
Floor	Location	Area	Perimeter
Roof Terrace	ROOF TERRACE 01	39.02	26.23
	ROOF TERRACE 04	38.67	26.08
	ROOF TERRACE 03	37.67	25.64
	ROOF TERRACE 02	37.67	25.64
	APT 2 UPP. LIVING	34.57	25.21
	APT 3 UPP. LIVING	34.57	25.21
	APT 4 STUDIO	16.80	16.51
	APT 1 STUDIO	16.64	16.33
		255.61 m²	



Solar Panels:
Each apartment has their own solar panels.
Refer to notes on roof for specific amounts

Natural Ventilation:
Apartment 01, 02, 03 and 04 have natural cross ventilation. Refer to floor plans

Orientation
Apartments 01, 02, 03 and 04 have Northern orientation to maximise daylight and solar aspect as well as having optimum relationship with the public realm



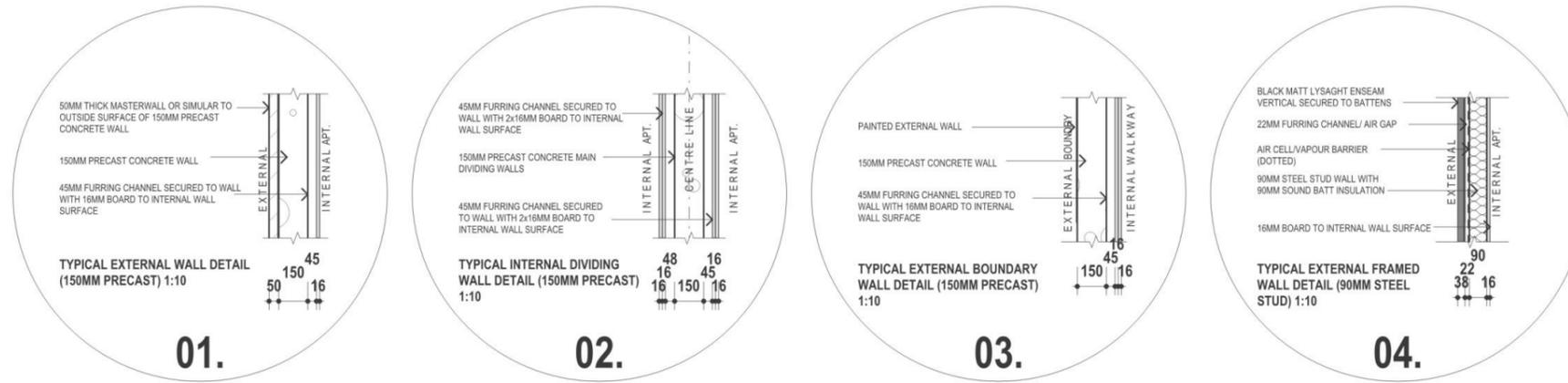
PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 6 OF 20
30th JUNE 2022

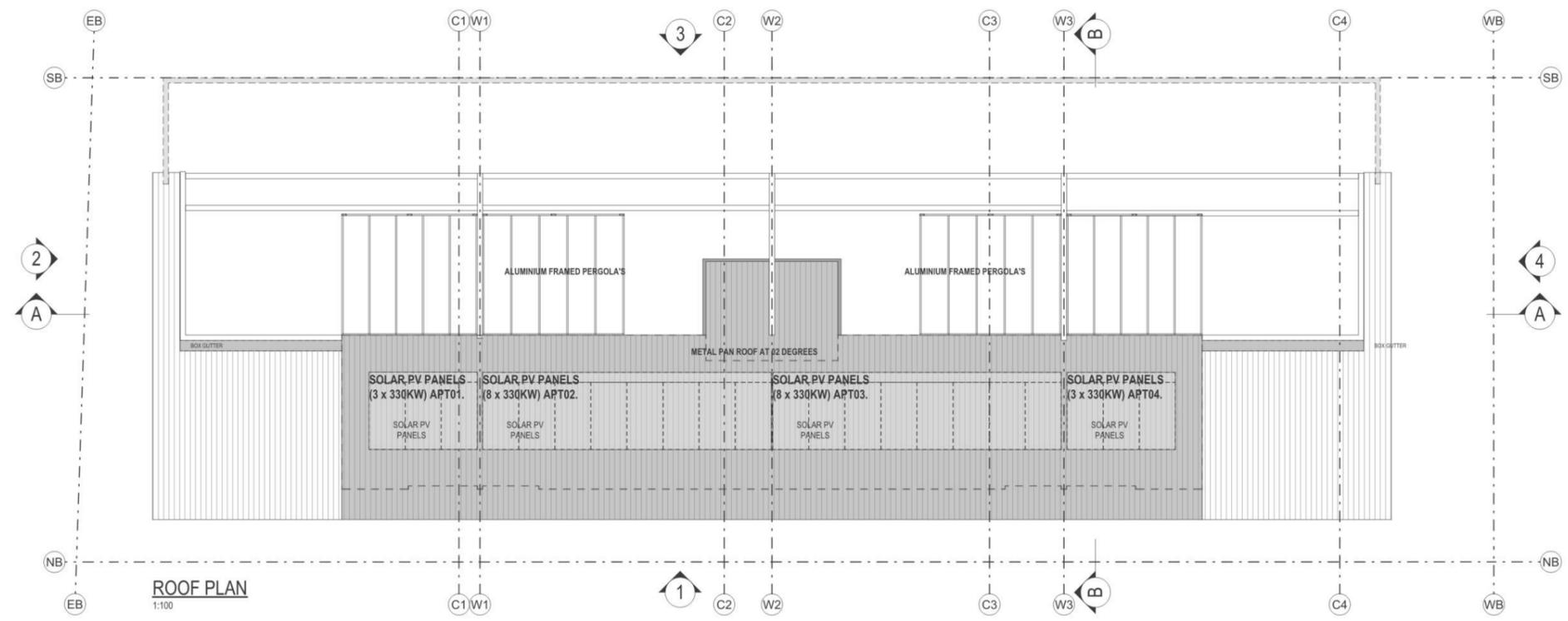


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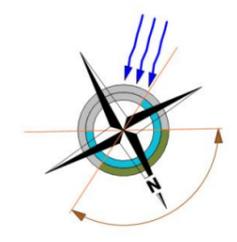
NOTE: ALSO TYPICAL DETAIL FOR WALKWAY/ APARTMENT DIVIDING WALL

FIRST FLOOR AREA		Area	Perimeter
First Floor	APARTMENT 04- LOWER	98.46	45.3
	APARTMENT 01- LOWER	74.42	36.8
	APARTMENT 02- LOWER	72.37	36.5
	APARTMENT 03- LOWER	71.87	36.4
	WALKWAY FIRST FLOOR	35.03	44.0
	ROOF TERRACE 04	18.99	17.5
	ROOF TERRACE 04	17.57	16.2
	BALCONY 01	13.84	15.6
	BALCONY 04	13.84	15.6
	BALCONY 02	10.00	12.6
	BALCONY 03	10.00	12.6
	STAIRS FIRST FLOOR V...	9.00	12.1



PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 7 OF 20
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ELEVATION 2
1:100



ELEVATION 4
1:100



EXTERNAL MATERIAL SELECTIONS

LYSIGHT DREAM WALL CLADDING
WOODSIEGE MATT FINISH

FEATURE CONCRETE LOOK RENDER APPLIED TO EXTERNAL FACE
OF ALL PANELS

LIGHTWEIGHT CONCRETE RENDERED FINISH

TREASURY RED TUMBLER MIDLAND BRICK

ART MURAL

Polished Porcelain
Entry Cafe

Polished Ivory Coast Exposed Aggregate
(to enter porch, cafe terrace, pedestrian path, lift entry)

KNOTTWOOD 180MM FLAT PROFILE CLADDING

LYSIGHT DREAM WALL CLADDING
SHALE GREY MATT FINISH

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 8 OF 20
30th JUNE 2022



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ELEVATION 3
1:100

EXTERNAL MATERIAL SELECTIONS

- LYSIGHT INSIDE WALL CLADDING (WOODSIEGE MATT FINISH)
- FEATURE CONCRETE LOOK RENDER APPLIED TO EXTERNAL FACE OF ALL PANELS
- LIGHTWEIGHT CONCRETE RENDERS FINISH
- TREASURY RED TUMBLED MIDLAND BRICK
- ART MURAL
- Milux Polished Stone Entry Cafe
- Milux Ivory Coast Exposed Aggregate (to entry porch, cafe terrace, pedestrian path, lift entry)
- KNOTWOOD 180MM FLAT PROFILE CLADDING
- LYSIGHT INSIDE WALL CLADDING (SHALE GREY MATT FINISH)

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

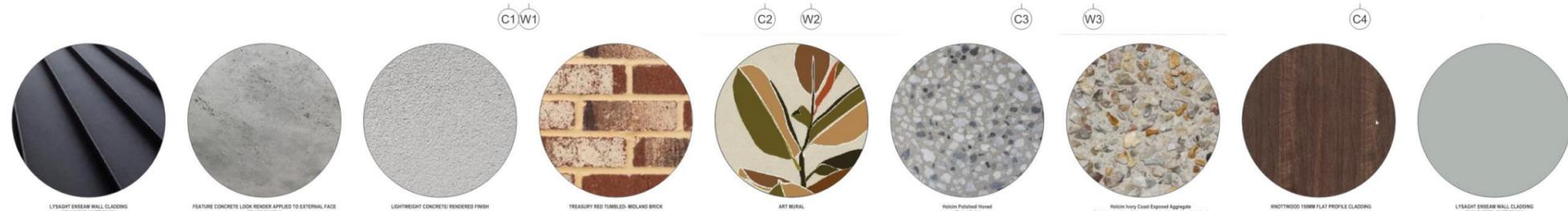
SHEET 9 OF 20
30th JUNE 2022



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RECEIVED
4 July 2022



NATURAL GROUND LINE AT BOUNDARY
ELEVATION 1
1:100



EXTERNAL MATERIAL SELECTIONS

- LYSAGHT ENSEAM WALL CLADDING (WOODSIEGE METT FINISH)
- FEATURE CONCRETE LOOK RENDER APPLIED TO EXTERNAL FACE OF AFS PANELS
- LIGHTWEIGHT CONCRETE RENDERS FINISH
- TREASURY RED TUMBLER MIDLAND BRICK
- ART MURAL
- Metin Polished Stone Entry Cafe
- Metin Ivory Coast Exposed Aggregate (to entry porch, cafe terrace, pedestrian path, lift entry)
- KNOTTWOOD 150MM FLAT PROFILE CLADDING
- LYSAGHT ENSEAM WALL CLADDING (SHALE GREY - METT FINISH)

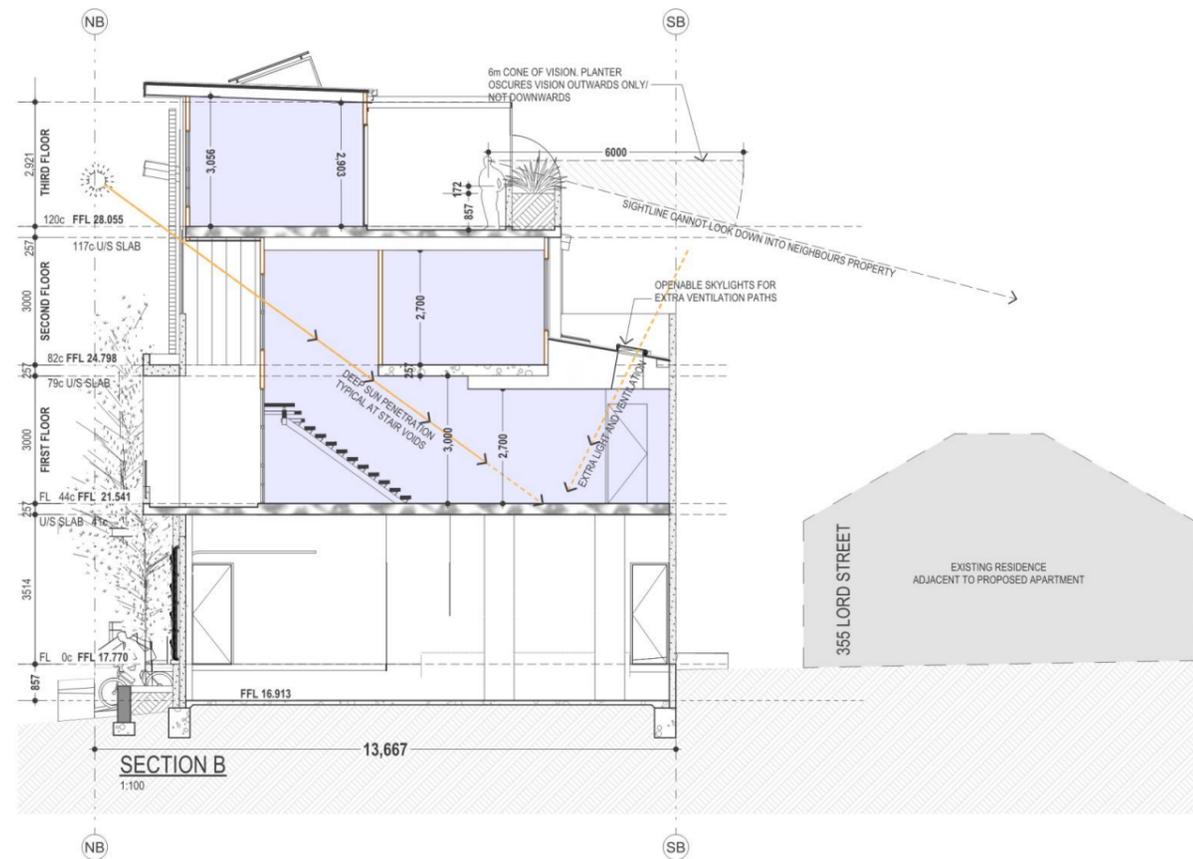
PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 10 OF 20
30th JUNE 2022



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PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 11 OF 20
30th JUNE 2022



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172



SECTION A
1:100

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 12 OF 20
30th JUNE 2022



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PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 13 OF 20
30th JUNE 2022



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PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 14 OF 20
30th JUNE 2022



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PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 15 OF 20
30th JUNE 2022



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PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 16 OF 20
30th JUNE 2022



CITY OF VINCENT
RECEIVED
4 July 2022



PROPOSED APARTMENTS

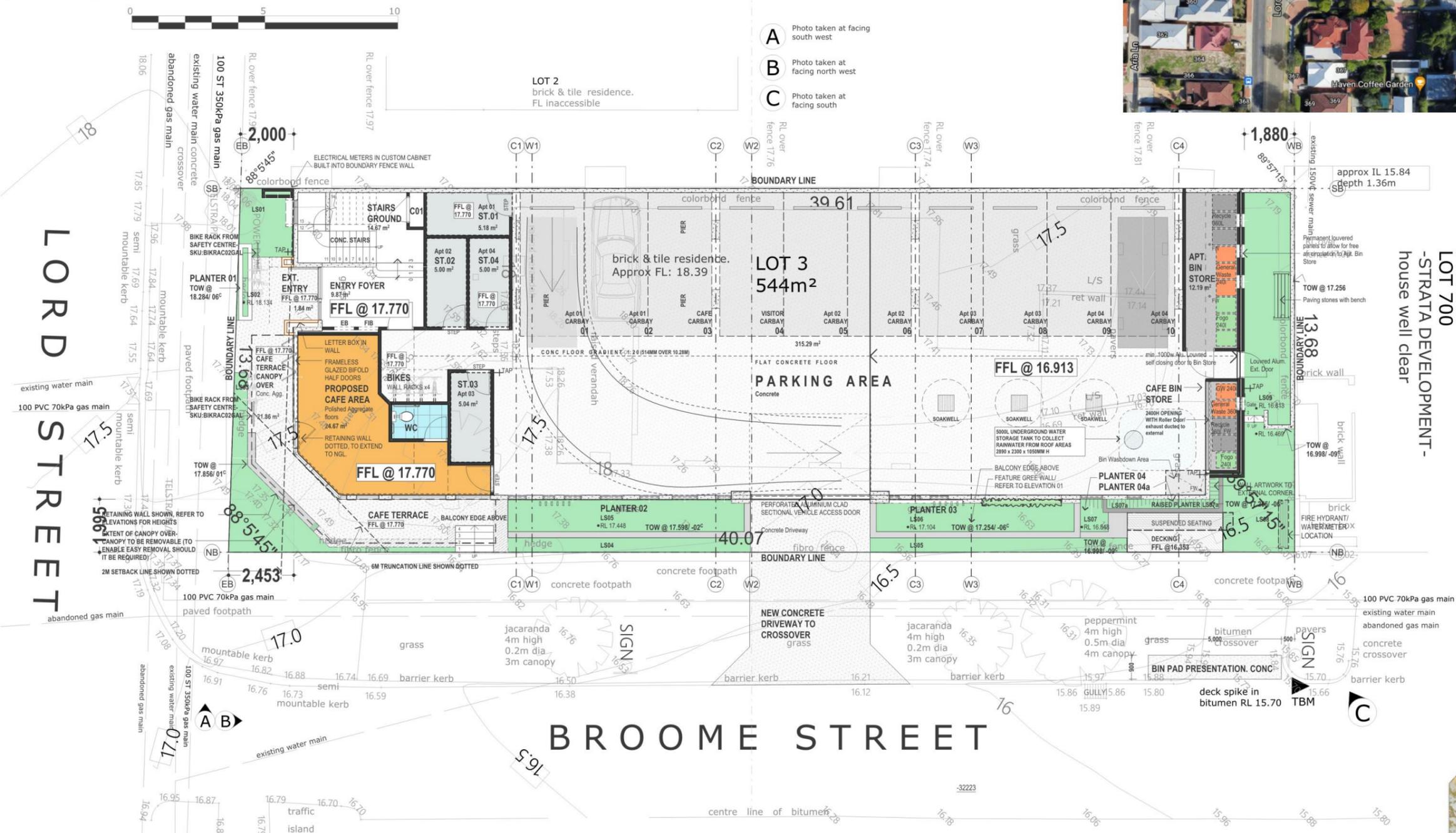
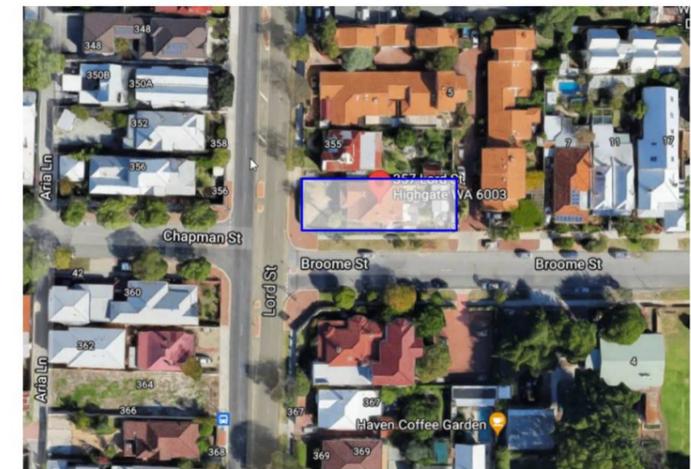
357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 17 OF 20
30th JUNE 2022



LEGEND			Survey Date: 20 January 2021		Scale 1:200@A3		FEATURE AND CONTOUR SURVEY		Feature Survey by		NOTE: No title viewed by The Land Division. A certificate of title check for easements and encumbrances is highly recommended as should they exist, they may affect design. NOTES: 1) CONSULT LEGAL ADVICE ON EASEMENTS, ENCUMBRANCES AND CAVEATS THAT MAY APPEAR ON THE CERTIFICATE OF TITLE. 2) LEVELS ON ADJOINING PROPERTIES ARE APPROXIMATE DUE TO ACCESS RESTRICTIONS. 3) SERVICES PLOTTED AS VISUALLY SEEN ON SITE AND ARE APPROXIMATE. 4) SEWER POSITION AND LEVELS FROM WATER CORPORATION PLANS. 5) CONSULT DIAL BEFORE YOU DIG TO CHECK LOCATION OF UNDERGROUND SERVICES. 6) BEWARE OF OVERHEAD POWER LINE HAZARDS. 7) CONSULT TLD ON ANY ANOMALY BEFORE DESIGN AND CONSTRUCTION. 8) POSITION AND DEPTH OF SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR. 9) FEATURES ARE RELATED TO FENCE-LINES ONLY. NO CONNECTION MADE TO BOUNDARIES.
Abandoned Gas Main	Stop Valve	Fire Hydrant	Client: Daniel Jovanovic - Imak Developments	Rev	Date	Description	Surv	Drawn	THE LAND DIVISION PLANNING SURVEYING DESIGN PO Box 2444, Malaga, WA 6090 Tel 08 9209 3232 Fax 08 9249 2551		
Gas Main	Water Meter	Tree		0	28/01/2021	Feature Survey Drafted	JD	TF			
Water Main	Power Dome	TBM deck spike in bitumen equals RL 15.70 AHD Based on BM - MWS 51 RL 17.288 AHD (Landgate Geodetic Section) Contractor to check datum before adopting levels							our ref. 21-9175 REPEG RECOMMENDED.		
Sewer Main	Telstra/NBN Pit										
Gully	Sign										

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RECEIVED
4 July 2022



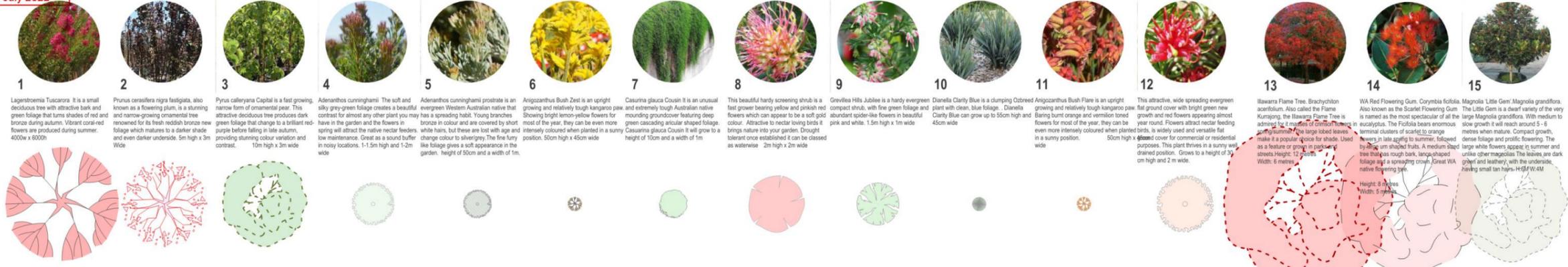
PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 18 OF 20
30th JUNE 2022



CITY OF VINCENT RECEIVED 4 July 2022



1 Lagerstroemia Tuscara. It is a small deciduous tree with attractive bark and green foliage that turns shades of red and bronze during autumn. Vibrant coral-red flowers are produced during summer. 4000w x 6000h

2 Prunus cerasifera nigra fastigiata, also known as a flowering plum, is a stunning and narrow-growing ornamental tree renowned for its fresh reddish bronze foliage which matures to a darker shade and even darker underside. 5m high x 3m wide

3 Pyrus calleryana Capital is a fast growing narrow form of ornamental pear. This attractive deciduous tree produces dark green foliage that change to a brilliant red-purple before falling in late autumn, providing stunning colour variation and contrast. 10m high x 3m wide

4 Adenanthos cunninghamii. The soft and silky grey-green foliage creates a beautiful contrast for almost any other plant you may have in the garden and the flowers in spring will attract the native nectar feeders. Low maintenance. Great as a sound buffer in noisy locations. 1-1.5m high and 1-2m wide

5 Adenanthos cunninghamii prostrata is an evergreen Western Australian native that has a spreading habit. Young branches have a silvery-grey sheen and are covered with white hairs, but these are lost with age and change colour to silvery-grey. The fine furry like foliage gives a soft appearance in the garden. Height of 50cm and a width of 1m.

6 Anigozanthus Bush Zest is an upright growing and relatively tough kangaroo paw. Showing bright lemon-yellow flowers for most of the year, they can be even more intensely coloured when planted in a sunny position. 50cm high x 45cm wide

7 Casuarina glauca Cousin It is an unusual and extremely tough Australian native mounding groundcover featuring deep green cascading anular shaped foliage. Casuarina glauca Cousin It will grow to a height of 10cm and a width of 1m

8 This beautiful hardy screening shrub is a fast grower bearing yellow and pinkish red flowers which can appear to be a soft gold colour. Attractive to nectar loving birds it brings nature into your garden. Drought tolerant once established it can be classed as waterwise. 2m high x 2m wide

9 Grevillea Hills Jubilee is a hardy evergreen compact shrub, with fine green foliage and abundant spider-like flowers in beautiful pink and white. 1.5m high x 1m wide

10 Dianella Clarity Blue is a clumping Otobreed growing and relatively tough kangaroo paw. Bearing burnt orange and vermilion toned flowers for most of the year, they can be even more intensely coloured when planted in a sunny position. 50cm high x 45cm wide

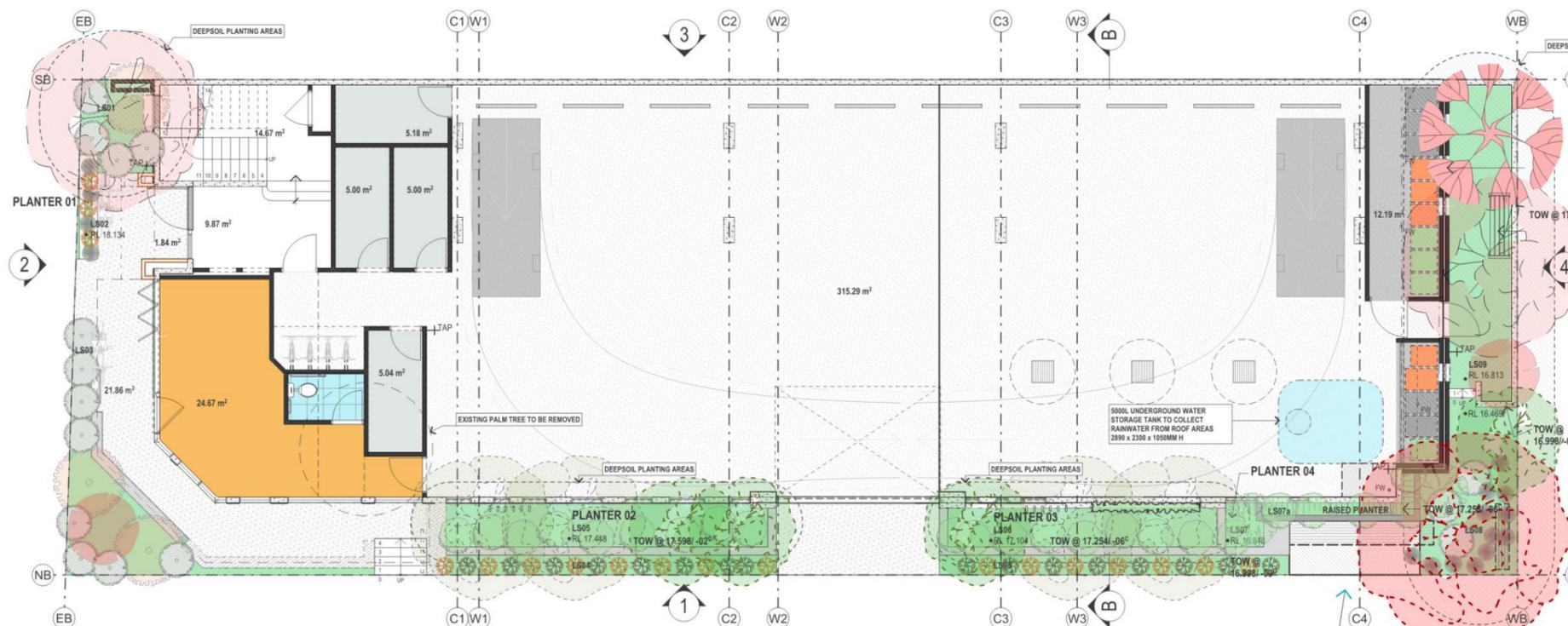
11 This attractive, wide spreading evergreen flat ground cover with bright green new growth and red flowers appearing almost year round. Flowers attract nectar feeding birds. It is widely used and versatile for planted cover for commercial or residential purposes. This plant thrives in a sunny well drained position. Grows to a height of 30cm high and 2m wide.

12 Illawarra Flame Tree. Brachychiton acerifolium. Also called the Flame Kurrajong, the Illawarra Flame Tree is named after the state of New South Wales. The large leaved leaves make it a popular choice for shade. Used as a feature or grown in parkland streets. Height: 12-15m. Width: 6 metres.

13 WA Red Flowering Gum. Corymbia ficifolia. Also known as the Scarlet Flowering Gum. The Little Gem is a dwarf variety of the very slow growing it will reach around 5-6 metres when mature. Compact growth, dense foliage and prolific flowering. The large white flowers appear in summer and unlike other magnolias the leaves are dark green and leathery, with the underside having small tan hairs. H: 4-6m W: 4m

14 Magnolia Little Gem Magnolia grandiflora. The Little Gem is a dwarf variety of the very slow growing it will reach around 5-6 metres when mature. Compact growth, dense foliage and prolific flowering. The large white flowers appear in summer and unlike other magnolias the leaves are dark green and leathery, with the underside having small tan hairs. H: 4-6m W: 4m

15

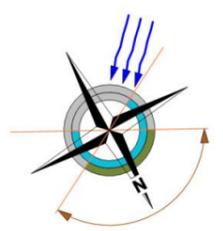


LANDSCAPING PLAN- GROUND
1:100

Plant Irrigation Notes

- Drip irrigation throughout the proposed landscaping. All water irrigation to be subsurface
- No overhead sprinklers to all landscaped areas
- All landscape areas to have soil moisture sensors
- Development to have rain sensors to enable system to adapt to changing weather scenarios
- Collected stormwater from underground water tank to be used to irrigate landscape areas
- All trees to have adequate bubblers suitable to tree sizes
- 5000L UNDERGROUND WATER STORAGE TANK TO COLLECT RAINWATER FROM ROOF AREAS 2890 x 2300 x 1050MM H- this is to be used to irrigate landscaped areas. Any extra rainwater to be dispersed into soakwells on site

Landscape AREA			
Floor	Location	Area	Perimeter
Roof Terrace	LS13	11.66	25.33
	LS10	8.25	18.50
	LS12	8.10	18.21
	LS11	8.10	18.21
			36.11 m ²
Ground Floor	LS09	15.25	23.83
	LS08	11.37	15.16
	LS05	10.84	20.21
	LS03	10.32	28.54
	LS06	9.09	17.32
	LS01	5.02	9.23
	LS07	4.15	9.24
	LS07a	1.83	11.17
	LS02	0.53	5.76
	LS01	0.13	5.75
	LS03	0.06	1.00
LS01	0.00	0.08	
		68.59 m ²	
		19.02% LANDSCAPED COVER	

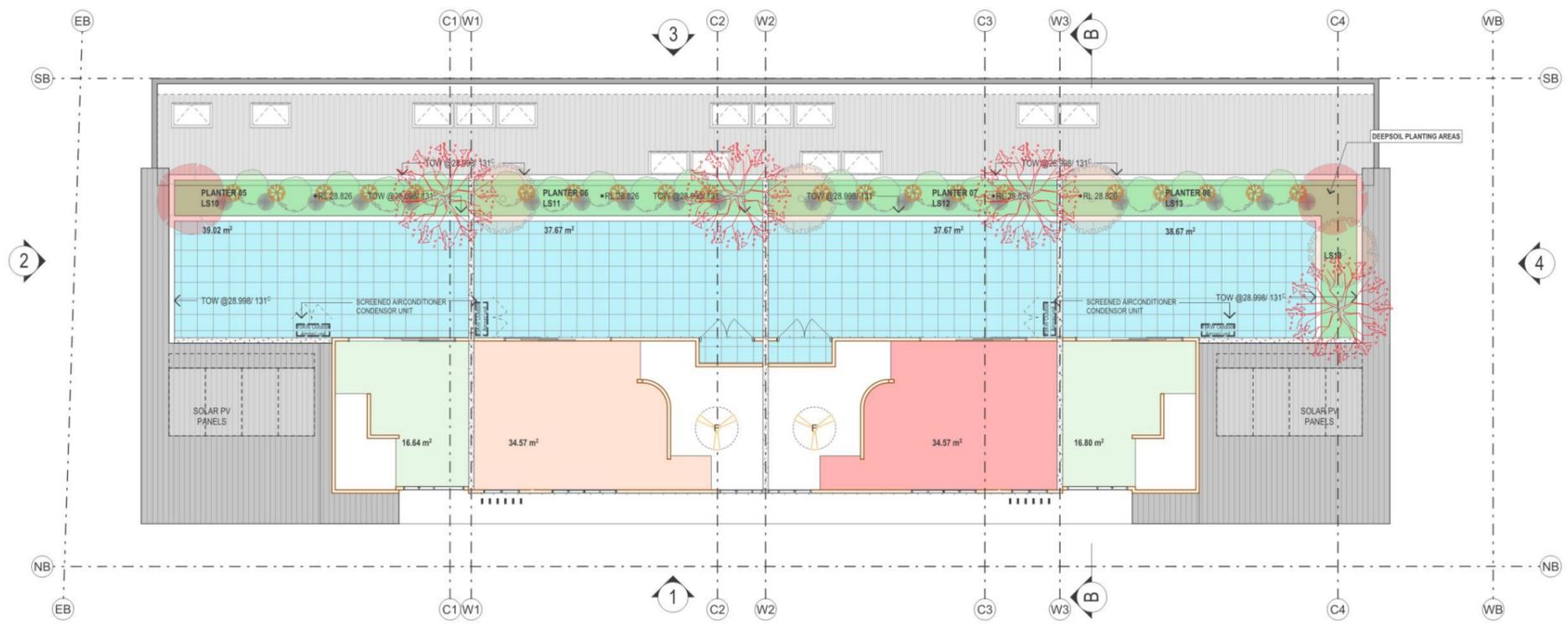
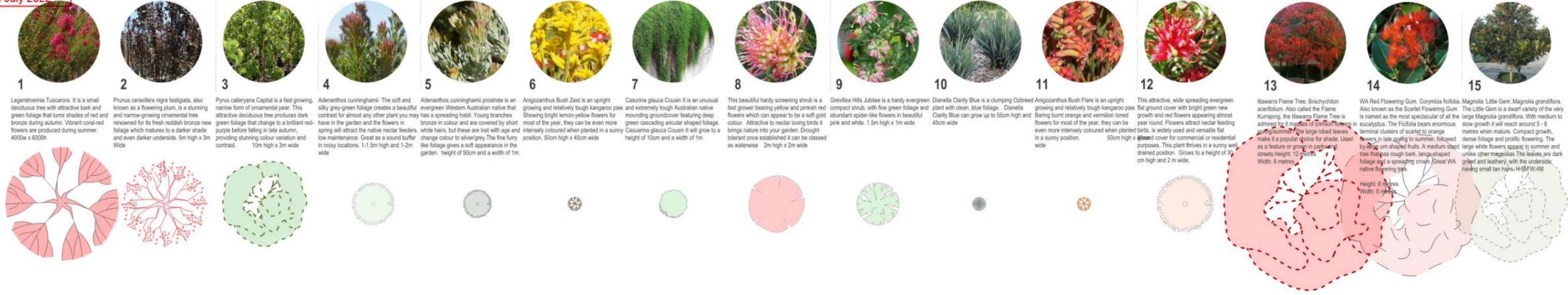


PROPOSED APARTMENTS
357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 19 OF 20
30th JUNE 2022



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LANDSCAPING PLAN- ROOF TERRACE
1:100

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

SHEET 20 OF 20
30th JUNE 2022





LBS REFERENCE NUMBER
LBS_12634

DATE
22/02/2022

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SHADING | SOLAR | VENTILATION ANALYSIS

PROJECT NAME
Proposed Mixed-use Development

PROJECT ADDRESS
357 Lord Street, Highgate WA 6003

BUILDING CLASS
2 | 6

CLIMATE ZONE
5

REPORT COMMISSIONED BY
Arconic Design

ON BEHALF OF
Daniel Jovanovic

CLIENT REFERENCE NUMBER
-

DOCUMENT CONTROL

Revision	Date	Description	Author	Reviewed
1	11.02.222	For submission	JM	BH
DRAWING REFERENCE	15.02.2022	-	N/A	-



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ANALYSIS SUMMARY

Living Building Solutions has completed shading, solar and ventilation analysis for the proposed development at 357 Lord Street, Highgate. This report has been prepared in response to the State Planning Policy 7.3 Residential Design Codes, Volume 2 – Apartments.

SHADING ANALYSIS

Element Objectives 3.2

O 3.2.1 Building layouts respond to the streetscape, topography and site attributes while optimising solar and daylight access within the development.

O 3.2.2 Building form and orientation minimises overshadowing of the habitable rooms, open space and solar collectors of neighbouring properties during mid-winter.

Acceptable Outcomes 3.2.3

A 3.2.3 - adjoining properties coded R80 or higher – Nil requirements

Design Response

Appendix A depicts the shading analysis. This analysis compares the overshadowing impact of the proposed development on the neighbouring lots between 9am-3pm on the 21st June (Winter Solstice). Land contours, building heights and other shading obstructions have been considered in the modelling of overshadowing.

- Outlined in Appendix A, the proposed development results in substantial overshadowing of 355 Lord Street at 12.00pm on the 21st of June (>50% of site). However, the proposed site and neighbouring sites are coded at R100 and therefore subject to **nil** overshadowing requirements.
- The proposed development is <10 sole occupancy units and has no communal areas



SOLAR ANALYSIS

Element Objectives 4.1

O 4.1.1 In climate zones 4, 5 and 6: the development is sited and designed to optimise the number of dwellings receiving winter sunlight to private open space and via windows to habitable rooms.

O 4.1.2 Windows are designed and positioned to optimise daylight access for habitable rooms.

O 4.1.3 The development incorporates shading and glare control to minimise heat gain and glare: — from mid-spring to autumn in climate zones 4, 5 and 6 AND — year-round in climate zones 1 and 3.

Acceptable Outcomes 4.1

A 4.1.1 In climate zones 4, 5 and 6 only: (a) Dwellings with a northern aspect are maximised, with a minimum of 70 per cent of dwellings having living rooms and private open space that obtain at least 2 hours direct sunlight between 9am and 3pm on 21 June AND (b) A maximum of 15 per cent of dwellings in a building receiving no direct sunlight between 9am and 3pm on 21 June.

A 4.1.2 Every habitable room has at least one window in an external wall, visible from all parts of the room, with a glazed area not less than 10 per cent of the floor area and comprising a minimum of 50 per cent of clear glazing.

A 4.1.3 Lightwells and/or skylights do not form the primary source of daylight to any habitable room.

A 4.1.4 The building is oriented and incorporates external shading devices in order to: — minimise direct sunlight to habitable rooms:

- *between late September and early March in climate zones 4, 5 and 6 only AND*
- *in all seasons in climate zones 1 and 3 — permit winter sun to habitable rooms in accordance with A 4.1.1 (a)*

Design Response

- Appendix A outlines that all living rooms and private open spaces receive at least 2 hours of direct sunlight between the hours of 9am and 3pm on the 21 June.
- No lightwells or skylights are used as the primary source of daylight to habitable rooms
- All habitable rooms have at least 1 x window visible from all parts of the room
- Average Star rating of 6.6 stars conveys that the proposed glazing specification, glazing to floor area ratio, and façade shading perform on average 10% better than minimum NCC requirements. Refer to SDA report completed by LBS on the 2nd of February 2022



VENTILATION ANALYSIS

Element Objectives 4.2

- O 4.2.1 Development maximises the number of apartments with natural ventilation.*
- O 4.2.2 Individual dwellings are designed to optimise natural ventilation of habitable rooms.*
- O 4.2.3 Single aspect apartments are designed to maximise and benefit from natural ventilation.*

Acceptable Outcomes 4.2

A 4.2.1 Habitable rooms have openings on at least two walls with a straight line distance between the centre of the openings of at least 2.1m.

A 4.2.2 (a) A minimum 60 per cent of dwellings are, or are capable of, being naturally cross ventilated in the first nine storeys of the building

(b) Single aspect apartments included within the 60 per cent minimum at (a) above must have:

- ventilation openings oriented between 45° – 90° of the prevailing cooling wind direction AND*
- room depth no greater than 3 × ceiling height (c) For dwellings located at the 10th storey or above, balconies incorporate high and low level ventilation openings.*

A 4.2.3 The depth of cross-over and cross-through apartments with openings at either end and no openings on side walls does not exceed 20m.

A 4.2.4 No habitable room relies on lightwells as the primary source of fresh-air.

Design Response

- Where possible all habitable rooms have at least two openings to encourage cross flow ventilation in accordance with A 4.2.1.
- Outlined in Appendix B, ventilation diagrams show that all habitable spaces are capable of being cross ventilated either through single room cross ventilation or cross ventilation via adjacent rooms
- No breeze path exceeds 20m



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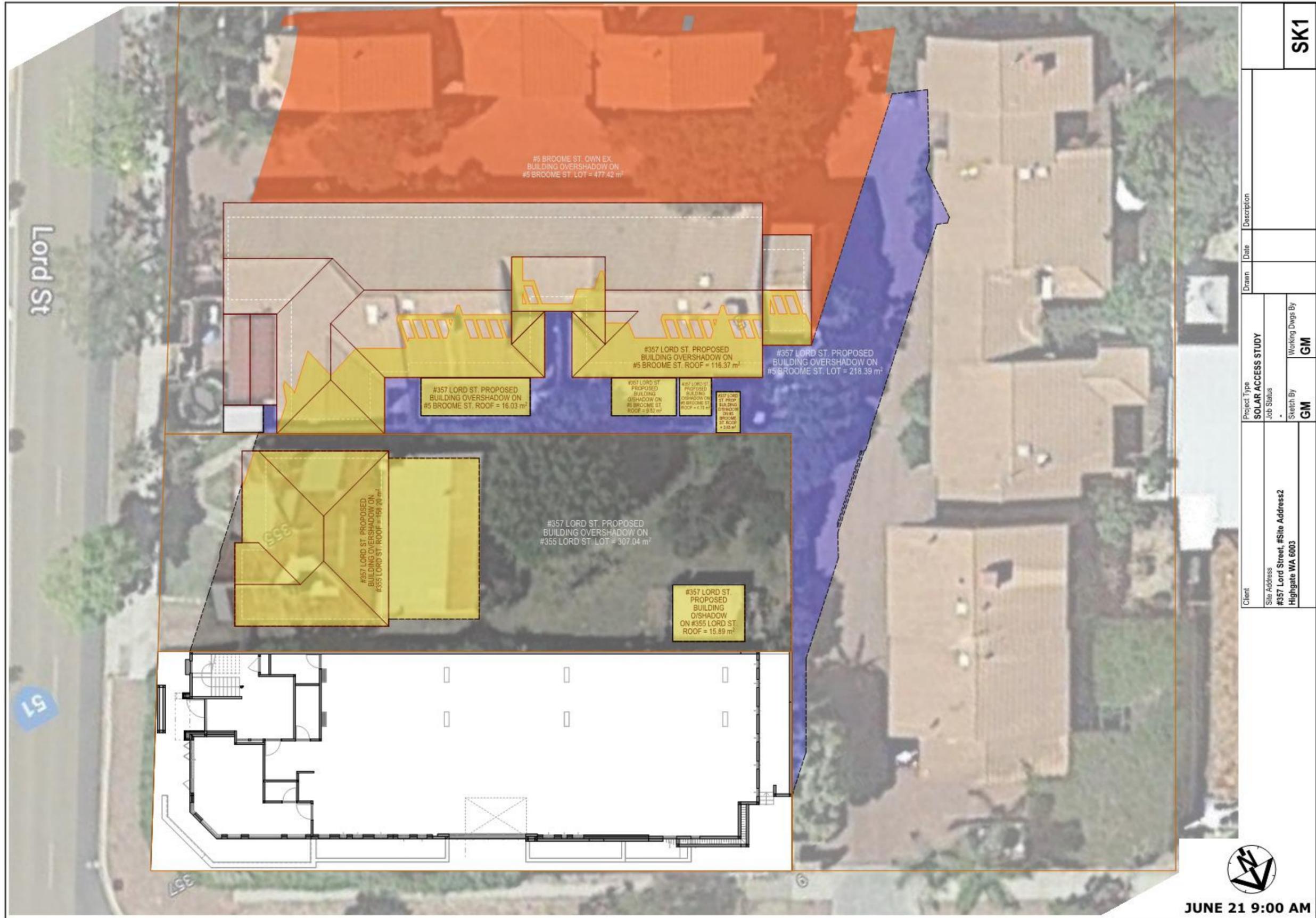


APPENDIX A – SHADING & SOLAR ACCESS

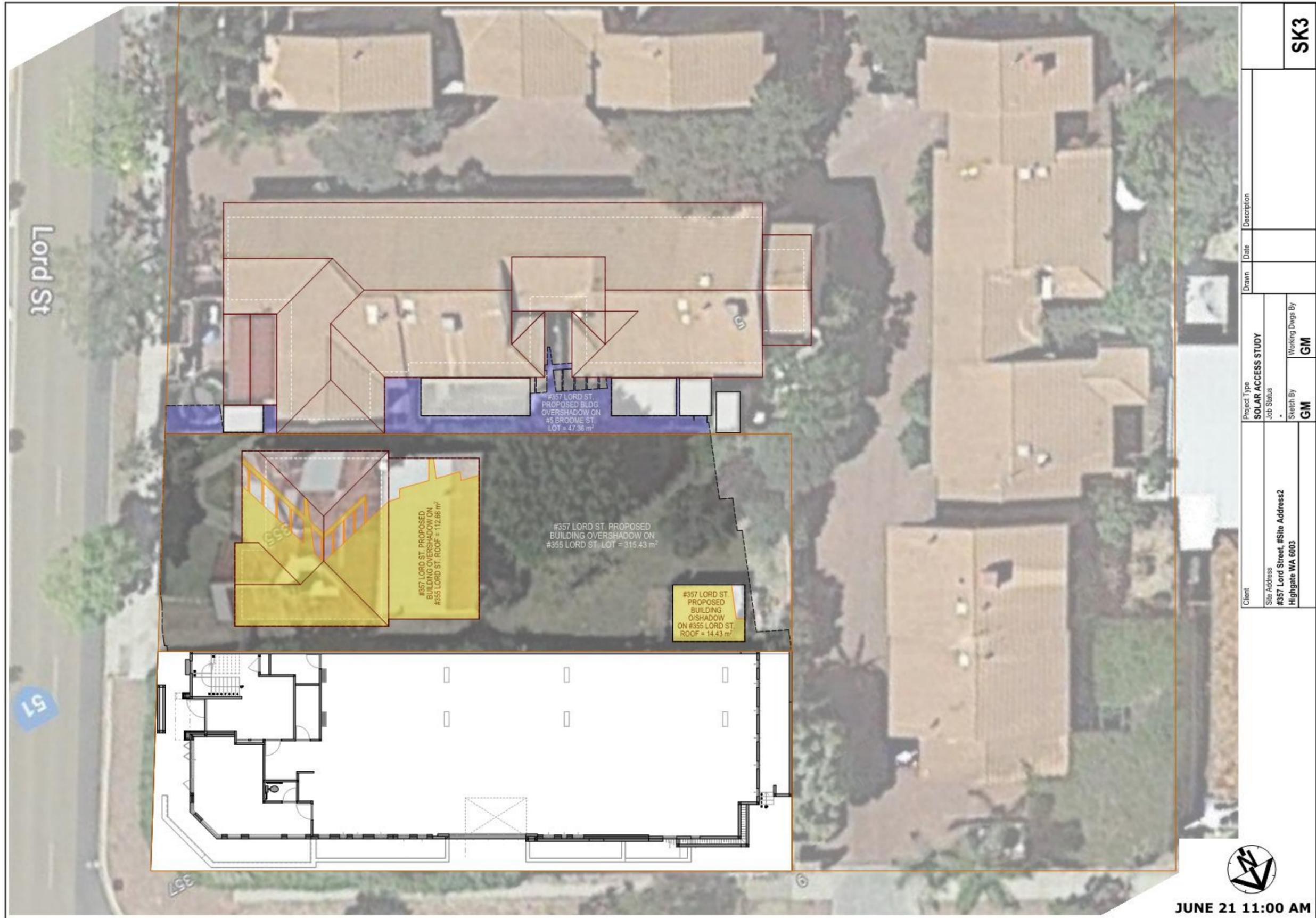


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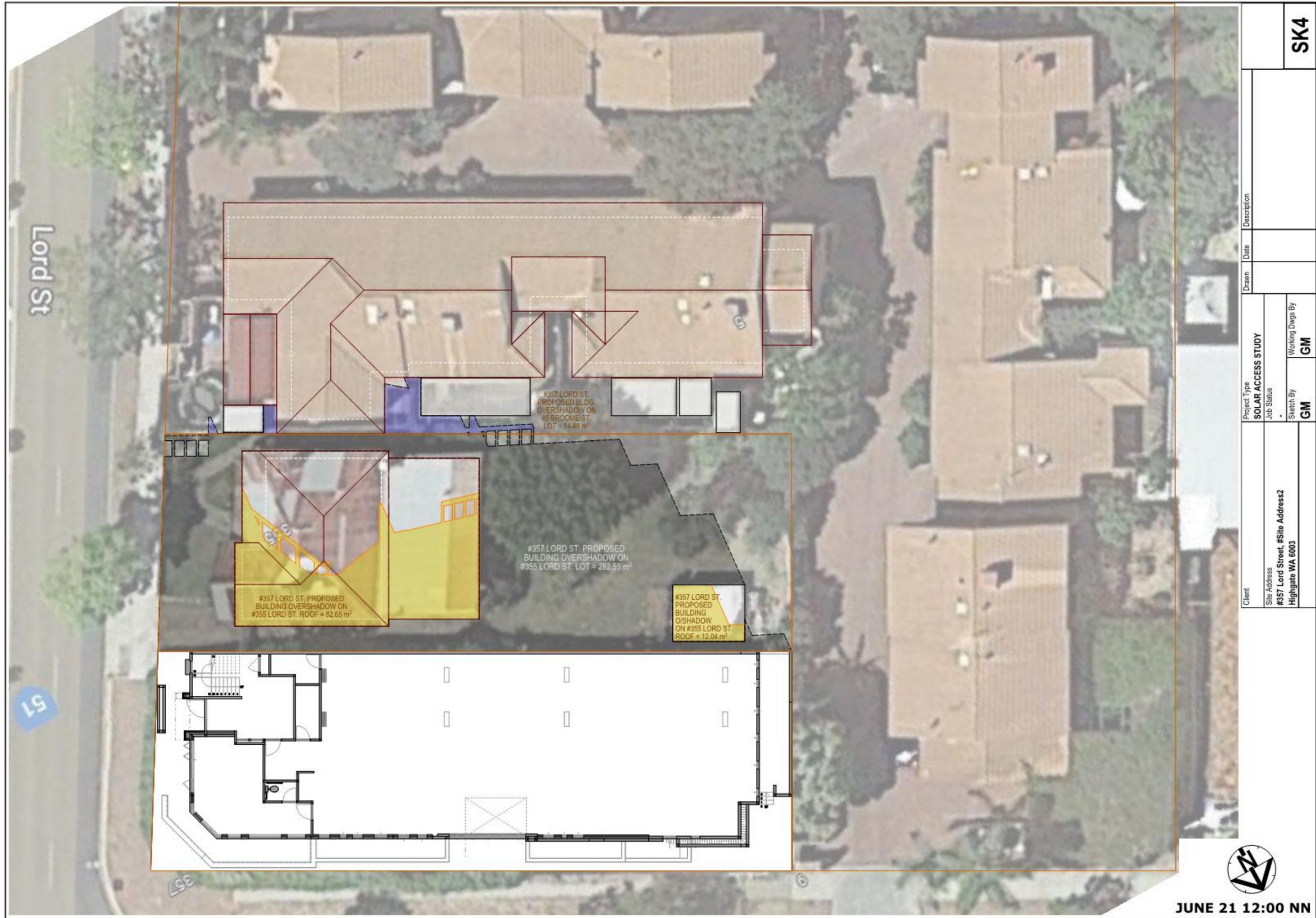
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Client	Site Address	Job Status	Working Days By
#357 Lord Street, #Site Address2 Highgate WA 6003			GM
Drawn	Date	Description	SK1
Sketch By	Working Days By		
GM	GM		



JUNE 21 11:00 AM



Client		Project Type		Date		Description	
Site Address #357 Lord Street, #Site Address2 Highgate WA 6003		SOLAR ACCESS STUDY					
		Job Status		Drawn			
		Sketch By		Date			
		GM					
		Working Dwg By					
		GM					
						SK3	

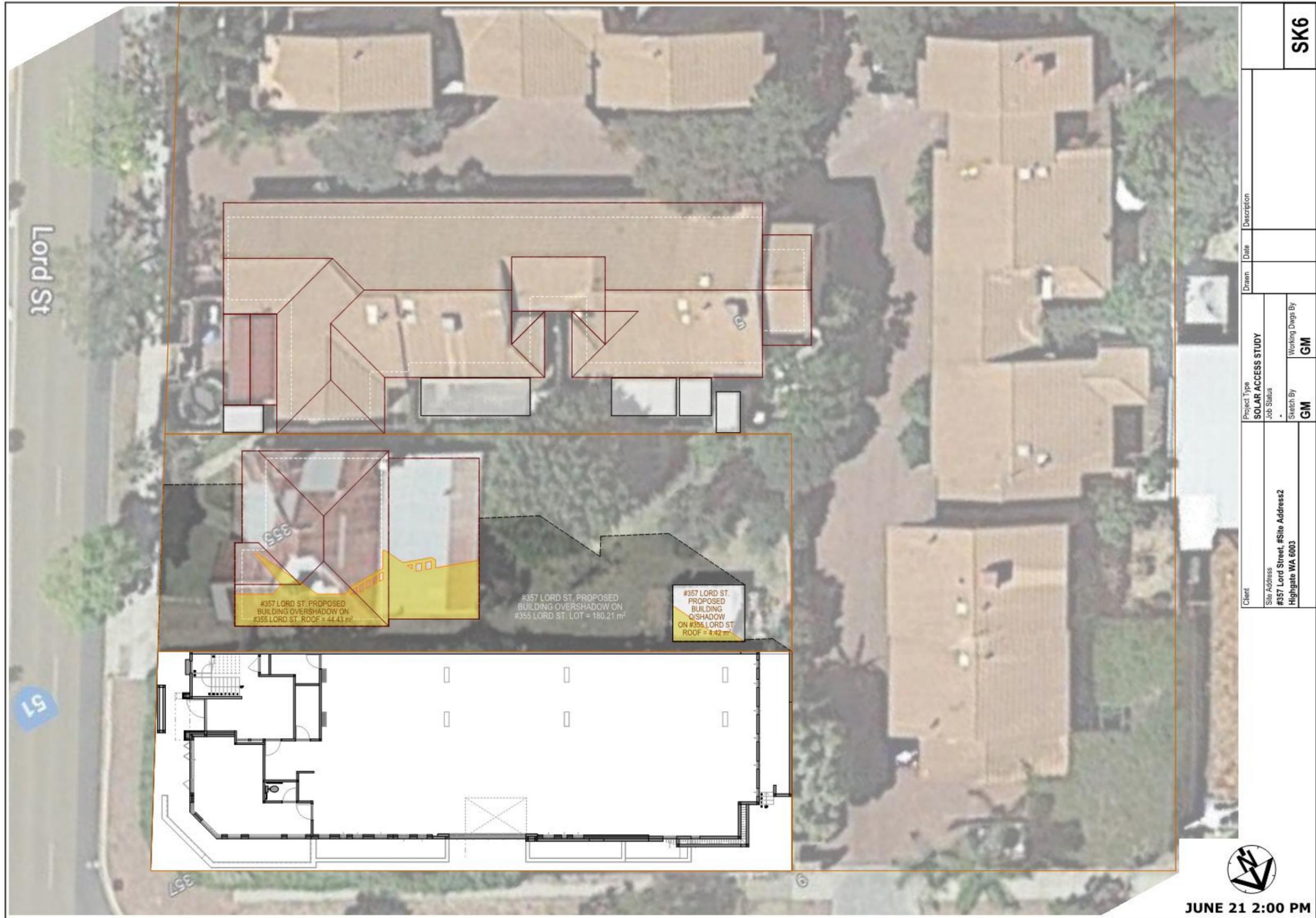


Project Type		SOLAR ACCESS STUDY	
Job Status		-	
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Working Dwg. By		GM	
Client			
Site Address			
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Drawn	Date	Description	SK4



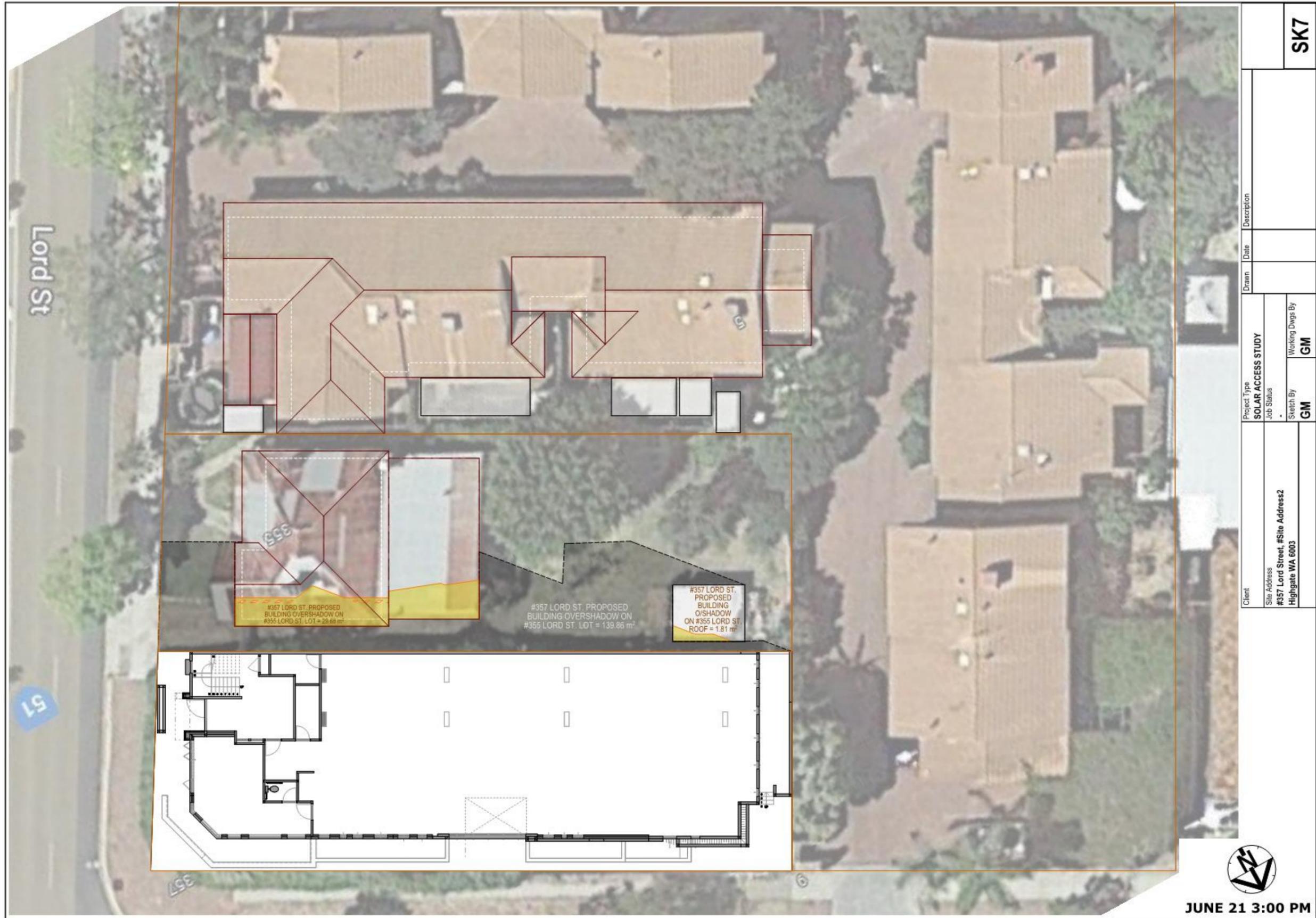
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		Sketch By		Date			
		GM					
		Working Dwg By					
		GM					
						SK5	



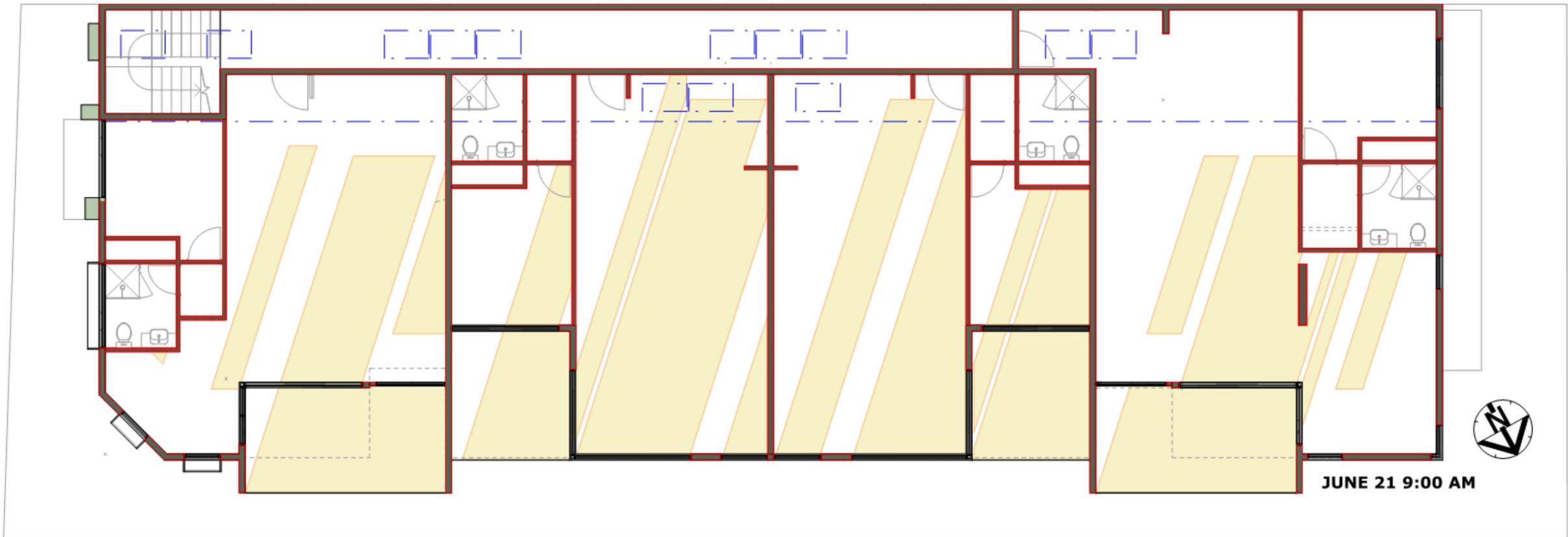
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Client		Project Type		Date		Description	
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		Sketch By		Date			
		GM					
		Working Dwg By					
		GM					
						SK6	



JUNE 21 3:00 PM

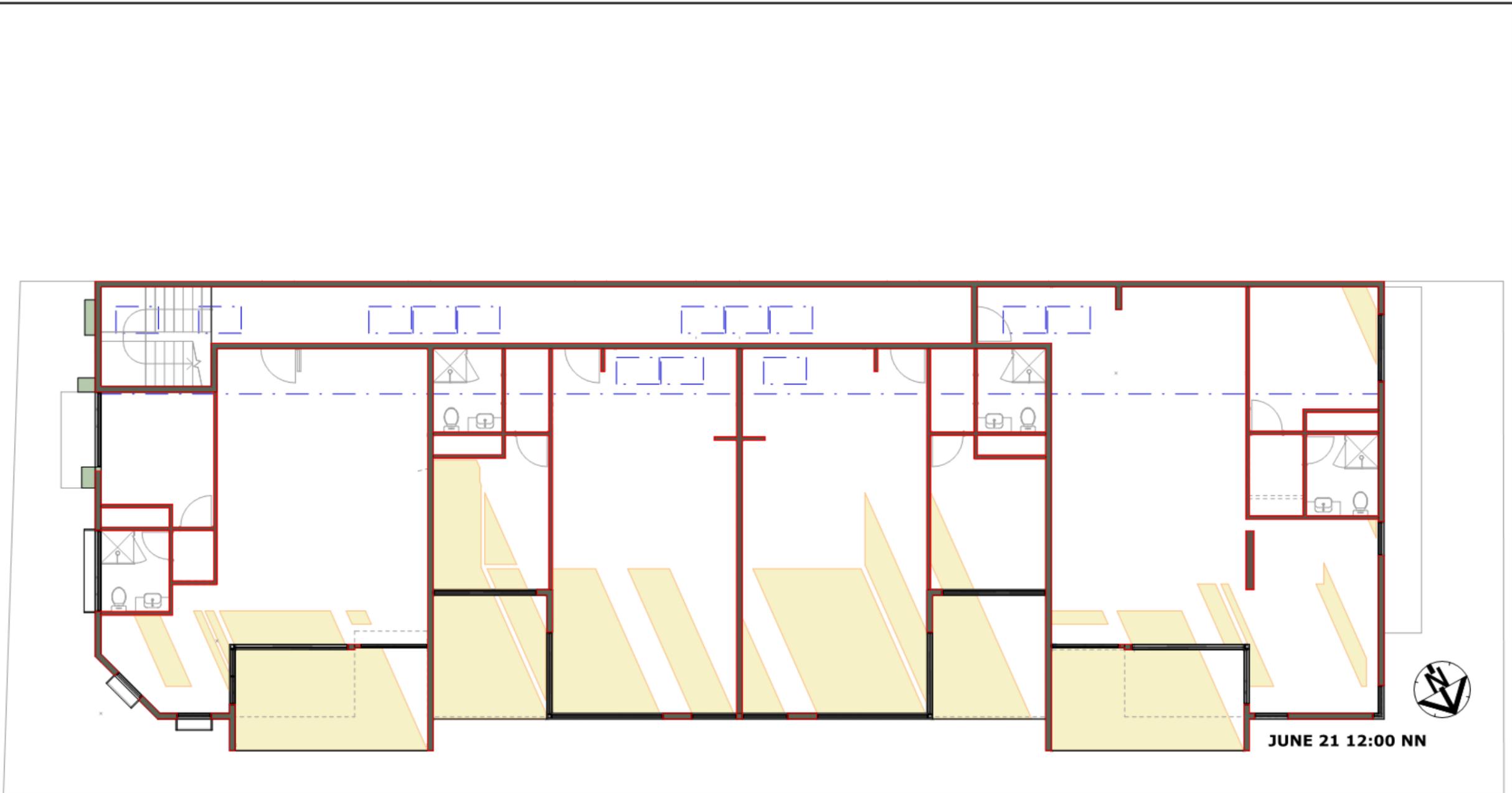
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Site Address #357 Lord Street, #Site Address2 Highgate WA 6003		SOLAR ACCESS STUDY					
		Job Status		Drawn			
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		Working Dwg By GM					
						SK7	



JUNE 21 9:00 AM

FIRST FLOOR SOLAR ACCESS MAP

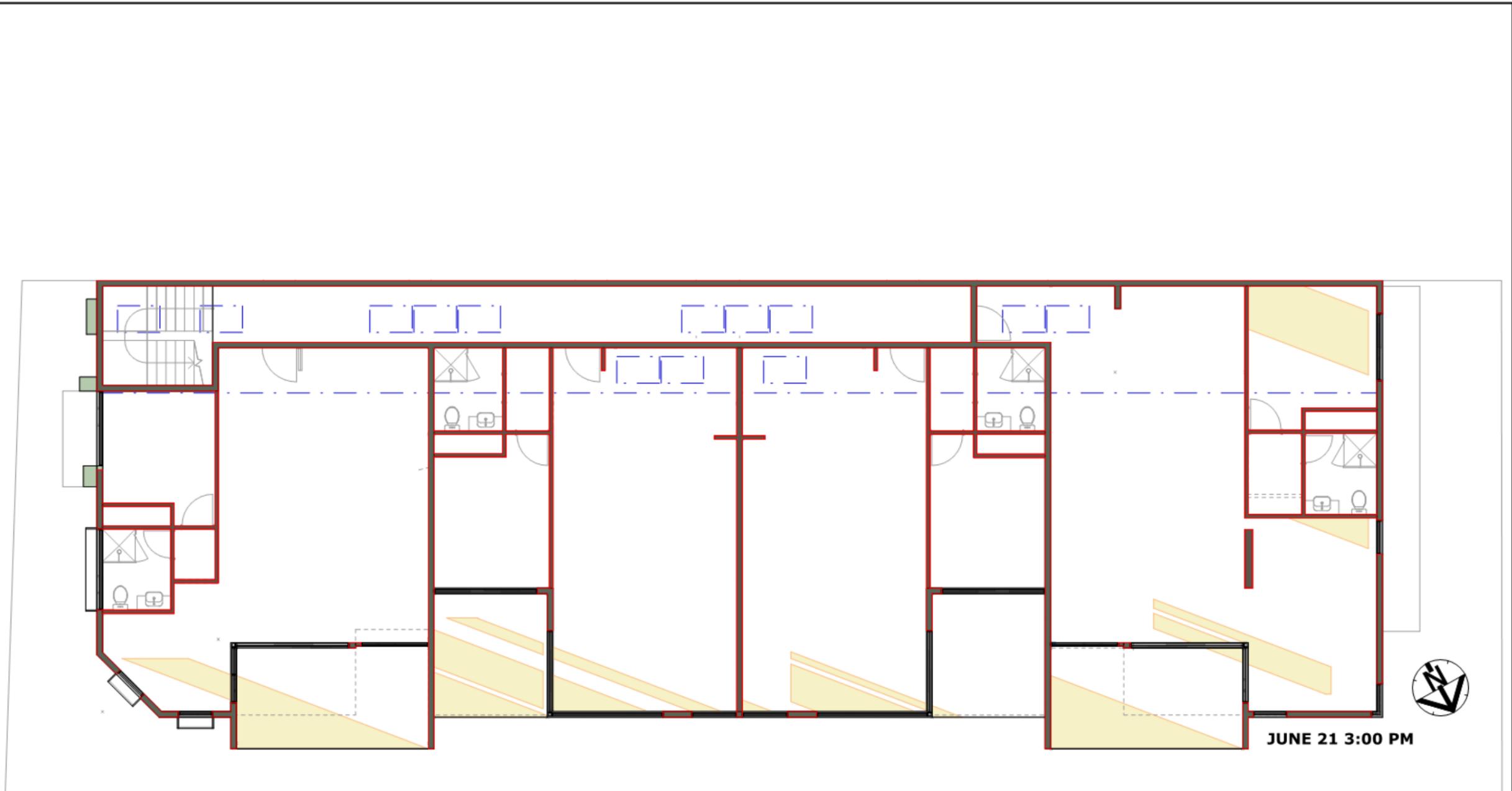
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#357 Lord Street, #Site Address2 Highgate WA 6003	Job Status				
	Sketch By	Working Dwgs By			
	GM	GM			



JUNE 21 12:00 NN

FIRST FLOOR SOLAR ACCESS MAP

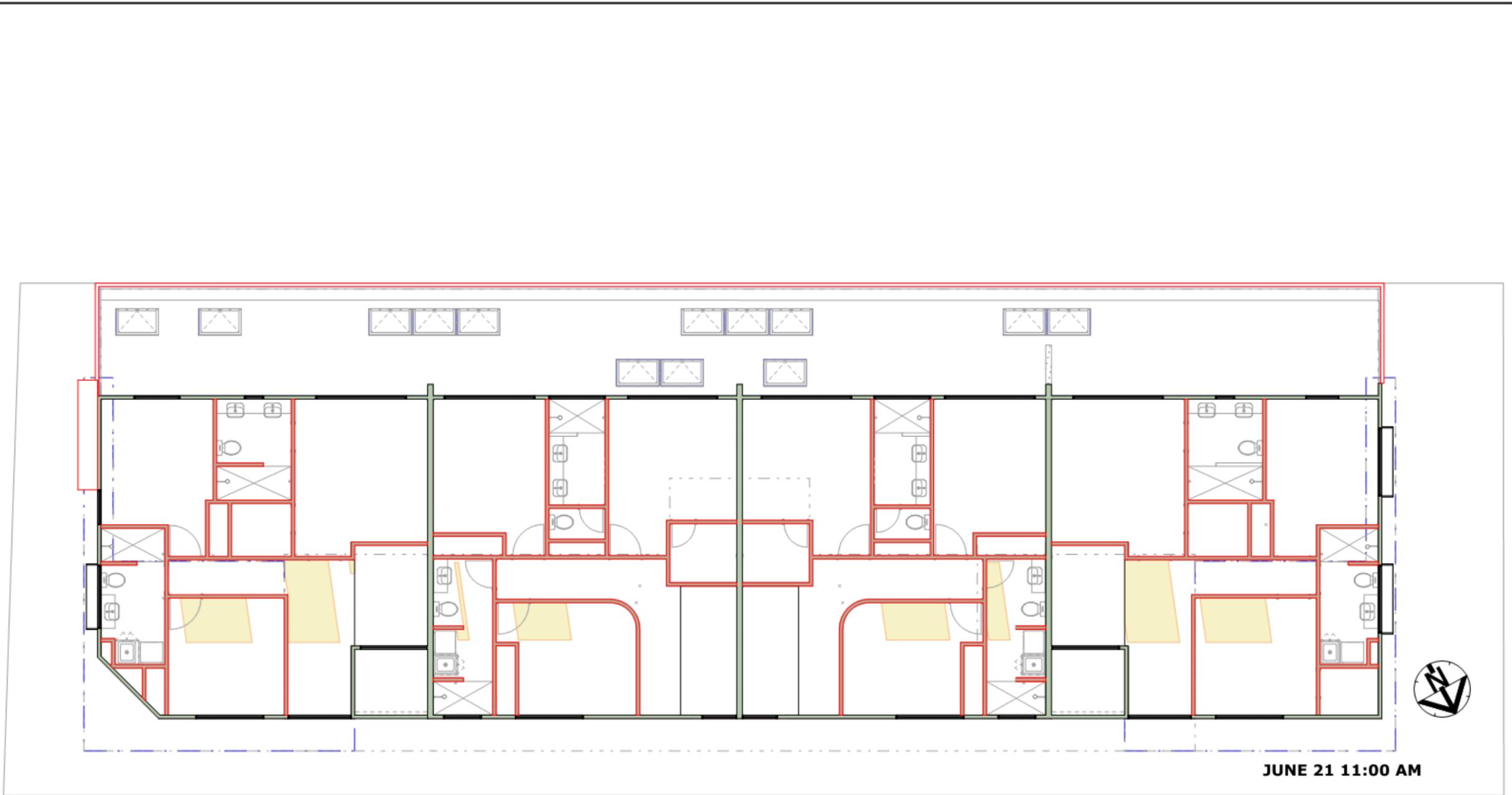
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Site Address	SOLAR ACCESS STUDY				
#357 Lord Street, #Site Address2 Highgate WA 6003	Job Status				
	Sketch By	Working Dwgs By			
	GM	GM			



JUNE 21 3:00 PM

FIRST FLOOR SOLAR ACCESS MAP

Client	Project Type	Drawn	Date	Description	SK10
Site Address	SOLAR ACCESS STUDY				
#357 Lord Street, #Site Address2 Highgate WA 6003	Job Status				
	Sketch By	Working Dwg By			
	GM	GM			



JUNE 21 11:00 AM

SECOND FLOOR SOLAR ACCESS MAP

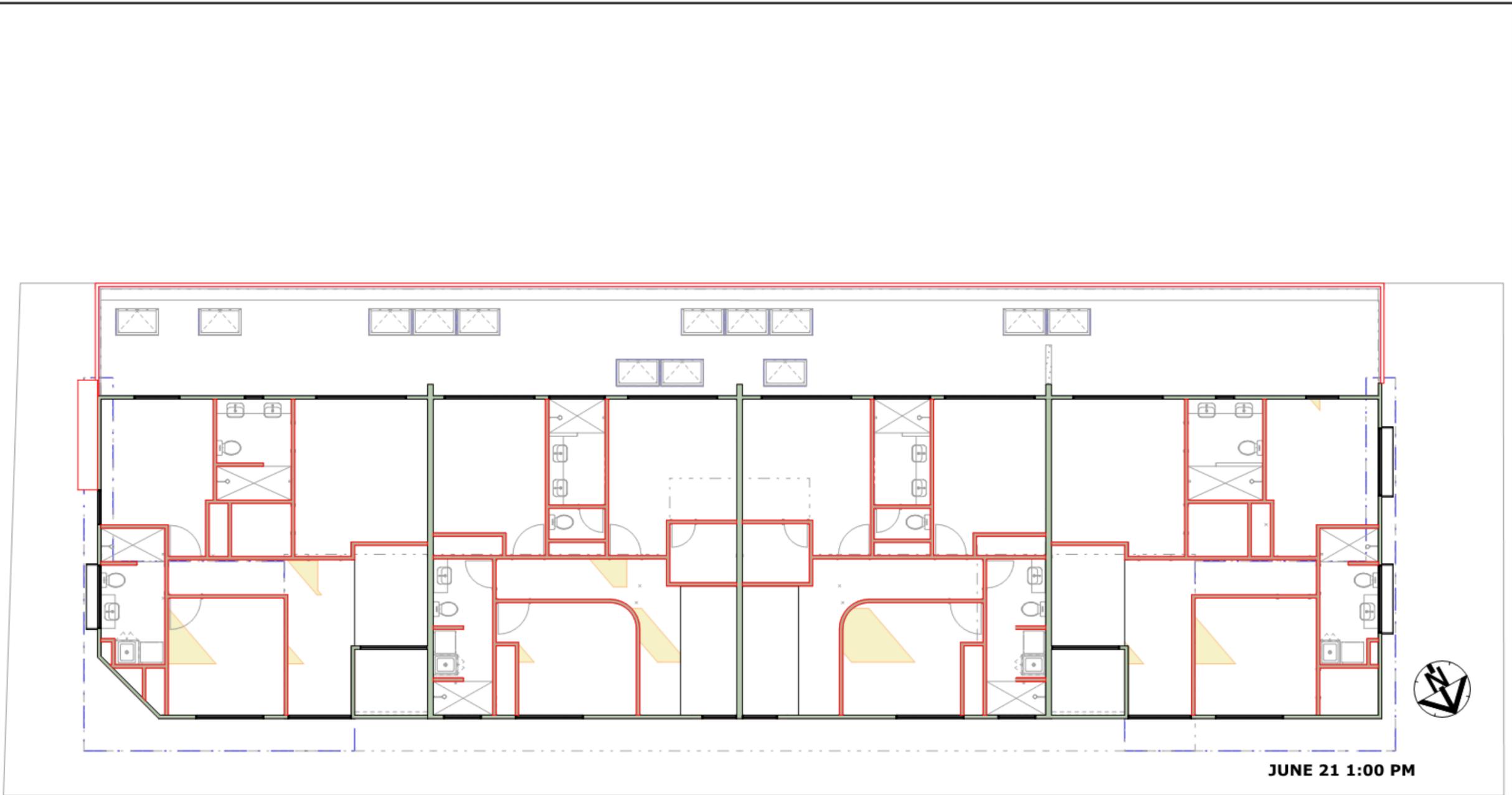
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	GM	GM			



JUNE 21 12:00 NN

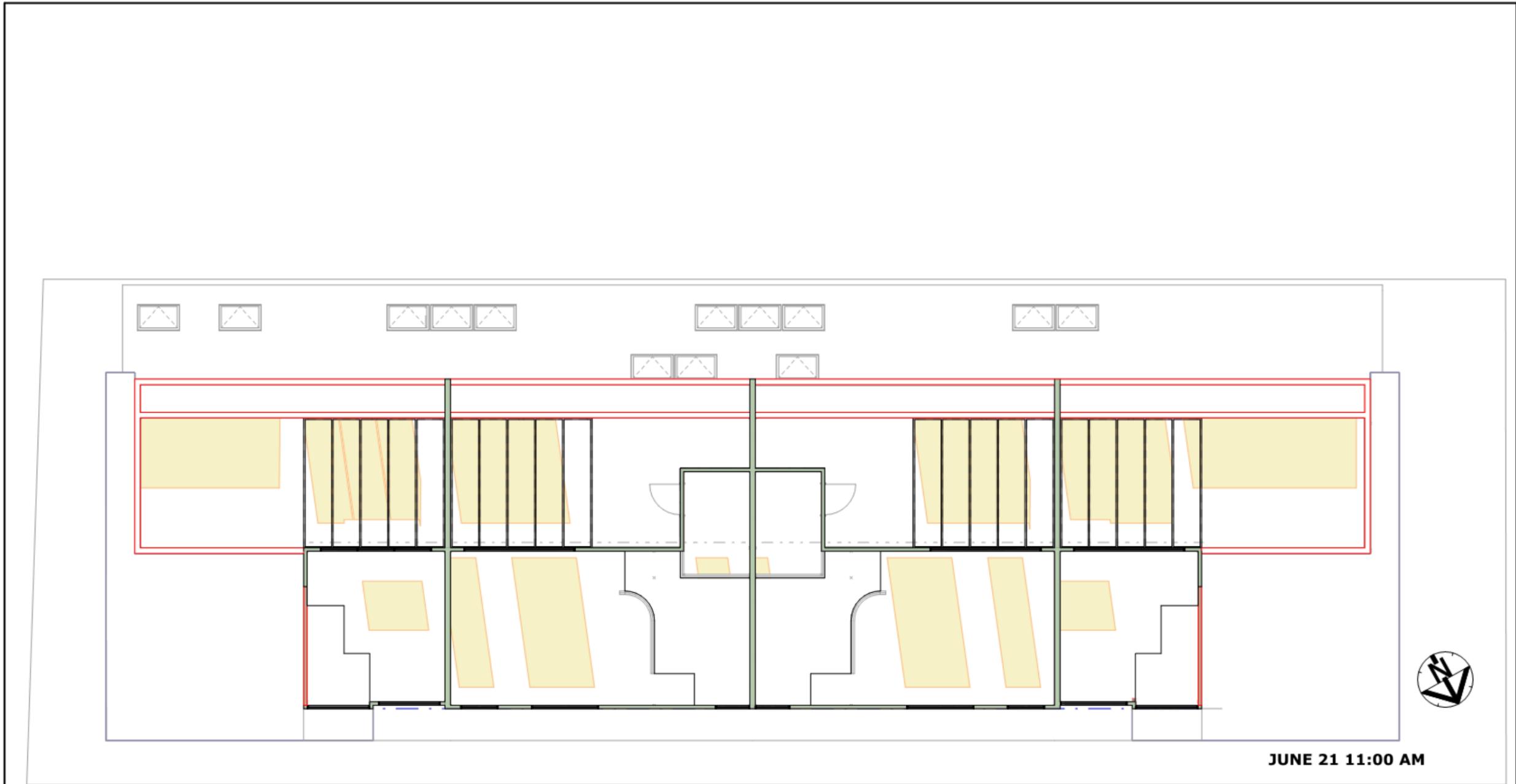
SECOND FLOOR SOLAR ACCESS MAP

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	Sketch By	Working Dwgs By			
	GM	GM			



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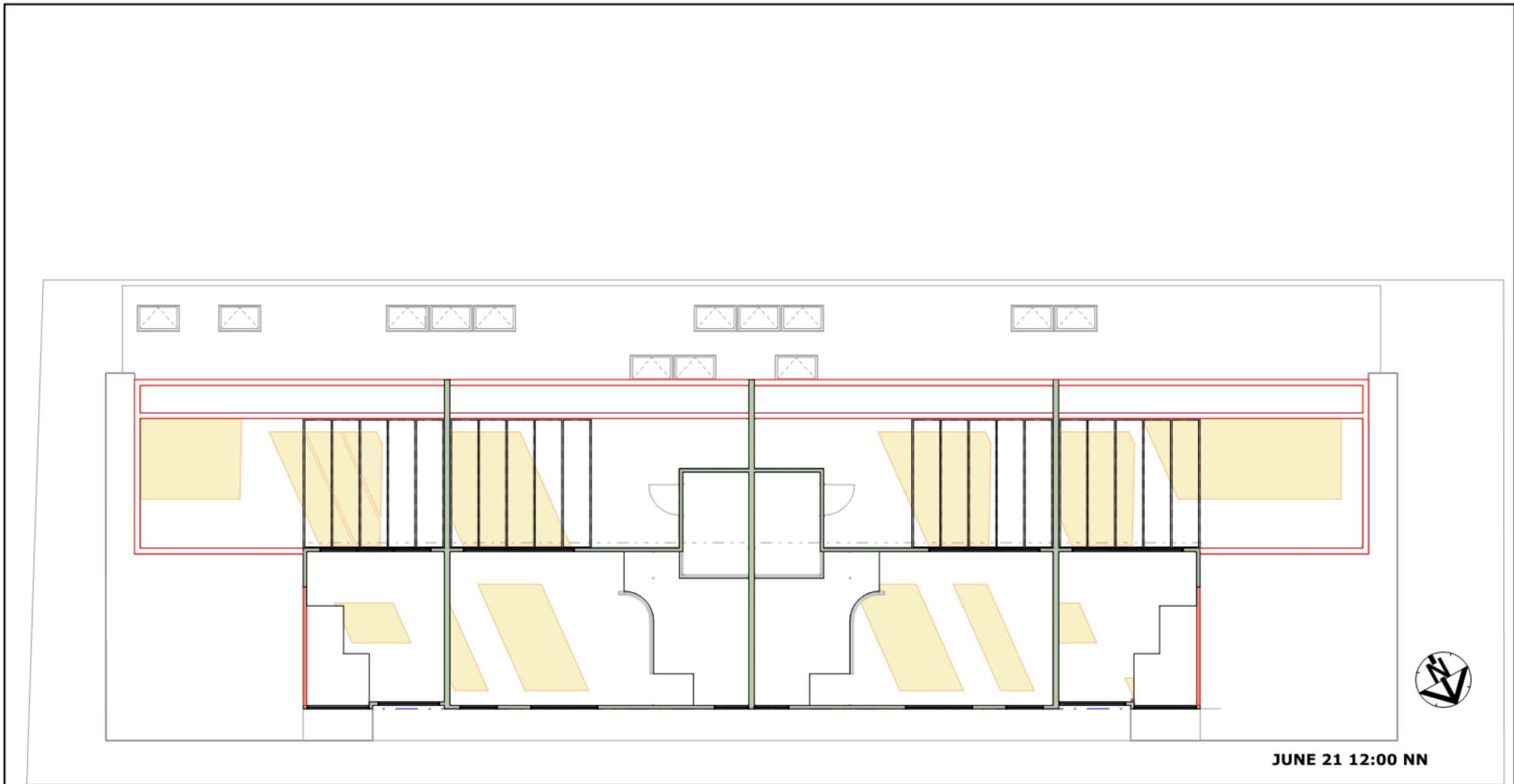
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Site Address	SOLAR ACCESS STUDY				
#357 Lord Street, #Site Address2	Job Status				
Highgate WA 6003	-				
	Sketch By	Working Dwgs By			
	GM	GM			



JUNE 21 11:00 AM

ROOF TERRACE SOLAR ACCESS MAP

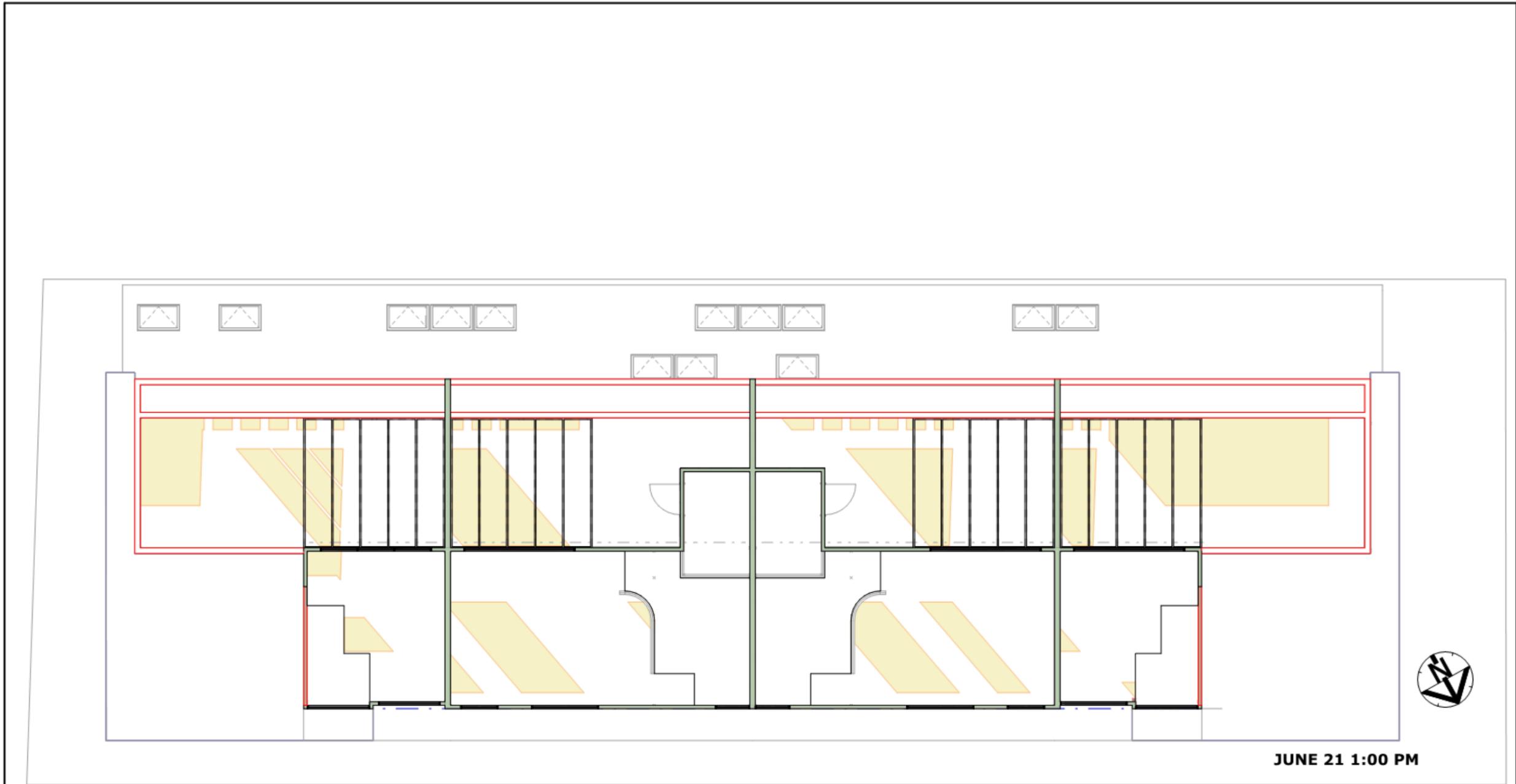
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Site Address	SOLAR ACCESS STUDY				
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	Sketch By	Working Dwg By			
	GM	GM			



JUNE 21 12:00 NN

ROOF TERRACE SOLAR ACCESS MAP

Client	Project Type	Drawn	Date	Description	SK15
Site Address	SOLAR ACCESS STUDY				
#357 Lord Street, #Site Address2 Highgate WA 6003	Job Status				
	Sketch By	Working Dwgs By			
	GM	GM			



ROOF TERRACE SOLAR ACCESS MAP

Client	Project Type	Drawn	Date	Description	SK16
Site Address	SOLAR ACCESS STUDY				
#357 Lord Street, #Site Address2 Highgate WA 6003	Job Status				
	Sketch By	Working Dwgs By			
	GM	GM			

APPENDIX B – VENTILATION ANALYSIS



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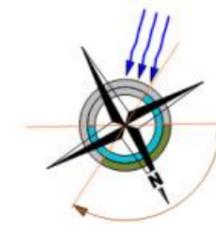
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FIRST FLOOR AREA			
Floor	Location	Area	Perimeter
First Floor	APARTMENT 04- LOWER	96.46	45.37
	APARTMENT 01- LOWER	74.42	36.83
	APARTMENT 02- LOWER	72.37	36.56
	APARTMENT 03- LOWER	71.67	36.41
	WALKWAY FIRST FLOOR	35.03	44.07
	BALCONY 01	13.84	15.67
	BALCONY 04	13.84	15.67
	BALCONY 02	10.00	12.66
	BALCONY 03	10.00	12.66
	STAIRS FIRST FLOOR V...	9.00	12.10
		408.83 m²	



PROPOSED APARTMENTS

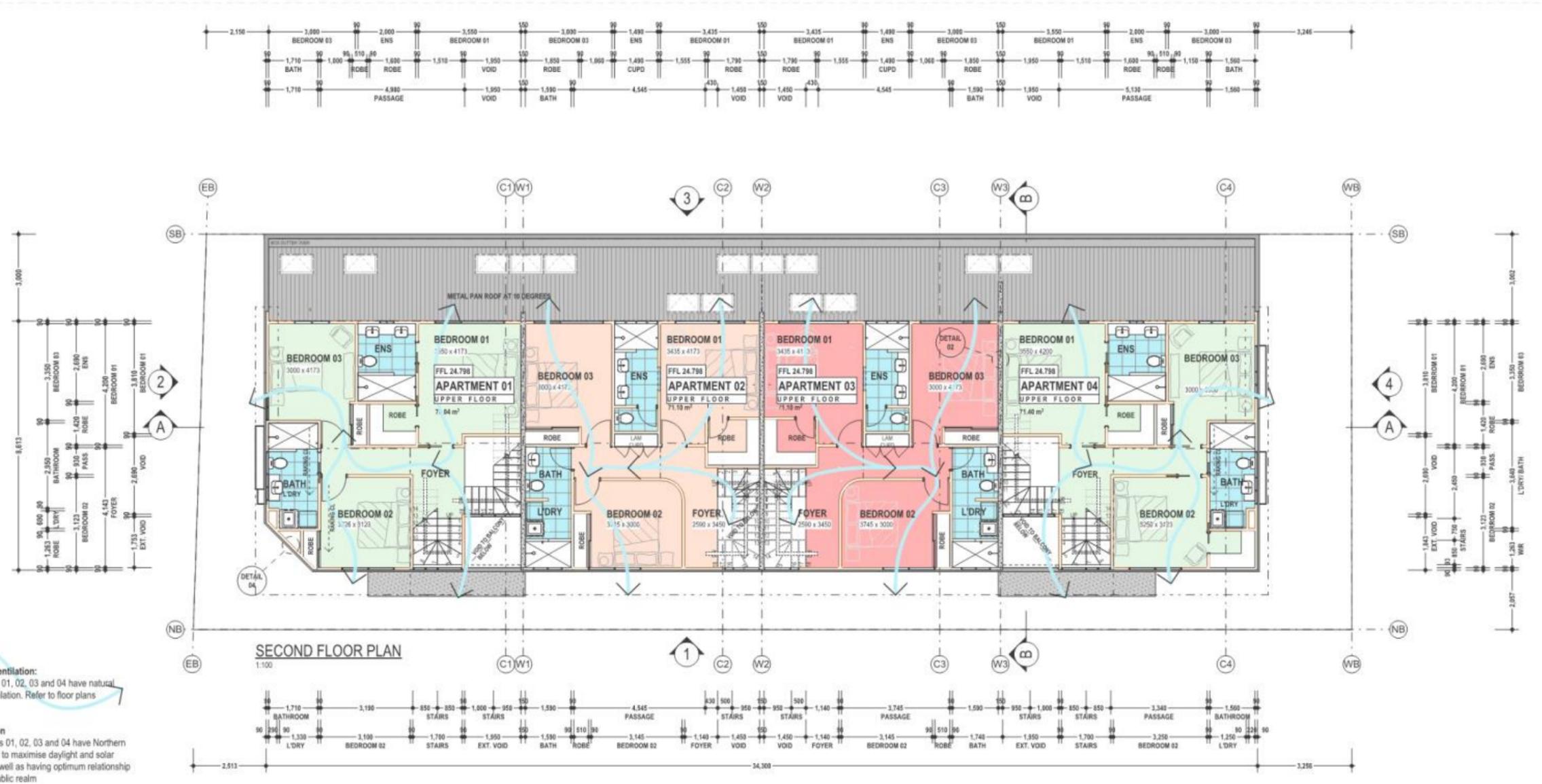
357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 4 OF 19
15 FEB. 2022

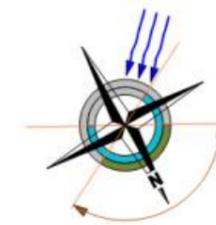


SECOND FLOOR AREA		
Floor Location	Area	Perimeter
Second Floor		
APARTMENT 04-UPPER	71.40	34.87
APARTMENT 02-UPPER	71.10	33.74
APARTMENT 03-UPPER	71.10	33.74
APARTMENT 01-UPPER	70.04	33.90
	283.64 m²	



PROPOSED APARTMENTS

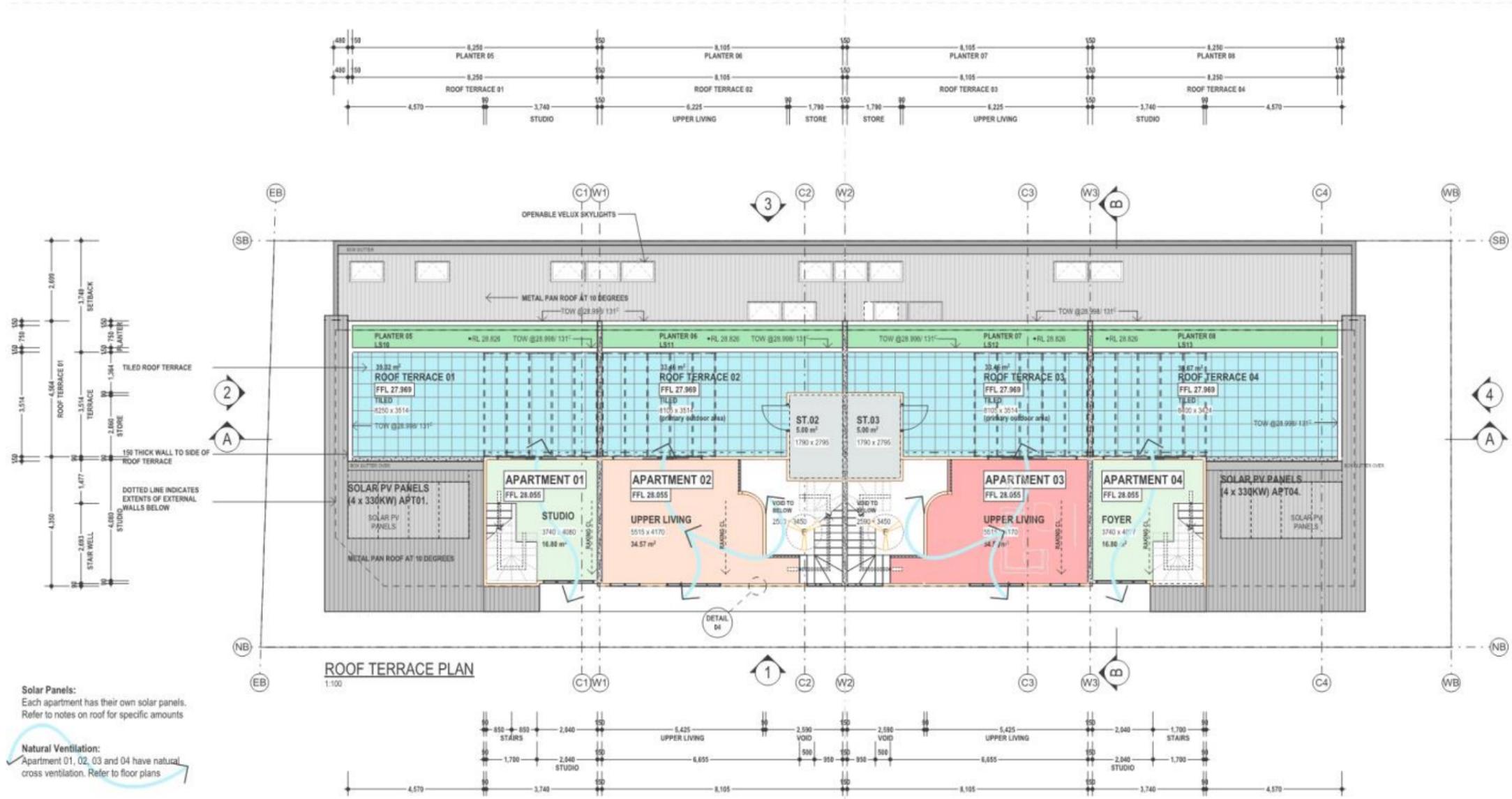
357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 5 OF 19
15 FEB. 2022



ROOF TERRACE FLOOR AREA		
Floor Location	Area	Perimeter
Roof Terrace		
ROOF TERRACE 01	39.02	26.23
ROOF TERRACE 04	38.67	26.08
APT 2. UPP. LIVING	34.57	25.21
ROOF TERRACE 03	33.48	25.64
ROOF TERRACE 02	33.48	25.64
APT 4. STUDIO	16.80	16.51
APT 1. STUDIO	16.80	16.51
STORE 03	5.00	9.17
STORE 02	5.00	9.17
TOTAL	257.35 m²	



Solar Panels:
Each apartment has their own solar panels. Refer to notes on roof for specific amounts

Natural Ventilation:
Apartment 01, 02, 03 and 04 have natural cross ventilation. Refer to floor plans

Orientation
Apartments 01, 02, 03 and 04 have Northern orientation to maximise daylight and solar aspect as well as having optimum relationship with the public realm

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 6 OF 19
15 FEB. 2022





**RESIDENTIAL DEVELOPMENT
357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT**

Report 10.00389R-02

prepared for Arconic Design
on 01/07/2022





RESIDENTIAL DEVELOPMENT 357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT

REPORT PREPARED BY

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BASIS OF REPORT

This report has been prepared by **Acoustics Consultants Australia (ACA)** with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

REFERENCE	DATE	PREPARED	REVIEWED	AUTHORISED
10.00389R-01	24/01/2022	TGD	MdlM	Miguel de la Mata
10.00389R-02	30/06/2022	TGD	MdlM	Miguel de la Mata



RESIDENTIAL DEVELOPMENT 357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT

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RESIDENTIAL DEVELOPMENT 357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT



Report 10.00389R-02

1. INTRODUCTION

Acoustics Consultants Australia (ACA) were commissioned by Arconic Design to undertake acoustics consultancy services for the building design of the proposed residential development located at 357 Lord Street, Highgate.

This report presents the findings of the road traffic noise assessment conducted by ACA for the proposed residential development.

The following regulations and guidelines have been addressed in this report:

- State Planning Policy 5.4 (SPP5.4, September 2019) with regards to noise intrusion due to the nearby road (Lord Street);
- Australian Standard 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS2107).
- State Planning Policy 7.3 (SPP7.3) *Residential Design Codes. Volume 2 – Apartments* (May 2019).
- National Construction Code 2019 (NCC), for airborne and impact sound insulation, and acoustic treatment of services, as per section F5 of the NCC;
- Association of Australasian Acoustical Consultants *Guideline for Apartment and Townhouse Acoustic Rating* (Version 1.0);
- WA Environmental Protection (Noise) Regulations 1997 (WA EPNR 1997), for noise emissions from the building compound into the environment due to reported building services.
- City of Vincent's Planning and Building Policy Manual, Development and Design Policy No. 7.5.21 *Sound Attenuation*.

By adhering to the recommendations in this report, the development will be complying with the requirements of the guidelines listed above.

Further details of methodology and Standards used to conduct the assessment, as well as the numeric assessment results are presented in the following sections of this report.

Acoustic terms used in this report are defined in the Glossary of **Appendix A**.



RESIDENTIAL DEVELOPMENT 357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT

2. PROJECT DESCRIPTION

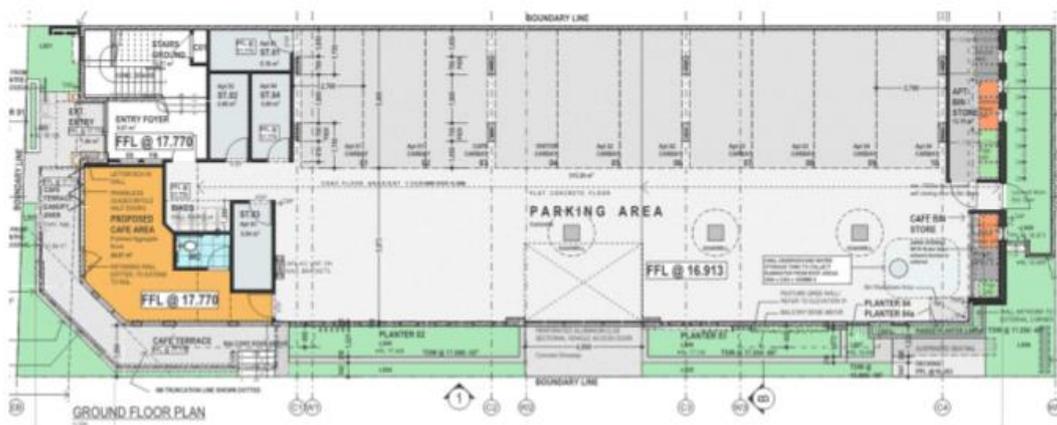
The proposal is for a mix-use development, which includes four three-storey residential dwellings and one commercial unit (café) on the ground floor. The site is located in the corner of Lord Street and Broome Street in Highgate. **Figure 1** shows the overall site location and its surroundings.

Figure 1 Site location – 357 Lord Street, Highgate



The main source of external noise to the proposed site, confirmed from the site visit, is road traffic from Lord Street at approximately 5 m away from the nearest site boundary. Intrusive noise has been assessed to meet Planning Policies. Noise emissions from the proposed café on the ground floor has been assessed to meet Statutory requirements. Internal proposed constructions of sole occupancy units have been assessed for Code compliance. **Figures 2 and 3** show the proposed project layout.

Figure 2 Site Layout (Ground Floor: Café and Parking)



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Figure 3 Site Layout (Residential: 1st, 2nd and Terrace Levels)





RESIDENTIAL DEVELOPMENT 357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT

3. ACOUSTIC CRITERIA

Acoustic criteria have been determined from a review of the following documents:

- State Planning Policy 5.4 (SPP5.4) ‘Road and Rail Noise’.
- Australian Standard 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.
- State Planning Policy 7.3 (SPP7.3) ‘Residential Design Codes. Volume 2 – Apartments’ (May 2019).
- National Construction Code 2019.
- Association of Australasian Acoustical Consultants (AAAC) *Guideline for Apartment and Townhouse Acoustic Rating*.
- The WA Environmental Protection (Noise) Regulations 1997 (EPNR).
- City of Vincent’s Planning and Building Policy Manual, Development and Design Policy No. 7.5.21 *Sound Attenuation*.

3.1. Rail and Road Noise – State Planning Policy 5.4 (SPP5.4)

Noise sensitive development proposed in close proximity to major or significant traffic routes are subject to the State Planning Policy 5.4 ‘Road and Rail Noise’ (SPP5.4, Sept. 2019). Table 1 of the SPP5.4 outlines the ‘trigger distances’, which are the perpendicular distances measured from the subject road carriageway edge that defines the catchment areas that would require assessment for potential transport noise impacts, following the requirements of the Policy. The applicable section of this table to rail and road corridors is shown in **Table 1**.

Table 1 SPP5.4 transport corridor classification and trigger distances

Transport corridor classification	Trigger Distance	Triggers Assessment?
Road		
Strategic freight and major traffic routes Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume	300 metres	No
Other significant freight/traffic routes These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meets the criteria of either >= 100 Class 7 to 12 Austroads vehicles daily or >= 23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes).	200 metres	Yes

7

Transport corridor classification	Trigger Distance	Triggers Assessment?
Rail		
Passenger railway	100 metres	No
Freight railway	200 metres	No

Further, the Department of Planning Lands and Heritage (DPLH) 'PlanWA' website provides a digital map with the trigger of the SPP5.4. This map is shown in the following **Figure 4**.

Figure 4 SPP5.4 Road and Rail Noise trigger distances – DPLH



The development proposed for the site, considered to be noise sensitive, is within 200 metres of Lord Street.

Relevant outdoor noise targets regarding road, rail and freight related transport noise are stated within Section 6.1 of SPP5.4 and are outlined in **Table 2**. These noise criteria are not retrospective and relevant to the emission of road traffic noise as received at a sensitive land use such as residential dwellings, offices, schools and child-care centres. The criteria are applicable at 1 metre from the most exposed habitable façade of the building receiving the noise, at ground floor level.

Table 2 SPP5.4 Noise Criteria (1m from a noise sensitive façade)

Time of the Day	Outdoor Noise Target – L _{Aeq,Period} (dB)	Indoor Noise Target – L _{Aeq} (dB)
Day (6am to 10pm)	55	L _{Aeq} (Day) 40 (living and work areas)
Night (10pm to 6am)	50	L _{Aeq} (Night) 35 (bedrooms)

The noise target is defined as the level from which further investigation would be required to determine potential noise impacts to sensitive receivers. Where the outdoor noise levels meet the noise target, no further measures are required under the SPP5.4.

The SPP5.4 Implementation Guidelines provides methodology for assessment and treatment of cases where detailed assessments may be required. Further, the Guideline provides direction to either develop a site-specific noise management plan to demonstrate compliance with the Policy or to follow a set of recommendations called the *Quiet House Requirements* that define sound insulation packages to achieve internal noise level objectives as recommended by Australian Standards.

Notification on Certificate of Title

Notification and advice to prospective purchasers of the potential for noise impacts from major transport corridors should be provided and required as a condition of subdivision (including strata subdivision) for the purposes of planning approval involving noise sensitive development where external noise levels are forecasted to exceed the 'Target'. An example of a suitable notice is provided in **Appendix C**.

3.2. Australian Standard 2107:2016

For internal spaces, Australian Standard 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS/NZS 2107) provides recommended noise limits for specific room usages.

The following **Table 3** presents recommended internal noise levels for residential houses and apartments near major roads in table 1 of AS/NZS 2107.

Table 3 AS/NZS 2107 Recommended design sound levels

Type of occupancy	Design sound levels ($L_{Aeq,t}$ range) – dB
Houses and apartments in inner city areas or entertainment districts or near major roads	
Living areas	35-45
Sleeping areas (night-time)	35-40
Work areas	35-45

The assessment related to environmental emissions from the development (EPNR) has not been undertaken in this report and it will be covered prior to Building Permit stage.

3.3. Building Design

3.3.1. National Construction Code (NCC) 2019

The acoustic provisions for inter-tenancy walls in Class 2 and 3 Buildings are outlined in Part F5 of the National Construction Code, NCC 2019. These requirements consist of the minimum airborne and impact sound insulation performance parameters, which are summarised in **Table 4**.



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Table 4 Performance requirements NCC 2019

Condition	Deemed-to-Satisfy Requirements	Verification ⁽¹⁾
Walls		
<i>Airborne Sound Insulation</i>		
Between sole-occupancy units	Minimum $R_w + C_{tr}$ 50	Minimum $D_{nT,w} + C_{tr}$ 45
Between a sole-occupancy unit and a plant room, lift shaft, stairway corridor, public corridor or the like	Minimum R_w 50	Minimum $D_{nT,w}$ 45
<i>Impact Sound Insulation</i>		
Between a laundry, kitchen, bathroom or sanitary compartment in a sole-occupancy unit, and a habitable room in an adjoining unit	Discontinuous construction	As deemed to satisfy
Between a sole-occupancy unit and a plant room or lift shaft	Discontinuous construction	As deemed to satisfy
Floors		
<i>Airborne Sound Insulation</i>		
Between sole-occupancy units	Minimum $R_w + C_{tr}$ 50	Minimum $D_{nT,w} + C_{tr}$ 45
Between a sole-occupancy unit and a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification	Minimum $R_w + C_{tr}$ 50	Minimum $D_{nT,w} + C_{tr}$ 45
<i>Impact Sound Insulation</i>		
Between sole-occupancy units	Maximum $L_{n,w}$ 62	Maximum $L_{nT,w}$ 62
Between a sole-occupancy unit and a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification	Maximum $L_{n,w}$ 62	Maximum $L_{nT,w}$ 62
Door Assemblies		
Between a sole-occupancy unit and a stairway, public corridor, public lobby or the like	Minimum R_w 30	Minimum $D_{nT,w}$ 25
Services		
Between a habitable room (other than a kitchen) in a sole-occupancy unit and a duct, soil, waste or water supply pipe duct (if the duct or pipe is located in a wall or floor cavity and serves or passes through more than one sole-occupancy unit)	Minimum $R_w + C_{tr}$ 40	Deemed-to-Satisfy Provisions
Between a kitchen or non-habitable room in a sole-occupancy unit and a duct, soil, waste or water supply pipe duct (if the duct or pipe is located in a wall or floor cavity and serves or passes through more than one sole-occupancy unit)	Minimum $R_w + C_{tr}$ 25	
If a storm water pipe passes through a sole-occupancy unit (habitable room other than kitchen)	Minimum $R_w + C_{tr}$ 40	
If a storm water pipe passes through a sole-occupancy unit (kitchen or non-habitable room)	Minimum $R_w + C_{tr}$ 25	

Notes: (1) Determined under AS/NZS ISO 717.1 (airborne noise) and AS/NZS ISO 717.2 (impact noise).
 (2) For the purposes of this part, "discontinuous construction" means a wall having a minimum 20 mm cavity between two separate leaves.



3.3.2. AAAC Guideline for Apartment and Townhouse Acoustic Rating

Evidence suggests that the NCC requirements for sound transmission do not manage noise levels to the satisfaction of occupants. This element identifies design initiatives that aim to exceed these minimum requirements to provide better long-term outcomes for residents.

The AAAC Guideline provides a logical tool to determine an accepted or expected acoustical result related to multi-dwellings. A Star Rating system is presented in the Guideline for use by designers, developers and purchasers of apartments or townhouses to encourage consistency between the apparent quality of the design of apartments and the underlying acoustical quality of the structure.

The acoustical attributes covered in the AAAC Guideline are external noise intrusion, internal building services noise, airborne sound insulation of walls and floors, impact sound isolation of floors. **Table 5** presents a summary of the sound insulation rating criteria.

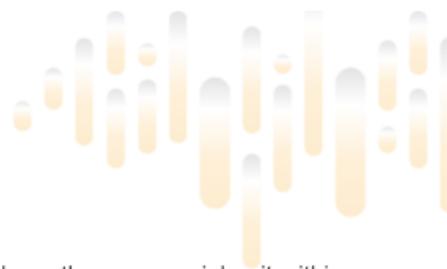
Table 5 AAAC Star Rating

Intertency Activities	2 Star	3 Star	4 Star	5 Star	6 Star
Airborne Sound Insulation for Walls and Floors					
Between Separate Tenancies – $D_{nT,w} + C_{tr} \geq$	35	40	45	50	55
Between Lobby/Corridor and Bedrooms – $D_{nT,w} + C_{tr} \geq$	30	40	40	45	50
Between Lobby/Corridor and Living – $D_{nT,w} + C_{tr} \geq$	25	40	40	40	45
Impact Isolation of Floors					
Between Tenancies – $L_{nT,w} \leq$	65	55	50	45	40
Between all other spaces and Tenancies – $L_{nT,w} \leq$	65	55	50	45	40
Impact Isolation of Floors					
Between Tenancies	No	Yes	Yes	Yes	Yes
Between common areas and Tenancies	No	No	No	Yes	Yes

It is noted that the NCC requirements are equivalent of 4-star for airborne noise and 2-star for impact noise.

3.4. Environmental Protection (Noise) Regulations 1997

Noise emissions from residential and commercial premises to nearby residential properties are covered by State noise policy in the form of the Western Australia Environmental Protection (Noise) Regulations of 1997 (EPNR). To achieve compliance with this policy, noise levels at nearby residential areas are not to exceed defined limits. These limits are determined from consideration of prevailing background noise levels and 'influencing factors' that consider the level of commercial and industrial zoning in the locality.



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receivers at the same lot; that is, at the residents located directly above the commercial unit within the development.

Table 6 WA EPNR Assigned Noise Levels

Type of premises receiving noise	Time of day	Assigned Level (dB)		
		LA10	LA1	LAmax
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Monday to Saturday	53	63	73
	0900 to 1900 hours Sunday and public holidays	48	58	73
	1900 to 2200 hours All days	48	58	63
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	43	53	63
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

A series of adjustments must be added to the noise source levels. If noise received at the sensitive premises cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, and the adjusted level must comply with the assigned level. Definition of these terms (tonality, modulation and impulsiveness) can be read from Regulation 9(1) of the EPNR. **Table 6** summarises the adjustments, as defined by the Regulations.

Table 6 Noise character adjustments

Adjustment where noise emission is not music		
Where tonality is present	Where modulation is present	Where impulsiveness is present
+5 dB	+5 dB	+10 dB

Notes: The full table in the EPNR includes corrections for tonality, modulation and impulsiveness for the case when noise emission is music. Such case does not apply to this assessment. Thus, not included herein to avoid confusion.

Mechanical plant and, in general, building services must comply with the assigned noise levels when assessed at the nearest noise sensitive receiver. Air conditioning units and toilet/kitchen extraction fans must be designed to minimise noise emissions to adjacent dwellings.



4. ROAD TRAFFIC NOISE ASSESSMENT

A detailed assessment has been prepared for the proposed site in accordance with the methodology described in the SPP5.4 Guidelines. In general, the following tasks were conducted as part of the noise study to predict road traffic noise levels at the proposed residential dwelling:

- A screening assessment to investigate the likelihood of exceeding the noise target;
- A noise survey conducted in order to quantify existing levels of road traffic noise from Lord Street;
- Based on the results of the noise survey, noise levels at the proposed dwelling and the relevant sound insulation package recommended.

4.1. SPP5.4 Screening Assessment

A basic screening level assessment was undertaken in accordance with the SPP5.4 Implementation Guidelines for the proposed development site. A noise exposure forecast calculation tool is provided in Table 2 of the Guidelines and based on distance of the development façade to the road corridor and the number of the road lanes, a forecast noise level is estimated.

The screening assessment (**Appendix B**) results in a forecasted daytime noise level of L_{Aeq} **69 dB**, which is 14 dB in excess of the daytime noise target. The 'Exposure Categories' shown in Table 2 of the Guidelines define bands of noise exceeding the target. In this case, the Exposure Category 'D' is suggested, which requires a detailed noise management plan to control noise intrusion to the proposed noise-sensitive development.

A detailed assessment has been undertaken as outlined in the following section.

4.2. Detailed Assessment

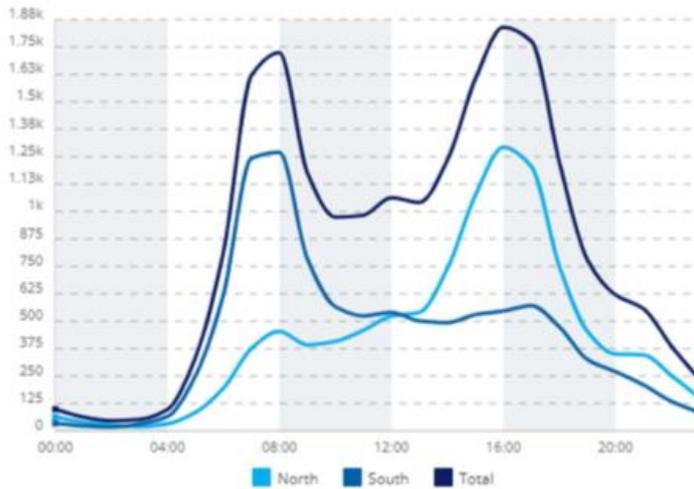
ACA carried out measurements of potential incident road traffic noise levels and adjusted the levels according to the guidelines.

From traffic counts of Lord St (year 2021/22, site No. 4404) provided by MainRoads' Traffic Data (**Figure 6**) it was determined that 93-95% of the traffic occurs during daytime (6 am to 10 pm). Thus, daytime assessment is the most stringent period with regards to noise impacts as daytime road traffic noise is expected to be over 5 dB louder than for night-time.



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Figure 6 Hourly traffic volumes of Lord St (Weekday time vs. Traffic volumes)



4.3. Noise Measurements

Attended noise measurement was conducted on Wednesday 19th of January 2022 between 16:00 and 16:30hrs outside of 357 Lord Street; which provides a good representative level for the 16-hour daytime conditions. **Figure 7** shows the location of the noise monitoring.

Figure 7 Noise measurements location



The following **Table 7** lists the equipment used to measure existing noise levels.

Table 7 Monitoring Equipment

Sound Level Meter			
Make and model	Type	Serial No.	Calibrated on
SVANTEK 971	1	77604	02/12/2020
Field Calibrator			
SVANTEK SV-33		76674	07/12/2020

Note: The equipment used is NATA certified IEC 61672 Type 1 meters.

All items of acoustic instrumentation employed for noise monitoring were set to 'Slow' response. The instrumentation employed during the noise measurement surveys comply with AS IEC 61672.2-2004 *Electroacoustics - Sound level meters – Specifications*. The sound levels meter was field calibrated before and after the measurements with the calibrator. No significant drift (greater than 0.5 dB) in calibration was detected.

Table 8 Noise measurements conducted on 19th January 2021 between 16:00 – 16:30 hrs

Location	$L_{Aeq(20min)}$, Free Filed Conditions (dB)	In-situ Traffic Volume Counts
357 Lord Street (SITE) – 1m from the most exposed proposed façade	71	608 vehicles in 20 minutes (or approximately 1,824 vehicles for the entire hour)
Representative Rating for the Daytime Period	$L_{Aeq,Day}$ 71 dB	

A traffic volume count was conducted during the road noise survey for comparison with the published volumes shown in **Figure 6**. The 608 vehicles counted during the measurements is a similar figure to Main Roads' data for the relevant time period (i.e. 1,840 vehicles from Main Roads data at 16:00hrs against the estimated 1,824 vehicles during measurements). All considering, noise levels conducted during 'peak hours' provide a higher representation of the L_{Aeq} day period, which was corrected and used to calibrate the predictions of this assessment.

The resulting façade noise level was adjusted to $L_{Aeq,Day}$ **70 dB** after the following corrections were applied:

- + 2.5 dB for façade reflection adjustment; and
- + 2 dB for traffic growth adjustment (assuming 60% traffic growth in the next 20 years, as required by the road traffic noise standard).
- - 2 dB correction of $L_{Aeq,day}$ against peak hour measurement.
- - 3 dB for distance attenuation (i.e. 4 m between the road and the proposed façade boundary, against 2 m between the measurements' location and the road).

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Thus, the proposed building would fall within 'Exposure Category' D. It is recommended that a tailored 'Quiet House' package design methodology is followed and applied.

Floorplans of the proposed building, details of internal rooms, external walls and proposed window schedules were provided by the client, prepared by Arconic Design dated 22/06/2022.

4.4. Recommendations

The proposed dwellings fall within 'Exposure Category D'. The following recommendations will be required to comply with internal noise design levels, as recommended by the SPP5.4 Guidelines. The east façade would be the most exposed to road traffic noise.

The materials recommended in **Table 9** provide sound attenuation to reduce internal noise levels to meet internal design as recommended in **Table 2**. Acoustic markups are provided in **Appendix D**.

Table 9 House façade treatment

Room / Façade	Building Element	Sound Insulation Required $R_w + C_{tr}$ (dB)	Material Recommend
ALL - External	Wall	60	150mm precast – outside to inside: <ul style="list-style-type: none"> - 50mm Masterwall panels (M-Series panels) - 150mm precast concrete wall - 45mm furring channels secured to wall - 16mm fire rated plasterboard.
ROOF	Ceiling	40	Metal roof sheeting – <ul style="list-style-type: none"> - Anticon beneath metal roof sheeting, - 88 mm New Generation Soundscreen (26 kg/m³) insulation in the ceiling void, - 1 x layers of 13 mm fire rated plasterboard
Apartment 1			
Lower Floor			
BEDROOM 4 - EAST	Fixed or Awning type of window	32	6.5 mm Vlam Hush glass on certified frames (e.g. AWS Series 616 – Awning Window)
STUDY - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
LIVING - NORTH	Sliding glass door	32	6.5 Vlam Hush on certified frame (e.g. AWS Series Apartment Sliding Door)

Room / Façade	Building Element	Sound Insulation Required $R_w + C_{tr}$ (dB)	Material Recommend
	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Upper Floor			
BEDROOM 1 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROM 2 – NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROOM 3 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROOM 3 – EAST	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
FOYER - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Roof Terrace Floor			
STUDIO - WEST	Sliding type of door	30	6.38 mm Laminated glass on certified frame (e.g. AWS Series 541 Sliding door)
STUDIO - EAST	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Apartment 2			
Lower Floor			
BEDROOM 4 - NORTH	Sliding glass door	35	12.5 Vlam Hush on certified frame (e.g. AWS Series 642 Commercial D'Stacked Door)
LIVING - EAST	Sliding glass door	32	6.5 Vlam Hush on certified frame (e.g. AWS Series Apartment Sliding Door)

Room / Façade	Building Element	Sound Insulation Required $R_w + C_{tr}$ (dB)	Material Recommend
LIVING - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Upper Floor			
BEDROOM 1 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROOM 2 – NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROOM 3 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
FOYER - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Roof Terrace Floor			
STUDIO - WEST	Sliding type of window	30	6.38 mm Laminated glass on certified frame (e.g. AWS Series 541 Sliding door)
STUDIO - EAST	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Apartment 3			
Lower Floor			
BEDROOM 4 - NORTH	Sliding glass door	35	12.5 Vlam Hush on certified frame (e.g. AWS Series 642 Commercial D'Stacked Door)
LIVING - WEST	Sliding glass door	32	6.5 Vlam Hush on certified frame (e.g. AWS Series Apartment Sliding Door)

Room / Façade	Building Element	Sound Insulation Required $R_w + C_{tr}$ (dB)	Material Recommend
LIVING - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Upper Floor			
BEDROOM 1 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROM 2 – NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROOM 3 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
FOYER - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Roof Terrace Floor			
STUDIO - WEST	Sliding type of window	30	6.38 mm Laminated glass on certified frame (e.g. AWS Series 541 Sliding door)
STUDIO - EAST	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Apartment 4			
Lower Floor			
ENTRY - EAST	Entry door	25	35mm solid core timber (without glass or with glass inserts not less than 10mm float glass), side hinged with certificated R_w 28 dB acoustically rated door frame system including seals
BEDROOM 4 - WEST	Fixed or Awning type of window	29	6 mm Float glass on certified frames

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Room / Façade	Building Element	Sound Insulation Required $R_w + C_{tr}$ (dB)	Material Recommend
THEATR/SITTING – WEST	Fixed or Awning type of window	29	6 mm Float glass on certified frames
THEATR/SITTING – NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
THEATR/SITTING – EAST	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
LIVING - NORTH	Sliding glass door	32	6.5 Vlam Hush on certified frame (e.g. AWS Series Apartment Sliding Door)
	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Upper Floor			
BEDROOM 1 – SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROM 2 – NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
BEDROOM 3 – WEST	Fixed or Awning type of window	29	6 mm Float glass on certified frames
BEDROOM 3 - SOUTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
FOYER - NORTH	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)
Roof Terrace Floor			
STUDIO - WEST	Sliding type of window	30	6.38 mm Laminated glass on certified frame (e.g. AWS Series 541 Sliding door)

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Room / Façade	Building Element	Sound Insulation Required $R_w + C_{tr}$ (dB)	Material Recommend
STUDIO - EAST	Fixed or Awning type of window	32	6.38 mm Laminated glass on certified frames (e.g. AWS Series 616 – Awning Window)

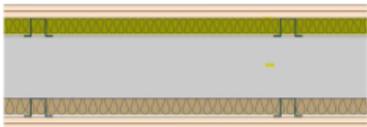


5. BUILDING ACOUSTICS ASSESSMENT

5.1. Party Walls

Table 10 shows typical party wall configurations to meet 'Deemed to Satisfy' NCC standards and the proposed system. Any alternative method of wall systems proposed shall be verified by the acoustic engineer. Appendix D provides acoustic mark ups to be read in conjunction with this table, these markups consider the minimum NCC objectives.

Table 10 Assessment of internal walls

Wall Type	Typical Compliant System	Performance Required	Verification Required	Star Rating (AAAC)
Sole-occupancy unit party walls 	<p>Deemed-to-Satisfy: 150 mm concrete panel (including solid pre-cast concrete)</p> <p>Total thickness = 150 mm</p>	$R_w + C_{tr}$ 50 dB	No	4
	<p>Performance solution (proposed): 150 mm concrete panel –</p> <ul style="list-style-type: none"> Two layers of 16 mm standard plasterboard fixed to; Furring channels secured to both sides of the concrete leaf; Filled with 50 mm thick glass wool insulation (compressed) with a minimum density of 11 kg/m³ positioned between the channels.  <p>Total thickness = 304 mm</p>	$R_w + C_{tr}$ 50 dB	No	6
Sole-occupancy unit party walls (Discontinuous) 	<p>Performance solution (proposed): 150 mm concrete panel –</p> <ul style="list-style-type: none"> One layer of 16 mm standard plasterboard fixed to a furring channel secured to one side of the leaf; Filled with 50 mm thick glass wool insulation (compressed) with a minimum density of 11 kg/m³ positioned between the channels; 	$R_w + C_{tr}$ 50 dB	No	6



Wall Type	Typical Compliant System	Performance Required	Verification Required	Star Rating (AAC)
	<ul style="list-style-type: none"> One row of 51mm steel studs, 20 mm discontinuous from the concrete leaf filled with insulation; One layer of 16 mm standard plasterboard fixed to the studs.  <p>Total thickness = 247 mm</p>			
Corridor walls	<p>Deemed-to-Satisfy: 150 mm concrete panel (including solid pre-case concrete)</p> <p>Total thickness = 150 mm</p>	R _w 50 dB	No	5
	<p>Performance solution (proposed): 150 mm concrete panel –</p> <ul style="list-style-type: none"> One layer of 10 mm standard plasterboard fixed to a 25 mm furring channel secured to one side of the leaf; One layer of 10 mm standard plasterboard fixed to a 45 mm furring channel secured to the other side of the leaf (internal); Filled with 50 mm insulation.  <p>Total thickness = 240 mm</p>	R _w 50 dB	No	6

Any deviation of the recommended walls system must be consulted with the acoustic engineer for approval. Chasing of pipes or other services in acoustically rated walls is not allowed per NCC and penetrations must be avoided.

NCC Part F5.5(f) states that where a separating wall that is required to have a minimum sound insulation performance as a floor or roof above, then that wall must continue to the underside of the floor/roof above, or the roof or ceiling must have an equal sound insulation performance as the wall.



5.2. Floors

5.2.1. Floor/Ceiling Constructions

The colour-coded floor plan in **Appendix D** identifies the recommended vertical airborne sound insulation performance and impact sound insulation performance for the project.

The proposed development has 250 mm concrete slab, which meets the airborne sound insulation requirements. No impact control would be required for vertical noise transmission to meet the NCC requirements as no apartments are located above or below of any other; however, it is recommended that where hard floors are installed in the apartments, these are treated for impact noise with a resilient acoustic underlay. This is particularly important for the staircases where the points of contact shall be treated to minimise vibration (See **Appendix D** for detail).

Table 11 Assessment of floors

Floor Finish Type	Typical Compliant System
Tile, Hardwood	Tile, wooden or vinyl floors installed as per manufacturer’s requirement followed by a– <ul style="list-style-type: none"> • High performance acoustic underlay (e.g. REGUPOL sonus multi 4.5)

The preferred resilient underlay treatment must have test results in accordance with AS ISO 140-8: 2006 – *Measurement of sound insulation of buildings and of building elements* laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor and rated in accordance with AS ISO 717-2: 2004 – *Acoustics – Rating of sound insulation in buildings and of building elements – Part 2: Impact Sound Insulation*.

Resilient isolation layers must be installed in strict accordance with manufacturer’s details with appropriate edge detailing applied to avoid ‘shorting’ the resilient layer at perimeter junctions.

5.3. Roof

The proposed roof construction is comprised of a Colourbond metal deck roof. In order to control rain noise, it is proposed to apply the Colourbond roof with the following treatment;

- 75 mm thick high density Anticon insulation hard fixed to the underside of the roof; and
- Suspended plasterboard ceiling with 50 mm insulation laid directly above.

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This arrangement is expected to provide a minimum sound reduction index value of R_w 45 dB and shall be adequate to mitigate rain noise.

5.4. Building Services

5.4.1. NCC Requirements

The NCC makes provision of criteria specific to the placement and function of mechanical building services. To be deemed to satisfy, provisions must be made such that;

- i) Services must not be chased into concrete or masonry elements.
- ii) Access doors/panels required to have a certain $R_w + C_{tr}$ that provides access to a duct, pipe or other service must –
 - a) not open into any habitable room; and
 - b) be firmly fixed such that the rebate or frame is overlapped by the access panel by not less than 10 mm, and be fitted with a sealing gasket along all edges. And be constructed of;
 - wood, particleboard or block board > 33 mm thick
 - compressed fibre reinforced cement sheeting > 9 mm thick
 - Other suitable material with mass per unit area > 24.4 kg/m²
- iii) A water supply pipe must –
 - a) Only be installed in the cavity of a discontinuous construction; and
 - b) In the case of a pipe that serves only one sole-occupancy unit, not be fixed to the wall leaf on the side adjoining any other sole-occupancy unit, and have a clearance of at least 10 mm to the other leaf.
- iv) Electrical outlets must be offset from each other –
 - a) In masonry walling, not less than 100 mm; and
 - b) In timber or steel framed walling, not less than 300 mm.

5.4.2. Service Risers and Ducts

Walls

In addition to minimum airborne sound insulation performance parameters as specified for separating walls, the NCC also prescribes minimum airborne sound insulation parameters for service duct walls which separate building services from residential spaces, in order to preserve a minimum level of acoustic amenity for building occupants.

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Where a duct, soil, waste or water supply pipe passes through more than one sole occupancy unit they must be located within a construction capable of achieving an $R_w + C_{tr}$ not less than 40 if they pass through a habitable room (other than a kitchen) or an $R_w + C_{tr}$ not less than 25 if they pass through a kitchen or a non-habitable room.

Ceilings

The appropriate treatments for concealment of hydraulic services are presented in **Table 12**. This applies if a service riser is to be shared between adjacent apartments. Where services risers will not be shared by adjacent apartments, this section may not be applicable.

Table 12 Services inside buildings

Schematic Services Concealment Treatment	Ceiling Lining	Insulation	Pipe Lagging	Max No. of Downlights per 5m ²	R _w + C _{tr}
	1 layer of 13 mm fire rated plasterboard	Min 75 mm thick glass wool batts, min density 14 kg/m ³ . Installed to a min distance of 1200 mm either side of pipe.	Min 25 mm glass wool or foam bonded to a loaded vinyl noise barrier layer (min mass per unit area of 4.5 kg/m ² , Pyrotek 4525C or equivalent).	5	≥40 (Habitable Rooms)
	1 layer of 13 mm fire rated plasterboard	N/A	N/A	2	≥25 (Non-Habitable Rooms)

All pipes should be secured in cavities, voids or service risers using resilient pipe clip connections which incorporate an isolating rubber or neoprene collar, to avoid introducing pipe-borne noise into the surrounding structural elements.

Furthermore, all pipe runs connected to hydraulic circulation pumps or similar plant equipment must be connected via flexible couplings to avoid the introduction of structure borne noise through rigid connections.

All pipes should be secured in cavities, voids or service risers using resilient pipe clip connections which incorporate an isolating rubber or neoprene collar, to avoid introducing pipe-borne noise into the surrounding structural elements.

ACA recommends all pipe runs connected to hydraulic circulation pumps or similar plant equipment must be connected via flexible couplings to avoid the introduction of structure borne noise through rigid connections.

5.4.3. Hydraulic Services

Location

Where practicable, pipe systems should be routed away from noise sensitive areas to minimise penetrations in acoustically rated walls and minimise noise impacts.

Pipe system layouts should minimise the number of turns. The internal cross-sectional area throughout each bend should be maintained either through a suitable pipe bending technique (e.g. mandrel bending instead of ram bending) or inserted junction.

Vibration Isolation

All piping (including internal soil, waste and stormwater pipes) must be isolated at each support point to prevent vibration energy transfer into the building structure or between noise sensitive areas. There must be no rigid contact between the pipe and building structure and a 20 mm clearance is recommended. Isolation elements manufactured from neoprene rubber, closed-cell foam at least 6 mm thick or commercial pipe isolation products such as Unistrut 'Unicushion' will suffice.

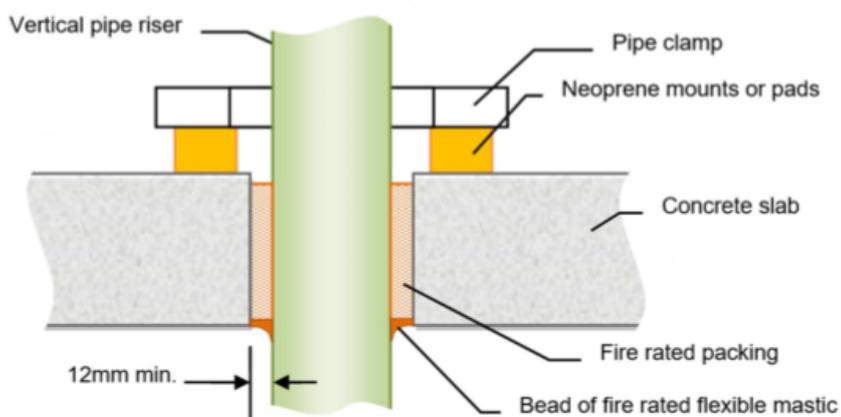
Penetrations

Pipe penetrations through all vertical and horizontal building elements must employ acoustic isolation treatments to prevent contact between the pipe and the structure and hence provide vibration isolation. More effective sealing is obtained in practice where the pipe axis throughout the penetration is perpendicular to the building element.

Provide a minimum 12 mm clearance around the pipe for all penetrations, and pack with acoustic insulation as required. Vertical riser pipes should employ pipe clamps which rest on neoprene pads or mounts. In acoustically rated partitions, the seal around the pipe must be airtight.

Figure 8 presents an example of a floor penetration using the above principles. Major drywall manufacturers provide additional in-principle examples of achieving appropriate acoustic and fire rated seals around penetrations.

Figure 8 Vertical pipe penetration detail





Water Flow Rates

Relocate major control valves to less-sensitive areas where practicable. Reduce flow velocities to less than 2.5 m/s in general areas and less than 1 m/s in critical spaces through increasing the size of the internal pipe diameter.

Actions to avoid and minimise water hammer must be addressed in the hydraulics specification. Water hammer may be controlled through use of confined air arrestors mounted to the outlet side of valves that quickly close.

5.4.4. Electrical Outlets and Services

Electrical services drawings have been reviewed to confirm the following:

- Electrical outlets are offset at least 100 mm for masonry walls;
- Distribution boards are not placed so as to compromise the performance over acoustically rated walls (e.g. party or corridor walls); and
- Light fittings do not compromise the performance of recessed ceilings or bulkheads where hydraulic services are to be installed.

5.4.5. Mechanical Services

Internal Services

Noise from internal mechanical services such as fan coil units (air conditioning), toilet exhaust fans must meet internal noise criteria set out in **Section 3.2**.

A/C units

External units will be assessed (**Section 6**) to meet the environmental noise regulations.

Where internal FCU units are required, FCUs should be located above living and open-plan spaces wherever possible. If an FCU is located above bedrooms, then this should be enclosed with plasterboard layers and insulation within. The return path must be ducted and lined to minimise excessive breakout.

Toilet Exhaust Fans

Fans must be concealed within non-habitable areas' ceiling voids, fitted with anti-vibration mounts and, subject to detailed review, wrapped with mass loaded vinyl to avoid breakout noise. Access panels must be acoustically rated.

External Services

Noise from external mechanical services such as air conditioning, fans, car park ventilation fans and services linked to the commercial units on ground floor must meet the WA Environmental Protection (Noise) Regulations 1997 (**Section 6**).

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External air conditioning condensing units will be installed for each apartment (one per apartment). These units would connect to internal FCUs via penetration of the external walls for the refrigerant pipe to reach the internal units. The penetrations must be treated and filled with acoustic/fire rated mastic or fire rated pillows to minimise flanking paths for external noise.

Anti-vibration mounts are recommended to minimise structure-borne noise within the apartments (for example, Embelton NR1 mechanical isolation rubber mount).

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REF *Report 10.00389R-02*



6. ENVIRONMENTAL NOISE ASSESSMENT

6.1. Assessment

The noise sources linked to the development, including all the residential and commercial units have been assessed against the environmental noise criteria at the nearest residential receivers, as described in **Section 3.4**. This includes assessment of all the air conditioning units, noise from typical operations of a café and the associated mechanical plant. It is noted that Apartment 1 of this development has been considered the nearest noise sensitive receiver to the café.

While the tenant/operator of the café and detailed fitout of the premises are yet to be defined upon finishing construction of the building. This assessment considers generic crowd noise from 20 patrons eating and chatting at a café during an early morning and the noise from beverage/food preparation.

Due to close distance between the proposed café seating bar/window to the windows of Bedroom 4 of Apartment 1, two scenarios have been considered for the café operations:

1. Window closed. This scenario has been identified as the potential management noise control to mitigate impacts on the new proposed residential apartments.
2. Window open. This represents the overall intention of operations for a typical café.

Description of Noise Sources:

- Five residential air conditioning units located on the roof of the building and one in the car park linked to the proposed café are being proposed.
- Café operations have been calculated using the Rindel formula for internal crowd noise considering 20 patrons with conversation voice within a reverberant field using a reverberation time of 0.7 seconds. This would require that the internal ceiling of the café would require absorptive panels or, as recommended, perforated plasterboard with a minimum 200 mm plenum and 50 mm of insulation above. The sound transmission loss of 10.38mm laminated glass window and door elements have been used to estimate the breakout noise from the café facades, following standard BS EN ISO 123544:2000.
- Sound power levels for the external air conditioning unit – Sound Power Levels: SWL = 65 dBA. These sound power levels have been elevated to 70 dBA to allow for 5 dB tonality adjustment, in line with the EPNR noise character adjustments (**Section 3.4**).

After consideration of the above, predictions were carried out with SoundPLAN Essential V5.1 software including all the identified noise sources. **Figures 9** and **10** show the location of noise sources and receiver locations, extracted from the SoundPLAN noise model setup.

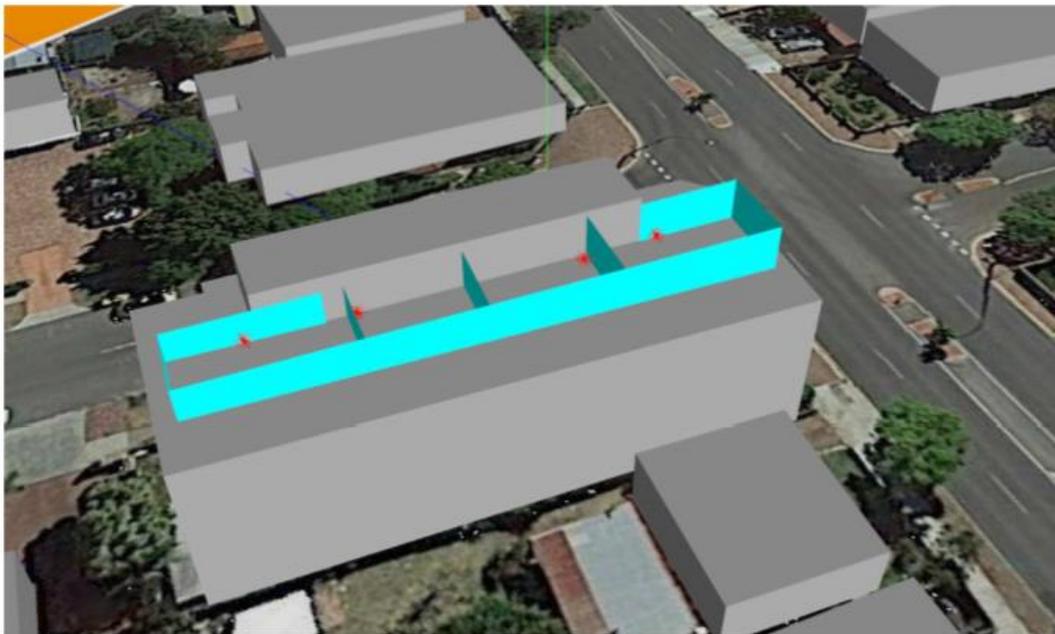


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Figure 9 Noise model setup – Café facades noise sources in red



Figure 10 Noise model setup – Air conditioning units on the rooftop





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6.2. Noise Modelling Results and Assessment

Noise contours have been generated for the assessment scenarios and these are attached in **Appendix E**. The predicted noise levels (L_{A10}) at the nearest receiver locations are presented below:

Table 13 Noise predictions at sensitive receivers and assessment

Scenario	Receiver	Predicted Noise Level – L_{A10} (dB)	Most Stringent Assigned Noise Level – L_{A10} (dB)	Margin / Comment
1 – Café Window Closed	5 Broome St	19	43	-24 dB / Complies
	355 Lord St	21		-22 dB / Complies
	356 Lord St	20		-23 dB / Complies
	360 Lord St	22		-21 dB / Complies
	Apartment 1 / 357 Lord St (1 st floor)	29		-14 dB / Complies
2 – Café Window Open	5 Broome St	20		-23 dB / Complies
	355 Lord St	40		-3 dB / Complies
	356 Lord St	43		0 dB / Complies
	360 Lord St	41		-2 dB / Complies
	Apartment 1 / 357 Lord St (1 st floor)	54		+11 / Exceedance

Notes: Predictions include +5 dB tonality penalty applied to mechanical plant

6.3. Discussion and Recommendations

The noise assessment suggests that the when the café operates with window and door closed, the assigned noise levels would be met at all times. When considering the worst-case operational scenario of window and door open, the following recommendations apply:

1. The Café internal ceiling (90% coverage) is fitted with absorptive panels or perforated plasterboard with a minimum 200mm plenum and 50mm insulation above.
2. Early morning operations of the Café (i.e. before 7am Monday to Saturday or 9am on Sundays and Public Holidays) shall be conducted with the Café window closed and patrons shall be encouraged to sit inside, to minimise potential impacts to Apartment 1 within the same building development.
3. The Café façade/windows shall use 10.38mm laminated glass. The proposed front glass door and bifold window are to be sealed with perimeter and drop seals to minimise noise breakout

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while the café door and window are kept closed. Additional recommendations are provided in the markups in **Appendix D**.

4. Kitchen extraction fan and other café related mechanical plant shall be designed to minimise noise emissions to the environment. Wrapped and internally lined ducted systems shall be used and the quietest available system shall be selected. Exhausts are to be aimed at the building car park and not directly to Lord St or Broome St.
5. Air conditioning units shall be installed with approved vibration isolation systems and care should be taken to avoid bridging the A/C conditioning units' bolts with the installation brackets (or the floor).

When the recommendations above are thoroughly implemented in the building and future management of the development, the noise emissions from the proposed development are expected to meet the assigned noise levels of the EPNR.

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**Statement of Prediction Uncertainty**

The typical uncertainty of measurements in L_{Aeq} for the testing described in the previous sections is estimated as being U_{95} 3 dB according to the methods listed within the ISO Guide to Uncertainty of Measurement with empirical data obtained from published sources¹. This infers that the true value for such a scenario is expected to lie within a +/- 3 dB range for 95 out of 100 observations.

¹ Craven, N.J., Kerry, G., 2007, A Good Practice Guide on the Sources and Magnitude of Uncertainty Arising in the Practical Measurement of Environmental Noise, University of Salford, Edition 1a, Salford UK.

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APPENDIX A: GLOSSARY



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1 Sound Level or Noise Level

Sound consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. Noise is often used to refer to unwanted sound.

The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable range by using logarithms.

The symbols SPL, L or L_p are commonly used to represent Sound Pressure Level.

The symbol L_A represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10⁻⁵ Pa.

2 "A" Weighted Sound Levels

The overall level of a sound is usually expressed in terms of dB(A), which is measured using a sound level meter with an "A-weighting" filter. This is an electronic filter with a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dB(A) is a good measure of the loudness of that sound. Different sources having the same dB(A) level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB(A) change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels:

Typical noise levels and subjective scale

Sound Pressure Level dB(A)	Noise Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely loud
110	Grinding on steel	
100	Loud car horn at 3 m	Very loud
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (e.g. B, C and D) are less commonly used than A-weighting in environmental acoustics. Sound Levels measured without any weighting are referred to as "linear" and the units are expressed as dB(Lin) or dB.

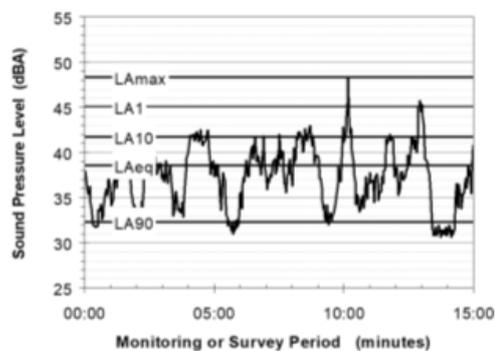
3 Sound Power Level

The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units, and these may be identified by the symbols SWL or L_w . The Sound Power definitions expressed in dB are typically referenced to the acoustic energy unit 10^{-12} W.

4 Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels L_{AN} , where L_{AN} is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time.

The following figure presents a hypothetical 15-minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

- L_{A1} The noise level exceeded for 1% of the 15 minute interval.
- L_{A10} The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
- L_{A90} The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
- L_{Aeq} The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. Standardised methods are available for determining these representative levels. Different jurisdictions would choose to define their own preferred Standard.

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APPENDIX B: NOISE EXPOSURE

Table 2 of The SPP5.4 Implementation Guidelines.

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APPENDIX C: TITLE NOTIFICATION

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A Notification, pursuant to Section 165 of the Planning and Development Act 2005 is to be placed on the Certificate(s) of Title of the proposed lot(s) / subject lot(s) [DELETE AS APPLICABLE]. Notice of this Notification is to be included on the diagram or plan of survey (Deposited Plan).

The Notification is to state as follows:

'This lot is in the vicinity of a transport corridor and is affected, or may in the future be affected, by road and rail transport noise. Road and rail transport noise levels may rise or fall over time depending on the type and volume of traffic.'

(Western Australian Planning Commission)

For development approvals, local governments use Section 70A of the Transfer of Land Act 1893. It is strongly encouraged that proponents make prospective purchasers aware of the existence of the Notifications on Title on affected lots, such as through Contracts of Sale.

Prospective purchasers of land/lots/dwellings located within the area to which the policy applies may wish to contact the relevant local government for further advice.

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APPENDIX D: MARK UPS

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REF Report 10.00389R-02



ACOUSTIC MARK UPS
TRAFFIC NOISE INSULATION RECOMMENDATIONS - 13/01/2022

NOTES:

1) Windows and Doors:

To comply with the ratings provided in this table, all external glass windows and doors specified must:

- Have a seal to restrict air infiltration fitted to each edge of an operable window;
- within doors or fixed framing, glazing must be set and sealed using an airtight arrangement of non-hardening sealant, soft rubber (elastomer) gasket and / or or glazing tape, or be verified by manufacturer or otherwise approved person that the construction system as to be installed complies with the relevant R_w+C_{tr} value as per the SPP5.4 Implementation Guidelines; and
- All external doors must have compressible silicon based rubber seals to the full perimeter and/or a drop seal to provide an airtight seal when closed.

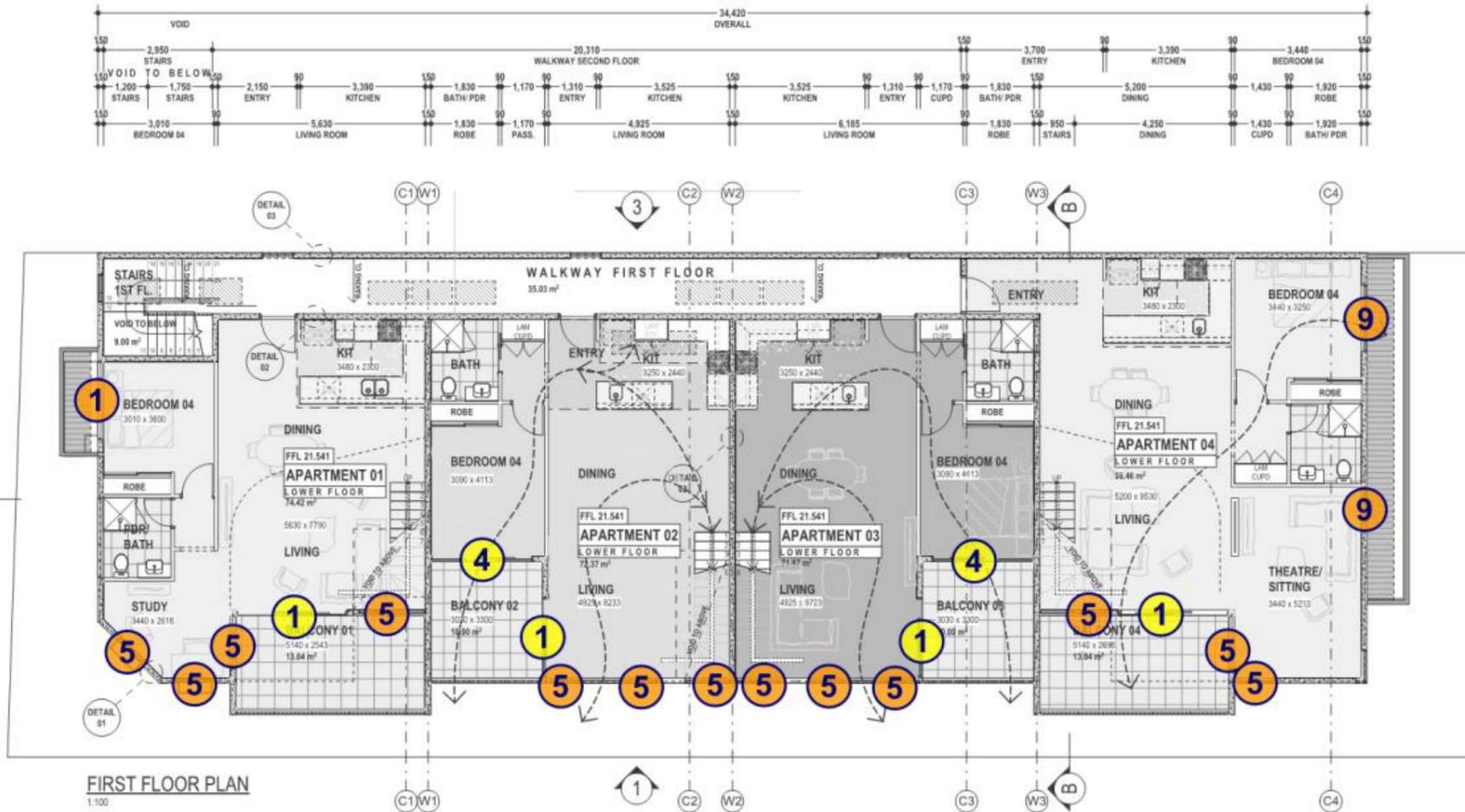
2) Mechanical Ventilation

- Mechanical ventilation systems will comply with AS 1668.2 – The use of mechanical ventilation and air-conditioning in buildings.

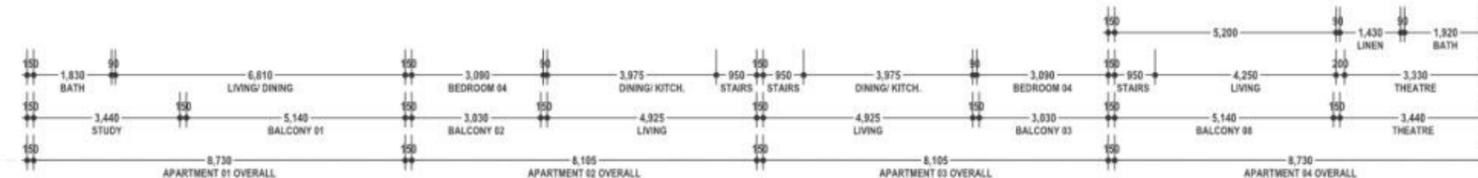
- Fresh intake and relief air paths will need to be fully ducted to allow windows to be closed, and be located at positions furthest from the traffic noise sources where practicable.

Natural Ventilation:
Apartments 01, 02, 03 and 04 have natural cross ventilation.

Orientation
Apartments 01, 02, 03 and 04 have Northern orientation to maximise daylight and solar aspect as well as having optimum relationship with the public realm



FIRST FLOOR PLAN
1:100



Legend (Section 5 of the Report):

- 1 6.5 mm VLam Hush
- 2 8.5 mm VLam Hush
- 3 10.5 mm VLam Hush
- 4 12.5 mm VLam Hush
- 5 6.38mm laminated
- 6 8.38mm laminated
- 7 10.38mm laminated
- 8 4mm float glass
- 9 6mm float glass
- 10 8mm float glass
- Sliding
- Fixed Sash / Awning or Casement type only
- 40mm solid core door and certified frame with seals (10.38mm lam)
- 35mm solid core door and certified frame with seals (6.38mm lam)
- Metal sheet roof, 10mm fire rated plasterboard, 88mm R2.5 New Generation Soundscreen insulation
- Metal sheet roof, 13mm fire rated plasterboard ceiling, 88mm R2.5 New Generation Soundscreen insulation
- Metal sheet roof, 2 x 13mm fire rated plasterboard ceiling, 1 x 66mm Anticon 55 R1.3 Insulation, 1 x 88mm R2.5 New Generation Soundscreen insulation, on solid joist with rubber isolation clip

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 4 OF 17
06 DEC. 2021





ACOUSTIC MARK UPS
TRAFFIC NOISE INSULATION RECOMMENDATIONS - 13/01/2022

NOTES:

1) Windows and Doors:

To comply with the ratings provided in this table, all external glass windows and doors specified must:

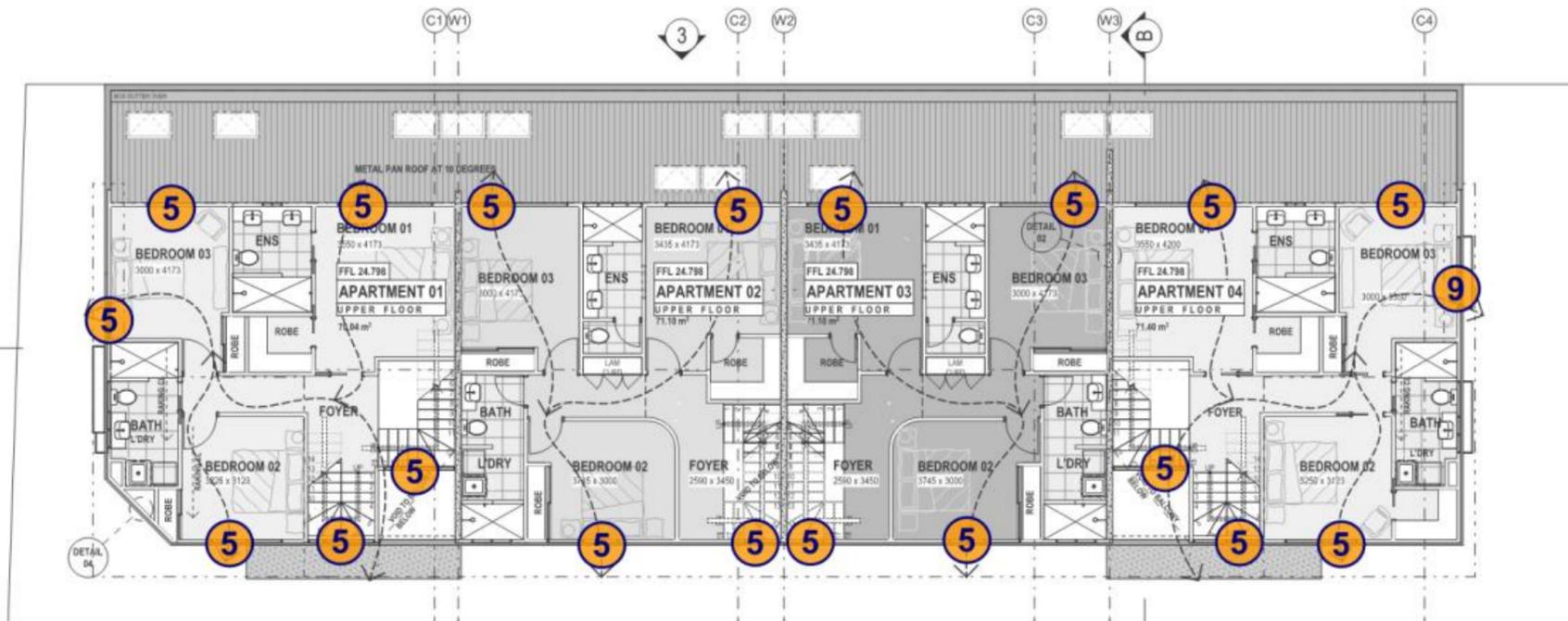
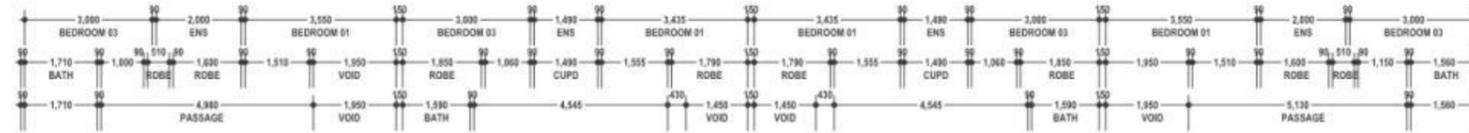
- Have a seal to restrict air infiltration fitted to each edge of an operable window;
- within doors or fixed framing, glazing must be set and sealed using an airtight arrangement of non-hardening sealant, soft rubber (elastomer) gasket and / or glazing tape, or be verified by manufacturer or otherwise approved person that the construction system as to be installed complies with the relevant R_w+C_{tr} value as per the SPP5.4 Implementation Guidelines; and
- All external doors must have compressible silicon based rubber seals to the full perimeter and/or a drop seal to provide an airtight seal when closed.

2) Mechanical Ventilation

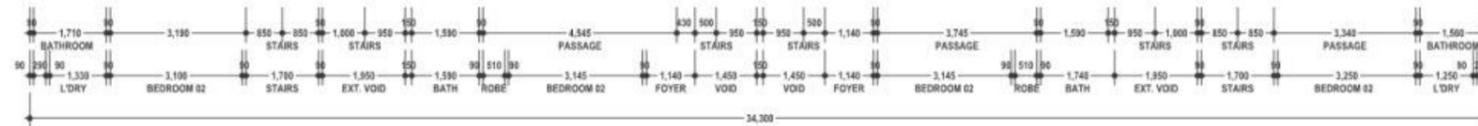
- Mechanical ventilation systems will comply with AS 1668.2 – The use of mechanical ventilation and air-conditioning in buildings.
- Fresh intake and relief air paths will need to be fully ducted to allow windows to be closed, and be located at positions furthest from the traffic noise sources where practicable.

Natural Ventilation:
Apartments 01, 02, 03 and 04 have natural cross ventilation.

Orientation
Apartments 01, 02, 03 and 04 have Northern orientation to maximise daylight and solar aspect as well as having optimum relationship with the public realm



SECOND FLOOR PLAN
1:100

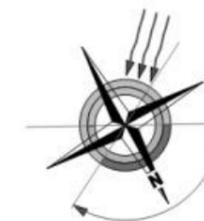


Legend (Section 5 of the Report):

- 1 6.5 mm VLam Hush
- 2 8.5 mm VLam Hush
- 3 10.5 mm VLam Hush
- 4 12.5 mm VLam Hush
- 5 6.38mm laminated
- 6 8.38mm laminated
- 7 10.38mm laminated
- 8 4mm float glass
- 9 6mm float glass
- 10 8mm float glass
- Sliding
- Fixed Sash / Awning or Casement type only
- 40mm solid core door and certified frame with seals (10.38mm lam)
- 35mm solid core door and certified frame with seals (6.38mm lam)
- Metal sheet roof, 10mm fire rated plasterboard, 88mm R2.5 New Generation Soundscreen insulation
- Metal sheet roof, 13mm fire rated plasterboard ceiling, 88mm R2.5 New Generation Soundscreen insulation
- Metal sheet roof, 2 x 13mm fire rated plasterboard ceiling, 1 x 66mm Anticon 55 R1.3 Insulation, 1 x 88mm R2.5 New Generation Soundscreen insulation, on solid joist with rubber isolation clip

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 5 OF 17
06 DEC. 2021





ACOUSTIC MARK UPS
TRAFFIC NOISE INSULATION RECOMMENDATIONS - 13/01/2022

NOTES:

1) Windows and Doors:

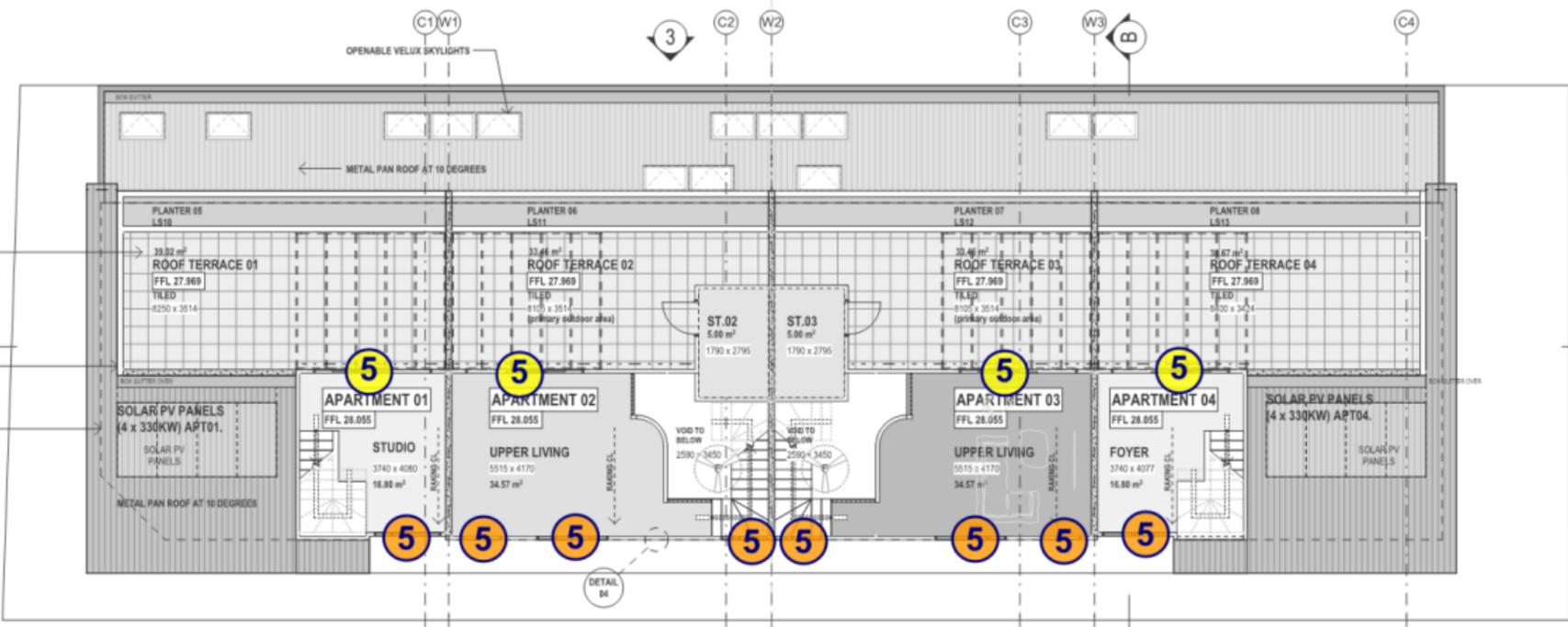
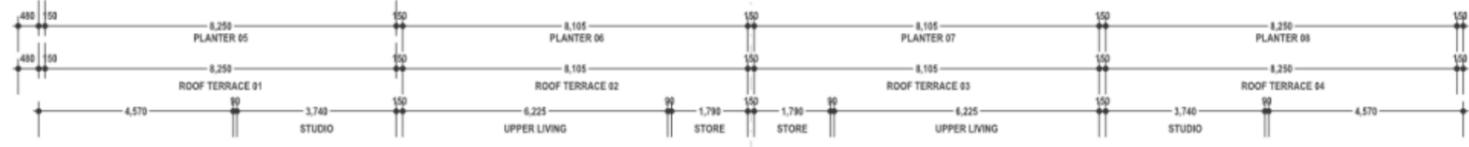
To comply with the ratings provided in this table, all external glass windows and doors specified must:

- Have a seal to restrict air infiltration fitted to each edge of an operable window;
- within doors or fixed framing, glazing must be set and sealed using an airtight arrangement of non-hardening sealant, soft rubber (elastomer) gasket and / or or glazing tape, or be verified by manufacturer or otherwise approved person that the construction system as to be installed complies with the relevant R_w+C_{tr} value as per the SPP5.4 Implementation Guidelines; and
- All external doors must have compressible silicon based rubber seals to the full perimeter and/or a drop seal to provide an airtight seal when closed.

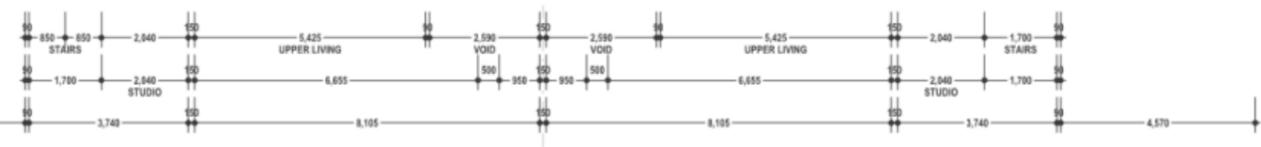
2) Mechanical Ventilation

- Mechanical ventilation systems will comply with AS 1668.2 – The use of mechanical ventilation and air-conditioning in buildings.
- Fresh intake and relief air paths will need to be fully ducted to allow windows to be closed, and be located at positions furthest from the traffic noise sources where practicable.

10' 750'
3.314'



ROOF TERRACE PLAN
1:100



Legend (Section 5 of the Report):

- 1 6.5 mm VLam Hush
- 2 8.5 mm VLam Hush
- 3 10.5 mm VLam Hush
- 4 12.5 mm VLam Hush
- 5 6.38mm laminated
- 6 8.38mm laminated
- 7 10.38mm laminated
- 8 4mm float glass
- 9 6mm float glass
- 10 8mm float glass
- Sliding
- Fixed Sash / Awning or Casement type only
- 40mm solid core door and certified frame with seals (10.38mm lam)
- 35mm solid core door and certified frame with seals (6.38mm lam)
- Metal sheet roof, 10mm fire rated plasterboard, 88mm R2.5 New Generation Soundscreen insulation
- Metal sheet roof, 13mm fire rated plasterboard ceiling, 88mm R2.5 New Generation Soundscreen insulation
- Metal sheet roof, 2 x 13mm fire rated plasterboard ceiling, 1 x 66mm Anticon 55 R1.3 Insulation, 1 x 88mm R2.5 New Generation Soundscreen insulation, on solid joist with rubber isolation clip

Solar Panels:
Each apartment has their own solar panels.
Refer to notes on roof for specific amounts

PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE

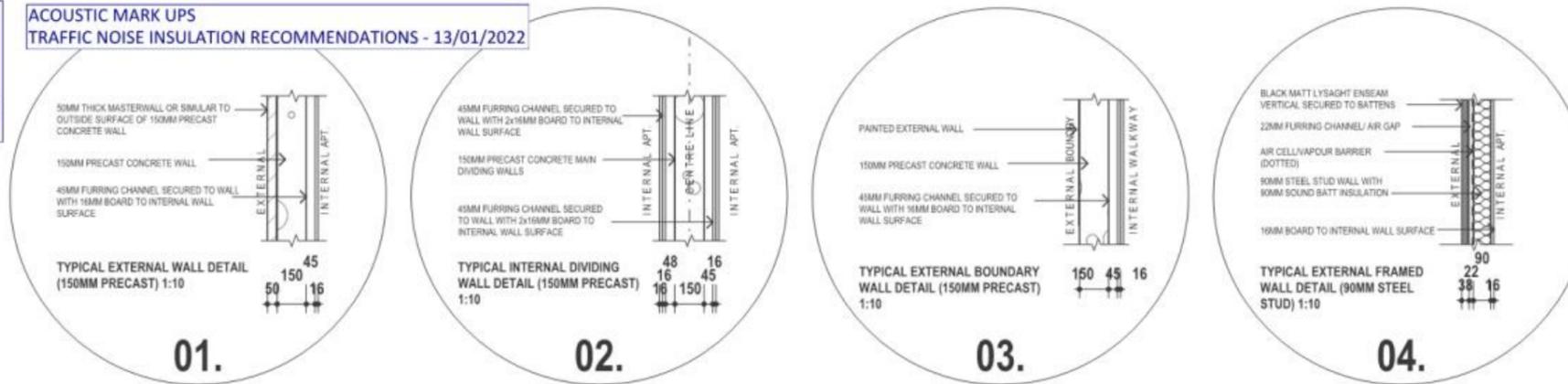


SHEET 6 OF 17
06 DEC. 2021

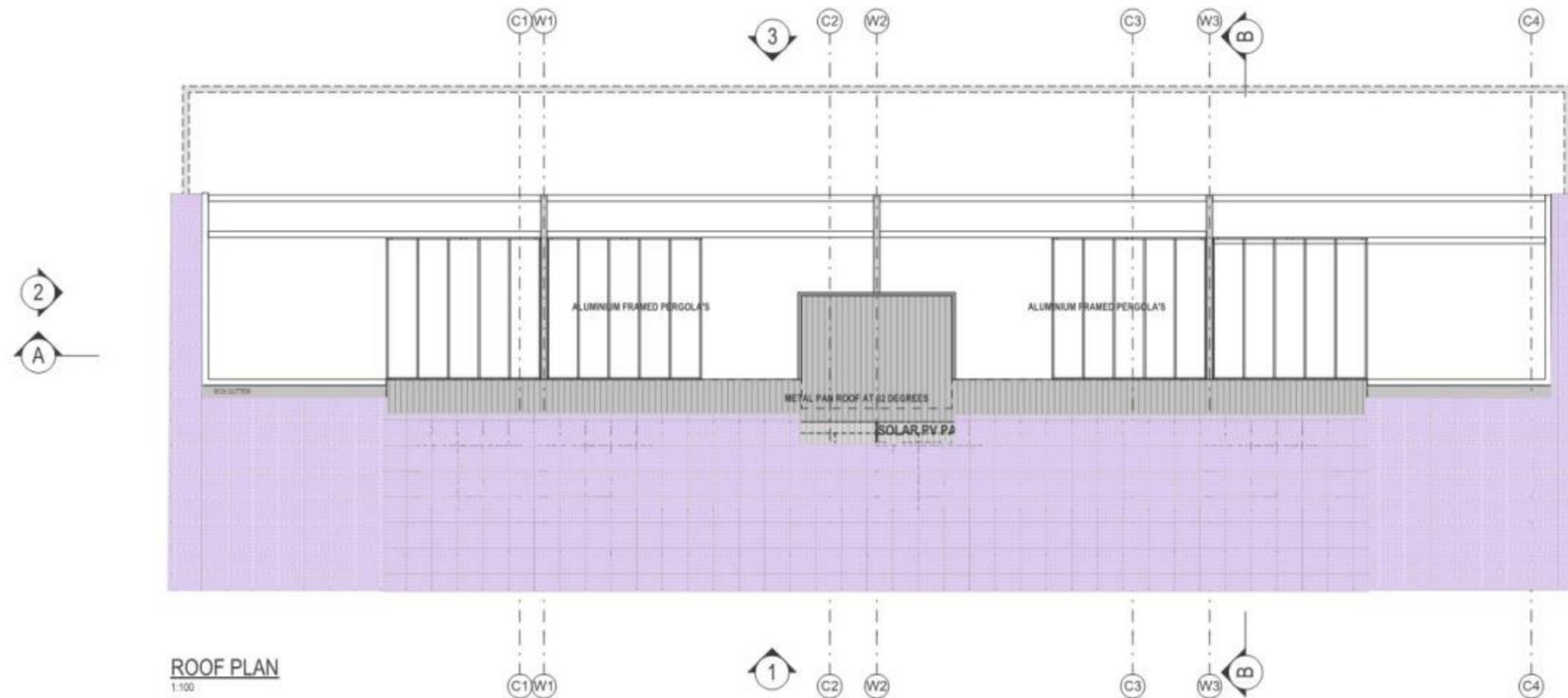




ACOUSTIC MARK UPS
TRAFFIC NOISE INSULATION RECOMMENDATIONS - 13/01/2022



NOTE: ALSO TYPICAL DETAIL FOR WALKWAY/ APARTMENT DIVIDING WALL



Legend (Section 5 of the Report):

1	6.5 mm VLam Hush
2	8.5 mm VLam Hush
3	10.5 mm VLam Hush
4	12.5 mm VLam Hush
5	6.38mm laminated
6	8.38mm laminated
7	10.38mm laminated
8	4mm float glass
9	6mm float glass
10	8mm float glass
(Yellow circle)	Sliding
(Orange circle)	Fixed Sash / Awning or Casement type only
(Cyan circle)	40mm solid core door and certified frame with seals (10.38mm lam)
(Grey circle)	35mm solid core door and certified frame with seals (6.38mm lam)
(Green square)	Metal sheet roof, 10mm fire rated plasterboard, 88mm R2.5 New Generation Soundscreen insulation
(Purple square)	Metal sheet roof, 13mm fire rated plasterboard ceiling, 88mm R2.5 New Generation Soundscreen insulation
(Red square)	Metal sheet roof, 2 x 13mm fire rated plasterboard ceiling, 1 x 66mm Anticon 55 R1.3 Insulation, 1 x 88mm R2.5 New Generation Soundscreen insulation, on solid joist with rubber isolation clip

PROPOSED APARTMENTS
357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 7 OF 17
06 DEC. 2021



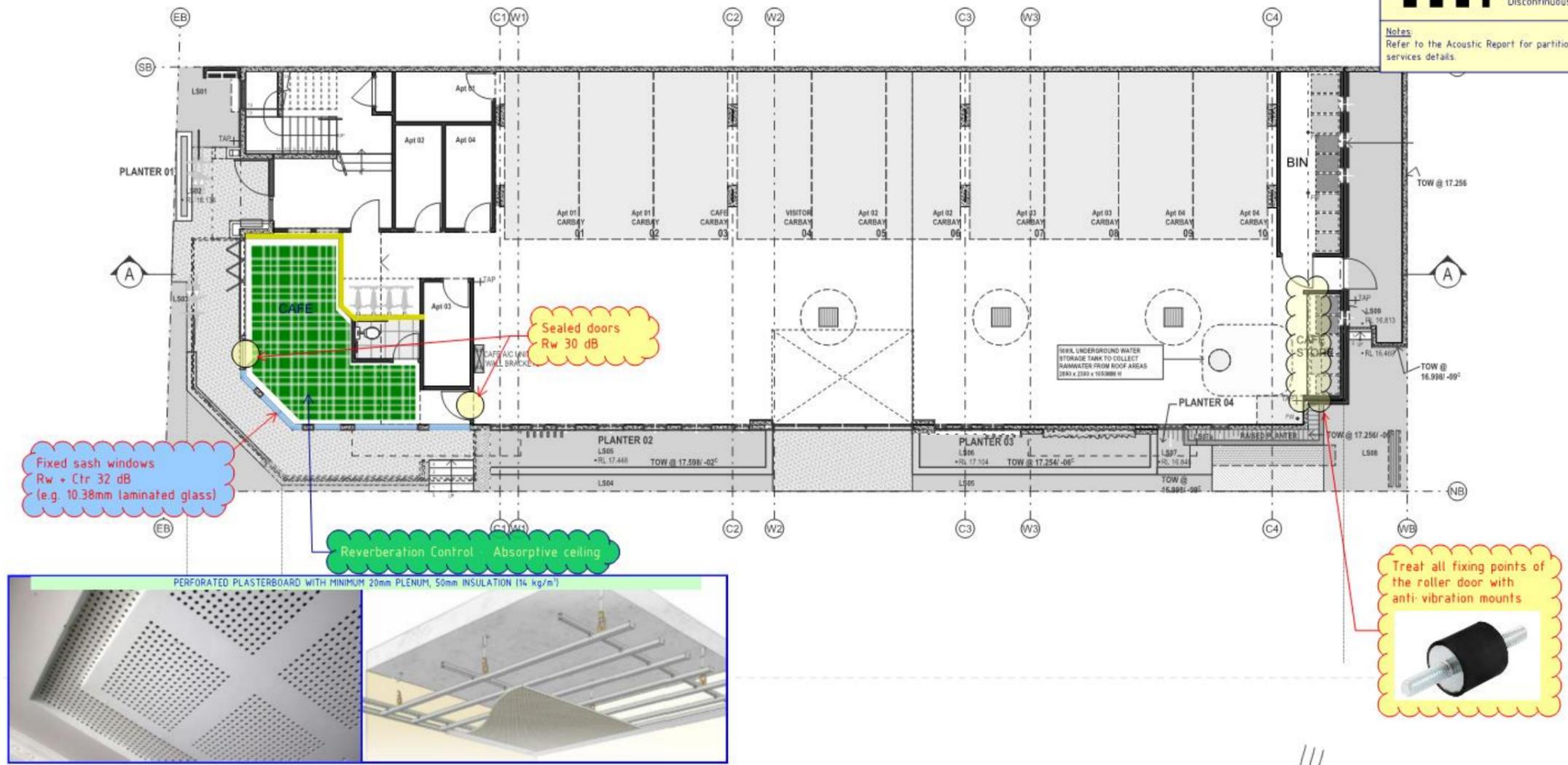
ACOUSTIC MARKUPS
SOUND INSULATION REQUIREMENTS
 Project: 357 Lord St, Highgate
 Project No.: 10_00389
 Consultant: MdM
 Date: 30/06/2022



PARTITION SOUND ISOLATION PERFORMANCE

	Wall Rw 30 dB
	Wall Rw 40 dB
	Wall Rw 45 dB
	Wall Rw 50 dB
	Wall Rw 55 dB
	Wall Rw 60 dB
	Discontinuous Construction

Notes:
 Refer to the Acoustic Report for partition construction and services details.



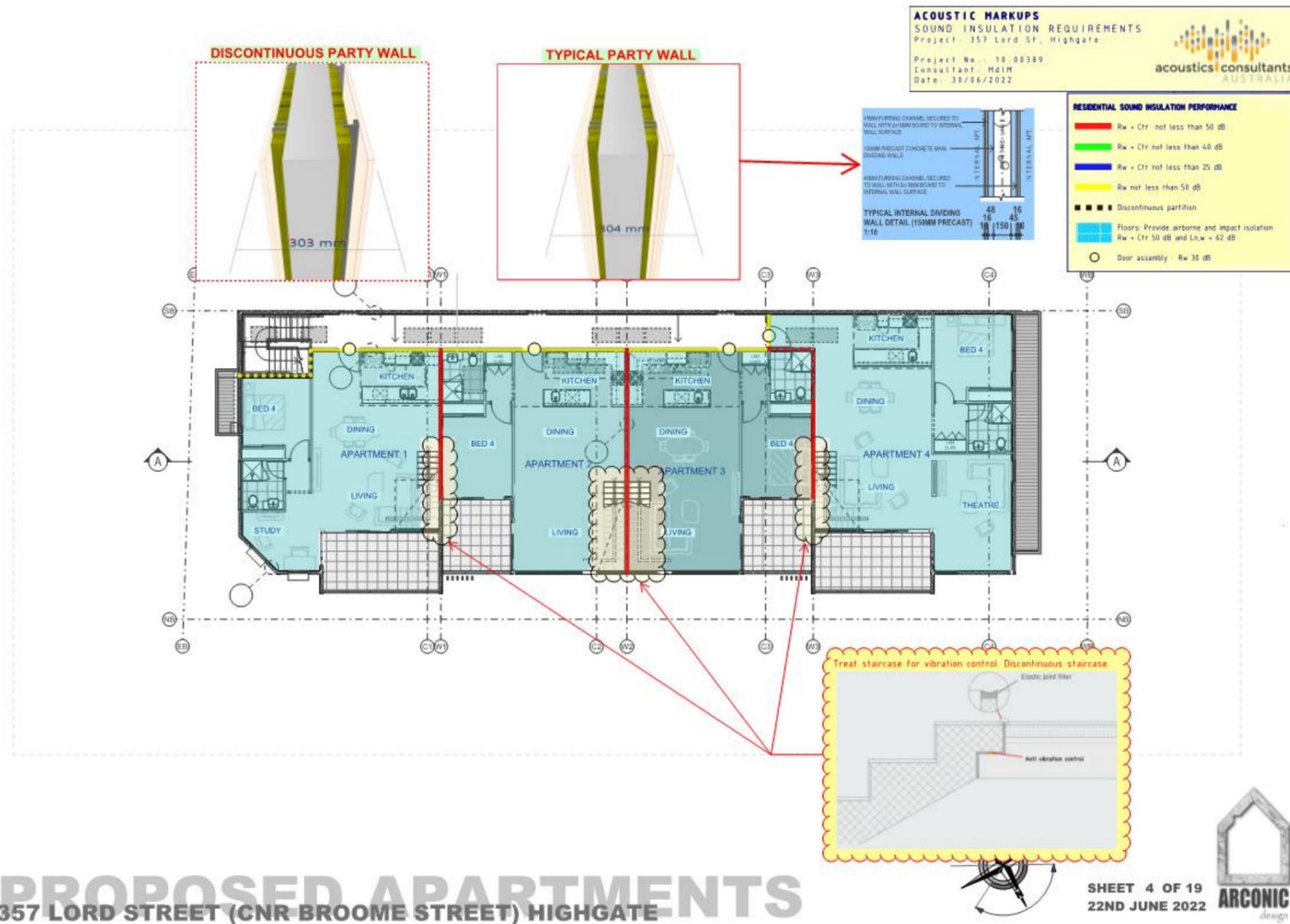
PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 3 OF 19
 22ND JUNE 2022



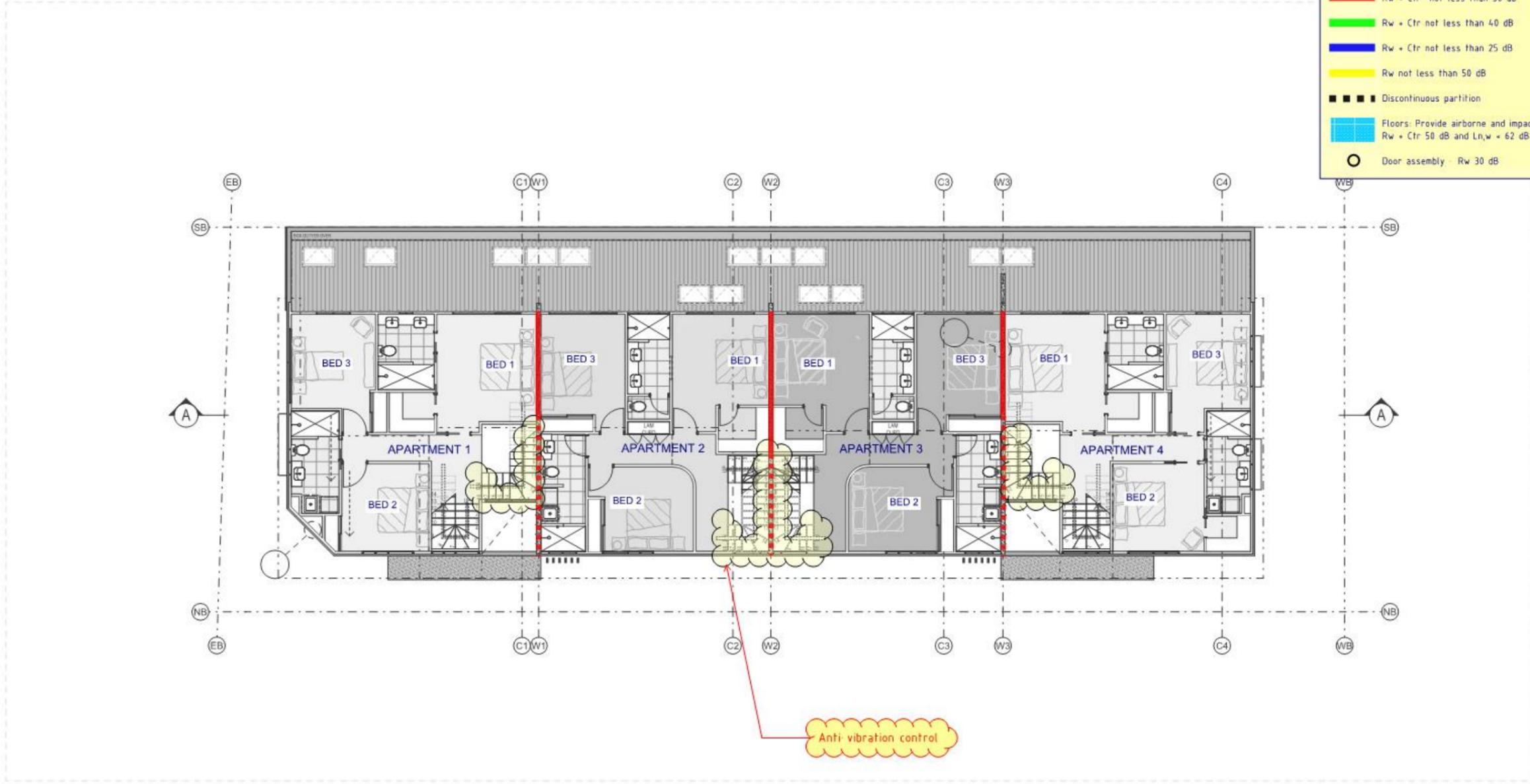


ACOUSTIC MARKUPS
SOUND INSULATION REQUIREMENTS
 Project: 357 Lord St, Highgate
 Project No.: 10_00389
 Consultant: MdM
 Date: 30/06/2022



RESIDENTIAL SOUND INSULATION PERFORMANCE

- █ $R_w + C_{tr}$ not less than 50 dB
- █ $R_w + C_{tr}$ not less than 40 dB
- █ $R_w + C_{tr}$ not less than 25 dB
- █ R_w not less than 50 dB
- █ Discontinuous partition
- █ Floors: Provide airborne and impact isolation
 $R_w + C_{tr}$ 50 dB and $L_{n,w}$ 62 dB
- Door assembly - R_w 30 dB



PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 5 OF 19
 22ND JUNE 2022

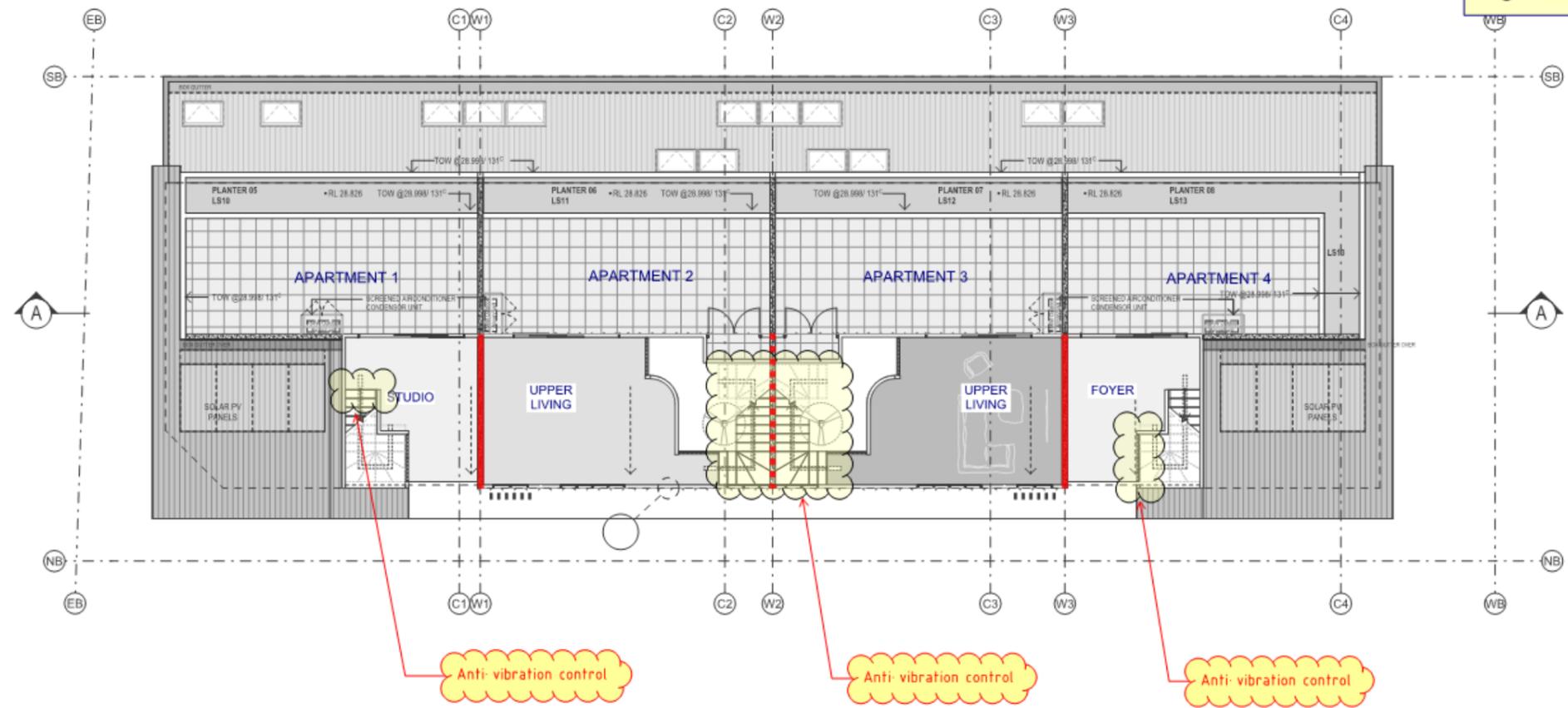


ACOUSTIC MARKUPS
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 Project: 357 Lord St, Highgate
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RESIDENTIAL SOUND INSULATION PERFORMANCE

- $R_w + C_{tr}$ not less than 50 dB
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- $R_w + C_{tr}$ not less than 25 dB
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- Discontinuous partition
- Floors: Provide airborne and impact isolation
 $R_w + C_{tr}$ 50 dB and $L_{n,w}$ 62 dB
- Door assembly - R_w 30 dB



PROPOSED APARTMENTS

357 LORD STREET (CNR BROOME STREET) HIGHGATE



SHEET 6 OF 19
 22ND JUNE 2022



RESIDENTIAL DEVELOPMENT 357 LORD STREET, HIGHGATE
ACOUSTIC ASSESSMENT

acoustics consultants
AUSTRALIA

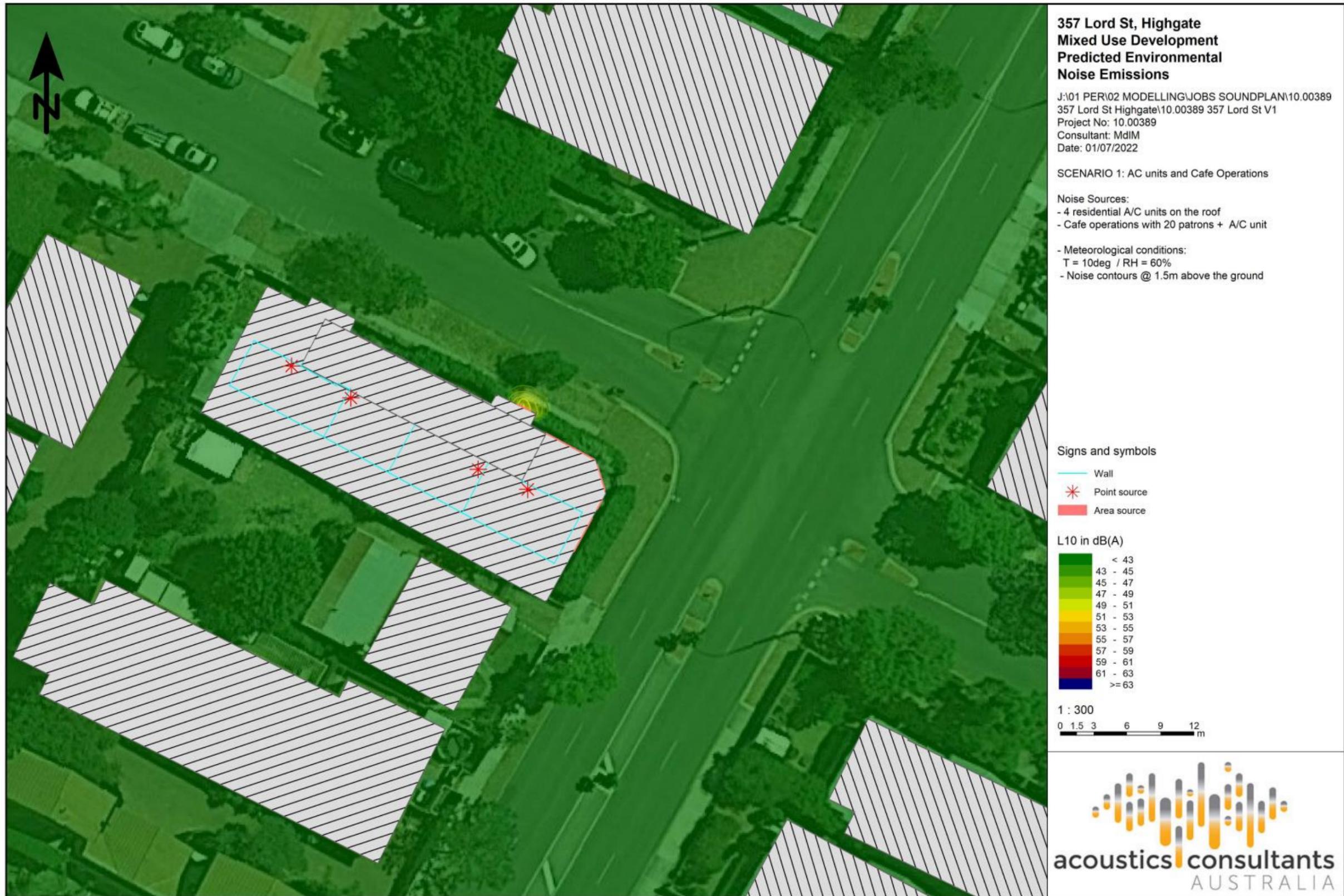


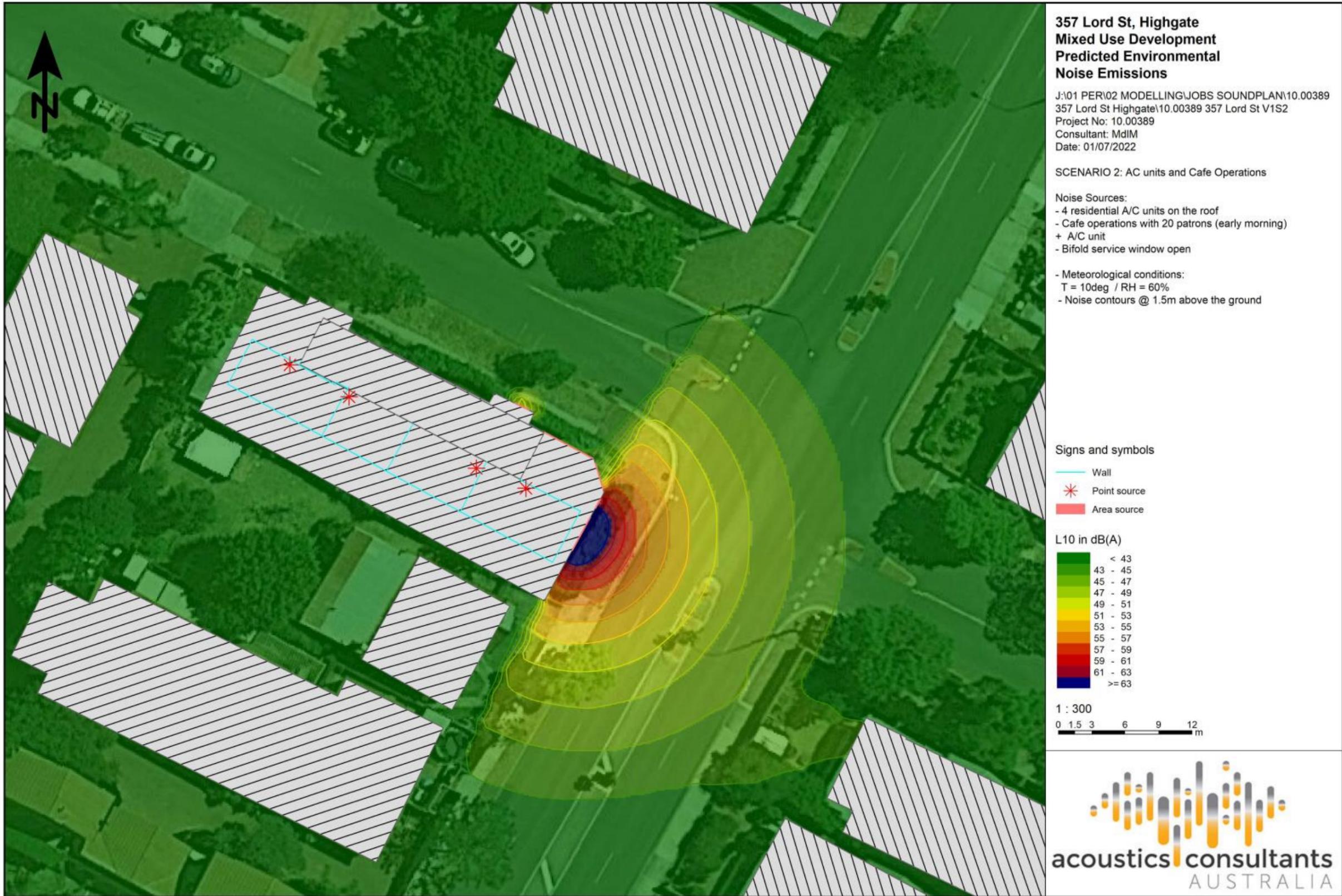
APPENDIX E: NOISE PREDICTION CONTOURS

52

PHONE (08) 6186 4122 EMAIL perth@acousticsconsultants.com.au
ADDRESS PO BOX 1537 ▶ East Victoria Park, WA 6981

REF Report 10.00389R-02





CITY OF VINCENT
RECEIVED
8 February 2022

**LBS REFERENCE NUMBER**

LBS_12634

DATE

2/02/2022

SUSTAINABLE DESIGN ASSESSMENT**PROJECT NAME**

Proposed Mixed-use Development

PROJECT ADDRESS

357 Lord Street, Highgate WA 6003

BUILDING CLASS

2 | 6

CLIMATE ZONE

5

REPORT COMMISSIONED BY

Arconic Design

ON BEHALF OF

Daniel Jovanovic

CLIENT REFERENCE NUMBER

-

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DOCUMENT CONTROL

Revision	Date	Description	Author	Reviewed
V1.0	25 th January 2022	For Review	JM	NG
V1.1	2 nd February 2022	For Submission	JM	NG



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1.0 INTRODUCTION

The City of Vincent requires all applications for residential (including single houses, grouped dwellings and apartments), mixed use and commercial developments to achieve the Environmentally Sustainable Design (ESD) objectives and performance standards of Policy No7.1.1 – Built Form.

Living Building Solutions (LBS) has developed a Sustainable Design Assessment (SDA) to assess the proposed development against the objectives and performance standards of Policy No7.1.1 – Built Form - 1.8 Environmentally Sustainable Design. The SDA will also consider whole of life environmental impact by assessing the proposed development against the following key categories:

Indoor Environment Quality

Transport

Energy Efficiency

Waste Management

Water Efficiency

Urban Ecology

Stormwater Management

Innovation

Building Materials

Construction & Building Management

KEY OUTCOMES

Class 2

- 50% reduction in global warming potential when compared against Code-Compliant design; and
- 50% reduction in net freshwater use when compared against Code-Compliant Design

Class 6

- 30% reduction in global warming potential when compared against Code-Compliant design; and
- 25% reduction in net freshwater use when compared against Code-Compliant Design

ESD ASSESSMENT TOOLS

There are a variety of ESD assessment tools available to assess SDA requirements. LBS will use the following tools, benchmarks and standards to achieve the overall objectives of Policy No7.1.1 – Built Form - 1.8 Environmentally Sustainable Design.

- City of Vincent Guidelines
- NCC 2019 Amd.1 Volume 1
- Green Star Design & As Built v1.3
- WA Better Design Standards
- ASHRAE
- ATTMA



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ENVIRONMENTAL SUSTAINABLE DESIGN (ESD) STRATEGY

The project team has collaborated to consider ESD principles and initiatives during the design phase, these principles have been based on the following ESD hierarchy:

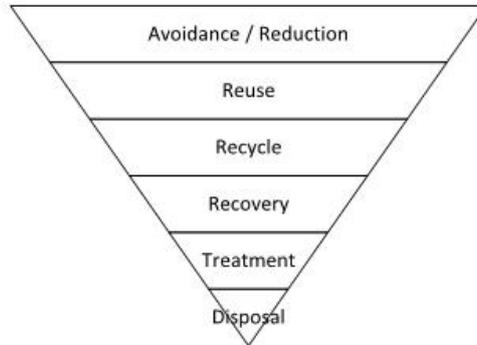


Figure 1 - ESD Hierarchy

SITE DESCRIPTION

Details	357 Lord Street, Highgate
Proposed building works	Proposed mixed-use development
Areas	
Ground Floor (Class 6, Common + Parking)	429.02 m ²
First Floor (Class 2 + Common)	408.83 m ²
Second Floor (Class 2)	283.64 m ²
Roof Terrace (Class 2)	257.35 m ²
Total Site	544 m ²



Figure 2 – Proposed development



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2.0 RESULTS

GLOBAL WARMING POTENTIAL - CLASS 6

Design Builder (EnergyPlus) thermal analysis software has been used to calculate the annual energy consumption of the proposed development and the same development built to minimum NCC 2019 Volume 1 Section J Compliance (Code Compliant Design), allowing the annual global warming potential (Tonnes CO₂e) to be compared (Outlined in Table 3).

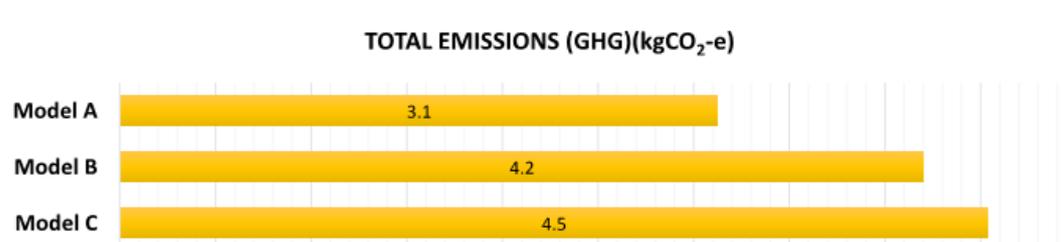
To convey this, 3 buildings have been modelled:

- **Proposed Building (Model A)** – The proposed building with the proposed building fabric and building services specification
- **Intermediate Building (Model B)** – The proposed building with the proposed building fabric specification and NCC Section J Deemed-to-Satisfy Provisions for building services
- **Reference Building (Model C)** – The proposed building with minimum NCC Section J Deemed-to-Satisfy Provisions for both the building fabric and building services

Through passive design, strategic building specification selection, efficient lighting and building services, the proposed development results in a **31% reduction in global warming potential** when compared to Code Compliant Design.

In addition, the project team has collaborated to consider the lifecycle energy cost of materials in the design of the proposed development. This is further documented in Section 4.0 ESD Initiatives.

TABLE 3	PROPOSED BUILDING Proposed Fabric + Proposed Services	INTERMEDIATE BUILDING Proposed Fabric + DtS Services	REFERENCE BUILDING DtS Fabric + DtS Services
HEATING (kWh)	370	316	233
COOLING (kWh)	1985	2142	2675
EQUIPMENT (kWh)	905	905	905
LIGHTING (kWh)	936	2278	2278
TOTAL (kWh)	4196	5641	6091
TONNES CO ₂ e	3.1	4.2	4.5
REDUCTION (%)	31%	7%	



Please refer to Appendix A Calculations for details on energy modelling calculations.



GLOBAL WARMING POTENTIAL - CLASS 2

FirstRate5 (NatHERS accredited) thermal analysis software has been used to calculate the annual energy consumption of the proposed development and the same development built to minimum NCC 2019 Volume 1 Section J Compliance (Code Compliant Design), allowing the annual global warming potential (Tonnes CO_{2e}) to be compared (Outlined in Table 4).

To convey this, 3 buildings have been modelled:

- **Proposed Building** – The proposed building with the proposed building fabric and building services specification
- **Intermediate Building** – The proposed building with the proposed building fabric specification and NCC Section J Deemed-to-Satisfy Provisions for building services
- **Reference Building** – The proposed building with minimum NCC Section J Deemed-to-Satisfy Provisions for both the building fabric and building services

Through passive design, strategic building specification selection, efficient lighting and onsite renewable energy, the proposed development results in a **51% reduction in global warming potential** when compared to Code Compliant Design .

In addition, the project team has collaborated to consider the lifecycle energy cost of materials in the design of the proposed development. This is further documented in Section 4.0 ESD Initiatives.

TABLE 4

	PROPOSED BUILDING Proposed Fabric + Proposed Services	INTERMEDIATE BUILDING Proposed Fabric + DtS Services	REFERENCE BUILDING DtS Fabric + DtS Services
UNIT 1 (MJ/M²)	32.5	60.8	70.0
UNIT 2 (MJ/M²)	34.4	60.4	70.0
UNIT 3 (MJ/M²)	27.6	51.8	70.0
UNIT 4 (MJ/M²)	43	67.6	70.0
AVE STAR RATING	N/A	6.6	6.0
TOTAL (MJ/M²)	137.5	240.6	280.0
TOTAL (MJ)	19385	33733	39109
TOTAL (KWH) (COP =1)	5385	9370	10864
TONNES CO_{2e}	4.01	6.98	8.09
REDUCTION (%)	51%	14%	



FRESHWATER USE – CLASS 6 & CLASS 2

The Green Star Potable Water Calculator has been used to compare net freshwater use of the proposed development against a Code Compliant Design. For the purpose of calculations, the Code Compliant Design for sanitation, whitegoods and landscaping is considered to be a Green Star Standard Practice Building.

Table 5 outlines the proposed developments predicted water usage when compared to Code Complaint Design. The proposed development achieves this reduction if the items documented under 4.0 ESD INITIATIVES WATER are implemented.

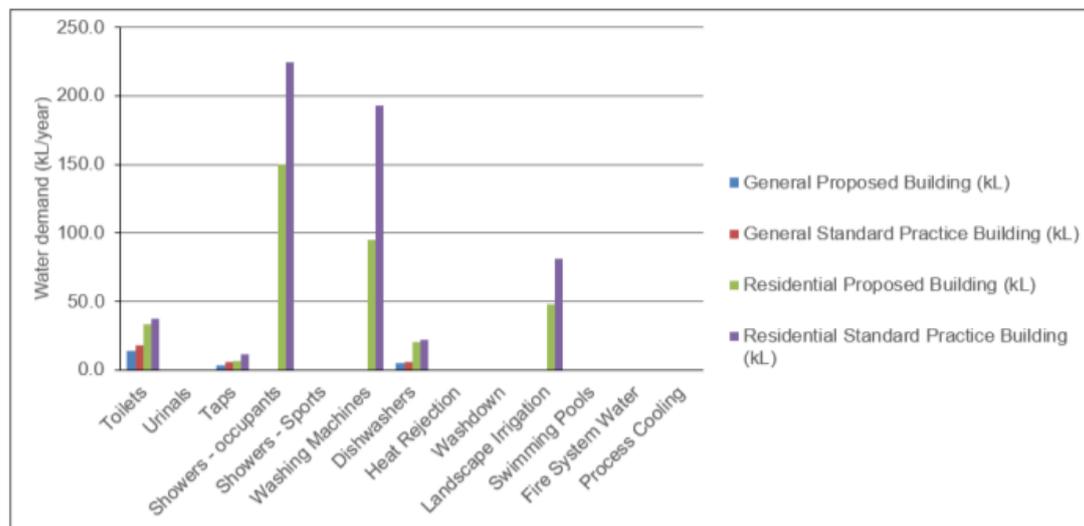
TABLE 5	PROPOSED BUILDING Proposed Water Usage (kL)	REFERENCE BUILDING Proposed Water Usage (kL)	WATER USAGE REDUCTION
CLASS 2	331.9	571	42%
CLASS 6	22	30	28%
Total	308.5	601	41%

The Class 2 component of the building achieves a 42% reduction in water usage (City of Vincent requirement is 50%). Due to the high density of the project and minimal roof catchment area (285m²) it is not feasible to increase rainwater tank demand internally (toilets or laundry) without significantly decreases rainwater reliability. This in turn will have negative impact on the rainwater reuse for landscaping during in the summer months.

LBS believes it is a better ESD outcome to have the rainwater retention tank solely available for landscape irrigation.

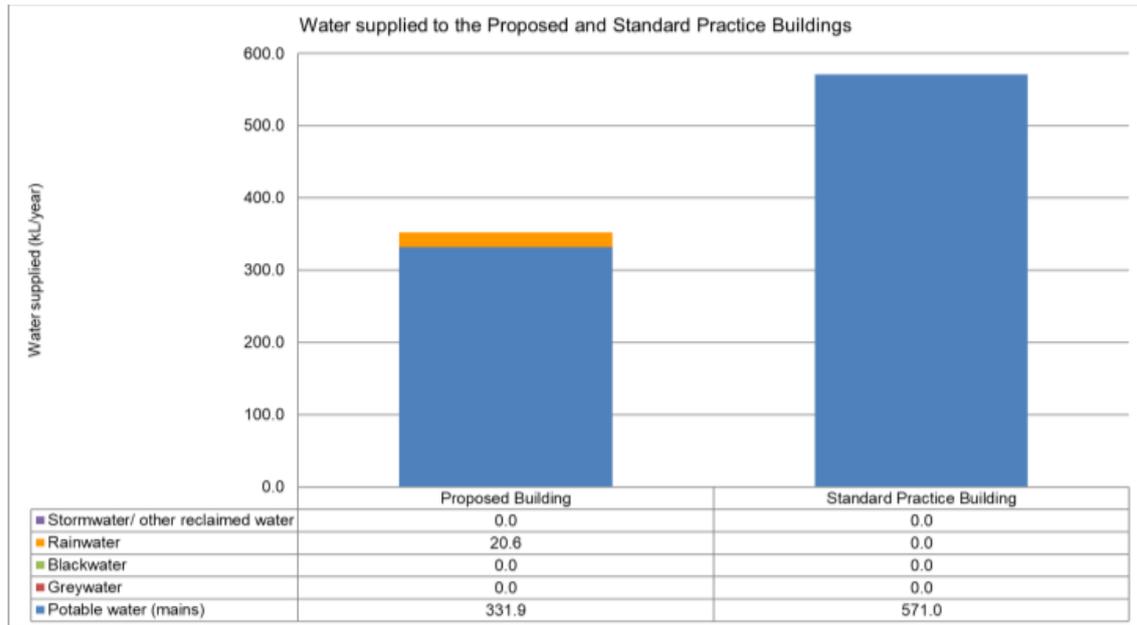
Figure 3 outlines the predicted potable water demand for relevant sections of the building and Figure 4 outlines the Class 2 potable water domain including the rainwater reuse. As depicted, showering and washing machines are the highest water demand in the building. This demand has been minimised through efficient fixtures and fittings and / or reclaimed rainwater.

FIGURE 3 POTABLE WATER DEMAND



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FIGURE 4 CLASS 2 WATER DEMAND INCLUDING RAINWATER RE-USE



* Calculations have assumed mains water backup when the rainwater tank(s) are empty.



3.0 ESD INITIATIVES

The following sections outline the sustainable initiatives that will be incorporated into the design, construction, and operation of the proposed development. In addition, this section outlines the relevant project stage and nominates the appropriate project stakeholder responsibility.

INDOOR ENVIRONMENTAL QUALITY

Goals

- ✓ Ensure healthy indoor environmental quality for the wellbeing of occupants
- ✓ Consider air quality, natural ventilation, and daylight access in the design of the proposed development
- ✓ Control noise
- ✓ Control shading and prevent glare
- ✓ Reduce the need for building services such as artificial lighting, mechanical ventilation, and heating/cooling devices by providing a naturally comfortable indoor environment

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
Daylight Access Class 2 and Class 6 components have adequate access to daylight through dual facades of glazing. Coupled with the narrow footprint, it's expected it would meet Green Star hand calculations.	ESD	Design Development
Ventilation Systems – Maintenance Provide adequate access for maintenance, to both sides of all moisture / debris catching components, within the air distribution system.	Services Engineer Architect	Construction Documentation
Air Quality - Volatile Organic Compounds (VOC) ≥95% of new paints, adhesives, sealants (by volume) or carpets (by area) meet the total VOC limits specified in Appendix C or relevant certification scheme (e.g. GECA, Global GreenTag, GreenRate).	Architect Development Manager	Construction Documentation
Duct Cleaning Ductwork to remain sealed until commissioning or all ductwork is to be cleaned in accordance with AIRAH HVAC 2010 Hygiene Best Practice Guideline or relevant standard.	Services Engineer Development Manager	Construction Documentation
Condensation Management Water vapour management and ventilation to be designed in accordance with NCC Vol.1 Amd.1 Part F6.	Architect Development Manager	Construction Documentation
Thermal Comfort (Class 6 only) In accordance with the requirements for a 2019 NCC JV3 modelling approach, a thermal comfort model has been undertaken in accordance with ASHRAE 55 criteria using the Fanger Predicted Mean Vote (PMV) method. The intent of this model is to ensure that the space is comfortable for the occupants who use the space. All occupied zones as a whole are comfortable for not less than 98% of the time, confirming the building is compliant with the thermal comfort requirements of 2019 NCC JV3 methodology.	ESD	Design Development



Please refer to Appendix B Section J – JV3 Report completed by LBS (10/01/2022)

ENERGY EFFICIENCY

Goals

- ✓ Ensure energy efficiency is incorporated into the planning and design of the proposed development
- ✓ Reduce greenhouse gas emissions
- ✓ Reduce peak energy demand
- ✓ Promote the use of alternative energy sources

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
<p>Preliminary Energy Modelling (Class 6)</p> <p>Preliminary Section J – JV3 energy modelling has been completed. This modelling demonstrates the proposed design’s annual heating and cooling energy consumption is less than the reference case if the following specification is incorporated into the design:</p> <p>Specification Requirement:</p> <ul style="list-style-type: none"> - All external glazing must meet or exceed the following performance: U≤6.0, SHGC≤0.60 - Additional requirements outlined in Section J Report completed by LBS <p>Please refer to Appendix B Section J – JV3 Report completed by LBS (13/01/2022)</p>	Development Manager	Design Development
<p>Preliminary Energy Modelling (Class 2)</p> <p>Preliminary Section J – NatHERS energy modelling has been completed. This modelling demonstrates the proposed design’s annual heating and cooling energy consumption is 51% less than (building fabric + Services) the minimum required of Section J.</p> <p>Specification Requirement:</p> <ul style="list-style-type: none"> - R4.0 insulation located at ceiling level to all lightweight roofs of apartments - R2.5 insulation to all external heavyweight roofs of apartments - R2.5 insulation to all external framed walls of apartments only - R1.0 insulation to all external concrete walls of apartments only - R1.0 insulation to soffit of Garage Carpark sections with apartments above - Velux double glazing (or equivalent) skylights - Dowell SP10 single glazed (or equivalent) glazing to the following zones: <ul style="list-style-type: none"> o Apartment 1 – Living/Study o Apartment 2 – Living/Void o Apartment 3 – Living/Void o Apartment 4 – Living - All exhaust fans sealed to outside air - Solar Photovoltaic systems: <ul style="list-style-type: none"> o Apartment 1 – PV - ≥2.3kW, Inverter ≥2kW o Apartment 2 – PV - ≥2.6kW, Inverter ≥2kW o Apartment 3 – PV - ≥2.6kW, Inverter ≥2kW o Apartment 4 – PV - ≥2.3kW, Inverter ≥2kW 	Development Manager	Design Development



<ul style="list-style-type: none"> - Additional requirements outlined in Preliminary Section J Class 2 Report completed by LBS <p>Refer to Appendix B Section J – Class 2 Preliminary Report completed by LBS (24/01/2021)</p>		
Lighting (Class 6) (Indoor)		
Maximum illumination power density to Class 6 component of the building to be ≤ 5.6 watts/m ²	Services Engineer	Detailed Design
Lighting (External)		
Daylight and occupancy sensors to be fitted to external and lift lighting in accordance with NCC Vol1 Amd.1 Part J6	Services Engineer	Detailed Design

WATER EFFICIENCY & STORMWATER MANAGEMENT

Goals

- ✓ Ensure the efficient and sustainable use of water resources
- ✓ Reduce dependency on potable water
- ✓ Encourage and maximise use of alternative water sources
- ✓ Promote use of water efficient landscaping
- ✓ Ensure best practice water sensitive urban design stormwater treatment practices are incorporated into the planning and design of the proposed development

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
Water Efficiency		
<p>The Green Star Potable Water Calculator has been used to benchmark the water savings of the proposed development.</p> <p>If the proposed fixtures, fittings, and rainwater collection / reuse are implemented, the proposed development consumes 41% less water when compared to Standard Building Practice</p> <p><u>Class 2</u> The development will include efficient fitting and fixtures to reduce the consumption of mains water. The following Water Efficiency Labelling Scheme (WELS) star rating products are required:</p> <ul style="list-style-type: none"> - Kitchen Taps: ≥ 6 Star WELS - Bathroom Taps: ≥ 6 Star WELS - Showerhead: ≥ 4 Star WELS ($\leq 6.0L/m$) - Dishwashers: ≥ 4.0 Star WELS - Washing Machine ≥ 5.0 Star WELS (if applicable) - WC: ≥ 4 Star WELS <p><u>Class 6</u> The development will include efficient fitting and fixtures to reduce the consumption of mains water. The following Water Efficiency Labelling Scheme (WELS) star rating products are required:</p> <ul style="list-style-type: none"> - Kitchen Taps: ≥ 6 Star WELS - Bathroom Taps: ≥ 6 Star WELS - Dishwashers: ≥ 4.0 Star WELS - WC: ≥ 5 Star WELS 	Architect	Design Development



Rainwater Collection, Reuse, and Stormwater Management		
The following water reuse and stormwater management initiatives are implemented per warehouse: 1. Rainwater Re-use <ul style="list-style-type: none"> - ≥5,000L used for retention and reuse in the building - Tank connected to main roof space (≥ 280m²) - Connected to all ground floor landscape irrigation - Overflow directed to On-Site Detention (OSD) prior to Legal Point of Discharge (LPD) 	CIVIL Engineer Development Manager	Design Development
Stormwater design to be confirmed by CIVIL Engineer.		
Water Efficient Landscaping		
Native water efficient/drought tolerant plants to be planted in all landscaped areas. If irrigation is required, sub-surface drip irrigation to be used.	Architect	Design Development
Stormwater Pollution Reduction		
A stormwater pollution reduction strategy to be developed and implemented as part of the building construction works.	Development Manager	Construction Documentation Construction

BUILDING MATERIALS

Goals

- ✓ Promote waste avoidance, re-use and recycling during the planning, design, construction, and operation of the proposed development
- ✓ Consider maintenance and durability in the selection of materials
- ✓ Consider embodied energy and life cycle costs in material selection
- ✓ Consider material re-use and materials with recycled content

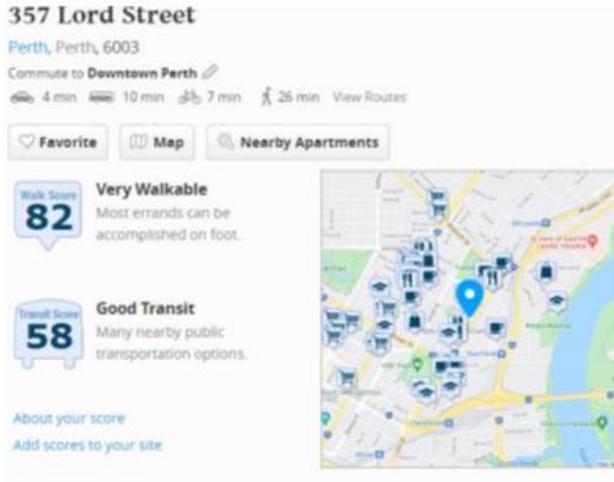
DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
Sustainable Materials (Steel)		
Where possible, structural steel is to be sourced from a Responsible Steel Maker (ISO 14001 & World Steel Association Climate Action Program).	Structural Engineer	Construction
Sustainable Materials (Timber)		
All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC).	Architect	Construction Documentation
Embodied Energy		
Consideration has been given to the choice of materials during the design phase: <ul style="list-style-type: none"> - Concrete has been specified to some of the structure. Whilst this contains a high level of embodied energy, it also has a positive impact on the passive design/operational performance. This is demonstrated in the preliminary energy modelling results. 	ESD	Design Development
Steel roof sheeting specified in the design also has high embodied energy but is easily recyclable at the end of the building's life cycle.		



TRANSPORT

Goals

- ✓ Reduce car dependency
- ✓ Promote alternative forms of low emission transport such as walking, cycling, public transport

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
<p>Low-Emission Transport</p> <p>Information on bike / walking paths and public transport routes to be provided with handover package to all building tenants.</p> <p>Example - https://www.walkscore.com/score/357-lord-st-highgate-wa-australia</p> 	<p>Architect Development Manager</p>	<p>Design Development</p>

WASTE MANAGEMENT

Goals

- ✓ Promote waste avoidance, re-use, and recycling during the planning, design, construction, and operation of the proposed development

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
Construction Waste		
<p>≥ 70% of demolition and construction waste (by mass) will be recycled or re-used. The builder will develop a construction waste management plan for the demolition, pre-construction, civil works, and construction phases.</p> <p>In addition:</p> <ul style="list-style-type: none"> - Standard sizes materials and/or prefabricated materials will be used where possible 	Development Manager	Construction
Operational Waste		
Waste recycling facilities will be as conveniently located as those for general waste and all waste streams separated and clearly identified through adequate signage.	Architect Development Manager	Design Development
On-going Management		
On-going waste management is the responsibility of the building owner.	Development Manager	Post Occupancy

URBAN ECOLOGY

Goals

- ✓ Consider green spaces that focus on health, social, environmental, and economic benefits
- ✓ Encourage and consider the retention of existing significant trees
- ✓ Consider climatic conditions and minimise use of potable water
- ✓ Protect and enhance biodiversity
- ✓ Provide sustainable landscaping with low water and fertiliser requirements
- ✓ Utilise local native plant species/indigenous vegetation

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
Endangered, Threatened & Vulnerable Species		
No critically endangered, endangered, vulnerable species, or ecological communities were present on the site at the time of purchase or contract.	Development Manager	Design Development
Hazardous Materials		
A hazardous materials survey has or will be conducted of any existing buildings, structures in accordance with relevant Environmental and Occupational Health Standards. If asbestos, lead or PCBs are identified, they are to be removed and disposed of in accordance with best practice guidelines.	Development Manager	Design Development
Heat Island		
Heat island effect will be reduced by incorporating building materials with the following properties: - All pitched roofs - Initial Solar Reflectance Index (SRI) of ≥ 82 (surfmist)	Architect	Design Development



CONSTRUCTION AND BUILDING MANAGEMENT

Goals

- ✓ Integrate sustainable principles from concept through to construction and operation of the proposed development
- ✓ Future proof the proposed development for future occupants
- ✓ Ensure key building services and other relevant information is accessible to occupants

DESIGN INITIATIVE	STAKEHOLDER	PROJECT STAGE
On-going Management		
The building manager is responsible for the implementation, monitoring, maintenance, and review of all initiatives outlined in this report	Development Manager	Post Occupancy
Building Information		
Information on key building services and appliances is to be made available for all building tenants / owners	Development Manager	Post Occupancy

4.0 CONCLUSION

The contents of this SDA assesses the proposed development against the City of Vincent sustainable objectives.

The proposed development will meet and / or exceed the objectives if it is constructed in accordance with the contents of this report, supporting documentation and applicable drawings. This report is to be read in conjunction with relevant reports written by LBS or third parties. It is the responsibility of the development manager to ensure the implementation, monitoring, maintenance, and review of all initiatives outlined in this report are upheld.



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APPENDIX A – SECTION J – JV3 REPORT



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LBS REFERENCE NUMBER
LBS_12634

DATE
Thursday, 13 January 2022

NCC 2019, VOL.1 AMD.1 SECTION J COMPLIANCE REPORT

DEVELOPED IN ACCORDANCE WITH THE PERFORMANCE REQUIREMENTS OF THE NCC

PROJECT NAME
Proposed Apartments/Café

PROJECT ADDRESS
357 Lord Street, Highgate WA 6003

BUILDING CLASS
6

REPORT COMMISSIONED BY
Arconic Design

ON BEHALF OF
Arconic Design

OWNER'S REPRESENTATIVE
Arconic Design

RELEVANT AUTHORITY
N/A

CLIENT REFERENCE NUMBER
-



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337Lord_Section J Compliance_LBS12634

2

COMPLIANCE SUMMARY

The proposed development has been assessed using the prescribed *Verification Method: JV3* 'Verification using a reference building' to determine compliance with the *Performance Requirement JP1* in Section J of NCC 2019 Vol.1 Amd.1.

SPECIFICATION REQUIREMENTS

The proposed development must be constructed in accordance with the following specification to achieve compliance:

All external 'CAFÉ' glazing must meet or exceed the following performance: $U \leq 6.0$, $SHGC \leq 0.50$

ADDITIONAL REQUIREMENTS

The proposed development must also be constructed in accordance with the following provisions to be compliant with Section J (See *Appendix A*) :

- (a) for general thermal construction, J1.2; and
- (b) for floor edge insulation, J1.6(b) and J1.6(c); and
- (c) for building sealing, JV4 or J3.1 to J3.7; and
- (d) for air-conditioning and mechanical ventilation system control, J5.2 and J5.3; and
- (e) for fan systems, J5.4; and
- (f) for ductwork insulation and sealing, J5.5 and J5.6; and
- (g) for pump systems, J5.7; and
- (h) for pipework insulation, J5.8; and
- (i) for space heating, J5.9; and
- (j) for refrigerant chillers, J5.10; and
- (k) for packaged air-conditioners less than 65kW_r, MEPS; and
- (l) for packaged air-conditioners equal to or greater than 65kW_r, J5.11; and
- (m) for cooling tower, closed circuit cooler or evaporative condenser, J5.12; and
- (n) for interior/exterior artificial lighting and power control, J6.2 to J6.5; and
- (o) for boiling water and chilled water storage unit control, Specification J6
- (p) for lifts, escalators and moving walkways, J6.7 and J6.8; and
- (q) for heated water supply, Part B2 of NCC Volume Three - Plumbing Code of Australia
- (r) for swimming pool and spa pool plant, J7.3 and J7.4; and
- (s) for facilities for energy monitoring, J8.3; and
- (t) for thermal comfort a PMV of -1 to +1 across $\geq 95\%$ of occupied floor area for $\geq 98\%$ of annual hours of operation



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NCC 2019, SECTION J ENERGY EFFICIENCY

Objective - JO1

The Objective of this Section is to reduce greenhouse gas (GHG) emissions.

Functional Statement - JF1

To reduce greenhouse gas emissions, to the degree necessary –

- (a) a building, including its services, is to be capable of efficient using energy; and
- (b) a building's services are to obtain their energy from –
 - (i) a low greenhouse gas intensity source; or
 - (ii) an on-site renewable energy source; or
 - (iii) another process as reclaimed energy.

Performance Requirements - JP1 Energy Use

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

- (a) the function and use of the building; and
- (b) the level of human comfort required for the building use; and
- (c) solar radiation being—
 - (i) utilised for heating; and
 - (ii) controlled to minimise energy for cooling; and
- (d) the energy source of the services; and
- (e) the sealing of the building envelope against air leakage; and
- (f) for a conditioned space, achieving an hourly regulated energy consumption, averaged over the annual hours of operation, of not more than—
 - (i) for a Class 6 building, 80 kJ/m².hr; and
 - (ii) for a Class 5, 7b, 8 or 9a building other than a ward area, or a Class 9b school, 43 kJ/m².hr; and
 - (iii) for all other building classifications, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, 15 kJ/m².hr.



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EXECUTIVE SUMMARY

PERFORMANCE-BASED DESIGN BRIEF (PBDB)

A PBDB has been developed in collaboration with the stakeholders outlined on Page 1 of this report to establish JP1 compliance options and agreed compliance pathways. The PBDB outlines the assessment methodology, relevant DtS Provisions and key criteria which this Performance Solution must satisfy. The contents of this report provides further detail on the requirements of the PBDB and thus evaluates the performance of the proposed design against the *Performance Requirement JP1*.

Compliance Pathway

Compliance with the Performance Requirement **JP1** in Section J of NCC 2019 Vol.1 Amd.1 can be achieved using either a *Performance Solution*, *Deemed-to-Satisfy Solution* or a combination of the two.

A *DtS Solution* uses the DtS Provisions and any referenced documents contained within the NCC. These provisions include prescriptive examples of materials, components, design factors, construction and installation methods, which if followed in full, are deemed to comply with the Performance Requirements of the NCC. The DtS Provisions for energy efficiency are contained in Section J, Parts J0 – J8 of NCC Vol.1 One Amd.1.

A *Performance Solution* is any solution that can meet the Performance Requirements, other than a *DtS Solution*. A *Performance Solution* may differ in whole or part from the DtS Provisions, but will still meet the Performance Requirements as long as it can be successfully demonstrated to the Appropriate Authority how this will be achieved.

A *Performance Solution* must use one or more of the following *Assessment Methods*:

- (a) Evidence of Suitability,
- (b) *Verifications Methods*,
- (c) Expert Judgement
- (d) Comparison with the DtS Provisions

JV3 - 'VERIFICATION USING A REFERENCE BUILDING'

JV3 is the Section J prescribed Verification Method used to demonstrate that a Performance Solution meets the Performance Requirements for JP1 in a Class 3, 5, 6, 7, 8 and 9 building.

The JV3 methodology uses a reference building, which complies with the DtS Provisions, to determine the annual energy consumption. This quantifiable benchmark is the predetermined acceptance criteria that the proposed building design must meet. The annual energy consumption for the proposed building is then calculated using the same thermal calculation method. Compliance is demonstrated when the annual energy consumption of the proposed building does not exceed the reference building. The energy efficiency of services in the proposed building can not be used to offset poor building thermal performance when comparing to the reference building.

Calculation Method

The EnergyPlus thermal analysis software used to calculate the building annual energy consumption is deemed to comply with ANSI/ASHRAE Standard 140 2007 Evaluation of Building Energy Analysis Computer Programs as required by JV3(c).

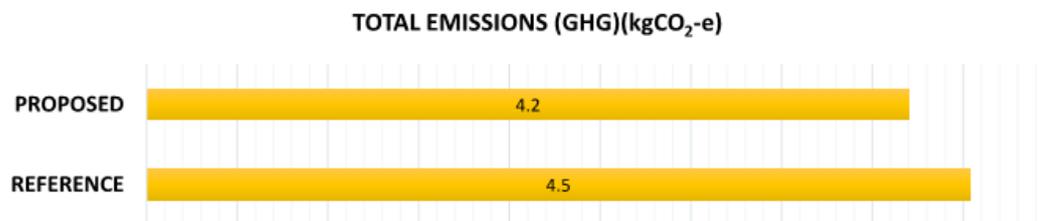
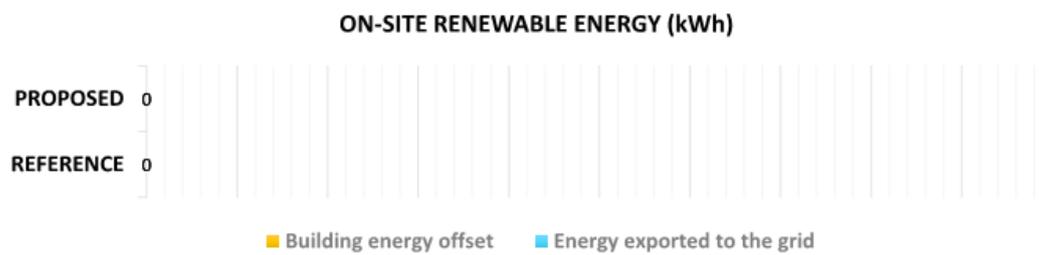
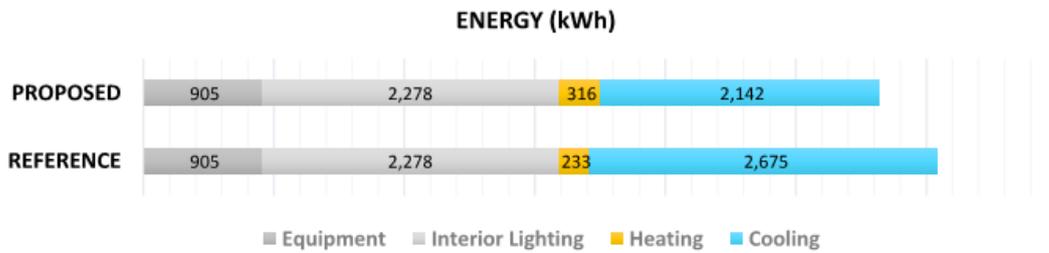
Fixed Modelling Parameters

The proposed and reference building annual energy consumptions have been calculated using the fixed parameters and profiles described in Specification JVb and JVc of Section J Energy Efficiency.



SIMULATION SUMMARY

Compliance is verified when the annual greenhouse gas emissions of the reference building are more than the proposed building and proposed building modelled with DTS services.



The Dts Provisions listed under 'ADDITIONAL REQUIREMENTS' (page 2) and detailed in Appendix A must be complied with in addition to the requirements listed under 'SPECIFICATION REQUIREMENTS' (page 2) for compliance with Section J to be achieved.



THERMAL COMFORT

In accordance with the requirements for a 2019 NCC JV3 modelling approach a thermal comfort model has been undertaken in accordance with ASHRAE 55 criteria using the Fanger Predicted Mean Vote (PMV) method. The intent of this model is to ensure that the space is comfortable for the occupants who use the space.

The NCC states that:

In the proposed building, a thermal comfort level of between a Predicted Mean Vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building.

The PMV method uses a range of variables to calculate if the space is comfortable for occupants within the space.

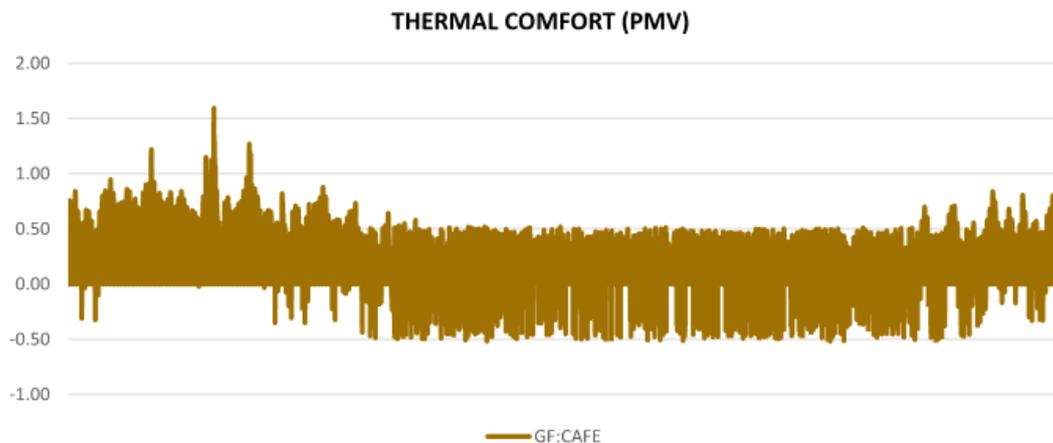
The following variable were fixed during the PMV calculation:

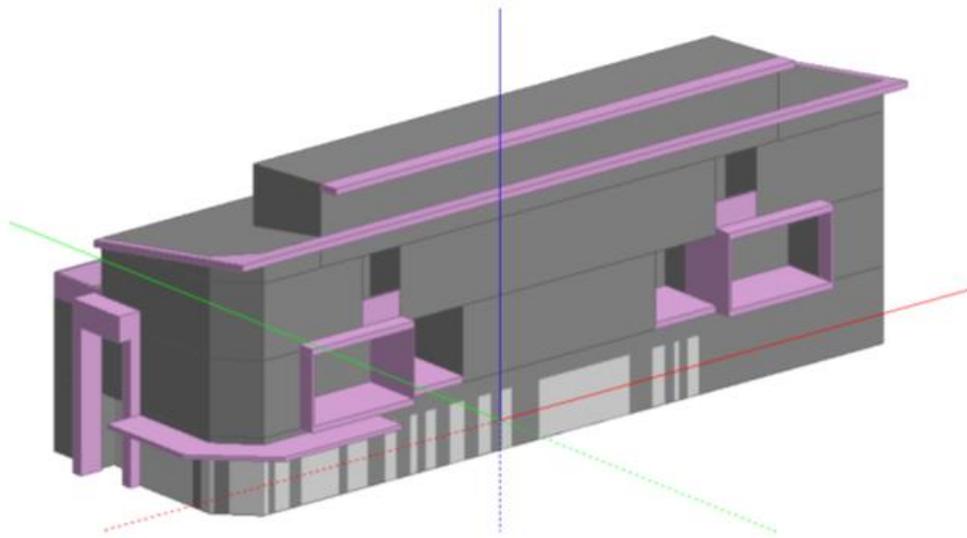
VARIABLE	INPUT	SOURCE
Air speed (m/s)	0.1	NCC 2019
Metabolic rate (W/person)	130	ASHRAE Standard 55
Metabolic factor	1	ASHRAE Standard 55
Summer clothing (clo)	0.36	ASHRAE Standard 55
Winter clothing (clo)	1.01	ASHRAE Standard 55

Air temperature, mean radiant temperature and relative humidity have all been calculated hourly using DesignBuilder and EnergyPlus.

Only occupied spaces in the building are required to meet thermal comfort requirements. For the building as a whole, the area-weighted average of the percentage of comfortable hours is required to meet the PMV of -1 to +1 for not less than 98% of the time.

Results showed all occupied zones as a whole are comfortable for not less that 98% of the time, confirming the building is compliant with the thermal comfort requirements of 2019 NCC JV3 methodology. Refer Thermal Comfort (PMV) graph below:





CALCULATION METHOD

The EnergyPlus thermal analysis software used to calculate the building annual energy consumption is deemed to comply with the ABCB Protocol for Building Energy Analysis Software and ANSI/ASHRAE Standard 140.

GENERAL INPUT DATA

	PROPOSED BUILDING	DTS BUILDING
Location file	Perth	Perth
Weather file	Perth	Perth
Geometry	As per attached drawings	As per attached drawings
Internal temperature set points	Specification JVb(c)	Specification JVb(c)
Infiltration	Specification JVb(d)	Specification JVb(d)
Occupancy profile	Specification JVc, Tables 2a-2k	Specification JVc, Tables 2a-2k
Internal heat gains from appliances and equipment	Specification JVc, Tables 2l	Specification JVc, Tables 2l
Internal heat gains from occupants and hot meals	Specification JVc, Tables 2n	Specification JVc, Tables 2n
Heated water supply consumption	Specification JVc, Tables 2m	Specification JVc, Tables 2m
Occupancy density	Table D1.13	Table D1.13
GHG emissions factor	0.75	0.75



SPECIFICATION

PART J1 INPUT DATA

J1.3 ROOF/CEILING CONSTRUCTION	PROPOSED BUILDING	DTS BUILDING
<i>Flat roof</i>		
Product R-Value	R0.00	R3.05
Total R-Value	R0.65	R3.70
Bridged Total R-Value	R0.65	R3.70
Solar Absorptance	0.60	0.45
Thermal Break	Y	Y

J1.5 WALLS & GLAZING	PROPOSED BUILDING	DTS BUILDING
<u>Walls</u>		
<i>Heavyweight</i>		
Product R-Value	R0.00	R0.69
Total R-Value	R0.71	R1.40
Bridged Total R-Value	R0.71	R1.40
Solar absorptance	0.60	0.60
Thermal Break	Y	Y

<u>Glazing</u>				
<u>Orientation</u>	<u>U-Value</u>	<u>SHGC</u>	<u>U-Value</u>	<u>SHGC</u>
North	6.00	0.50	2.72	0.20
East	6.00	0.50	2.51	0.18
South	N/A	N/A	N/A	N/A
West	N/A	N/A	N/A	N/A
Internal	N/A	N/A	N/A	N/A

J1.6 FLOORS	PROPOSED BUILDING	DTS BUILDING
<i>CSOG</i>		
Product R-Value	R0.00	R0.18
Total R-Value	R1.82	R2.00
Bridged Total R-Value	R1.82	R2.00



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PART J5 INPUT DATA

J5.2 AIR-CONDITIONING SYSTEM	PROPOSED BUILDING	DTS BUILDING
Air-To-Air Heat Pump/Air Conditioner Ducted Split Systems <10kw	MEPS - COP/EER 3.10	MEPS - COP/EER 3.10

PART J6 INPUT DATA

J6.2 ARTIFICIAL LIGHTING	PROPOSED BUILDING	DTS BUILDING
Wattage	Max. Allowable Table J6.2a	Max. Allowable Table J6.2a



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APPENDIX A

J1.2 Thermal construction — general

- (a) Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it—
- (i) abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation must be against the member; and
 - (ii) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
 - (iii) does not affect the safe or effective operation of a service or fitting.
- (b) Where required, reflective insulation must be installed with—
- (i) the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and
 - (ii) the reflective insulation closely fitted against any penetration, door or window opening; and
 - (iii) the reflective insulation adequately supported by framing members; and
 - (iv) each adjoining sheet of roll membrane being—
 - (A) overlapped not less than 50 mm; or
 - (B) taped together
- (c) Where required, bulk insulation must be installed so that—
- (i) it maintains its position and thickness, other than where it is compressed between cladding and supporting members, water pipes, electrical cabling or the like; and
 - (ii) in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, it overlaps the wall by not less than 50 mm.
- (d) Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in Specification J1.2.
- (e) The required Total R-Value and Total System U-Value, including allowance for thermal bridging, must be—
- (i) calculated in accordance with AS/NZS 4859.2 for a roof or floor; or
 - (ii) determined in accordance with Specification J1.5a for wall-glazing construction; or
 - (iii) determined in accordance with Specification J1.6 or Section 3.5 of CIBSE Guide A for soil or sub-floor spaces.

J1.6 Floors

- (a) A floor must achieve the Total R-Value specified in Table J1.6.
- (b) A floor must be insulated around the vertical edge of its perimeter with insulation having an R-Value greater than or equal to 1.0 when the floor—
- (i) is a concrete slab-on-ground in climate zone 8; or
 - (ii) has an in-slab or in-screed heating or cooling system, except where used solely in a bathroom, amenity area or the like.
- (c) Insulation required by (b) for a concrete slab-on-ground must—
- (i) be water resistant; and
 - (ii) be continuous from the adjacent finished ground level—
 - (A) to a depth not less than 300 mm; or
 - (B) for the full depth of the vertical edge of the concrete slab-on-ground.

J3.2 Chimneys and flues

The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue.

J3.3 Roof lights

- (a) A roof light must be sealed, or capable of being sealed, when serving—
- (i) a conditioned space; or
 - (ii) a habitable room in climate zones 4, 5, 6, 7 or 8.
- (b) A roof light required by (a) to be sealed, or capable of being sealed, must be constructed with—
- (i) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or



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- (ii) a weatherproof seal; or
- (iii) a shutter system readily operated either manually, mechanically or electronically by the occupant.

J3.4 Windows and doors

- (a) A door, openable window or the like must be sealed—
 - (i) when forming part of the envelope; or
 - (ii) in climate zones 4, 5, 6, 7 or 8.
- (b) The requirements of (a) do not apply to—
 - (i) a window complying with AS 2047; or
 - (ii) a fire door or smoke door; or
 - (iii) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security.
- (c) A seal to restrict air infiltration—
 - (i) for the bottom edge of a door, must be a draft protection device; and
 - (ii) for the other edges of a door or the edges of an openable window or other such opening, may be a foam or rubber compression strip, fibrous seal or the like.
- (d) An entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, rapid roller door, revolving door or the like, other than—
 - (i) where the conditioned space has a floor area of not more than 50 m²; or
 - (ii) where a café, restaurant, open front shop or the like has—
 - (A) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and
 - (B) at all other entrances to the café, restaurant, open front shop or the like, self-closing doors.
- (e) A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like.

J3.5 Exhaust fans

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

J3.6 Construction of ceilings, walls and floors

- (a) Ceilings, walls, floors and any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage in accordance with (b) when forming part of—
 - (i) the envelope; or
 - (ii) in climate zones 4, 5, 6, 7 or 8.
- (b) Construction required by (a) must be—
 - (i) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or
 - (ii) sealed at junctions and penetrations with—
 - (A) close fitting architrave, skirting or cornice; or
 - (B) expanding foam, rubber compressible strip, caulking or the like.
- (c) The requirements of (a) do not apply to openings, grilles or the like required for smoke hazard management.

J3.7 Evaporative coolers

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

- (a) when serving a heated space; or
- (b) in climate zones 4, 5, 6, 7 or 8.

J5.2 Air-conditioning system control

- (a) An air-conditioning system—
 - (i) must be capable of being deactivated when the building or part of a building served by that system is not occupied; and
 - (ii) when serving more than one air-conditioning zone or area with different heating or cooling needs, must—
 - (A) thermostatically control the temperature of each zone or area; and
 - (B) not control the temperature by mixing actively heated air and actively cooled air; and
 - (C) limit reheating to not more than—



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- (aa) for a fixed supply air rate, a 7.5 K rise in temperature; and
 - (bb) for a variable supply air rate, a 7.5 K rise in temperature at the nominal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased; and
 - (iii) which provides the required mechanical ventilation, other than in climate zone 1 or where dehumidification control is needed, must have an outdoor air economy cycle if the total air flow rate of any airside component of an air-conditioning system is greater than or equal to the figures in Table J5.2; and
 - (iv) which contains more than one water heater, chiller or coil, must be capable of stopping the flow of water to those not operating; and
 - (v) with an airflow of more than 1000 L/s, must have a variable speed fan when its supply air quantity is capable of being varied; and
 - (vi) when serving a sole-occupancy unit in a Class 3 building, must not operate when any external door of the sole-occupancy unit that opens to a balcony or the like, is open for more than one minute; and
 - (vii) must have the ability to use direct signals from the control components responsible for the delivery of comfort conditions in the building to regulate the operation of central plant; and
 - (viii) must have a control dead band of not less than 2°C, except where a smaller range is required for specialised applications; and
 - (ix) must be provided with balancing dampers and balancing valves that ensure the maximum design air or fluid flow is achieved but not exceeded by more than 15% above design at each—
 - (A) component; or
 - (B) group of components operating under a common control in a system containing multiple components, as required to meet the needs of the system at its maximum operating condition; and
 - (x) must ensure that each independently operating space of more than 1 000 m² and every separate floor of the building has provision to terminate airflow independently of the remainder of the system sufficient to allow for different operating times; and
 - (xi) must have automatic variable temperature operation of heated water and chilled water circuits; and
 - (xii) when deactivated, must close any motorised outdoor air or return air damper that is not otherwise being actively controlled.
- (b) When two or more air-conditioning systems serve the same space they must use control sequences that prevent the systems from operating in opposing heating and cooling modes.
- (c) Time switches—
- (i) A time switch must be provided to control—
 - (A) an air-conditioning system of more than 2 kWh; and
 - (B) a heater of more than 1 kW heating used for air-conditioning.
 - (ii) The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.
 - (iii) The requirements of (i) and (ii) do not apply to—
 - (A) an air-conditioning system that serves—
 - (aa) only one sole-occupancy unit in a Class 2, 3 or 9c building; or
 - (bb) a Class 4 part of a building; or
 - (B) a conditioned space where air-conditioning is needed for 24 hour continuous use.

J5.3 Mechanical ventilation system control

- (a) General — A mechanical ventilation system, including one that is part of an air-conditioning system, except where the mechanical system serves only one sole-occupancy unit in a Class 2 building or serves only a Class 4 part of a building, must—
- ☒ (i) be capable of being deactivated when the building or part of the building served by that system is not
 - (ii) when serving a conditioned space, except in periods when evaporative cooling is being used—
 - (A) where specified in Table J5.3, have—
 - (aa) an energy reclaiming system that preconditions outdoor air at a minimum sensible heat transfer effectiveness of 60%; or
 - (bb) demand control ventilation in accordance with AS 1668.2 if appropriate to the application;
 - and
 - (B) not exceed the minimum outdoor air quantity required by Part F4 by more than 20%, except where—
 - (aa) additional unconditioned outdoor air is supplied for free cooling; or
 - (bb) additional mechanical ventilation is needed to balance the required exhaust or process



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exhaust; or

(cc) an energy reclaiming system preconditions all the outdoor air; and

(iii) for an airflow of more than 1000 L/s, have a variable speed fan unless the downstream airflow is required by Part F4 to be constant.

(b) Exhaust systems — An exhaust system with an air flow rate of more than 1000 L/s must be capable of stopping the motor when the system is not needed, except for an exhaust system in a sole-occupancy unit in a Class 2, 3 or 9c building.

(c) Carpark exhaust systems — Carpark exhaust systems must have a control system in accordance with—

(i) 4.11.2 of AS 1668.2; or

(ii) 4.11.3 of AS 1668.2.

(d) Time switches—

(i) A time switch must be provided to a mechanical ventilation system with an air flow rate of more than 1000 L/s.

(ii) The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.

(iii) The requirements of (i) and (ii) do not apply to—

(A) a mechanical ventilation system that serves—

(aa) only one sole-occupancy unit in a Class 2, 3 or 9c building; or

(bb) a Class 4 part of a building; or

(B) a building where mechanical ventilation is needed for 24 hour occupancy.

J5.4 Fan systems

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

(i) separately comply with (b), (c), (d) and (e); or

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

(b) Fans—

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

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

where-

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

p = the static pressure of the system (Pa).

(ii) Fans in systems that have a static pressure above 200 Pa must have an efficiency at the full load operating point not less than the efficiency calculated with the following formula:

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

where—

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

P = the motor input power of the fan (kW); and

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

a = regression coefficient a, obtained from Table J5.4b; and

b = regression coefficient b, obtained from Table J5.4c; and

ln = natural logarithm

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

(c) Ductwork—

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

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

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

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



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- (A) the inclusion of turning vanes presents a fouling risk; or
 - (B) a long radius bend in accordance with AS 4254.2 is used.
- (d) Ductwork components in the index run—
- (i) The pressure drop across a coil must not exceed the value specified in Table J5.4d.
 - (ii) A high efficiency particulate arrestance (HEPA) air filter must not exceed the higher of—
 - (A) a pressure drop of 200 Pa when clean; or
 - (B) the filter design pressure drop when clean at an air velocity of 1.5 m/s.
 - (iii) Any other air filter must not exceed—
 - (A) the pressure drop specified in Table J5.4e when clean; or
 - (B) the filter design pressure drop when clean at an air velocity of 2.5 m/s.
 - (iv) The pressure drop across intake louvres must not exceed the higher of—
 - (A) for single stage louvres, 30 Pa; and
 - (B) for two stage louvres, 60 Pa; and
 - (C) for acoustic louvres, 50 Pa; and
 - (D) for other non-weatherproof louvres, 30 Pa.
 - (v) The pressure drop across a variable air volume box, with the damper in the fully open position, must not exceed -
 - (A) for units with electric reheat, 100 Pa; and
 - (B) for other units, 25 Pa not including coil pressure losses.
 - (vi) Rooftop cowls must not exceed a pressure drop of 30 Pa.
 - (vii) Attenuators must not exceed a pressure drop of 40 Pa.
 - (viii) Fire dampers must not exceed a pressure drop of 15 Pa when open.
 - (ix) Balancing and control dampers in the index run must not exceed a pressure drop of 25 Pa when in the fully open position.
 - (x) Supply air diffusers and grilles must not exceed a pressure drop of 40 Pa.
 - (xi) Exhaust grilles must not exceed a pressure drop of 30 Pa.
 - (xii) Transfer ducts must not exceed a pressure drop of 12 Pa.
 - (xiii) Door grilles must not exceed a pressure drop of 12 Pa.
 - (xiv) Active chilled beams must not exceed a pressure drop of 150 Pa.
- (e) The requirements of (a), (b), (c) and (d) do not apply to—
- (i) fans in unducted air-conditioning systems with a supply air capacity of less than 1000 L/s; and
 - (ii) smoke spill fans, except where also used for air-conditioning or ventilation; and
 - (iii) the power for process-related components; and
 - (iv) kitchen exhaust systems.

J5.5 Ductwork insulation

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



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- (iii) return air ductwork in, or passing through, a conditioned space; or
- (iv) ductwork for outdoor air and exhaust air associated with an air-conditioning system; or
- (v) the floor of an in-situ air-handling unit; or
- (vi) packaged air conditioners, split systems, and variable refrigerant flow air-conditioning equipment complying

with MEPS; or

- (vii) flexible fan connections.

(d) For the purposes of (a), (b) and (c), fittings—

- (i) include non-active components of a ductwork system such as cushion boxes; and
- (ii) exclude active components such as air-handling unit components.

J5.6 Ductwork sealing

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

J5.7 Pump systems

(a) General — Pumps and pipework that form part of an air-conditioning system must either—

- (i) separately comply with (b), (c) and (d); or
- (ii) achieve a pump motor power per unit of flowrate lower than the pump motor power per unit of flowrate

achieved when applying (b), (c) and (d) together

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

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

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

(i) in pipework systems that do not have branches and have the same flow rate throughout the entire pipe network, must achieve an average pressure drop of not more than—

- (A) for constant speed systems, the values nominated in Table J5.7a; or
- (B) for variable speed systems, the values nominated in Table J5.7b; or

(ii) in any other pipework system, must achieve an average pressure drop of not more than—

- (A) for constant speed systems, the values nominated in Table J5.7c; or
- (B) for variable speed systems, the values nominated in Table J5.7d.

(e) the requirements of (d) do not apply—

- (i) to valves and fittings; or
- (ii) where the smallest pipe size compliant with (d) results in a velocity of 0.7 m/s or less at design flow.

J5.8 Pipework insulation

(a) Piping, vessels, heat exchangers and tanks containing heating or cooling fluid, where the fluid is held at a heated or cooled temperature, that are part of an air-conditioning system, other than in appliances covered by MEPS, must be provided with insulation—

- (i) complying with AS/NZS 4859.1; and
- (ii) for piping of heating and cooling fluids, having an insulation R-Value in accordance with Table J5.8a; and
- (iii) for vessels, heat exchangers or tanks, having an insulation R-Value in accordance with Table J5.8b; and
- (iv) for refill or pressure relief piping, having an insulation R-Value equal to the required insulation R-Value of the connected pipe, vessel or tank within 500 mm of the connection.

(b) Insulation must—

- (i) be protected against the effects of weather and sunlight; and
- (ii) be able to withstand the temperatures within the piping, vessel, heat exchanger or tank.

(c) Insulation provided to piping, vessels, heat exchangers or tanks containing cooling fluid must be protected by a vapour barrier on the outside of the insulation.

(d) The requirements of (a) and (b) do not apply to piping, vessels or heat exchangers—

- (i) located within the only or last room served by the system and downstream of the control device for the



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regulation of heating or cooling service to that room; or

(ii) encased within a concrete slab or panel which is part of a heating or cooling system; or

(iii) supplied as an integral part of a chiller, boiler or unitary air-conditioner complying with the requirements of

J5.9, J5.10 and J5.11; or

(iv) inside an air-handling unit, fan-coil unit, or the like.

(e) For the purposes of (a), (b), (c) and (d)—

(i) heating fluids include refrigerant, heated water, steam and condensate; and

(ii) cooling fluids include refrigerant, chilled water, brines and glycol mixtures, but do not include condenser cooling

water.

J5.9 Space heating

(a) A heater used for air-conditioning or as part of an air-conditioning system must be—

(i) a solar heater; or

(ii) a gas heater; or

(iii) a heat pump heater; or

(iv) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or

(v) an electric heater if—

(A) the heating capacity is not more than—

(aa) 10 W/m² of the floor area of the conditioned space in climate zone 1; or

(bb) 40 W/m² of the floor area of the conditioned space in climate zone 2; or

(cc) the value specified in Table J5.9 where reticulated gas is not available at the allotment

boundary; or

(B) the annual energy consumption for heating is not more than 15 kWh/m² of the floor area of the

conditioned space in climate zones 1, 2, 3, 4 and 5; or

(C) the in-duct heater complies with J5.2(a)(ii)(C); or

(vi) any combination of (i) to (v).

(b) An electric heater may be used for heating a bathroom in a Class 2, 3, 9a or 9c building if the heating capacity is not more than 1.2 kW and the heater has a timer.

(c) A fixed heating or cooling appliance that moderates the temperature of an outdoor space must be configured to automatically shut down when—

(i) there are no occupants in the space served; or

(ii) a period of one hour has elapsed since the last activation of the heater; or

(iii) the space served has reached the design temperature.

(d) A gas water heater, that is used as part of an air-conditioning system, must—

(i) if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86%; or

(ii) if rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%.

J5.10 Refrigerant chillers

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

J5.11 Unitary air-conditioning equipment

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

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

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

J5.12 Heat rejection equipment

(a) The motor rated power of a fan in a cooling tower, closed circuit cooler or evaporative condenser must not exceed the allowances in Table J5.12.

(b) The fan in an air-cooled condenser must have a motor rated power of not more than 42 W for each kW of heat rejected from the refrigerant, when determined in accordance with AHRI 460 except for—



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- (i) a refrigerant chiller in an air-conditioning system that complies with the energy efficiency ratios in J5.10; or
- (ii) packaged air-conditioners, split systems, and variable refrigerant flow air-conditioning equipment that complies with the energy efficiency ratios in J5.11.

J6.2 Artificial lighting

- (a) In a sole-occupancy unit of a Class 2 building or a Class 4 part of a building—
- (i) the lamp power density or illumination power density of artificial lighting must not exceed the allowance of—
 - (A) 5 W/m² within a sole-occupancy unit; and
 - (B) 4 W/m² on a verandah, balcony or the like attached to a sole-occupancy unit; and
 - (ii) the illumination power density allowance in (i) may be increased by dividing it by the illumination power density adjustment factor for a control device in Table J6.2b as applicable; and
 - (iii) when designing the lamp power density or illumination power density, the power of the proposed installation must be used rather than nominal allowances for exposed batten holders or luminaires; and
 - (iv) halogen lamps must be separately switched from fluorescent lamps.
- (b) In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building—
- (i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density in Table J6.2a; and
 - (ii) the aggregate design illumination power load in (i) is the sum of the design illumination power loads in each of the spaces served; and
 - (iii) where there are multiple lighting systems serving the same space, the design illumination power load for (ii) is—
 - (A) the total illumination power load of all systems; or
 - (B) where a control system permits only one system to operate at a time—
 - (aa) based on the highest illumination power load; or
 - (bb) determined by the formula—

$$[H \times T/2 + P \times (100 - T/2)] / 100$$
 where—
 - H = the highest illumination power load; and
 - T = the time for which the maximum illumination power load will occur, expressed as a percentage
 - P = the predominant illumination power load
- (c) The requirements of (a) and (b) do not apply to the following:
- (i) Emergency lighting provided in accordance with Part E4.
 - (ii) Signage, display lighting within cabinets and display cases that are fixed in place.
 - (iii) Lighting for accommodation within the residential part of a detention centre.
 - (iv) A heater where the heater also emits light, such as in bathrooms.
 - (v) Lighting of a specialist process nature such as in a surgical operating theatre, fume cupboard or clean workstation.
 - (vi) Lighting of performances such as theatrical or sporting.
 - (vii) Lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.
 - (viii) Lighting installed solely to provide photosynthetically active radiation for indoor plant growth on green walls and the like.
- (d) For the purposes of Table J6.2b, the following control devices must comply with Specification J6:
- (i) Lighting timers.
 - (ii) Motion detectors.
 - (iii) Daylight sensors and dynamic lighting control devices.

J6.3 Interior artificial lighting and power control

- (a) All artificial lighting of a room or space must be individually operated by—
- (i) a switch; or
 - (ii) other control device; or
 - (iii) a combination of (i) and (ii).
- (b) An occupant activated device, such as a room security device, a motion detector in accordance with Specification J6, or the like, must be provided in the sole-occupancy unit of a Class 3 building, other than where providing accommodation for people with a



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disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the sole-occupancy unit is unoccupied.

- (c) An artificial lighting switch or other control device in (a) must—
- (i) if an artificial lighting switch, be located in a visible and easily accessed position—
 - (A) in the room or space being switched; or
 - (B) in an adjacent room or space from where 90% of the lighting being switched is visible; and
 - (ii) for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse—
 - (A) not operate lighting for an area of more than 250 m² if in a Class 5 building or a Class 8 laboratory;
- or
- (B) not operate lighting for an area of more than—
 - (aa) 250 m² for a space of not more than 2000 m²; or
 - (bb) 1000 m² for a space of more than 2000 m², if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building
- (d) 95% of the light fittings in a building or storey of a building, other than a Class 2 or 3 building or a Class 4 part of a building, of more than 250 m² must be controlled by—
- (i) a time switch in accordance with Specification J6; or
 - (ii) an occupant sensing device such as—
 - (A) a security key card reader that registers a person entering and leaving the building; or
 - (B) a motion detector in accordance with Specification J6.
- (e) In a Class 5, 6 or 8 building of more than 250 m², artificial lighting in a natural lighting zone adjacent to windows must be separately controlled from artificial lighting not in a natural lighting zone in the same storey except where—
- (i) the room containing the natural lighting zone is less than 20 m²; or
 - (ii) the room's natural lighting zone contains less than 4 luminaires; or
 - (iii) 70% or more of the luminaires in the room are in the natural lighting zone.
- (f) Artificial lighting in a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp, must be controlled by a motion detector in accordance with Specification J6.
- (g) Artificial lighting in a foyer, corridor and other circulation spaces—
- (i) of more than 250 W within a single zone; and
 - (ii) adjacent to windows,
- must be controlled by a daylight sensor and dynamic lighting control device in accordance with Specification J6.
- (h) Artificial lighting for daytime travel in the first 19 m of travel in a carpark entry zone must be controlled by a daylight sensor in accordance with Specification J6.
- (i) The requirements of (a), (b), (c), (d), (e), (f), (g) and (h) do not apply to the following:
 - (i) Emergency lighting in accordance with Part E4.
 - (ii) Where artificial lighting is needed for 24 hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a detention centre.
 - (i) The requirements of (d) do not apply to the following:
 - (i) Artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as—
 - (A) in a patient care area in a Class 9a building or in a Class 9c building; or
 - (B) a plant room or lift motor room; or
 - (C) a workshop where power tools are used.
 - (ii) A heater where the heater also emits light, such as in bathrooms.

J6.4 Interior decorative and display lighting

- (a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled—
- (i) separately from other artificial lighting; and
 - (ii) by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and
 - (iii) by a time switch in accordance with Specification J6 where the display lighting exceeds 1 kW.
- (b) Window display lighting must be controlled separately from other display lighting.

J6.5 Exterior artificial lighting

- (a) Exterior artificial lighting attached to or directed at the facade of a building, must—



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(i) be controlled by—

- (A) a daylight sensor; or
- (B) a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and
- (ii) when the total lighting load exceeds 100 W—
 - (A) use LED luminaires for 90% of the total lighting load; or
 - (B) be controlled by a motion detector in accordance with Specification J6; or
 - (C) when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with Specification J6.

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

- (i) Emergency lighting in accordance with Part E4.
- (ii) Lighting around a detention centre.

J6.6 Boiling water and chilled water storage units

Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification J6.

J6.7 Lifts

Lifts must—

- (a) be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes; and
- (b) achieve the idle and standby energy performance level in Table 6.7a; and
- (c) achieve—
 - (i) the energy efficiency class in Table 6.7b; or
 - (ii) if a dedicated goods lift, energy efficiency class D in accordance with ISO 25745-2.

J6.8 Escalators and moving walkways

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

J7.3 Swimming pool heating and pumping

(a) Heating for a swimming pool must be by—

- (i) a solar heater; or
- (ii) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or
- (iii) a geothermal heater; or
- (iv) a gas heater that—
 - (A) if rated to consume 500 MJ/hour or less, achieves a minimum gross thermal efficiency of 86%; or
 - (B) if rated to consume more than 500 MJ/hour, achieves a minimum gross thermal efficiency of 90%; or
- (v) a heat pump; or
- (vi) a combination of (i) to (v).

(b) Where some or all of the heating required by (a) is by a gas heater or a heat pump, the swimming pool must have—

- (i) a cover with a minimum R-Value of 0.05; and
- (ii) a time switch to control the operation of the heater

(c) A time switch must be provided to control the operation of a circulation pump for a swimming pool.

(d) Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.

(e) Pipework carrying heated or chilled water for a swimming pool must comply with the insulation requirements of J5.8.

(f) For the purpose of J7.3, a swimming pool does not include a spa pool.

J7.4 Spa pool heating and pumping

(a) Heating for a spa pool that shares a water recirculation system with a swimming pool must be by—

- (i) a solar heater; or
- (ii) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or
- (iii) a geothermal heater; or



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- (iv) a gas heater that—
 - (A) if rated to consume 500 MJ/hour or less, achieves a minimum gross thermal efficiency of 86%; or
 - (B) if rated to consume more than 500 MJ/hour, achieves a minimum gross thermal efficiency of 90%; or
 - (v) a heat pump; or
 - (vi) a combination of (i) to (v).
- (b) Where some or all of the heating required by (a) is by a gas heater or a heat pump, the spa pool must have—
- (i) a cover with a minimum R-Value of 0.05; and
 - (ii) a push button and a time switch to control the operation of the heater.
- (c) A time switch must be provided to control the operation of a circulation pump for a spa pool having a capacity of 680L or more.
- (d) Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.
- (e) Pipework carrying heated or chilled water for a spa pool must comply with the insulation requirements of J5.8.

J8.3 Facilities for energy monitoring

- (a) A building or sole-occupancy unit with a floor area of more than 500 m² must have an energy meter configured to record the time-of-use consumption of gas and electricity.
- (b) A building with a floor area of more than 2 500 m² must have energy meters configured to enable individual time-of-use energy consumption data recording, in accordance with (c), of the energy consumption of—
- (i) air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
 - (ii) artificial lighting; and
 - (iii) appliance power; and
 - (iv) central hot water supply; and
 - (v) internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and
 - (vi) other ancillary plant.
- (c) Energy meters required by (b) must be interlinked by a communication system that collates the time-of-use energy consumption data to a single interface monitoring system where it can be stored, analysed and reviewed.
- (d) The provisions of (b) do not apply to a Class 2 building with a floor area of more than 2 500 m² where the total area of the common areas is less than 500 m².



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APPENDIX B – SECTION J – PRELIMINARY CLASS 2 REPORT



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SECTION J – PRELIMINARY RESULTS

LBS REFERENCE NUMBER: LBS12634

DATE: 24/01/2022

PROJECT ADDRESS: 357 Lord Street, Highgate WA 6003

BUILDING CLASS: Class 2

CLIMATE ZONE: ABCB 5 / NatHERS 13

REPORT COMMISSIONED BY: Arconic Design

ON BEHALF OF: Daniel Jovanovic

CLIENT REFERENCE NUMBER: -

SCOPE

Living Building Solutions (LBS) has completed preliminary energy modelling on the proposed apartment development for compliance with JP1 of the National Construction Code (NCC) 2019 Volume One. This report is not to be used for building rules consent and is to be read in conjunction with relevant compliance report(s).

NCC 2019 Volume One Amd.1 – Section J Compliance

Compliance with the Performance Requirements of JP1 in Section J of NCC 2019 Volume One can be achieved using either a *Performance Solution* and/or *Deemed-to-Satisfy Solution*.

JP1 Compliance Path

Class 2 - has been assessed for compliance using *Deemed-to-Satisfy Provisions J.02(a)-(e)*. Compliance with JP1 will be achieved for individual sole-occupancy units using *house energy rating software*, where units:

- (i) *Collectively achieve an average energy rating of not less than 6 stars, including separate heating and cooling load limits; and*
- (ii) *Individually achieve an energy rating of not less than 5 stars, including separate heating and cooling load limits*



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COMPLIANCE SUMMARY

Table 1 outlines the base specification assumed to assess each Class 2 unit. If applicable, required specification upgrades are outlined in Table 2.

Table 1 – Preliminary Specification

Drawing Reference	-
Plans	Construction as per plans Surfmist roof colour
Insulation	R4.0 insulation located at ceiling level to all lightweight roofs of apartments R2.5 insulation to all external heavyweight roofs of apartments R2.5 insulation to all external framed walls of apartments R1.0 insulation to all external concrete walls of apartments R1.0 insulation to soffit of Garage Carpark sections with apartments above
Glazing	Dowell SP10 single glazing (or equivalent) to the following zones: Apartment 1 – Living/Study Apartment 2 – Living/Void Apartment 3 – Living/Void Apartment 4 – Living Dowell single glazing (or equivalent) to all remaining windows and doors Velux double glazed or equivalent skylights
Sealing	All exhaust fans sealed to outside air
Services	Lighting as per 3.12.5.5 Input Data
Additional Requirements	If used, all downlights are a sealed IC rated LED system Additional Requirements outlined in Report Limitations (Page 4) All external walls must have: - A pliable building membrane installed in accordance with AS4200; or - Primary water control layer is separated from water sensitive materials by a drained cavity, installed in accordance with AS4200

Table 2 – Specification Upgrades

Unit No.	Upgrades
	As per Base Specification



SIMULATION RESULTS

Table 3 outlines the average and minimum star ratings for the Class 2 units, along with average and maximum energy intensity.

Table 3 – NatHERS Star Rating Results & Energy Intensity

	Proposed	NCC Requirement
Ave. Star Rating	6.6	≥ 6.0
Min. Star Rating	6.2	≥ 5.0
Ave. Annual Heating (MJ/m²)	N/A	≤ N/A
Max. Annual Heating (MJ/m²)	N/A	≤ N/A
Ave. Annual Cooling (MJ/m²)	N/A	≤ N/A
Max. Annual Cooling (MJ/m²)	N/A	≤ N/A

At the time of the assessment, not all provisions could be confirmed. In addition to Table 1 and 2, all units must be constructed in accordance with:

Part J1 Building Fabric

J1.2(a), J1.2(b), J1.2(c)

Part J3 Building Sealing

J3.2

J3.3(a), J3.3(b)

J3.4(a), J3.4(b), J3.4(c), J3.4(d)

J3.5(a)

J3.6(a), J3.6(b), J3.6(c)

J3.7(a), J3.7(b)

Part J5 Air-Conditioning and Ventilation Systems

J5.2(a), J5.2(b), J5.2(c)

J5.3(a), J5.3(b), J5.3(c), J5.3(d)

J5.4(a), J5.4(b), J5.4(c), J5.4(d), J5.4(e)

J5.5(a), J5.5(b), J5.5(c), J5.5(d)

J5.6

J5.7(a), J5.7(b), J5.7(c), J5.7(d), J5.7(e)

J5.8(a), J5.8(b), J5.8(c), J5.8(d), J5.8(e)

J5.9(a), J5.9(b), J5.9(c), J5.9(d)

J5.10

J5.11(a), J5.11(b)

J5.12(a), J5.12(b)

Part J6 Artificial Lighting and Power

J6.2(a), J6.2(c), J6.2(d)

J6.3(a), J6.3(b), J6.3(c), J6.3(d), J6.3(e), J6.3(f), J6.3(g), J6.3(h), J6.3(i), J6.3(j)

J6.4(a), J6.4(b)

J6.5(a), J6.5(b)

J6.6

J6.7(a), J6.7(b), J6.7(c)

J6.8

Part J7 Heated Water Supply and Swimming Pool and Spa Pool Plant

J7.2



Individual star ratings of Class 2 units are detailed in Table 4.

Table 4 – Detailed Class 2 Results

Unit	Annual Heating (MJ/m2)	Annual Cooling (MJ/m2)	Total (MJ/m2)	Star Rating
1	17.7	43.1	60.8	6.5
2	18.5	41.9	60.4	6.5
3	11.3	40.5	51.8	7.0
4	22.6	45.0	67.6	6.2



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APPENDIX C – TOTAL VOC LIMITS

Compliance with Low VOC products is met the product meets the requirements of Table 3 or is recognised under a Product Certification Scheme - <http://new.gbca.org.au/product-certification-schemes/>

Table 1 - Max TVOC Limits for Paints, Adhesive and Sealants

Product Category	Max TVOC content in grams per litre of ready to use product
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Interior wall and ceiling paint, all sheen levels	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Compliance with Carpets is met by demonstrating the carpet meets the requirements of Table 4 or is recognised under a Product Certification Scheme - <http://new.gbca.org.au/product-certification-schemes/>

Table 2 - Carpet Test Standards and TVOC Emissions Limit

Compliance Option	Test Protocol	Limit
ASTM D5116	ASTM D5116 - Total VOC limit*	0.5mg/m ² per Hour
	ASTM D5116 - 4-PC (4-Phenylcyclohexene)*	0.05mg/m ² per Hour
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m ² per hour
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5 mg/m ² per hour

* Both limits should be met when testing against ASTM D5116





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WASTE MANAGEMENT PLAN

PROJECT NAME
Proposed Mixed-use Development

PROJECT ADDRESS
357 Lord Street, Highgate WA 6003

BUILDING CLASS
2 | 6

CLIMATE ZONE
5

REPORT COMMISSIONED BY
Arconic Design

ON BEHALF OF
Daniel Jovanovic

CLIENT REFERENCE NUMBER
-



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DOCUMENT CONTROL

Revision	Date	Description	Author	Reviewed
V1.0	22 nd Feb 2022	Preliminary for client review	JM	NG
V1.1	4 th March 2022	For Submission	JM	NG
V1.2	7 th June 2022	RFI	JM	NG
V1.3	30 th June 2022	Design Change	JM	NG



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1.0 INTRODUCTION

The City of Vincent is committed to creating an environmentally sustainable and liveable city by incorporating environmentally sustainable design into new developments. As a part of the Planning Application, the City of Vincent has requested a Waste Management Plan be developed in accordance with the City of Vincent *Waste Guidelines for New Developments (May 2020)*.

This Waste Management Plan (WMP) has been prepared to assist the project team in achieving effective operational waste management that meets or exceeds the City of Vincent waste management objectives.

WASTE MANAGEMENT STRATEGY

The project team has collaborated to consider waste management principles and initiatives during the design phase that align with the City of Vincent waste management objectives. This report is to be in conjunction with other Environmentally Sustainable Development Reports (ESD). Principles have been based on the following ESD hierarchy:

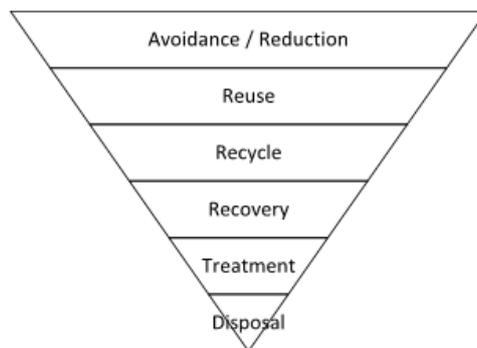


Figure 1 - ESD Hierarchy



SITE DESCRIPTION

Table 1 - Proposed Development

Address	357 Lord Street, Highgate WA 6003
Proposed building works	Proposed Mixed-use 4 Storey Development
Total Site Area	544 m ²
Ground Parking	316 m ²
Café*	27.36 m ²
Entry / Stairs	39.02 m ²
Apartments (No.)	4 x 3 Bedroom

* Nominated areas have been measured based on the floor area definition outlined in the National Construction Code Vol.1 2019 Amd.1



Figure 2 - Proposed Development

2.0 WASTE GENERATION

Table 2 outlines the predicted waste generation for the proposed tenancy. Calculations are based on the waste generation rates outlined in Appendix A of the City of Vincent *Waste Guidelines for New Developments (May 2020)*.

Table 2 – Café Waste Generation Rates

Occupancy	Classification	Area (m²)	General Waste (L)	Recycling (L)	FOGO (L)
Café	Café	25	74.0	49	30
Total Daily			74.0	49	30
Weekly Total (7 Days)			518	345	207

Table 3 – Apartment Waste Generation Rates

Occupancy	Classification	Bedrooms	General Waste (L)	Recycling (L)	FOGO (L)
Apartment 1	Residential	3	70	120	140
Apartment 2	Residential	3	70	120	140
Apartment 3	Residential	3	70	120	140
Apartment 4	Residential	3	70	120	140
Weekly Total (7 Days)			280	480	560

3.0 COLLECTION, SIZE, AND QUANTITY

In addition to the waste generation rates outlined above the City requires the following in accordance with Clause 7.2.6

7.2.6 - All waste storage facilities must be sized to be capable of containing a minimum of 2 weeks' worth of general waste and recycling and one week of FOGO regardless of any reduction in bin quantity or waste volume estimates from compaction or increased collection frequencies

Clause 7.2.6 allows for a change in use or occupancy and a possible increase in Waste Generation. In terms of waste classification and waste generation, the proposed Café is at its highest and best use and no increase in waste generation is expected, even if there was a change in occupancy. It is the tenant's contractual responsibility to ensure bins are presented for bin collection as per this waste management plan (Refer to Management section).

Table 4 – Café / Bar Pick-up Frequencies (Private Collection)

Waste Stream	Waste Generation (L)	Waste Bin Size (L)	No. Waste Bins	Pick Up Frequency
General Waste	518	360L 240L	1x360L 1x240L	1 x week
General Recycling	345	360L	2	1 x fortnight
FOGO	207	240L	1	1 x week



Clause 7.2.6 allows for a change in use or occupancy and a possible increase in Waste Generation. The council has outlined that the collection and bins provided by the council cannot meet the requirements of Clause 7.2.6 and therefore the project team has based the waste generation and collection on council bin provisions. This provision still allows for an increase in waste generation.

Table 5 – Apartment Pick-up Frequencies

Waste Stream	Waste Generation (L)	Waste Bin Size (L)	No. Waste Bins	Pick Up Frequency
General Waste	280	240L	3	1 x week
General Recycling	480	360L	3	1 x fortnight
FOGO	560	240L	3	1 x week

4.0 WASTE SYSTEMS

Recycling waste systems will be made just as accessible as garbage waste systems throughout the proposed development. Waste to be sorted on-site by employees as appropriate in the following streams:

- General Waste
 - To be bagged
- General Recycling
 - Disposed of loosely
- FOGO
 - To be bagged in compostable bags
- E-Waste | Hard Waste
 - To be transported to waste storage room / location

3.1 GENERAL WASTE

- Appropriately sized plastic lined bins for the temporary holding of general waste will be provided. Staff and tenants will transfer waste to the refuse area as required.

3.2 GENERAL RECYCLING

- Appropriately sized unlined bins for the temporary holding of general recycling will be provided. Staff and tenants will transfer waste to the refuse area as required.

3.3 LARGE CARDBOARD

- Employees and tenants will be responsible for breaking down and storing large cardboard in the general recycling bins provided.

3.4 BULK WASTE

- Bulk waste is to be temporarily stored on-site and collected through a private collection service. A dedicated bulk waste space is to be provided in accordance with Section 7.5 of the City of Vincent *Waste Guidelines for New Developments (May 2020)*. Refer to Section 5.1

3.5 FOOD WASTE

- Appropriately sized compostable bag lined bins for the temporary holding of food waste will be provided. Staff and tenants will transfer waste to the refuse area as required.



5.0 WASTE STORAGE

A dedicated bin room is to be provided within the proposed development.

Design consideration is to be given to the following key areas:

- Bin room size and layout
- Wash down area
- Ventilation
- Vehicle access
- Vermin control
- Noise reduction
- Stormwater pollution prevention

The dedicated compound / bin room(s) have been designed in accordance with the following design requirements:

- Have a floor area of not less than 5m² and sufficient space provided for the number of bins for each waste stream
 - **Total bin areas for café and apartments exceed 5m² and permit sufficient space of bins and waste streams**
- Each bin must have minimum 50mm clearance around all sides
 - **Refer to drawings**
- Each bin store to have an aisle width of ≥1000mm
 - **Catered for in Apartment bin store, due to bin room sizes for café this is not feasible / required as there is sufficient space for access and manoeuvring of bins**
- Each bin store to have an access point of ≥1000mm
 - **Catered for in apartments, due to bin room sizes for café this is not feasible / required as there is sufficient space for access and manoeuvring of bins**
- Located in a convenient position with internal access for staff
 - **All bin rooms are in a convenient location, with recycling waste just as accessible as general waste**
 - **All bin rooms located in accessible possible for manual movement to collection locations**
- To be enclosed, undercover, and designed to prevent stormwater runoff
 - **All bin rooms are enclosed and undercover**
- Clear signage of bin store and waste streams. Signage to outline guidance on the separation of waste streams
 - **Project to incorporate clear signage of bin rooms and wastes streams in accordance with local relevant authority guidelines**
- Walls and floor constructed of a material which facilities cleaning of the bin store
 - **Construction is of impervious surfaces and durable materials to facilitate cleaning**
- Secure and have self-closing doors
 - **As per Clause 7.2.5, roller doors are being used in Cafes due to space**
 - **Door to Apartment Bin Store is self-closing**
- Ventilation:
 - **Café Bin Store 1 is mechanically ventilated through external exhaust extraction**
 - **Café Bin Store 2 and Apartment Bin Store are ventilated via permanent louvered panels**
- A drained wash down area to wash down bins as required
 - **Wash down area with wash cock and floor waste located in Northwest corner of underground parking area**
- Artificial lighting, with sensor or switch controlled both internal/external of the room.



5.1 BULK WASTE (APARTMENTS)

Development to provide a bulk waste store to allow temporary storage of bulky items while awaiting disposal. The City offers one bulk waste verge collection to residents each year and on demand mattress and white goods collections at a cost.

Design consideration is to be given to the following key areas:

- Readily accessible to all residents
- Secure
- Have a minimum doorway width of 1500mm
- A minimum area of 4m²

Each apartment has been provided with an onsite storage. As per Figure 3, apartment 1 and 4 storage is located on the Ground floor and apartment 2 and 3 Storage is located on the Roof Terrace. All storage areas are readily accessible by each apartment, secure and > 4m². Whilst the entry door width is 820mm, the size and layout of each storage unit permits access for most large household items (inc. mattress). Due to the large floor area of each apartment, it is expected that any other bulky items that do not fit in the dedicated storage area can be stored temporarily in each apartment.

Figure 3 - Apartment Storerooms



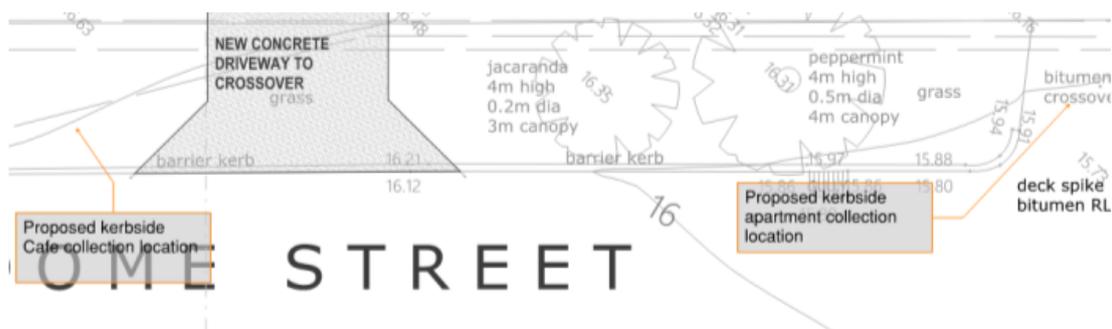
6.0 COLLECTION LOCATION

Waste collection location is to be via the verge with design consideration is to be given to the collection location to ensure:

- Bins must be presented to the verge on the specified collection day for collection
- Bins placed on the verge for collection must not be placed on a neighbouring verge
- Bins should be stored behind the property boundary line, within 24 hours of collection
- Bins placed for collection on the verge must not obstruct pedestrians, street furniture or bike lanes. Bins must be placed at least 1m from cars, street signs or power poles and 1m away from trees, not under the tree canopy. A discussion with the City's Waste Team regarding bin placement under tree canopies is required if there is no other option for bin positioning
- Bins are to be lined up neatly and in a single row along the verge and have no less than 0.5m spacing between each bin
- Where more than 5 x 240L bins are to be presented to the verge, an area must be paved to accommodate the bins on the verge and allow passage to and from the storage area
- Surfaces of all bin travel paths must be designed to allow easy transportation of the bins. Travel paths should be level and with smooth non-slip surfaces and be finished in a way which reduces the noise of the bins as they are manoeuvred
- The travel path between the bin store and the collection point is to be kept free of obstacles and steps
- Gradients of bin travel paths must not exceed 1:14 for two wheeled bins and 1:30 for four wheeled bins

The proposed collection locations are outlined in Figure 4:

Figure 4 - Collection Locations



5.2 COLLECTION TIMES

The apartments will be subject to collection by the City's Residential Waste Services and the Café may use the City's Commercial Collection Service or seek private waste collection arrangements. Collection days and times to be derived by the City.



7.0 ON-GOING MANAGEMENT

It is the responsibility of the building manager and the tenants that the principles documented in this WMP are implemented and enforced:

- Tenancy agreements are to outline scheduled waste collection dates
- Tenancy agreements are to outline it is the responsibility of the tenants to ensure bins are presented at agreed collection location on the agreed collection dates.
- Building Strata to monitor and evaluate waste management plan and adjust waste management practices accordingly

8.0 CONCLUSION

The contents of this WMP assesses the proposed development against the City of Vincent waste management requirements and is subject to approval by the relevant authority. Variations to predicted waste streams, waste storage areas, or additional council requests will require a revision to this Waste Management Plan.

DISCLAIMER

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Summary of Submissions:

The tables below summarise the comments received during the advertising period of the proposal, together with the City’s response to each comment.

Comments Received in Support:	Administration Comment:
<p><u>General</u></p> <p>The proposal will be great for the local area. The building is a nice design, it will look much better than the existing building and has plenty of parking. Overall the look of the street will be much improved by this building.</p>	<p>Noted.</p>
Comments Received in Objection:	Administration Comment:
<p><u>General</u></p> <ul style="list-style-type: none"> • Object to the height of the project, and the fact that the project is both commercial and residential. A two storey residential only building would be a more acceptable option. • Concerned about the adjoining properties to the south being completely surrounded by high-rise buildings. 	<p>The height and scale of the proposal is consistent with the applicable planning framework to the subject site and those along this section of Lord Street, including the adjoining properties to the south. The subject site and adjoining properties are zoned Residential R100 under the City’s Local Planning Scheme No.2, which is recognised as a higher density residential area under the Residential Design Codes Volume 2, and they have a building height standard of six storeys under the acceptable outcomes of the City’s Built Form Policy. The proposal is for a four storey building with only four apartments, and is therefore consistent with the desired future scale and character of Lord Street and an appropriate response for the lot size.</p>
<p><u>Design</u></p> <ul style="list-style-type: none"> • The existing dwelling adds considerably to the streetscape. Highgate has lost too many old dwellings recently, and more unsightly developments impacting the appearance of Highgate is opposed, especially when they are being built over older properties that added considerable character to the suburb. The many high-rise apartment buildings constructed along Lord Street recently are architecturally insignificant, and are weathering poorly due to their poor-quality design and construction. They have greatly diminished the charm and character of the area and have not benefitted the community. • The City’s policies state that new dwellings should respect the existing character of the locality and streetscape, and concerns are raised that the development would not do that. 	<ul style="list-style-type: none"> • The existing dwelling is not heritage listed and is permitted to be demolished without the need for development approval under the <i>Planning and Development Regulations 2015</i>. • The design of the proposal has been reviewed by the City’s Design Review Panel who have supported it, including in relation to aspects of the proposal such as context and character, community and aesthetics. The development includes recycled red face brick, white rendered brick and timber elements to reference and tie into the existing context in the surrounding area. • Refer to the comments above under ‘General’ regarding the height and scale of the proposal, and its consistency with the applicable planning framework to Lord Street.

Summary of Submissions:

Comments Received in Objection:	Administration Comment:
<ul style="list-style-type: none"> The rear southern wall of the development is very high and will negatively impact the views of surrounding properties. The building should be set back further to allow for tall perennial trees to be planted to obscure views. As per City's policy, new dwellings have to respect the existing character of the locality and streetscape. There is no building of this nature or style in the vicinity. A redesign of the building needs to be performed with height the prime concern to be addressed. The proposed design does not ensure the amenity of neighbouring properties is maintained. 	<ul style="list-style-type: none"> The acceptable outcomes of the Built Form Policy outline that developments are permitted to have nil setbacks to the adjoining properties for the first three floors. The rear southern wall of the development has a nil setback for the first two floors, and the upper two floors have been set back a minimum of 2.7 metres from the southern boundary to reduce the impact on the southern adjoining properties.
<p><u>Construction</u></p> <ul style="list-style-type: none"> Neighbours are tired of the constant noise, disruption and inconvenience of construction occurring near their properties, particularly the development at 70 Wright Street, Highgate. This development has been a building site for more than two years now, and further construction taking place nearby is opposed. The subject site is over the road from a day care centre and a park much-used by the local community, and concerns are raised at the risk it may pose to these amenities, in terms of the community's safety and quiet enjoyment when utilising them. Residents of adjoining properties have had to endure years of noise generated by the construction site at 70 Wright Street, which has no definite timeframe for completion. It would be completely unreasonable to expect people to endure even more noise from an additional construction site when the existing site has not been completed. Some residents are shift workers and need to sleep during the daytime, and constant construction during these periods is very disruptive. A crane will be required for construction of the development which will be very unaesthetically pleasing for surrounding homeowners. There is already a crane over the surrounding properties from the development at 70 Wright Street. Noise levels would be unacceptably high with two cranes around these properties and it would be unfair. Concerned about more construction in the area, and associated impacts of noise, dust and a crane hanging over surrounding properties. Concerned that similar to 70 Wright Street that the developer could go into liquidation and that there would be an unfinished building site with no known completion date. 	<ul style="list-style-type: none"> Concerns regarding the proximity to, progress and management of other nearby developments under construction are not relevant planning matters in the consideration of this application. However, it is recognised that the subject site is constrained from a construction perspective due to its size, location adjacent to Lord Street and proximity to adjoining properties. Primary access would be also be from Broome Street which is an access road used by surrounding residential properties and visitors to the nearby park, school and businesses. <p>The careful management of the construction process and associated off-site impacts is required to ensure that the development does not have an adverse impact on the amenity of the surrounding residential properties, in particular those to the west and south.</p> <p>A condition is recommended to be imposed requiring the submission of a construction management plan prior to the issue of a building permit in accordance with the City's Policy No. 7.5.23 – Construction Management Plans. This would require the builder and/or development to demonstrate how the construction process and off-site impacts would be managed, including details on construction hours, crane location and operation, noise control, dust management, traffic management and access, and public safety.</p>

Summary of Submissions:

Comments Received in Objection:	Administration Comment:
<ul style="list-style-type: none"> • Neighbouring properties have already been impacted by the development on 70 Wright Street with a crane directly overlooking gardens and properties. The development on 70 Wright Street is far from completion. It would be unacceptable to have another crane over these properties. The potential location of the crane is not yet known and they are dangerous. The City needs to consult neighbouring properties on the crane safety and its location even after the public consultation period is closed. The adverse aesthetic effect of having a second crane directly above these properties also needs to be addressed. With potentially two building sites in the area, acceptable noise levels cannot be adhered to as per the regulations. Should the development be approved, work should only commence once the building on 70 Wright Street is fully completed and commissioned. 	
<ul style="list-style-type: none"> • The City should check that the setbacks are according to the regulations and regular checks must be performed during construction to make sure approved drawings are adhered to. • The adjoining properties should have a grace period of at least two years where no weekend work can be performed for this development given the impact of construction work on Saturday mornings for the development at 70 Wright Street. Weekend construction works disrupt the peace and quiet of the surrounding community and their mental health. 	<ul style="list-style-type: none"> • The City would complete an inspection at occupancy permit stage to ensure that the development, if approved, has been constructed in accordance with the approved plans.
<ul style="list-style-type: none"> • Question whether there is a reserve fund available for completion of the building if the building constructors go into liquidation. Concerns that there will potentially be another unfinished building in the area like 70 Wright Street. • Concerned that the building will require a crane to be constructed. With the existing crane, slow pace of construction and noise impacts (including on Saturday mornings) for the development at 70 Wright Street, there are concerns that this development will start construction when 70 Wright Street is still ongoing. 	<ul style="list-style-type: none"> • The City does not have a reserve fund available for completion of a building if the builder goes into liquidation. If construction works aren't completed within the two year period that a building permit is valid for, the current or new developer can apply to extend the validity of the building permit to continue the works. If they did not make this application and construction works weren't progressing, the City would follow up the developer to understand the situation, however the City would not be able to take enforcement or prosecution action on this basis. The appropriate contact for these situations would be the Department of Mines, Industry, Regulation and Safety.

Summary of Submissions:

Comments Received in Objection:	Administration Comment:
<p><u>Privacy</u></p> <ul style="list-style-type: none"> • Currently the balconies of the apartments at 337 Lord Street completely overlook the driveway of 5 Broome Street and they also have a direct line of sight into some of the units. Given how tall the proposed development will be, this will further impede upon the privacy of adjoining properties by directly overlooking people’s backyards. • Many elements of the visual privacy requirements are not met, meaning there will be overlooking over all surrounding properties, resulting in a permanent loss of privacy. • Privacy of surrounding properties will be compromised with each of the dwellings having roof terraces. This will also cause lots of noise issues. • The roof terraces will overlook the adjoining properties and would seriously impact on privacy. Overlooking should be directed towards Lord Street or Broome Street. • The four roof terraces directly overlooking adjoining properties disregards the privacy of these properties. This will also create a noise issue at night for neighbouring properties. The roof terraces need to be facing Broome Street to avoid privacy and noise issues. • The four storey building will allow occupants to look into the courtyards of adjoining properties. 	<ul style="list-style-type: none"> • The proposal would not adversely impact the privacy of the adjoining properties, with all windows on the upper floors either being highlight windows, set back in accordance with the acceptable outcomes or only overlooking spaces which do not contain private outdoor living areas or major openings to habitable rooms. <p>The roof terraces have been designed to minimise overlooking as the usable area of the roof terraces is separated from the adjoining properties by planters with a width of 1.3 metres and an internal height of 1.0 metre above the floor level. This restricts the ability of users to look down directly towards the outdoor living areas and habitable rooms of the adjoining properties, and ensures that views are directed out from the roof terraces above these properties. This is demonstrated by the diagrams in the development plans in Attachment 1 (Sheet 12 and 13). This would be further assisted by the planters containing landscaping offering visual and noise screening, including small plantings with expected heights ranging from 10 to 50 centimetres along with four <i>Prunus cerasifera</i> (Flowering Plum) trees with expected heights of 5 metres. In regards to noise, future occupants would be required to comply with the noise levels in the <i>Environmental Protection (Noise) Regulations 1997</i>.</p>
<p><u>Building Height</u></p> <p>The building will be very high and will negatively impact surrounding properties, particularly as sunlight will be blocked to homes.</p>	<p>Refer to the comments above under ‘General’ regarding the height and scale of the proposal, and its consistency with the applicable planning framework to Lord Street.</p>
<p><u>Overshadowing</u></p> <ul style="list-style-type: none"> • The back wall of the development will block sunlight off the driveway of Broome Street providing access to 5 Broome Street. This will significantly reduce any natural light coming through to the area, taking away the openness of the shared area of the property at 5 Broome Street. This property is already surrounded by large apartment blocks on two sides of the property, and having a third will create a boxed in effect by a valley of buildings. • The four storey building will block sunlight to the adjoining properties. • The building is too high and will block sunlight for adjoining properties which has implications for their solar panels. 	<p>Refer to the comments above under ‘General’ regarding the height and scale of the proposal, and its consistency with the applicable planning framework to Lord Street. Overshadowing of the adjoining properties in mid-winter (between 9am and 3pm) is demonstrated by the diagrams in Attachment 3 (SK1 to SK7). These demonstrate that in the worst-case periods of the morning in mid-winter, overshadowing to the west will only fall on the driveway and landscaped areas of the western adjoining property and not onto any private open spaces or windows to habitable rooms. To the south, although overshadowing will fall over habitable rooms and open spaces of the southern adjoining properties, the diagrams demonstrate that in the afternoon that the open spaces of the southern adjoining properties will still be capable of receiving solar access. This is considered an appropriate outcome when looking at the future development context and the applicable planning framework of these properties as set out above, with the existing buildings likely to change in the future to be of a similar built form and scale to the proposal. It is noted that no existing solar panels would be overshadowed by the proposal.</p>

Summary of Submissions:

Comments Received in Objection:	Administration Comment:
<p><u>Traffic</u></p> <ul style="list-style-type: none"> Concerns with increased traffic using Broome Street from changes to the surrounding local network as well as from this development, particularly with many young children around the kindergarten and adjacent playground. The proposed café is likely to create serious traffic and congestion in an already busy area on the corner of Lord Street, with a school and medical centre in the vicinity. The café is not appropriate for the location as this will increase traffic on an already busy road (Broome Street), where traffic will further increase due to the proposed change to the local road network. This is a clear danger to the primary school which has no pedestrian walkway or speed bumps to protect children and their parents during school drop-offs and pick-ups. 	<p>The proposal is not expected to generate a significant amount of traffic given that it is only for four dwellings and small 24.7 square metre café tenancy, where it's expected that the majority of patrons will be from the surrounding area. The proposal is classified as low impact under the Western Australian Planning Commission's Transport Impact Assessment Guidelines and doesn't require a transport impact statement to be submitted. This only needs to be submitted when developments meet the threshold for moderate impact, with this being a minimum of 10 dwellings and/or a café with a minimum floor area of 200 square metres (or 100 seats/patrons).</p>
<p><u>Parking</u></p> <ul style="list-style-type: none"> The current planning assessment proposes the use of approximately 24 parking spots on Broome Street. This is concerning when there is rarely even close to this number of spots available, and this is further limited during school drop off times and in the evenings when the dog park is busiest. There is not enough parking to support a cafe and visitors to the development. Parking on Broome Street is already at a premium, especially due to the day care, dog park and adjacent businesses as well as local residents. Concerns that no bicycle parking is provided and question how this is acceptable or consistent with Vincent's other policies and initiatives. The proposal includes the use of 24 parking spaces on Broome Street. Most spaces are already taken up with visitors from the school, medical centre and dog park. The development has the potential to create an unacceptably high amount of congestion and accidents, which is concerning given the school nearby. There is limited parking availability on Broome Street already due to the day care centre, the medical centre and the dog park nearby. There is not parking available on Broome Street for the café users. It's indicated that 24 parking spots on Broome Street will be used. This is unacceptable and unrealistic in the current situation, where there is a primary school, medical centre and dog park which all occupy the parking spots. This would be made worse by the café, and is against the City's policy of discouraging vehicle traffic in the area. There is ample 	<ul style="list-style-type: none"> The 24 car parking bays on Broome Street would remain as being publicly available and no change is proposed to the operation of these as part of the proposal. A total of six bicycle parking bays have been provided, with four located within the internal parking area for the use of residents, visitors and café staff, and two located externally on Lord Street for the use of visitors and café patrons. The 10 car parking bays provided on-site is considered adequate to accommodate demand associated with the proposal. One car bay is provided within the internal parking area for visitors to the dwellings. This is considered appropriate given that the proposal only includes four dwellings. Although no car parking is allocated for café patrons, this is considered appropriate given the café's size as it would only be capable of accommodating a limited amount of seating and customers. The applicant has stated that the café will primarily cater for local residents or people travelling to and from work as it has been designed to allow takeaway and with limited space for seating. This is considered likely given the residential nature of the immediate surrounding area. These patrons will

Summary of Submissions:

Comments Received in Objection:	Administration Comment:
<p>public transport access and the allowance of 24 car spots on Broome Street shouldn't be granted.</p> <ul style="list-style-type: none"> Concerned that the development is located on the busy corner of Broome Street and Lord Street where parking is already at a premium. 	<p>be able to walk to the café using the existing pedestrian paths along Broome Street and Lord Street, with cyclists then accommodated by the provision of two short term bicycle parking bays outside the café to Lord Street. It is considered that any additional visitor and café patron demand outside of this can be accommodated with the on-street parking available in the surrounding area. The City has reviewed its parking data for Broome Street which indicates that there is capacity available in the event that this is needed by visitors or café patrons.</p>
<p><u>Street Setback</u></p> <p>The setbacks on Broome Street are less than required and will impact streetscape and amenity of the area.</p>	<p>The street setback provided is considered adequate as the ground floor setback is a minimum of 1.8 metres which allows deep soil areas to be provided along Broome Street which would accommodate eight trees. This compliments the existing landscape character along Broome Street while also assisting to soften the appearance of the building from the street. The ground floor setback to Broome Street also contains landscaping, retaining walls, an outdoor café terrace and a community pocket park with public seating and art work. This provides a clear transition between the public and private realm, with these areas designed and landscaped to be publicly accessible and to add to the amenity of Broome Street. These will also assist to activate and provide visual interest from the proposal at the ground level to Broome Street.</p>
<p><u>Side and Rear Setbacks</u></p> <ul style="list-style-type: none"> The side and rear setbacks are much smaller than required. This will make the 4 storey building imposing from the neighbouring properties The side setbacks are insufficient to allow for adequate daylight and direct sun onto the adjoining properties. The setbacks do not allow for landscaping between the proposed four storey building and the neighbouring dwellings to soften the visual appearance. 	<p>The proposal has a side and rear setback standard of nil for the first three floors under the acceptable outcomes of the City's Built Form Policy, with greater setback standards applying for the third floor under the acceptable outcomes. The proposal has its first two floors with a nil setback to the southern boundary and it has been set back a minimum of 1.9 metres from the western boundary which allows the landscaping to be provided to soften the appearance of the building. The third floor has been set back further from the southern boundary by a minimum of 2.7 metres and from the western boundary by a minimum of 3.7 metres with these only being to a low planter wall surrounding the roof terrace. This planter would contain landscaping which would again assist to soften the appearance of the building. The above along with the setbacks of the lower levels and the skillion roof design which is lower towards the south would assist in reducing the impact of building bulk and scale on the adjoining properties. Refer to the comments above under 'General' regarding the height and scale of the proposal, and it's consistency with the applicable planning framework to Lord Street.</p>

Summary of Submissions:

Comments Received in Objection:	Administration Comment:
<p><u>Plot Ratio</u></p> <p>The plot ratio exceeds the standards, again resulting in an imposing building adjacent to 1 and 2 storey buildings.</p>	<p>Refer to the comments above under 'General' regarding the height and scale of the proposal, and it's consistency with the applicable planning framework to Lord Street.</p>
<p><u>Landscaping</u></p> <ul style="list-style-type: none"> • The tree species are deciduous and non-native/endemics. Question how this is acceptable given the City's other policies, and also raise concerns with this meaning that the bulk of the building will be exposed for 5 to 6 months a year. • Perennial trees tall enough to cover the building need to be planted to minimise the adverse visual effect on neighbouring properties. The design needs to allow for further setbacks in order to allow for this. 	<p>The landscaping plan has been updated to include evergreen and native tree species, with these assisting to reduce the bulk and soften the appearance of the building. Refer to the comments above under 'Side and Rear Setbacks'.</p>
<p><u>Other</u></p> <p>To minimise kitchen smells from the café kitchen, all outward extractors need to be directed onto Lord Street. The bin location needs also to be on the Lord Street side so as to avoid noise and smell issues to adjoining properties.</p>	<p>Standard advice notes have been recommended to advise the applicant that the café and associated mechanical devices will need to comply and operate in accordance with the <i>Environmental Protection (Noise) Regulations 1997</i>, <i>Food Act 2008</i>, <i>Food Regulations 2009</i> and the <i>Australia New Zealand Food Standards Code</i>. The bins would be picked up on Broome Street similar to other residential properties along Broome Street as this is where the main frontage and building access point to the bin storage areas is located.</p>

Comments Received in Support:	Administration Comment:
<p><u>Parking</u></p> <p>It's noted that 10 undercroft car parking bays would be provided. Given that the proposal is for four 4-bedroom apartments, it is highly probable that parking for apartment visitors coupled with the café staff and its patrons will exceed the two bays provided for this purpose. The only available alternative is to park in Broome Street, where street parking is rarely available. Concerned that apartment visitors or café patrons will park in Broome Street or the private car parks of adjoining businesses. This will disadvantage the staff and visitors to these businesses who may be forced to park some distance away from the businesses. There would also be no way of policing unauthorised parking or identifying such vehicles, presenting a major inconvenience to businesses if this were to occur. The City should assist to provide restrictions and signage over the private car parks to ensure that this doesn't occur.</p>	<p>Refer to the comments above under 'Parking'. Management of car parks on private property associated with businesses is the responsibility of the landowner and occupier</p>

Note: Submissions are considered and assessed by issue rather than by individual submitter.

Summary of Submissions:

The tables below summarise the comments received during the advertising period of the proposal, together with the Applicant's response to each comment.

Comments Received in Support:	Applicant Comment
<p><u>General</u></p> <ul style="list-style-type: none"> The proposal will be great for the local area. The building is a nice design, it will look much better than the existing building and has plenty of parking. Overall, the look of the street will be much improved by this building. 	<p>We agree with the comment. It will definitely enhance the local area.</p>
Comments Received in Objection:	Applicant Comment
<p><u>General</u></p> <ul style="list-style-type: none"> Object to the height of the project, and the fact that the project is both commercial and residential. A two storey residential only building would be a more acceptable option. Concerned about the adjoining properties to the south being completed surrounding by high-rise buildings. 	<p>The height of the building is well under what is permissible- in theory we would be able to add an additional 2 stories. By not extending the height to its permissible maximum, keeping the roof to a low pitch, and stepping the top level back to have a roof terrace has allowed for maximum solar access to the R100 coded site to the south.</p> <p>This property is located in the high transit corridor and the property to the south will eventually be developed to a building typology of up to six storeys. Apartment proposals are preferred in policy 7.1.1</p> <p>Properties to the south are all coded R100, these will eventually be developed to six storeys in height.</p>
<p><u>Design</u></p> <ul style="list-style-type: none"> The existing dwelling adds considerably to the streetscape. Highgate has lost too many old dwellings recently, and more unsightly developments impacting the appearance of Highgate is opposed, especially when they are being built over older properties that added considerable character to the suburb. The many high-rise apartment buildings constructed along Lord Street recently are architecturally insignificant, and are weathering poorly due to their poor-quality design and construction. They have greatly diminished the charm and character of the area and have not benefitted the community. The City's policies state that new dwellings should respect the existing 	<p>357 Lord Street is within the High Transit Corridor. The existing property is not registered as a significant residence.</p> <p>The proposed development is a positive proposal that responds to the city of Vincent policy 7.1.1 which encourages development up to 6 storeys. This would entail a significant shift in the typology that currently exists but will over time change to accommodate the new development as per the guidelines of policy 7.1.1</p>

Comments Received in Objection:	Applicant Comment
<p>character of the locality and streetscape, and concerns are raised that the development would not do that.</p> <ul style="list-style-type: none"> The rear southern wall of the development is very high and will negatively impact the views of surrounding properties. The building should be set back further to allow for tall perennial trees to be planted to obscure views. As per City’s policy, new dwellings have to respect the existing character of the locality and streetscape. There is no building of this nature or style in the vicinity. A redesign of the building needs to be performed with height the prime concern to be addressed. The proposed design does not ensure the amenity of neighbouring properties is maintained. 	<p>The proposed development has recycled brickwork as part of the external material palette to provide a link to the existing residential character of the area.</p> <p>The southern wall height is within the recommended heights allowable for the R100 coded site. It would be envisaged that future development of the adjacent site may possibly build up to the same boundary and also up to 2 storeys.</p> <p>As forementioned the overall height of the building is 2 storeys less than what is allowed so solar access to the adjacent site is favourable within the design constraints allowable. On the southern wall it is also proposed to provide a wall mural to enhance and reduce its visual impact.</p>
<p><u>Construction</u></p> <ul style="list-style-type: none"> Neighbours are tired of the constant noise, disruption and inconvenience of construction occurring near their properties, particularly the development at 70 Wright Street, Highgate. This development has been a building site for more than two years now, and further construction taking place nearby is opposed. The subject site is over the road from a day care centre and a park much-used by the local community, and concerns are raised at the risk it may pose to these amenities, in terms of the community’s safety and quiet enjoyment when utilising them. Residents of adjoining properties have had to endure years of noise generated by the construction site at 70 Wright Street, which has no definite timeframe for completion. It would be completely unreasonable to expect people to endure even more noise from an additional construction site when the existing site has not been completed. Some residents are shift workers and need to sleep during the daytime, and constant construction during these periods is very disruptive. A crane will be required for construction of the development which will be very unaesthetically pleasing for surrounding homeowners. There is already a crane over the surrounding properties from the development at 70 Wright Street. Noise levels would be unacceptably high with two cranes around these properties and it would be unfair. 	<p>It is unfortunate that 70 Wright Street has caused the concerns listed here specifically- Wright Street is a much larger development site and the owner of 357 Lord Street has no ownership or involvement in that particular site.</p> <p>The proposed construction of the apartment will have a construction management plan prepared as part of the building license application.</p> <p>The management plan will address any associated impacts that could occur during the construction phase of the project. This construction plan will address items such as noise, construction start and finish times, machinery use and application on site, dust and waste management, general noise control etc</p> <p>Financial checks for both developer and builder will undergo relevant checks and balances. Due diligence will be part of the normal formal process regarding financial requirements. Required insurances will be applied to the construction project. The developer will have all the necessary financial requirements satisfied prior to any start of construction.</p> <p>A construction management plan will outline any construction times for day-to-day operations and will be in line with any permissible regulations and criteria.</p>

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Comments Received in Objection:	Applicant Comment
<ul style="list-style-type: none"> • Concerned about more construction in the area, and associated impacts of noise, dust and a crane hanging over surrounding properties. Concerned that similar to 70 Wright Street that the developer could go into liquidation and that there would be an unfinished building site with no known completion date. • Neighbouring properties have already been impacted by the development on 70 Wright Street with a crane directly overlooking gardens and properties. The development on 70 Wright Street is far from completion. It would be unacceptable to have another crane over these properties. The potential location of the crane is not yet known and they are dangerous. The City needs to consult neighbouring properties on the crane safety and its location even after the public consultation period is closed. The adverse aesthetic effect of having a second crane directly above these properties also needs to be addressed. With potentially two building sites in the area, acceptable noise levels cannot be adhered to as per the regulations. Should the development be approved, work should only commence once the building on 70 Wright Street is fully completed and commissioned. • The City should check that the setbacks are according to the regulations and regular checks must be performed during construction to make sure approved drawings are adhered to. • The adjoining properties should have a grace period of at least two years where no weekend work can be performed for this development given the impact of construction work on Saturday mornings for the development at 70 Wright Street. Weekend construction works disrupt the peace and quiet of the surrounding community and their mental health. • Question whether there is a reserve fund available for completion of the building if the building constructors go into liquidation. Concerns that there will potentially be another unfinished building in the area like 70 Wright Street. • Concerned that the building will require a crane to be constructed. With the existing crane, slow pace of construction and noise impacts (including on Saturday mornings) for the development at 70 Wright Street, there are concerns that this development will start construction when 70 Wright Street is still ongoing. 	<p>The plan will also have a project timeframe for the start and completion of the project.</p>
<p>Privacy</p>	

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Comments Received in Objection:	Applicant Comment
<ul style="list-style-type: none"> Currently the balconies of the apartments at 337 Lord Street completely overlook the driveway of 5 Broome Street and they also have a direct line of sight into some of the units. Given how tall the proposed development will be, this will further impede upon the privacy of adjoining properties by directly overlooking people’s backyards. Many elements of the visual privacy requirements are not met, meaning there will be overlooking over all surrounding properties, resulting in a permanent loss of privacy. Privacy of surrounding properties will be compromised with each of the dwellings having roof terraces. This will also cause lots of noise issues. The roof terraces will overlook the adjoining properties and would seriously impact on privacy. Overlooking should be directed towards Lord Street or Broome Street. The four roof terraces directly overlooking adjoining properties disregards the privacy of these properties. This will also create a noise issue at night for neighbouring properties. The roof terraces need to be facing Broome Street to avoid privacy and noise issues. The four storey building will allow occupants to look into the courtyards of adjoining properties. 	<p>Permanent obscuring of the first-floor bed 4 window will occur to part of the window which will now allow for no overlooking of the property on the south.</p> <p>There are two small windows on the first floor U4 sitting/ theatre- these only impinge 1.15m into the western property and only over the common access leg (driveway) into the grouped development site adjacent. No privacy has been adversely affected to neighbouring properties by these windows as there are no active outdoor areas within these areas within the required dimensions of the cones of visions.</p> <p>The roof terraces planters have been increased in width to allow for more plants to screen and further reduce the downwards sightlines, thus not impinging the privacy of adjacent neighbouring properties. A further permanent planting structure (planter) has been applied to the western side of U4 terrace.</p> <p>You will not be able to see into any adjacent courtyards as a result of sightlines not being downwards as demonstrated via the diagrams on section A and B of the drawings.</p>
<p><u>Building Height</u></p> <ul style="list-style-type: none"> The building will be very high and will negatively impact surrounding properties, particularly as sunlight will be blocked to homes. 	<p>The height of the building is well under what is permissible- in theory we would be able to add an additional 2 stories. By not extending the height to its permissible maximum, keeping the roof to a low pitch, and stepping the top level back to have a roof terrace has allowed for maximum solar access to the R100 coded site to the south. This property is located in the high transit corridor and the property to the south will eventually be developed to a building typology of up to six storeys.</p> <p>The proposed development also tapers down to the east and western boundaries to further reduce over shadowing of adjacent sites.</p>
<p><u>Overshadowing</u></p> <ul style="list-style-type: none"> The back wall of the development will block sunlight off the driveway off Broome Street providing access to 5 Broome Street. This will 	<p>A separate overshadowing diagram from an external consultant has completed for the site. Currently there are no restrictions in overshadowing for the R100 coded site. We have however a reduced the overall building</p>

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Comments Received in Objection:	Applicant Comment
<p>significantly reduce any natural light coming through to the area, taking away the openness of the shared area of the property at 5 Broome Street. This property is already surrounded by large apartment blocks on two sides of the property, and having a third will create a boxed in effect by a valley of buildings.</p> <ul style="list-style-type: none"> • The four storey building will block sunlight to the adjoining properties. • The building is too high and will block sunlight for adjoining properties which has implications for their solar panels. 	<p>height to 4 storeys compared to the allowable 6 storey maximum, being a total of 2 storeys less than allowable. On the 4th storey towards the rear southern boundary there is a roof terrace which reduces the overall height</p> <p>down to essential 3 storeys and thus reducing the overall impact of the building further. The outcome is favourable if the development site were to be designed to what is allowed in regards to a maximum height of 6 storeys. The proposed development also tapers down to the east and western boundaries to further reduce over shadowing of adjacent sites.</p> <p>The proposed development is a good outcome regarding solar access for the adjacent lot on the southern boundary and the other adjacent lot which are also coded R100.</p>
<p><u>Traffic</u></p> <ul style="list-style-type: none"> • Concerns with increased traffic using Broome Street from changes to the surrounding local network as well as from this development, particularly with many young children around the kindergarten and adjacent playground. • The proposed café is likely to create serious traffic and congestion in an already busy area on the corner of Lord Street, with a school and medical centre in the vicinity. • The café is not appropriate for the location as this will increase traffic on an already busy road (Broome Street), where traffic will further increase due to the proposed change to the local road network. This is a clear danger to the primary school which has no pedestrian walkway or speed bumps to protect children and their parents during school drop-offs and pick-ups. 	<p>The site is coded R100- with a maximum height of potentially 6 storeys. The site can be developed to accommodate more housing units than only the 4 proposed for the site. The impact of only 4 apartments mitigates and reduces what the potential increase would be for this site as a result of keeping the number of apartments to such a low number. Also, each apartment has 2 car bays and the required visitor parking. The café also has an allocated car bay for workers.</p> <p>The proposed café is very small in size and would add to the amenity of the locality and especially on the proposed corner location. As mentioned in comments received there are many associated businesses that would benefit from being able to easily walk to the cafe and buy a coffee and a muffin. The café proposed would be used by "local "residents that would in most part walk to the café from their residences or on their way to and from work which they would access via the high frequency bus or train services offered within the site's location.</p>
<p><u>Parking</u></p> <ul style="list-style-type: none"> • The current planning assessment proposes the use of approximately 24 parking spots on Broome Street. This is concerning when there is rarely even close to this number of spots available, and this is further limited during school drop off times and in the evenings when the dog park is busiest. 	<p>The development does not rely on the parking located on the street- it was mentioned as part of the overall information provided as part of the parking management plan.</p> <p>The proposed development has 2 car bays allocated for each unit together with a visitor bay- this complies with relevant requirements and the development is</p>

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Comments Received in Objection:	Applicant Comment
<ul style="list-style-type: none"> There is not enough parking to support a cafe and visitors to the development. Parking on Broome Street is already at a premium, especially due to the day care, dog park and adjacent businesses as well as local residents. Concerns that no bicycle parking is provided and question how this is acceptable or consistent with Vincent's other policies and initiatives. The proposal includes the use of 24 parking spaces on Broome Street. Most spaces are already taken up with visitors from the school, medical centre and dog park. The development has the potential to create an unacceptably high amount of congestion and accidents, which is concerning given the school nearby. There is limited parking availability on Broome Street already due to the day care centre, the medical centre and the dog park nearby. There is not parking available on Broome Street for the café users. It's indicated that 24 parking spots on Broome Street will be used. This is unacceptable and unrealistic in the current situation, where there is a primary school, medical centre and dog park which all occupy the parking spots. This would be made worse by the café, and is against the City's policy of discouraging vehicle traffic in the area. There is ample public transport access and the allowance of 24 car spots on Broome Street shouldn't be granted. Concerned that the development is located on the busy corner of Broome Street and Lord Street where parking is already at a premium. 	<p>not seeking to negate any resident parking from being contained on the development site.</p> <p>Additional bicycle parking spots have been allocated in front of the apartment, these add further to what is provided within the proposed building and another in front of the café to meet any demands for parking a bicycle by customers of the cafe. The café terrace also has a feature handrail that can also accommodate more locations where someone can rest their bicycle as they enjoy their latte with a catch up with friends and or colleagues.</p> <p>The café is also located within a high frequency transport location with both bus and train options nearby. Customers will be locals living nearby or transiting via the train or bus routes nearby.</p> <p>The development should not affect people using the dog park as it would be assumed the park is being used by local residents who walk their dogs to the park. The café may provide a range of dog treats perhaps, that could be of benefit and enjoyment of the local 4-legged friends.</p>
<p><u>Street Setback</u></p> <ul style="list-style-type: none"> The setbacks on Broome Street are less than required and will impact streetscape and amenity of the area. 	<p>The street setback to Broome Street is well articulated with great surveillance of the street from the apartments. A variety of materials have been employed and expressed, and a high amenity of landscaping is proposed. The building is only 4 storeys in height and achieves the required setback on the primary building façade. The balconies have been projected slightly to further articulate the façade. As mentioned, the primary surface of the building complies with the required setbacks and the overall bulk and scale is less than what would be permissible.</p>
<p><u>Side and Rear Setbacks</u></p> <ul style="list-style-type: none"> The side and rear setbacks are much smaller than required. This will 	<p>The side setback complies with required regulations. The rear (or really in this instance the side setback) has been provided with a complete landscaping</p>

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Comments Received in Objection:	Applicant Comment
<p>make the 4 storey building imposing from the neighbouring properties.</p> <ul style="list-style-type: none"> The side setbacks are insufficient to allow for adequate daylight and direct sun onto the adjoining properties. The setbacks do not allow for landscaping between the proposed four storey building and the neighbouring dwellings to the soften visual appearance. 	<p>area for the entirety of the building boundary. This has been applied to provide a green band between the proposed property and the adjacent lot. The overall building height at the western boundary is only 3 storeys, which is 3 storeys less than what would be allowed if designing to the maximum heights allowed. The facade facing this boundary also has a variety of materials to provide high visual appeal.</p>
<p><u>Plot Ratio</u></p> <ul style="list-style-type: none"> The plot ratio exceeds the standards, again resulting in an imposing building adjacent to 1 and 2 storey buildings. 	<p>The plot ratio is inline with the coding of the site. The overall height is less than what is allowable, therefore mitigating impact that could be defined as imposing as the overall bulk and scale has been reduced from it potential maximums.</p>
<p><u>Landscaping</u></p> <ul style="list-style-type: none"> The tree species are deciduous and non-native/endemics. Question how this is acceptable given the City's other policies, and also raise concerns with this meaning that the bulk of the building will be exposed for 5 to 6 months a year. Perennial trees tall enough to cover the building need to be planted to minimise the adverse visual effect on neighbouring properties. The design needs to allow for further setbacks in order to allow for this. 	<p>Most of the planting suggested for the development are native and suitable for their locations. Some of the trees for the development have been changed to include non-deciduous varieties that will grow taller in height than the trees initially proposed. This will further screen and provide a soft edge to the external environments of the building's ground foot print. The planters on the upper terrace have also been increased in with to allow for the planting of more plants and small trees.</p>
<p><u>Other</u></p> <ul style="list-style-type: none"> To minimise kitchen smells from the café kitchen, all outward extractors need to be directed onto Lord Street. The bin location needs also to be on the Lord Street side so as to avoid noise and smell issues to adjoining properties. 	<p>The cafe will have all relevant mechanical services designed in accordance with relevant rules and regulations.</p>

Comments Received Expressing Concern:	Applicant Comment
<p><u>Parking</u></p> <ul style="list-style-type: none"> It's noted that 10 undercroft car parking bays would be provided. Given 	<p>The development does not rely on the parking located on the street- it was</p>

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Comments Received Expressing Concern:	Applicant Comment
<p>that the proposal is for four 4-bedroom apartments, it is highly probable that parking for apartment visitors coupled with the café staff and its patrons will exceed the two bays provided for this purpose. The only available alternative is to park in Broome Street, where street parking is rarely available. Concerned that apartment visitors or café patrons will park in Broome Street or the private car parks of adjoining businesses. This will disadvantage the staff and visitors to these businesses who may be forced to park some distance away from the businesses. There would also be no way of policing unauthorised parking or identifying such vehicles, presenting a major inconvenience to businesses if this were to occur. The City should assist to provide restrictions and signage over the private car parks to ensure that this doesn't occur.</p>	<p>mentioned as part of the overall information provided as part of the parking management plan.</p> <p>The proposed development has 2 car bays allocated for each unit together with a visitor bay- this complies with relevant requirements and the development is not seeking any reduction in the minimum requirements.</p> <p>Additional bicycle parking spots have been allocated in front of the apartment, that ad further to what is provided within the proposed building and another in front of the café to meet any demands for parking a bicycle. The café terrace also has a feature handrail that can also accommodate more locations where someone can rest their bicycle as they enjoy their latte with a catch up with friends and or colleagues.</p> <p>The café is also located within a high frequency transport location with both bus and train options nearby. Customers will be locals living nearby or transiting via the train or bus routes nearby.</p>

Note: Submissions are considered and assessed by issue rather than by individual submitter.

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MINUTES



DESIGN REVIEW PANEL
Wednesday 20 April 2022 at 3.00pm
Venue: Zoom
City of Vincent
Administration and Civic Centre
244 Vincent Street, Leederville

Meeting Attendees	
Design Review Panel Members	<ul style="list-style-type: none"> James Christou - Chairperson Munira Mackay Joe Chindarsi
City of Vincent Officers	<ul style="list-style-type: none"> Jay Naidoo (Manager Development & Design) Karsen Reynolds (Coordinator Planning Services) Mitchell Hoad (Specialist Planner) Dan McCluggage (Senior Urban Planner) Adam Parker (Urban Planner)
Applicants	<u>Item 3.3</u> <ul style="list-style-type: none"> Robert Kirkovski – Arconic Design

Meeting Minutes	
1	Welcome and Declaration of Meeting Opening James Christou declared the meeting open at 3.00pm
2	Apologies Damien Pericles
3	Meeting Business

3.3	<u>Item 3.3</u> Address: No. 357 Lord Street, Highgate Proposal: Mixed Use Development – Four Multiple Dwellings and One Café Applicant: Arconic Design Reason for Referral: Lodged DA – Previously Referred To consider amendments to the proposal made in response to the comments of the Design Review Panel (DRP) on 29 September 2021
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DRP Comments 29 September 2021	
Design quality evaluation	
	<i>Supported</i>
	<i>Pending further attention – refer to detailed comments provided</i>
	<i>Not supported</i>
	<i>Insufficient information for comments to be able to be provided.</i>
Strengths of the Proposal	
<ul style="list-style-type: none"> Good apartment product mix The activation of the ground level Lord Street interface is supported North light access potential to all apartments is good The upper level apartments have a high level of cross ventilation The tapering roof form on the south side of the Lord Street elevation is responsive to the adjoining properties The inclusion of rooftop solar PV panels and a rainwater tank is supported 	
Design Principles	
Principle 1 - Context and character	Principle <i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i>

	<ul style="list-style-type: none"> The applicant is to submit an Urban Design Study investigating the surrounding built form context using this to integrate successful forms, materials and colours into the development to establish stronger links to the surrounding local context. Look at the surrounding buildings such as the TAFE which incorporates breeze blocks and potentially integrate these within the project The entire Broome Street streetscape is inactive and dominated by solid walls and screened car-parking. This is the key concern that will not be supported by the DRP. The applicant is strongly encouraged to consider basement car-parking or re-organisation of the ground level parking to significantly increase the level of activation along Broome Street
Principle 2 - Landscape quality	<p><u>Principle</u> <i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i></p> <ul style="list-style-type: none"> There is minimal landscaping currently included on the site, but it's acknowledged that this is a tight site. The applicant is encouraged to look for further opportunities to increase landscaping on the site In the western setback area there is an opportunity to look for non-exotic species which grow higher If a basement / ramp is provided additional on-structure landscaping would be required due to the resultant loss of landscaping An opportunity exists to create a community 'pocket park' space in north-west landscaped area along Broome Street which wraps around in-front of the building. This could be used by residents as well as the public There are opportunities for further landscaping on the roof terraces. The drawings and renders are not currently co-ordinated. Planter boxes on the south side could also assist in providing the required setbacks as well as controlling the view of adjacent properties to ensure visual privacy from the roof terraces are compliant
Principle 3 - Built form and scale	<p><u>Principle</u> <i>Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.</i></p> <ul style="list-style-type: none"> The overall level of compliance with the planning framework is positive. A minor variation is proposed to plot ratio however this could be considered in this location if a high quality outcome is achieved If the development is reconfigured with a basement the applicant may consider addressing Broome Street with a central pedestrian entry point
Principle 4 - Functionality and build quality	<p><u>Principle</u> <i>Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.</i></p> <ul style="list-style-type: none"> The balcony for Apartment 1 is undersized There is quite a deep snorkel for the balcony in Apartment 2. Consider re-arranging the apartment planning to resolve this. Bedroom 2 is also quite detached from the bathroom and in a 2x1 it's preferred to have the bathroom close to the bedrooms In relation to Apartment 4 and 8 consider bringing the front doors forward to reduce the communal corridor and add the additional area into the apartments The depth of the balcony for Apartment 7 could be reduced to increase the internal size for Bedroom 2 Consider re-organising the floor planning for the middle apartments, particularly Apartments 2 and 3 on the first floor as the lounge / dining room receives limited northern / natural light
Principle 5 - Sustainability	<p><u>Principle</u> <i>Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.</i></p> <ul style="list-style-type: none"> Not addressed by the applicant The applicant will need to engage an ESD consultant and submit an ESD report outlining the ESD initiatives that will be incorporated into the project
Principle 6 -	<p><u>Principle</u></p>

<p>Amenity</p>	<p><i>Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.</i></p> <ul style="list-style-type: none"> • The amenity provided for the apartments is generally positive with all having good potential northern light access • The upper level and side apartments have good cross-ventilation • The depth of the balconies is also positive
<p>Principle 7 - Legibility</p>	<p><i>Principle</i> <i>Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.</i></p> <ul style="list-style-type: none"> • The large pedestrian entry on Lord Street is positive • Concern relating to the lack of activation of the entire Broome Street streetscape as outlined in previous Principles impacts on the legibility of the project
<p>Principle 8 - Safety</p>	<p><i>Principle</i> <i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i></p> <ul style="list-style-type: none"> • No concerns related to safety and security
<p>Principle 9 - Community</p>	<p><i>Principle</i> <i>Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.</i></p> <ul style="list-style-type: none"> • Strong concern in relation to the lack of ground level activation along Broome Street as noted in previous principles. Encourage the applicant to consider a basement to allow more ground floor activation which could also include additional apartments. The topography and slope down Broome Street works in favor of a basement with a ramp on the western side. Alternatively consider re-organisation of the ground level parking to increase the activation of the Broome Street interface. This is the key issue that requires attention. • A central entry core accessed from Broome Street could provide an opportunity for a communal roof terrace rather than exclusive use for individual apartments which would be supported • The café on the corner with outdoor alfresco space is a positive element. Potential to expand the alfresco space further into the corner truncation area pending discussion with the City • The mural is generally a positive element and there is an opportunity to tie this into the area's local context however ensure the location of the artwork will not be covered by development of the adjoining property • There is an opportunity to introduce a 'pocket park' in the north-west corner. The activation of Broome Street at ground level
<p>Principle 10 - Aesthetics</p>	<p><i>Principle</i> <i>Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.</i></p> <ul style="list-style-type: none"> • The artwork intent is positive, but important to note the City's Public Art requirements that artwork will face the public domain as well as ensuring the location of the artwork will not be covered by development of the adjoining property • The level of articulation and material diversity is generally positive however the Broome Street elevation is busy, slightly un-cohesive and should be simplified. Look at the materials closely, including the vertical and horizontal lines which are currently competing against each other • The large central rectangular orange / timber element to Broome Street accentuates the bulk and mass of the development and could be broken down into two smaller elements. • Consider removing the white portal frame outline banding along the Broome Street elevation to simplify the busy aesthetic • The black colour at high level makes the development look top heavy and is visually accentuating bulk and mass of the development • As noted in the Context and Character Principle the forms, colours and materials do not currently reflect, reference or interpret the surrounding local context. Provide an Urban Design Study to inform these elements of the development

Other comments provided by the DRP
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Other general comments provided by the City
<ul style="list-style-type: none"> If streetscape activation concerns to Broome Street can be resolved further discussion should be had with the City's Engineering team and the Department of Planning in terms of what level of development and obstruction is permitted within the truncation at the corner of Broome and Lord Street The City's Public Art Policy requirements should be reviewed in relation to the public art's interface with the public domain
Conclusion
<ul style="list-style-type: none"> There are a number of positive aspects to the development. The proposal includes a minor plot ratio variation which could be support by the DRP on this site given then overall level of compliance with the planning framework if a high quality outcome is achieved. The DRP however will not support the current level of activation of the Broome Street ground level interface which needs to be resolved. In addition to this there are a number of minor items that can be further developed to generate a positive level of amenity for future residents as we as the surrounding community. To be returned to the DRP.

DRP Comments 20 April 2022	
Design quality evaluation	
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	<i>Not supported</i>
	<i>Insufficient information for comments to be able to be provided.</i>
Strengths of the Proposal	
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Design Principles	
Principle 1 - Context and character	<div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 20px; background-color: red; margin-right: 5px;"></div> <div> <p><i>Principle</i></p> <p><i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i></p> <ul style="list-style-type: none"> No change from previous DRP minutes. The aesthetics and streetscape activation to Broome Street needs to be improved as per the comments below. </div> </div>
Principle 2 - Landscape quality	<div style="display: flex; align-items: flex-start;"> <div style="width: 15px; height: 20px; background-color: yellow; margin-right: 5px;"></div> <div> <p><i>Principle</i></p> <p><i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i></p> </div> </div>

	<ul style="list-style-type: none"> No change from previous DRP minutes. Upon review the landscape design is attempting to mitigate the lack of ground floor activation to the northern frontage. Whilst the greenery is helpful it will not be able to mitigate the lack of ground floor activation. Art and seating edge is supported. Café edge is supported. A small tree in deep soil to the NW corner is of some benefit but should be upsized to a medium sized tree and be native in order to contribute to urban biodiversity. The 600mm difference between FFL of ground floor parking to existing pavement level along the northern boundary seems too steep – grade (and levels of FFL) to be reviewed. The inclusion of rear deep soil area (western boundary) is to be commended however ideally this is more meaningfully integrated such that views or access can be afforded. Currently this area is fenced and with no views or informal access supported. This will negatively impact the ongoing maintenance of the area and result in a potential eyesore. Reorientation of store rooms against the southern wall could liberate green open space to be integrated better. The roof garden tree planting is of assistance however uncreative with integration of the planter box. Safety against access to falls (off the roof) seem unresolved and this is a significant concern. Stepping from seat to planter to roof is the issue.
Principle 3 - Built form and scale	<p><u>Principle</u> <i>Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.</i></p> <ul style="list-style-type: none"> No change from previous DRP minutes. Positive to see that the massing of the upper levels has been located centrally with reduced height to the south, west and east sides.
Principle 4 - Functionality and build quality	<p><u>Principle</u> <i>Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.</i></p> <ul style="list-style-type: none"> No change from previous DRP minutes.
Principle 5 - Sustainability	<p><u>Principle</u> <i>Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.</i></p> <ul style="list-style-type: none"> ESD report has now been provided. The inclusion of solar panels and a water tank is positive. The level of cross-ventilation, shading and sunlight access for all apartments is positive. Encourage providing electric car-charging opportunities in the car park.
Principle 6 - Amenity	<p><u>Principle</u> <i>Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.</i></p> <ul style="list-style-type: none"> Positive cross-ventilation and sunlight access for all apartments.
Principle 7 - Legibility	<p><u>Principle</u> <i>Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.</i></p> <ul style="list-style-type: none"> No change from previous DRP minutes.
Principle 8 - Safety	<p><u>Principle</u> <i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i></p> <ul style="list-style-type: none"> No change from previous DRP minutes.

<p>Principle 9 - Community</p>	<p><u>Principle</u> <i>Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.</i></p> <ul style="list-style-type: none"> • The café is positive in terms of interaction and extending the café interface around to Broome Street is a positive change as well. A connection point between the café and footpath to Broome Street is encouraged. • Concerns remain still with level of activation to Broome Street. Recommend looking at the quantity of car parking and whether it's necessary to have two car bays per apartment. Reduced car parking could allow a small studio or additional interactive space to be provided facing Broome Street. • The lack of housing diversity is a concern.
<p>Principle 10 - Aesthetics</p>	<p><u>Principle</u> <i>Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.</i></p> <ul style="list-style-type: none"> • With the shift to four townhouse-apartments, there is an opportunity to develop more vertical expression and express them as four vertical units. This may also provide an opportunity to add a gable form to tie into the residential nature of the surrounding area. • Look to further simplify the mullion and transom design. • The recycled brickwork is really positive at the base. • Look to decrease the high level of contrast between the white render and darker cladding on the upper level/s. The extent of darker cladding makes the upper level/s appear out of proportion with the lower levels.
<p><i>Other comments provided by the DRP</i></p>	
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<p><i>Other general comments provided by the City</i></p>	
<p>• The City will be in contact to discuss the comments above and how this advice can be considered in conjunction with the assessment against the planning framework.</p>	
<p><i>Conclusion</i></p>	
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<p>4</p>	<p>Meeting Close James Christou closed the meeting at 6.10pm The next meeting is scheduled to be held on 4 May 2022</p>

Determination Advice Notes:

1. This is a development approval issued under the City of Vincent Local Planning Scheme No. 2 and the Metropolitan Region Scheme only. It is not a building permit or an approval to commence or carry out development under any other law. It is the responsibility of the applicant/owner to obtain any other necessary approvals and to commence and carry out development in accordance with all other laws.
2. If the development the subject of this approval is not substantially commenced within a period of two years, or another period specified in the approval after the date of determination, the approval will lapse and be of no further effect.
3. A further two years is added to the date by which the development shall be substantially commenced, pursuant to Schedule 4, Clause 4.2 of the Clause 78H Notice of Exemption from Planning Requirements During State of Emergency signed by the Minister for Planning on 8 April 2020.
4. If an applicant or owner is aggrieved by this determination there is a right of review by the State Administrative Tribunal in accordance with the *Planning and Development Act 2005* Part 14. An application must be made within 28 days of the determination.
5. No verge trees shall be REMOVED. The verge trees shall be RETAINED and PROTECTED from any damage including unauthorized pruning.
6. An Infrastructure Protection Bond together with a non-refundable inspection fee shall be lodged with the City by the applicant, prior to the commencement of works, and will be held until all building/development works have been completed and any disturbance of, or damage to the City's infrastructure, including verge trees, has been repaired/reinstated to the satisfaction of the City. An application for the refund of the bond shall be made in writing. The bond is non-transferable.
7. The movement of all path users, with or without disabilities, within the road reserve, shall not be impeded in any way during the course of the building works. This area shall be maintained in a safe and trafficable condition and a continuous path of travel (minimum width 1.5 metres) shall be maintained for all users at all times during construction works. Permits are required for placement of any material within the road reserve.
8. The owner/applicant may be required to obtain a Work Zone Permit from the City in order to satisfy the Construction Management Plan condition due to the location of the site on a regional road with access constraints. The requirement for, and cost of any such permit shall be determined by the City following the lodgement of a Building Permit.
9. The applicant and landowner are advised that sufficient parking can be provided on the subject site and as such the City of Vincent will not issue a residential or visitor car parking permit to any owner or occupier of the multiple dwellings in accordance with the City's Policy No. 3.9.3 – Parking Permits. This information should be provided to all prospective purchasers and it is recommended that a notice be placed on Sales Contracts to advise purchasers of this restriction.
10. The owners of the subject land shall obtain the consent of the owners of relevant adjoining properties before entering those properties in order to make good the boundary walls.
11. The City encourages landscaping methods and species selection which do not rely on reticulation.
12. All storm water produced on the subject land shall be retained on site, by suitable means to the full satisfaction of the City. No further consideration shall be given to the disposal of stormwater 'offsite' without the submission of a geotechnical report from a qualified consultant. Should approval to dispose of stormwater 'offsite' be subsequently provided, detailed design drainage plans and associated calculations for the proposed stormwater disposal shall be lodged together with the building permit application working drawings.

Determination Advice Notes:

13. All new crossovers to lots are subject to a separate application to be approved by the City. All new crossovers shall be constructed in accordance with the City's Standard Crossover Specifications, which specify that the portion of the existing footpath traversing the proposed crossover (subject to the Footpath being in good condition as determined by the Infrastructure and Environment Services Directorate), must be retained. The proposed crossover levels shall match into the existing footpath levels. Should the footpath not to be in satisfactory condition, it must be replaced with in-situ concrete panels in accordance with the City's specification for reinstatement of concrete paths.
14. Prior to the first occupation of the development, redundant or "blind" crossovers shall be removed and the verge and kerb made good to the satisfaction of the City, at the applicant/owner's full expense.
15. All mechanical devices/installations (i.e. roller doors, air conditioners, exhaust outlets, pool pumps, compressors etc), to be located in a position that will not result in the emission of unreasonable noise, in accordance with the *Environmental Protection Act 1986* and *Environmental Protection (Noise) Regulations 1997*.
16. The business must comply with the *Food Act 2008*, *Food Regulations 2009* and the *Australia New Zealand Food Standards Code*. The applicant must register with the City's Health Services prior to operation of the food business. Please contact Health Services on 9273 6533 upon receipt of this approval to discuss the requirements further with an Environmental Health Officer.
17. This approval is not an authority to ignore any constraint to development on the land, which may exist through statute, regulation, contract or on title, such as an easement or restrictive covenant. It is the responsibility of the applicant and not the City to investigate any such constraints before commencing development. This approval will not necessarily have regard to any such constraint to development, regardless of whether or not it has been drawn to the City's attention.
18. The applicant is responsible for ensuring that all lot boundaries as shown on the approved plans are correct.
19. As per the Department of Water and Environmental Regulation's groundwater atlas, the maximum groundwater table encountered at this site was 12.5 metres AHD. It is recommended that geotechnical advice be obtained prior to designing the storm water system as this may have an impact on floor levels and building heights.
20. The proposed levels at the property boundary, including any driveways and pedestrian access points, shall match the existing footpath levels which are to be maintained. Any adjustment to the levels is to be achieved within the property, and details of all existing and proposed levels should be shown in the submitted working drawings at building permit stage.
21. There is a sewer line at the rear of the property, and approval from the Water Corporation may be required prior to works commencing.